APPENDIX

Appendix A: Process Operating Data
Appendix B: Calculations
Appendix C: Raw Field Data and Calibration Data Sheets
Appendix D: Reduced Field Data Sheets
Appendix E: Sampling Log and Chain of Custody Records
Appendix F: Analytical Data Sheets
Appendix G: List of Participants

Valley Power Plant - Boiler # 3
Mercury ICR
CEM Data
November 30, 19999

		Stack Data					Boiler Data				
Test Run #	Time	S2STEMP (DEGFAHRE)	S2CPCO2 (PERCENT)	S2CPFLOW (SCFH)	S2NOX#M1 (LB/MMBTU)	S2SO2#M1 (LB/MMBTU)	U3STEAM (KLBS/HR)	U3STEMP (KLBS/HR)	U3HEAT1 (MMBTU/HR)	D3CO2 (PERCENT)	D3NOX#M1 (LB/MMBTU)
1	9:00 - 10:19	312.1	12.7	23150098	0.526	1.59	652	752.3	938	12.97	0.633
2	12:00 - 14:17	313.1	12.3	22927015	0.545	1.61	654	754.8	923	12.90	0.647
3	14:50 - 17:10	313.0	12.2	23082755	0.539	1.65	646	744.9	900	12.77	0.653
	Average	**312.7**	**12.4**	**23053289**	**0.536**	**1.61**	**651**	**750.7**	**920**	**12.88**	**0.644**

Valley Power Plant - Boiler # 3
Mercury ICR
CEM Data
November 30, 19999

	Stack Data					Boiler Data				
	S2STEMP	S2CPCO2	S2CPFLOW	S2NOX#M1	S2SO2#M1	U3STEAM	U3STEMP	U3HEAT1	D3CO2	D3NOX#M1
Time	(DEGFAHRE)	(PERCENT)	(SCFH)	(LB/MMBTU)	(LB/MMBTU)	(KLBS/HR)	(KLBS/HR)	(MMBTU/HR)	(PERCENT)	(LB/MMBTU)
0:00	299.3	11.8	18425114	0.421	1.59	406	468.9	597	11.90	0.444
1:00	292.7	11.7	17550264	0.426	1.60	393	453.3	563	11.83	0.446
2:00	288.1	12.0	17036714	0.406	1.58	394	455.0	561	11.85	0.453
3:00	287.3	12.0	17112364	0.405	1.56	404	466.7	570	11.79	0.454
4:00	286.9	12.1	17366736	0.405	1.57	406	468.2	575	11.85	0.459
5:00	289.2	12.4	19057206	0.427	1.58	461	531.4	647	12.37	0.486
6:00	293.8	12.4	20451186	0.442	1.58	490	565.4	695	12.58	0.504
7:00	297.6	12.6	20664826	0.447	1.57	501	578.3	716	12.66	0.509
8:00	306.7	12.7	23213342	0.528	1.59	641	739.4	906	13.00	0.624
9:00	**312.1**	**12.7**	**23279734**	**0.524**	**1.58**	**651**	**750.7**	**937**	**12.97**	**0.631**
10:00	**312.0**	**12.7**	**23020462**	**0.527**	**1.59**	**653**	**753.8**	**939**	**12.97**	**0.634**
11:00	312.0	12.6	22979474	0.533	1.59	653	754.0	942	12.66	0.635
12:00	**312.9**	**12.5**	**22932700**	**0.544**	**1.60**	**654**	**755.1**	**937**	**12.93**	**0.640**
13:00	**313.3**	**12.1**	**22921330**	**0.545**	**1.62**	**654**	**754.5**	**908**	**12.86**	**0.653**
14:00	312.7	12.0	22774768	0.540	1.64	648	748.2	890	12.82	0.654
15:00	**312.9**	**12.1**	**23002266**	**0.541**	**1.65**	**647**	**746.0**	**898**	**12.77**	**0.653**
16:00	**313.1**	**12.2**	**23163244**	**0.536**	**1.64**	**645**	**743.8**	**901**	**12.76**	**0.653**
17:00	312.7	12.2	22941846	0.527	1.63	607	700.8	861	12.73	0.627
18:00	311.8	12.1	22984118	0.523	1.65	565	651.9	773	12.64	0.587
19:00	316.4	12.1	23869440	0.524	1.65	571	658.9	798	12.55	0.576
20:00	312.2	12.0	22412680	0.484	1.64	539	622.3	751	12.51	0.534
21:00	305.7	11.9	20526402	0.443	1.63	478	552.0	680	12.29	0.500
22:00	303.5	12.0	21429958	0.471	1.63	517	596.4	716	12.41	0.531
23:00	298.9	10.4	14970989	0.415	1.53	311	358.3	433	10.62	0.461
Average	304.3	12.1	21003632	0.483	1.60	537	619.7	758	12.43	0.556
Maximum	316.4	12.7	23869440	0.545	1.65	654	755.1	942	13.00	0.654
Minimum	286.9	10.4	14970989	0.405	1.53	311	358.3	433	10.62	0.444

Hours in **BOLD** represent data used in calculating average during test run.

Valley Power Plant - Boiler # 3
Mercury ICR
Operational Data
November 30, 1999

Test Run #	Time	Main Steam Flow (klb/hr) 23MS0F80	Total Air Flow (%) 23BA0F80	Baghouse Differential Pressure (in H2O) 23PE0P4S	Boiler O2 (%) O021Z006	Boiler Opacity (%) 23BA0A90	3A Pulverized Coal Feed (klb/hr) 23BYAF10	3B Pulverized Coal Feed (klb/hr) 23BYBF10	Total Pulverized Coal Feed (klb/hr) calc as fired
1	9:00 - 11:25	650.2	87.7	4.45	3.71	3.8	33.0	34.0	67.0
2	12:00 - 14:17	652.0	88.0	4.75	3.70	3.3	32.8	33.9	66.6
3	14:50 - 17:10	644.3	87.7	4.50	3.73	3.0	32.0	33.4	65.4
	Average	**648.8**	**87.8**	**4.56**	**3.71**	**3.4**	**32.6**	**33.7**	**66.3**

Historical Tabular Trend 5
30-Nov-99

Time	Main Steam Flow 23MS0F80 KLBH ACTUAL	Total Air Flow 23BA0F80 PERCNT ACTUAL	Baghouse Differential Pressure 23PE0P4S WC ACTUAL	Boiler O2 O021Z006 PCT ACTUAL	Boiler Opacity 23BA0A90 PERCNT ACTUAL	3A Pulverized Coal Feed 23BYAF10 KLBH ACTUAL	3B Pulverized Coal Feed 23BYBF10 KLBH ACTUAL	Total Coal Flow KLBH CALC
9:00:52	645	88	5.5	3.7	4	33	34	67
9:02:05	650	87	5.5	3.7	4	33	34	67
9:03:18	645	87	5.5	3.7	4	33	34	67
9:04:31	650	87	5.7	3.7	4	33	34	67
9:05:44	655	88	5.3	3.7	4	33	34	67
9:06:57	645	87	5.3	3.7	4	33	34	67
9:08:10	644	87	5.5	3.7	4	33	34	67
9:09:23	650	87	5.5	3.7	4	33	34	67
9:10:36	642	88	5.4	3.7	0	33	34	67
9:11:49	647	87	5.1	3.7	4	33	34	67
9:13:02	652	87	5.1	3.7	4	33	33	66
9:14:15	647	88	5.1	3.7	4	33	34	67
9:15:28	647	88	5.1	3.7	4	33	34	67
9:16:41	652	88	5.3	3.7	4	33	34	67
9:17:54	646	87	4.6	3.7	4	33	34	67
9:19:07	652	88	4.8	3.7	4	33	34	67
9:20:20	647	88	4.8	3.7	4	33	34	67
9:21:33	653	87	5	3.7	4	33	34	67
9:22:46	651	87	5	3.7	4	33	34	67
9:23:59	646	87	4.4	3.7	4	33	34	67
9:25:12	646	87	4.6	3.7	4	33	34	67
9:26:25	651	87	4.6	3.7	4	33	34	67
9:27:38	645	87	4.6	3.7	4	33	34	67
9:28:51	646	87	4.8	3.7	4	33	34	67
9:30:04	651	87	4.8	3.7	4	33	34	67
9:31:17	651	87	2.3	3.7	4	33	34	67
9:32:30	651	87	8.5	3.7	4	33	34	67
9:33:43	651	88	4.1	3.7	6	33	34	67
9:34:56	645	88	4.6	3.7	4	33	34	67
9:36:09	650	88	4.6	3.7	3	33	34	67
9:37:22	650	87	4.8	3.7	3	33	34	67
9:38:35	657	88	7.3	3.7	3	33	34	67
9:39:48	651	88	4.9	3.7	3	33	34	67
9:41:01	646	88	3.7	3.7	4	33	34	67
9:42:14	646	87	6.4	3.7	4	33	34	67
9:43:27	651	88	4.4	3.7	4	33	34	67
9:44:40	651	87	3.4	3.7	4	32	34	66
9:45:53	641	87	3.9	3.7	4	33	34	67
9:47:06	641	87	4.3	3.9	4	33	34	67
9:48:19	647	88	4.4	3.7	4	33	34	67
9:49:32	651	87	4.2	3.7	4	33	34	67
9:50:45	651	88	4.2	3.7	4	33	34	67
9:51:58	651	87	4.7	3.7	4	33	34	67
9:53:11	651	88	6.2	3.7	4	33	35	68
9:54:24	651	87	4.6	3.7	4	33	34	67
9:55:37	646	88	4.8	3.7	4	33	34	67
9:56:50	647	88	4.8	3.7	4	33	34	67
9:58:03	647	88	4.4	3.7	4	33	34	67
9:59:16	647	88	2.3	3.7	4	33	34	67
10:00:29	652	88	2.1	3.9	4	33	34	67
10:01:42	652	88	2.1	3.7	4	33	34	67
10:02:55	652	88	4.4	3.7	4	33	34	67
10:04:08	646	87	4.3	3.7	4	33	34	67
10:05:21	651	87	4.3	3.7	4	33	34	67
10:06:34	657	87	4.3	3.7	4	33	34	67
10:07:47	656	88	4.5	3.7	4	33	34	67

Historical Tabular Trend 5
30-Nov-99

Time	Main Steam Flow 23MS0F80 KLBH ACTUAL	Total Air Flow 23BA0F80 PERCNT ACTUAL	Baghouse Differential Pressure 23PE0P4S WC ACTUAL	Boiler O2 O021Z006 PCT ACTUAL	Boiler Opacity 23BA0A90 PERCNT ACTUAL	3A Pulverized Coal Feed 23BYAF10 KLBH ACTUAL	3B Pulverized Coal Feed 23BYBF10 KLBH ACTUAL	Total Coal Flow KLBH CALC
10:09:00	656	88	4.5	3.7	4	33	34	67
10:10:13	651	88	3.8	3.7	3	33	34	67
10:11:26	651	88	4.4	3.7	3	33	34	67
10:12:39	646	88	4.4	3.7	3	33	34	67
10:13:52	650	88	4.4	3.7	3	33	34	67
10:15:05	650	88	4.4	3.7	3	33	35	68
10:16:18	650	88	3.9	3.9	3	33	34	67
10:17:31	650	88	4.2	3.9	3	33	34	67
10:18:44	651	88	4.2	3.9	3	33	34	67
10:19:57	651	88	4.2	3.7	3	33	34	67
10:21:10	647	88	4.2	3.7	3	33	34	67
10:22:23	652	88	4.6	3.7	3	33	34	67
10:23:36	647	88	4.4	3.7	3	33	34	67
10:24:49	652	88	4.4	3.7	3	33	34	67
10:26:02	646	88	3.6	3.7	3	33	34	67
10:27:15	652	88	4.4	3.7	4	33	34	67
10:28:28	652	88	5.9	3.7	4	33	34	67
10:29:41	652	88	4.7	3.7	4	33	34	67
10:30:54	652	88	4.7	3.7	4	33	34	67
10:32:07	652	88	4.8	3.7	4	33	34	67
10:33:20	652	87	3.7	3.7	4	33	34	67
10:34:33	652	88	3.9	3.7	4	33	34	67
10:35:46	652	88	3.9	3.7	4	33	34	67
10:36:59	652	88	3.9	3.7	4	33	34	67
10:38:12	646	88	4	3.9	4	33	34	67
10:39:25	652	88	4	3.7	4	33	34	67
10:40:38	652	88	4.2	3.7	4	33	34	67
10:41:51	652	88	4	3.7	4	33	34	67
10:43:04	652	88	4.1	3.7	4	33	34	67
10:44:17	652	88	4.1	3.7	4	33	34	67
10:45:30	652	88	4.1	3.7	4	33	34	67
10:46:43	658	88	4.1	3.7	4	33	34	67
10:47:56	653	88	4.1	3.7	4	33	34	67
10:49:09	658	88	4.1	3.7	4	33	34	67
10:50:22	653	88	4.2	3.7	4	33	34	67
10:51:35	647	88	3.9	3.7	4	33	34	67
10:52:48	652	88	5.3	3.7	4	33	34	67
10:54:01	652	88	4.3	3.7	4	33	34	67
10:55:14	652	88	4.3	3.7	4	33	34	67
10:56:27	652	88	4.3	3.7	4	33	34	67
10:57:40	652	88	2	3.7	4	33	34	67
10:58:53	652	88	2	3.7	4	33	34	67
11:00:06	652	88	4.1	3.7	4	33	34	67
11:01:19	652	88	4.1	3.7	4	33	34	67
11:02:32	646	87	4.1	3.7	4	33	34	67
11:03:45	652	88	4.0F,	,	,	,	,	,
11:04:58	652	88	4.0F,	,	,	,	,	,
11:06:11	652	88	4.0F,	,	,	,	,	,
11:07:24	652	88	4.0F,	,	,	,	,	,
11:08:37	652	88	4.0F,	,	,	,	,	,
11:09:50	652	88	4.0F,	,	,	,	,	,
11:11:03	652	88	4.2	3.7	4	32	34	66
11:12:16	657	88	4.2	3.7	4	33	34	67
11:13:29	652	89	4.2	3.7	4	33	34	67
11:14:42	652	88	4.2	3.7	4	33	34	67
11:15:55	653	88	4.2	3.7	4	33	34	67

Historical Tabular Trend 5
30-Nov-99

Time	Main Steam Flow 23MS0F80 KLBH ACTUAL	Total Air Flow 23BA0F80 PERCNT ACTUAL	Baghouse Differential Pressure 23PE0P4S WC ACTUAL	Boiler O2 O021Z006 PCT ACTUAL	Boiler Opacity 23BA0A90 PERCNT ACTUAL	3A Pulverized Coal Feed 23BYAF10 KLBH ACTUAL	3B Pulverized Coal Feed 23BYBF10 KLBH ACTUAL	Total Coal Flow KLBH CALC
11:17:08	648	88	4.2	3.7	4	33	34	67
11:18:21	642	88	4.2	3.7	4	33	34	67
11:19:34	648	88	4.2	3.7	4	33	34	67
11:20:47	648	87	4.2	3.7	4	33	34	67
11:22:00	648	88	4.2	3.7	4	33	34	67
11:23:13	653	88	4.7	3.7	4	33	34	67
11:24:26	653	88	4.3	3.7	4	33	34	67
11:25:39	653	88	4.3	3.7	4	33	34	67
	650.2	**87.7**	**4.45**	**3.71**	**3.8**	**33.0**	**34.0**	**67.0**
12:00:56	653	88	4.6	3.7	3	33	34	67
12:02:09	653	88	4.6	3.7	3	33	34	67
12:03:22	653	89	4.6	3.7	3	33	34	67
12:04:35	653	89	4.6	3.7	3	33	34	67
12:05:48	652	89	4.6	3.7	3	33	34	67
12:07:01	652	88	4.6	3.7	3	33	34	67
12:08:14	658	89	4.6	3.7	3	33	34	67
12:09:27	652	88	4.6	3.7	3	33	34	67
12:10:40	652	88	4.6	3.7	3	33	34	67
12:11:53	652	88	4.7	3.7	3	33	34	67
12:13:06	647	88	4.7	3.7	3	33	34	67
12:14:19	652	88	4.7	3.9	3	33	34	67
12:15:32	652	88	4.7	3.7	3	33	34	67
12:16:45	652	88	4.7	3.7	3	33	34	67
12:17:58	652	88	4.8	3.7	3	33	34	67
12:19:11	652	88	4.8	3.7	3	33	34	67
12:20:24	656	89	4.8	3.7	3	33	34	67
12:21:37	651	89	4.8	3.7	3	33	34	67
12:22:50	656	89	4.8	3.7	3	33	34	67
12:24:03	656	89	4.8	3.7	3	33	34	67
12:25:16	656	88	4.8	3.7	3	33	34	67
12:26:29	650	87	4.8	3.7	3	33	36	69
12:27:42	655	89	2.4	3.7	3	33	34	67
12:28:55	650	87	6.3	3.7	3	33	34	67
12:30:08	650	89	5.7	3.7	3	33	34	67
12:31:21	655	89	5.9	3.7	3	33	34	67
12:32:34	655	88	5.7	3.7	3	33	34	67
12:33:47	655	88	5.7	3.7	3	33	34	67
12:35:00	654	88	5.6	3.7	3	33	34	67
12:36:13	648	88	5.6	3.7	3	33	34	67
12:37:26	653	89	5.6	3.7	3	33	34	67
12:38:39	653	89	5.6	3.7	3	32	34	66
12:39:52	653	89	5.6	3.7	3	32	34	66
12:41:05	653	87	5.3	3.7	3	33	34	67
12:42:18	659	89	5.8	3.7	3	33	34	67
12:43:31	653	89	6.5	3.7	3	33	34	67
12:44:44	648	87	5.5	3.7	3	33	34	67
12:45:57	648	88	5.5	3.7	3	33	34	67
12:47:10	653	87	5.1	3.7	3	33	34	67
12:48:23	653	89	5.4	3.7	3	33	34	67
12:49:36	653	88	5.4	3.7	3	33	34	67
12:50:49	653	88	5.4	3.7	3	33	34	67
12:52:02	654	87	6.3	3.7	3	33	34	67
12:53:15	652	88	5.4	3.7	3	33	34	67
12:54:28	652	88	5.1	3.7	3	33	34	67
12:55:41	652	88	5.4	3.7	3	33	34	67
12:56:54	652	88	7.5	3.7	3	33	34	67

Historical Tabular Trend 5
30-Nov-99

Time	Main Steam Flow 23MS0F80 KLBH ACTUAL	Total Air Flow 23BA0F80 PERCNT ACTUAL	Baghouse Differential Pressure 23PE0P4S WC ACTUAL	Boiler O2 O021Z006 PCT ACTUAL	Boiler Opacity 23BA0A90 PERCNT ACTUAL	3A Pulverized Coal Feed 23BYAF10 KLBH ACTUAL	3B Pulverized Coal Feed 23BYBF10 KLBH ACTUAL	Total Coal Flow KLBH CALC
12:58:07	652	88	2.4	3.7	3	33	34	67
12:59:20	652	88	5	3.7	3	33	34	67
13:00:33	652	88	4.6	3.7	3	33	34	67
13:01:46	652	88	4.6	3.7	3	33	34	67
13:02:59	652	89	4.6	3.7	3	33	34	67
13:04:12	647	88	4.5	3.7	3	33	34	67
13:05:25	652	88	4.1	3.7	3	33	34	67
13:06:38	652	88	5	3.7	3	33	34	67
13:07:51	652	88	5	3.7	3	33	34	67
13:09:04	652	88	5	3.7	3	33	34	67
13:10:17	652	89	4.5	3.7	4	33	34	67
13:11:30	652	88	4.5	3.7	4	33	34	67
13:12:43	652	88	4.5	3.7	4	32	34	66
13:13:56	652	88	4.7	3.7	4	33	34	67
13:15:09	652	88	4.7	3.7	4	32	34	66
13:16:22	657	89	3.7	3.7	5	33	34	67
13:17:35	657	89	3.7	3.7	4	33	34	67
13:18:48	657	89	3.9	3.7	4	33	34	67
13:20:01	652	89	3.9	3.7	4	33	34	67
13:21:14	658	88	3.9	3.7	4	33	34	67
13:22:27	653	88	3.9	3.7	4	33	34	67
13:23:40	653	89	8.3	3.7	4	33	34	67
13:24:53	652	89	6.2	3.7	4	33	34	67
13:26:06	658	89	4.8	3.7	4	33	34	67
13:27:19	653	88	4.9	3.7	4	33	34	67
13:28:32	653	88	4.9	3.7	4	33	34	67
13:29:45	653	88	4.5	3.7	4	33	34	67
13:30:58	653	88	4.8	3.7	4	33	34	67
13:32:11	658	88	4.8	3.7	4	33	34	67
13:33:24	657	88	4.8	3.7	4	33	34	67
13:34:37	657	88	4.8	3.7	4	33	34	67
13:35:50	657	88	4.2	3.7	4	33	34	67
13:37:03	651	89	4.5	3.7	4	33	34	67
13:38:16	656	88	4.5	3.7	4	33	34	67
13:39:29	656	88	4.8	3.7	4	33	34	67
13:40:42	656	88	4.9	3.7	4	33	34	67
13:41:55	657	88	4.7	3.7	4	33	34	67
13:43:08	657	88	4.5	3.7	4	33	34	67
13:44:21	651	88	4.5	3.7	4	33	34	67
13:45:34	656	88	4.5	3.7	4	32	34	66
13:46:47	656	88	4.8	3.7	4	33	34	67
13:48:00	649	87	4.6	3.7	4	32	34	66
13:49:13	649	87	4.5	3.7	3	32	34	66
13:50:26	652	88	4.5	3.7	3	33	34	67
13:51:39	647	87	4.5	3.7	3	32	33	65
13:52:52	647	87	4.5	3.7	3	32	34	66
13:54:05	647	87	4.5	3.7	3	32	33	65
13:55:18	647	87	4	3.7	3	32	34	66
13:56:31	647	87	4	3.7	3	32	34	66
13:57:44	647	87	4	3.7	3	32	33	65
13:58:57	647	87	4	3.7	3	32	33	65
14:00:10	647	87	4.3	3.7	3	32	33	65
14:01:23	647	87	4.4	3.7	3	32	33	65
14:02:36	647	87	4.5	3.7	3	32	33	65
14:03:49	647	87	4.5	3.7	3	32	33	65
14:05:02	645	87	3.5	3.7	3	33	33	66

