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: Field Notes and Audit Data

Appendix G: Analytical Data Sheets

Appendix H: List of Participants

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Montana Dakota Utilities Lewis and Clark Station Mercury Emissions Test Plant Data

DATE Test Run #1	TIME	LOADMW MW	CO2C PERCENT	FLOWSCFH SCFH	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	HEATIN MMBTU/HR	BTU *10^6
4/11/2000	8:00	48.11	12.40	9301224	356.8	0.357	629.219	220.227
4/11/2000	9:00	47.59	12.60	9132449	352.8	0.366	627.757	627.757
4/11/2000	10:00	47.51	12.65	9097535	357.5	0.354	630.346	630.346
4/11/2000	11:00	47.52	12.69	9182762	359.9	0.369	636.263	349.945
Average		47.68	12.59	9178493	356.7	0.361		
		Coal BTU/LB	6525				Total BTU	1828.274
							lbs coal	280195
							Tons coal	140.1

DATE Test Run #2	TIME	LOADMW MW	CO2C PERCENT	FLOWSCFH SCFH	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	HEATIN MMBTU/HR	BTU *10^6
4/11/2000	12:00	47.59	12.70	9252907	338.8	0.356	641.117	128.223
4/11/2000	13:00	47.53	12.78	9141456	348.5	0.367	638.325	638.325
4/11/2000	14:00	47.34	12.75	9162592	345.7	0.357	634.867	634.867
4/11/2000	15:00	47.25	12.73	9183610	342.0	0.370	636.330	286.348
Average		47.43	12.74	9185141	343.8	0.362		
		Coal BTU/LB	6538				Total BTU	1687.763
							lbs coal	258147
							Tons coal	129.1

DATE Test Run #3	TIME	LOADMW MW	CO2C PERCENT	FLOWSCFH SCFH	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	HEATIN MMBTU/HR	BTU *10^6
4/11/2000	15:00	47.25	12.73	9183610	342.0	0.370	636.330	21.211
4/11/2000	16:00	47.21	12.76	9210833	346.9	0.357	643.217	643.217
4/11/2000	17:00	47.08	12.68	9136808	340.8	0.373	633.072	633.072
4/11/2000	18:00	47.20	12.74	9118379	340.7	0.358	631.742	357.987
Average		47.18	12.73	9162408	342.6	0.364		
		Coal BTU/LB	6543				Total BTU	1634.275
							lbs coal	249775
							Tons coal	124.9

Test Run #1								DIFFERENTIAL	SLURRY	SLURRY	TOTAL
Date	Time CST	LOADMW MW	CO2C PERCENT	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	FUELFACT SCF/CMM	FLOWSCFH SCFH	PRESSURE IWC	DENSITY SGU	PH	SLURRY FLOW gpm
4/11/2000	8:39	47.44	11.76	335.94	0.363	1910	9177568	11.80	1.0871	5.01	3627
4/11/2000	8:40	47.54	11.98	337.55	0.356	1910	9172350	11.98	1.0870	5.02	3580
4/11/2000	8:41	47.80	12.18	339.69	0.348	1910	9168361	11.89	1.0869	5.03	3628
4/11/2000	8:42	47.85	12.31	339.38	0.342	1910	9168464	11.99	1.0869	5.04	3664
4/11/2000	8:43	47.95	12.43	349.01	0.347	1910	9168655	12.18	1.0868	5.04	3620
4/11/2000	8:44	47.80	12.39	358.29	0.346	1910	9212299	12.35	1.0868	5.05	3652
4/11/2000	8:45	47.47	12.35	357.16	0.343	1910	9262230	12.08	1.0867	5.06	3627
4/11/2000	8:46	47.52	12.37	345.04	0.343	1910	9241635	11.92	1.0866	5.07	3656
4/11/2000	8:47	47.55	12.36	342.61	0.343	1910	9217639	12.03	1.0866	5.08	3687
4/11/2000	8:48	47.45	12.31	341.32	0.348	1910	9166879	11.88	1.0865	5.09	3627
4/11/2000	8:49	47.62	12.38	342.94	0.345	1910	9124605	11.94	1.0864	5.09	3669
4/11/2000	8:50	47.71	12.44	342.07	0.344	1910	9053775	11.94	1.0863	5.09	3645
4/11/2000	8:51	47.65	12.41	339.97	0.347	1910	9025847	11.84	1.0862	5.08	3668
4/11/2000	8:52	47.68	12.45	346.77	0.349	1910	9137570	11.89	1.0867	5.08	3614
4/11/2000	8:53	47.74	12.45	350.94	0.350	1910	9152137	11.81	1.0872	5.08	3599
4/11/2000	8:54	47.59	12.46	353.49	0.347	1910	9162930	11.83	1.0866	5.07	3626
4/11/2000	8:55	47.84	12.49	358.29	0.347	1910	9164532	11.87	1.0861	5.07	3689
4/11/2000	8:56	47.78	12.51	357.64	0.346	1910	9168441	11.79	1.0863	5.07	3694
4/11/2000	8:57	47.91	12.55	358.58	0.343	1910	9156764	11.82	1.0864	5.06	3672
4/11/2000	8:58	47.85	12.59	361.74	0.343	1910	9113900	11.94	1.0866	5.06	3620
4/11/2000	8:59	47.92	12.56	363.70	0.345	1910	9110065	11.81	1.0868	5.06	3680
4/11/2000	9:00	47.88	12.54	362.86	0.347	1910	9108338	11.81	1.0870	5.06	3660
4/11/2000	9:01	47.82				1910	9023441	11.89	1.0872	5.05	3649
4/11/2000	9:02	47.75				1910	8971119	11.82	1.0874	5.05	3636
4/11/2000	9:03	47.70				1910	8867444	11.96	1.0876	5.05	3617
4/11/2000	9:04	47.74				1910	8838876	12.00	1.0878	5.04	3630
4/11/2000	9:05	47.63				1910	8879549	11.94	1.0874	5.04	3651
4/11/2000	9:06	47.60				1910	8961666	12.18	1.0870	5.04	3601
4/11/2000	9:07	47.31				1910	9189929	12.39	1.0872	5.04	3658
