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

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Plant Name: NSPB
General Average Report
Reporting Period: 10/26/1999 to 10/26/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:46
Rolling Average Interval: 1

Run 1

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/26/99	14:15	14.39	249.1	194142.	9.33
	14:16	14.39	248.9	193124.	9.23
	14:17	14.39	248.6	193091.	9.15
	14:18	14.39	247.6	192872.	9.25
	14:19	14.40	245.9	192760.	9.26
	14:20	14.40	247.5	192544.	9.27
	14:21	14.40	248.0	193359.	9.20
	14:22	14.40	246.9	193373.	9.30
	14:23	14.40	246.4	193625.	9.21
	14:24	14.40	249.9	195277.	9.28
	14:25	14.40	250.5	194588.	9.42
	14:26	14.40	248.0	194838.	9.26
	14:27	14.39	247.6	196108.	9.34
	14:28	14.40	249.4	197187.	9.37
	14:29	14.40	249.7	196479.	9.43
	14:30	14.39	250.7	193934.	9.37
	14:31	14.40	247.6	192882.	9.07
	14:32	14.40	247.7	192764.	9.16
	14:33	14.40	246.9	195699.	9.18
	14:34	14.40	246.4	193963.	9.54
	14:35	14.39	246.2	193750.	9.23
	14:36	14.40	247.7	194865.	9.25
	14:37	14.40	247.4	195641.	9.38
	14:38	14.40	247.7	196147.	9.31
	14:39	14.40	247.4	194103.	9.41
	14:40	14.40	249.3	194992.	9.14
	14:41	14.40	248.3	194574.	9.40
	14:42	14.40	247.8	194362.	9.34
	14:43	14.40	248.8	194698.	9.28
	14:44	14.39	247.9	193733.	9.38
	14:45	14.39	248.8	193967.	9.22
	14:46	14.39	248.1	195715.	9.32
	14:47	14.39	247.5	197128.	9.43
	14:48	14.39	250.0	196062.	9.50
	14:49	14.39	248.8	194946.	9.29
	14:50	14.40	248.7	195552.	9.25
	14:51	14.40	247.4	196104.	9.37
	14:52	14.40	246.6	199251.	9.37
	14:53	14.40	247.6	198551.	9.66
	14:54	14.40	246.5	197576.	9.44
	14:55	14.40	247.9	196285.	9.36
	14:56	14.40	246.3	195373.	9.29
	14:57	14.40	247.7	196571.	9.24
	14:58	14.40	248.4	195179.	9.47
	14:59	14.40	248.5	193283.	9.26
	15:00	14.40	248.5	194715.	9.09
	15:01	14.40	247.4	193551.	9.40
	15:02	14.40	248.2	194679.	9.14
	15:03	14.40	247.0	194380.	9.39
	15:04	14.40	248.7	193504.	9.32

Site Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:46
Rolling Average Interval: 1

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/26/99	15:05	14.40	245.8	195039.	9.19
	15:06	14.40	248.1	196015.	9.40
	15:07	14.40	249.3	196852.	9.36
	15:08	14.40	246.6	196854.	9.46
	15:09	14.40	247.6	197171.	9.39
	15:10	14.40	247.7	196605.	9.42
	15:11	14.40	247.8	194797.	9.43
	15:12	14.40	247.1	194269.	9.15
	15:13	14.40	249.0	192099.	9.35
	15:14	14.40	249.9	192164.	9.11
	15:15	14.40	246.5	194203.	9.23
	15:16	14.40	248.0	194747.	9.48
	15:17	14.40	249.4	194394.	9.37
	15:18	14.40	249.6	193812.	9.23
	15:19	14.41	249.7	193030.	9.26
	15:20	14.40	248.6	194701.	9.19
	15:21	14.40	248.3	195566.	9.42
	15:22	14.40	248.5	194996.	9.40
	15:23	14.40	246.9	194470.	9.36
	15:24	14.40	248.4	194360.	9.33
	15:25	14.40	247.7	194792.	9.29
	15:26	14.40	249.4	195174.	9.33
	15:27	14.40	245.9	194682.	9.36
	15:28	14.40	247.0	194947.	9.35
	15:29	14.40	249.0	193968.	9.37
	15:30	14.40	249.0	195194.	9.20
	15:31	14.40	246.4	196152.	9.43
	15:32	14.40	245.3	195992.	9.40
	15:33	14.40	248.2	194018.	9.32
	15:34	14.40	245.6	194459.	9.19
	15:35	14.40	246.0	194901.	9.31
	15:36	14.40	248.6	195713.	9.32
	15:37	14.40	248.6	195204.	9.42
	15:38	14.40	247.6	193824.	9.34
	15:39	14.40	245.5	194434.	9.15
	15:40	14.40	246.9	195750.	9.38
	15:41	14.40	248.0	196925.	9.43
	15:42	14.40	245.9	197221.	9.41
	15:43	14.40	248.7	195611.	9.46
	15:44	14.41	246.9	196298.	9.23
	15:45	14.41	249.0	196364.	9.39
	15:46	14.40	249.4	195732.	9.35
	15:47	14.40	250.7	193434.	9.32
	15:48	14.40	250.0	193242.	9.14
	15:49	14.40	249.4	193329.	9.22
	15:50	14.40	248.0	193001.	9.27
	15:51	14.40	248.4	194289.	9.17
	15:52	14.40	248.4	193815.	9.40
	15:53	14.40	248.8	194913.	9.19
	15:54	14.40	248.3	195937.	9.31

Plant Name: NSPB
General Average Report
Reporting Period: 10/26/1999 to 10/26/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:46
Rolling Average Interval: 1

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/26/99	15:55	14.40	247.7	195988.	9.33
	15:56	14.40	247.2	197355.	9.25
	15:57	14.40	247.1	195255.	9.49
	15:58	14.40	246.6	194412.	9.22
	15:59	14.40	247.9	195092.	9.24
	16:00	14.40	246.3	196675.	9.37
	16:01	14.41	245.7	197762.	9.45
	16:02	14.40	247.6	197805.	9.45
	16:03	14.40	247.9	197579.	9.34
	16:04	14.40	246.8	197584.	9.29
	16:05	14.40	245.5	196786.	9.38
	16:06	14.40	246.7	196328.	9.35
	16:07	14.40	246.5	195674.	9.35
	16:08	14.40	248.0	195176.	9.27
	16:09	14.40	248.4	195816.	9.28
	16:10	14.40	248.8	196855.	9.35
	16:11	14.40	247.4	196374.	9.41
	16:12	14.40	247.2	195427.	9.33
	16:13	14.40	248.2	194393.	9.20
	16:14	14.40	250.1	194231.	9.17
	16:15	14.40	252.4	194228.	9.29
	16:16	14.40	251.9	193785.	9.25
	16:17	14.40	250.2	193680.	9.22
	16:18	14.40	248.9	193577.	9.22
	16:19	14.40	249.9	194705.	9.21
	16:20	14.40	248.9	195162.	9.29
	16:21	14.40	249.0	195563.	9.34
	16:22	14.40	250.3	196145.	9.32
	16:23	14.40	248.9	195064.	9.38
	16:24	14.40	246.1	196803.	9.19
	16:25	14.40	245.4	194605.	9.48
	16:26	14.40	246.6	194592.	9.09
	16:27	14.39	246.5	195803.	9.28
	16:28	14.40	246.9	195699.	9.39
	16:29	14.40	245.7	196174.	9.25
	16:30	14.40	245.3	196910.	9.35
	16:31	14.40	244.7	196737.	9.42
	16:32	14.40	245.7	195909.	9.36
	16:33	14.40	246.8	195185.	9.31
	16:34	14.40	247.7	195815.	9.24
	16:35	14.40	249.7	193541.	9.32
	16:36	14.40	249.8	193156.	9.06
	16:37	14.40	250.1	193037.	9.18
	16:38	14.41	248.7	194689.	9.22
	16:39	14.40	248.6	195262.	9.31
	16:40	14.40	250.4	194414.	9.31
	16:41	14.40	250.9	193118.	9.23
	16:42	14.40	248.6	194414.	9.10
	16:43	14.40	247.4	194829.	9.31
	16:44	14.40	247.8	195403.	9.23

Plant Name: NSPB
General Average Report
Reporting Period: 10/26/1999 to 10/26/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:46
Rolling Average Interval: 1

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/26/99	16:45	14.40	250.0	195598.	9.35
	16:46	14.40	249.3	195778.	9.23
	16:47	14.41	248.5	193982.	9.26
	16:48	14.41	249.1	192932.	9.10
	16:49	14.41	249.1	193002.	9.04
	16:50	14.41	250.0	191860.	9.25
	16:51	14.41	248.7	193199.	9.09
	16:52	14.41	247.3	194779.	9.30
	16:53	14.41	250.0	194715.	9.35
	16:54	14.41	248.4	195344.	9.16
	16:55	14.41	246.2	196663.	9.30
	16:56	14.41	246.1	195310.	9.45
	16:57	14.40	246.3	194350.	9.17
	16:58	14.40	246.4	195162.	9.12
	16:59	14.40	247.6	194519.	9.24
	17:00	14.40	248.9	194350.	9.25
	17:01	14.40	248.2	193043.	9.30
	17:02	14.40	248.8	193753.	9.09
	17:03	14.40	247.2	194231.	9.22
	17:04	14.40	246.3	193889.	9.21
	17:05	14.40	249.0	192827.	9.30
	17:06	14.40	250.6	194149.	9.09
	17:07	14.40	250.0	194718.	9.34
	17:08	14.40	248.2	195846.	9.28
	17:09	14.40	247.8	195270.	9.37
	17:10	14.40	248.1	196969.	9.21
Average =		14.40	248.0	194967.	9.30
Maximum =		14.41	252.4	199251.	9.66
Minimum =		14.39	244.7	191860.	9.04
Possible Values =		176	176	176	176
Included Values =		176	176	176	176
Total =		2534.68	43653.0	34314116.	1636.22

- excluded values (missing, OOC, invalid, suspect)
- missing
T - out-of-control
- invalid
- suspect
V - invalid for state
H - exceedance
- stack not operating
- invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Plant Name: NSPB
General Average Report
Reporting Period: 10/26/1999 to 10/26/1999

Site Name: B5
Averaging Type: 6m

Time of Report: 10/27/99 15:45
Rolling Average Interval: 1

Date	Time	B50PC (PERCENT)
10/26/99	14:18	25.58
	14:24	26.62
	14:30	25.26
	14:36	24.48
	14:42	25.11
	14:48	26.51
	14:54	27.67
	15:00	26.33
	15:06	26.67
	15:12	25.26
	15:18	24.84
	15:24	25.03
	15:30	26.43
	15:36	25.89
	15:42	26.63
	15:48	26.33
	15:54	28.01
	16:00	30.38
	16:06	29.58
	16:12	28.22
	16:18	27.86
	16:24	28.68
	16:30	31.13
	16:36	30.63
	16:42	32.06
	16:48	30.56
	16:54	30.93
	17:00	29.05
	17:06	30.34

Average =	27.66
Maximum =	32.06
Minimum =	24.48
Possible Values =	29
Included Values =	29
Total =	802.06

* - excluded values (missing, OOC, invalid, suspect)
- missing
- out-of-control
I - invalid
- suspect
- invalid for state
H - exceedance
F - stack not operating
- invalid (PADER)
- missing data substituted
-999 - missing value
888 - value could not be calculated

Plant Name: NSPB
General Average Report
Reporting Period: 10/26/1999 to 10/26/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:57
Rolling Average Interval: 1

Date	Time	B5CPFLOW (SCFH)
10/26/99	13:15	4356183.
	13:16	4384002.
	13:17	4341177.
	13:18	4352811.
	13:19	4366930.
	13:20	4384523.
	13:21	4415116.
	13:22	4374113.
	13:23	4261894.
	13:24	4260498.
	13:25	4328513.
	13:26	4343298.
	13:27	4333676.
	13:28	4414011.
	13:29	4369973.
	13:30	4325080.
	13:31	4227033.
	13:32	4166136.
	13:33	4218724.
	13:34	4282711.
	13:35	4317192.
	13:36	4319595.
	13:37	4340561.
	13:38	4393813.
	13:39	4448289.
	13:40	4496244.
	13:41	4495068.
	13:42	4447007.
	13:43	4460184.
	13:44	4561632.
	13:45	4600997.
	13:46	4584234.
	13:47	4491953.
	13:48	4449694.
	13:49	4415211.
	13:50	4369110.
	13:51	4343029.
	13:52	4357815.
	13:53	4359418.
	13:54	4348384.
	13:55	4326723.
	13:56	4285811.
	13:57	4331928.
	13:58	4331395.
	13:59	4286109.
	14:00	4228113.
	14:01	4236629.
	14:02	4186565.
	14:03	4179009.
	14:04	4242586.

Plant Name: NSPB
General Average Report
Reporting Period: 10/26/1999 to 10/26/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:57
Rolling Average Interval: 1

Date	Time	B5CPFLOW (SCFH)
10/26/99	14:05	4275123.
	14:06	4347350.
	14:07	4343886.
	14:08	4368177.
	14:09	4293369.
	14:10	4158520.
	14:11	4090887.
	14:12	3967754.
	14:13	3961713.
	14:14	3979324.
	14:15	3876132.
	14:16	3798447.
	14:17	3857604.
	14:18	3844947.
	14:19	3831952.
	14:20	3843235.
	14:21	3832518.
	14:22	3886410.
	14:23	3961654.
	14:24	3998828.
	14:25	4046147.
	14:26	4038887.
	14:27	4039131.
	14:28	4079175.
	14:29	4153420.
	14:30	4245022.
	14:31	4298692.
	14:32	4315224.
	14:33	4295231.
	14:34	4143592.
	14:35	4075882.
	14:36	4123646.
	14:37	4135834.
	14:38	4121073.
	14:39	4055095.
	14:40	3993410.
	14:41	3974898.
	14:42	4069632.
	14:43	4107813.
	14:44	4129901.
	14:45	4170027.
	14:46	4169802.
	14:47	4164525.
	14:48	4212645.
	14:49	4293386.
	14:50	4298378.
	14:51	4370408.
	14:52	4422577.
	14:53	4349997.
	14:54	4302805.

Plant Name: NSPB
General Average Report
Reporting Period: 10/26/1999 to 10/26/1999

Line Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:57
Rolling Average Interval: 1

Date	Time	B5CPFLOW (SCFH)
10/26/99	14:55	4242303.
	14:56	4117426.
	14:57	4122239.
	14:58	4191479.
	14:59	4166817.
	15:00	4145100.
	15:01	4196267.
	15:02	4236980.
	15:03	4239165.
	15:04	4204956.
	15:05	4123414.
	15:06	4117523.
	15:07	4184844.
	15:08	4264055.
	15:09	4240668.
	15:10	4211098.
	15:11	4196066.
	15:12	4232613.
	15:13	4266670.
	15:14	4219526.
	15:15	4197840.
	15:16	4283534.
	15:17	4259983.
	15:18	4319279.
	15:19	4316669.
	15:20	4222591.
	15:21	4225537.
	15:22	4202459.
	15:23	4163914.
	15:24	4152259.
	15:25	4185581.
	15:26	4129449.
	15:27	4067634.
	15:28	4015393.
	15:29	4112270.
	15:30	4160570.
	15:31	4184042.
	15:32	4177343.
	15:33	4115298.
	15:34	4102550.
	15:35	4094105.
	15:36	4061555.
	15:37	4056798.
	15:38	4001075.
	15:39	3982856.
	15:40	3857269.
	15:41	3870559.
	15:42	3900071.
	15:43	3948166.
	15:44	3955170.

Site Name: BS
Averaging Type: 1M

Time of Report: 10/29/99 09:57
Rolling Average Interval: 1

Date	Time	BSCPFLOW (SCFH)
10/26/99	15:45	3890847.
	15:46	3908148.
	15:47	3983328.
	15:48	4001212.
	15:49	3960386.
	15:50	3956376.
	15:51	4085588.
	15:52	4178001.
	15:53	4220185.
	15:54	4258261.
	15:55	4165460.
	15:56	4178714.
	15:57	4172674.
	15:58	4100603.
	15:59	4078192.
	16:00	4041020.
	16:01	4083278.
	16:02	4081090.
	16:03	4052373.
	16:04	4044966.
	16:05	4125045.
	16:06	4201473.
	16:07	4290122.
	16:08	4247007.
	16:09	4157253.
	16:10	4151534.

Average =	4189255.
Maximum =	4600997.
Minimum =	3798447.
Possible Values =	176
Included Values =	176
Total =	737308915

- excluded values (missing, OOC, invalid, suspect)
- missing
T - out-of-control
I - invalid
- suspect
- invalid for state
H - exceedance
- stack not operating
- invalid (PADER)
U - missing data substituted
-999 - missing value
-888 - value could not be calculated

Test 1

NO. 4 AND NO. 5 BOILER - BAY FRONT BOILER ROOM SHEET

TIME	BOILER DRUM PRESS.	FEED-WATER INLET PRESS.	SUP. HTR. OUTLET PRESS.	SUP. HTR. TEMP. °F	STEAM FLOW LB/HR.	FEED-WATER TEMP. °F	PERCENT O²	OPACITY	I. D. FAN AMPS.	TEMP. AIR TO AIR HTR.	TEMP. AIR FROM AIR HTR.	TEMP. GAS TO AIR HTR.	TEMP. GAS FROM AIR HTR.	F. D. FAN AMPS	COAL FDR. R.P.M. CY. 5A	COAL FDR. R.P.M. CY. 5B	STEAM PRESS DEVIATION	DUST COLL. DIFF. PRESS	FURN. PRESS.	BOILER EXIT GAS PRESS.	AIR HTR. OUTLET GAS PRESS.	F. D. FAN BLOWER DISH	AIR PRESS. TO AIR HTR.	AIR PRESS. LVG. AIR HTR.	TOTAL AIR DIFF. CY. 5A	PRIM. AIR DIFF. CY. 5A	TOTAL AIR PRESS. CY. 5A	TOTAL AIR DIFF. CY. 5B	PRIM. AIR DIFF. CY. 5B	TOTAL AIR PRESS CY. 5B	STEAM FLOW INTG. READING
1415	660	1000	610	900	210	360	4.5	25	45	185	490	640	280	166	32.0	32.1	15	3	13	11	8	28	28	26	7.6	1.6	26	1	1.1	28	227340
1445	660	1010	610	905	210	350	4.4	24	45	185	490	640	280	164	32.0	32.1	10	3	13	11	8	29	28	26	8.8	1.6	26	1	1.1	28	227362
1515	660	1010	610	900	210	350	4.4	25	45	185	490	640	280	170	32.0	32.2	10	3	13	195	8	29	28	26	8.4	1.6	26	1	1.1	28	227388
1545	660	1010	610	900	210	350	5.0	22	45	185	490	640	280	170	32.0	32.1	10	3	13	11	8	29	28	26	8.5	1.6	26	1	1.1	28	227412
1615	660	1010	610	900	210	350	4.2	24	45	185	490	640	280	165	32.0	32.1	15	3	13	11	8	29	28	26	8.0	1.6	26	1	1.1	28	227437
1645	660	1010	610	900	210	350	4.0	28	45	185	490	640	280	168	32.0	32.1	15	3	13	11	8	29	28	26	8.0	1.6	26	1	1.1	28	227459
1710	660	1010	610	900	210	350	4.4	28	46	185	490	635	280	168	32.0	32.2	+13	3.0	13.0	11.0	8.0	29	28	26	8.0	1.6	27	1.0	1.2	28	227480
1800																															
1900																															
2000																															
2100																															
2200																															
2300																															
2400																															
AVG.																															