Historical Tabular Trend 5
30-Nov-99

Time	Main Steam Flow 23MS0F80 KLBH ACTUAL	Total Air Flow 23BA0F80 PERCNT ACTUAL	Baghouse Differential Pressure 23PE0P4S WC ACTUAL	Boiler O2 O021Z006 PCT ACTUAL	Boiler Opacity 23BA0A90 PERCNT ACTUAL	3A Pulverized Coal Feed 23BYAF10 KLBH ACTUAL	3B Pulverized Coal Feed 23BYBF10 KLBH ACTUAL	Total Coal Flow KLBH CALC
14:06:15	650	87	4.3	3.7	3	33	34	67
14:07:28	649	87	4.5	3.7	3	32	33	65
14:08:41	648	87	4.5	3.7	3	32	34	66
14:09:54	648	88	4.5	3.7	3	32	33	65
14:11:07	648	88	4.5	3.7	3	32	33	65
14:12:20	648	87	3.5	3.7	3	32	33	65
14:13:33	648	88	3.5	3.7	3	32	34	66
14:14:46	642	87	3.5	3.7	3	32	33	65
14:15:59	648	87	3.8	3.7	3	32	34	66
14:17:12	648	88	3.8	3.7	3	32	33	65
	652.0	**88.0**	**4.75**	**3.70**	**3.3**	**32.8**	**33.9**	**66.6**
14:50:03	647	88	4.1	3.7	3	32	33	65
14:51:16	642	88	4.3	3.7	3	32	33	65
14:52:29	647	88	4.3	3.7	3	32	34	66
14:53:42	642	88	4.3	3.7	3	32	34	66
14:54:55	647	88	4.3	3.7	3	32	34	66
14:56:08	647	88	4.3	3.7	3	32	34	66
14:57:21	647	88	4.3	3.7	3	32	33	65
14:58:34	652	88	4.3	3.7	3	32	33	65
14:59:47	646	88	4.3	3.7	3	32	33	65
15:01:00	648	88	4.3	3.9	3	32	33	65
15:02:13	646	88	4.3	3.9	3	32	33	65
15:03:26	646	88	4.3	3.9	3	32	34	66
15:04:39	646	88	4.3	3.9	3	32	33	65
15:05:52	651	88	4.3	3.7	3	32	34	66
15:07:05	645	88	4.3	3.7	3	32	33	65
15:08:18	645	88	4.3	3.7	3	32	33	65
15:09:31	645	88	4.3	3.7	3	32	33	65
15:10:44	645	87	4.3	3.7	3	32	34	66
15:11:57	645	88	4.3	3.7	3	32	33	65
15:13:10	645	87	4.3	3.7	3	32	33	65
15:14:23	645	88	4.5	3.7	3	32	33	65
15:15:36	650	88	4.5	3.7	3	32	33	65
15:16:49	644	87	4.5	3.7	3	32	33	65
15:18:02	644	87	6.9	3.7	3	32	33	65
15:19:15	644	88	7.3	3.7	3	32	34	66
15:20:28	644	87	5.1	3.7	3	32	33	65
15:21:41	650	87	5.3	3.7	3	32	33	65
15:22:54	650	88	5.3	3.7	3	32	33	65
15:24:07	650	88	4.4	3.7	3	32	34	66
15:25:20	645	87	5	3.7	3	32	33	65
15:26:33	645	88	5.2	3.7	3	32	34	66
15:27:46	645	88	5.2	3.7	3	32	34	66
15:28:59	645	88	5.2	3.7	3	32	33	65
15:30:12	645	87	5.2	3.7	3	32	33	65
15:31:25	645	88	5.1	3.7	3	32	33	65
15:32:38	645	88	5.1	3.7	3	32	34	66
15:33:51	650	88	5.1	3.7	3	32	34	66
15:35:04	644	88	5.1	3.7	3	32	34	66
15:36:17	644	88	5.1	3.7	3	32	34	66
15:37:30	644	87	4.7	3.7	3	32	33	65
15:38:43	644	88	4.9	3.7	3	32	33	65
15:39:56	644	87	4.9	3.7	3	32	34	66
15:41:09	644	87	4.9	3.7	3	32	33	65
15:42:22	644	87	4.9	3.7	3	32	33	65
15:43:35	644	87	4.2	3.7	3	32	33	65

Historical Tabular Trend 5
30-Nov-99

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15:44:48	643	87	4.9	3.7	3	32	34	66
15:46:01	643	87	4.7	3.7	3	32	34	66
15:47:14	643	87	4.7	3.7	3	32	33	65
15:48:27	649	87	2.3	3.7	3	32	34	66
15:49:40	649	88	1.9	3.7	4	32	33	65
15:50:53	649	88	4.4	3.7	3	32	34	66
15:52:06	642	87	4.4	3.7	3	32	34	66
15:53:19	642	88	4.4	3.7	3	32	34	66
15:54:32	648	88	4.4	3.7	3	32	33	65
15:55:45	641	87	4.4	3.9	3	32	33	65
15:56:58	641	87	4.7	3.9	3	32	33	65
15:58:11	647	87	4.7	3.7	3	32	33	65
15:59:24	647	87	4.7	3.7	3	32	34	66
16:00:37	640	87	4.4	3.7	3	32	34	66
16:01:50	645	87	4.6	3.7	3	32	33	65
16:03:03	645	87	4.4	3.7	3	32	33	65
16:04:16	645	87	4.6	3.7	3	32	33	65
16:05:29	645	88	4.6	3.7	3	32	33	65
16:06:42	640	87	3.5	3.7	3	32	33	65
16:07:55	640	87	3.7	3.7	3	32	33	65
16:09:08	645	87	3.8	3.7	3	32	33	65
16:10:21	645	88	3.8	3.7	3	32	34	66
16:11:34	645	88	3.8	3.7	3	32	33	65
16:12:47	645	88	3.8	3.7	3	32	34	66
16:14:00	645	88	3.8	3.7	3	32	34	66
16:15:13	645	88	3.8	3.7	3	32	33	65
16:16:26	644	87	8.4	3.7	3	32	33	65
16:17:39	644	87	4.6	3.7	3	32	33	65
16:18:52	649	87	4.8	3.7	3	32	34	66
16:20:05	649	87	4.6	3.7	3	32	34	66
16:21:18	644	87	4.6	3.7	3	32	33	65
16:22:31	638	87	4.4	3.7	3	32	33	65
16:23:44	644	89	4.6	3.7	3	32	34	66
16:24:57	643	88	4.6	3.9	3	32	34	66
16:26:10	643	88	4.6	3.9	3	32	33	65
16:27:23	648	88	4.6	3.9	3	32	33	65
16:28:36	643	88	4.9	3.9	3	32	33	65
16:29:49	636	88	4.7	3.9	3	32	33	65
16:31:02	641	88	4.7	3.9	3	32	34	66
16:32:15	641	88	4.7	3.9	3	33	34	67
16:33:28	641	88	4.7	3.7	3	32	33	65
16:34:41	641	88	4.7	3.7	3	32	33	65
16:35:54	647	88	4.7	3.7	3	32	33	65
16:37:07	642	88	4.5	3.7	3	32	34	66
16:38:20	642	88	4.7	3.7	3	32	34	66
16:39:33	642	88	4.7	3.7	3	32	33	65
16:40:46	642	88	4.8	3.7	3	32	33	65
16:41:59	642	88	4.5	3.7	3	32	33	65
16:43:12	642	88	4.7	3.7	3	32	34	66
16:44:25	642	88	4.7	3.7	3	32	34	66
16:45:38	642	88	2.5	3.7	3	32	33	65
16:46:51	648	88	4.6	3.7	3	32	33	65
16:48:04	647	88	4	3.7	3	32	33	65
16:49:17	641	88	4	3.9	3	32	34	66
16:50:30	641	88	4	3.7	3	32	33	65
16:51:43	642	88	4	3.7	3	32	34	66

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16:52:56	636	87	4	3.7	3	32	34	66
16:54:09	642	89	4.6	3.7	3	32	33	65
16:55:22	642	88	4.6	3.7	3	32	33	65
16:56:35	642	88	4.6	3.7	3	32	33	65
16:57:48	642	88	3.7	3.7	3	32	33	65
16:59:01	648	88	4.4	3.7	3	32	34	66
17:00:14	642	88	4.4	3.9	3	32	33	65
17:01:27	642	88	4.4	3.9	3	32	33	65
17:02:40	642	88	4.6	3.7	3	32	33	65
17:03:53	642	88	4.7	3.7	3	32	33	65
17:05:06	642	88	3.7	3.7	3	32	33	65
17:06:19	642	88	3.7	3.7	3	32	33	65
17:07:32	642	87	3.7	3.7	3	32	33	65
17:08:45	642	87	3.7	3.7	3	32	33	65
17:09:58	642	87	3.7	3.7	3	32	33	65
	644.3	**87.7**	**4.50**	**3.73**	**3.0**	**32.0**	**33.4**	**65.4**

SUMMARY OF RESULTS CALCULATIONS

$$Vm\,(std) = 17.647 \times Vm \times \left[\frac{P_{bar} + \frac{DH}{13.6}}{(460 + Tm)}\right] \times Y$$

$$Vw\,(std) = 0.0471 \times Vlc$$

Vlc = water + silica net

$$Bws = \left[\frac{Vw\,(std)}{Vw\,(std) + Vm\,(std)}\right]$$

$$Md = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + [0.28 \times (100 - \%CO_2 - \%O_2)]$$

$$MS = Md \times (1 - Bws) + (18 \times Bws)$$

$$Vs = \sqrt{\frac{(Ts + 460)}{Ms \times Ps}} \times \sqrt{DP} \times Cp \times 85.49$$

Cp = pitot tube correction factor
Ps = absolute flue gas pressure
Ms = molecular weight of gas (lb/lb mole)
Md = dry molecular weight of gas (lb/lb mole)
Bws = water vapor in gas stream proportion by volume

$$Acfm = Vs \times Area\ (of\ stack\ or\ duct) \times 60$$

$$Dscfm = Acfm \times 17.647 \times \left[\frac{Ps}{(460 + Ts)}\right] \times (1 - Bws)$$

$$Scfm = Acfm \times 17.647 \times \left[\frac{Ps}{(460 + Ts)}\right]$$

$$Scfh = Scfm \times 60\frac{min}{hr}$$

CALCULATION FORMULAS

1. $$V_{m(std)} = V_m Y \left(\frac{T_{std}}{T_m}\right)\left(\frac{P_{bar} + \frac{\Delta H}{13.6}}{P_{std}}\right) = K_1 V_m Y \frac{P_{bar} + \frac{\Delta H}{13.6}}{T_m}$$

2. $$V_{w(std)} = V_{lc}\left(\frac{\rho_w}{M_w}\right)\left(\frac{RT_{std}}{P_{std}}\right) = K_2 V_{lc}$$

3. $$B_{ws} = \frac{V_{w(std)}}{V_{m(std)} + V_{w(std)}}$$

4a. $$C_a = \frac{m_a}{V_a \rho_a}$$

4b. $$W_a = C_a V_{aw} \rho_a$$

5. $$C_S = (15.43 \text{ grains/gram})\,(m_n / V_{m(std)})$$

6. $$C_{acf} = 15.43 K_i \left(\frac{m_n P_s}{V_{w(std)} + V_{m(std)}\, T_s}\right)$$

7. $$\%EA = \left(\frac{\%O_2 - (0.5\,\%CO}{0.264\,\%N_2 - (\%O_2 - 0.5\,\%CO)}\right) \times 100$$

8. $$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2 + \%CO)$$

9. $$M_s = M_d(1 - B_{ws}) + 18.0 B_{ws}$$

10. $$v_s = K_p C_p \sqrt{\frac{\Delta P\, T_s}{P_s M_s}}$$

11. $$Q_{acfm} = v_s A(60_{sec/min})$$

12. $$Q_{sd} = (3600_{sec/hr})(1 - B_{ws})\, v_s \left(\frac{T_{std} P_s}{T_s P_{std}}\right) A$$

13. $$E \text{ (emission rate, lbs/hr)} = Q_{std}(C_s / 7000 \text{ grains/lb})$$

14. $$IKV = \frac{T_s V_{m(std)} P_{std}}{T_{std} v_s \theta A_n P_s 60(1 - B_{ws})} = K_4 \frac{T_s V_{m(std)}}{P_s v_s A_n \theta (1 - B_{ws})}$$

NOMENCLATURE

A = Cross-sectional area of stack or duct, ft^2
A_n = Cross-sectional area of nozzle, ft^2
B_{ws} = Water vapor in gas stream, proportion by volume
C_a = Acetone blank residue concentration, g/g
C_{acf} = Concentration of particulate matter in gas stream at actual conditions, gr/acf
C_p = Pitot tube coefficient, dimensionless
C_s = Concentration of particulate matter in gas stream, dry basis, corrected to standard conditions, gr/dscf
IKV = Isokinetic sampling variance, must be $.90 \leq IKV \leq 1.10$
M_d = Dry molecular weight of gas, lb/lb-mole
m_n = Total amount of particulate matter collected, grams
M_s = Molecular weight of gas, wet basis, lb/lb-mole
M_w = Molecular weight of water, 18.0 lb/lb-mole
m_a = Mass of residue of acetone after evaporation, grams
P_{bar} = Barometric pressure at testing site, in. Hg
P_g = Static pressure of gas, in. Hg (in. H_2O/13.6)
P_s = Absolute pressure of gas, in. Hg = $P_{bar} + P_g$
P_{std} = Standard absolute pressure, 29.92 in. Hg
Q_{acfm} = Actual volumetric gas flow rate, acfm
Q_{sd} = Dry volumetric gas flow rate corrected to standard conditions, dscf/hr
R = Ideal gas constant, 21.85 in. Hg-ft^3/°R-lb-mole
T_m = Absolute dry gas meter temperature, °R
T_s = Absolute gas temperature, °R
T_{std} = Standard absolute temperature, 528°R
V_a = Volume of acetone blank, ml
V_{aw} = Volume of acetone used in wash, ml
V_{lc} = Total volume of liquid collected in impingers and silica gel, ml
V_m = Volume of gas sample as measured by dry gas meter, dcf
$V_{m(std)}$ = Volume of gas sample measured by dry gas meter, corrected to standard conditions, dscf
v_s = Gas velocity, ft/sec
$V_{w(std)}$ = Volume of water vapor in gas sample, corrected to standard conditions, scf
W_a = Weight of residue in acetone wash, grams
Y = Dry gas meter calibration factor
ΔH = Average pressure differential across the orifice meter, in. H_2O
Δp = Velocity head of gas, in. H_2O
ρ_a = Density of acetone, 0.7855 g/ml (average)
ρ_w = Density of water, 0.002201 lb/ml
θ = Total sampling time, minutes
K_1 = 17.64 °R/in. Hg
K_2 = 0.04707 ft^3/ml
K_4 = 0.09450/100 = 0.000945
K_p = Pitot tube constant, $85.49 \frac{ft}{sec}\left[\frac{(lb/lb-mole)(in.Hg)}{(°R)(in.H_2O)}\right]^{1/2}$
%EA = Percent excess air
$\%CO_2$ = Percent carbon dioxide by volume, dry basis
$\%O_2$ = Percent oxygen by volume, dry basis
%CO = Percent carbon monoxide by volume, dry basis
$\%N_2$ = Percent nitrogen by volume, dry basis
0.264 = Ratio of O_2 to N_2 in air, v/v
0.28 = Molecular weight of N_2 or CO, divided by 100
0.32 = Molecular weight of O_2 divided by 100
0.44 = Molecular weight of CO_2 divided by 100
13.6 = Specific gravity of mercury (Hg)

MERCURY CALCULATIONS

Determination of Speciated Mercury

Concentration

$$\frac{\text{ug of Mercury detected} \times \frac{10^{-6}\text{g}}{\text{ug}}}{453.6\,\text{g/lb}} = \text{lbs Mercury/sample}$$

$$\frac{\text{lbs Mercury/sample}}{\text{Vm(std)}} = \text{lbs Mercury/dscf}$$

Emission Rates

$$\text{lbs Mercury/hr} = \text{lbs/dscf} \times \text{dscf/min} \times 60\ \text{min/hr}$$

$$\text{lbs Mercury}/10^{12}\,\text{Btu} = \text{lbs/dscf} \times F_d\,\text{Factor}\left(\text{dscf}/10^{6}\,\text{Btu}\right) \times \frac{20.9\%}{20.9\% - O_2\%} \times 10^{6}$$

Mercury Fractions

Elemental Mercury Catch – mercury collected in the acidified hydrogen peroxide (HNO_3-H_2O_2) and potassium permanganate (H_2SO_4-$KMnO_4$) impinger solutions.

Oxidized Mercury Catch – mercury collected in the aqueous potassium chloride (KCl) impinger solution.

Particle-bound Mercury Catch – mercury associated with the particulate matter collected in the front half of the sampling train.

Determination of Mercury Available from Coal

$$\text{lbs Mercury/hr} = \frac{\text{ug Mercury}}{\text{g Coal}}(\text{dry}) \times \frac{10^{-6}\text{g}}{\text{ug}} \times \frac{\text{lbs Coal (wet)}}{\text{hr}} \times (1 - B_{ws})\ \text{moisture corr.}$$

$$\text{lbs Mercury}/10^{12}\,\text{Btu} = \frac{\text{lbs Mercury}}{\text{hr}} \div \frac{10^{12}\,\text{Btu}}{\text{hr}}$$

EMISSION RATE CALCULATIONS

A pollutant emission rate (E), expressed as pounds of pollutant per million Btu heat input from the fuel combusted can be calculated by several methods as follows:

1. $C = C_s/7000$ where, C = pollutant concentration, lb/dscf
   c_s = pollutant concentration, grains/dscf

2. If fuel flow is monitored and the fuel combusted during the test is sampled and analyzed for gross calorific value, then:

$$E = \frac{Q_{sd} C}{\text{fuel flow rate (lb / hr) GCV}} \times 10^6$$

where, E = lbs per million Btu
GCV = gross calorific value, Btu / lb
Q_{sd} = dry volumetric gas flow at standard conditions, dscf / hr

3. If an integrated gas sample is taken during the test and analyzed for $\%CO_2$ or $\%O_2$, dry basis by volume, with an Orsat gas analyzer, then

$$E = C F_c \frac{100}{(\%CO_2)} \text{ or, } E = C F \frac{20.9}{(20.9 - \%O_2)} \text{ where,}$$

$\%CO_2$ and $\%O_2$ are expressed as percent; and, for example, for subbituminous and bituminous coals:

F_c = a factor representing a ratio of the volume of carbon dioxide generated to the calorific value of the fuel combusted, 1800 scf CO_2/million Btu.

F = a factor representing a ratio of the volume of dry flue gases generated to the calorific value of the fuel combusted, 9780 dscf/million Btu.

4. If fuel sample increments are taken and composited during the test and an ultimate analysis is performed and the GCV is determined, then

$$F_c = \frac{321 \times 10^3 (\%C)}{GCV}$$ where, %C = carbon content by weight expressed as percent

$$F = \frac{[3.64 (\%H) + 1.53 (\%C) + 0.57 (\%S) + 0.14 (\%N) - 0.46 (\%O_2)]}{GVC} \times 10^6$$

where, H, C, S, N, and O are content by weight of hydrogen, carbon, sulfur, nitrogen, and oxygen (expressed as percent) respectively.

5. If fuels other than subbituminous and bituminous coals are fired, other F-factors than those above will apply; and, if combinations of different fuels are fired, the F-factors must be prorated according to the fraction of the total heat input derived from each type of fuel.

MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 1

COMPANY: WEPCO
PLANT: Valley Power Plant
TEST LOCATION: Boiler #3 Baghouse Inlet
CLIENT: EPRI
OPERATOR: D. Helm
DATE: 11/30/99
CONTROL BOX: E12 POT. NO.: E12
METER NO.: E12
METER CALIBRATION FACTOR: 0.997
PITOT ID NO.: 427 A
PITOT TUBE COEFFICIENT: 0.830
PORT LENGTH: 28 in.
PORT SIZE: 6 in.
PORT TYPE: Flange

IMPINGER H_2O
FINAL: 4698.9 ml/gm
INITIAL: 4597.0 ml/gm
GAIN: 101.9 ml/gm
TOTAL H_2O COLLECTED: 113.3

SILICA GEL:
FINAL WT: 723.8 gm
INITIAL WT: 712.4 gm
WT. GAIN: 11.4 gm

DESCRIPTION OF IMPINGER H_2O:
SILICA GEL EXHAUSTED?:
IMPINGERS RECOVERED BY:
SILICA GEL WEIGHED BY:

COMMENTS & NOTES

THIMBLE NO: 071 TARE WT: 3.1408
FILTER NO: TARE WT:
BAROMETRIC PRESSURE in. Hg: 30.11
FLUE PRESSURE in. H_2O: -13.5
FLUE PRESSURE in. Hg ABS: 29.117
PROBE LENGTH: 10 ft.
PROBE LINER MATERIAL: Teflon
NOZZLE IDENTIFICATION NO: 8
CALIBRATED NOZZLE DIAMETER: 0.240
LEAK CHECK: PRE: 0.008 POST: 0.005 @ 11 in. Hg
DUCT SHAPE: Rectangular DIAMETER:
DUCT AREA: 120.33 sq. ft. L 12'.8" W 9'6"
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 125 min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 25
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 11.4
O_2: 6.6

PITOT LEAK CHECK: PRE ✓ POST ✓
ΔH@
SAMPLES REMOVED FROM SITE BY:

For computer data entry: Supervisor, please complete.
Do you want to enter a fuel analysis? Y ☐ N ☐
What value do you want to use? F = 9,780 F_c = 1,800 Other = _____
Circle to indicate "Yes" or add other value if not given.

FIELD TEST DATA SHEET FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - VALLEY

TEST RUN NO. #1

TEST LOCATION Boiler #9 - INLET

DATE 30 Nov 99 PAGE 1 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft³	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
		1.7425							0.7491		x5				
1-1	0.38	0.6164	901	17.024	0.66	328	38	34	0.462	5	2.309		237	231	68
1-2	0.42	0.6481	906	19.390	0.73	324	41	35	0.486	4	2.427	19.333	235	232	Fully
1-3	0.43	0.6557	911	21.710	0.75	317	43	38	0.491	5	2.456	21.760	235	232	Iced
1-4	0.41	0.6403	916	24.170	0.71	311	44	37	0.480	5	2.398	24.216	237	232	
1-5	0.43	0.6557	921	26.670	0.75	297	45	38	0.491	5	2.456	26.614	239	233	
		0.6432	926	29.020	0.720	315.4	42.2	36.4				29.070			
				11.996								12.046			
2-1	0.40	0.6325	927	29.550	0.70	324	46	39	0.474	5	2.369		237	231	
2-2	0.43	0.6557	932	31.880	0.75	320	47	39	0.491	5	2.456	31.919	236	231	
2-3	0.47	0.6856	937	34.310	0.82	315	48	40	0.514	5	2.568	34.375	240	232	
2-4	0.45	0.6708	942	36.980	0.78	308	48	41	0.503	5	2.513	36.943	240	232	
2-5	0.29	0.5385	947	39.410	0.51	287	49	42	0.403	4	2.017	39.456	242	232	
		0.6366	952	41.450	0.712	310.8	47.6	40.2				41.473			
				11.900								11.923			
3-1	0.46	0.6782	954	41.865	0.80	330	49	42	0.508	5	2.540		232	231	
3-2	0.46	0.6782	959	44.400	0.80	328	49	43	0.508	5	2.540	44.405	234	232	
3-3	0.47	0.6856	1004	46.980	0.82	319	50	43	0.514	5	2.568	46.945	234	232	
3-4	0.55	0.7416	1009	49.540	0.96	311	51	44	0.556	6	2.778	49.513	235	232	
3-5	0.38	0.6164	1014	52.320	0.66	297	51	44	0.462	5	2.309	52.291	235	231	
		0.6800	1019	54.660	0.808	317.2	50.8	43.2				54.600			
				12.795								12.735			
4-1	0.54	0.7348	1021	55.215	0.94	330	51	45	0.551	6	2.752		235	231	
4-2	0.50	0.7071	1026	58.010	0.87	325	51	46	0.530	6	2.649	57.967	236	231	
4-3	0.48	0.6928	1031	60.690	0.84	320	52	46	0.519	6	2.595	60.616	236	231	
4-4	0.48	0.6928	1036	63.270	0.84	313	52	46	0.519	6	2.595	63.211	237	232	
4-5	0.36	0.6000	1041	65.890	0.63	288	52	46	0.450	6	2.247	65.806	238	232	
		0.6855	1046	68.100	0.824	315.2	51.6	45.8				68.053			
				12.885								12.838			

Form 1026 [Rev. 5/27]

FIELD TEST DATA SHEET FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO – VALLEY

TEST RUN NO. #1

TEST LOCATION Boiler #3 – INLET

DATE 30Nov99 PAGE 2 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O (1.7425)	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm (0.7491)	Pump Vacuum in. Hg	Notes (x5)		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
5-1	0.18	0.4243	1048	68.640	0.31	328	51	46	0.318	5	1.589		238	230	< 68°
5-2	0.49	0.7000	1053	70.240	0.85	323	51	47	0.524	7	2.622	70.229	237	231	Fully
5-3	0.52	0.7211	1058	72.880	0.91	316	52	47	0.540	7	2.701	72.851	237	231	Full
5-4	0.45	0.6708	1103	75.560	0.78	310	53	48	0.503	7	2.513	75.552	236	231	
5-5	0.46	0.6782	1108	78.090	0.80	295	53	47	0.508	7	2.540	78.065	236	232	
		0.6389	1113	80.610	0.730	314.4	52.0	47.0				80.605			
				11.970								11.965			
		0.6568		61.546	0.759	314.6	48.7	42.5				61.507			
	3.8														

Form 1026 [Rev. 5/27]

MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 2

COMPANY: WEPCO
PLANT: Valley
TEST LOCATION: Boiler #3
CLIENT: EPRI
OPERATOR: D. Helm
DATE: 11/30/99
CONTROL BOX: E12 POT. NO.: E12
METER NO.: E12
METER CALIBRATION FACTOR: 0.997
PITOT ID NO.: 427A
PITOT TUBE COEFFICIENT: 0.830
PORT LENGTH: 28 in.
PORT SIZE: 6 in.
PORT TYPE: Flange

IMPINGER H_2O
FINAL: 4723.3 ml/gm
INITIAL: 4626.2 ml/gm
GAIN: 97.1 ml/gm
TOTAL H_2O COLLECTED: 110.3

SILICA GEL:
FINAL WT: 751.7 gm
INITIAL WT: 738.5 gm
WT. GAIN: 13.2 gm

DESCRIPTION OF IMPINGER H_2O:
SILICA GEL EXHAUSTED?:
IMPINGERS RECOVERED BY:
SILICA GEL WEIGHED BY:

COMMENTS & NOTES

THIMBLE NO: 069 TARE WT: 3.3274
FILTER NO: TARE WT:
BAROMETRIC PRESSURE in. Hg: 30.11
FLUE PRESSURE in. H_2O: -13.5
FLUE PRESSURE in. Hg ABS: 29.117
PROBE LENGTH: 10 ft.
PROBE LINER MATERIAL: Teflon
NOZZLE IDENTIFICATION NO: 8
CALIBRATED NOZZLE DIAMETER: 0.240
LEAK CHECK: PRE: 0.007 POST: 0.005 @ 11 in. Hg
DUCT SHAPE: Rectangular DIAMETER:
DUCT AREA: 120.33 sq. ft. L 12'8" W 9'6"
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 125 min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 25
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 11.4
O_2: 6.6

PITOT LEAK CHECK: PRE ✓ POST ✓
ΔH@
SAMPLES REMOVED FROM SITE BY:

For computer data entry: Supervisor, please complete.
Do you want to enter a fuel analysis? Y ☐ N ☐
What value do you want to use? F = 9,780 F_c = 1,800 Other = _____
Circle to indicate "Yes" or add other value if not given.

FIELD TEST DATA SHEET FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - VALLEY

TEST RUN NO. #2

TEST LOCATION Boiler - #3 - INLET

DATE 30 NOV 99 PAGE 1 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$ (0.7931)	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm (0.7675)	Pump Vacuum in. Hg	Notes (x5)		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
1-1	0.44	0.6633	1200	81.685	0.79	326	50	47	0.509	6	2.546		240	230	< 68
1-2	0.43	0.6557	1205	84.190	0.77	322	52	48	0.503	7	2.516	84.231	241	231	FULL
1-3	0.40	0.6325	1210	86.720	0.72	314	56	49	0.485	6	2.427	86.747	241	231	ICED
1-4	0.40	0.6325	1215	89.130	0.72	310	59	50	0.485	6	2.427	89.174	241	230	
1-5	0.43	0.6557	1220	91.650	0.77	296	61	52	0.503	6	2.516	91.601	242	231	
		0.6479	1225	94.150	0.754	313.6	55.6	49.2				94.117			
				12.465								12.432			
2-1	0.44	0.6633	1227	94.590	0.79	325	63	54	0.509	7	2.546		240	232	
2-2	0.48	0.6928	1232	97.170	0.86	321	63	56	0.532	7	2.659	97.136	240	231	
2-3	0.47	0.6856	1237	99.820	0.84	314	62	56	0.526	7	2.631	99.795	241	231	
2-4	0.46	0.6782	1242	102.500	0.83	309	62	55	0.521	7	2.603	102.426	241	231	
2-5	0.35	0.5916	1247	105.050	0.63	294	61	55	0.454	6	2.270	105.029	240	232	
		0.6623	1252	107.310	0.790	312.6	62.2	55.2				107.299			
				12.720								12.709			
3-1	0.45	0.6708	1254	107.600	0.81	331	62	54	0.515	7	2.574		242	232	
3-2	0.47	0.6856	1259	110.210	0.84	327	61	55	0.526	7	2.631	110.174	241	233	
3-3	0.54	0.7348	1304	112.780	0.97	320	61	56	0.564	8	2.820	112.805	242	233	
3-4	0.54	0.7348	1309	115.590	0.97	311	61	55	0.564	8	2.820	115.625	243	232	
3-5	0.33	0.5745	1314	118.420	0.59	288	60	55	0.441	6	2.205	118.445	242	231	
		0.6801	1319	120.660	0.836	315.4	61.0	55.0				120.650			
				13.060								13.050			
4-1	0.56	0.7483	1321	121.000	1.00	329	59	55	0.574	9	2.872		244	232	
4-2	0.45	0.6708	1326	123.910	0.81	324	60	55	0.515	8	2.574	123.872	245	232	
4-3	0.44	0.6633	1331	126.420	0.79	321	60	55	0.509	8	2.546	126.446	244	232	
4-4	0.58	0.7616	1336	128.990	1.04	314	60	55	0.585	9	2.923	128.992	245	231	
4-5	0.31	0.5568	1341	131.880	0.56	285	59	54	0.427	7	2.137	131.915	243	231	
		0.6802	1346	134.070	0.840	314.6	59.6	54.8				134.052			
				13.070								13.052			

FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - VALLEY
TEST RUN NO. #2
TEST LOCATION Boiler #3 - INLET

DATE 30NOV99 PAGE 2 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$ (1)	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O (1.7931)	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm (0.7675)	Pump Vacuum in. Hg	Notes (x5)		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
5-1	0.16	0.4000	1348	134.456	0.29	329	57	54	0.307	4	1.535		242	231	< 68°
5-2	0.46	0.6782	1353	135.920	0.83	322	57	53	0.521	7	2.603	135.991	243	231	FULLY
5-3	0.50	0.7071	1358	138.530	0.90	314	56	53	0.543	9	2.714	138.594	243	232	ICED
5-4	0.53	0.7280	1403	141.270	0.95	309	56	54	0.559	9	2.794	141.308	242	232	
5-5	0.53	0.7280	1408	144.070	0.95	291	56	54	0.559	11	2.794	144.102	242	231	
		0.6483	1413	146.860	0.784	313.0	56.6	53.6				146.896			
				12.404								12.440			
		0.6638		63.719	0.801	313.8	59.0	53.6				63.683			

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Form 1026 [Rev. 5/27]

MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 3

COMPANY: WEPCO
PLANT: Valley
TEST LOCATION: Boiler #3
CLIENT: EPRI
OPERATOR: D. Helm
DATE: 11/30/99
CONTROL BOX: E12 POT. NO.: E12
METER NO.: E12
METER CALIBRATION FACTOR: 0.997
PITOT ID NO.: 427A
PITOT TUBE COEFFICIENT: 0.830
PORT LENGTH: 28 in.
PORT SIZE: 6 in.
PORT TYPE: Flange

IMPINGER H_2O
FINAL: 4731.0 ml/gm
INITIAL: 4630.5 ml/gm
GAIN: 100.5 ml/gm
TOTAL H_2O COLLECTED: 111.9

SILICA GEL:
FINAL WT: 634.6 gm
INITIAL WT: 623.2 gm
WT. GAIN: 11.4 gm

DESCRIPTION OF IMPINGER H_2O:
SILICA GEL EXHAUSTED?:
IMPINGERS RECOVERED BY:
SILICA GEL WEIGHED BY:

COMMENTS & NOTES

THIMBLE NO: 093 TARE WT: 2.8706
FILTER NO: TARE WT:
BAROMETRIC PRESSURE in. Hg: 30.11
FLUE PRESSURE in. H_2O: -13.5
FLUE PRESSURE in. Hg ABS: 29.117
PROBE LENGTH: 10 ft.
PROBE LINER MATERIAL: Teflon
NOZZLE IDENTIFICATION NO: 8
CALIBRATED NOZZLE DIAMETER: 0.240
LEAK CHECK: PRE: 0.007 POST: 0.005 @ 11 in. Hg
DUCT SHAPE: Rectangular DIAMETER:
DUCT AREA: 120.33 sq. ft. L 12'8" W 9'6"
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 125 min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 25
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 11.5
O_2: 6.5

PITOT LEAK CHECK: PRE ✓ POST ✓
ΔH@
SAMPLES REMOVED FROM SITE BY:

For computer data entry: Supervisor, please complete.
Do you want to enter a fuel analysis? Y ☐ N ☐
What value do you want to use? F = 9,780 F_c = 1,800 Other = _____
Circle to indicate "Yes" or add other value if not given.

FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - Valley
TEST RUN NO. #3
TEST LOCATION Boiler #3 - Inlet

DATE 11/30/99 PAGE 1 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$ (1.7924)	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm (0.7674)	Pump Vacuum in. Hg	Notes (X5)		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
1-1	0.40	0.6325	1450	48.340	0.72	325	48	48	0.485	5	2.427		246	233	< 68°
1-2	0.42	0.6481	1455	50.790	0.75	322	49	48	0.497	5	2.487	50.767	245	233	Fully
1-3	0.40	0.6325	1500	53.280	0.72	315	49	48	0.485	5	2.427	53.254	245	233	ICED
1-4	0.39	0.6245	1505	55.620	0.70	310	49	47	0.479	5	2.396	55.681	244	232	
1-5	0.42	0.6481	1510	58.050	0.75	300	49	48	0.497	5	2.487	58.077	244	232	
		(0.6371)	1515	60.570	(0.728)	(314.4)	(48.8)	(47.8)				60.564			
				(12.230)								(12.224)			
2-1	0.43	0.6557	1517	60.991	0.77	327	49	46	0.503	5	2.516		243	231	
2-2	0.40	0.6325	1522	63.540	0.72	319	50	46	0.485	5	2.427	63.507	244	231	
2-3	0.45	0.6708	1527	65.950	0.81	313	51	47	0.515	5	2.574	65.934	243	231	
2-4	0.47	0.6856	1532	68.510	0.84	308	53	47	0.526	5	2.631	68.508	243	232	
2-5	0.36	0.6000	1537	71.150	0.65	286	53	47	0.460	5	2.302	71.139	244	232	
		(0.6489)	1542	73.440	(0.758)	(310.6)	(51.2)	(46.6)				73.441			
				(12.449)								(12.450)			
3-1	0.49	0.7000	1543	73.855	0.88	328	53	47	0.537	6	2.686		244	233	
3-2	0.43	0.6557	1548	76.490	0.77	327	55	48	0.503	6	2.516	76.541	245	233	
3-3	0.45	0.6708	1553	78.990	0.81	318	57	49	0.515	6	2.574	79.057	245	234	
3-4	0.52	0.7211	1558	81.620	0.93	311	58	50	0.553	6	2.767	81.631	244	234	
3-5	0.31	0.5568	1603	84.350	0.56	292	59	51	0.427	5	2.136	84.398	244	234	
		(0.6609)	1608	86.520	(0.79)	(315.2)	(56.4)	(49.0)				86.534			
				(12.665)								(12.679)			
4-1	0.52	0.7211	1610	86.825	0.93	327	58	52	0.553	6	2.767		244	233	
4-2	0.51	0.7141	1615	89.560	0.91	324	58	52	0.548	5	2.740	89.592	245	233	
4-3	0.44	0.6633	1620	92.320	0.79	320	56	52	0.509	6	2.545	92.332	244	233	
4-4	0.48	0.6928	1625	94.890	0.86	312	54	52	0.532	6	2.658	94.877	244	232	
4-5	0.32	0.5657	1630	97.570	0.57	295	53	51	0.434	5	2.171	97.535	244	232	
		(0.6714)	1635	99.710	(0.812)	(315.6)	(55.8)	(51.2)				99.706			
				(12.885)								(12.881)			
		2.6183		50.229	3.088	1255.8	212.2	194.6							

Form 1026 [Rev. 5/27]

FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - VALLEY
TEST RUN NO. #3
TEST LOCATION Boiler #3 - INLET

DATE 11/30/99 PAGE 2 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
					1.7924				0.7674		X5				
5-1	0.43	0.6557	1637	100.094	0.77	326	52	50	0.503	6	2.516		245	232	<68°
5-2	0.37	0.6083	1642	102.640	0.66	321	52	50	0.467	6	2.334	102.610	244	232	FULLY
5-3	0.42	0.6481	1647	104.970	0.75	314	51	49	0.497	6	2.487	104.944	244	233	ICED
5-4	0.44	0.6633	1652	107.450	0.79	310	51	49	0.509	6	2.545	107.431	245	233	
5-5	0.35	0.5916	1657	109.990	0.63	291	51	48	0.454	6	2.270	109.976			
		0.6334	1702	112.250	0.720	312.4	51.6	49.2				112.246			
				12.156								12.152			
		0.6503		62.385	0.762	31316	52.7	48.8				62.386			

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Form 1026 [Rev. 5/27]

PITOT TRAVERSE DATA

Project: WEPCO - VALLEY

Location: UNIT #3 - INLET

Date: 29 Nov 99 Test No: #1 Time: 1359 - 1450

Point No.	ΔP	√ΔP	t_s	α	Point No.	ΔP	√ΔP	t_s	α
1-1	0.36		323	0°	4-1	0.53		324	0°
1-2	0.38		321	7°	4-2	0.50		328	0°
1-3	0.42		316	12°	4-3	0.47		324	6°
1-4	0.39		311	10°	4-4	0.55		318	4°
1-5	0.47		308	0°	4-5	0.48		311	0°
2-1	0.43		322	0°	5-1	0.46		326	0°
2-2	0.45		321	0°	5-2	0.47		325	10°
2-3	0.51		316	16°	5-3	0.49		321	0°
2-4	0.54		312	6°	5-4	0.49		314	5°
2-5	0.50		308	8°	5-5	0.50		311	0°
							0.6848	318.4	
3-1	0.42		325	0°					
3-2	0.44		326	5°					
3-3	0.50		324	5°					
3-4	0.57		315	4°					
3-5	0.44		311	7°					
	10.0941								

P_{bar}_____ "Hg Static -12.7 "H_2O P_g_____ "Hg P_s_____ "Hg Pitot ID_____ C_p_____ Temp. ID_____

0.44 × _____ $\%CO_2$ = _____ √ΔP _____ t_s_____ °F T_____ °R Flue Area _____ ft^2

0.32 × _____ $\%O_2$ = +_____ Duct Dimensions _____

0.28 × _____ $\%N_2$ = +_____ B_{ws}_____ 1 - B_{ws} _____ Disturbance: Upstream _____

(_____ Md × _____ 1-B_{ws}) + (18 × _____ B_{ws}) = _____ (Ms) Downstream _____

$$v_s = 85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} = \_\_\_\_ \text{ ft/sec (Vs)}$$

Q_{acfm} = _____ Vs × _____ Flue Area × 60 = _____ acfm Port Length 28 Inches

$$Q_{dscfm} = 17.647 \times ACFM \times \frac{Ps}{Ts\ °R} = \_\_\_\_\_ \text{ SCFM}$$

$$Q_{dscfm} = 17.647 \times ACFM \times \frac{Ps}{Ts\ °R} \times (1\text{-}Bws) = \_\_\_\_\_ \text{ DSCFM}$$

Pre-test leak check _____ "H_2O

Post-test leak check _____ "H_2O 4278

45

Data Taken By: _____

Field Engineer / Test Technician

MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 1

COMPANY: WEPCo
PLANT: Valley Power Plant
TEST LOCATION: Boiler #3 Baghouse Outlet
CLIENT: EPRI.
OPERATOR: NS
DATE: 11/30/99
CONTROL BOX: ES1 POT. NO.: ES1
METER NO.: ES1
METER CALIBRATION FACTOR: 1.009
PITOT ID NO.: 318 A
PITOT TUBE COEFFICIENT: 0.837
PORT LENGTH: 28 in.
PORT SIZE: 6 in.
PORT TYPE: Flange

IMPINGER H_2O
FINAL: 4677.1 ml/gm
INITIAL: 4581.5 ml/gm
GAIN: 95.6 ml/gm
TOTAL H_2O COLLECTED: 110.1

SILICA GEL:
FINAL WT: 808.4 gm
INITIAL WT: 793.9 gm
WT. GAIN: 14.5 gm

DESCRIPTION OF IMPINGER H_2O:
SILICA GEL EXHAUSTED?:
IMPINGERS RECOVERED BY:
SILICA GEL WEIGHED BY:

COMMENTS & NOTES

THIMBLE NO: 090 TARE WT: 3.5248
FILTER NO: — TARE WT: —
BAROMETRIC PRESSURE in. Hg: 30.11
FLUE PRESSURE in. H_2O: -18.0
FLUE PRESSURE in. Hg ABS:
PROBE LENGTH: 13' ft.
PROBE LINER MATERIAL: Teflon
NOZZLE IDENTIFICATION NO: #8
CALIBRATED NOZZLE DIAMETER: .245
LEAK CHECK: PRE: 0.0 POST: 0.00 @ 14/16 in. Hg
DUCT SHAPE: Rectangular DIAMETER:
DUCT AREA: 120.83 sq. ft. L 9'6" W 12'8"
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 225 min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 25
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 11.2
O_2: 6.8

PITOT LEAK CHECK: PRE POST
ΔH@
SAMPLES REMOVED FROM SITE BY:

For computer data entry: Supervisor, please complete.
Do you want to enter a fuel analysis? Y ☐ N ☐
What value do you want to use? F = 9,780 F_c = 1,800 Other =
Circle to indicate "Yes" or add other value if not given.