4/11/2000	9:08	47.05	12.45	368.35	0.356	1910	9195822	11.98	1.0874	5.03	3678
4/11/2000	9:09	47.11	12.42	366.38	0.358	1910	9360304	11.88	1.0877	5.03	3630
4/11/2000	9:10	47.21	12.38	359.62	0.354	1910	9354203	11.90	1.0871	5.03	3673
4/11/2000	9:11	47.36	12.47	361.21	0.347	1910	9338757	11.87	1.0879	5.02	3615
4/11/2000	9:12	47.59	12.55	361.84	0.345	1910	9252426	11.87	1.0876	5.02	3625
4/11/2000	9:13	47.87	12.63	362.06	0.338	1910	9102751	12.16	1.0873	5.02	3617
4/11/2000	9:14	47.91	12.66	364.85	0.335	1910	9119844	12.15	1.0869	5.01	3573
4/11/2000	9:15	47.99	12.68	384.44	0.335	1910	9124774	12.25	1.0860	5.01	3576
4/11/2000	9:16	47.74	12.66	391.74	0.348	1910	9107763	11.99	1.0863	5.01	3623
4/11/2000	9:17	47.43	12.51	378.35	0.360	1910	9106219	11.74	1.0867	5.01	3645
4/11/2000	9:18	47.51	12.31	369.88	0.357	1910	9365679	12.11	1.0871	5.00	3683
4/11/2000	9:19	47.35	12.33	365.37	0.360	1910	9365727	12.06	1.0867	5.00	3670
4/11/2000	9:20	47.40	12.40	360.07	0.355	1910	9246292	12.20	1.0864	5.00	3617
4/11/2000	9:21	47.39	12.48	359.83	0.354	1910	9232130	12.20	1.0861	4.99	3623
4/11/2000	9:22	47.48	12.60	359.39	0.348	1910	9201175	12.30	1.0865	4.99	3647
4/11/2000	9:23	47.64	12.60	358.25	0.344	1910	9163950	12.15	1.0869	4.99	3587
4/11/2000	9:24	47.84	12.67	355.08	0.341	1910	9014317	12.19	1.0873	4.99	3551
4/11/2000	9:25	47.88	12.68	354.94	0.346	1910	8984337	12.25	1.0877	4.98	3639
4/11/2000	9:26	48.11	12.76	358.21	0.340	1910	8965339	12.26	1.0881	4.98	3664
4/11/2000	9:27	48.20	12.76	361.43	0.347	1910	9026798	11.99	1.0884	4.98	3660
4/11/2000	9:28	48.11	12.70	359.07	0.360	1910	9080599	11.98	1.0879	4.98	3622
4/11/2000	9:29	48.10	12.57	351.17	0.367	1910	9059994	11.73	1.0873	4.99	3638
4/11/2000	9:30	48.01	12.49	342.98	0.379	1910	9058493	11.90	1.0868	5.00	3641
4/11/2000	9:31	47.61	12.53	345.36	0.388	1910	9225558	11.86	1.0869	5.01	3629
4/11/2000	9:32	47.65	12.59	343.70	0.387	1910	9264061	11.82	1.0870	5.02	3677
4/11/2000	9:33	47.37	12.64	351.70	0.392	1910	9316501	12.09	1.0871	5.03	3662
4/11/2000	9:34	46.92	12.65	360.44	0.393	1910	9318621	12.17	1.0872	5.04	3658
4/11/2000	9:35	46.97	12.53	341.01	0.397	1910	9376427	11.93	1.0874	5.04	3623
4/11/2000	9:36	47.13	12.57	331.59	0.395	1910	9342786	11.74	1.0881	5.05	3579
4/11/2000	9:37	47.46	12.54	325.64	0.395	1910	9283849	11.69	1.0878	5.06	3591
4/11/2000	9:38	47.69	12.66	328.93	0.381	1910	9194738	11.81	1.0875	5.07	3604

Test Run #1								DIFFERENTIAL	SLURRY	SLURRY	TOTAL
Date	Time CST	LOADMW MW	CO2C PERCENT	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	FUELFACT SCF/CMM	FLOWSCFH SCFH	PRESSURE IWC	DENSITY SGU	PH	SLURRY FLOW gpm
4/11/2000	9:39	47.84	12.75	332.31	0.373	1910	9086644	11.74	1.0876	5.08	3628
4/11/2000	9:40	47.90	12.58	329.56	0.381	1910	9086368	11.82	1.0877	5.09	3596
4/11/2000	9:41	47.77	12.67	334.99	0.383	1910	9086156	11.76	1.0879	5.09	3630
4/11/2000	9:42	47.87	12.69	335.83	0.381	1910	9060469	11.75	1.0880	5.08	3663
4/11/2000	9:43	47.68	12.61	334.45	0.385	1910	9055046	11.67	1.0877	5.08	3639
4/11/2000	9:44	47.67	12.68	338.75	0.386	1910	9101905	11.99	1.0876	5.07	3599
4/11/2000	9:45	47.62	12.65	342.38	0.386	1910	9102200	12.22	1.0891	5.07	3597
4/11/2000	9:46	47.53	12.65	343.39	0.385	1910	9069153	12.24	1.0890	5.07	3578
4/11/2000	9:47	47.45	12.71	347.87	0.379	1910	9071558	12.34	1.0888	5.06	3562
4/11/2000	9:48	47.45	12.73	346.79	0.378	1910	9091360	12.25	1.0887	5.06	3624
4/11/2000	9:49	47.35	12.64	343.32	0.386	1910	9079422	12.30	1.0887	5.05	3646
4/11/2000	9:50	47.43	12.54	337.76	0.388	1910	9031070	12.31	1.0896	5.05	3656
4/11/2000	9:51	47.27	12.53	339.67	0.385	1910	9081651	12.25	1.0891	5.05	3668
4/11/2000	9:52	47.40	12.66	342.94	0.383	1910	9113408	11.85	1.0886	5.04	3587
4/11/2000	9:53	47.41	12.72	345.06	0.378	1910	9101233	11.76	1.0881	5.04	3632
4/11/2000	9:54	47.51	12.76	348.11	0.376	1910	9086031	11.91	1.0877	5.03	3711
4/11/2000	9:55	47.46	12.74	355.74	0.380	1910	9166343	11.94	1.0877	5.03	3737
4/11/2000	9:56	47.57	12.74	361.27	0.379	1910	9178988	11.89	1.0878	5.03	3734
4/11/2000	9:57	47.64	12.72	361.70	0.378	1910	9136034	11.80	1.0879	5.02	3673
4/11/2000	9:58	47.58	12.71	360.86	0.380	1910	9106996	11.80	1.0879	5.02	3641