NO. 4 BOILER

TIME	BOILER DRUM PRESS.	650 LB. HDR. STEAM PRESS.	STEAM FLOW INTG. READING	STEAM FLOW	O²	OPACITY	200 LB. HDR. STEAM PRESS	FEED WATER PRESS.	SUPHT. STEAM TEMP. °F	FEED WATER TEMP.	BLDG. VAC.
2400											
0100											
0200											
0300											
0400											
0500											
0600											
0700											
0800											
0900											
1000											
1100											
1200											
1300											
1400											
1500											
1600											
1700											
1800											

NO. 1 SHIFT

ASSISTANT OPERATOR	PLANT ATTENDANT

TUBES BLOWN TIME	
AIR HTR. BLOWN TIME	
BAHCO AND NUVA TIME	
SLUICE SLAG TIME	
DEWATERED TIME	

NO. 2 SHIFT

ASSISTANT OPERATOR	PLANT ATTENDANT

TUBES BLOWN TIME	
AIR HTR. BLOWN TIME	
BAHCO AND NUVA TIME	
SLUICE SLAG TIME	
DEWATERED TIME	

NO. 5 BOILER INTEGRATO

	STEAM
END OF DAY	
START OF DAY	
DIFF.	
	X 4000
TOTALS	

NO. 4 BOILER INTEGRATO

	STEAM
END OF DAY	
START OF DAY	

Bruce Diff. Pressure Test 1

10/26/99 BLR5

Time	North	South
1415	7.0	7.6
1445	6.8	7.3
1515	7.2	7.7
1545	6.6	7.2
1615	6.6	6.7
1645	7.0	7.3
1710	7.2	7.4

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:36
Rolling Average Interval: 1

Run 2

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/27/99	08:40	14.39	243.3	193991.	9.26
	08:41	14.39	245.0	192329.	9.15
	08:42	14.39	242.9	194231.	9.03
	08:43	14.39	242.5	194090.	9.35
	08:44	14.39	243.7	193208.	9.18
	08:45	14.39	242.6	192494.	9.18
	08:46	14.39	242.9	191118.	9.23
	08:47	14.39	242.2	190574.	9.14
	08:48	14.39	242.5	189183.	9.39
	08:49	14.39	244.0	188817.	9.17
	08:50	14.39	242.4	189273.	9.11
	08:51	14.39	243.2	188920.	9.15
	08:52	14.39	243.6	187584.	9.09
	08:53	14.39	243.9	186927.	8.98
	08:54	14.39	243.1	187310.	8.84
	08:55	14.39	242.9	186895.	9.01
	08:56	14.39	243.1	187761.	9.05
	08:57	14.39	244.2	186685.	9.10
	08:58	14.39	245.9	186682.	9.15
	08:59	14.39	244.7	189243.	9.11
	09:00	14.39	245.1	188816.	9.33
	09:01	14.39	245.1	189719.	9.28
	09:02	14.39	242.9	191873.	9.13
	09:03	14.39	244.9	189580.	9.43
	09:04	14.39	243.7	190597.	9.16
	09:05	14.39	244.3	187575.	9.31
	09:06	14.39	245.5	189667.	9.05
	09:07	14.39	245.9	188408.	9.27
	09:08	14.39	244.3	187199.	9.23
	09:09	14.39	244.7	188932.	9.01
	09:10	14.39	245.5	188874.	9.18
	09:11	14.39	245.4	187864.	9.12
	09:12	14.39	246.4	188490.	9.18
	09:13	14.38	245.5	185097.	9.44
	09:14	14.39	245.9	183273.	8.97
	09:15	14.39	245.8	182980.	8.79
	09:16	14.38	245.1	185646.	8.71
	09:17	14.38	246.7	184264.	9.04
	09:18	14.39	246.6	182242.	8.79
	09:19	14.38	244.8	184609.	8.55
	09:20	14.38	245.5	184156.	8.89
	09:21	14.38	245.9	183771.	8.96
	09:22	14.39	245.1	182204.	8.82
	09:23	14.38	244.8	181651.	8.80
	09:24	14.38	244.9	181687.	8.82
	09:25	14.38	246.2	182271.	8.69
	09:26	14.38	246.7	185127.	8.70
	09:27	14.38	245.5	183834.	8.97
	09:28	14.38	247.6	182205.	8.87
	09:29	14.38	247.6	182360.	8.60

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

ite Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:36
Rolling Average Interval: 1

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/27/99	09:30	14.38	246.6	183536.	8.65
	09:31	14.38	246.5	186182.	8.73
	09:32	14.39	243.5	188580.	8.91
	09:33	14.39	245.0	189193.	9.11
	09:34	14.39	245.3	188247.	8.94
	09:35	14.39	244.9	188064.	8.93
	09:36	14.39	244.8	187787.	8.88
	09:37	14.38	246.4	187684.	8.91
	09:38	14.38	244.5	185645.	8.95
	09:39	14.39	244.9	184090.	8.88
	09:40	14.38	246.3	181883.	8.88
	09:41	14.38	246.1	182754.	8.62
	09:42	14.38	246.2	183495.	8.89
	09:43	14.38	246.3	184415.	8.77
	09:44	14.38	244.4	183349.	8.99
	09:45	14.38	245.1	181491.	8.83
	09:46	14.38	245.0	182974.	8.71
	09:47	14.38	245.2	182345.	9.03
	09:48	14.38	245.1	183715.	8.76
	09:49	14.38	244.1	183943.	9.01
	09:50	14.38	245.1	184148.	8.95
	09:51	14.38	247.1	185231.	8.91
	09:52	14.38	245.9	181749.	9.03
	09:53	14.38	245.7	181477.	8.73
	09:54	14.38	246.0	181396.	8.89
	09:55	14.38	245.8	183223.	8.95
	09:56	14.38	245.5	182817.	8.98
	09:57	14.38	247.7	184325.	8.74
	09:58	14.38	247.1	184696.	8.94
	09:59	14.38	244.7	184749.	8.78
	10:00	14.38	245.4	183990.	8.92
	10:01	14.38	246.0	182569.	8.77
	10:02	14.38	244.5	183853.	8.59
	10:03	14.38	243.2	184514.	8.90
	10:04	14.38	243.7	186069.	8.81
	10:05	14.38	245.9	185088.	9.05
	10:06	14.38	247.1	183692.	8.83
	10:07	14.38	245.6	183537.	8.72
	10:08	14.38	245.1	182028.	8.86
	10:09	14.38	246.6	181109.	8.82
	10:10	14.38	245.1	180459.	8.79
	10:11	14.37	245.0	180076.	8.75
	10:12	14.38	245.6	181117.	8.75
	10:13	14.38	244.5	183295.	8.73
	10:14	14.38	244.2	183260.	8.91
	10:15	14.38	243.1	182053.	8.71
	10:16	14.38	243.0	183567.	8.80
	10:17	14.38	243.3	183583.	9.01
	10:18	14.38	244.7	184579.	8.81
	10:19	14.38	246.0	184022.	8.92

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:36
Rolling Average Interval: 1

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/27/99	10:20	14.38	248.1	183390.	8.71
	10:21	14.38	244.7	184134.	8.72
	10:22	14.38	243.1	183823.	8.78
	10:23	14.38	244.0	185149.	8.68
	10:24	14.38	243.7	184909.	8.93
	10:25	14.38	245.5	183685.	8.83
	10:26	14.38	243.7	182204.	8.63
	10:27	14.37	244.5	182515.	8.68
	10:28	14.37	245.0	183449.	8.79
	10:29	14.37	246.0	183514.	8.87
	10:30	14.37	244.7	183757.	8.86
	10:31	14.37	245.3	184492.	8.71
	10:32	14.37	245.7	182619.	8.93
	10:33	14.37	244.8	184334.	8.68
	10:34	14.37	243.4	186659.	8.86
	10:35	14.37	244.5	184736.	9.08
	10:36	14.37	245.0	185975.	8.71
	10:37	14.37	244.5	185222.	9.01
	10:38	14.37	244.5	183994.	8.88
	10:39	14.37	244.0	183755.	8.73
	10:40	14.37	245.3	183597.	8.69
	10:41	14.37	244.3	185668.	8.61
	10:42	14.37	244.3	184566.	8.93
	10:43	14.37	245.4	184087.	8.83
	10:44	14.37	246.0	184107.	8.78
	10:45	14.37	247.1	185814.	8.68
	10:46	14.37	247.3	186347.	8.93
	10:47	14.37	247.5	185017.	8.77
	10:48	14.37	247.2	183443.	8.59
	10:49	14.37	246.6	183293.	8.67
	10:50	14.37	246.9	181931.	8.64
	10:51	14.37	246.3	184401.	8.57
	10:52	14.37	247.0	184958.	8.88
	10:53	14.37	245.8	184691.	8.78
	10:54	14.37	245.1	183934.	8.74
	10:55	14.37	247.7	185565.	8.72
	10:56	14.36	245.0	188147.	8.92
	10:57	14.36	246.8	188657.	9.02
	10:58	14.36	245.9	186999.	8.84
	10:59	14.36	246.6	184909.	8.81
	11:00	14.36	247.2	185058.	8.73
	11:01	14.36	245.9	187035.	8.76
	11:02	14.36	246.1	189387.	8.92
	11:03	14.36	246.8	190457.	9.07
	11:04	14.35	246.9	189099.	9.12
	11:05	14.35	247.9	186272.	8.84
	11:06	14.35	247.3	184458.	8.61
	11:07	14.35	247.0	184313.	8.68
	11:08	14.35	246.6	187583.	8.72
	11:09	14.35	247.2	185496.	9.07

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

ite Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:36
Rolling Average Interval: 1

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/27/99	11:10	14.35	247.2	184609.	8.71
	11:11	14.35	246.7	186710.	8.73
	11:12	14.35	247.1	185170.	9.01
	11:13	14.35	245.7	185212.	8.66
	11:14	14.35	246.7	184966.	8.78
	11:15	14.35	248.1	183388.	8.86
	11:16	14.35	249.5	182989.	8.65
	11:17	14.35	249.1	183054.	8.70
	11:18	14.35	246.6	183822.	8.72
	11:19	14.35	248.0	184508.	8.72
	11:20	14.35	247.8	184923.	8.84
Average =		14.38	245.4	185397.	8.89
Maximum =		14.39	249.5	194231.	9.44
Minimum =		14.35	242.2	180076.	8.55
Possible Values =		161	161	161	161
Included Values =		161	161	161	161
Total =		2314.46	39506.9	29848877.	1431.90

- excluded values (missing, OOC, invalid, suspect)
- missing
T - out-of-control
I - invalid
- suspect
- invalid for state
H - exceedance
- stack not operating
- invalid (PADER)
- missing data substituted
-999 - missing value
888 - value could not be calculated

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

ite Name: B5
Averaging Type: 6m

Time of Report: 10/27/99 15:42
Rolling Average Interval: 1

Date	Time	B5OPC (PERCENT)
10/27/99	08:42	27.62
	08:48	26.55
	08:54	27.30
	09:00	29.62
	09:06	30.39
	09:12	27.25
	09:18	27.13
	09:24	26.85
	09:30	27.88
	09:36	27.39
	09:42	27.42
	09:48	28.34
	09:54	27.42
	10:00	26.89
	10:06	26.37
	10:12	26.29
	10:18	27.58
	10:24	27.03
	10:30	27.35
	10:36	28.14
	10:42	26.79
	10:48	28.61
	10:54	29.87
	11:00	29.30
	11:06	27.87
	11:12	27.21
	11:18	28.27

Average =	27.73
Maximum =	30.39
Minimum =	26.29
ossible Values =	27
ncluded Values =	27
Total =	748.75

- excluded values (missing, OOC, invalid, suspect)
< - missing
- out-of-control
- invalid
s - suspect
V - invalid for state
- exceedance
- stack not operating
B - invalid (PADER)
U - missing data substituted
999 - missing value
888 - value could not be calculated

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:56
Rolling Average Interval: 1

Date	Time	B5CPFLOW (SCFH)
10/27/99	07:45	4051015.
	07:46	4079182.
	07:47	4131081.
	07:48	4180813.
	07:49	4283715.
	07:50	4354640.
	07:51	4407942.
	07:52	4352985.
	07:53	4306143.
	07:54	4201511.
	07:55	4102489.
	07:56	4063569.
	07:57	4028036.
	07:58	4005800.
	07:59	4029239.
	08:00	4050861.
	08:01	4051053.
	08:02	4026732.
	08:03	4076185.
	08:04	4004621.
	08:05	3977718.
	08:06	4030701.
	08:07	4010265.
	08:08	4019229.
	08:09	4098883.
	08:10	4160099.
	08:11	4230549.
	08:12	4230911.
	08:13	4222978.
	08:14	4225549.
	08:15	4222050.
	08:16	4180423.
	08:17	4151045.
	08:18	4196275.
	08:19	4179951.
	08:20	4160556.
	08:21	4147492.
	08:22	4092771.
	08:23	4062031.
	08:24	4064912.
	08:25	4153155.
	08:26	4181152.
	08:27	4232043.
	08:28	4216082.
	08:29	4167541.
	08:30	4167737
	08:31	4199[illegible].
	08:32	422[illegible]95.
	08:33	4[illegible]4683.
	08:34	[illegible]50240.

Post-it® Fax Note 7671

To Jeff Daniels	Date 10/29/99	# of pages ▶ 12	
Co./Dept.	From Jeff Wright		
Phone #	Co.		
Fax #	Phone #		
	Fax #		

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:56
Rolling Average Interval: 1

Date	Time	B5CFFLOW (SCFH)
10/27/99	08:35	4129933.
	08:36	3992591.
	08:37	3956281.
	08:38	3922529.
	08:39	3968700.
	08:40	4012007.
	08:41	4026335.
	08:42	3918602.
	08:43	3815416.
	08:44	3752651.
	08:45	3736923.
	08:46	3776576.
	08:47	3808308.
	08:48	3883501.
	08:49	3876401.
	08:50	3885900.
	08:51	3943529.
	08:52	3875720.
	08:53	3834879.
	08:54	3803565.
	08:55	3858767.
	08:56	3946098.
	08:57	3996122.
	08:58	4044497.
	08:59	4009223.
	09:00	3994557.
	09:01	3975744.
	09:02	4007398.
	09:03	4035225.
	09:04	3974764.
	09:05	3874891.
	09:06	3902464.
	09:07	3970606.
	09:08	4005944.
	09:09	4007133.
	09:10	4024776.
	09:11	4029544.
	09:12	4024152.
	09:13	4092014.
	09:14	4115122.
	09:15	4084624.
	09:16	4059362.
	09:17	3964865.
	09:18	3874545.
	09:19	3885257.
	09:20	3921103.
	09:21	3923793.
	09:22	3900459.
	09:23	3897030.
	09:24	3925490.

Site Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:56
Rolling Average Interval: 1

Date	Time	B5CPFLOW (SCFH)
10/27/99	09:25	4004400.
	09:26	4015984.
	09:27	3976108.
	09:28	4046265.
	09:29	3966469.
	09:30	3931312.
	09:31	3983682.
	09:32	4035358.
	09:33	4093091.
	09:34	4097262.
	09:35	4136314.
	09:36	4179019.
	09:37	4205178.
	09:38	4160552.
	09:39	4159662.
	09:40	4183503.
	09:41	4174780.
	09:42	4221079.
	09:43	4295421.
	09:44	4253590.
	09:45	4109857.
	09:46	3996309.
	09:47	4003619.
	09:48	4015271.
	09:49	4035611.
	09:50	4057840.
	09:51	4124195.
	09:52	4087514.
	09:53	3982751.
	09:54	3971168.
	09:55	4000602.
	09:56	4007430.
	09:57	4066606.
	09:58	4073173.
	09:59	4093832.
	10:00	4116578.
	10:01	4069467.
	10:02	4008458.
	10:03	4011778.
	10:04	4047488.
	10:05	4135997.
	10:06	4132565.
	10:07	4054815.
	10:08	4084381.
	10:09	4183322.
	10:10	4179944.
	10:11	4169736.
	10:12	4149037.
	10:13	4193823.
	10:14	4197925.

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:56
Rolling Average Interval: 1

Date	Time	B5CPFLOW (SCFM)
10/27/99	10:15	4229677.
	10:16	4229054.
	10:17	4206081.
	10:18	4193689.
	10:19	4181638.
	10:20	4147177.
	10:21	4089623.
	10:22	4144090.
	10:23	4186554.
	10:24	4137601.
	10:25	4041908.
	10:26	3995020.
	10:27	3953719.
	10:28	3948577.
	10:29	3953929.
	10:30	3987582.
	10:31	3962312.
	10:32	3972174.
	10:33	3989080.
	10:34	4046235.
	10:35	4091528.

Average =	4064044.
Maximum =	4407942.
Minimum =	3736923.
Possible Values =	171
Included Values =	171
Total =	694951584

* - excluded values (missing, OOC, invalid, suspect)
t - missing
T - out-of-control
I - invalid
S - suspect
V - invalid for state
E - exceedance
F - stack not operating
A - invalid (PADER)
M - missing data substituted
-999 - missing value
-888 - value could not be calculated

Every ½ hour Run #2 10/27/99

[redacted] AND NO. 5 BOILER - BAY FRONT BOILER ROOM SHEET

TIME	BOILER DRUM PRESS.	FEED-WATER INLET PRESS.	SUP. HTR. OUTLET PRESS.	SUP. HTR. TEMP. °F	STEAM FLOW LB/HR.	FEED-WATER TEMP. °F	PERCENT O²	OPACITY	I.D. FAN AMPS.	TEMP. AIR TO AIR HTR.	TEMP. AIR FROM AIR HTR.	TEMP. GAS TO AIR HTR.	TEMP. GAS FROM AIR HTR.	F.D. FAN AMPS	COAL FDR. R.P.M. CY. 5A	COAL FDR. R.P.M. CY. 5B	STEAM PRESS DEVIATION	DUST COLL. DIFF. PRESS	FURN. PRESS.	BOILER EXIT GAS PRESS.	AIR HTR. OUTLET GAS PRESS.	F.D. FAN BLOWER DISH	AIR PRESS. TO AIR HTR.	AIR PRESS. LVG. AIR HTR.	TOTAL AIR DIFF. CY. 5A	PRIM. AIR DIFF. CY. 5A	TOTAL AIR PRESS. CY. 5A	TOTAL AIR DIFF. CY. 5B	PRIM. AIR DIFF. CY. 5B	TOTAL AIR PRESS CY. 5B	STEAM FLOW INTG. READING
8:45	[redacted]	1600	1020	610	900	215	345	4	26	50	180	470	630	275	170	32	32	+15	3	10	9	6	29	29	26	8	2	27	1	1.4	27	228255
9.15	[redacted]	1600	1000	610	900	210	345	4	26	50	180	470	630	275	170	32	32	+15	3	10	9	6	29	29	26	8	2	27	1	1.4	27	228279
9:45	[redacted]	1600	1020	610	900	210	345	4	26	50	180	470	630	275	170	32	32	+20	3	10	9	6	29	29	26	8	2	27	1	1.4	27	228304
10:15	[redacted]	1680	1080	620	910	200	345	4	26	50	180	470	630	275	170	32	32	+20	3	10	9	6	29	29	26	8	2	27	1	1.4	27	228330
10 45	[redacted]	1660	1020	610	910	200	345	4	26	50	180	470	630	275	172	29	32	+25	3	10	9	6	29	29	26	8	2	27	1	1.4	27	228330
11 15	[redacted]	1670	1020	620	910	200	345	4	26	50	180	470	630	275	171	29	32	+25	3	10	9	6	29	29	26	8	2	27	1	1.4	27	228330
0600																																
0700																																
0800																																
0900																																
1000																																
1100																																
1200																																
1300																																
1400																																
1500																																
1600																																
1700																																
1800																																
1900																																
2000																																
2100																																
2200																																
2300																																
2400																																
AVG.																																