FIELD TEST DATA SHEET FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - Valley

TEST RUN NO. #1

TEST LOCATION Boiler #3 - Outlet

DATE 30 Nov 99 PAGE 1 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft³	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
		1			1.9762				0.7468		x5				
1-1	0.12	0.346	0900	146.168	0.237	315	37	32	0.258	8.0	1.290	—	246	228	≤ 68 °F
1-2	0.44	0.663	0905	147.700	0.870	318	39	33	0.495	8.5	2.475	147.458	247	227	Ice load
1-3	0.53	0.728	0910	149.950	1.047	318	46	34	0.544	4.5	2.720	149.933	247	227	
1-4	0.57	0.755	0915	152.150	1.126	317	43	35	0.564	9.5	2.820	152.653	248	228	
1-5	0.59	0.768	0920	155.510	1.166	314	46	37	0.574	9.5	2.870	155.473	247	225	
			0925	158.350								158.343			
2-1	0.46	0.678	0930	158.350	0.909	315	47	38	0.506	9.0	2.530	—		225	
2-2	0.48	0.693	0935	160.600	0.949	317	50	39	0.518	9.5	2.590	160.873	250	226	
2-3	0.59	0.768	0940	163.100	1.166	317	51	40	0.574	9.5	2.870	163.463	247	229	
2-4	0.61	0.781	0945	166.350	1.205	317	55	42	0.583	10.0	2915	166.333	246	228	
2-5	0.55	0.742	0950	169.250	1.087	312	58	43	0.554	9.5	2.770	169.248	247	228	
			0955	172.020								172.018			
3-1	0.61	0.781	1000	172.020	1.205	318	59	47	0.583	10.0	2.915	—	247	227	
3-2	0.63	0.794	1005	174.950	1.245	318	61	48	0.593	10.0	2.965	174.933	247	228	
3-3	0.65	0.806	1010	177.900	1285	318	64	50	0.602	9.5	3.010	177.898	259	230	
3-4	0.54	0.735	1015	180.900	1.067	317	66	52	0.549	9.5	2.745	180.908	249	230	
3-5	0.47	0.686	1020	183.650	.929	312	67	53	0.512	10.0	2.560	183.653	256	233	
			1025	186.220								186.213			
4-1	0.58	0.762	1030	186.220	1.146	316	67	55	0.569	9.5	2.845		247	228	
4-2	0.59	0.768	1035	189.100	1.166	318	68	57	0.574	9.5	2.870	189.058	249	229	
4-3	0.51	0.714	1040	191.900	1.008	318	64	60	0.533	9.5	2.665	191.928	249	226	
4-4	0.54	0.735	1045	194.590	1.067	317	61	60	0.549	9.0	2.745	194.593	248	227	
4-5	0.48	0.693	1050	197.200	0.949	313	63	63	0.518	9.0	2.590	197.338	246	228	
			1055	199.930								199.928			

Form 1026 [Rev. 5/27]

FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - VALLEY
TEST RUN NO. #1
TEST LOCATION Boiler #3 - Outlet

DATE 30 Nov 99 PAGE 2 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
5-1	0.58	0.762	1100	199.930	1.146	316	62	68	0.569	11.0	2.845	199.928	247	230	≤ 68°F
5-2	0.59	0.768	1105	202.730	1.166	317	64	70	0.574	11.0	2.870	202.773	248	230	Fully id
5-3	0.37	0.608	1110	205.600	0.731	317	65	72	0.454	7.0	2.270	205.643	247	234	
5-4	0.31	0.557	1115	207.900	0.613	316	64	72	0.416		2.080	207.913	245	232	
5-5	0.26	0.510	1120	209.990	0.514	312	64	74	0.381		1.905	209.993	249	233	
			1125	211.900								211.898			

MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 2

COMPANY: WEPCO
PLANT: Valley
TEST LOCATION: Boiler #3 Outlet
CLIENT: EPRI
OPERATOR: NS
DATE: 11/30/99
CONTROL BOX: E51 POT. NO.: E51
METER NO.: E51
METER CALIBRATION FACTOR: 1.009
PITOT ID NO.: 318A
PITOT TUBE COEFFICIENT: 0.837
PORT LENGTH: 28 in.
PORT SIZE: 6 in.
PORT TYPE: Flange

IMPINGER H_2O
FINAL: 4754.5 ml/gm
INITIAL: 4661.5 ml/gm
GAIN: 93.0 ml/gm

SILICA GEL:
FINAL WT: 724.3 gm
INITIAL WT: 707.4 gm
WT. GAIN: 16.9 gm

TOTAL H_2O COLLECTED: 109.9
DESCRIPTION OF IMPINGER H_2O:
SILICA GEL EXHAUSTED?:
IMPINGERS RECOVERED BY:
SILICA GEL WEIGHED BY:

COMMENTS & NOTES

THIMBLE NO: 091 TARE WT: 3.5580
FILTER NO: TARE WT:
BAROMETRIC PRESSURE in. Hg: 30.11
FLUE PRESSURE in. H_2O: -18.0
FLUE PRESSURE in. Hg ABS:
PROBE LENGTH: 13' ft.
PROBE LINER MATERIAL: Teflon
NOZZLE IDENTIFICATION NO: #8
CALIBRATED NOZZLE DIAMETER: .245
LEAK CHECK: PRE: 0.0 POST: 0.0 @ 15/15 in. Hg
DUCT SHAPE: Rectangular DIAMETER:
DUCT AREA: 120.33 sq. ft. L 9'6" W 12'8"
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 225 min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 25
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 11.0
O_2: 6.7

PITOT LEAK CHECK: PRE POST
ΔH@
SAMPLES REMOVED FROM SITE BY:

For computer data entry: Supervisor, please complete.
Do you want to enter a fuel analysis? Y ☐ N ☐
What value do you want to use? F = 9,780 F_c = 1,800 Other =
Circle to indicate "Yes" or add other value if not given.

FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - VALLEY
TEST RUN NO. #2
TEST LOCATION BOILER #3 - OUTLET

DATE 30-NOV-99 PAGE 1 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
	*	1			1.962				0.7481		1	×5			
1-1	0.59	0.768	1200	212.630	1.166	318	63	73	0574	6.5	2.870	—	235	230	<68°
1-2	0.58	0.762	1205	215.500	1.146	318	64	75	0.569	6.0	2.845	215.500	237	233	FULLY
1-3	0.38	0.616	1210	218.400	0.751	318	67	77	0.460	6.0	2.300	218.345	247	235	ICED
1-4	0.27	0.520	1215	220.600	0.534	318	68	78	0.388	6.0	1.940	220.645	248	234	
1-5	0.30	0.548	1220	222.600	0.593	313	68	77	0.409	5.5	2.045	222.585	247	233	
			1225	224.630								224.630	246	232	
2-1	0.58	0.762	1230	224.630	1.146	316	64	76	0.569	7.0	2.845	—	250	229	
2-2	0.60	0.775	1235	227.470	1.186	320	66	77	0.579	7.0	2.895	227.475	257	233	
2-3	0.54	0.735	1240	230.100	1.067	320	64	75	0.549	6.0	2.745	230.370	250	231	
2-4	0.52	0.721	1245	233.150	1.028	320	66	76	0.538	7.0	2.690	233.115	250	231	
2-5	0.46	0.678	1250	235.800	0.909	314	67	75	0.506	6.5	2.530	235.805	250	232	
			1255	238.335								238.335			
3-1	0.74	0.860	1257	238.335	1.462	316	66	75	0.642	7.5	3.210	—	249	231	
3-2	0.68	0.825	1302	241.600	1.344	320	67	76	0.616	8.0	3.080	241.545	250	232	
3-3	0.68	0.825	1307	244.720	1.344	320	66	74	0.616	8.5	3.080	244.625	251	233	
3-4	0.65	0.806	1312	247.700	1.285	318	67	73	0.602	8.0	3.010	247.705	249	233	
3-5	0.52	0.721	1317	250.700	1.028	315	68	75	0.538	8.0	2.690	250.715	250	232	
			1322	253.410					C			253.405			
4-1	0.48	0.693	1324	253.410	0.949	319	68	75	0.518	8.0	2.590	—	249	231	
4-2	0.50	0.707	1329	255.950	0.988	320	66	75	0.530	8.0	2.650	255.995	249	230	
4-3	0.60	0.775	1334	258.650	1.186	320	63	74	0.579	7.5	2.895	258.645	249	230	
4-4	0.64	0.800	1339	261.550	1.265	318	65	73	0.597	7.5	2.985	261.545	249	229	
4-5	0.60	0.775	1344	264.500	1.186	315	64	72	0.579	7.5	2.895	264.530	250	232	
			1349	267.430								267.425			

FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - Valley
TEST RUN NO. #2
TEST LOCATION Boiler #3 - Out Let

DATE 30 Nov 99 PAGE 2 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	0.7468 Meter Rate cfm	Pump Vacuum in. Hg	Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
					1.9820						x5				
5-1	0.42	0.648	1352	267.430	0.830	318	61	70	0.484	7.5	2.420	—	247	228	<68°
5-2	0.41	0.640	1357	269.900	0.810	319	60	69	0.478	6.5	2.390	269.845	247	228	Fully
5-3	0.50	0.707	1402	272.250	0.988	318	60	69	0.528	6.5	2.640	272.235	243	230	ICED
5-4	0.48	0.693	1407	274.870	0.949	315	62	67	0.518	6.5	2.590	274.875	247	231	
5-5	0.60	0.775	1412	277.490	1.186	315	63	67	0.579	7.0	2.895	277.465	250	231	
			1417	280.360								280.360			

Form 1026 [Rev. 5/27]

MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 3

COMPANY: WEPCO
PLANT: Valley
TEST LOCATION: Unit 3 Outlet
CLIENT: EPRI
OPERATOR: NS
DATE: 11/30/99
CONTROL BOX: E51 POT. NO.: E51
METER NO.: E51
METER CALIBRATION FACTOR: 1.009
PITOT ID NO.: 318A
PITOT TUBE COEFFICIENT: 0.837
PORT LENGTH: 28 in.
PORT SIZE: 6 in.
PORT TYPE: Flange

IMPINGER H_2O
FINAL: 4734.9 ml/gm
INITIAL: 4631.0 ml/gm
GAIN: 103.9 ml/gm
TOTAL H_2O COLLECTED: 118.4
DESCRIPTION OF IMPINGER H_2O:

SILICA GEL:
FINAL WT: 804.3 gm
INITIAL WT: 789.8 gm
WT. GAIN: 14.5 gm

SILICA GEL EXHAUSTED?:
IMPINGERS RECOVERED BY:
SILICA GEL WEIGHED BY:

COMMENTS & NOTES

THIMBLE NO: 097 TARE WT: 3.2432
FILTER NO: TARE WT:
BAROMETRIC PRESSURE in. Hg: 30.11
FLUE PRESSURE in. H_2O: -1.8
FLUE PRESSURE in. Hg ABS:
PROBE LENGTH: 13' ft.
PROBE LINER MATERIAL: Teflon
NOZZLE IDENTIFICATION NO: #8
CALIBRATED NOZZLE DIAMETER: .245
LEAK CHECK: PRE: 0.0 POST: 0.0 @ 15/15 in. Hg
DUCT SHAPE: Rectangular DIAMETER:
DUCT AREA: 120.33 sq. ft. L 9'6" W 12'8"
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 225 min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 25
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 11.2
O_2: 6.7

PITOT LEAK CHECK: PRE POST
ΔH@
SAMPLES REMOVED FROM SITE BY:

For computer data entry: Supervisor, please complete.
Do you want to enter a fuel analysis? Y ☐ N ☐
What value do you want to use? F = 9,780 F_c = 1,800 Other =
Circle to indicate "Yes" or add other value if not given.

FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - VALLEY
TEST RUN NO. #3
TEST LOCATION Boiler #3 - OUTLET

DATE 30 Nov 99 PAGE 1 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
1-1	0.44	0.663	1450	80.80	0.87	318	58	67	0.50	8.0	2.50	—	254	230	<68°
1-2	0.43	0.656	1455	83.50	0.85	318	58	66	0.49	8.0	2.45	83.3	251	230	FULLY
1-3	0.51	0.714	1500	85.80	1.008	318	56	65	0.54	8.5	2.70	85.75	254	230	ICED
1-4	0.54	0.735	1505	88.40	1.067	318	55	64	0.55	9.0	2.75	88.45	253	231	
1-5	0.60	0.775	1510	91.20	1.186	317	54	62	0.58	8.5	2.90	91.20	252	230	
			1515	94.10								94.10			
2-1	0.48	0.693	1519	94.10	0.948	318	49	55	0.52	9.0	2.6	—	250	227	
2-2	0.49	0.700	1524	96.70	0.968	318	50	53	0.53	9.0	2.65	96.7	250	226	
2-3	0.62	0.787	1529	99.30	1.225	319	49	52	0.59	8.5	2.95	99.35	247	228	
2-4	0.62	0.787	1534	102.30	1.225	318	49	49	0.59	9.5	2.95	102.30	247	230	
2-5	0.60	0.775	1539	105.25	1.186	321	49	47	0.58	11.0	2.90	105.25	247	229	
			1544	108.15								108.15			
3-1	0.72	0.849	1548	108.15	1.423	319	50	46	0.64	9.0	3.2	—	247	230	
3-2	0.74	0.860	1553	111.35	1.462	318	51	46	0.65	9.0	3.25	111.35	250	229	
3-3	0.74	0.860	1558	114.65	1.462	319	48	46	0.65	8.5	3.25	114.60	251	230	
3-4	0.70	0.837	1603	117.85	1.383	320	50	46	0.63	8.5	3.15	117.85	250	228	
3-5	0.56	0.748	1608	121.00	1.107	314	51	45	0.56	10.0	2.80	121.00	250	230	
			1613	123.80								123.80	249		
4-1	0.57	0.755	1617	123.80	1.126	318	51	45	0.57	10.5	2.85	—	249	226	
4-2	0.60	0.775	1622	126.650	1.186	318	51	45	0.58	10.5	2.90	126.65	250	227	
4-3	0.54	0.735	1627	129.550	1.067	318	49	45	0.55	10.5	2.75	129.55	245	228	
4-4	0.52	0.721	1632	132.30	1.028	318	52	47	0.54	11.0	2.70	132.30	250	227	
4-5	0.49	0.700	1637	135.00	0.968	314	50	45	0.53	9.5	2.65	135.00	250	226	
			1642	137.65								137.65			

Form 1026 [Rev. 5/27]

FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT WEPCO - VALLEY
TEST RUN NO. #3
TEST LOCATION Boiler #3 - Outlet

DATE 30 Nov 99 PAGE 2 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
	• 1				1.914 •				1.75		1				
5-1	0.63	0.794	1645	137.65	1.245	318	50	45	.60	10.5	x5 3.00	—	249	228	< 68°
5-2	0.58	0.762	1650	140.65	1.146	318	49	45	.57	9.5	2.85	140.65	250	224	FULL
5-3	0.40	0.632	1655	143.50	.790	318	49	45	.47	4.0	2.35	143.50	250	227	ICED
5-4	0.30	0.548	1700	145.85	.593	317	49	45	.41	6.5	2.05	145.85	250	227	
5-5	0.33	0.574	1705	147.90	.652	314	49	44	.43	8.0	2.15	147.90	250	229	
			1710	150.05								150.05			

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Form 1026 [Rev. 5/27]

PITOT TRAVERSE DATA

Project: WEPCO Valley

Location: Unit 3 Outlet

Date: 11/29/99 Test No: 1 - Prelim Time:

Point No.	ΔP	√ΔP	t_s	α	Point No.	ΔP	√ΔP	t_s	α
1-1	.55	0.7416	311	5°	5-1	.38	0.6164	310	15°
-2	.52	0.7211	312	10°	-2	.42	0.6481	314	15°
-3	.37	0.6082	312	10°	-3	.49	0.7000	314	15°
-4	.27	0.5196	310	13°	-4	.53	0.7280	314	15°
-5	.28	0.5292	310	8°	-5	.52	0.7211	311	15°
2-1	.61	0.7810	312	5°					
-2	.51	0.7141	313	10°					
-3	.46	0.6782	314	10°					
-4	.48	0.6928	313	8°					
-5	.42	0.6481	313	8°					
3-1	.50	0.7071	312	5°					
-2	.58	0.7616	314	10°					
-3	.57	0.7550	314	10°					
-4	.52	0.7211	314	8°					
-5	.48	0.6928	312	10°					
4-1	.41	0.6403	312	5°					
-2	.52	0.7211	314	10°					
-3	.53	0.7280	314	5°					
-4	.52	0.7211	314	10°					
-5	.54	0.7348	313	8°					

P_{bar}_____ "Hg Static_____ "H_2O P_g_____ "Hg P_s_____ "Hg Pitot ID 535A C_p 0.836 Temp. ID E51

0.44 × 13.0 $\%CO_2$ = _____ √ΔP _____ t_s_____°F T_____°R Flue Area _____ ft^2

0.32 × 6.0 $\%O_2$ = +_____ Duct Dimensions _____

0.28 × 81.0 $\%N_2$ = +_____ B_{ws} 0.10 1 - B_{ws} 0.90 Disturbance: Upstream _____

(_____Md × _____1-B_{ws}) + (18 × _____B_{ws}) = _____(Ms) Downstream _____

$$v_s = 85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} = \_\_\_\_ \text{ ft/sec (Vs)}$$

Q_{acfm} = _____ Vs × _____ Flue Area × 60 = _____acfm Port Length_____Inches

$$Q_{dscfm} = 17.647 \times ACFM \times \frac{Ps}{Ts\ °R} = \_\_\_\_\_ \text{ SCFM}$$

$$Q_{dscfm} = 17.647 \times ACFM \times \frac{Ps}{Ts\ °R} \times (1\text{-}Bws) = \_\_\_\_\_ \text{ DSCFM}$$

Pre-test leak check ✓ "H_2O

Post-test leak check ✓ "H_2O

Data Taken By: _____/_____

Field Engineer / Test Technician

Form 1012 [Rev. 5/97]

CALIBRATION PROCEDURES

PITOT TUBES

The pitot tubes used during this test program are fabricated according to the specification described and illustrated in the *Code of Federal Regulations*, Title 40, Part 60, Appendix A, Methods 1 through 5 as published in the *Federal Register*, Volume 42, No. 160; hereafter referred to by the appropriate method number. The pitot tubes comply with the alignment specifications in Method 2, Section 4; and the pitot tube assemblies are in compliance with specifications in the same section.

Pitot tube assemblies are calibrated in accordance with Method 2, Section 4, against a standard hemispherical pitot utilizing a wind tunnel meeting the specification in Method 2, Section 4.1.2.

NOZZLES

The nozzles are measured according to Method 5, Section 5.1.

TEMPERATURE SENSING DEVICES

The potentiometer and thermocouples are calibrated against a mercury thermometer in a calibration well. Alternatively, readings are checked utilizing a NBS traceable millivolt source.

DRY GAS METERS

The test meters are calibrated according to Method 5, Section 5.3 and "Procedures for Calibrating and Using Dry Gas Volume Meters as Calibration Standards" by P.R. Westlin and R.T. Shigehara, March 10, 1978.

ANALYTICAL BALANCE

The accuracy of the analytical balance is checked with Class S, Stainless Steel Type 303 weights manufactured by F. Hopken and Son, Jersey City, New Jersey.