4/11/2000	9:59	47.55	12.70	360.21	0.381	1910	9064290	11.95	1.0880	5.01	3683
4/11/2000	10:00	47.58	12.66	361.15	0.376	1910	9065022	11.85	1.0880	5.01	3711
4/11/2000	10:01	47.57				1910	9069803	11.83	1.0881	5.01	3656
4/11/2000	10:02	47.54				1910	9095830	11.94	1.0881	5.00	3661
4/11/2000	10:03	47.67				1910	9129746	11.90	1.0883	5.00	3675
4/11/2000	10:04	47.77				1910	9187244	12.07	1.0884	4.99	3591
4/11/2000	10:05	47.71				1910	9294261	12.14	1.0886	4.99	3605
4/11/2000	10:06	47.73				1910	9352987	12.16	1.0887	4.99	3619
4/11/2000	10:07	47.61				1910	9370587	12.24	1.0889	4.98	3631
4/11/2000	10:08	47.37	12.72	399.65	0.384	1910	9356819	12.21	1.0890	4.98	3662
4/11/2000	10:09	47.22	12.64	392.09	0.391	1910	9335902	11.98	1.0892	4.97	3664
4/11/2000	10:10	47.13	12.51	367.79	0.396	1910	9250929	12.03	1.0893	4.97	3629
4/11/2000	10:11	47.02	12.38	358.46	0.392	1910	9247868	11.96	1.0894	4.98	3635
4/11/2000	10:12	47.21	12.53	351.91	0.386	1910	9075201	11.86	1.0893	4.99	3685
4/11/2000	10:13	47.15	12.71	348.74	0.376	1910	9032084	11.95	1.0892	5.00	3696
4/11/2000	10:14	47.23	12.75	345.24	0.374	1910	8975845	11.80	1.0891	5.01	3658
4/11/2000	10:15	47.29	12.75	341.11	0.369	1910	8981453	11.88	1.0892	5.02	3654
4/11/2000	10:16	47.44	12.77	336.60	0.361	1910	8991888	11.88	1.0893	5.03	3633
4/11/2000	10:17	47.48	12.79	331.55	0.351	1910	9009213	11.77	1.0894	5.05	3637
4/11/2000	10:18	47.64	12.88	330.04	0.338	1910	9024749	11.94	1.0894	5.06	3643
4/11/2000	10:19	47.72	12.86	328.92	0.333	1910	9081315	11.90	1.0892	5.07	3694
4/11/2000	10:20	47.74	12.83	331.21	0.331	1910	9118938	11.90	1.0890	5.08	3707
4/11/2000	10:21	47.78	12.78	332.75	0.327	1910	9123949	11.90	1.0888	5.09	3696
4/11/2000	10:22	47.75	12.73	333.88	0.330	1910	9130137	11.90	1.0887	5.09	3706
4/11/2000	10:23	47.75	12.78	338.91	0.331	1910	9184193	11.94	1.0891	5.08	3659
4/11/2000	10:24	47.77	12.80	341.83	0.334	1910	9140130	11.91	1.0895	5.08	3693
4/11/2000	10:25	47.72	12.76	340.60	0.335	1910	9019288	11.94	1.0894	5.08	3686
4/11/2000	10:26	47.67	12.74	343.93	0.341	1910	9008290	11.99	1.0870	5.07	3684
4/11/2000	10:27	47.53	12.74	342.53	0.341	1910	8986638	11.78	1.0879	5.07	3664
4/11/2000	10:28	47.55	12.66	343.08	0.345	1910	9033172	11.79	1.0888	5.07	3624
4/11/2000	10:29	47.53	12.64	339.29	0.352	1910	9063726	11.89	1.0896	5.06	3609
4/11/2000	10:30	47.52	12.68	347.71	0.348	1910	9138954	11.85	1.0895	5.06	3601
4/11/2000	10:31	47.53	12.64	352.85	0.347	1910	9173839	12.00	1.0893	5.06	3641
4/11/2000	10:32	47.63	12.60	354.68	0.347	1910	9178159	11.77	1.0892	5.05	3611
4/11/2000	10:33	47.50	12.78	363.25	0.340	1910	9178705	11.86	1.0891	5.05	3595
4/11/2000	10:34	47.48	12.76	358.41	0.338	1910	8999689	11.90	1.0889	5.05	3619
4/11/2000	10:35	47.65	12.74	356.45	0.342	1910	8977309	11.93	1.0891	5.04	3694
4/11/2000	10:36	47.47	12.69	353.80	0.341	1910	8959178	11.76	1.0902	5.04	3699
4/11/2000	10:37	47.56	12.71	353.62	0.341	1910	8928210	11.87	1.0900	5.04	3651
4/11/2000	10:38	47.67	12.73	352.34	0.339	1910	8865505	11.83	1.0899	5.03	3651

Test Run #1											
Date	Time CST	LOADMW MW	CO2C PERCENT	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	FUELFACT SCF/CMM	FLOWSCFH SCFH	DIFFERENTIAL PRESSURE IWC	SLURRY DENSITY SGU	SLURRY PH	TOTAL SLURRY FLOW gpm
4/11/2000	10:39	47.58	12.74	356.09	0.340	1910	8900901	12.14	1.0898	5.03	3631
4/11/2000	10:40	47.51	12.75	361.69	0.340	1910	8926419	12.00	1.0897	5.02	3615
4/11/2000	10:41	47.60	12.69	360.19	0.340	1910	8871259	12.17	1.0896	5.02	3608
4/11/2000	10:42	47.68	12.61	373.05	0.349	1910	8843760	12.04	1.0894	5.02	3609
4/11/2000	10:43	47.73	12.78	399.13	0.361	1910	9080135	11.84	1.0893	5.01	3660
4/11/2000	10:44	47.56	12.72	384.96	0.353	1910	9080128	12.07	1.0892	5.01	3661
4/11/2000	10:45	47.56	12.65	381.36	0.339	1910	9120190	12.16	1.0894	5.01	3633
4/11/2000	10:46	47.46	12.54	375.74	0.351	1910	9164093	11.99	1.0903	5.00	3592
4/11/2000	10:47	47.44	12.52	372.86	0.352	1910	9250507	11.76	1.0902	5.00	3624
4/11/2000	10:48	47.36	12.50	365.05	0.355	1910	9208831	11.85	1.0901	5.00	3658
4/11/2000	10:49	47.33	12.54	370.53	0.365	1910	9118484	11.95	1.0902	4.99	3672
4/11/2000	10:50	47.37	12.50	375.22	0.371	1910	9074289	12.09	1.0903	4.99	3674
4/11/2000	10:51	47.31	12.46	364.63	0.355	1910	9058263	11.72	1.0904	4.99	3673