43

NO. 4 BOILER

TIME	BOILER DRUM PRESS.	650 LB. HDR. STEAM PRESS.	STEAM FLOW INTG. READING	STEAM FLOW	O²	OPACITY	200 LB. HDR. STEAM PRESS	FEED WATER PRESS.	SUPHT. STEAM TEMP. °F	FEED WATER TEMP.	BLDG. VAC.
2400											
0100											
0200											
0300											
0400											
0500											
0600											
0700											
0800											
0900											
1000											
1100											
1200											
1300											
1400											
1500											
1600											
1700											

NO. 1 SHIFT

ASSISTANT OPERATOR	PLANT ATTENDANT

TUBES BLOWN TIME	
AIR HTR. BLOWN TIME	
BAHCO AND NUVA TIME	
SLUICE SLAG TIME	
DEWATERED TIME	

NO. 2 SHIFT

ASSISTANT OPERATOR	PLANT ATTENDANT

TUBES BLOWN TIME	
AIR HTR. BLOWN TIME	
BAHCO AND NUVA TIME	

NO. 5 BOILER INTEGRATOR

	STEAM
END OF DAY	
START OF DAY	
DIFF.	
	X 4000
TOTALS	

NO. 4 BOILER INTEGRATOR F

	STEAM
END OF DAY	

BS 2nd Run Bacho Diff Press 10.21/99

Time	South	North
0845	7.5	7.3
	7.7	7.5
	7.4	7.3
	7.6	7.5
	7.7	7.2
	7.4	7.2

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

.te Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:38
Rolling Average Interval: 1

Run 3

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/27/99	12:45	14.33	247.9	186807.	8.72
	12:46	14.33	247.1	186541.	8.90
	12:47	14.33	247.1	187001.	8.76
	12:48	14.32	246.6	185197.	8.84
	12:49	14.33	244.9	185848.	8.62
	12:50	14.33	245.8	188862.	8.74
	12:51	14.33	245.7	189850.	9.08
	12:52	14.33	248.3	190576.	8.98
	12:53	14.33	247.1	190366.	8.94
	12:54	14.33	249.2	188141.	8.91
	12:55	14.33	247.4	188368.	8.76
	12:56	14.33	246.5	187522.	8.88
	12:57	14.32	246.6	185928.	8.79
	12:58	14.32	248.3	185427.	8.68
	12:59	14.32	247.3	184420.	8.69
	13:00	14.32	247.1	184938.	8.74
	13:01	14.32	248.3	186049.	8.73
	13:02	14.32	249.1	186360.	8.86
	13:03	14.32	248.2	184586.	8.87
	13:04	14.32	249.9	184215.	8.55
	13:05	14.32	247.5	186550.	8.67
	13:06	14.32	248.0	187062.	8.86
	13:07	14.32	248.7	185298.	8.87
	13:08	14.32	248.0	184352.	8.67
	13:09	14.32	249.1	184042.	8.64
	13:10	14.32	247.3	184581.	8.66
	13:11	14.32	248.7	185566.	8.72
	13:12	14.32	249.1	186176.	8.84
	13:13	14.32	249.9	184036.	8.80
	13:14	14.32	250.8	181356.	8.56
	13:15	14.32	251.6	183117.	8.47
	13:16	14.32	248.9	185496.	8.74
	13:17	14.32	249.8	186966.	8.90
	13:18	14.32	251.2	185073.	8.84
	13:19	14.32	250.9	186001.	8.64
	13:20	14.32	250.7	188316.	8.83
	13:21	14.32	249.0	190474.	8.96
	13:22	14.32	248.7	190028.	9.00
	13:23	14.32	251.8	187419.	8.98
	13:24	14.32	250.2	187557.	8.61
	13:25	14.31	247.6	185305.	8.81
	13:26	14.31	247.1	185928.	8.67
	13:27	14.31	247.3	187550.	8.71
	13:28	14.31	246.7	186656.	8.90
	13:29	14.31	246.2	185067.	8.72
	13:30	14.32	247.0	185565.	8.68
	13:31	14.32	248.7	184521.	8.80
	13:32	14.31	247.3	184899.	8.63
	13:33	14.32	245.7	184778.	8.71
	13:34	14.32	248.5	186165.	8.70

te Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:38
Rolling Average Interval: 1

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/27/99	13:35	14.32	248.6	185226.	8.89
	13:36	14.32	249.6	184919.	8.69
	13:37	14.31	250.3	184544.	8.73
	13:38	14.31	250.1	185132.	8.62
	13:39	14.31	249.1	187293.	8.83
	13:40	14.31	247.5	187105.	8.91
	13:41	14.31	248.5	187864.	8.85
	13:42	14.31	249.3	188272.	8.91
	13:43	14.30	250.7	187827.	8.92
	13:44	14.31	251.3	187092.	8.91
	13:45	14.30	249.6	185316.	8.99
	13:46	14.30	249.3	184991.	8.79
	13:47	14.30	249.1	184314.	8.84
	13:48	14.31	250.2	182080.	8.76
	13:49	14.31	248.9	181546.	8.61
	13:50	14.30	250.7	179970.	8.92
	13:51	14.31	250.6	180068.	8.69
	13:52	14.31	249.9	180077.	8.74
	13:53	14.30	249.8	181786.	8.77
	13:54	14.30	249.7	183349.	8.97
	13:55	14.30	250.0	184070.	8.98
	13:56	14.30	249.5	185891.	8.75
	13:57	14.31	249.2	187577.	8.79
	13:58	14.30	251.0	187131.	8.88
	13:59	14.30	251.7	190133.	8.64
	14:00	14.30	249.6	188898.	8.77
	14:01	14.30	251.4	189978.	8.59
	14:02	14.30	250.4	188700.	8.65
	14:03	14.30	249.8	187172.	8.66
	14:04	14.30	251.4	186208.	8.66
	14:05	14.30	251.0	185305.	8.62
	14:06	14.30	251.0	186102.	8.68
	14:07	14.30	249.4	187495.	8.78
	14:08	14.30	250.9	188617.	8.85
	14:09	14.30	251.0	187524.	8.85
	14:10	14.30	249.4	187146.	8.70
	14:11	14.30	250.6	186690.	8.84
	14:12	14.30	250.3	184680.	8.77
	14:13	14.30	250.8	183765.	8.57
	14:14	14.30	251.4	186148.	8.66
	14:15	14.30	254.0	185345.	8.89
	14:16	14.30	252.3	185034.	8.60
	14:17	14.30	251.1	185822.	8.61
	14:18	14.30	251.4	183006.	8.76
	14:19	14.30	253.4	183267.	8.50
	14:20	14.30	251.5	185188.	8.66
	14:21	14.30	251.1	185506.	8.82
	14:22	14.30	252.1	184390.	8.71
	14:23	14.30	251.6	183251.	8.58
	14:24	14.30	251.3	183541.	8.52

te Name: B5
Averaging Type: 1M

Time of Report: 10/27/99 15:38
Rolling Average Interval: 1

Date	Time	B5BPRES (INCHESHG)	B5STEMP (DEGFAHRE)	B5STEAM (LBS/HOUR)	B5CPCO2 (PERCENT)
10/27/99	14:25	14.30	250.6	183434.	8.67
	14:26	14.30	250.8	184755.	8.65
	14:27	14.30	250.7	185344.	8.80
	14:28	14.30	250.8	184544.	8.81
	14:29	14.30	251.2	185893.	8.63
	14:30	14.30	252.1	185746.	8.80
	14:31	14.30	251.3	185207.	8.68
	14:32	14.30	250.3	184340.	8.59
	14:33	14.30	251.4	184269.	8.66
	14:34	14.29	250.8	185545.	8.75
	14:35	14.29	251.0	186972.	8.82
	14:36	14.30	253.1	185960.	8.92
	14:37	14.29	250.0	185838.	8.66
	14:38	14.30	250.9	184430.	8.82
	14:39	14.29	251.5	183742.	8.68
	14:40	14.30	252.8	185420.	8.53
Average =		14.31	249.6	185747.	8.76
Maximum =		14.33	254.0	190576.	9.08
Minimum =		14.29	244.9	179970.	8.47
ssible Values =		116	116	116	116
cluded Values =		116	116	116	116
Total =		1659.94	28952.6	21546688.	1015.81

- excluded values (missing, OOC, invalid, suspect)
< - missing
" - out-of-control
- invalid
s - suspect
V - invalid for state
- exceedance
- stack not operating
B - invalid (PADER)
U - missing data substituted
99 - missing value
88 - value could not be calculated

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

ite Name: B5
Averaging Type: 6m

Time of Report: 10/27/99 15:42
Rolling Average Interval: 1

Date	Time	B5OPC (PERCENT)
10/27/99	12:48	28.89
	12:54	29.60
	13:00	29.24
	13:06	28.11
	13:12	27.40
	13:18	30.37
	13:24	28.70
	13:30	28.42
	13:36	28.09
	13:42	28.92
	13:48	27.78
	13:54	28.03
	14:00	27.68
	14:06	28.70
	14:12	32.30
	14:18	29.75
	14:24	27.43
	14:30	27.83
	14:36	28.44

Average =	28.72
Maximum =	32.30
Minimum =	27.40
ble Values =	19
ied Values =	19
Total =	545.70

- excluded values (missing, OOC, invalid, suspect)
< - missing
T - out-of-control
- invalid
- suspect
V - invalid for state
H - exceedance
- stack not operating
- invalid (PADER)
U - missing data substituted
999 - missing value
888 - value could not be calculated

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

ite Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:56
Rolling Average Interval: 1

Date	Time	B5CPFLOW (SCFH)
10/27/99	11:50	4025443.
	11:51	4043922.
	11:52	4169302.
	11:53	4177616.
	11:54	4089940.
	11:55	4015379.
	11:56	4053984.
	11:57	4108721.
	11:58	4154894.
	11:59	4100276.
	12:00	4101050.
	12:01	4087698.
	12:02	4134434.
	12:03	4124705.
	12:04	4119206.
	12:05	4128602.
	12:06	4082558.
	12:07	4046954.
	12:08	3982035.
	12:09	3927932.
	12:10	3898946.
	12:11	3951299.
	12:12	4058616.
	12:13	4100192.
	12:14	4059914.
	12:15	3983436.
	12:16	3976238.
	12:17	3956273.
	12:18	3946796.
	12:19	3969192.
	12:20	3969772.
	12:21	3966140.
	12:22	3902666.
	12:23	3880529.
	12:24	3996397.
	12:25	4151120.
	12:26	4191001.
	12:27	4224731.
	12:28	4190197.
	12:29	4230840.
	12:30	4288313.
	12:31	4276356.
	12:32	4224372.
	12:33	4169392.
	12:34	4178369.
	12:35	4197575.
	12:36	4248101.
	12:37	4202067.
	12:38	4085255.
	12:39	4044335.

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:56
Rolling Average Interval: 1

Date	Time	B5CPFLOW (SCFH)
10/27/99	12:40	4095205.
	12:41	4100402.
	12:42	4057203.
	12:43	4083927.
	12:44	4149817.
	12:45	4182983.
	12:46	4107728.
	12:47	4037555.
	12:48	3997628.
	12:49	3993587.
	12:50	4048534.
	12:51	4048684.
	12:52	4044115.
	12:53	3975451.
	12:54	3942618.
	12:55	3925057.
	12:56	3915223.
	12:57	3913275.
	12:58	3930800.
	12:59	3999745.
	13:00	4058371.
	13:01	4008064.
	13:02	4075823.
	13:03	4127808.
	13:04	4106592.
	13:05	4087163.
	13:06	4020611.
	13:07	3976685.
	13:08	3951537.
	13:09	3924788.
	13:10	3935394.
	13:11	3887271.
	13:12	3849999.
	13:13	3909595.
	13:14	3987863.
	13:15	4061995.
	13:16	4064833.
	13:17	4036057.
	13:18	3998054.
	13:19	4016429.
	13:20	4025204.
	13:21	4034850.
	13:22	4070695.
	13:23	4083658.
	13:24	4115026.
	13:25	4162096.
	13:26	4108307.
	13:27	4068100.
	13:28	4073545.
	13:29	4079797.

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:56
Rolling Average Interval: 1

Date	Time	B5CPFLOW (SCFH)
10/27/99	13:30	4056408.
	13:31	4069578.
	13:32	4061803.
	13:33	4003466.
	13:34	4039969.
	13:35	4048054.
	13:36	4032432.
	13:37	3989296.
	13:38	4010780.
	13:39	4017359.
	13:40	4008172.
	13:41	3998900.
	13:42	4060122.
	13:43	4137381.
	13:44	4197030.
	13:45	4123185.
	13:46	3998187.
	13:47	4020744.
	13:48	4045021.
	13:49	4081822.
	13:50	4032376.
	13:51	4020819.
	13:52	3980756.
	13:53	3969795.
	13:54	4023086.
	13:55	4192617.
	13:56	4180743.
	13:57	4195667.
	13:58	4251822.
	13:59	4264418.
	14:00	4191313.
	14:01	4159354.
	14:02	4174656.
	14:03	4200720.
	14:04	4198148.
	14:05	4150376.
	14:06	4060033.
	14:07	3988572.
	14:08	4017741.
	14:09	4013559.
	14:10	4059259.
	14:11	4032933.
	14:12	4007928.
	14:13	4117972.
	14:14	4200756.
	14:15	4320963.
	14:16	4398435.
	14:17	4480054.
	14:18	4429549.
	14:19	-4412179.

Plant Name: NSPB
General Average Report
Reporting Period: 10/27/1999 to 10/27/1999

Site Name: B5
Averaging Type: 1M

Time of Report: 10/29/99 09:56
Rolling Average Interval: 1

Date	Time	B5CPFLOW (SCFH)
10/27/99	14:20	4344006.
	14:21	4302786.
	14:22	4380723.
	14:23	4359378.
	14:24	4289069.
	14:25	4191042.
	14:26	4203057.
	14:27	4206776.
	14:28	4227466.
	14:29	4203884.
	14:30	4204647.
	14:31	4116818.
	14:32	4100831.
	14:33	4095057.
	14:34	4111411.
	14:35	4157105.
	14:36	4178070.
	14:37	4164020.
	14:38	4111711.
	14:39	4175350.
	14:40	4227202.
	14:41	4237990.
	14:42	4227131.
	14:43	4172433.

Average =	4094052.
Maximum =	4480054.
Minimum =	3849999.
Possible Values =	174
Included Values =	174
Total =	712365078

* - excluded values (missing, OOC, invalid, suspect)
- missing
- out-of-control
I - invalid
S - suspect
- invalid for state
- exceedance
F - stack not operating
B - invalid (FADER)
- missing data substituted
999 - missing value
-888 - value could not be calculated

Run 3 Every ½ hour

~~NO. 4~~ AND NO. 5 BOILER - BAY FRONT BOILER ROOM SHEET

TIME	BOILER DRUM PRESS.	FEED-WATER INLET PRESS.	SUP. HTR. OUTLET PRESS.	SUP. HTR. TEMP. °F	STEAM FLOW LB/HR.	FEED-WATER TEMP. °F	PERCENT O²	OPACITY	I.D. FAN AMPS.	TEMP. AIR TO AIR HTR.	TEMP. AIR FROM AIR HTR.	TEMP. GAS TO AIR HTR.	TEMP. GAS FROM AIR HTR.	F.D. FAN AMPS	COAL FDR. R.P.M. CY. 5A	COAL FDR. R.P.M. CY. 5B	STEAM PRESS DEVIATION	DUST COLL. DIFF. PRESS	FURN. PRESS.	BOILER EXIT GAS PRESS.	AIR HTR. OUTLET GAS PRESS.	F.D. FAN BLOWER DISH	AIR PRESS. TO AIR HTR.	AIR PRESS. LVG. AIR HTR.	TOTAL AIR DIFF. CY. 5A	PRIM. AIR DIFF. CY. 5A	TOTAL AIR PRESS. CY. 5A	TOTAL AIR DIFF. CY. 5B	PRIM. AIR DIFF. CY. 5B	TOTAL AIR PRESS CY. 5B	STEAM FLOW INTG. READING
1150	660	1020	600	910	200	345	4	26	50	185	470	630	275	170	29	32	+10	3	10	9	6	29	29	25	8	2	27	1	1.4	27	228452
1220	660	1020	600	905	200	345	4	26	50	185	470	630	280	170	29	32	+10	3	10	9	6	29	29	25	8	2	27	1	1.4	27	228489
1250	660	1020	600	900	200	345	4	26	50	185	470	630	280	170	29	32	+10	3	10	9	6	29	29	25	8	2	27	1	1.4	27	228511
1320	660	1020	600	905	200	345	4	26	50	185	470	630	280	170	29	32	+15	3	10	9	6	29	29	25	8	2	27	1	1.4	27	228511
1350	660	1020	600	905	200	345	4	26	50	185	470	630	280	168	29	32	+20	3	10	9	6	29	29	25	8	2	27	1	1.4	27	228560
1420	680	1020	610	905	200	345	4	25	50	185	470	630	280	170	29	32	+15	3	10	9	6	29	29	25	8	2	27	1	1.4	27	228560
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AVG.																															

53

NO. 4 BOILER

TIME	BOILER DRUM PRESS.	650 LB. HDR. STEAM PRESS.	STEAM FLOW INTG. READING	STEAM FLOW	O²	OPACITY	200 LB. HDR. STEAM PRESS	FEED WATER PRESS.	SUPHT. STEAM TEMP. °F	FEED WATER TEMP.	BLDG. VAC.
2400											
0100											
0200											
0300											
0400											
0500											
0600											
0700											
0800											
0900											
1000											
1100											
1200											
1300											
1400											
1500											
1600											
1700											
1800											

NO. 1 SHIFT

ASSISTANT OPERATOR	PLANT ATTENDANT

TUBES BLOWN TIME	
AIR HTR. BLOWN TIME	
BAHCO AND NUVA TIME	
SLUICE SLAG TIME	
DEWATERED TIME	

NO. 2 SHIFT

ASSISTANT OPERATOR	PLANT ATTENDANT

TUBES BLOWN TIME	
AIR HTR. BLOWN TIME	
BAHCO AND NUVA TIME	
SLUICE SLAG TIME	

NO. 5 BOILER INTEGRATOR

	STEAM
END OF DAY	
START OF DAY	
DIFF.	
	X 4000
TOTALS	

NO. 4 BOILER INTEGRATOR

	STEAM
END OF DAY	
START OF DAY	

Blk 5 10/27 Rem #3

Bpcho Diff Press

Time	North	South
11:50	7.4 7.2	7.5 7.0
	7.1 7.4	7.8 7.6
	7.3 7.2	7.5 7.6

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

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

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

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

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

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

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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)

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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

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

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

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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.

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MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 1 Inlet

COMPANY: NSP
PLANT: Bay Front
TEST LOCATION: Unit 5 INLET Duct
CLIENT: NSP
OPERATOR: Norm Smith
DATE: 10 26 99
CONTROL BOX: E-35 POT. NO.: E-35
METER NO.: E-35
METER CALIBRATION FACTOR: 1.002
PITOT ID NO.: 541-A
PITOT TUBE COEFFICIENT: 0.841
PORT LENGTH: 10 in.
PORT SIZE: 6 in.
PORT TYPE: Flange

IMPINGER H_2O SILICA GEL:
FINAL: 5004.8 ml/gm FINAL WT: 803.6 gm
INITIAL: 4853.7 ml/gm INITIAL WT: 783.0 gm
GAIN: 151.1 ml/gm WT. GAIN: 20.6 gm
TOTAL H_2O COLLECTED: 171.7
DESCRIPTION OF IMPINGER H_2O:
SILICA GEL EXHAUSTED?:
IMPINGERS RECOVERED BY:
SILICA GEL WEIGHED BY:

COMMENTS & NOTES

THIMBLE NO: TARE WT:
FILTER NO: TARE WT:
BAROMETRIC PRESSURE in. Hg: 29.45
FLUE PRESSURE in. H_2O: +3.8
FLUE PRESSURE in. Hg ABS: 29.729
PROBE LENGTH: 9.5 ft.
PROBE LINER MATERIAL: GLASS
NOZZLE IDENTIFICATION NO: Set B #10
CALIBRATED NOZZLE DIAMETER: 0.31
LEAK CHECK: PRE: 0.007 POST: 0.005 @ 14/15 in. Hg
DUCT SHAPE: Round DIAMETER: 13.5
DUCT AREA: 143.14 sq. ft. L W
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 144 min
MINUTES PER POINT: 6
TOTAL NUMBER OF TRAVERSE POINTS: 24
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 10.8 10.6 10.8 (10.73)
O_2: 8.6 8.8 8.6 (8.67)

PITOT LEAK CHECK: PRE 4.4 " H_2O POST 3.8" H_2O
ΔH@ 1.893
SAMPLES REMOVED FROM SITE BY: JW

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.