Pitot Tube Calibration Data

Calibration Pitot Tube: Type: HEMI STD Size (OD): 1/4" Pitot ID #: 16018

Type "S" Pitot Tube ID Numbe 427 (1/4") Cp(std) = 0.99

Calibration Date: 12/4/1997 Performed By: M. McIntyre

P_{std}, (in.) H_2O		A-Side Calibration		
Set Value	**Read Value**	**P_s, (in.) H_2O**	**$C_{p(S)}$ [a]**	**DEV. [b]**
0.25	0.27	0.39	0.829	0.001
0.55	0.55	0.78	0.830	0.000
0.85	0.85	1.20	0.831	0.001
1.00	1.05	1.50	0.828	0.002
2.00	2.00	2.85	0.829	0.001
3.00	3.00	4.25	0.832	0.002
		Average	0.830	0.001

P_{std}, (in.) H_2O		B-Side Calibration		
Set Value	**Read Value**	**P_s, (in.) H_2O**	**$C_{p(S)}$ [a]**	**DEV. [b]**
0.25	0.26	0.37	0.830	0.001
0.55	0.55	0.78	0.830	0.001
0.85	0.85	1.20	0.831	0.001
1.00	1.05	1.50	0.828	0.003
2.00	2.00	2.80	0.837	0.005
3.00	3.00	4.25	0.832	0.000
		Average	0.831	0.002

$\overline{C_p}(A) - \overline{C_p}(B) =$ 0.001 (must be ≤ 0.01)

[a] $C_{p(S)} = C_{p(std)}\sqrt{\frac{\Delta P_{std}}{\Delta P_s}}$

[b] $DEV = C_{p(S)} - \overline{C_p}$, (must be ≤ 0.01)

Pitot Tube Calibration Data

Calibration Pitot Tube: Type: Hemi Std. Size (OD): 0.25 Pitot ID #: 160-18

Type "S" Pitot Tube ID Numbe 318 Cp(std) = 0.99

Calibration Date: 9/8/95 Performed By: BR/BDL

P_{std}, (in.) H_2O		A-Side Calibration		
Set Value	**Read Value**	**P_s, (in.) H_2O**	**$C_{p(S)}$ [a]**	**DEV. [b]**
0.25	0.24	0.34	0.832	0.006
0.55	0.55	0.76	0.842	0.005
0.85	0.84	1.20	0.828	0.009
1.00	0.99	1.40	0.833	0.005
2.00	1.90	2.60	0.846	0.009
3.00	2.90	4.00	0.843	0.006
		Average	0.837	0.006

P_{std}, (in.) H_2O		B-Side Calibration		
Set Value	**Read Value**	**P_s, (in.) H_2O**	**$C_{p(S)}$ [a]**	**DEV. [b]**
0.25	0.24	0.34	0.832	0.005
0.55	0.55	0.77	0.837	0.000
0.85	0.84	1.20	0.828	0.008
1.00	0.99	1.40	0.833	0.004
2.00	1.90	2.60	0.846	0.010
3.00	2.90	4.00	0.843	0.007
		Average	0.836	0.006

$\overline{C_p}(A) - \overline{C_p}(B) =$ 0.001 (must be ≤ 0.01)

[a] $C_{p(S)} = C_{p(std)}\sqrt{\frac{\Delta P_{std}}{\Delta P_s}}$

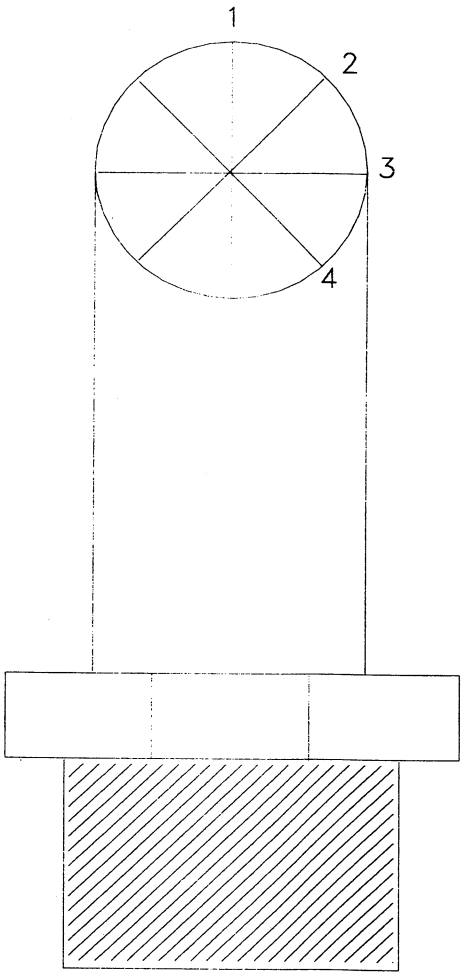
[b] $DEV = C_{p(S)} - \overline{C_p}$, (must be ≤ 0.01)

Nozzle Calibration

Date: 11/29/00

Nozzle ID No.: Set No.8

Analyst: DSM



Pre Test		Post Test
0.240	1	√
0.239	2	√
0.240	3	√
0.239	4	√

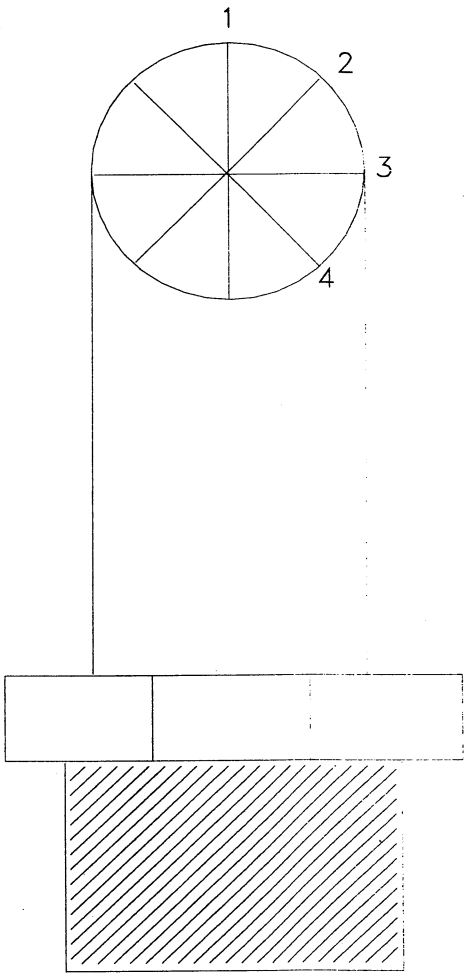
Average
0.240

Nozzle Calibration

Date: 11/29/00

Nozzle ID No.: Set No.8

Analyst: DSM



Pre Test		Post Test
0.246	1	√
0.245	2	√
0.244	3	√
0.244	4	√

Average
0.245

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM (FOR K-TYPE THERMOCOUPLES)

EPA Control Module Number: E12 Name: Rich Russ

Ambient Temperatu 63 °F Date: 11-12-99

Model 1061; S/N: A20821 Reference Source (T/C Calibrator): Transmation, Inc.

Date of Calibration Verification: 10/18/94

Primary Standards Directly Traceable to
National Institute of Standards and Technology (NIST)

Reference[a] Source Temperature, (°F)	Test Thermometer Temperature, (°F)	Temperature Difference,[b] %
50	49	0.196
100	99	0.179
150	149	0.164
200	199	0.152
250	249	0.141
300	300	0.000
350	350	0.000
400	400	0.000
450	450	0.000
500	500	0.000
550	550	0.000
600	600	0.000
650	650	0.000
700	700	0.000
800	800	0.000
900	900	0.000
1000	1000	0.000
1100	1100	0.000
1200	1200	0.000

[a]Every (50°F) for each reference point.

$$\frac{(\text{Ref. Temp., °F} + 460) - (\text{Test Therm. Temp., °F} + 460)}{\text{Ref. Temp., °F} + 460} * 100 <= 1.5\ \%$$

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM (FOR K-TYPE THERMOCOUPLES)

EPA Control Module Number: E12 Name: Rich Russ

Ambient Temperatu 68 °F Date: 12-09-99

Model 1061; S/N: A20821 Reference Source (T/C Calibrator): Transmation, Inc.

Date of Calibration Verification: 10/18/94

Primary Standards Directly Traceable to
National Institute of Standards and Technology (NIST)

Reference[a] Source Temperature, (°F)	Test Thermometer Temperature, (°F)	Temperature Difference,[b] %
50	50	0.000
100	100	0.000
150	150	0.000
200	200	0.000
250	250	0.000
300	300	0.000
350	350	0.000
400	400	0.000
450	450	0.000
500	500	0.000
550	550	0.000
600	600	0.000
650	650	0.000
700	700	0.000
800	800	0.000
900	900	0.000
1000	1000	0.000
1100	1101	0.064
1200	1201	0.060

[a]Every (50°F) for each reference point.

$$\frac{(\text{Ref. Temp., °F} + 460) - (\text{Test Therm. Temp., °F} + 460)}{\text{Ref. Temp., °F} + 460} * 100 <= 1.5\ \%$$

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM (FOR K-TYPE THERMOCOUPLES)

EPA Control Module Number: E51 Name: Rich Russ

Ambient Temperatu 67 °F Date: 11-03-99

Model 1061; S/N: A20821 Reference Source (T/C Calibrator): Transmation, Inc.

Date of Calibration Verification: 10/18/94

Primary Standards Directly Traceable to
National Institute of Standards and Technology (NIST)

Reference[a] Source Temperature, (°F)	Test Thermometer Temperature, (°F)	Temperature Difference,[b] %
50	51	0.196
100	101	0.179
150	151	0.164
200	201	0.152
250	251	0.141
300	300	0.000
350	350	0.000
400	400	0.000
450	450	0.000
500	500	0.000
550	550	0.000
600	600	0.000
650	650	0.000
700	700	0.000
800	800	0.000
900	900	0.000
1000	1000	0.000
1100	1100	0.000
1200	1200	0.000

[a]Every (50°F) for each reference point.

$$\frac{(\text{Ref. Temp., °F} + 460) - (\text{Test Therm. Temp., °F} + 460)}{\text{Ref. Temp., °F} + 460} * 100 <= 1.5\ \%$$

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM (FOR K-TYPE THERMOCOUPLES)

EPA Control Module Number: E51 Name: Rich Russ

Ambient Temperatu 67 °F Date: 12-08-99

Model 1061; S/N: A20821 Reference Source (T/C Calibrator): Transmation, Inc.

Date of Calibration Verification: 10/18/94

Primary Standards Directly Traceable to
National Institute of Standards and Technology (NIST)

Reference[a] Source Temperature, (°F)	Test Thermometer Temperature, (°F)	Temperature Difference,[b] %
50	51	0.196
100	101	0.179
150	151	0.164
200	201	0.152
250	251	0.141
300	301	0.132
350	351	0.123
400	401	0.116
450	451	0.110
500	501	0.104
550	551	0.099
600	601	0.094
650	650	0.000
700	700	0.000
800	800	0.000
900	900	0.000
1000	1000	0.000
1100	1100	0.000
1200	1200	0.000

[a]Every (50°F) for each reference point.

$$\frac{(\text{Ref. Temp., °F} + 460) - (\text{Test Therm. Temp., °F} + 460)}{\text{Ref. Temp., °F} + 460} * 100 <= 1.5\ \%$$

METER BOX CALIBRATION

Dry Gas Meter No.	E12	Date:	11-12-99
Standard Meter No.	3623851	Calibrated By:	Rich Russ
Standard Meter (Yr)	1.0063	Barometric Pressure :	29.64

Formula Protection Password: MPA

Run Number		Orifice Setting in H20 Chg (H)	Standard Meter Gas Volume Vr	Dry Meter Gas Volume Vd	Standard Meter Temp. F tr	Dry Gas Meter Inlet Temp. F tdi	Dry Gas Meter Outlet Temp. F tdo	Dry Gas Meter Avg. Temp. F td	Time Min.	Time Sec.	Y	Chg (H@)
Final			37.364	27.363	66	66	64					
Inital			32.330	22.311	66	68	65					
Difference	1	0.20	5.034	5.052	66	67	64.5	65.75	18	35	0.995	1.533
Final			42.574	32.608	66	67	64					
Inital			37.513	27.508	66	66	64					
Difference	2	0.50	5.061	5.100	66	66.5	64	65.25	12	12	0.990	1.636
Final			26.366	16.331	66	70	65					
Inital			21.317	11.249	66	68	64					
Difference	3	0.70	5.049	5.082	66	69	64.5	66.75	10	21	0.993	1.651
Final			48.141	38.198	67	71	65					
Inital			42.813	32.850	66	67	64					
Difference	4	0.90	5.328	5.348	66.5	84	64.5	74.25	9	32	1.009	1.598
Final			53.436	43.510	68	74	66					
Inital			48.323	38.378	67	70	65					
Difference	5	1.20	5.113	5.132	67.5	72	65.5	68.75	8	3	0.996	1.673
Final			31.899	21.853	66	72	65					
Inital			26.766	16.721	66	69	65					
Difference	6	2.00	5.133	5.132	66	70.5	65	67.75	6	17	0.999	1.679
									Average		0.997	1.628

METER BOX CALIBRATION

Dry Gas Meter No.	E12	Date:	12-09-99
Standard Meter No.	677191	Calibrated By:	Rich Russ
Standard Meter (Yr)	0.9991	Barometric Pressure :	30.04

Formula Protection Password: MPA

Run Number		Orifice Setting in H20 Chg (H)	Standard Meter Gas Volume Vr	Dry Meter Gas Volume Vd	Standard Meter Temp. F tr	Dry Gas Meter Inlet Temp. F tdi	Dry Gas Meter Outlet Temp. F tdo	Dry Gas Meter Avg. Temp. F td	Time Min.	Time Sec.	Y	Chg (H@)
Final			55.361	70.756	68	71	70					
Inital			50.319	65.714	68	72	71					
Difference	1	0.20	5.042	5.042	68	71.5	70.5	71	18	50	1.005	1.545
Final			60.549	75.956	69	73	70					
Inital			55.535	70.935	68	71	70					
Difference	2	0.50	5.014	5.021	68.5	72	70	71	12	2	1.002	1.598
Final			50.172	65.559	68	73	71					
Inital			45.160	60.505	68	72	71					
Difference	3	0.70	5.012	5.054	68	72.5	71	71.75	10	18	0.997	1.635
Final			65.851	81.242	69	75	71					
Inital			60.835	76.229	69	73	70					
Difference	4	0.90	5.016	5.013	69	84	70.5	77.25	8	59	1.014	1.586
Final			71.165	86.550	70	76	71					
Inital			66.126	81.512	69	74	70					
Difference	5	1.20	5.039	5.038	69.5	75	70.5	72.75	7	52	1.003	1.623
Final			100.217	15.607	68	76	70					
Inital			95.187	10.579	68	77	70					
Difference	6	2.00	5.030	5.028	68	76.5	70	73.25	6	11	1.005	1.666
								Average			1.005	1.609

VOLUME METERING SYSTEM FIELD AUDIT

Date: 11-12-99 Name: Rich Russ

EPA Control Module No.: E12 Ambient Temperature: 68 °F

Calibration (Y): 0.997 Barometric Pressure: 29.64 "Hg

Delta H: 1.628

#VALUE!

Run No.	Time (Minutes)	Gas Meter Reading/Gas Meter Temperature (Cubic Feet)	Inlet (°F)	Outlet (°F)	Yc (Calculated)
1	0	48.680	75	67	0.999
	10	56.257	78	69	
	Vm=	7.577	Avg.= 72.25	532.25	
2	0	56.257	78	69	1.002
	10	63.824	79	70	
	Vm=	7.567	Avg.= 74.00	534.00	
3	0	63.824	79	70	1.006
	10	71.365	80	71	
	Vm=	7.541	Avg.= 75.00	535.00	

$$Yc = \frac{10}{Vm}\sqrt{\frac{Pbar}{0.0319Tm}}$$

Limit: 0.97Y <Yc< 1.03Y

Limit: 0.967 <Yc< 1.027

$$\text{Calc. Delta H @} = \frac{0.0319\ (\text{Delta H})(Tm)(100)}{Pbar(Y^2)(Vm^2)}$$ (From Calibration Data) = 1.909

METER BOX CALIBRATION

Dry Gas Meter No.	E51	Date:	11-03-99
Standard Meter No.	3623851	Calibrated By:	Rich Russ
Standard Meter (Yr)	1.0063	Barometric Pressure :	29.38

Formula Protection Password: MPA

Run Number		Orifice Setting in H20 Chg (H)	Standard Meter Gas Volume Vr	Dry Meter Gas Volume Vd	Standard Meter Temp. F tr	Dry Gas Meter Inlet Temp. F tdi	Dry Gas Meter Outlet Temp. F tdo	Dry Gas Meter Avg. Temp. F td	Time Min.	Time Sec.	Y	Chg (H@)
Final			79.160	85.107	67	72	70					
Inital			74.125	80.070	67	70	69					
Difference	1	0.20	5.035	5.037	67	71	69.5	70.25	19	31	1.005	1.697
Final			91.537	97.454	67	77	70					
Inital			85.621	91.519	67	76	70					
Difference	2	0.50	5.916	5.935	67	76.5	70	73.25	14	52	1.007	1.773
Final			73.972	79.915	66	73	69					
Inital			68.946	74.879	66	70	69					
Difference	3	0.70	5.026	5.036	66	71.5	69	70.25	10	50	1.004	1.830
Final			98.281	104.170	67	74	69					
Inital			92.351	98.271	67	72	69					
Difference	4	0.90	5.930	5.899	67	73	69	71	11	22	1.011	1.865
Final			104.915	10.738	67	75	69					
Inital			98.435	4.338	67	72	69					
Difference	5	1.20	6.480	6.400	67	73.5	69	71.25	10	42	1.018	1.844
Final			85.266	91.184	67	79	70					
Inital			79.545	85.488	67	72	70					
Difference	6	2.00	5.721	5.696	67	75.5	70	72.75	7	23	1.010	1.872
									Average		1.009	1.814

METER BOX CALIBRATION

Dry Gas Meter No.	E51	Date:	12-08-99
Standard Meter No.	3623851	Calibrated By:	Rich Russ
Standard Meter (Yr)	1.0063	Barometric Pressure :	29.53

Formula Protection Password: MPA

Run Number		Orifice Setting in H20 Chg (H)	Standard Meter Gas Volume Vr	Dry Meter Gas Volume Vd	Standard Meter Temp. F tr	Dry Gas Meter Inlet Temp. F tdi	Dry Gas Meter Outlet Temp. F tdo	Dry Gas Meter Avg. Temp. F td	Time Min.	Time Sec.	Y	Chg (H@)
Final			65.880	34.702	65	73	70					
Inital			60.875	29.615	65	74	70					
Difference	1	0.20	5.005	5.087	65	73.5	70	71.75	19	33	0.996	1.697
Final			71.201	40.097	65	75	70					
Inital			66.035	34.850	65	72	70					
Difference	2	0.50	5.166	5.247	65	73.5	70	71.75	13	7	0.996	1.792
Final			60.742	29.484	65	76	70					
Inital			55.724	24.446	64	74	69					
Difference	3	0.70	5.018	5.038	64.5	75	69.5	72.25	10	54	1.009	1.831
Final			76.537	45.474	65	78	70					
Inital			71.519	40.405	65	75	70					
Difference	4	0.90	5.018	5.069	65	76.5	70	73.25	9	44	1.003	1.878
Final			81.757	50.730	65	79	71					
Inital			76.744	45.692	65	77	70					
Difference	5	1.20	5.013	5.038	65	78	70.5	74.25	8	18	1.010	1.821
Final			87.073	56.096	65	82	71					
Inital			82.020	51.002	65	77	70					
Difference	6	2.00	5.053	5.094	65	79.5	70.5	75	6	37	1.006	1.895
									Average		1.003	1.819

VOLUME METERING SYSTEM FIELD AUDIT

Date: 11-03-99 Name: Rich Russ

EPA Control Module No.: E51 Ambient Temperature: 69 °F

Calibration (Y): 1.009 Barometric Pressure: 29.38 "Hg

Delta H: 1.814

Run No.	Time (Minutes)	Gas Meter Reading/Gas Meter Temperature (Cubic Feet)	Inlet (°F)	Outlet (°F)	Yc (Calculated)
1	0	16.740	72	68	1.019
	10	24.189	75	68	
	Vm=	7.449	Avg.= 70.75	530.75	
2	0	24.189	74	68	1.026
	10	31.596	77	68	
	Vm=	7.407	Avg.= 71.75	531.75	
3	0	31.596	76	68	1.018
	10	39.061	77	68	
	Vm=	7.465	Avg.= 72.25	532.25	

$$Yc = \frac{10}{Vm}\sqrt{\frac{Pbar}{0.0319Tm}}$$

Limit: 0.97Y <Yc< 1.03Y

Limit: 0.979 <Yc< 1.039

$$\text{Calc. Delta H @} = \frac{0.0319\ (\text{Delta H})(Tm)(100)}{Pbar(Y^2)(Vm^2)}$$ (From Calibration Data) = 1.945

ONTARIO HYDRO METHOD TEST SUPPORT DATA

PROJECT NO.:	94805	**TEST RUN NO.:**	1	**TEST DATE:**	11/30/99

CUSTOMER:	Wisconsin Electric Power Company	**BAROMETRIC PRESSURE (Pb)**	30.11	**in. Hg.**	
PLANT:	Valley Power Plant	**STATIC PRESSURE**	-13.5	**in. H2O**	
TEST LOC.:	Boiler #3 Baghouse Inlet	**FLUE PRESSURE (Ps)**	29.12	**in. Hg. abs.**	
CLIENT:	Electric Power Research Institute	**PROBE LENGTH:**	10	**ft.**	
OPERATOR:	D. Helm	**PROBE LINER MATERIAL:**	Teflon		
CONTROL BOX:	E-12	**NOZZLE IDENTIFICATION NO.:**	#8		
METER NO.:	E-12	**CALIBRATED NOZZLE DIAMETER:**	0.240	**in.**	
METER CALIBRATION FACTOR:	0.997	**LEAK CHECK** **PRE:**	0.008	**POST:**	0.005 @ 11 in. Hg.
PITOT ID NO.:	427A	**DUCT SHAPE:**	Circular	DIA.	Feet
PITOT TUBE COEFFICIENT:	0.830		Rectangular	12.6666 Feet	9.5 Feet
PORT LENGTH:	28 in.	**DUCT AREA:**	120.3327	**sq. ft.**	
PORT SIZE:	6 in.	**TEST LENGTH:**	125	**min.**	
PORT TYPE:	Flange	**MINUTES PER POINT:**	5		
		TOTAL NUMBER OF TRAVERSE POINTS:	25		