4/11/2000	10:52	47.35	12.36	363.40	0.352	1910	9133187	11.70	1.0905	4.98	3709
4/11/2000	10:53	47.06	12.43	361.94	0.356	1910	9168810	12.22	1.0905	4.98	3663
4/11/2000	10:54	47.10	12.46	358.70	0.349	1910	9102194	12.12	1.0905	4.98	3618
4/11/2000	10:55	47.21	12.45	358.39	0.353	1910	9101826	12.11	1.0912	4.97	3591
4/11/2000	10:56	47.31	12.50	359.32	0.349	1910	9210921	12.08	1.0914	4.97	3620
4/11/2000	10:57	47.55	12.60	356.92	0.346	1910	9169096	12.06	1.0906	4.97	3564
4/11/2000	10:58	47.60	12.68	353.46	0.340	1910	9052772	12.09	1.0898	4.96	3532
4/11/2000	10:59	47.75	12.67	353.12	0.340	1910	9079291	12.12	1.0890	4.96	3566
4/11/2000	11:00	47.91	12.61	353.92	0.345	1910	9118609	12.07	1.0884	4.96	3610
4/11/2000	11:01	47.84				1910	9061778	12.13	1.0881	4.95	3638
4/11/2000	11:02	47.93				1910	9047462	12.01	1.0883	4.95	3665
4/11/2000	11:03	47.65				1910	9187908	11.97	1.0872	4.95	3627
4/11/2000	11:04	47.46				1910	9224573	12.16	1.0862	4.94	3650
4/11/2000	11:05	47.38				1910	9228616	12.14	1.0856	4.94	3641
4/11/2000	11:06	47.26				1910	9221844	12.04	1.0861	4.94	3590
4/11/2000	11:07	47.27				1910	9178500	11.90	1.0860	4.93	3621
4/11/2000	11:08	47.26	12.57	355.24	0.358	1910	9160533	11.98	1.0859	4.93	3673
4/11/2000	11:09	47.14	12.66	369.24	0.353	1910	9145679	11.88	1.0858	4.93	3690
4/11/2000	11:10	47.05	12.65	372.66	0.351	1910	9147897	11.78	1.0858	4.92	3639
4/11/2000	11:11	47.18	12.57	361.39	0.352	1910	9151376	11.81	1.0861	4.92	3671
4/11/2000	11:12	47.31	12.52	356.01	0.353	1910	9169038	11.66	1.0863	4.92	3676
4/11/2000	11:13	47.56	12.42	352.05	0.351	1910	9173457	12.26	1.0866	4.91	3638
4/11/2000	11:14	47.47	12.62	358.25	0.347	1910	9105828	12.45	1.0869	4.91	3617
4/11/2000	11:15	47.34	12.69	359.93	0.343	1910	9076329	11.74	1.0871	4.91	3587
4/11/2000	11:16	47.58	12.68	354.94	0.348	1910	9002864	11.74	1.0874	4.90	3625
4/11/2000	11:17	47.49	12.66	350.12	0.352	1910	9029187	12.26	1.0879	4.90	3621
4/11/2000	11:18	47.45	12.67	352.98	0.347	1910	9090942	12.26	1.0883	4.90	3625
4/11/2000	11:19	47.41	12.70	352.40	0.343	1910	9045128	12.19	1.0883	4.89	3642
4/11/2000	11:20	47.41	12.75	349.80	0.342	1910	9008542	12.31	1.0875	4.89	3605
4/11/2000	11:21	47.59	12.85	350.11	0.333	1910	9020906	12.26	1.0869	4.89	3591
4/11/2000	11:22	47.71	12.82	347.01	0.341	1910	9030392	12.05	1.0867	4.88	3651
4/11/2000	11:23	47.55	12.68	342.40	0.343	1910	9023244	11.96	1.0859	4.88	3670
4/11/2000	11:24	47.52	12.79	345.19	0.345	1910	8997737	11.92	1.0854	4.88	3665
4/11/2000	11:25	47.69	12.89	354.64	0.348	1910	9017645	11.90	1.0855	4.87	3620
4/11/2000	11:26	47.61	12.80	358.41	0.359	1910	9091013	11.82	1.0858	4.87	3588
4/11/2000	11:27	47.68	12.81	363.61	0.361	1910	9142113	12.03	1.0862	4.86	3582
4/11/2000	11:28	47.52	12.84	365.89	0.371	1910	9183864	11.88	1.0867	4.86	3635
4/11/2000	11:29	47.53	12.81	364.10	0.376	1910	9138883	11.92	1.0871	4.86	3597
4/11/2000	11:30	47.27	12.78	361.72	0.379	1910	9102016	11.93	1.0872	4.85	3615
4/11/2000	11:31	47.17	12.74	362.12	0.384	1910	9096637	11.73	1.0872	4.85	3614
4/11/2000	11:32	47.28	12.75	359.52	0.387	1910	9096446	11.90	1.0873	4.85	3669
4/11/2000	11:33	47.32	12.66	354.66	0.381	1910	9030143	11.83	1.0874	4.84	3619
Averages Test #1		47.55	12.61	354.02	0.358	1910	9118130	11.97422865	1.087933	5.005242	3638.953

Test Run #2											
Date	Time CST	LOADMW MW	CO2C PERCENT	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	FUELFACT SCF/CMM	FLOWSCFH SCFH	DIFFERENTI PRESSURE IWC	SLURRY DENSITY SGU	SLURRY PH	TOTAL SLURRY FLOW GPM
4/11/2000	12:48	47.71	12.73	374.07	0.338	1910	9261579	12.20	1.0869	5.02	3666
4/11/2000	12:49	47.68	12.74	370.35	0.342	1910	9291779	11.90	1.0872	5.01	3601
4/11/2000	12:50	47.62	12.61	362.60	0.347	1910	9310889	11.87	1.0876	5.01	3687
4/11/2000	12:51	47.60	12.49	356.25	0.356	1910	9425482	11.78	1.0877	5.00	3698
4/11/2000	12:52	47.56	12.55	360.70	0.350	1910	9431180	11.68	1.0877	5.00	3553
4/11/2000	12:53	47.53	12.57	363.89	0.349	1910	9464890	11.72	1.0877	4.99	3595
4/11/2000	12:54	47.50	12.63	363.42	0.355	1910	9465274	11.76	1.0878	4.99	3695
4/11/2000	12:55	47.54	12.67	364.80	0.352	1910	9447710	12.22	1.0879	4.98	3630
4/11/2000	12:56	47.39	12.70	365.48	0.351	1910	9421463	12.28	1.0880	4.97	3671