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. BAYFRONT PLANT
TEST RUN NO. #1
TEST LOCATION INLET STACK - UNITS

DATE 26 Oct 99 PAGE 1 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	X $\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	6.53 Orifice (H) in. H_2O	-1 Stack Temp (t_s) °F	Meter Temp. (t_m) #6 Inlet °F	#7 Outlet °F	1.40 * Meter Rate cfm	Pump Vacuum in. Hg	x6 Notes		#5 Probe Temp. °F	#3 Filter Holder Temp. °F	#4 Impinger Outlet Temp. °F
1-1	.33	.574	1415	84.145	2.15	283	55	55	0.804	4.0	4.824	—	249	241	45°
1-2	.33	.574	1421	88.400	2.15	282	54	56	0.804	8.0	4.824	88.969	281	244	45°
1-3	.33	.574	1427	93.500	2.15	282	57	57	0.804	15.0	4.824	93.793	287	241	45°
1-4	.03	0.173	1433	98.050	0.20	275	58	58	0.242	15.0	1.44	98.617	294	241	50°
1-5	.03	0.173	1439	100.900	0.20	275	58	58	0.242	15.0	1.44	100.057	288	243	52°
1-6	.01	0.10	1445	101.500	0.07	273	58	58	0.14	15.0	0.84	101.497	287	242	52°
		2.176	1451	102.264	6.92	1670	340	342				102.337			
				18.119											
2-1	.25	0.50	1454	102.264	1.63	275	58	58	0.70	15.0	4.200	—	280	234	50°
2-2	.25	0.50	1500	106.750	1.63	275	58	59	0.70	15.0	4.200	106.537	280	233	51°
2-3	.20	0.447	1506	110.600	1.31	274	59	59	0.626	15.0	3.756	110.737	282	237	54°
2-4	.15	0.387	1512	114.000	0.98	275	59	59	0.542	16.0	3.252	114.493	283	239	55°
2-5	.14	0.374	1518	117.400	0.91	278	59	59	0.52	16.0	3.120	117.745	280	238	55°
2-6	.10	.316	1524	120.75	0.65	280	59	59	0.443	17.0	2.658	120.865	280	239	56
		2.525	1530	124.04	7.11	1657	705					123.523			
				21.776											
		4.695			14.03	3327	1387								
				39.895											
Change out thimble — loading Causing high Vac Post 0.014 @ 18" / Pre 0.015 @ 18															
3-1	0.33	0.574	1541	126.52	2.155	277	58	59	0.804	8	4.824				
2	0.31	0.557	1547	131.67	2.024	278	59	59	0.779	8	4.677	131.644	275	234	
3	0.08	0.283	1553	136.11	1.302	278	59	59	0.396	5	2.376	136.321	274	234	
4	.01	0.10	1559	138.53	0.07	280	59	59	0.014	3	0.084	138.697	272	234	
5	.01	0.10	1605	138.70	0.07	275	59	59	0.014	3	0.084	138.781	270	235	
6	.01	0.10	1611	138.81	0.07	273	59	59	0.014	3	0.084	138.865	268	235	
		1.714	1617	139.00	5.695	1661	707								
				12.48											

6.409 52.375 19.725 4988 7.91

Form 1026 [Rev. 5/27]

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. BAYFRONT PLANT
TEST RUN NO. #1
TEST LOCATION OUTLET STACK - UNITS

DATE 26 Oct 99 PAGE 2 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	X $\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft³	6.53 Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) 6 Inlet °F	Meter Temp. (t_m) 7 Outlet °F	1.407 X Meter Rate cfm	Pump Vacuum in. Hg	x6 Notes		2 Probe Temp. °F	3 Filter Holder Temp. °F	4 Impinger Outlet Temp. °F
4-1	.27	.520	1620	139.00	1.77	275	60	61	.731	12	4.387	—	277	231	53°
4-2	.23	.480	1626	142.410	1.50	275	60	61	.675	12	4.050	43.387	277	231	53°
4-3	.25	.500	1632	147.100	1.63	275	63	61	.704	13	4.221	47.437	279	224	54°
4-4	.14	.374	1638	151.400	.91	277	64	62	.526	13	3.156	51.658	279	228	55°
4-5	.11	.332	1644	155.400	0.718	279	64	62	.467	13	2.802	54.814	279	229	55°
4-6	.11	.332	1650	158.900	0.718	278	64	62	.467	13	2.802	57.616	278	229	55°
			1656	160.420								60.418			
		2.538		21.42	7.246	1659	744								
		8.947		73.795	26.971	6647	2838								
S2		0.373			1.124	276.96	59.125	519.125							
						736.96									

Form 1026 [Rev. 5/27]

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MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 2 Inlet

COMPANY: NSP
PLANT: Bay Front
TEST LOCATION: Unit 5 Inlet Duct
CLIENT: NSP
OPERATOR: Norm Smith
DATE: 10-27-99
CONTROL BOX: E35 POT. NO.: E35
METER NO.: E35
METER CALIBRATION FACTOR: 1,002
PITOT ID NO.: 541A
PITOT TUBE COEFFICIENT: 0,840
PORT LENGTH: 10 in.
PORT SIZE: 6 in.
PORT TYPE: Flange

IMPINGER H_2O + silica gel
FINAL: 4820.3 ml/gm
INITIAL: 4725.3 ml/gm
GAIN: 95.0 ml/gm
TOTAL H_2O COLLECTED: 103.3

SILICA GEL:
FINAL WT: 714.4 gm
INITIAL WT: 706.1 gm
WT. GAIN: 8.3 gm

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

COMMENTS & NOTES

THIMBLE NO: TARE WT:
FILTER NO: TARE WT:
BAROMETRIC PRESSURE in. Hg: 29.45
FLUE PRESSURE in. H_2O: + 3.8
FLUE PRESSURE in. Hg ABS: 29.715
PROBE LENGTH: 9.5 ft.
PROBE LINER MATERIAL: ~~Pyrex~~ Pyrex
NOZZLE IDENTIFICATION NO:
CALIBRATED NOZZLE DIAMETER:
LEAK CHECK: PRE: 0.002 POST: @ 11 in. Hg
DUCT SHAPE: Round DIAMETER: 13.5
DUCT AREA: 143.14 sq. ft. L W
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 144 min
MINUTES PER POINT: 6
TOTAL NUMBER OF TRAVERSE POINTS: 24
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 11.8
O_2: 8.3

PITOT LEAK CHECK: PRE 4.3 " H_2O 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.

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. - BAY FRONT PLANT
TEST RUN NO. #2 - INLET STACK
TEST LOCATION UNIT #5 - ASHLAND, WI

DATE 27 Oct 99 PAGE 1 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$ X	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O (6.542 A)	Stack Temp (t_s) °F (1 A)	Meter Temp. (t_m) 6 Inlet °F	Meter Temp. (t_m) 7 Outlet °F	Meter Rate X cfm (1,388 A)	Pump Vacuum in. Hg	Notes (x 6)		2 Probe Temp. °F	3 Filter Holder Temp. °F	4 Impinger Outlet Temp. °F
1-1	0.27	.521	0845	62.050	1.766	269	44	39	.723	6.0	4.339	62.050	268	223	43°
1-2	0.20	.447	0851	65.540	1.308	270	46	38	.620	7.0	3.723	66.389	277	215	43°
1-3	0.14	.374	0857	69.510	0.916	271	47	39	.519	7.0	3.114	70.112	276	217	42°
1-4	0.14	.374	0903	73.300	0.916	271	48	42	.519	5.0	3.114	73.226	276	221	43°
1-5	0.17	.412	0909	76.590	1.112	274	48	42	.572	5.0	3.432	76.340	277	234	43°
1-6	0.17	.412	0915	79.870	1.112	274	48	42	.572	5.0	3.432	79.772	273	239	42°
			0921	83.205	7.13	1629	523					83.204			
		2540		21.155											
2-1	0.34	.583	0924	83.205	2.224	279	48	41	.802	10.0	4.812	—	276	225	41°
2-2	0.20	.447	0930	87.800	1.308	274	49	41	.620	10.0	3.723	88.016	272	221	44°
2-3	0.01	.100	0936	91.800	0.065	270	45	42	.139	2.0	.834	91.739	270	236	44°
2-4	0.01	.100	0942	93.590	0.065	269	44	42	.139	2.0	.834	92.573	269	243	45°
2-5	0.01	.100	0948	93.685	0.065	270	44	42	.139	2.0	.834	93.407	269	237	44°
2-6	0.01	.100	0954	94.265	0.065	268	44	44	.139	2.0	.834	94.241	272	237	47°
		1.430	1000	95.075	3.792	1636	526					95.075			
				11.870											
3-1	0.30	.548	1007	95.075	1.963	278	47	44	.761	10.0	4.564	—	279	212	43°
3-2	0.34	.583	1013	99.040	2.224	276	49	44	.802	10.0	4.812	99.639	284	209	46°
3-3	0.20	.447	1019	103.470	1.308	274	51	43	.620	10.0	3.723	104.451	285	205	47°
3-4	0.04	.200	1025	108.030	0.262	270	50	44	.278	2.0	1.668	108.174	285	205	45°
3-5	0.01	.100	1031	110.100	0.065	267	47	45	.139	2.0	.834	109.842	282	205	42°
3-6	0.01	.100	1037	110.675	0.065	267	47	46	.139	2.0	.834	110.676	286	208	42°
		1.978	1043	111.510	5.887	1632	551					111.510			
				16.435											
		5.948		49.46	16.809	4891	1606								

Form 1026 [Rev. 5/27]

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. - BAY FRONT PLANT
TEST RUN NO. #2 - ASHLAND WI
TEST LOCATION UNIT #5 - INLET STACK

DATE 27 OCT 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 x cfm	Pump Vacuum in. Hg	Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
					6.542	1	6	7	1.388		x6		2	3	4
4-1	0.40	0.632	1049	111.510	2.617	268	50	47	0.877	14	5.262	—	283	205	41°
4-2	0.12	0.346	1055	116.030	0.785	265	50	45	0.480	5	2.880	116.772	285	205	43°
4-3	0.01	0.100	1101	119.665	0.065	266	48	45	0.139	2	.834	119.652	287	205	43°
4-4	0.01	0.100	1107	120.485	0.065	265	48	47	0.139	2	.834	120.486	287	211	43°
4-5	0.01	0.100	1113	121.400	0.065	264	48	48	0.139	2	.834	121.320	282	212	46°
4-6	0.01	0.100	1119	122.155	0.065	265	49	51	0.139	2	.834	122.154	280	211	44°
			1125	123.000								122.988			
	(0.56)	(1.378)		(11.490)	(3.662)	(1593)	(576)		(1.904)						
						(270.167)	45.458								

Form 1026 [Rev. 5/27]

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MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 3

COMPANY: NSP
PLANT: Bay Front
TEST LOCATION: Unit 5 Inlet Duct
CLIENT: NSP
OPERATOR: Norm Smith
DATE: 10-27-95
CONTROL BOX: E35 POT. NO.: E35
METER NO.: E35
METER CALIBRATION FACTOR: 1.002
PITOT ID NO.: 54A
PITOT TUBE COEFFICIENT: 0.810
PORT LENGTH: 10 in.
PORT SIZE: 6 in.
PORT TYPE: Flange
IMPINGER H_2O + Silica gel

FINAL: 4951.0 ml/gm
INITIAL: 4897.0 ml/gm
GAIN: 98.0 ml/gm

SILICA GEL:
FINAL WT: 791.7 gm
INITIAL WT: 772.8 gm
WT. GAIN: 18.9 gm

TOTAL H_2O COLLECTED: 98.9
DESCRIPTION OF IMPINGER H_2O:
SILICA GEL EXHAUSTED?:
IMPINGERS RECOVERED BY:
SILICA GEL WEIGHED BY:

COMMENTS & NOTES

THIMBLE NO: TARE WT:
FILTER NO: TARE WT:
BAROMETRIC PRESSURE in. Hg: 29.45
FLUE PRESSURE in. H_2O: +3.6
FLUE PRESSURE in. Hg ABS: 29.715
PROBE LENGTH: 9.5 ft.
PROBE LINER MATERIAL: Pyrex
NOZZLE IDENTIFICATION NO:
CALIBRATED NOZZLE DIAMETER:
LEAK CHECK: PRE: POST: @ in. Hg
DUCT SHAPE: Circular DIAMETER: 13.5
DUCT AREA: 143.14 sq. ft. L W
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 144 min
MINUTES PER POINT: 6
TOTAL NUMBER OF TRAVERSE POINTS: 24
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 11.5
O_2: 9.0

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.

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FIELD TEST DATA SHEET FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. BAYFRONT PLANT
TEST RUN NO. #3 - ASHLAND, WI
TEST LOCATION UNIT #5 - INLET STACK

DATE 27 Oct 99 PAGE 1 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	X / $\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	6.611 Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) 6 Inlet °F	Meter Temp. (t_m) 7 Outlet °F	1.399 Meter Rate X cfm	Pump Vacuum in. Hg	×6 Notes		2 Probe Temp. °F	3 Filter Holder Temp. °F	4 Impinger Outlet Temp. °F
1-1	0.400	0.632	1250	23.350	2.644	272	61	62	0.884	14	5.304	23.350	254	215	64°
1-2	0.060	0.245	1256	28.440	0.397	269	62	64	0.555	4	3.330	28.654	259	216	65°
1-3	0.010	0.100	1302	31.490	0.066	269	62	66	0.140	2	0.840	31.984	255	215	64°
1-4	0.010	0.100	1308	32.950	0.066	269	61	65	0.140	2	0.840	32.824	254	221	60°
1-5	0.010	0.100	1314	33.690	0.066	268	62	66	0.140	2	0.840	33.664	251	223	58°
1-6	0.010	0.100	1320	34.120	0.066	268	62	66	0.140	2	0.840	34.104	251	222	58°
			1326	34.945								34.944			
2-1	0.330	0.574	1332	34.945	2.182	280	63	66	0.803	10	4.818	—	257	215	54°
2-2	0.420	0.648	1338	39.505	2.771	280	65	65	0.907	14	5.442	39.762	256	216	55°
2-3	0.200	0.447	1344	44.800	1.322	278	65	64	0.625	8	3.900	45.204	254	216	59°
2-4	0.040	0.200	1350	48.870	0.264	276	66	66	0.280	4	1.680	49.104	255	217	58°
2-5	0.010	0.100	1356	50.800	0.066	271	63	66	0.140	2	0.840	50.784	240	216	62°
2-6	0.010	0.100	1402	51.525	0.066	270	63	67	0.140	2	0.840	51.624	265	216	60°
			1408	52.470								52.464			
3-1	0.360	0.600	1417	52.470	2.380	280	64	65	0.839	14	5.034	—	258	215	50°
3-2	0.140	0.374	1423	57.360	0.926	276	64	65	0.523	6	3.138	57.498	256	215	55°
3-3	0.010	0.100	1429	60.540	0.066	274	64	66	0.140	2	0.840	60.636	252	216	56°
3-4	0.010	0.100	1435	61.470	0.066	272	64	66	0.140	2	0.840	61.476	251	216	57°
3-5	0.010	0.100	1441	62.300	0.066	272	64	67	0.140	2	0.840	62.316	252	216	60°
3-6	0.010	0.100	1447	63.160	0.066	270	65	68	0.140	2	0.840	63.156	250	215	59°
			1453	64.000								63.996			

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. - BAY FRONT PLANT
TEST RUN NO. #3 - ASHLAND, WI
TEST LOCATION UNIT #5 - INLET STACK

DATE 27 Oct 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	6.611 Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) 6 Inlet °F	7 Outlet °F	1.399 Meter Rate x cfm	Pump Vacuum in. Hg	x 6 Notes		2 Probe Temp. °F	3 Filter Holder Temp. °F	Impinger Outlet Temp. °F
4-1	0.290	0.539	1507	64.000	1.917	274	67	68	0.754	12.0	4.524	—	256	217	59°
4-2	0.140	0.374	1513	68.390	0.926	276	67	68	0.523	6.0	3.138	68.524	254	215	59°
4-3	0.140	0.374	1519	71.865	0.926	277	66	69	0.523	6.0	3.138	71.662	249	216	58°
4-4	0.140	0.374	1525	74.800	0.926	277	67	68	0.523	6.0	3.138	74.800	252	216	58°
4-5	0.140	0.374	1531	77.400	0.926	278	68	68	0.523	6.0	3.138	77.938	253	215	58°
4-6	0.170	0.412	1537	81.005	1.124	278	67	68	0.576	10.0	3.456	81.038	253	216	58°
			1543	84.500								84.494			

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MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 1

COMPANY: NSP
PLANT: Bay Front
TEST LOCATION: Unit 5 Outlet Duct
CLIENT: NSP
OPERATOR: Tom Wenzel
DATE: 10-26-99
CONTROL BOX: E24 POT. NO.: E24
METER NO.: E24
METER CALIBRATION FACTOR: 0.997
PITOT ID NO.: 352(A)
PITOT TUBE COEFFICIENT: 0.835
PORT LENGTH: 12 in.
PORT SIZE: 4 in.
PORT TYPE: 90 Nipple

IMPINGER H_2O
FINAL: 4700.6 ml/gm
INITIAL: 4842.4 ml/gm
GAIN: 141.8 ml/gm
TOTAL H_2O COLLECTED: 163.6

SILICA GEL:
FINAL WT: 749.0 gm
INITIAL WT: 770.8 gm
WT. GAIN: 21.8 gm

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

COMMENTS & NOTES

THIMBLE NO: TARE WT:
FILTER NO: TARE WT:
BAROMETRIC PRESSURE in. Hg: 29.45
FLUE PRESSURE in. H_2O: -0.5
FLUE PRESSURE in. Hg ABS: 29.487
PROBE LENGTH: 9.5 ft.
PROBE LINER MATERIAL: Glass
NOZZLE IDENTIFICATION NO: Set B #8
CALIBRATED NOZZLE DIAMETER: 0.24
LEAK CHECK: PRE: 0.004 POST: 0.008 @ 15/10 in. Hg
DUCT SHAPE: Rectangle DIAMETER:
DUCT AREA: 30.6155 sq. ft. L 6.417 W 4.771
DISTURBANCE UPSTREAM: 3.33 diameters DOWNSTREAM: 2.22 diameters
TEST LENGTH: 150 min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 30
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 10.4 / 10.2 / 10.2 10.3
O_2: 9.2 / 8.8 / 9.0 9.6

PITOT LEAK CHECK: PRE 4.2" H_2O POST 4.5" H_2O
ΔH@ 1.593
SAMPLES REMOVED FROM SITE BY: JW

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.