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Wisconsin Electric Power Company **Date:** 11/30/99 **Test Ru** 1

Location: Boiler #3 Baghouse Inlet

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.38	0.616	9:01	17.02	0.66	328	38	34	5	2.366
1-2	0.42	0.648	9:06	19.39	0.73	324	41	35	4	2.320
1-3	0.43	0.656	9:11	21.71	0.75	317	43	38	5	2.460
1-4	0.41	0.640	9:16	24.17	0.71	311	44	37	5	2.500
1-5	0.43	0.656	9:21	26.67	0.75	297	45	38	5	2.350
			9:26	29.02						0.000
2-1	0.40	0.632	9:27	29.55	0.70	324	46	39	5	2.330
2-2	0.43	0.656	9:32	31.88	0.75	320	47	39	5	2.430
2-3	0.47	0.686	9:37	34.31	0.82	315	48	40	5	2.670
2-4	0.45	0.671	9:42	36.98	0.78	308	48	41	5	2.430
2-5	0.29	0.539	9:47	39.41	0.51	287	49	42	4	2.040
			9:52	41.45						0.000
3-1	0.46	0.678	9:54	41.87	0.80	330	49	42	5	2.535
3-2	0.46	0.678	9:59	44.40	0.80	328	49	43	5	2.580
3-3	0.47	0.686	10:04	46.98	0.82	319	50	43	5	2.560
3-4	0.55	0.742	10:09	49.54	0.96	311	51	44	6	2.780
3-5	0.38	0.616	10:14	52.32	0.66	297	51	44	5	2.340
			10:19	54.66						0.000
4-1	0.54	0.735	10:21	55.22	0.94	330	51	45	6	2.795
4-2	0.50	0.707	10:26	58.01	0.87	325	51	46	6	2.680
4-3	0.48	0.693	10:31	60.69	0.84	320	52	46	6	2.580
4-4	0.48	0.693	10:36	63.27	0.84	313	52	46	6	2.620
4-5	0.36	0.600	10:41	65.89	0.63	288	52	46	6	2.210
			10:46	68.10						0.000
5-1	0.18	0.424	10:48	68.64	0.31	328	51	46	5	1.600
5-2	0.49	0.700	10:53	70.24	0.85	323	51	47	7	2.640
5-3	0.52	0.721	10:58	72.88	0.91	316	52	47	7	2.680
5-4	0.45	0.671	11:03	75.56	0.78	310	53	48	7	2.530
5-5	0.46	0.678	11:08	78.09	0.80	295	53	47	7	2.520
			11:13	80.61						0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
		0.657		61.546	0.76	315	49	43		#####
							45.60			

MOISTURE, DILUENT AND MERCURY DATA

Company Wisconsin Electric Power Compa **Date:** 11/30/99 **Test Run:** 1

Location: Boiler #3 Baghouse Inlet

SILICA GEL FINAL WT.:	723.80	**grams**
SILICA GEL INITIAL WT.:	712.40	**grams**
DIFFERENCE:	11.40	
FINAL IMPINGER WATER:	4698.90	**mls.**
INITIAL IMPINGER WATER:	4597.00	**mls.**
DIFFERENCE:	101.90	
TOTAL WATER GAIN:	113.30	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	0.060		0.000000060
PROBE WASH:	0.002		0.000000002
		Particle-bound Total:	0.000000062
KCl:	2.096		0.000002096
		Oxidized Total:	0.000002096
HNO_3/H_2O_2:	1.330		0.000001330
$KMNO_4$:	0.439		0.000000439
		Elemental Total:	0.000001769

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	11.40			11.40
Oxygen:	6.60			6.60

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	**Wisconsin Electric Power Company**
Date:	11/30/99
Test Run:	1
Stack or Duct No.:	Boiler #3 Baghouse Inlet
Start Time:	9:01
Stop Time:	11:13

Pb:	30.11	Inches Hg
Static	-13.50	Inches H2O
Ps:	29.12	Inches Hg Abs.
Vlc:	113	ml + grams
Mn:	0.0000	gm
Test Time:	125	minutes
% O2:	6.60	%
% CO2:	11.40	%
% N2:	82.00	%
Delta H:	0.76	Inches H20
Cp:	0.830	Dimensionless - pitot
Tm:	45.60	°F
Sqrt P:	0.657	Inches H20
Ts:	314.56	°F
Vm:	61.546	Cubic Feet
Dn:	0.240	Inches - nozzle
As:	120.33	Sq. Feet
Yd:	0.997	Mcf
CF:	N/A	Process tons/hr
Heat Input:	N/A	MM BTU/hr
Fd:	N/A	dscf/10^6 Btu
Fc:	N/A	scf/10^6 Btu

Vmstd:	64.606	cubic feet (dry)
Vwstd:	5.336	cubic feet (wet)
Bwo:	0.076	
Md:	30.088	lb/lb-mole (dry)
Ms:	29.166	lb/lb-mole (wet)
Excess Air (%)	43.860	
Vs:	44.513	fps
ACFM:	321379.	
DSCFM:	196932.	
WSCFM:	213199	
%I:	100.6	isokinetic variance
GR/ACF:	---	
GR/DSCF:	---	
lbs/hr	---	
lbs/ton prod.:	N/A	
lbs/MM BTU:	N/A	Heat Input
lbs/MM BTU:	N/A	O2 Basis
lbs/MM BTU:	N/A	CO2 Basis

ONTARIO HYDRO METHOD TEST SUPPORT DATA

PROJECT NO.:	94805	**TEST RUN NO.:**	2	**TEST DATE:**	11/30/99

CUSTOMER:	Wisconsin Electric Power Company	**BAROMETRIC PRESSURE (Pb)**	30.11	**in. Hg.**	
PLANT:	Valley Power Plant	**STATIC PRESSURE**	-13.5	**in. H2O**	
TEST LOC.:	Boiler #3 Baghouse Inlet	**FLUE PRESSURE (Ps)**	29.12	**in. Hg. abs.**	
CLIENT:	Electric Power Research Institute	**PROBE LENGTH:**	10	**ft.**	
OPERATOR:	D. Helm	**PROBE LINER MATERIAL:**	Teflon		
CONTROL BOX:	E-12	**NOZZLE IDENTIFICATION NO.:**	8		
METER NO.:	E-12	**CALIBRATED NOZZLE DIAMETER:**	0.240	**in.**	
METER CALIBRATION FACTOR:	0.997	**LEAK CHECK** **PRE:**	0.007	**POST:**	0.005 @ 11 in. Hg.
PITOT ID NO.:	427A	**DUCT SHAPE:**	Circular	DIA.	Feet
			Rectangular	12.6666 Feet	9.5 Feet
PITOT TUBE COEFFICIENT:	0.830	**DUCT AREA:**	120.3327	**sq. ft.**	
PORT LENGTH:	28 in.	**TEST LENGTH:**	125	**min.**	
PORT SIZE:	6 in.	**MINUTES PER POINT:**	5		
PORT TYPE:	Flange	**TOTAL NUMBER OF TRAVERSE POINTS:**	25		

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Wisconsin Electric Power Company **Date:** 11/30/99 **Test Ru** 2

Location: Boiler #3 Baghouse Inlet

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.44	0.663	12:00	81.69	0.79	326	50	47	6	2.505
1-2	0.43	0.656	12:05	84.19	0.77	322	52	48	7	2.530
1-3	0.40	0.632	12:10	86.72	0.72	314	56	49	6	2.410
1-4	0.40	0.632	12:15	89.13	0.72	310	59	50	6	2.520
1-5	0.43	0.656	12:20	91.65	0.77	296	61	52	6	2.500
			12:25	94.15						0.000
2-1	0.44	0.663	12:27	94.59	0.79	325	63	54	7	2.580
2-2	0.48	0.693	12:32	97.17	0.86	321	63	56	7	2.650
2-3	0.47	0.686	12:37	99.82	0.84	314	62	56	7	2.680
2-4	0.46	0.678	12:42	102.50	0.83	309	62	55	7	2.550
2-5	0.35	0.592	12:47	105.05	0.63	294	61	55	6	2.260
			12:52	107.31						0.000
3-1	0.45	0.671	12:54	107.60	0.81	331	62	54	7	2.610
3-2	0.47	0.686	12:59	110.21	0.84	327	61	55	7	2.570
3-3	0.54	0.735	13:04	112.78	0.97	320	61	56	8	2.810
3-4	0.54	0.735	13:09	115.59	0.97	311	61	55	8	2.830
3-5	0.33	0.574	13:14	118.42	0.59	288	60	55	6	2.240
			13:19	120.66						0.000
4-1	0.56	0.748	13:21	121.00	1.00	329	59	55	9	2.910
4-2	0.45	0.671	13:26	123.91	0.81	324	60	55	8	2.510
4-3	0.44	0.663	13:31	126.42	0.79	321	60	55	8	2.570
4-4	0.58	0.762	13:36	128.99	1.04	314	60	55	9	2.890
4-5	0.31	0.557	13:41	131.88	0.56	285	59	54	7	2.190
			13:46	134.07						0.000
5-1	0.16	0.400	13:48	134.46	0.29	329	57	54	4	1.464
5-2	0.46	0.678	13:53	135.92	0.83	322	57	53	7	2.610
5-3	0.50	0.707	13:58	138.53	0.90	314	56	53	9	2.740
5-4	0.53	0.728	14:03	141.27	0.95	309	56	54	9	2.800
5-5	0.53	0.728	14:08	144.07	0.95	291	56	54	11	2.790
			14:13	146.86						0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
		0.664		63.719	0.80	314	59	54		#####
							56.26			

MOISTURE, DILUENT AND MERCURY DATA

Company Wisconsin Electric Power Compa **Date:** 11/30/99 **Test Run:** 2

Location: Boiler #3 Baghouse Inlet

SILICA GEL FINAL WT.:	751.70	**grams**
SILICA GEL INITIAL WT.:	738.50	**grams**
DIFFERENCE:	13.20	
FINAL IMPINGER WATER:	4723.30	**mls.**
INITIAL IMPINGER WATER:	4626.20	**mls.**
DIFFERENCE:	97.10	
TOTAL WATER GAIN:	110.30	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	0.057		0.000000057
PROBE WASH:	0.025		0.000000025
		Particle-bound Total:	0.000000082
KCl:	2.216		0.000002216
		Oxidized Total:	0.000002216
HNO_3/H_2O_2:	0.362		0.000000362
$KMNO_4$:	0.306		0.000000306
		Elemental Total:	0.000000668

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	11.40			11.40
Oxygen:	6.60			6.60

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	**Wisconsin Electric Power Company**
Date:	11/30/99
Test Run:	2
Stack or Duct No.:	Boiler #3 Baghouse Inlet
Start Time:	12:00
Stop Time:	14:13

Pb:	30.11	Inches Hg
Static	-13.50	Inches H2O
Ps:	29.12	Inches Hg Abs.
Vlc:	110	ml + grams
Mn:	0.0000	gm
Test Time:	125	minutes
% O2:	6.60	%
% CO2:	11.40	%
% N2:	82.00	%
Delta H:	0.80	Inches H20
Cp:	0.830	Dimensionless - pitot
Tm:	56.26	°F
Sqrt P:	0.664	Inches H20
Ts:	313.84	°F
Vm:	63.719	Cubic Feet
Dn:	0.240	Inches - nozzle
As:	120.33	Sq. Feet
Yd:	0.997	Mcf
CF:	N/A	Process tons/hr
Heat Input:	N/A	MM BTU/hr
Fd:	N/A	dscf/10^6 Btu
Fc:	N/A	scf/10^6 Btu

Vmstd:	65.513	cubic feet (dry)
Vwstd:	5.195	cubic feet (wet)
Bwo:	0.073	
Md:	30.088	lb/lb-mole (dry)
Ms:	29.200	lb/lb-mole (wet)
Excess Air (%)	43.860	
Vs:	44.933	fps
ACFM:	324413.	
DSCFM:	199585.	
WSCFM:	215412	
%I:	100.6	isokinetic variance
GR/ACF:	---	
GR/DSCF:	---	
lbs/hr	---	
lbs/ton prod.:	N/A	
lbs/MM BTU:	N/A	Heat Input
lbs/MM BTU:	N/A	O2 Basis
lbs/MM BTU:	N/A	CO2 Basis

ONTARIO HYDRO METHOD TEST SUPPORT DATA

PROJECT NO.:	94805	**TEST RUN NO.:**	3	**TEST DATE:**	11/30/99

CUSTOMER:	Wisconsin Electric Power Company	**BAROMETRIC PRESSURE (Pb)**	30.11	**in. Hg.**	
PLANT:	Valley Power Plant	**STATIC PRESSURE**	-13.5	**in. H2O**	
TEST LOC.:	Boiler #3 Baghouse Inlet	**FLUE PRESSURE (Ps)**	29.12	**in. Hg. abs.**	
CLIENT:	Electric Power Research Institute	**PROBE LENGTH:**	10	**ft.**	
OPERATOR:	D. Helm	**PROBE LINER MATERIAL:**	Teflon		
CONTROL BOX:	E-12	**NOZZLE IDENTIFICATION NO.:**	8		
METER NO.:	E-12	**CALIBRATED NOZZLE DIAMETER:**	0.240	**in.**	
METER CALIBRATION FACTOR:	0.997	**LEAK CHECK**	**PRE:** 0.007	**POST:**	0.005 @ 11 in. Hg.
PITOT ID NO.:	427A	**DUCT SHAPE:**	Circular	DIA.	Feet
PITOT TUBE COEFFICIENT:	0.830		Rectangular	12.6666 Feet	9.5 Feet
PORT LENGTH:	28 in.	**DUCT AREA:**	120.3327	**sq. ft.**	
PORT SIZE:	6 in.	**TEST LENGTH:**	125	**min.**	
PORT TYPE:	Flange	**MINUTES PER POINT:**	5		
		TOTAL NUMBER OF TRAVERSE POINTS:	25		

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Wisconsin Electric Power Company **Date:** 11/30/99 **Test Ru** 3

Location: Boiler #3 Baghouse Inlet

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.40	0.632	14:50	48.34	0.72	325	48	48	5	2.450
1-2	0.42	0.648	14:55	50.79	0.75	322	49	48	5	2.490
1-3	0.40	0.632	15:00	53.28	0.72	315	49	48	5	2.340
1-4	0.39	0.624	15:05	55.62	0.70	310	49	47	5	2.430
1-5	0.42	0.648	15:10	58.05	0.75	300	49	48	5	2.520
			15:15	60.57						0.000
2-1	0.43	0.656	15:17	60.99	0.77	327	49	46	5	2.549
2-2	0.40	0.632	15:22	63.54	0.72	319	50	46	5	2.410
2-3	0.45	0.671	15:27	65.95	0.81	313	51	47	5	2.560
2-4	0.47	0.686	15:32	68.51	0.84	308	53	47	5	2.640
2-5	0.36	0.600	15:37	71.15	0.65	286	53	47	5	2.290
			15:42	73.44						0.000
3-1	0.49	0.700	15:43	73.86	0.88	328	53	47	6	2.635
3-2	0.43	0.656	15:48	76.49	0.77	327	55	48	6	2.500
3-3	0.45	0.671	15:53	78.99	0.81	318	57	49	6	2.630
3-4	0.52	0.721	15:58	81.62	0.93	311	58	50	6	2.730
3-5	0.31	0.557	16:03	84.35	0.56	292	59	51	5	2.170
			16:08	86.52						0.000
4-1	0.52	0.721	16:10	86.83	0.93	327	58	52	6	2.735
4-2	0.51	0.714	16:15	89.56	0.91	324	58	52	5	2.760
4-3	0.44	0.663	16:20	92.32	0.79	320	56	52	6	2.570
4-4	0.48	0.693	16:25	94.89	0.86	312	54	52	6	2.680
4-5	0.32	0.566	16:30	97.57	0.57	295	53	51	5	2.140
			16:35	99.71						0.000
5-1	0.43	0.656	16:37	100.09	0.77	326	52	50	6	2.546
5-2	0.37	0.608	16:42	102.64	0.66	321	52	50	6	2.330
5-3	0.42	0.648	16:47	104.97	0.75	314	51	49	6	2.480
5-4	0.44	0.663	16:52	107.45	0.79	310	51	49	6	2.540
5-5	0.35	0.592	16:57	109.99	0.63	291	51	48	6	2.260
			17:02	112.25						0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
		0.650		62.385	0.76	314	53	49		#####
							50.80			

MOISTURE, DILUENT AND MERCURY DATA

Company Wisconsin Electric Power Compa **Date:** 11/30/99 **Test Run:** 3

Location: Boiler #3 Baghouse Inlet

SILICA GEL FINAL WT.:	634.60	**grams**
SILICA GEL INITIAL WT.:	623.20	**grams**
DIFFERENCE:	11.40	
FINAL IMPINGER WATER:	4731.00	**mls.**
INITIAL IMPINGER WATER:	4630.50	**mls.**
DIFFERENCE:	100.50	
TOTAL WATER GAIN:	111.90	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	0.046		0.000000046
PROBE WASH:	0.014		0.000000014
		Particle-bound Total:	0.000000060
KCl:	1.806		0.000001806
		Oxidized Total:	0.000001806
HNO_3/H_2O_2:	0.570		0.000000570
$KMNO_4$:	0.413		0.000000413
		Elemental Total:	0.000000983

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	11.50			11.50
Oxygen:	6.50			6.50

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	**Wisconsin Electric Power Company**
Date:	11/30/99
Test Run:	3
Stack or Duct No.:	Boiler #3 Baghouse Inlet
Start Time:	14:50
Stop Time:	17:02

Pb:	30.11	Inches Hg
Static	-13.50	Inches H2O
Ps:	29.12	Inches Hg Abs.
Vlc:	112	ml + grams
Mn:	0.0000	gm
Test Time:	125	minutes
% O2:	6.50	%
% CO2:	11.50	%
% N2:	82.00	%
Delta H:	0.76	Inches H20
Cp:	0.830	Dimensionless - pitot
Tm:	50.80	°F
Sqrt P:	0.650	Inches H20
Ts:	313.64	°F
Vm:	62.385	Cubic Feet
Dn:	0.240	Inches - nozzle
As:	120.33	Sq. Feet
Yd:	0.997	Mcf
CF:	N/A	Process tons/hr
Heat Input:	N/A	MM BTU/hr
Fd:	N/A	dscf/10^6 Btu
Fc:	N/A	scf/10^6 Btu

Vmstd:	64.821	cubic feet (dry)
Vwstd:	5.270	cubic feet (wet)
Bwo:	0.075	
Md:	30.100	lb/lb-mole (dry)
Ms:	29.190	lb/lb-mole (wet)
Excess Air (%)	42.910	
Vs:	44.027	fps
ACFM:	317870.	
DSCFM:	195247.	
WSCFM:	211122	
%I:	101.8	isokinetic variance
GR/ACF:	---	
GR/DSCF:	---	
lbs/hr	---	
lbs/ton prod.:	N/A	
lbs/MM BTU:	N/A	Heat Input
lbs/MM BTU:	N/A	O2 Basis
lbs/MM BTU:	N/A	CO2 Basis

ONTARIO HYDRO METHOD TEST SUPPORT DATA

PROJECT NO.:	94805	**TEST RUN NO.:**	1	**TEST DATE:**	11/30/99

CUSTOMER:	Wisconsin Electric Power Company	**BAROMETRIC PRESSURE (Pb)**	30.11	**in. Hg.**	
PLANT:	Valley Power Plant	**STATIC PRESSURE**	-18	**in. H2O**	
TEST LOC.:	Boiler #3 Baghouse Outlet	**FLUE PRESSURE (Ps)**	28.79	**in. Hg. abs.**	
CLIENT:	Electric Power Research Institute	**PROBE LENGTH:**	13	**ft.**	
OPERATOR:	N. Smith	**PROBE LINER MATERIAL:**	Teflon		
CONTROL BOX:	E-51	**NOZZLE IDENTIFICATION NO.:**	#8		
METER NO.:	E-51	**CALIBRATED NOZZLE DIAMETER:**	0.245	**in.**	
METER CALIBRATION FACTOR:	1.009	**LEAK CHECK** **PRE:**	0.000	**POST:**	0.000 @ 16 in. Hg.
PITOT ID NO.:	318A	**DUCT SHAPE:**	Circular DIA.		Feet
			Rectangular 12.6666	Feet	9.5 Feet
PITOT TUBE COEFFICIENT:	0.837	**DUCT AREA:**	120.3327	**sq. ft.**	
PORT LENGTH:	28 in.	**TEST LENGTH:**	125	**min.**	
PORT SIZE:	6 in.	**MINUTES PER POINT:**	5		
PORT TYPE:	Flange	**TOTAL NUMBER OF TRAVERSE POINTS:**	25		

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Wisconsin Electric Power Company **Date:** 11/30/99 **Test Ru** 1