4/11/2000	12:57	47.70	12.70	359.15	0.349	1910	9354296	12.28	1.0881	4.97	3637
4/11/2000	12:58	47.59	12.76	358.82	0.346	1910	9385576	12.18	1.0875	4.96	3648
4/11/2000	12:59	47.72	12.66	357.29	0.347	1910	9464548	12.23	1.0872	4.96	3637
4/11/2000	13:00	47.63	12.64	357.87	0.350	1910	9443482	12.19	1.0876	4.95	3637
4/11/2000	13:01	47.58				1910	9387532	12.15	1.0879	4.94	3630
4/11/2000	13:02	47.58				1910	9387246	12.31	1.0879	4.94	3536
4/11/2000	13:03	47.53				1910	9259622	12.26	1.0874	4.93	3647
4/11/2000	13:04	47.53				1910	9247695	12.29	1.0870	4.93	3593
4/11/2000	13:05	47.53				1910	9091074	12.32	1.0866	4.92	3578
4/11/2000	13:06	47.70				1910	9090967	12.15	1.0862	4.92	3752
4/11/2000	13:07	47.45				1910	9079746	12.15	1.0860	4.91	3578
4/11/2000	13:08	47.39	12.83	372.90	0.354	1910	9069284	12.27	1.0858	4.90	3607
4/11/2000	13:09	47.30	12.80	369.74	0.357	1910	9095451	12.04	1.0860	4.90	3628
4/11/2000	13:10	47.28	12.64	369.65	0.353	1910	9129859	11.76	1.0865	4.89	3712
4/11/2000	13:11	47.45	12.60	361.40	0.359	1910	9074716	11.85	1.0870	4.89	3630
4/11/2000	13:12	47.42	12.67	358.16	0.353	1910	9058331	11.91	1.0875	4.88	3586
4/11/2000	13:13	47.45	12.74	362.19	0.348	1910	9090726	11.91	1.0876	4.87	3708
4/11/2000	13:14	47.35	12.79	364.92	0.351	1910	9099182	11.77	1.0874	4.87	3684
4/11/2000	13:15	47.39	12.76	363.82	0.354	1910	9113007	11.75	1.0873	4.86	3595
4/11/2000	13:16	47.51	12.84	363.85	0.353	1910	9110007	11.82	1.0881	4.86	3622
4/11/2000	13:17	47.41	12.84	365.04	0.347	1910	9101863	11.82	1.0887	4.85	3610
4/11/2000	13:18	47.45	12.87	364.42	0.341	1910	9011698	11.77	1.0886	4.85	3721
4/11/2000	13:19	47.42	12.84	361.09	0.342	1910	8970014	11.73	1.0885	4.87	3680
4/11/2000	13:20	47.56	12.82	356.92	0.337	1910	8970129	11.82	1.0884	4.89	3642
4/11/2000	13:21	47.46	12.66	343.37	0.336	1910	8970106	11.73	1.0885	4.91	3587
4/11/2000	13:22	47.54	12.78	337.64	0.339	1910	9052221	11.81	1.0878	4.92	3703
4/11/2000	13:23	47.69	12.83	335.37	0.339	1910	9084349	11.74	1.0873	4.94	3637
4/11/2000	13:24	47.74	12.84	336.29	0.345	1910	9200468	11.72	1.0872	4.96	3614
4/11/2000	13:25	47.71	12.92	330.17	0.344	1910	9128413	11.82	1.0871	4.98	3674
4/11/2000	13:26	47.59	13.02	325.42	0.345	1910	9079865	11.75	1.0871	4.99	3629
4/11/2000	13:27	47.70	12.96	325.24	0.348	1910	9129989	11.76	1.0876	5.01	3645
4/11/2000	13:28	47.79	12.90	326.49	0.354	1910	9194977	11.80	1.0878	5.03	3675
4/11/2000	13:29	47.79	12.96	325.36	0.352	1910	9175600	11.87	1.0877	5.05	3634
4/11/2000	13:30	47.70	12.96	323.49	0.358	1910	9162367	11.86	1.0875	5.06	3685
4/11/2000	13:31	47.73	12.81	323.18	0.366	1910	9240221	11.69	1.0874	5.08	3668
4/11/2000	13:32	47.62	12.74	324.66	0.376	1910	9255888	11.79	1.0874	5.09	3693
4/11/2000	13:33	47.51	12.86	327.39	0.376	1910	9168984	11.76	1.0874	5.09	3667
4/11/2000	13:34	47.45	12.85	329.33	0.381	1910	9151349	11.97	1.0875	5.08	3608
4/11/2000	13:35	47.46	12.85	330.23	0.379	1910	9137559	11.97	1.0876	5.08	3669
4/11/2000	13:36	47.43	12.87	331.69	0.381	1910	9123897	11.95	1.0877	5.08	3635
4/11/2000	13:37	47.54	12.93	333.00	0.381	1910	9072576	11.78	1.0878	5.07	3600
4/11/2000	13:38	47.45	12.84	330.29	0.388	1910	9035995	11.80	1.0878	5.07	3613
4/11/2000	13:39	47.54	12.82	331.01	0.388	1910	9034900	11.85	1.0886	5.07	3578
4/11/2000	13:40	47.44	12.82	332.66	0.387	1910	9030551	12.16	1.0889	5.06	3659
4/11/2000	13:41	47.62	12.82	342.29	0.387	1910	9027905	12.33	1.0889	5.06	3715
4/11/2000	13:42	47.57	12.73	355.23	0.393	1910	9013948	12.14	1.0888	5.06	3529
4/11/2000	13:43	47.62	12.76	347.45	0.382	1910	9013727	12.07	1.0887	5.05	3659
4/11/2000	13:44	47.59	12.85	358.75	0.379	1910	9211517	11.98	1.0886	5.05	3653
4/11/2000	13:45	47.71	12.71	351.15	0.390	1910	9277729	11.93	1.0883	5.05	3627
4/11/2000	13:46	47.64	12.61	345.18	0.394	1910	9282598	11.91	1.0882	5.04	3515
4/11/2000	13:47	47.50	12.72	347.64	0.391	1910	9283071	11.92	1.0883	5.04	3560
4/11/2000	13:48	47.62	12.73	348.87	0.393	1910	9291460	11.87	1.0882	5.04	3717
4/11/2000	13:49	47.56	12.63	344.73	0.401	1910	9299775	11.95	1.0880	5.03	3679
4/11/2000	13:50	47.56	12.67	342.66	0.393	1910	9162263	11.88	1.0880	5.03	3719
4/11/2000	13:51	47.50	12.73	343.36	0.394	1910	9063638	11.81	1.0881	5.03	3643