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. BAYFRONT PLANT
TEST RUN NO. #1
TEST LOCATION Outlet STACK - Unit #5

DATE 26 Oct 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	1.950 Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	0.838 Meter Rate cfm	Pump Vacuum in. Hg	X5 Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
1-1	0.37	0.806	14:15	63.00	0.708	274	67	67	0.500	5	2.500	—	238	252	67
1-2	0.37	0.608	14:20	65.50	0.708	273	69	67	0.500	3	2.500	65.504	237	251	51
1-3	0.52	0.721	14:25	68.01	1.014	274	71	67	0.604	4	3.021	68.004	236	251	43
1-4	0.54	0.735	14:30	71.10	1.053	274	71	68	0.616	4	3.079	71.025	235	250	43
1-5	0.40	0.632	14:35	74.13	0.780	274	74	67	0.538	4	2.650	74.104	248	249	44
		3.305	14:40	76.759	4.263	1369	68.8		2.75			76.754			
				13.759											
2-1	0.38	0.616	14:42	76.759	0.741	273	73	68	0.516	4	2.581	—	249	251	42
2-2	0.65	0.806	14:47	79.34	1.268	273	73	68	0.676	5	3.378	79.340	247	248	43
2-3	0.76	0.872	14:52	82.71	1.482	275	74	68	0.731	6	3.653	82.718	248	252	43
2-4	0.68	0.825	14:57	86.38	1.326	274	74	68	0.691	6	3.455	86.371	247	252	43
2-5	0.47	0.686	15:02	89.82	0.917	274	75	69	0.575	6	2.873	89.826	249	254	47
		3.805	15:07	92.697	7.977	1369	71.0		3.189			92.699			
				15.938											
3-1	0.46	0.678	15:12	92.697	0.897	274	71	69	0.568	6	2.842	—	250	255	47
3-2	0.55	0.742	15:17	95.54	1.073	274	73	69	0.621	6	3.107	95.539	249	255	47
3-3	0.83	0.911	15:22	98.65	1.619	274	74	69	0.763	6	3.817	98.646	249	257	47
3-4	0.71	0.843	15:27	102.46	1.385	274	77	71	0.706	6	3.531	102.463	250	256	45
3-5	0.23	0.480	15:32	105.99	0.449	274	76	70	0.402	6	2.009	105.994	251	255	45
		3.654	15:37	108.002	5.423	1370	77.9		3.060			108.003			
				15.305											

Form 1026 [Rev. 5/27/]

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. BAYFRONT PLANT
TEST RUN NO. #1
TEST LOCATION Outlet - STACK - Unit 5

DATE 26 Oct 99 PAGE 2 OF 2

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$ x	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	0.838 x Meter Rate cfm	Pump Vacuum in. Hg	x6 Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
4-1	0.95	0.975	15:46	108.002	1.853	274	71	69	0.817	6	4.084	—	248	253	52
4-2	0.70	0.837	15:51	112.08	1.365	274	75	69	0.701	6	3.506	112.086	249	253	49
4-3	0.80	0.894	15:56	115.58	1.560	274	75	70	0.750	6	3.748	115.592	247	254	49
4-4	0.44	0.663	16:01	119.34	0.858	275	76	70	0.556	6	2.779	119.340	251	253	49
4-5	0.18	0.424	16:06	122.11	0.351	275	75	70	0.356	6	1.778	122.119	251	253	47
..		3.793	16:11	123.899	5.987	1372	721		3.180			123.897			
				15.897											
5-1	1.40	1.183	16:13	123.899	2.730	274	72	71	0.992	6	4.958	—	250	251	47
5-2	0.66	0.812	16:18	128.85	1.287	274	75	70	0.681	6	3.404	128.855	251	252	47
5-3	0.34	0.583	16:23	132.26	0.663	274	75	70	0.489	6	2.443	132.259	251	250	47
5-4	0.39	0.616	16:28	134.70	0.741	275	75	70	0.517	6	2.583	134.702	250	250	48
5-5	0.22	0.469	16:33	137.27	0.429	275	75	70	0.393	6	1.965	137.285	253	251	48
-		3.663	16:38	139.249	5.850	1372	723		3.072			139.250			
				15.35											
6-1	0.50	0.707	16:45	139.249	0.975	274	75	70	0.593	6	2.963	—	253	251	47
6-2	0.50	0.707	16:50	142.100	0.975	275	75	70	0.593	6	2.963	142.213	252	251	46
6-3	0.21	0.458	16:55	145.22	0.410	274	75	70	0.384	6	1.920	145.176	251	252	46
6-4	0.84	0.917	17:00	147.43	1.638	274	75	70	0.768	6	3.840	147.096	250	251	46
6-5	0.17	0.33	17:05	150.28	0.412	274	75	71	0.346	6	1.728	150.936	253	252	46
		3.201	17:10	152.487	4.41	-			2.684			152.664			
				13.238											
		21.421			33.91				17.941						
		0.714		89.487	1.130	274.1	71.43		0.598						

Form 1026 [Rev. 5/27]

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MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 2 - Mercury

COMPANY: NSP
PLANT: Bay Front
TEST LOCATION: Unit 5 Outlet Duct
CLIENT: NSP
OPERATOR: Tom Utrup
DATE: 10-27-99
CONTROL BOX: E24 POT. NO.: E24
METER NO.: E24
METER CALIBRATION FACTOR: 0.997
PITOT ID NO.: 352(A)
PITOT TUBE COEFFICIENT: 0.835
PORT LENGTH: 12 in.
PORT SIZE: 4 in.
PORT TYPE: Nipple

IMPINGER H_2O + Silica gel

FINAL: 4683.4 ml/gm
INITIAL: 4601.8 ml/gm
GAIN: 83.6 ml/gm
TOTAL H_2O COLLECTED: 94.0
DESCRIPTION OF IMPINGER H_2O:
SILICA GEL EXHAUSTED?:
IMPINGERS RECOVERED BY:
SILICA GEL WEIGHED BY:

SILICA GEL:

FINAL WT: 746.6 gm
INITIAL WT: 736.2 gm
WT. GAIN: 10.4 gm

COMMENTS & NOTES

THIMBLE NO: TARE WT:
FILTER NO: 063 TARE WT:
BAROMETRIC PRESSURE in. Hg: 29.45
FLUE PRESSURE in. H_2O: +0.5
FLUE PRESSURE in. Hg ABS: 29.487
PROBE LENGTH: 9.5 ft.
PROBE LINER MATERIAL: Pyrex
NOZZLE IDENTIFICATION NO: #6
CALIBRATED NOZZLE DIAMETER: 0.180
LEAK CHECK: PRE: 0.006 POST: 0.004 @ 12/13 in. Hg
DUCT SHAPE: Rectangular DIAMETER: —
DUCT AREA: 30.616 sq. ft. L 6.417 W 4.771
DISTURBANCE UPSTREAM: 3.33 D DOWNSTREAM: 2.22 D
TEST LENGTH: 150 min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 30
GAS ANALYSIS (ORSAT/FYRITE):

CO_2:	10.4	10.6	10.6	10.53
O_2:	9.0	9.0	9.0	9.0

PITOT LEAK CHECK: PRE 4.1" POST 4.7"
ΔH@ 1.593
SAMPLES REMOVED FROM SITE BY: JW

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 N.S.P. BAY FRONT PLANT
TEST RUN NO. #2 — 1 OUTLET STACK
TEST LOCATION UNIT #5 Ashland, WI

DATE 27 Oct 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	0.614 Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	0.466 Meter Rate cfm	Pump Vacuum in. Hg	Notes (x5)		Probe Temp. °F	Heated Line ~~Filter Holder~~ Temp. °F	Impinger Outlet Temp. °F
1-1	0.61	0.781	8:45	59.466	0.375	267	51	50	0.364	3	1.820	—	273	250	49
1-2	0.77	0.877	8:50	61.28	0.473	268	50	50	0.409	3	2.045	61.286	273	251	40
1-3	0.82	0.906	8:55	63.33	0.503	268	51	50	0.422	3	2.110	63.331	272	252	41
1-4	0.88	0.938	9:00	65.44	0.540	269	52	50	0.437	3	2.186	65.441	271	253	41
1-5	0.91	0.954	9:05	67.62	0.559	269	53	50	0.445	3	2.223	67.627	270	252	48
		(4.456)	9:10	69.853	2.450	(1341)	(50.7)		2.880			69.850			
				(10.387)											
2-1	0.65	0.806	9:15	69.853	0.399	268	52	50	0.376	3	1.879	—	273	253	44
2-2	0.56	0.748	9:20	71.73	0.344	268	54	50	0.349	3	1.744	71.732	272	253	42
2-3	0.57	0.755	9:25	73.47	0.350	269	54	51	0.352	3	1.759	73.476	273	252	42
2-4	0.54	0.735	9:30	75.24	0.332	269	54	51	0.342	3	1.712	75.235	272	252	42
2-5	0.61	0.781	9:35	76.95	0.375	269	53	51	0.364	3	1.820	76.947	271	251	43
		(3.825)	9:40	78.765	(1.800)	(1343)	(52.0)		(1.783)			78.767			
				(8,912)											
3-1	0.32	0.566	9:44	78.765	0.196	268	53	52	0.264	3	1.318	—	272	249	47
3-2	0.35	0.592	9:49	80.08	0.215	269	54	52	0.276	3	1.378	80.083	271	249	45
3-3	0.55	0.742	9:54	81.46	0.338	269	54	52	0.346	3	1.728	81.461	271	250	45
3-4	0.42	0.648	9:59	83.21	0.258	269	55	54	0.302	3	1.510	83.189	265	250	45
3-5	0.41	0.640	10:04	84.70	0.252	269	55	54	0.298	3	1.492	84.699	267	251	45
		(3.188)	10:09	86.193	(1.259)	(1344)	(53.5)		(1.486)			86.191			

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. BAYFRONT PLANT
TEST RUN NO. #2 - ASHLAND, WI
TEST LOCATION Unit #5 - OUTLET STACK

DATE 27 Oct 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	x 5 Notes		Probe Temp. °F	Heated ~~Filter~~ Line ~~Holder~~ Temp. °F	Impinger Outlet Temp. °F
4-1	0.45	0.671	10:13	86.193	0.276	269	55	54	0.313	3	1.563	—	268	253	51
4-2	0.44	0.663	10:18	87.75	0.270	269	55	54	0.309	3	1.546	87.756	270	251	47
4-3	0.74	0.860	10:23	89.302	0.454	268	56	54	0.401	3	2.004	89.302	269	251	47
4-4	0.48	0.693	10:28	91.31	0.295	269	57	55	0.323	3	1.614	91.306	270	252	46
4-5	0.27	0.520	10:33	92.92	0.166	269	58	55	0.242	3	1.211	92.920	270	250	47
		(3.407)	10:38	94.127	(1.461)	(1344)	(553)		(1.568)			94.131			
5-1	1.10	1.049	10:41	94.127	0.675	269	58	56	0.489	3	2.444	—	271	253	53
5-2	0.73	0.854	10:46	96.57	0.448	269	60	57	0.398	3	1.991	96.571	270	251	48
5-3	0.92	0.959	10:51	98.56	0.565	269	62	58	0.447	3	2.235	98.562	270	251	48
5-4	0.55	0.742	10:56	100.79	0.338	269	63	59	0.346	3	1.728	100.797	270	252	48
5-5	0.44	0.663	11:01	102.53	0.270	269	63	59	0.309	3	1.546	102.525	271	252	48
		(4.267)	11:06	104.077	2.296	(345)	(59.5)		(1.989)			104.071			
6-1	1.30	1.140	11:10	104.077	0.798	269	62	60	0.531	3	2.657	—	271	253	48
6-2	1.15	1.072	11:15	106.73	0.706	269	64	61	0.450	3	2.499	106.734	270	251	53
6-3	1.10	1.049	11:20	109.23	0.675	269	64	61	0.489	3	2.444	109.233	270	252	51
6-4	1.10	1.049	11:25	111.71	0.675	269	66	62	0.489	4	2.444	111.677	265	251	50
6-5	0.85	.922	11:30	114.08	0.52	270	66	62	0.43		2.148	114.121	263	250	53
			11:35	116.612								116.269			
		(0.813)			(0.421)	(268.77)	(55.63)		(0.403)						

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MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 3 - Mercury

COMPANY: NSP
PLANT: Bay Front
TEST LOCATION: Unit 5 Outlet Duct
CLIENT: NSP
OPERATOR: Tom Wenzel
DATE: 10-27-99
CONTROL BOX: E24 POT. NO.: E24
METER NO.: E24
METER CALIBRATION FACTOR: 0.997
PITOT ID NO.: 352(A)
PITOT TUBE COEFFICIENT: 0.835
PORT LENGTH: 12 in.
PORT SIZE: 4 in.
PORT TYPE: Nipple

IMPINGER H_2O
FINAL: 4812.7 ml/gm
INITIAL: 4734.5 ml/gm
GAIN: 78.2g ml/gm
TOTAL H_2O COLLECTED: 90.4

SILICA GEL:
FINAL WT: 759.6 gm
INITIAL WT: 747.4 gm
WT. GAIN: 12.2 gm

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

COMMENTS & NOTES

THIMBLE NO: TARE WT:
FILTER NO: 060 TARE WT:
BAROMETRIC PRESSURE in. Hg: 29.45
FLUE PRESSURE in. H_2O: +0.5
FLUE PRESSURE in. Hg ABS: 29.413
PROBE LENGTH: 9.5 ft.
PROBE LINER MATERIAL: Pyrex
NOZZLE IDENTIFICATION NO: #6
CALIBRATED NOZZLE DIAMETER: 0.180
LEAK CHECK: PRE: 0.009 POST: 0.005 @ 12/10 in. Hg
DUCT SHAPE: Rectangular DIAMETER:
DUCT AREA: 30.616 sq. ft. L 6.417 W 4.771
DISTURBANCE UPSTREAM: 3.33 D DOWNSTREAM: 2.22 D
TEST LENGTH: 150 min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 30
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 9.5 / 9.6 / 9.8 9.63
O_2: 9.0 / 9.2 / 9.2 9.13

PITOT LEAK CHECK: PRE 4.9 POST 6.1
ΔH@ 1.593
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.

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. - BAYFRONT PLANT
TEST RUN NO. #3 - OUTLET STACK
TEST LOCATION UNIT #5 - ASHLAND, WI

DATE 27 Oct 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	0.628 Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	0.475 Meter Rate cfm	Pump Vacuum in. Hg	x5 Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
1-1	0.69	0.831	12:50	17.077	0.433	272	62	63	0.395	3	1.973	—	271	253	58
1-2	0.90	0.949	12:55	19.05	0.565	273	63	62	0.451	3	2.253	19.050	270	253	51
1-3	0.85	0.922	13:00	21.30	0.534	272	65	63	0.438	3	2.190	21.303	272	251	50
1-4	0.92	0.959	13:05	24.48	0.578	274	65	63	0.456	3	2.278	23.493	270	251	50
1-5	0.85	0.922	13:10	25.76	0.534	273	66	64	0.498	3	2.190	25.771	271	252	51
		4.583	13:15	27.959	1.644	1364	636		2.178			27.961			
2-1	0.33	0.574	13:19	27.959	0.207	272	65	65	0.273	2	1.364	—	272	253	51
2-2	0.20	0.447	13:24	29.32	0.126	271	66	65	0.212	3	1.062	29.323	271	251	54
2-3	0.66	0.812	13:29	30.39	0.414	273	64	64	0.386	3	1.929	30.385	273	252	54
2-4	0.61	0.781	13:34	32.31	0.383	273	65	64	0.371	3	1.855	32.314	272	251	54
2-5	0.53	0.728	13:39	34.13	0.333	274	66	65	0.346	3	1.729	34.169	268	250	54
		3.342	13:44	35.899	1.463	1363	649		1.588			35.898			
3-1	0.28	0.529	13:48	35.899	0.176	274	65	65	0.251	3	1.257	—	269	251	54
3-2	0.45	0.671	13:53	37.15	0.283	273	66	65	0.319	3	1.593	37.156	271	253	54
3-3	0.66	0.812	13:58	38.74	0.414	273	67	65	0.386	3	1.929	38.749	270	253	54
3-4	0.33	0.574	14:03	40.67	0.207	273	66	66	0.273	3	1.364	40.678	271	251	54
3-5	0.54	0.735	14:08	40.042	0.379	273	67	66	0.349	3	1.745	42.042	271	253	56
		3.321	14:13	43.790	1.419	1366	658		1.578			43.787			

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT N.S.P. - Bay Front Plant
TEST RUN NO. #3 - Ashland, WI
TEST LOCATION Unit #5 - Outlet Stack

DATE 27 Oct 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	x5 Notes		Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
4-1	0.23	0.480	14:16	43.790	0.144	273	66	66	0.228	3	1.139	—	270	251	55
4-2	0.31	0.557	14:21	44.93	0.195	273	66	66	0.264	3	1.322	44.929	271	253	55
4-3	0.66	0.812	14:26	46.85	0.414	273	66	66	0.386	3	1.929	46.251	270	251	55
4-4	0.46	0.678	14:31	48.18	0.289	273	66	66	0.322	3	1.611	48.180	271	253	55
4-5	0.32	0.566	14:36	49.79	0.201	273	66	66	0.269	3	1.344	49.791	270	252	55
		3.093	14:41	51.133	1.243	1365	660		1.469			51.135			
5-1	0.54	0.735	14:44	51.133	0.339	273	66	66	0.349	3	1.745	—	271	253	55
5-2	0.31	0.557	14:49	52.87	0.195	274	68	67	0.264	3	1.322	52.878	270	252	55
5-3	0.81	0.900	14:54	54.20	0.509	274	68	67	0.428	3	2.138	54.200	271	251	55
5-4	0.73	0.854	14:59	56.34	0.458	274	68	67	0.406	3	2.030	56.338	270	253	57
5-5	0.53	0.728	15:04	58.36	0.333	274	68	67	0.457	3	2.286	58.368	272	253	57
		3.774	15:09	60.658	1.834	1369	672		1.904			60.654			
6-1	1.20	1.095	15:14	60.658	0.754	274	68	68	0.520	3	2.602	—	271	251	57
6-2	1.20	1.095	15:19	63.26	0.754	274	68	68	0.520	3	2.602	63.260	271	253	56
6-3	1.10	1.049	15:24	65.86	0.691	274	69	68	0.498	3	2.491	65.862	271	253	56
6-4	1.10	1.049	15:29	68.35	0.691	274	69	68	0.498	3	2.491	68.353	270	251	56
6-5	0.78	0.883	15:34	70.85	0.490	274	69	68	0.420	3	2.098	70.844	271	253	56
			15:39	72.945								72.942			
		0.776		55.464	0.399	273.2	68.96		0.372						

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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.

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.

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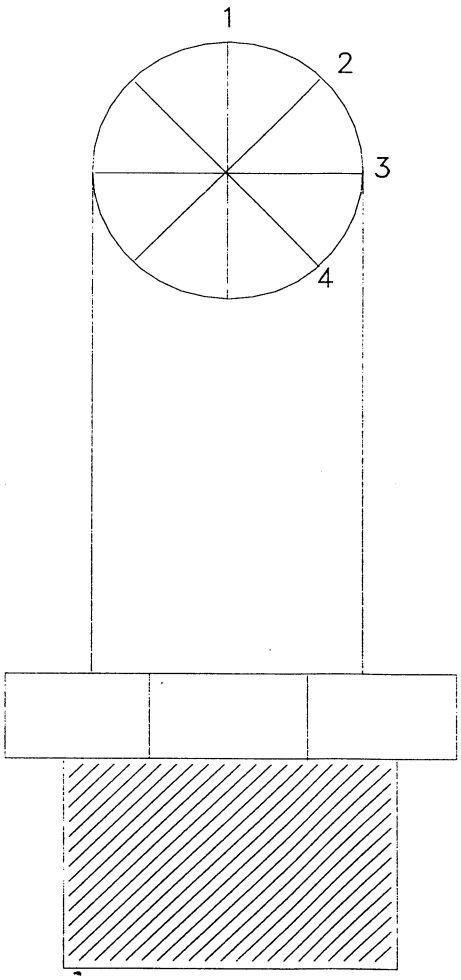
Nozzle Calibration

Date: 10/26/99

Nozzle ID No.: Set B #10

Analyst: JCD



Pre Test		Post Test
0.310	1	√
0.310	2	√
0.311	3	√
0.310	4	√

Average
0.310

DWG-AN2 (indnozzl.xls)

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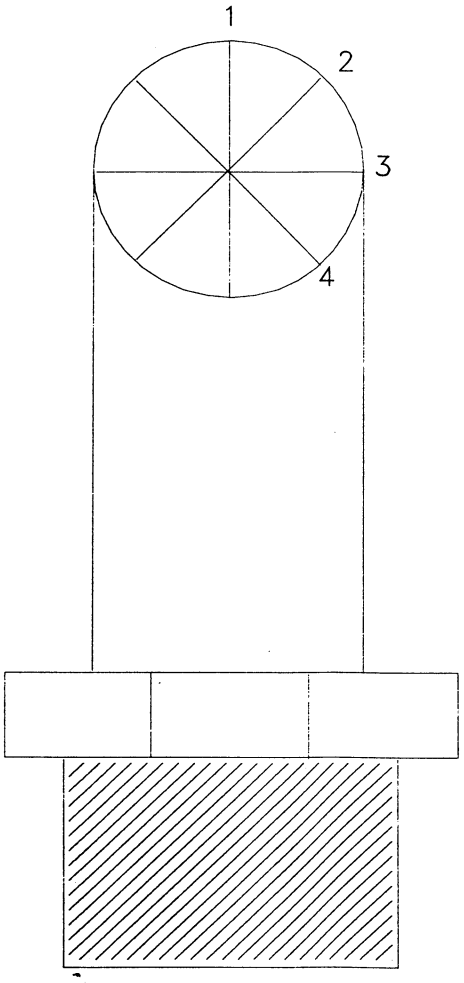
Nozzle Calibration

Date: 10/26/99

Nozzle ID No.: Set B #8

Analyst: JCD



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

Average
0.240

DWG-AN2 (indnozzl.xls)