Location: Boiler #3 Baghouse Outlet

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.12	0.346	9:00	146.17	0.24	315	37	32	8	1.532
1-2	0.44	0.663	9:05	147.70	0.87	318	39	33	8.5	2.250
1-3	0.53	0.728	9:10	149.95	1.05	318	40	34	4.5	2.700
1-4	0.57	0.755	9:15	152.65	1.13	317	43	35	9.5	2.860
1-5	0.59	0.768	9:20	155.51	1.17	314	46	37	9.5	2.840
			9:25	158.35						0.000
2-1	0.46	0.678	9:30	158.35	0.91	315	47	38	9	2.250
2-2	0.48	0.693	9:35	160.60	0.95	317	50	39	9.5	2.500
2-3	0.59	0.768	9:40	163.10	1.17	317	51	40	9.5	3.250
2-4	0.61	0.781	9:45	166.35	1.21	317	55	42	10	2.900
2-5	0.55	0.742	9:50	169.25	1.09	312	58	43	9.5	2.770
			9:55	172.02						0.000
3-1	0.61	0.781	10:00	172.02	1.21	318	59	47	10	2.930
3-2	0.63	0.794	10:05	174.95	1.25	318	61	48	10	2.950
3-3	0.65	0.806	10:10	177.90	1.29	318	64	50	9.5	3.000
3-4	0.54	0.735	10:15	180.90	1.07	317	66	52	9.5	2.750
3-5	0.47	0.686	10:20	183.65	0.93	312	67	53	10	2.570
			10:25	186.22						0.000
4-1	0.58	0.762	10:30	186.22	1.15	316	67	55	9.5	2.880
4-2	0.59	0.768	10:35	189.10	1.17	318	68	57	9.5	2.800
4-3	0.51	0.714	10:40	191.90	1.01	318	64	60	9.5	2.690
4-4	0.54	0.735	10:45	194.59	1.07	317	61	60	9	2.610
4-5	0.48	0.693	10:50	197.20	0.95	313	63	63	9	2.730
			10:55	199.93						0.000
5-1	0.58	0.762	11:00	199.93	1.15	316	62	68	11	2.800
5-2	0.59	0.768	11:05	202.73	1.17	317	64	70	11	2.870
5-3	0.37	0.608	11:10	205.60	0.73	317	65	72	7	2.300
5-4	0.31	0.557	11:15	207.90	0.61	316	64	72	7	2.090
5-5	0.26	0.510	11:20	209.99	0.51	312	64	74	7	1.910
			11:25	211.90						0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
		0.704		65.732	1.00	316	57	51		#####
							53.98			

MOISTURE, DILUENT AND MERCURY DATA

Company Wisconsin Electric Power Compa **Date:** 11/30/99 **Test Run:** 1

Location: Boiler #3 Baghouse Outlet

SILICA GEL FINAL WT.:	808.40	**grams**
SILICA GEL INITIAL WT.:	793.90	**grams**
DIFFERENCE:	14.50	
FINAL IMPINGER WATER:	4677.10	**mls.**
INITIAL IMPINGER WATER:	4581.50	**mls.**
DIFFERENCE:	95.60	
TOTAL WATER GAIN:	110.10	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	0.183		0.000000183
PROBE WASH:	0.000		0.000000000
		Particle-bound Total:	0.000000183
KCl:	3.086		0.000003086
		Oxidized Total:	0.000003086
HNO_3/H_2O_2:	0.339		0.000000339
$KMNO_4$:	0.280		0.000000280
		Elemental Total:	0.000000619

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	11.20			11.20
Oxygen:	6.80			6.80

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	**Wisconsin Electric Power Company**
Date:	11/30/99
Test Run:	1
Stack or Duct No.:	Boiler #3 Baghouse Outlet
Start Time:	9:00
Stop Time:	11:25

Pb:	30.11	Inches Hg
Static	-18.00	Inches H2O
Ps:	28.79	Inches Hg Abs.
Vlc:	110	ml + grams
Mn:	0.0000	gm
Test Time:	125	minutes
% O2:	6.80	%
% CO2:	11.20	%
% N2:	82.00	%
Delta H:	1.00	Inches H20
Cp:	0.837	Dimensionless - pitot
Tm:	53.98	°F
Sqrt P:	0.704	Inches H20
Ts:	316.12	°F
Vm:	65.732	Cubic Feet
Dn:	0.245	Inches - nozzle
As:	120.33	Sq. Feet
Yd:	1.009	Mcf
CF:	N/A	Process tons/hr
Heat Input:	N/A	MM BTU/hr
Fd:	N/A	dscf/10^6 Btu
Fc:	N/A	scf/10^6 Btu

Vmstd:	68.733	cubic feet (dry)
Vwstd:	5.186	cubic feet (wet)
Bwo:	0.070	
Md:	30.064	lb/lb-mole (dry)
Ms:	29.218	lb/lb-mole (wet)
Excess Air (%)	45.797	
Vs:	48.391	fps
ACFM:	349382.	
DSCFM:	212638.	
WSCFM:	228682	
%I:	95.1	isokinetic variance
GR/ACF:	---	
GR/DSCF:	---	
lbs/hr	---	
lbs/ton prod.:	N/A	
lbs/MM BTU:	N/A	Heat Input
lbs/MM BTU:	N/A	O2 Basis
lbs/MM BTU:	N/A	CO2 Basis

ONTARIO HYDRO METHOD TEST SUPPORT DATA

PROJECT NO.:	94805	**TEST RUN NO.:**	2	**TEST DATE:**	11/30/99

CUSTOMER:	Wisconsin Electric Power Company	**BAROMETRIC PRESSURE (Pb)**	30.11	**in. Hg.**	
PLANT:	Valley Power Plant	**STATIC PRESSURE**	-18	**in. H2O**	
TEST LOC.:	Boiler #3 Baghouse Outlet	**FLUE PRESSURE (Ps)**	28.79	**in. Hg. abs.**	
CLIENT:	Electric Power Research Institute	**PROBE LENGTH:**	13	**ft.**	
OPERATOR:	N. Smith	**PROBE LINER MATERIAL:**	Teflon		
CONTROL BOX:	E-51	**NOZZLE IDENTIFICATION NO.:**	8		
METER NO.:	E-51	**CALIBRATED NOZZLE DIAMETER:**	0.245	**in.**	
METER CALIBRATION FACTOR:	1.009	**LEAK CHECK** **PRE:**	0.000	**POST:**	0.000 @ 15 in. Hg.
PITOT ID NO.:	318A	**DUCT SHAPE:**	Circular	DIA.	Feet
			Rectangular	12.6666 Feet	9.5 Feet
PITOT TUBE COEFFICIENT:	0.837	**DUCT AREA:**	120.3327	**sq. ft.**	
PORT LENGTH:	28 in.	**TEST LENGTH:**	125	**min.**	
PORT SIZE:	6 in.	**MINUTES PER POINT:**	5		
PORT TYPE:	Flange	**TOTAL NUMBER OF TRAVERSE POINTS:**	25		

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Wisconsin Electric Power Company **Date:** 11/30/99 **Test Ru** 2

Location: Boiler #3 Baghouse Outlet

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.59	0.768	12:00	212.63	1.17	318	63	73	6.5	2.870
1-2	0.58	0.762	12:05	215.50	1.15	318	64	75	6	2.900
1-3	0.38	0.616	12:10	218.40	0.75	318	67	77	6	2.200
1-4	0.27	0.520	12:15	220.60	0.53	318	68	78	6	2.000
1-5	0.30	0.548	12:20	222.60	0.59	313	68	77	5.5	2.030
			12:25	224.63						0.000
2-1	0.58	0.762	12:30	224.63	1.15	316	64	76	7	2.840
2-2	0.60	0.775	12:35	227.47	1.19	320	66	77	7	2.630
2-3	0.54	0.735	12:40	230.10	1.07	320	64	75	6	3.050
2-4	0.52	0.721	12:45	233.15	1.03	320	66	76	7	2.650
2-5	0.46	0.678	12:50	235.80	0.91	314	67	75	6.5	2.535
			12:55	238.34						0.000
3-1	0.74	0.860	12:57	238.34	1.46	316	66	75	7.5	3.265
3-2	0.68	0.825	13:02	241.60	1.34	320	67	76	8	3.120
3-3	0.68	0.825	13:07	244.72	1.34	320	66	74	8.5	2.980
3-4	0.65	0.806	13:12	247.70	1.29	318	67	73	8	3.000
3-5	0.52	0.721	13:17	250.70	1.03	315	68	75	8	2.710
			13:22	253.41						0.000
4-1	0.48	0.693	13:24	253.41	0.95	319	68	75	8	2.540
4-2	0.50	0.707	13:29	255.95	0.99	320	66	75	8	2.700
4-3	0.60	0.775	13:34	258.65	1.19	320	63	74	7.5	2.900
4-4	0.64	0.800	13:39	261.55	1.27	318	65	73	7.5	2.950
4-5	0.60	0.775	13:44	264.50	1.19	315	64	72	7.5	2.930
			13:49	267.43						0.000
5-1	0.42	0.648	13:52	267.43	0.83	318	61	70	7.5	2.470
5-2	0.41	0.640	13:57	269.90	0.81	319	60	69	6.5	2.350
5-3	0.50	0.707	14:02	272.25	0.99	318	60	69	6.5	2.620
5-4	0.48	0.693	14:07	274.87	0.95	315	62	67	6.5	2.620
5-5	0.60	0.775	14:12	277.49	1.19	315	63	67	7	2.870
			14:17	280.36						0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
		0.725		67.730	1.05	318	65	74		#####
							69.32			

MOISTURE, DILUENT AND MERCURY DATA

Company Wisconsin Electric Power Compa **Date:** 11/30/99 **Test Run:** 2

Location: Boiler #3 Baghouse Outlet

SILICA GEL FINAL WT.:	724.30	**grams**
SILICA GEL INITIAL WT.:	707.40	**grams**
DIFFERENCE:	16.90	
FINAL IMPINGER WATER:	4754.50	**mls.**
INITIAL IMPINGER WATER:	4661.50	**mls.**
DIFFERENCE:	93.00	
TOTAL WATER GAIN:	109.90	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	0.068		0.000000068
PROBE WASH:	0.000		0.000000000
		Particle-bound Total:	0.000000068
KCl:	2.386		0.000002386
		Oxidized Total:	0.000002386
HNO_3/H_2O_2:	0.478		0.000000478
$KMNO_4$:	0.164		0.000000164
		Elemental Total:	0.000000642

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	11.00			11.00
Oxygen:	6.70			6.70

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	**Wisconsin Electric Power Company**
Date:	11/30/99
Test Run:	2
Stack or Duct No.:	Boiler #3 Baghouse Outlet
Start Time:	12:00
Stop Time:	14:17

Pb:	30.11	Inches Hg
Static	-18.00	Inches H2O
Ps:	28.79	Inches Hg Abs.
Vlc:	110	ml + grams
Mn:	0.0000	gm
Test Time:	125	minutes
% O2:	6.70	%
% CO2:	11.00	%
% N2:	82.30	%
Delta H:	1.05	Inches H20
Cp:	0.837	Dimensionless - pitot
Tm:	69.32	°F
Sqrt P:	0.725	Inches H20
Ts:	317.64	°F
Vm:	67.730	Cubic Feet
Dn:	0.245	Inches - nozzle
As:	120.33	Sq. Feet
Yd:	1.009	Mcf
CF:	N/A	Process tons/hr
Heat Input:	N/A	MM BTU/hr
Fd:	N/A	dscf/10^6 Btu
Fc:	N/A	scf/10^6 Btu

Vmstd:	68.778	cubic feet (dry)
Vwstd:	5.176	cubic feet (wet)
Bwo:	0.070	
Md:	30.028	lb/lb-mole (dry)
Ms:	29.186	lb/lb-mole (wet)
Excess Air (%)	44.586	
Vs:	49.931	fps
ACFM:	360499.	
DSCFM:	219014.	
WSCFM:	235497	
%I:	92.4	isokinetic variance
GR/ACF:	---	
GR/DSCF:	---	
lbs/hr	---	
lbs/ton prod.:	N/A	
lbs/MM BTU:	N/A	Heat Input
lbs/MM BTU:	N/A	O2 Basis
lbs/MM BTU:	N/A	CO2 Basis

ONTARIO HYDRO METHOD TEST SUPPORT DATA

PROJECT NO.:	94805	**TEST RUN NO.:**	3	**TEST DATE:**	11/30/99

CUSTOMER:	Wisconsin Electric Power Company	**BAROMETRIC PRESSURE (Pb)**	30.11	**in. Hg.**	
PLANT:	Valley Power Plant	**STATIC PRESSURE**	-18	**in. H2O**	
TEST LOC.:	Boiler #3 Baghouse Outlet	**FLUE PRESSURE (Ps)**	28.79	**in. Hg. abs.**	
CLIENT:	Electric Power Research Institute	**PROBE LENGTH:**	13	**ft.**	
OPERATOR:	N. Smith	**PROBE LINER MATERIAL:**	Teflon		
CONTROL BOX:	E-51	**NOZZLE IDENTIFICATION NO.:**	8		
METER NO.:	E-51	**CALIBRATED NOZZLE DIAMETER:**	0.245	**in.**	
METER CALIBRATION FACTOR:	1.009	**LEAK CHECK** **PRE:**	0.000	**POST:**	0.000 @ 15 in. Hg.
PITOT ID NO.:	318A	**DUCT SHAPE:**	Circular DIA.		Feet
			Rectangular 12.6666	Feet	9.5 Feet
PITOT TUBE COEFFICIENT:	0.837	**DUCT AREA:**	120.3327	**sq. ft.**	
PORT LENGTH:	28 in.	**TEST LENGTH:**	125	**min.**	
PORT SIZE:	6 in.	**MINUTES PER POINT:**	5		
PORT TYPE:	Flange	**TOTAL NUMBER OF TRAVERSE POINTS:**	25		

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Wisconsin Electric Power Company **Date:** 11/30/99 **Test Ru** 3

Location: Boiler #3 Baghouse Outlet

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.44	0.663	14:50	80.80	0.87	318	58	67	8	2.700
1-2	0.43	0.656	14:55	83.50	0.85	318	58	66	8	2.300
1-3	0.51	0.714	15:00	85.80	1.01	318	56	65	8.5	2.600
1-4	0.54	0.735	15:05	88.40	1.07	318	55	64	9	2.800
1-5	0.60	0.775	15:10	91.20	1.19	317	54	62	8.5	2.900
			15:15	94.10						0.000
2-1	0.48	0.693	15:19	94.10	0.95	318	49	55	9	2.600
2-2	0.49	0.700	15:24	96.70	0.97	318	50	53	9	2.600
2-3	0.62	0.787	15:29	99.30	1.23	319	49	52	8.5	3.000
2-4	0.62	0.787	15:34	102.30	1.23	318	49	49	9.5	2.950
2-5	0.60	0.775	15:39	105.25	1.19	321	49	47	11	2.900
			15:44	108.15						0.000
3-1	0.72	0.849	15:48	108.15	1.42	319	50	46	9	3.200
3-2	0.74	0.860	15:53	111.35	1.46	318	51	46	9	3.300
3-3	0.74	0.860	15:58	114.65	1.46	319	48	46	8.5	3.200
3-4	0.70	0.837	16:03	117.85	1.38	320	50	46	8.5	3.150
3-5	0.56	0.748	16:08	121.00	1.11	314	51	45	10	2.800
			16:13	123.80						0.000
4-1	0.57	0.755	16:17	123.80	1.13	318	51	45	10.5	2.850
4-2	0.60	0.775	16:22	126.65	1.19	318	51	45	10.5	2.900
4-3	0.54	0.735	16:27	129.55	1.07	318	49	45	10.5	2.750
4-4	0.52	0.721	16:32	132.30	1.03	318	52	47	11	2.700
4-5	0.49	0.700	16:37	135.00	0.97	314	50	45	9.5	2.650
			16:42	137.65						0.000
5-1	0.63	0.794	16:45	137.65	1.25	318	50	45	10.5	3.000
5-2	0.58	0.762	16:50	140.65	1.15	318	49	45	9.5	2.850
5-3	0.40	0.632	16:55	143.50	0.79	318	49	45	4	2.350
5-4	0.30	0.548	17:00	145.85	0.59	317	49	45	6.5	2.050
5-5	0.33	0.574	17:05	147.90	0.65	314	49	44	8	2.150
			17:10	150.05						0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
		0.737		69.250	1.09	318	51	50		#####
							50.72			

MOISTURE, DILUENT AND MERCURY DATA

Company Wisconsin Electric Power Compa **Date:** 11/30/99 **Test Run:** 3

Location: Boiler #3 Baghouse Outlet

SILICA GEL FINAL WT.:	804.30	**grams**
SILICA GEL INITIAL WT.:	789.80	**grams**
DIFFERENCE:	14.50	
FINAL IMPINGER WATER:	4734.90	**mls.**
INITIAL IMPINGER WATER:	4631.00	**mls.**
DIFFERENCE:	103.90	
TOTAL WATER GAIN:	118.40	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	0.006		0.000000006
PROBE WASH:	0.000		0.000000000
		Particle-bound Total:	0.000000006
KCl:	3.086		0.000003086
		Oxidized Total:	0.000003086
HNO_3/H_2O_2:	0.773		0.000000773
$KMNO_4$:	0.070		0.000000070
		Elemental Total:	0.000000843

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	11.20			11.20
Oxygen:	6.70			6.70

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	**Wisconsin Electric Power Company**
Date:	11/30/99
Test Run:	3
Stack or Duct No.:	Boiler #3 Baghouse Outlet
Start Time:	14:50
Stop Time:	17:10

Pb:	30.11	Inches Hg
Static	-18.00	Inches H2O
Ps:	28.79	Inches Hg Abs.
Vlc:	118	ml + grams
Mn:	0.0000	gm
Test Time:	125	minutes
% O2:	6.70	%
% CO2:	11.20	%
% N2:	82.10	%
Delta H:	1.09	Inches H20
Cp:	0.837	Dimensionless - pitot
Tm:	50.72	°F
Sqrt P:	0.737	Inches H20
Ts:	317.76	°F
Vm:	69.250	Cubic Feet
Dn:	0.245	Inches - nozzle
As:	120.33	Sq. Feet
Yd:	1.009	Mcf
CF:	N/A	Process tons/hr
Heat Input:	N/A	MM BTU/hr
Fd:	N/A	dscf/10^6 Btu
Fc:	N/A	scf/10^6 Btu

Vmstd:	72.889	cubic feet (dry)
Vwstd:	5.577	cubic feet (wet)
Bwo:	0.071	
Md:	30.060	lb/lb-mole (dry)
Ms:	29.203	lb/lb-mole (wet)
Excess Air (%)	44.743	
Vs:	50.751	fps
ACFM:	366420.	
DSCFM:	222318.	
WSCFM:	239327	
%I:	96.5	isokinetic variance
GR/ACF:	---	
GR/DSCF:	---	
lbs/hr	---	
lbs/ton prod.:	N/A	
lbs/MM BTU:	N/A	Heat Input
lbs/MM BTU:	N/A	O2 Basis
lbs/MM BTU:	N/A	CO2 Basis

Project Summary-Samples Received Report

Project	*Client*	*Unit*
94805	WEPCO	VALLEY-MILWAUKEE,WI

Project	*Sample*	*Sample Point*	*Date Received*	*Analyte Detail*
94805	001	INL FILTER T1	12/1/1999	Mercury
94805	002	INL FILTER T2	12/1/1999	Mercury
94805	003	INL FILTER T3	12/1/1999	Mercury
94805	004	INL HNO3 RNS T1	12/1/1999	Mercury
94805	005	INL HNO3 RNS T2	12/1/1999	Mercury
94805	006	INL HNO3 RNS T3	12/1/1999	Mercury
94805	007	INL KCL IMP T1	12/1/1999	Mercury
94805	008	INL KCL IMP T2	12/1/1999	Mercury
94805	009	INL KCL IMP T3	12/1/1999	Mercury
94805	010	IN HNO3/H2O2 T1	12/1/1999	Mercury
94805	011	IN HNO3/H2O2 T2	12/1/1999	Mercury
94805	012	IN HNO3/H2O2 T3	12/1/1999	Mercury
94805	013	INL KMNO4 IM T1	12/1/1999	Mercury
94805	014	INL KMNO4 IM T2	12/1/1999	Mercury
94805	015	INL KMNO4 IM T3	12/1/1999	Mercury
94805	016	OUT FILTER T1	12/1/1999	Mercury
94805	017	OUT FILTER T2	12/1/1999	Mercury
94805	018	OUT FILTER T3	12/1/1999	Mercury
94805	019	OUT HNO3 RNS T1	12/1/1999	Mercury
94805	020	OUT HNO3 RNS T2	12/1/1999	Mercury
94805	021	OUT HNO3 RNS T3	12/1/1999	Mercury
94805	022	OUT KCL IMP T1	12/1/1999	Mercury
94805	023	OUT KCL IMP T2	12/1/1999	Mercury
94805	024	OUT KCL IMP T3	12/1/1999	Mercury
94805	025	OUT HNO3/H2O2-1	12/1/1999	Mercury
94805	026	OUT HNO3/H2O2-2	12/1/1999	Mercury