4/11/2000	13:52	47.52	12.68	344.15	0.399	1910	9076540	11.79	1.0883	5.03	3693
4/11/2000	13:53	47.44	12.55	342.38	0.404	1910	9085576	11.83	1.0884	5.02	3682
4/11/2000	13:54	47.37	12.72	347.44	0.399	1910	9096071	11.89	1.0885	5.02	3696
4/11/2000	13:55	47.48	12.75	352.99	0.394	1910	9145778	11.78	1.0887	5.02	3675

Test Run #2											
Date	Time CST	LOADMW MW	CO2C PERCENT	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	FUELFACT SCF/CMM	FLOWSCFH SCFH	DIFFERENTI PRESSURE IWC	SLURRY DENSITY SGU	SLURRY PH	TOTAL SLURRY FLOW GPM
4/11/2000	13:56	47.45	12.78	356.01	0.390	1910	9173141	11.91	1.0887	5.01	3597
4/11/2000	13:57	47.55	12.76	359.69	0.389	1910	9255844	11.81	1.0886	5.01	3695
4/11/2000	13:58	47.53	12.76	359.07	0.388	1910	9236442	11.86	1.0889	5.01	3620
4/11/2000	13:59	47.31	12.75	354.99	0.394	1910	9178458	11.76	1.0894	5.00	3656
4/11/2000	14:00	47.59	12.67	353.20	0.396	1910	9178718	11.81	1.0898	5.00	3614
4/11/2000	14:01	47.48				1910	9060140	11.88	1.0899	5.00	3564
4/11/2000	14:02	47.32				1910	9057926	11.76	1.0899	4.99	3574
4/11/2000	14:03	47.34				1910	8983506	11.87	1.0898	4.99	3680
4/11/2000	14:04	47.36				1910	8975727	11.76	1.0897	4.99	3726
4/11/2000	14:05	47.35				1910	9011142	11.70	1.0895	4.98	3585
4/11/2000	14:06	47.28				1910	9030228	11.81	1.0891	4.98	3643
4/11/2000	14:07	47.41				1910	9070803	11.91	1.0887	4.98	3648
4/11/2000	14:08	47.44	12.76	345.32	0.384	1910	9080080	12.05	1.0887	4.97	3640
4/11/2000	14:09	47.55	12.90	375.59	0.373	1910	9126746	11.96	1.0888	4.97	3703
4/11/2000	14:10	47.27	12.87	380.82	0.397	1910	9228314	12.22	1.0887	4.97	3668
4/11/2000	14:11	47.09	12.75	365.42	0.401	1910	9230270	12.11	1.0884	4.98	3623
4/11/2000	14:12	46.96	12.67	349.03	0.379	1910	9233563	12.10	1.0882	4.98	3694
4/11/2000	14:13	47.05	12.61	339.98	0.378	1910	9233911	11.94	1.0882	4.98	3689
4/11/2000	14:14	47.24	12.57	334.98	0.372	1910	9244103	11.88	1.0883	4.99	3677
4/11/2000	14:15	47.24	12.52	334.40	0.368	1910	9244966	11.92	1.0884	4.99	3619
4/11/2000	14:16	47.30	12.75	340.82	0.361	1910	9177752	12.01	1.0885	5.00	3677
4/11/2000	14:17	47.37	12.75	339.96	0.357	1910	9162665	11.96	1.0886	5.00	3687
4/11/2000	14:18	47.30	12.70	331.99	0.356	1910	9174476	11.83	1.0882	5.00	3648
4/11/2000	14:19	47.24	12.66	328.08	0.351	1910	9183953	11.85	1.0886	5.01	3639
4/11/2000	14:20	47.02	12.66	323.47	0.350	1910	9144337	11.94	1.0892	5.01	3722
4/11/2000	14:21	47.26	12.68	319.71	0.347	1910	9101754	11.89	1.0893	5.02	3711
4/11/2000	14:22	47.39	12.79	321.16	0.338	1910	9095895	11.89	1.0894	5.02	3643
4/11/2000	14:23	47.48	12.84	317.78	0.336	1910	9063949	11.85	1.0894	5.02	3635
4/11/2000	14:24	47.55	12.82	315.46	0.335	1910	9057859	11.93	1.0894	5.03	3610
4/11/2000	14:25	47.54	12.84	317.46	0.336	1910	9025124	11.85	1.0894	5.03	3720
4/11/2000	14:26	47.52	12.81	320.30	0.339	1910	9024971	11.84	1.0894	5.04	3597
4/11/2000	14:27	47.47	12.68	319.95	0.342	1910	9065504	11.99	1.0887	5.04	3651
4/11/2000	14:28	47.56	12.74	324.22	0.342	1910	9080137	11.94	1.0887	5.04	3635
4/11/2000	14:29	47.56	12.81	330.57	0.343	1910	9139185	11.94	1.0891	5.05	3634
4/11/2000	14:30	47.57	12.83	335.99	0.339	1910	9145510	11.76	1.0894	5.05	3683
4/11/2000	14:31	47.44	12.77	338.76	0.342	1910	9208897	12.01	1.0898	5.05	3657
4/11/2000	14:32	47.57	12.78	344.21	0.345	1910	9310621	11.89	1.0901	5.05	3575
4/11/2000	14:33	47.33	12.82	347.17	0.346	1910	9295470	11.90	1.0902	5.05	3576
4/11/2000	14:34	47.33	12.78	346.87	0.347	1910	9283354	12.15	1.0902	5.05	3591
4/11/2000	14:35	47.22	12.81	355.20	0.350	1910	9283488	12.07	1.0917	5.04	3629
4/11/2000	14:36	47.14	12.90	378.31	0.369	1910	9283272	12.33	1.0920	5.04	3626
4/11/2000	14:37	47.12	12.73	355.35	0.358	1910	9283308	11.87	1.0898	4.99	3680
4/11/2000	14:38	47.15	12.60	340.15	0.343	1910	9086828	11.76	1.0897	4.99	3726
4/11/2000	14:39	47.21	12.62	341.16	0.345	1910	9122220	11.70	1.0895	4.98	3585
4/11/2000	14:40	47.19	12.64	344.01	0.346	1910	9189721	11.81	1.0891	4.98	3643
4/11/2000	14:41	47.21	12.71	341.75	0.344	1910	9153707	11.91	1.0887	4.98	3648
4/11/2000	14:42	47.31	12.71	339.46	0.349	1910	9113120	12.05	1.0887	4.97	3640
4/11/2000	14:43	47.28	12.68	338.89	0.349	1910	9121996	11.96	1.0888	4.97	3703
4/11/2000	14:44	47.47	12.71	342.07	0.350	1910	9178531	12.22	1.0887	4.97	3668