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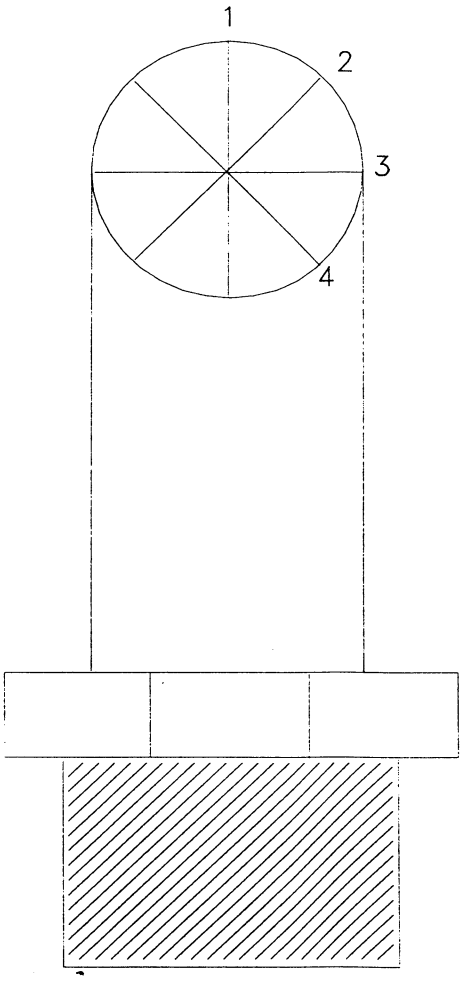
Nozzle Calibration

Date: 10/26/99

Nozzle ID No.: Set B #6

Analyst: JCD



Pre Test		Post Test
0.180	1	√
0.179	2	√
0.181	3	√
0.180	4	√

Average
0.180

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

EPA Control Module Number: E24 Name: Rich Russ

Ambient Temperatu 69 °F Date: 10-13-99

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	601	0.094
650	651	0.090
700	701	0.086
800	801	0.079
900	901	0.074
1000	1001	0.068
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: E35 Name: Rich Russ

Ambient Temperatu 62 °F Date: 10-01-99

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	98	0.357
150	148	0.328
200	198	0.303
250	248	0.282
300	298	0.263
350	348	0.247
400	398	0.233
450	448	0.220
500	498	0.208
550	549	0.099
600	599	0.094
650	649	0.090
700	699	0.086
800	799	0.079
900	899	0.074
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.	E35	Date:	10-01-99
Standard Meter No.	677191	Calibrated By:	Rich Russ
Standard Meter (Yr)	0.9991	Barometric Pressure :	29.44

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			54.443	30.322	64	67	66					
Inital			49.258	25.119	63	66	64					
Difference	1	0.20	5.185	5.203	63.5	66.5	65	65.75	20	59	1.000	1.837
Final			66.172	42.053	65	71	67					
Inital			61.156	37.024	64	70	67					
Difference	2	0.50	5.016	5.029	64.5	70.5	67	68.75	12	48	1.004	1.823
Final			49.130	24.988	62	66	63					
Inital			44.090	19.939	62	64	63					
Difference	3	0.70	5.040	5.049	62	65	63	64	10	58	1.000	1.855
Final			71.874	47.771	65	71	67					
Inital			66.421	42.301	65	70	67					
Difference	4	0.90	5.453	5.470	65	70.5	67	68.75	10	35	1.002	1.902
Final			77.311	53.229	65	72	67					
Inital			72.151	48.044	65	71	67					
Difference	5	1.20	5.160	5.185	65	71.5	67	69.25	8	48	1.000	1.956
Final			60.427	36.297	64	71	67					
Inital			55.129	31.010	64	67	66					
Difference	6	2.00	5.298	5.287	64	69	66.5	67.75	7	3	1.004	1.983
									Average		1.002	1.893

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VOLUME METERING SYSTEM FIELD AUDIT

Date: 10-01-99 Name: Rich Russ

EPA Control Module No.: E35 Ambient Temperature: 67 °F

Calibration (Y): 1.002 Barometric Pressure: 29.44 "Hg

Delta H: 1.893

#VALUE!

un N 32	Time (Minutes)	Gas Meter Reading/Gas Meter Temperature (Cubic Feet)	Inlet (°F)	Outlet (°F)	Yc (Calculated)
1	0	53.932	70	67	1.016
	10	61.386	72	68	
	Vm=	7.454	Avg.= 69.25	529.25	
2	0	61.386	72	68	1.016
	10	68.849	75	69	
	Vm=	7.463	Avg.= 71.00	531.00	
3	0	68.849	74	69	1.018
	10	76.307	76	69	
	Vm=	7.458	Avg.= 72.00	532.00	

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

Limit: 0.97Y <Yc< 1.03Y

Limit: 0.972 <Yc< 1.032

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

METER BOX CALIBRATION

Dry Gas Meter No.	E24	Date:	10-13-99
Standard Meter No.	3623853	Calibrated By:	Rich Russ
Standard Meter (Yr)	0.9943	Barometric Pressure :	29.95

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			45.788	38.583	70	82	79					
Inital			40.780	33.466	70	81	78					
Difference	1	0.20	5.008	5.117	70	81.5	78.5	80	18	34	0.997	1.513
Final			34.125	26.689	70	81	76					
Inital			28.971	21.462	70	79	75					
Difference	2	0.50	5.154	5.227	70	80	75.5	77.75	12	24	0.999	1.599
Final			5.197	97.482	75	79	75					
Inital			0.097	92.355	75	76	74					
Difference	3	0.70	5.100	5.127	75	77.5	74.5	76	10	23	0.995	1.639
Final			39.389	32.035	70	83	77					
Inital			34.325	26.889	70	80	76					
Difference	4	0.90	5.064	5.146	70	81.5	76.5	79	9	6	0.999	1.602
Final			28.684	21.158	70	80	74					
Inital			22.069	14.476	70	76	73					
Difference	5	1.20	6.615	6.682	70	78	73.5	75.75	10	15	0.998	1.598
Final			10.581	102.890	75	83	77					
Inital			5.548	97.829	75	79	76					
Difference	6	2.00	5.033	5.061	75	81	76.5	78.75	6	1	0.997	1.606
									Average		0.997	1.593

VOLUME METERING SYSTEM FIELD AUDIT

Date: 10-13-99 Name: Rich Russ

EPA Control Module No.: E24 Ambient Temperature: 70 °F

Calibration (Y): 0.997 Barometric Pressure: 29.95 "Hg

Delta H: 1.593

#VALUE!

Run No.	Time (Minutes)	Gas Meter Reading/Gas Meter Temperature (Cubic Feet)	Inlet (°F)	Outlet (°F)	Yc (Calculated)
1	0	39.234	82	80	1.009
	10	46.777	85	81	
	Vm=	7.543	Avg.= 83.50	543.50	
2	0	46.777	85	80	1.007
	10	54.350	88	81	
	Vm=	7.573	Avg.= 86.50	546.50	
3	0	54.350	88	81	1.010
	10	61.918	89	82	
	Vm=	7.568	Avg.= 88.50	548.50	

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

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) = #VALUE!

ONTARIO HYDRO METHOD TEST SUPPORT DATA

PROJECT NO.:	94303	**TEST RUN NO.:**	1	**TEST DATE:**	10/26/99

CUSTOMER:	Northern States Power Company	**BAROMETRIC PRESSURE (Pb)**	29.45	**in. Hg.**	
PLANT:	Bayfront	**STATIC PRESSURE**	3.8	**in. H2O**	
TEST LOC.:	Unit 5 Inlet Duct	**FLUE PRESSURE (Ps)**	29.73	**in. Hg. abs.**	
CLIENT:	Northern States Power Company	**PROBE LENGTH:**	9.5	**ft.**	
OPERATOR:	N. Smith	**PROBE LINER MATERIAL:**	Glass		
CONTROL BOX:	E-35	**NOZZLE IDENTIFICATION NO.:**	Set B #10		
METER NO.:	E-35	**CALIBRATED NOZZLE DIAMETER:**	0.310	**in.**	
METER CALIBRATION FACTOR:	1.002	**LEAK CHECK** **PRE:**	0.007	**POST:**	0.005 @ 15 in. Hg.
PITOT ID NO.:	541A	**DUCT SHAPE:**	Circular DIA.	13.5 Feet	
			Rectangular	Feet	Feet
PITOT TUBE COEFFICIENT:	0.840	**DUCT AREA:**	143.13869	**sq. ft.**	
PORT LENGTH:	10 in.	**TEST LENGTH:**	144	**min.**	
PORT SIZE:	6 in.	**MINUTES PER POINT:**	6		
PORT TYPE:	Flange	**TOTAL NUMBER OF TRAVERSE POINTS:**	24		

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Northern States Power Company **Date:** 10/26/99 **Test Run:** 1

Location: Unit 5 Inlet Duct

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.33	0.574	14:15	84.15	2.15	283	55	55	4	4.255
1-2	0.33	0.574	14:21	88.40	2.15	282	54	56	8	5.100
1-3	0.33	0.574	14:27	93.50	2.15	282	57	57	15	4.550
1-4	0.03	0.173	14:33	98.05	0.20	275	58	58	15	2.850
1-5	0.03	0.173	14:39	100.90	0.20	275	58	58	15	0.600
1-6	0.01	0.100	14:45	101.50	0.07	273	58	58	15	0.764
			14:51	102.26						0.000
2-1	0.25	0.500	14:54	102.26	1.63	275	58	58	15	4.486
2-2	0.25	0.500	15:00	106.75	1.63	275	58	59	15	3.850
2-3	0.20	0.447	15:06	110.60	1.31	274	59	59	15	4.000
2-4	0.15	0.387	15:12	114.60	0.98	275	59	59	16	2.800
2-5	0.14	0.374	15:18	117.40	0.91	278	59	59	16	3.350
2-6	0.10	0.316	15:24	120.75	0.65	280	59	59	17	3.290
			15:30	124.04						0.000
3-1	0.33	0.574	15:41	126.52	2.16	277	58	59	8	5.150
3-2	0.31	0.557	15:47	131.67	2.02	278	59	59	8	4.440
3-3	0.08	0.283	15:53	136.11	1.31	278	59	59	5	2.420
3-4	0.01	0.100	15:59	138.53	0.07	280	59	59	3	0.170
3-5	0.01	0.100	16:05	138.70	0.07	275	59	59	3	0.110
3-6	0.01	0.100	16:11	138.81	0.07	273	59	59	3	0.190
			16:17	139.00						0.000
4-1	0.27	0.520	16:20	139.00	1.77	275	60	61	12	3.410
4-2	0.23	0.480	16:26	142.41	1.50	275	60	61	12	4.690
4-3	0.25	0.500	16:32	147.10	1.63	275	63	61	13	4.300
4-4	0.14	0.374	16:38	151.40	0.91	277	64	62	13	4.000
4-5	0.11	0.332	16:44	155.40	0.72	279	64	62	13	3.500
4-6	0.11	0.332	16:50	158.90	0.72	278	64	62	13	1.520
			16:56	160.42						0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
		0.373		73.795	1.12	277	59	59		#####
							59.13			

MOISTURE, DILUENT AND MERCURY DATA

Company Northern States Power Company **Date:** 10/26/99 **Test Run:** 1

Location: Unit 5 Inlet Duct

SILICA GEL FINAL WT.:	803.60	**grams**
SILICA GEL INITIAL WT.:	783.00	**grams**
DIFFERENCE:	20.60	
FINAL IMPINGER WATER:	5004.80	**mls.**
INITIAL IMPINGER WATER:	4853.70	**mls.**
DIFFERENCE:	151.10	
TOTAL WATER GAIN:	171.70	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	1.096		0.000001096
PROBE WASH:	0.003		0.000000003
		Particle-bound Total:	0.000001099
KCl:	1.118		0.000001118
		Oxidized Total:	0.000001118
HNO_3/H_2O_2:	0.305		0.000000305
$KMNO_4$:	2.798		0.000002798
		Elemental Total:	0.000003103

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	10.80	10.60	10.80	10.73
Oxygen:	8.60	8.80	8.60	8.67

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	**Northern States Power Company**
Date:	10/26/99
Test Run:	1
Stack or Duct No.:	Unit 5 Inlet Duct
Start Time:	14:15
Stop Time:	16:56

Pb:	29.45	Inches Hg
Static	3.80	Inches H2O
Ps:	29.73	Inches Hg Abs.
Vlc:	172	ml + grams
Mn:	0.0000	gm
Test Time:	144	minutes
% O2:	8.67	%
% CO2:	10.73	%
% N2:	80.60	%
Delta H:	1.12	Inches H20
Cp:	0.840	Dimensionless - pitot
Tm:	59.13	°F
Sqrt P:	0.373	Inches H20
Ts:	276.96	°F
Vm:	73.795	Cubic Feet
Dn:	0.310	Inches - nozzle
As:	143.14	Sq. Feet
Yd:	1.002	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:	74.233	cubic feet (dry)
Vwstd:	8.087	cubic feet (wet)
Bwo:	0.098	
Md:	30.064	lb/lb-mole (dry)
Ms:	28.879	lb/lb-mole (wet)
Excess Air (%)	68.719	
Vs:	24.798	fps
ACFM:	212977.	
DSCFM:	136722.	
WSCFM:	151617	
%I:	103.0	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.:	94303	**TEST RUN NO.:**	2	**TEST DATE:**	10/27/99

CUSTOMER:	Northern States Power Company	**BAROMETRIC PRESSURE (Pb)**			29.45	**in. Hg.**		
PLANT:	Bayfront	**STATIC PRESSURE**			3.6	**in. H2O**		
TEST LOC.:	Unit 5 Inlet Duct	**FLUE PRESSURE (Ps)**			29.71	**in. Hg. abs.**		
CLIENT:	Northern States Power Company	**PROBE LENGTH:**			9.5	**ft.**		
OPERATOR:	N. Smith	**PROBE LINER MATERIAL:**			Glass			
CONTROL BOX:	E-35	**NOZZLE IDENTIFICATION NO.:**			Set B #10			
METER NO.:	E-35	**CALIBRATED NOZZLE DIAMETER:**			0.310	**in.**		
METER CALIBRATION FACTOR:	1.002	**LEAK CHECK**	**PRE:**		0.002	**POST:**	0.000	@ 11 in. Hg.
PITOT ID NO.:	541A	**DUCT SHAPE:**	Circular Rectangular	DIA.	13.5 Feet	Feet	 Feet	
PITOT TUBE COEFFICIENT:	0.840	**DUCT AREA:**			143.13869	**sq. ft.**		
PORT LENGTH:	10 in.	**TEST LENGTH:**			144	**min.**		
PORT SIZE:	6 in.	**MINUTES PER POINT:**			6			
PORT TYPE:	Flange	**TOTAL NUMBER OF TRAVERSE POINTS:**			24			

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Northern States Power Company **Date:** 10/27/99 **Test Run:** 2

Location: Unit 5 Inlet Duct

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.27	0.520	8:45	62.05	1.77	269	44	39	6	3.490
1-2	0.20	0.447	8:51	65.54	1.31	270	46	38	7	3.970
1-3	0.14	0.374	8:57	69.51	0.92	271	47	39	7	3.790
1-4	0.14	0.374	9:03	73.30	0.92	271	48	42	5	3.290
1-5	0.17	0.412	9:09	76.59	1.11	274	48	42	5	3.280
1-6	0.17	0.412	9:15	79.87	1.11	274	48	42	5	3.335
			9:21	83.21						0.000
2-1	0.34	0.583	9:24	83.21	2.22	279	48	41	10	4.595
2-2	0.20	0.447	9:30	87.80	1.31	274	49	41	10	4.000
2-3	0.01	0.100	9:36	91.80	0.07	270	45	42	2	1.790
2-4	0.01	0.100	9:42	93.59	0.07	269	44	42	2	0.095
2-5	0.01	0.100	9:48	93.69	0.07	270	44	42	2	0.580
2-6	0.01	0.100	9:54	94.27	0.07	268	44	44	2	0.810
			10:00	95.08						0.000
3-1	0.30	0.548	10:07	95.08	1.96	278	47	44	10	3.965
3-2	0.34	0.583	10:13	99.04	2.22	276	49	44	10	4.430
3-3	0.20	0.447	10:19	103.47	1.31	274	51	43	10	4.560
3-4	0.04	0.200	10:25	108.03	0.26	270	50	44	2	2.070
3-5	0.01	0.100	10:31	110.10	0.07	267	47	45	2	0.575
3-6	0.01	0.100	10:37	110.68	0.07	267	47	46	2	0.835
			10:43	111.51						0.000
4-1	0.40	0.632	10:49	111.51	2.62	268	50	47	14	4.520
4-2	0.12	0.346	10:55	116.03	0.79	265	50	45	5	3.635
4-3	0.01	0.100	11:01	119.67	0.07	266	48	45	2	0.820
4-4	0.01	0.100	11:07	120.49	0.07	265	48	47	2	0.915
4-5	0.01	0.100	11:13	121.40	0.07	264	48	48	2	0.755
4-6	0.01	0.100	11:19	122.16	0.07	265	49	51	2	0.845
			11:25	123.00						0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
		0.305		60.950	0.85	270	47	43		#####
							45.46			

MOISTURE, DILUENT AND MERCURY DATA

Company Northern States Power Company **Date:** 10/27/99 **Test Run:** 2

Location: Unit 5 Inlet Duct

SILICA GEL FINAL WT.:	714.40	**grams**
SILICA GEL INITIAL WT.:	706.10	**grams**
DIFFERENCE:	8.30	
FINAL IMPINGER WATER:	4820.30	**mls.**
INITIAL IMPINGER WATER:	4725.30	**mls.**
DIFFERENCE:	95.00	
TOTAL WATER GAIN:	103.30	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	1.358		0.000001358
PROBE WASH:	0.002		0.000000002
		Particle-bound Total:	0.000001360
KCl:	0.840		0.000000840
		Oxidized Total:	0.000000840
HNO_3/H_2O_2:	0.462		0.000000462
$KMNO_4$:	1.988		0.000001988
		Elemental Total:	0.000002450

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	11.80			11.80
Oxygen:	8.30			8.30

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	**Northern States Power Company**
Date:	10/27/99
Test Run:	2
Stack or Duct No.:	Unit 5 Inlet Duct
Start Time:	8:45
Stop Time:	11:25

Pb:	29.45	Inches Hg
Static	3.60	Inches H2O
Ps:	29.71	Inches Hg Abs.
Vlc:	103	ml + grams
Mn:	0.0000	gm
Test Time:	144	minutes
% O2:	8.30	%
% CO2:	11.80	%
% N2:	79.90	%
Delta H:	0.85	Inches H20
Cp:	0.840	Dimensionless - pitot
Tm:	45.46	°F
Sqrt P:	0.305	Inches H20
Ts:	270.17	°F
Vm:	60.950	Cubic Feet
Dn:	0.310	Inches - nozzle
As:	143.14	Sq. Feet
Yd:	1.002	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:	62.927	cubic feet (dry)
Vwstd:	4.865	cubic feet (wet)
Bwo:	0.072	
Md:	30.220	lb/lb-mole (dry)
Ms:	29.343	lb/lb-mole (wet)
Excess Air (%)	64.876	
Vs:	20.062	fps
ACFM:	172302.	
DSCFM:	114859.	
WSCFM:	123740	
%I:	104.0	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.:	94303	**TEST RUN NO.:**	3	**TEST DATE:**	10/27/99