Project	*Sample*	*Sample Point*	*Date Received*	*Analyte Detail*
94805	027	OUT HNO3/H2O2-3	12/1/1999	Mercury
94805	028	OUT KMNO4 IM T1	12/1/1999	Mercury
94805	029	OUT KMNO4 IM T2	12/1/1999	Mercury
94805	030	OUT KMNO4 IM T3	12/1/1999	Mercury
94805	031	FLD BL INL KCL	12/1/1999	Mercury
94805	032	F/B INHNO3/H2O2	12/1/1999	Mercury
94805	033	FLD BL IN KMNO4	12/1/1999	Mercury
94805	034	FLD BL OUT KCL	12/1/1999	Mercury
94805	035	F/B HNO3/H2O2	12/1/1999	Mercury
94805	036	F/B OUTL KMNO4	12/1/1999	Mercury
94805	037	BLANK:QRTZ FLT	12/1/1999	Mercury
94805	038	BLANK:QRTZ FLT	12/1/1999	Mercury
94805	039	BLANK:QRTZ FLT	12/1/1999	Mercury
94805	040	REAG BL HNO3	12/1/1999	Mercury
94805	041	REAG BL KCL	12/1/1999	Mercury
94805	042	R/BL HNO3/H2O2	12/1/1999	Mercury
94805	043	REAG BL KMNO4	12/1/1999	Mercury
94805	044	R/BL HYDROXYLAM	12/1/1999	Mercury
94805	045	COAL SAMPLE T1	12/1/1999	Chlorine
94805	045	COAL SAMPLE T1	12/1/1999	Ultimate/Proximate on Coal
94805	045	COAL SAMPLE T1	12/1/1999	Mercury
94805	046	COAL SAMPLE T2	12/1/1999	Mercury
94805	046	COAL SAMPLE T2	12/1/1999	Chlorine
94805	046	COAL SAMPLE T2	12/1/1999	Ultimate/Proximate on Coal
94805	047	COAL SAMPLE T3	12/1/1999	Ultimate/Proximate on Coal
94805	047	COAL SAMPLE T3	12/1/1999	Mercury
94805	047	COAL SAMPLE T3	12/1/1999	Chlorine
94805	048	ASH SAMPLE T1	12/1/1999	Mercury
94805	048	ASH SAMPLE	12/1/1999	Chlorine

LABORATORY REPORT

TEI Analytical, Inc.
7177 N. Austin
Niles, IL 60714-4617
847-647-1345

PREPARED FOR:

Frank Jarke
Mostardi-Platt Associates, Inc.
945 Oaklawn Avenue
Elmhurst, IL 60126

Report #: 38837 Corrected
Report Date: 2/24/00
Sample Received:
1/3/00 15:45

TEI	94805	Type	Total ug	mg/kg	Date	%RSD	Lin.Reg.	Blank	CPI	MS	MSD
38837	001	Filter		0.019	1/24/2000	0.298	0.99999	0.11	97.1	97.1	101
38838	002	Filter		0.017	1/24/2000	0.976	0.99999	0.11	97.1	97.1	101
38839	003	Filter		0.016	1/24/2000	0.39	0.99999	0.11	97.1	97.1	101
38840	004	HNO3	<0.003		2/23/2000	7.53	1	NA	98	117	117
38841	005	HNO3	0.025		2/23/2000	4.54	1	NA	98	117	117
38842	006	HNO3	0.014		2/23/2000	1.37	1	NA	98	117	117
38843	007	KCl	2.1		2/3/2000	2.58	0.99997	0.232	93.2	111	95
38844	008	KCl	2.22		2/3/2000	0.341	0.99997	0.232	93.2	111	95
38845	009	KCl	1.81		2/3/2000	0.491	0.99997	0.232	93.2	111	95
38846	010	H2O2	1.33		1/18/2000	0.913	0.99992	0.116	94.5	118	114
38847	011	H2O2	0.362		1/18/2000	0.26	0.99992	0.116	94.5	118	114
38848	012	H2O2	0.57		1/24/2000	0.918	0.99999	0.116	97.1	97.1	101
38849	013	KMnO4	0.447		2/23/2000	5.12	1	0.031	97.4	100	86
38850	014	KMnO4	0.314		2/23/2000	5.1	1	0.031	97.4	100	86
38851	015	KMnO4	0.421		2/23/2000	2.53	1	0.031	97.4	100	86
38852	016	Filter		0.052	1/24/2000	0.47	0.99999	0.11	97.1	97.1	101
38853	017	Filter		0.019	1/24/2000	0.099	0.99999	0.11	97.1	97.1	101
38854	018	Filter		<0.004	1/24/2000	1.44	0.99999	0.11	97.1	97.1	101
38855	019	HNO3	<0.003		2/23/2000	3.73	1	NA	98	117	117
38856	020	HNO3	<0.003		2/23/2000	4.18	1	NA	98	117	117
38857	021	HNO3	<0.003		2/23/2000	5.09	1	NA	98	117	117
38858	022	KCl	3.09		2/3/2000	0.172	0.99997	0.232	93.2	111	95
38859	023	KCl	2.39		2/3/2000	0.206	0.99997	0.232	93.2	111	95
38860	024	KCl	3.09		2/3/2000	0.277	0.99997	0.232	93.2	111	95
38861	025	H2O2	0.339		2/3/2000	1.96	0.99997	0.116	95.2	120	117
38862	026	H2O2	0.478		2/3/2000	0.813	0.99997	0.116	95.2	120	117
38863	027	H2O2	0.773		2/3/2000	0.5	0.99997	0.116	95.2	120	117

Gayle E. O'Neill, Ph.D.

LABORATORY REPORT

TEI Analytical, Inc.
7177 N. Austin
Niles, IL 60714-4617
847-647-1345

PREPARED FOR:

Frank Jarke
Mostardi-Platt Associates, Inc.
945 Oaklawn Avenue
Elmhurst, IL 60126

Report #: 38837 Corrected
Report Date: 2/24/00
Sample Received:
1/3/00 15:45

TEI	94805	Type	Total ug	mg/kg	Date	%RSD	Lin.Reg.	Blank	CPI	MS	MSD
38864	028	KMnO4	0.288		2/23/2000	1.71	1	0.031	97.4	100	86
38865	029	KMnO4	0.172		2/23/2000	1.57	1	0.031	97.4	100	86
38866	030	KMnO4	0.078		2/23/2000	4.15	1	0.031	97.4	100	86
38867	031	KCl	0.388		2/3/2000	0.893	0.99997	0.232	93.2	111	95
38868	032	H2O2	0.279		2/3/2000	0.031	0.99997	0.116	93.2	120	117
38869	033	KMnO4	0.074		2/23/2000	43.4	1	0.031	97.4	100	86
38870	034	KCl	0.363		2/3/2000	0.756	0.99997	0.232	93.2	111	95
38871	035	H2O2	0.235		2/3/2000	0.351	0.99997	0.116	93.2	120	117
38872	036	KMnO4	0.075		2/23/2000	12.7	1	0.031	97.4	100	86
38873	037	Filter		<0.004	1/24/2000	3.11	0.99999	0.11	97.1	97.1	101
38874	038	Filter		<0.004	1/24/2000	0.335	0.99999	0.11	97.1	97.1	101
38875	039	Filter		0.024	1/24/2000	0.537	0.99999	0.11	97.1	97.1	101
38876	040	HNO3	<0.003		2/23/2000	2.54	1	NA	98	117	117
38877	041	KCl	0.004		2/23/2000	54.7	1	NA	98	117	117
38878	042	H2O2	<0.007		2/3/2000	2.88	0.99997	0.116	95.2	120	117
38879	043	KMnO4	0.008		2/23/2000	2.49	1	0.031	97.4	100	86
38880	044	NH2OH	<0.003		2/23/2000	2.62	1	NA	97.4	117	117

G. E. O'Neill

Gayle E. O'Neill, Ph.D.

LABORATORY REPORT

TEI Analytical, Inc.
7177 N. Austin
Niles, IL 60714-4617
847-647-1345

PREPARED FOR:

Frank Jarke
Mostardi-Platt Associates, Inc.
945 Oaklawn Avenue
Elmhurst, IL 60126

Report #: 38837 Corrected
Report Date: 2/24/00
Sample Received:
1/3/00 15:45

Mercury (Ontario Hydro Method)

The QAPP called for the analysis of all samples in duplicate with every tenth sample run in triplicate. To simplify the instrument setup, we chose to run all samples, blanks, standards, matrix spikes and matrix spike duplicates in triplicate. The reported %RSD is for the triplicate measurements.

All sample results are reported as total micrograms in the sample received by the laboratory, with the exception of the filter samples. The filter sample results are expressed as mg/kg.

The instrument was calibrated at least daily with a blank and four standards. The Lin.Reg. column in this report represents the linear regression coefficient obtained during the calibration.

The laboratory method blank is reported in ug/l in the Blank column of this report. For samples requiring only addition of Hydroxylamine Hydrochloride, NA is entered in this column. No laboratory method blanks were applicable for these samples.

The CPI column presents the % Recovery of an independent standard (obtained from CPI). The calibration curve was prepared in our laboratory from Mercuric Chloride in accordance with EPA Method 7470.

The MS and MSD columns present the % Recovery of the Matrix Spikes and Matrix Spike Duplicates.

G. E. O'Neill

Gayle E. O'Neill, Ph.D.

COMMERCIAL TESTING & ENGINEERING CO.

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ADDRESS ALL CORRESPONDENCE TO:
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SOUTH HOLLAND, IL 60473
TEL: (708) 331-2900
FAX: (708) 333-3060

December 14, 1999

MOSTARDI-PLATT ASSOCIATES, INC
945 Oaklawn Avenue
Elmhurst, IL 60126
Attn: Frank Jarke

Sample identification by
Mostardi-Platt Assoc., Inc.

Kind of sample reported to us: Coal

Sample taken at: ------

Sample taken by: Mostardi-Platt Assoc., Inc.

Date sampled: November 30, 1999

Date received: December 3, 1999

MPA Sample No: 94805-045

P.O. No. 22688

Analysis Report No. 71-108390

PROXIMATE ANALYSIS	As Received	Dry Basis
% Moisture	8.70	xxxxx
% Ash	7.19	7.88
% Volatile	34.16	37.42
% Fixed Carbon	49.95	54.70
	100.00	100.00
Btu/lb	12159	13318
% Sulfur	0.78	0.85
MAF Btu		14457

ULTIMATE ANALYSIS	As Received	Dry Basis
% Moisture	8.70	xxxxx
% Carbon	68.68	75.22
% Hydrogen	4.46	4.89
% Nitrogen	1.54	1.69
% Sulfur	0.78	0.85
% Ash	7.19	7.88
% Oxygen(diff)	8.65	9.47
	100.00	100.00
CHLORIDE ug/g	113	124

METHODS

Moisture: ASTM D 3302; Ash: ASTM D 3174; Volatile: ASTM D 3175; Fixed Carbon: Calculated Value; ASTM D 3172
Btu/lb: ASTM 3286; Sulfur: ASTM D 4239 (Method C); Carbon, Hydrogen & Nitrogen: ASTM D 5373; Chloride: ASTM D 4208

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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December 14, 1999

MOSTARDI-PLATT ASSOCIATES, INC
945 Oaklawn Avenue
Elmhurst, IL 60126
Attn: Frank Jarke

Sample identification by
Mostardi-Platt Assoc., Inc.

Kind of sample reported to us: Coal

MPA Sample No: 94805-045

Sample taken at: ------

Sample taken by: Mostardi-Platt Assoc., Inc.

Date sampled: November 30, 1999

Date received: December 3, 1999

P.O. No. 22688

Analysis Report No. 71-108390

	Dry Basis, ug/g	MDL, ug/g
Mercury, Hg	0.07	0.01

	Expected	Observed
SARM 1157	0.05	0.05
NIST 1630A	0.11	0.10

MDL Denotes Method Detection Limit

METHOD
Mercury: ASTM D 3684

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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FAX: (708) 333-3060

December 14, 1999

MOSTARDI-PLATT ASSOCIATES, INC
945 Oaklawn Avenue
Elmhurst, IL 60126
Attn: Frank Jarke

Sample identification by
Mostardi-Platt Assoc., Inc.

Kind of sample reported to us: Coal

MPA Sample No: 94805-046

Sample taken at: ------

Sample taken by: Mostardi-Platt Assoc., Inc.

Date sampled: November 30, 1999

Date received: December 3, 1999

P.O. No. 22688

Analysis Report No. 71-108391

PROXIMATE ANALYSIS	As Received	Dry Basis
% Moisture	8.35	xxxxx
% Ash	7.17	7.82
% Volatile	34.03	37.13
% Fixed Carbon	50.45	55.05
	100.00	100.00
Btu/lb	12161	13269
% Sulfur	0.78	0.85
MAF Btu		14395

ULTIMATE ANALYSIS	As Received	Dry Basis
% Moisture	8.35	xxxxx
% Carbon	68.93	75.21
% Hydrogen	4.53	4.94
% Nitrogen	1.53	1.67
% Sulfur	0.78	0.85
% Ash	7.17	7.82
% Oxygen(diff)	8.71	9.51
	100.00	100.00
CHLORIDE ug/g	123	134

METHODS

Moisture: ASTM D 3302; Ash: ASTM D 3174; Volatile: ASTM D 3175; Fixed Carbon: Calculated Value; ASTM D 3172
Btu/lb: ASTM 3286; Sulfur: ASTM D 4239 (Method C); Carbon, Hydrogen & Nitrogen: ASTM D 5373; Chloride: ASTM D 4208

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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December 14, 1999

MOSTARDI-PLATT ASSOCIATES, INC
945 Oaklawn Avenue
Elmhurst, IL 60126
Attn: Frank Jarke

Sample identification by
Mostardi-Platt Assoc., Inc.

Kind of sample reported to us Coal

MPA Sample No: 94805-046

Sample taken at ------

Sample taken by Mostardi-Platt Assoc., Inc.

Date sampled November 30, 1999

Date received December 3, 1999

P.O. No. 22688

Analysis Report No. 71-108391

	Dry Basis, ug/g	MDL, ug/g
Mercury, Hg	0.07	0.01

	Expected	Observed
SARM 1157	0.05	0.05
NIST 1630A	0.11	0.10

MDL Denotes Method Detection Limit

METHOD
Mercury: ASTM D 3684

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

South Holland Laboratory

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December 14, 1999

MOSTARDI-PLATT ASSOCIATES, INC
945 Oaklawn Avenue
Elmhurst, IL 60126
Attn: Frank Jarke

Sample identification by
Mostardi-Platt Assoc., Inc.

Kind of sample reported to us: Coal

Sample taken at: ------

Sample taken by: Mostardi-Platt Assoc., Inc.

Date sampled: November 30, 1999

Date received: December 3, 1999

MPA Sample No: 94805-047

P.O. No. 22688

Analysis Report No. 71-108392

PROXIMATE ANALYSIS	As Received	Dry Basis
% Moisture	8.91	xxxxx
% Ash	6.50	7.14
% Volatile	33.62	36.91
% Fixed Carbon	50.97	55.95
	100.00	100.00
Btu/lb	12257	13456
% Sulfur	0.84	0.92
MAF Btu		14491

ULTIMATE ANALYSIS	As Received	Dry Basis
% Moisture	8.91	xxxxx
% Carbon	68.70	75.42
% Hydrogen	4.50	4.94
% Nitrogen	1.53	1.68
% Sulfur	0.84	0.92
% Ash	6.50	7.14
% Oxygen(diff)	9.02	9.90
	100.00	100.00
CHLORIDE ug/g	114	125

METHODS

Moisture: ASTM D 3302; Ash: ASTM D 3174; Volatile: ASTM D 3175; Fixed Carbon: Calculated Value; ASTM D 3172
Btu/lb: ASTM 3286; Sulfur: ASTM D 4239 (Method C); Carbon, Hydrogen & Nitrogen: ASTM D 5373; Chloride: ASTM D 4208

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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December 14, 1999

MOSTARDI-PLATT ASSOCIATES, INC
945 Oaklawn Avenue
Elmhurst, IL 60126
Attn: Frank Jarke

Sample identification by
Mostardi-Platt Assoc., Inc.

Kind of sample reported to us Coal

MPA Sample No: 94805-047

Sample taken at ------

Sample taken by Mostardi-Platt Assoc., Inc.

Date sampled November 30, 1999

Date received December 3, 1999

P.O. No. 22688

Analysis Report No. 71-108392

	Dry Basis, ug/g	MDL, ug/g
Mercury, Hg	0.07	0.01

	Expected	Observed
SARM 1157	0.05	0.05
NIST 1630A	0.11	0.10

MDL Denotes Method Detection Limit

METHOD
Mercury: ASTM D 3684

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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TEL: (708) 331-2900
FAX: (708) 333-3060

February 22, 2000

MOSTARDI-PLATT ASSOCIATES, INC
945 Oaklawn Avenue
Elmhurst, IL 60126
Attn: Frank Jarke

Sample identification by
Mostardi-Platt Assoc., Inc.

Kind of sample reported to us: Ash

Sample taken at: ------

Sample taken by: Mostardi-Platt Assoc., Inc.

Date sampled: November 30, 1999

Date received: February 10, 2000

MPA Sample No: 94805-048

P.O. No. 23037

Analysis Report No. 71-114323

	Dry Basis, ug/g	MDL, ug/g
Mercury, Hg	0.05	0.01

	Expected	Observed
SARM 1157	0.05	0.05
NIST 1630A	0.11	0.10

MDL Denotes Method Detection Limit

METHOD
Mercury: ASTM D 3684

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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SOUTH HOLLAND, IL 60473
TEL: (708) 331-2900
FAX: (708) 333-3060

February 22, 2000

MOSTARDI-PLATT ASSOCIATES, INC
945 Oaklawn Avenue
Elmhurst, IL 60126
Attn: Frank Jarke

Sample identification by
Mostardi-Platt Assoc., Inc.

Kind of sample reported to us: Ash

MPA Sample No: 94805-048

Sample taken at: ------

Sample taken by: Mostardi-Platt Assoc., Inc.

Date sampled: November 30, 1999

Date received: February 10, 2000

P.O. No. 23037

Analysis Report No. 71-114323 Page 1 of 2

Dry Basis

% Chloride	0.02

METHOD
Chloride: ASTM D 4208

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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South Holland Laboratory

MEMBER ACIL

Final Results

April 18, 2000

Set Number: 49978
Fund#: 4694
PI: Carolyn Lillemoen
Contact Person: C. Lillemoen

Request Date: Tuesday, March 28, 2000
Due Date: Tuesday, April 11, 2000
Set Description: ICR Coal Samples

Sample	49978-01				
49978-01	**AB82383**	**PW #32**	**Mill**		
Mercury				0.15	µg/g
49978-02	**AB82384**	**PW #32**	**Mill**		
Mercury				0.15	µg/g
49978-03	**AB82385**	**PW #32**	**Mill**		
Mercury				0.15	µg/g
49978-04	**AB82386**	**PW #41**	**Mill**		
Mercury				0.13	µg/g
49978-05	**AB82387**	**PW #41**	**Mill**		
Mercury				0.13	µg/g
49978-06	**AB82388**	**PW #41**	**Mill**		
Mercury				0.13	µg/g
49978-07	**AB82389**	**VA #3A**	**FDR**		
Mercury				0.0092	µg/g
49978-08	**AB82390**	**VA #3B**	**FDR**		
Mercury				0.013	µg/g
49978-09	**AB82391**	**VA #3**	**FDR**		
Mercury				0.015	µg/g
49978-10	**AB 82383**	**PW#32**	**Mill**	**microwave digestion**	
Mercury				0.186	µg/g
49978-11	**AB 82391**	**VA #3**	**FDR**	**microwave digestion**	
Mercury				0.014	µg/g

Coal samples 49978-01 through 49978-09 were analyzed for total Hg using EPA Method 7473: "Mercury in Solids and Solutions by Thermal Decomposition Amalgamation and Atomic Absorption Spectrophotometry". The instrument used for the analysis was the DMA-80a (Milestone, Inc.)

For comparison, samples 49978-01 and 49978-09 were renumbered 49978-10 and 49978-11 respectively, and prepared using EPA Method 3052: "Microwave Assisted Acid Digestion of Siliceous and Organically Based Matrices". The microwave used for the digestion was a MDS2100 (CEM Corporation). The digested samples were analyzed using EPA Method 7471a: "Mercury in Solid or Semisolid Wastes by Cold Vapor Atomic Absorption Spectroscopy". The instrument used for analysis was a M6000a Mercury Analyzer (CETAC Technologies, Inc.)

1 Distribution CML Date 4/18/00

Final Results

April 18, 2000

Set Number: 49973 **Request Date:** Tuesday, March 21, 2000

Fund#: 4694 **Due Date:** Tuesday, April 04, 2000

PI: Carolyn Lillemoen **Set Description:** ICR Fly Ash

Contact Person: C. Lillemoen

Sample **49973-01**

49973-01	**WEPCO-Port Washington ESP Ash #94606-054**		
	Mercury	0.621	µg/g
49973-02	**WEPCO-Milwaukee Ash #94805-049**		
	Mercury	0.0363	µg/g

Sample 49973-01 and 49973-02 were prepared using EPA Method 3051; "Microwave Assisted Acid Digestion of Siliceous and Organically Based Matrices". The microwave used for the digestion was a MDS2100 (CEM Corporation). The digested samples were analyzed using EPA Method 7471a; "Mercury in Solid or Semisolid Wastes by Cold Vapor Atomic Absorption Spectroscopy". The instrument used for analysis was a M6000a Mercury Analyzer (CETAC Technologies, Inc.)

Distribution CMC Date 4/18/00

LIST OF PARTICIPANTS

Name	Organization	Project Role
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Gayle O'Neill, Ph.D.	TEI Analytical, Inc.	Speciated Hg Sample Analysis
Joseph Houser	CTE	Coal Sample Analysis
Dennis Laudal	EERC	Coal/Ash Sample Analysis