4/11/2000	14:45	47.49	12.78	344.20	0.347	1910	9183327	12.11	1.0884	4.98	3623
4/11/2000	14:46	47.54	12.87	350.23	0.340	1910	9200616	12.10	1.0882	4.98	3694
4/11/2000	14:47	47.36	12.80	349.77	0.345	1910	9200662	11.94	1.0882	4.98	3689
4/11/2000	14:48	47.39	12.80	349.92	0.346	1910	9204787	11.88	1.0883	4.99	3677
4/11/2000	14:49	47.41	12.72	349.65	0.344	1910	9206042	11.92	1.0884	4.99	3619
4/11/2000	14:50	47.42	12.80	353.49	0.342	1910	9162792	12.01	1.0885	5.00	3677
4/11/2000	14:51	47.34	12.86	355.87	0.341	1910	9146195	11.96	1.0886	5.00	3687
4/11/2000	14:52	47.42	12.83	358.19	0.344	1910	9115765	11.83	1.0882	5.00	3648
4/11/2000	14:53	47.27	12.81	360.53	0.344	1910	9091129	11.85	1.0886	5.01	3639
4/11/2000	14:54	47.31	12.73	360.88	0.348	1910	9142231	11.94	1.0892	5.01	3722
4/11/2000	14:55	47.31	12.72	361.16	0.347	1910	9184124	11.89	1.0893	5.02	3711
4/11/2000	14:56	47.31	12.80	366.86	0.343	1910	9215810	11.89	1.0894	5.02	3643
4/11/2000	14:57	47.37	12.81	375.14	0.345	1910	9420441	11.85	1.0894	5.02	3635
4/11/2000	14:58	47.31	12.78	372.78	0.343	1910	9395847	11.93	1.0894	5.03	3610
4/11/2000	14:59	47.27	12.77	371.10	0.339	1910	9338019	11.85	1.0894	5.03	3720
4/11/2000	15:00	47.27	12.71	367.49	0.346	1910	9337249	11.84	1.0894	5.04	3597
4/11/2000	15:01	47.39				1910	9305564	11.99	1.0887	5.04	3651
4/11/2000	15:02	47.25				1910	9299961	11.94	1.0887	5.04	3635
4/11/2000	15:03	47.23				1910	9140469	11.94	1.0891	5.05	3634

Test Run #2											
Date	Time CST	LOADMW MW	CO2C PERCENT	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	FUELFACT SCF/CMM	FLOWSCFH SCFH	DIFFERENTI PRESSURE IWC	SLURRY DENSITY SGU	SLURRY PH	TOTAL SLURRY FLOW GPM
4/11/2000	15:04	47.14				1910	9140195	11.76	1.0894	5.05	3683
4/11/2000	15:05	47.15				1910	9174832	12.01	1.0898	5.05	3657
4/11/2000	15:06	47.26				1910	9189501	11.89	1.0901	5.05	3575
4/11/2000	15:07	47.10				1910	9232331	11.90	1.0902	5.05	3576
4/11/2000	15:08	47.01	12.64	341.34	0.355	1910	9250421	12.15	1.0902	5.05	3591
4/11/2000	15:09	46.90	12.65	334.69	0.356	1910	9236394	12.07	1.0917	5.04	3629
4/11/2000	15:10	47.00	12.61	326.48	0.357	1910	9211653	12.33	1.0920	5.04	3626
4/11/2000	15:11	47.00	12.68	328.45	0.354	1910	9189811	12.08	1.0917	5.04	3608
4/11/2000	15:12	46.90	12.70	328.27	0.349	1910	9151238	11.95	1.0914	5.04	3571
4/11/2000	15:13	46.91	12.64	325.99	0.348	1910	9151436	11.85	1.0910	5.03	3646
4/11/2000	15:14	46.97	12.75	321.90	0.349	1910	9032176	11.95	1.0906	5.03	3530
4/11/2000	15:15	47.05	12.84	322.06	0.342	1910	9027995	11.84	1.0902	5.03	3543
4/11/2000	15:16	47.17	12.86	328.15	0.338	1910	9135029	11.83	1.0897	5.03	3586
4/11/2000	15:17	47.19	12.89	330.43	0.333	1910	9134703	11.85	1.0886	5.03	3624
4/11/2000	15:18	47.12	12.87	332.76	0.332	1910	9208249	11.98	1.0874	5.02	3609
4/11/2000	15:19	47.30	12.89	337.35	0.330	1910	9228559	11.72	1.0867	5.02	3717
4/11/2000	15:20	47.36	12.89	341.38	0.329	1910	9296866	11.91	1.0862	5.02	3644
4/11/2000	15:21	47.41	12.82	341.77	0.337	1910	9315902	11.80	1.0857	5.02	3648
4/11/2000	15:22	47.46	12.78	340.85	0.340	1910	9311587	11.90	1.0858	5.01	3674
4/11/2000	15:23	47.48	12.78	343.10	0.342	1910	9305574	11.87	1.0855	5.01	3598
4/11/2000	15:24	47.57	12.68	343.06	0.342	1910	9305192	11.84	1.0851	5.01	3701
4/11/2000	15:25	47.55	12.78	350.32	0.347	1910	9305427	11.79	1.0847	5.01	3651
4/11/2000	15:26	47.49	12.82	352.07	0.352	1910	9285948	11.78	1.0847	5.00	3693
4/11/2000	15:27	47.40	12.82	348.51	0.354	1910	9140374	11.78	1.0848	5.00	3711
4/11/2000	15:28	47.46	12.76	347.60	0.361	1910	9124047	11.80	1.0850	5.00	3614
4/11/2000	15:29	47.16	12.62	341.77	0.376	1910	9058006	11.83	1.0857	5.00	3666
4/11/2000	15:30	47.34	12.67	341.77	0.379	1910	9058021	11.81	1.0859	5.00	3616
4/11/2000	15:31	47.28	12.71	341.99	0.381	1910	9024190	11.78	1.0858	4.99	3671
4/11/2000	15:32	47.26	12.71	341.38	0.383	1910	9008435	11.90	1.0857	4.99	3580
4/11/2000	15:33	47.32	12.79	350.60	0.374	1910	9146915	11.78	1.0863	4.99	3612
4/11/2000	15:34	47.28	12.81	349.01	0.378	1910	9157181	11.88	1.0861	4.99	3719
4/11/2000	15:35	47.23	12.67	343.34	0.385	1910	9167862	11.77	1.0858	4.98	3665
4/11/2000	15:36	47.18	12.66	345.58	0.388	1910	9178723	11.77	1.0865	4.98	3658