CUSTOMER:	Northern States Power Company	**BAROMETRIC PRESSURE (Pb)**	29.45	**in. Hg.**	
PLANT:	Bayfront	**STATIC PRESSURE**	3.6	**in. H2O**	
TEST LOC.:	Unit 5 Inlet Duct	**FLUE PRESSURE (Ps)**	29.71	**in. Hg. abs.**	
CLIENT:	Northern States Power Company	**PROBE LENGTH:**	9.5	**ft.**	
OPERATOR:	N. Smith	**PROBE LINER MATERIAL:**	Glass		
CONTROL BOX:	E-35	**NOZZLE IDENTIFICATION NO.:**	Set B #10		
METER NO.:	E-35	**CALIBRATED NOZZLE DIAMETER:**	0.310	**in.**	
METER CALIBRATION FACTOR:	1.002	**LEAK CHECK** **PRE:**	0.002	**POST:**	0.000 @ 11 in. Hg.
PITOT ID NO.:	541A	**DUCT SHAPE:**	Circular DIA.	13.5 Feet	
			Rectangular	Feet	Feet
PITOT TUBE COEFFICIENT:	0.840	**DUCT AREA:**	143.13869	**sq. ft.**	
PORT LENGTH:	10 in.	**TEST LENGTH:**	144	**min.**	
PORT SIZE:	6 in.	**MINUTES PER POINT:**	6		
PORT TYPE:	Flange	**TOTAL NUMBER OF TRAVERSE POINTS:**	24		

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Northern States Power Company **Date:** 10/27/99 **Test Run:** 3

Location: Unit 5 Inlet Duct

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	12:50	23.35	2.64	272	61	62	14	5.090
1-2	0.06	0.245	12:56	28.44	0.40	269	62	64	4	3.050
1-3	0.01	0.100	13:02	31.49	0.07	269	62	66	2	1.460
1-4	0.01	0.100	13:08	32.95	0.07	269	61	65	2	0.740
1-5	0.01	0.100	13:14	33.69	0.07	268	62	66	2	0.430
1-6	0.01	0.100	13:20	34.12	0.07	268	62	66	2	0.825
			13:26	34.95						0.000
2-1	0.33	0.574	13:32	34.95	2.18	280	63	66	10	4.560
2-2	0.42	0.648	13:38	39.51	2.78	280	65	65	14	5.295
2-3	0.20	0.447	13:44	44.80	1.32	278	65	66	8	4.070
2-4	0.04	0.200	13:50	48.87	0.26	276	66	66	4	1.930
2-5	0.01	0.100	13:56	50.80	0.07	271	63	66	2	0.725
2-6	0.01	0.100	14:02	51.53	0.07	270	63	67	2	0.945
			14:08	52.47						0.000
3-1	0.36	0.600	14:17	52.47	2.38	280	64	65	14	4.890
3-2	0.14	0.374	14:23	57.36	0.93	276	64	65	6	3.180
3-3	0.01	0.100	14:29	60.54	0.07	274	64	66	2	0.930
3-4	0.01	0.100	14:35	61.47	0.07	272	64	66	2	0.830
3-5	0.01	0.100	14:41	62.30	0.07	272	64	67	2	0.860
3-6	0.01	0.100	14:47	63.16	0.07	270	65	68	2	0.840
			14:53	64.00						0.000
4-1	0.29	0.539	15:07	64.00	1.92	274	67	68	12	4.390
4-2	0.14	0.374	15:13	68.39	0.93	276	67	68	6	3.475
4-3	0.14	0.374	15:19	71.87	0.93	277	66	69	6	2.935
4-4	0.14	0.374	15:25	74.80	0.93	277	67	68	6	2.600
4-5	0.14	0.374	15:31	77.40	0.93	278	68	68	6	3.605
4-6	0.17	0.412	15:37	81.01	1.12	278	67	68	10	3.495
			15:43	84.50						0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
										0.000
		0.299		61.150	0.85	274	64	66		#####
							65.27			

MOISTURE, DILUENT AND MERCURY DATA

Company Northern States Power Company **Date:** 10/27/99 **Test Run:** 3

Location: Unit 5 Inlet Duct

SILICA GEL FINAL WT.:	791.70	**grams**
SILICA GEL INITIAL WT.:	772.80	**grams**
DIFFERENCE:	18.90	
FINAL IMPINGER WATER:	4951.00	**mls.**
INITIAL IMPINGER WATER:	4871.00	**mls.**
DIFFERENCE:	80.00	
TOTAL WATER GAIN:	98.90	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	0.095		0.000000095
PROBE WASH:	0.002		0.000000002
		Particle-bound Total:	0.000000097
KCl:	0.869		0.000000869
		Oxidized Total:	0.000000869
HNO_3/H_2O_2:	0.228		0.000000228
$KMNO_4$:	1.768		0.000001768
		Elemental Total:	0.000001996

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	10.50			10.50
Oxygen:	9.00			9.00

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	**Northern States Power Company**
Date:	10/27/99
Test Run:	3
Stack or Duct No.:	Unit 5 Inlet Duct
Start Time:	12:50
Stop Time:	15:43

Pb:	29.45	Inches Hg
Static	3.60	Inches H2O
Ps:	29.71	Inches Hg Abs.
Vlc:	99	ml + grams
Mn:	0.0000	gm
Test Time:	144	minutes
% O2:	9.00	%
% CO2:	10.50	%
% N2:	80.50	%
Delta H:	0.85	Inches H20
Cp:	0.840	Dimensionless - pitot
Tm:	65.27	°F
Sqrt P:	0.299	Inches H20
Ts:	273.92	°F
Vm:	61.150	Cubic Feet
Dn:	0.310	Inches - nozzle
As:	143.14	Sq. Feet
Yd:	1.002	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:	60.751	cubic feet (dry)
Vwstd:	4.658	cubic feet (wet)
Bwo:	0.071	
Md:	30.040	lb/lb-mole (dry)
Ms:	29.183	lb/lb-mole (wet)
Excess Air (%)	73.457	
Vs:	19.734	fps
ACFM:	169478.	
DSCFM:	112467.	
WSCFM:	121090	
%I:	102.5	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

ONTARIO HYDRO METHOD TEST SUPPORT DATA

PROJECT NO.:	94303	**TEST RUN NO.:**	1	**TEST DATE:**	10/26/99

CUSTOMER:	Northern States Power Company	**BAROMETRIC PRESSURE (Pb)**	29.43	**in. Hg.**	
PLANT:	Bayfront	**STATIC PRESSURE**	-0.5	**in. H2O**	
TEST LOC.:	Unit 5 Outlet Duct	**FLUE PRESSURE (Ps)**	29.39	**in. Hg. abs.**	
CLIENT:	Northern States Power Company	**PROBE LENGTH:**	9.5	**ft.**	
OPERATOR:	T. Wenzel	**PROBE LINER MATERIAL:**	Glass		
CONTROL BOX:	E-24	**NOZZLE IDENTIFICATION NO.:**	Set B #8		
METER NO.:	E-24	**CALIBRATED NOZZLE DIAMETER:**	0.240	**in.**	
METER CALIBRATION FACTOR:	0.997	**LEAK CHECK** **PRE:**	0.004	**POST:**	0.008 @ 10 in. Hg.
PITOT ID NO.:	352A	**DUCT SHAPE:**	Circular DIA.		Feet
			Rectangular 6.417	Feet	4.771 Feet
PITOT TUBE COEFFICIENT:	0.835	**DUCT AREA:**	30.615507	**sq. ft.**	
PORT LENGTH:	12 in.	**TEST LENGTH:**	150	**min.**	
PORT SIZE:	4 in.	**MINUTES PER POINT:**	5		
PORT TYPE:	Nipple	**TOTAL NUMBER OF TRAVERSE POINTS:**	30		

100

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Northern States Power Company **Date:** 10/26/99 **Test Run:** 1

Location: Unit 5 Outlet Duct

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.37	0.608	14:15	63.00	0.71	274	67	67	5	2.500
1-2	0.37	0.608	14:20	65.50	0.71	273	69	67	3	2.510
1-3	0.52	0.721	14:25	68.01	1.01	274	71	67	4	3.090
1-4	0.54	0.735	14:30	71.10	1.05	274	71	68	4	3.030
1-5	0.40	0.632	14:35	74.13	0.78	274	74	67	4	2.629
			14:40	76.76						0.000
2-1	0.38	0.616	14:42	76.76	0.74	273	73	68	4	2.581
2-2	0.65	0.806	14:47	79.34	1.27	273	73	68	5	3.370
2-3	0.76	0.872	14:52	82.71	1.48	275	74	68	6	3.670
2-4	0.68	0.825	14:57	86.38	1.33	274	74	68	6	3.440
2-5	0.47	0.686	15:02	89.82	0.92	274	75	69	6	2.877
			15:07	92.70						0.000
3-1	0.46	0.678	15:12	92.70	0.90	274	71	69	6	2.843
3-2	0.55	0.742	15:17	95.54	1.07	274	73	69	6	3.110
3-3	0.83	0.911	15:22	98.65	1.62	274	74	69	6	3.810
3-4	0.71	0.843	15:27	102.46	1.39	274	77	71	6	3.530
3-5	0.23	0.480	15:32	105.99	0.45	274	76	70	6	2.012
			15:37	108.00						0.000
4-1	0.95	0.975	15:46	108.00	1.85	274	71	69	6	4.078
4-2	0.70	0.837	15:51	112.08	1.37	274	75	69	6	3.500
4-3	0.80	0.894	15:56	115.58	1.56	274	75	70	6	3.760
4-4	0.44	0.663	16:01	119.34	0.86	275	76	70	6	2.770
4-5	0.18	0.424	16:06	122.11	0.35	275	76	70	6	1.789
			16:11	123.90						0.000
5-1	1.40	1.183	16:13	123.90	2.73	274	72	71	6	4.951
5-2	0.66	0.812	16:18	128.85	1.29	274	75	70	6	3.410
5-3	0.34	0.583	16:23	132.26	0.66	274	75	70	6	2.440
5-4	0.38	0.616	16:28	134.70	0.74	275	75	70	6	2.570
5-5	0.22	0.469	16:33	137.27	0.43	275	75	70	6	1.979
			16:38	139.25						0.000
6-1	0.50	0.707	16:45	139.25	0.98	274	75	70	6	2.851
6-2	0.50	0.707	16:50	142.10	0.98	275	75	70	6	3.120
6-3	0.21	0.458	16:55	145.22	0.41	274	75	70	6	2.210
6-4	0.84	0.917	17:00	147.43	1.64	274	75	70	6	3.350
6-5	0.17	0.412	17:05	150.78	0.41	274	75	71	6	1.707
			17:10	152.49						0.000
										0.000
										0.000
		0.714		89.487	1.06	274	74	69		#####
							71.45			

MOISTURE, DILUENT AND MERCURY DATA

Company Northern States Power Company **Date:** 10/26/99 **Test Run:** 1

Location: Unit 5 Outlet Duct

SILICA GEL FINAL WT.:	770.80	**grams**
SILICA GEL INITIAL WT.:	749.00	**grams**
DIFFERENCE:	21.80	
FINAL IMPINGER WATER:	4842.40	**mls.**
INITIAL IMPINGER WATER:	4700.60	**mls.**
DIFFERENCE:	141.80	
TOTAL WATER GAIN:	163.60	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	1.953		0.000001953
PROBE WASH:	0.000		0.000000000
		Particle-bound Total:	0.000001953
KCl:	0.998		0.000000998
		Oxidized Total:	0.000000998
HNO_3/H_2O_2:	0.258		0.000000258
$KMNO_4$:	2.898		0.000002898
		Elemental Total:	0.000003156

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	10.40	10.20	10.20	10.27
Oxygen:	9.20	8.80	9.00	9.00

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	Northern States Power Company
Date:	10/26/99
Test Run:	1
Stack or Duct No.:	Unit 5 Outlet Duct
Start Time:	14:15
Stop Time:	17:10

Pb:	29.43	Inches Hg
Static	-0.50	Inches H2O
Ps:	29.39	Inches Hg Abs.
Vlc:	164	ml + grams
Mn:	0.0000	gm
Test Time:	150	minutes
% O2:	9.00	%
% CO2:	10.27	%
% N2:	80.73	%
Delta H:	1.06	Inches H20
Cp:	0.835	Dimensionless - pitot
Tm:	71.45	°F
Sqrt P:	0.714	Inches H20
Ts:	274.10	°F
Vm:	89.487	Cubic Feet
Dn:	0.240	Inches - nozzle
As:	30.62	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:	87.417	cubic feet (dry)
Vwstd:	7.706	cubic feet (wet)
Bwo:	0.081	
Md:	30.003	lb/lb-mole (dry)
Ms:	29.030	lb/lb-mole (wet)
Excess Air (%)	73.090	
Vs:	47.278	fps
ACFM:	86846.	
DSCFM:	56393.	
WSCFM:	61364	
%I:	100.8	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.:	94303	**TEST RUN NO.:**	2	**TEST DATE:**	10/27/99

CUSTOMER:	Northern States Power Company	**BAROMETRIC PRESSURE (Pb)**	29.45	**in. Hg.**	
PLANT:	Bayfront	**STATIC PRESSURE**	0.5	**in. H2O**	
TEST LOC.:	Unit 5 Outlet Duct	**FLUE PRESSURE (Ps)**	29.49	**in. Hg. abs.**	
CLIENT:	Northern States Power Company	**PROBE LENGTH:**	9.5	**ft.**	
OPERATOR:	T. Wenzel	**PROBE LINER MATERIAL:**	Glass		
CONTROL BOX:	E-24	**NOZZLE IDENTIFICATION NO.:**	#6		
METER NO.:	E-24	**CALIBRATED NOZZLE DIAMETER:**	0.180	**in.**	
METER CALIBRATION FACTOR:	0.997	**LEAK CHECK** **PRE:**	0.006	**POST:**	0.004 @ 13 in. Hg.
PITOT ID NO.:	352A	**DUCT SHAPE:** Circular	DIA.		Feet
		Rectangular	6.417 Feet		4.771 Feet
PITOT TUBE COEFFICIENT:	0.835	**DUCT AREA:**	30.615507	**sq. ft.**	
PORT LENGTH:	12 in.	**TEST LENGTH:**	150	**min.**	
PORT SIZE:	4 in.	**MINUTES PER POINT:**	5		
PORT TYPE:	Nipple	**TOTAL NUMBER OF TRAVERSE POINTS:**	30		

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Northern States Power Company **Date:** 10/27/99 **Test Run:** 2

Location: Unit 5 Outlet Duct

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.61	0.781	8:45	59.47	0.38	267	51	50	3	1.814
1-2	0.77	0.877	8:50	61.28	0.47	268	50	50	3	2.050
1-3	0.82	0.906	8:55	63.33	0.50	268	51	50	3	2.110
1-4	0.88	0.938	9:00	65.44	0.54	269	52	50	3	2.180
1-5	0.91	0.954	9:05	67.62	0.56	269	53	50	3	2.233
			9:10	69.85						0.000
2-1	0.65	0.806	9:15	69.85	0.40	268	52	50	3	1.877
2-2	0.56	0.748	9:20	71.73	0.34	268	54	50	3	1.740
2-3	0.57	0.755	9:25	73.47	0.35	269	54	51	3	1.770
2-4	0.54	0.735	9:30	75.24	0.33	269	54	51	3	1.710
2-5	0.61	0.781	9:35	76.95	0.38	269	53	51	3	1.815
			9:40	78.77						0.000
3-1	0.32	0.566	9:44	78.77	0.20	268	53	52	3	1.311
3-2	0.35	0.592	9:49	80.08	0.22	269	54	52	3	1.380
3-3	0.55	0.742	9:54	81.46	0.34	269	54	52	3	1.750
3-4	0.42	0.648	9:59	83.21	0.26	269	55	54	3	1.490
3-5	0.41	0.640	10:04	84.70	0.25	269	55	54	3	1.493
			10:09	86.19						0.000
4-1	0.45	0.671	10:13	86.19	0.28	269	55	54	3	1.557
4-2	0.44	0.663	10:18	87.75	0.27	269	55	54	3	1.552
4-3	0.74	0.860	10:23	89.30	0.45	268	56	54	3	2.008
4-4	0.48	0.693	10:28	91.31	0.30	269	57	55	3	1.610
4-5	0.27	0.520	10:33	92.92	0.17	269	58	55	3	1.207
			10:38	94.13						0.000
5-1	1.10	1.049	10:41	94.13	0.68	269	58	56	3	2.443
5-2	0.73	0.854	10:46	96.57	0.45	269	60	57	3	1.990
5-3	0.92	0.959	10:51	98.56	0.57	269	62	58	3	2.230
5-4	0.55	0.742	10:56	100.79	0.34	269	63	59	3	1.740
5-5	0.44	0.663	11:01	102.53	0.27	269	63	59	3	1.547
			11:06	104.08						0.000
6-1	1.30	1.140	11:10	104.08	0.80	269	62	60	3	2.653
6-2	1.15	1.072	11:15	106.73	0.71	269	64	61	3	2.500
6-3	1.10	1.049	11:20	109.23	0.68	269	64	61	3	2.480
6-4	1.10	1.049	11:25	111.71	0.68	269	66	62	4	2.370
6-5	0.85	0.922	11:30	114.08	0.52	270	66	62	4	2.532
			11:35	116.61						0.000
										0.000
										0.000
		0.813		57.142	0.42	269	57	54		#####
							55.63			

MOISTURE, DILUENT AND MERCURY DATA

Company Northern States Power Company **Date:** 10/27/99 **Test Run:** 2

Location: Unit 5 Outlet Duct

SILICA GEL FINAL WT.:	746.60	**grams**
SILICA GEL INITIAL WT.:	736.20	**grams**
DIFFERENCE:	10.40	
FINAL IMPINGER WATER:	4685.40	**mls.**
INITIAL IMPINGER WATER:	4601.80	**mls.**
DIFFERENCE:	83.60	
TOTAL WATER GAIN:	94.00	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	0.928		0.000000928
PROBE WASH:	0.000		0.000000000
		Particle-bound Total:	0.000000928
KCl:	2.978		0.000002978
		Oxidized Total:	0.000002978
HNO_3/H_2O_2:	0.182		0.000000182
$KMNO_4$:	1.768		0.000001768
		Elemental Total:	0.000001950

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	10.40	10.60	10.60	10.53
Oxygen:	9.00	9.00	9.00	9.00

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	**Northern States Power Company**
Date:	10/27/99
Test Run:	2
Stack or Duct No.:	Unit 5 Outlet Duct
Start Time:	8:45
Stop Time:	11:35

Pb:	29.45	Inches Hg
Static	0.50	Inches H2O
Ps:	29.49	Inches Hg Abs.
Vlc:	94	ml + grams
Mn:	0.0000	gm
Test Time:	150	minutes
% O2:	9.00	%
% CO2:	10.53	%
% N2:	80.47	%
Delta H:	0.42	Inches H20
Cp:	0.835	Dimensionless - pitot
Tm:	55.63	°F
Sqrt P:	0.813	Inches H20
Ts:	268.77	°F
Vm:	57.142	Cubic Feet
Dn:	0.180	Inches - nozzle
As:	30.62	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:	57.481	cubic feet (dry)
Vwstd:	4.427	cubic feet (wet)
Bwo:	0.072	
Md:	30.045	lb/lb-mole (dry)
Ms:	29.184	lb/lb-mole (wet)
Excess Air (%)	73.510	
Vs:	53.375	fps
ACFM:	98046.	
DSCFM:	65000.	
WSCFM:	70006	
%I:	102.2	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.:	94303	**TEST RUN NO.:**	3	**TEST DATE:**	10/27/99

CUSTOMER:	Northern States Power Company	**BAROMETRIC PRESSURE (Pb)**	29.45	**in. Hg.**	
PLANT:	Bayfront	**STATIC PRESSURE**	0.5	**in. H2O**	
TEST LOC.:	Unit 5 Outlet Duct	**FLUE PRESSURE (Ps)**	29.49	**in. Hg. abs.**	
CLIENT:	Northern States Power Company	**PROBE LENGTH:**	9.5	**ft.**	
OPERATOR:	T. Wenzel	**PROBE LINER MATERIAL:**	Glass		
CONTROL BOX:	E-24	**NOZZLE IDENTIFICATION NO.:**	#6		
METER NO.:	E-24	**CALIBRATED NOZZLE DIAMETER:**	0.180	**in.**	
METER CALIBRATION FACTOR:	0.997	**LEAK CHECK** **PRE:**	0.009	**POST:**	0.005 @ 10 in. Hg.
PITOT ID NO.:	352A	**DUCT SHAPE:**	Circular DIA.		Feet
			Rectangular	6.417 Feet	4.771 Feet
PITOT TUBE COEFFICIENT:	0.835	**DUCT AREA:**	30.615507	**sq. ft.**	
PORT LENGTH:	12 in.	**TEST LENGTH:**	150	**min.**	
PORT SIZE:	4 in.	**MINUTES PER POINT:**	5		
PORT TYPE:	Nipple	**TOTAL NUMBER OF TRAVERSE POINTS:**	30		

ONTARIO HYDRO METHOD TRAVERSE DATA

Company: Northern States Power Company **Date:** 10/27/99 **Test Run:** 3

Location: Unit 5 Outlet Duct

Point	Δp	Sq. Root Δp	Time	Volume cubic feet	ΔH	Stack Temp °F	Meter Inlet °F	Meter Outlet °F	Vacuum in. Hg	
1-1	0.69	0.831	12:50	17.08	0.43	272	62	63	3	1.973
1-2	0.90	0.949	12:55	19.05	0.57	273	63	62	3	2.250
1-3	0.85	0.922	13:00	21.30	0.53	272	65	63	3	3.180
1-4	0.92	0.959	13:05	24.48	0.58	274	65	63	3	1.280
1-5	0.85	0.922	13:10	25.76	0.53	273	66	64	3	2.199
			13:15	27.96						0.000
2-1	0.33	0.574	13:19	27.96	0.21	272	65	65	2	1.361
2-2	0.20	0.447	13:24	29.32	0.13	271	66	65	3	1.070
2-3	0.66	0.812	13:29	30.39	0.41	273	64	64	3	1.920
2-4	0.61	0.781	13:34	32.31	0.38	273	65	64	3	1.820
2-5	0.53	0.728	13:39	34.13	0.33	274	66	65	3	1.769
			13:44	35.90						0.000
3-1	0.28	0.529	13:48	35.90	0.18	274	65	65	3	1.251
3-2	0.45	0.671	13:53	37.15	0.28	273	66	65	3	1.590
3-3	0.66	0.812	13:58	38.74	0.41	273	67	65	3	1.302
3-4	0.33	0.574	14:03	40.04	0.21	273	66	66	3	0.628
3-5	0.54	0.735	14:08	40.67	0.34	273	67	66	3	3.120
			14:13	43.79						0.000
4-1	0.23	0.480	14:16	43.79	0.14	273	66	66	3	1.140
4-2	0.31	0.557	14:21	44.93	0.20	273	66	66	3	1.320
4-3	0.66	0.812	14:26	46.25	0.41	273	66	66	3	1.930
4-4	0.46	0.678	14:31	48.18	0.29	273	66	66	3	1.610
4-5	0.32	0.566	14:36	49.79	0.20	273	66	66	3	1.343
			14:41	51.13						0.000
5-1	0.54	0.735	14:44	51.13	0.34	273	66	66	3	1.737
5-2	0.31	0.557	14:49	52.87	0.20	274	68	67	3	1.330
5-3	0.81	0.900	14:54	54.20	0.51	274	68	67	3	2.140
5-4	0.73	0.854	14:59	56.34	0.46	274	68	67	3	2.020
5-5	0.53	0.728	15:04	58.36	0.33	274	68	67	3	2.298
			15:09	60.66						0.000
6-1	1.20	1.095	15:14	60.66	0.75	274	68	68	3	2.602
6-2	1.20	1.095	15:19	63.26	0.75	274	68	68	3	2.600
6-3	1.10	1.049	15:24	65.86	0.69	274	69	68	3	2.490
6-4	1.10	1.049	15:29	68.35	0.69	274	69	68	3	2.500
6-5	0.78	0.883	15:34	70.85	0.49	274	69	68	3	2.095
			15:39	72.95						0.000
										0.000
										0.000
		0.776		55.868	0.40	273	66	66		#####
							65.97			

MOISTURE, DILUENT AND MERCURY DATA

Company Northern States Power Company **Date:** 10/27/99 **Test Run:** 3

Location: Unit 5 Outlet Duct

SILICA GEL FINAL WT.:	759.60	**grams**
SILICA GEL INITIAL WT.:	747.40	**grams**
DIFFERENCE:	12.20	
FINAL IMPINGER WATER:	4812.70	**mls.**
INITIAL IMPINGER WATER:	4734.50	**mls.**
DIFFERENCE:	78.20	
TOTAL WATER GAIN:	90.40	

ITEM	MERCURY (UG)		= NET WT. (G)
FILTER:	0.497		0.000000497
PROBE WASH:	0.000		0.000000000
		Particle-bound Total:	0.000000497
KCl:	3.688		0.000003688
		Oxidized Total:	0.000003688
HNO_3/H_2O_2:	0.198		0.000000198
$KMNO_4$:	1.638		0.000001638
		Elemental Total:	0.000001836

Orsat Analysis	1	2	3	Average
Carbon Dioxide:	9.50	9.60	9.80	9.63
Oxygen:	9.00	9.20	9.20	9.13

ONTARIO HYDRO METHOD DATA ENTRY FORM

Field Data/Calculated Data

Company:	Northern States Power Company
Date:	10/27/99
Test Run:	3
Stack or Duct No.:	Unit 5 Outlet Duct
Start Time:	12:50
Stop Time:	15:39

Pb:	29.45	Inches Hg
Static	0.50	Inches H2O
Ps:	29.49	Inches Hg Abs.
Vlc:	90	ml + grams
Mn:	0.0000	gm
Test Time:	150	minutes
% O2:	9.13	%
% CO2:	9.63	%
% N2:	81.23	%
Delta H:	0.40	Inches H20
Cp:	0.835	Dimensionless - pitot
Tm:	65.97	°F
Sqrt P:	0.776	Inches H20
Ts:	273.23	°F
Vm:	55.868	Cubic Feet
Dn:	0.180	Inches - nozzle
As:	30.62	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:	55.092	cubic feet (dry)
Vwstd:	4.258	cubic feet (wet)
Bwo:	0.072	
Md:	29.907	lb/lb-mole (dry)
Ms:	29.052	lb/lb-mole (wet)
Excess Air (%)	74.181	
Vs:	51.261	fps
ACFM:	94162.	
DSCFM:	62030.	
WSCFM:	66824	
%I:	102.6	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

Project Summary-Samples Received Report

Project	*Client*	*Unit*
94303	NORTHERN STATES POWER	ASHLAND,WI

Project	*Sample*	*Sample Point*	*Date Received*	*Analyte Detail*
94303	001	INL HNO3 RNS T1	10/28/1999	Mercury
94303	002	INL HNO3 RNS T2	10/28/1999	Mercury
94303	003	INL HNO3 RNS T3	10/28/1999	Mercury
94303	004	INL KCL IMP T1	10/28/1999	Mercury
94303	005	INL KCL IMP T2	10/28/1999	Mercury
94303	006	INL KCL IMP T3	10/28/1999	Mercury
94303	007	IN HNO3/H2O2 T1	10/28/1999	Mercury
94303	008	IN HNO3/H2O2 T2	10/28/1999	Mercury
94303	009	IN HNO3/H2O2 T3	10/28/1999	Mercury
94303	010	INL KMNO4 IM T1	10/28/1999	Mercury
94303	011	INL KMNO4 IM T2	10/28/1999	Mercury
94303	012	INL KMNO4 IM T3	10/28/1999	Mercury
94303	013	OUT HNO3 RNS T1	10/28/1999	Mercury
94303	014	OUT HNO3 RNS T2	10/28/1999	Mercury
94303	015	OUT HNO3 RNS T3	10/28/1999	Mercury
94303	016	OUT KCL IMP T1	10/28/1999	Mercury
94303	017	OUT KCL IMP T2	10/28/1999	Mercury
94303	018	OUT KCL IMP T3	10/28/1999	Mercury
94303	019	OUT HNO3/H2O2-1	10/28/1999	Mercury
94303	020	OUT HNO3/H2O2-2	10/28/1999	Mercury
94303	021	OUT HNO3/H2O2-3	10/28/1999	Mercury
94303	022	OUT KMNO4 IM T1	10/28/1999	Mercury
94303	023	OUT KMNO4 IM T2	10/28/1999	Mercury
94303	024	OUT KMNO4 IM T3	10/28/1999	Mercury
94303	025	FLD BL INL KCL	10/28/1999	Mercury
94303	026	F/B INHNO3/H2O2	10/28/1999	Mercury

Project	*Sample*	*Sample Point*	*Date Received*	*Analyte Detail*
94303	027	FLD BL IN KMNO4	10/28/1999	Mercury
94303	028	FLD BL OUT KCL	10/28/1999	Mercury
94303	029	F/B HNO3/H2O2	10/28/1999	Mercury
94303	030	F/B OUTL KMNO4	10/28/1999	Mercury
94303	031	BLANK QRTZ FLT	10/28/1999	Mercury
94303	032	BLANK QRTZ FLT	10/28/1999	Mercury
94303	033	BLANK QRTZ FLT	10/28/1999	Mercury
94303	034	REAG BLNK HNO3	10/28/1999	Mercury
94303	035	REAG BLNK KCL	10/28/1999	Mercury
94303	036	R/BL HNO3/H2O2	10/28/1999	Mercury
94303	037	REAG BL KMNO4	10/28/1999	Mercury
94303	038	R/BL HYDROXYLAM	10/28/1999	Mercury
94303	039	COAL SAMPLE T1	10/28/1999	Ultimate/Proximate on Coal
94303	039	COAL SAMPLE T1	10/28/1999	Mercury
94303	039	COAL SAMPLE T1	10/28/1999	Chlorine
94303	040	COAL SAMPLE T2	10/28/1999	Mercury
94303	040	COAL SAMPLE T2	10/28/1999	Chlorine
94303	040	COAL SAMPLE T2	10/28/1999	Ultimate/Proximate on Coal
94303	041	COAL SAMPLE T3	10/28/1999	Mercury
94303	041	COAL SAMPLE T3	10/28/1999	Ultimate/Proximate on Coal
94303	041	COAL SAMPLE T3	10/28/1999	Chlorine
94303	042	ASH SAMPLE T1	10/28/1999	Hold
94303	043	ASH SAMPLE T2	10/28/1999	Hold
94303	044	ASH SAMPLE T3	10/28/1999	Hold

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 #: 37569
Report Date: 2/4/00
Sample Received:
11/8/99 15:37

TEI	94303	Type	Total ug	mg/kg	Date	%RSD	Lin.Reg.	Blank	CPI	MS	MSD
37592	024	KMnO4	1.65		12/15/99	1.25	0.99999	0.023	96.3	112	113
37593	025	KCl	1.30		12/16/99	1.05	1	0.104	99	110	QNS
37594	026	H2O2	0.038		01/12/00	1.86	0.99999	0.084	90.7	112	110
37595	027	KMnO4	0.114		12/15/99	1.64	0.99999	0.023	96.3	112	113
37596	028	KCl	0.273		12/16/99	2.4	1	0.104	99	110	QNS
37597	029	H2O2	0.078		01/12/00	2.98	0.99999	0.084	90.7	112	110
37598	030	KMnO4	0.166		12/15/99	5.92	0.99999	0.023	96.3	112	113
37599	031	Filt		0.024	11/15/99	13	0.99947	0.136	98.5	105	105
37600	032	Filt		0.046	11/15/99	12.8	0.99947	0.136	98.5	105	105
37601	033	Filt		0.003	11/15/99	11.5	0.99947	0.136	98.5	105	105
37602	034	HNO3	<0.002		01/09/00	2.44	0.99998	NA	101	108	112
37603	035	KCl	0.002		01/06/00	6.73	0.99999	0.148	99.5	105	93.5
37604	036	H2O2	0.020		01/12/00	1.07	0.99999	0.084	90.7	112	110
37605	037	KMnO4	0.012		12/15/99	0.199	0.99999	0.023	96.3	112	113
37606	038	NH2OH	<0.003		01/09/00	5.64	0.99998	NA	101	112	108
37607	001Filter	Filt		0.313	11/15/99	0.484	0.99996	0.136	93.4	98	99
37608	002Filter	Filt		0.388	11/15/99	0.314	0.99996	0.136	93.4	98	99
37609	003Filter	Filt		0.0272	01/11/00	0.278	0.99993	0.098	93.3	109	114
37610	013Filter	Filt		0.558	11/15/99	2.2	0.99996	0.136	93.4	98	99
37611	014Filter	Filt		0.265	01/11/00	0.237	0.99993	0.098	93.3	109	114
37613	015Filter	Filt		0.142	01/11/00	0.017	0.99993	0.098	93.3	109	114

Gayle E. O'Neill, Ph.D.

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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 #: 37569
Report Date: 2/4/00
Sample Received:
11/8/99 15:37

TEI	94303	Type	Total ug	mg/kg	Date	%RSD	Lin.Reg.	Blank	CPI	MS	MSD
37569	001	HNO3	0.003		01/05/00	3.71	0.99998	NA	97.5	104	103
37570	002	HNO3	0.002		01/05/00	5.9	0.99998	NA	97.5	104	103
37571	003	HNO3	<0.004		01/06/00	5.9	0.99999	NA	99.5	105	93.5
37572	004	KCl	1.12		01/06/00	0.591	0.99999	0.148	99.5	105	93.5
37573	005	KCl	0.842		01/06/00	0.52	0.99999	0.148	99.5	105	93.5
37574	006	KCl	0.871		01/06/00	0.678	0.99999	0.148	99.5	105	93.5
37575	007	H2O2	0.325		01/04/00	1.01	1	0.103	97.2	107	107
37576	008	H2O2	0.482		01/04/00	2.06	1	0.103	97.2	107	107
37577	009	H2O2	0.248		01/04/00	4.57	1	0.103	97.2	107	107
37578	010	KMnO4	2.81		12/15/99	0.772	0.99999	0.023	96.3	112	113
37579	011	KMnO4	2.00		12/15/99	2.15	0.99999	0.023	96.3	112	113
37580	012	KMnO4	1.78		12/15/99	0.716	0.99999	0.023	96.3	112	113
37581	013	HNO3	<0.002		01/05/00	10.6	0.99998	NA	97.5	104	103
37582	014	HNO3	<0.003		01/05/00	1.83	0.99998	NA	97.5	104	103
37583	015	HNO3	<0.004		01/05/00	2.7	0.99998	NA	97.5	104	103
37584	016	KCl	1.00		01/06/00	1.35	0.99999	0.148	99.5	105	93.5
37585	017	KCl	2.98		01/06/00	0.2	0.99999	0.148	99.5	105	93.5
37586	018	KCl	3.69		01/06/00	0.499	0.99999	0.148	99.5	105	93.5
37587	019	H2O2	0.278		01/04/00	1.9	1	0.103	97.2	107	107
37588	020	H2O2	0.202		01/03/00	0.61	0.99999	0.048	98	93.8	88.6
37589	021	H2O2	0.218		01/04/00	2.13	1	0.103	97.2	107	107
37590	022	KMnO4	2.91		12/15/99	0.425	0.99999	0.023	96.3	112	113
37591	023	KMnO4	1.78		12/15/99	0.262	0.99999	0.023	96.3	112	113

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LABORATORY REPORT

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PREPARED FOR:

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

Report #: 37569
Report Date: 2/4/00
Sample Received:
11/8/99 15:37

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.

Gayle E. O'Neill, Ph.D.

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COMMERCIAL TESTING & ENGINEERING CO.

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

November 18, 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: 94303-039

Sample taken at: ------

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

Date sampled: October 26, 1999

Date received: November 9, 1999

P.O. No. 22547

Analysis Report No. 71-106572

PROXIMATE ANALYSIS	As Received	Dry Basis
% Moisture	13.77	xxxxx
% Ash	6.53	7.57
% Volatile	35.97	41.71
% Fixed Carbon	43.73	50.72
	100.00	100.00
Btu/lb	11029	12790
% Sulfur	0.56	0.65
MAF Btu		13837

ULTIMATE ANALYSIS	As Received	Dry Basis
% Moisture	13.77	xxxxx
% Carbon	62.36	72.32
% Hydrogen	4.38	5.08
% Nitrogen	1.28	1.48
% Sulfur	0.56	0.65
% Ash	6.53	7.57
% Oxygen(diff)	11.12	12.90
	100.00	100.00
CHLORIDE ug/g	95	110

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.

117 Joseph B. Houser Jr.

South Holland Laboratory

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November 18, 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: 94303-039

Sample taken at ------

Sample taken by Mostardi-Platt Assoc., Inc.

Date sampled October 26, 1999

Date received November 9, 1999

P.O. No. 22547

Analysis Report No. 71-106572

	Dry Basis, ug/g	MDL, ug/g
Mercury, Hg	0.06	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.

118 Joseph B. Houser

South Holland Laboratory

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FAX: (708) 333-3060

November 12, 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: 94303-040

Sample taken at: ------

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

Date sampled: October 27, 1999

Date received: November 9, 1999

P.O. No. 22547

Analysis Report No. 71-106573

PROXIMATE ANALYSIS	As Received	Dry Basis
% Moisture	13.73	xxxxx
% Ash	6.48	7.51
% Volatile	35.76	41.45
% Fixed Carbon	44.03	51.04
	100.00	100.00
Btu/lb	10900	12635
% Sulfur	0.56	0.65
MAF Btu		13661

ULTIMATE ANALYSIS	As Received	Dry Basis
% Moisture	13.73	xxxxx
% Carbon	62.10	71.98
% Hydrogen	4.29	4.97
% Nitrogen	1.32	1.53
% Sulfur	0.56	0.65
% Ash	6.48	7.51
% Oxygen(diff)	11.52	13.36
	100.00	100.00
CHLORIDE ug/g	103	119

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.

119

Joseph B. Hrusa

South Holland Laboratory

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

November 12, 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: 94303-040

Sample taken at: ------

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

Date sampled: October 27, 1999

Date received: November 9, 1999

P.O. No. 22547

Analysis Report No. 71-106573

	Dry Basis, ug/g	MDL, ug/g
Mercury, Hg	0.06	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.

120 Joseph B. Arvesen

South Holland Laboratory

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FAX: (708) 333-3060

November 15, 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: 94303-041

Sample taken at: ------

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

Date sampled: October 27, 1999

Date received: November 9, 1999

P.O. No. 22547

Analysis Report No. 71-106574

PROXIMATE ANALYSIS	As Received	Dry Basis
% Moisture	13.26	xxxxx
% Ash	6.56	7.56
% Volatile	36.01	41.51
% Fixed Carbon	44.17	50.93
	100.00	100.00
Btu/lb	10927	12597
% Sulfur	0.57	0.66
MAF Btu		13627

ULTIMATE ANALYSIS	As Received	Dry Basis
% Moisture	13.26	xxxxx
% Carbon	62.67	72.25
% Hydrogen	4.27	4.92
% Nitrogen	1.34	1.54
% Sulfur	0.57	0.66
% Ash	6.56	7.56
% Oxygen(diff)	11.33	13.07
	100.00	100.00
CHLORIDE ug/g	132	152

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.

121 Joseph B. Hrusek

South Holland Laboratory

MEMBER ACIL

COMMERCIAL TESTING & ENGINEERING CO.

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

November 15, 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: 94303-041

Sample taken at ------

Sample taken by Mostardi-Platt Assoc., Inc.

Date sampled October 27, 1999

Date received November 9, 1999

P.O. No. 22547

Analysis Report No. 71-106574

	Dry Basis, ug/g	MDL, ug/g
Mercury, Hg	0.06	0.01

	Expected	Observed
SARM 1157	0.05	0.05
NIST 1630A	0.11	0.11

MDL Denotes Method Detection Limit

METHOD
Mercury: ASTM D 3684

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

122 Joseph B. Hrusek
South Holland Laboratory

MEMBER ACIL

Original Watermarked For Your Protection

TERMS AND CONDITIONS ON REVERSE

LIST OF PARTICIPANTS

Name	Organization	Project Role
Jeffrey Wright	Northern States Power Company	Plant Coordinator
Tina Ball	Northern States Power Company	Regulatory Compliance Analyst
Jeffery C. Daniels	Mostardi Platt	Project Supervisor
John Wendell	Mostardi Platt	Laboratory Chemist
Tom Wenzel	Mostardi Platt	Field Engineer
Norm Smith	Mostardi Platt	Test Technician
Corey Shelby	Mostardi Platt	Test Technician
Gayle O'Neill, Ph.D.	TEI Analytical, Inc.	Speciated Hg Sample Analysis
Joseph Houser	CTE	Coal Sample Analysis