4/11/2000	15:37	47.39	12.71	349.64	0.393	1910	9233909	11.87	1.0875	4.98	3624
4/11/2000	15:38	47.40	12.81	357.89	0.385	1910	9288594	11.87	1.0875	4.98	3670
4/11/2000	15:39	47.45	12.86	361.83	0.383	1910	9290875	12.00	1.0872	4.98	3625
4/11/2000	15:40	47.51	12.86	366.50	0.382	1910	9299718	12.13	1.0870	4.98	3692
4/11/2000	15:41	47.56	12.86	367.73	0.383	1910	9292053	11.83	1.0868	4.99	3620
4/11/2000	15:42	47.40	12.79	365.90	0.392	1910	9277490	11.83	1.0866	4.99	3594
4/11/2000	15:43	47.43	12.77	366.05	0.391	1910	9277395	11.60	1.0863	5.00	3666
4/11/2000	15:44	47.53	12.80	363.27	0.391	1910	9140541	11.65	1.0861	5.00	3664
4/11/2000	15:45	47.37	12.75	361.60	0.393	1910	9140615	11.67	1.0859	5.01	3669
4/11/2000	15:46	47.33	12.71	359.07	0.398	1910	9189487	11.78	1.0862	5.01	3682
4/11/2000	15:47	47.39	12.59	353.43	0.395	1910	9189450	11.87	1.0859	5.02	3615
4/11/2000	15:48	47.24	12.63	354.47	0.400	1910	9248295	11.81	1.0854	5.02	3588
4/11/2000	15:49	47.21	12.67	353.46	0.398	1910	9277551	11.83	1.0849	5.03	3614
4/11/2000	15:50	47.19	12.69	350.29	0.396	1910	9295734	11.84	1.0844	5.03	3575
4/11/2000	15:51	47.10	12.68	347.05	0.396	1910	9299896	11.70	1.0845	5.04	3682
4/11/2000	15:52	47.10	12.67	341.45	0.398	1910	9228158	11.76	1.0848	5.04	3671
4/11/2000	15:53	47.13	12.69	337.76	0.399	1910	9157038	11.75	1.0851	5.05	3726
4/11/2000	15:54	47.09	12.71	330.01	0.398	1910	9060886	11.95	1.0854	5.05	3672
4/11/2000	15:55	47.08	12.70	323.38	0.393	1910	8964772	11.96	1.0857	5.05	3657
4/11/2000	15:56	47.08	12.70	323.23	0.392	1910	8964603	11.92	1.0854	5.05	3595
4/11/2000	15:57	47.07	12.63	318.03	0.392	1910	8965128	11.81	1.0851	5.05	3598
4/11/2000	15:58	47.19	12.64	317.00	0.391	1910	8973856	11.94	1.0853	5.05	3605
4/11/2000	15:59	47.27	12.79	318.12	0.384	1910	8992569	11.92	1.0857	5.04	3625
4/11/2000	16:00	47.28	12.79	318.98	0.382	1910	8991944	12.00	1.0860	5.04	3620
Averages Test #2		47.39	12.75	345.87	0.363	1910	9176042	11.91	1.09	5.00	3643.66

Test Run #3											
Date	Time CST	LOADMW MW	CO2C PERCENT	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	FUELFACT SCF/CMM	FLOWSCFH SCFH	DIFFERENTIAL PRESSURE PDI540	SLURRY DENSITY DI542	SLURRY PH AI542	TOTAL SLURRY FLOW
4/11/2000	15:58	47.19	12.64	317.00	0.391	1910	8973856	11.98	1.0866	5.01	3606
4/11/2000	15:59	47.27	12.79	318.12	0.384	1910	8992569	11.93	1.0877	5.01	3613
4/11/2000	16:00	47.28	12.79	318.98	0.382	1910	8991944	11.87	1.0877	5.01	3684
4/11/2000	16:01	47.42				1910	9115448	12.03	1.0874	5.02	3627
4/11/2000	16:02	47.33				1910	9129415	11.95	1.0872	5.02	3592
4/11/2000	16:03	47.30				1910	9208402	11.93	1.0879	5.02	3660
4/11/2000	16:04	47.24				1910	9216916	11.96	1.0876	5.02	3613
4/11/2000	16:05	47.27				1910	9251255	11.89	1.0873	5.03	3685
4/11/2000	16:06	47.22				1910	9277723	11.85	1.0869	5.03	3590
4/11/2000	16:07	47.25				1910	9324065	12.06	1.0865	5.03	3603
4/11/2000	16:08	47.07	12.75	339.60	0.389	1910	9349547	11.90	1.0861	5.03	3673
4/11/2000	16:09	47.07	12.79	340.71	0.386	1910	9304210	11.92	1.0855	5.03	3631
4/11/2000	16:10	47.03	12.62	335.42	0.389	1910	9255980	11.89	1.0857	5.03	3596
4/11/2000	16:11	46.99	12.66	336.28	0.388	1910	9225158	11.86	1.0859	5.03	3645
4/11/2000	16:12	46.87	12.69	339.33	0.387	1910	9178730	11.99	1.0862	5.03	3593
4/11/2000	16:13	47.10	12.78	345.73	0.377	1910	9178528	12.08	1.0864	5.02	3593
4/11/2000	16:14	47.15	12.85	344.21	0.370	1910	9035402	12.05	1.0867	5.02	3659
4/11/2000	16:15	47.18	12.82	348.04	0.369	1910	9044899	11.99	1.0869	5.02	3642
4/11/2000	16:16	47.28	12.80	351.90	0.365	1910	9189376	11.91	1.0870	5.02	3638
4/11/2000	16:17	47.36	12.82	354.04	0.364	1910	9189420	12.05	1.0872	5.02	3660
4/11/2000	16:18	47.19	12.88	360.96	0.358	1910	9256757	11.94	1.0873	5.02	3695
4/11/2000	16:19	47.14	12.82	358.47	0.353	1910	9272171	11.95	1.0875	5.01	3633
4/11/2000	16:20	47.14	12.72	360.79	0.360	1910	9413285	11.98	1.0876	5.01	3619
4/11/2000	16:21	46.99	12.69	363.10	0.358	1910	9464621	11.90	1.0881	5.01	3634
4/11/2000	16:22	47.03	12.65	360.46	0.349	1910	9387644	11.98	1.0886	5.01	3598
4/11/2000	16:23	47.03	12.67	360.67	0.347	1910	9305436	11.90	1.0879	5.01	3708
4/11/2000	16:24	47.11	12.81	363.38	0.340	1910	9327258	11.95	1.0872	5.00	3661
4/11/2000	16:25	47.12	12.81	365.76	0.339	1910	9359785	11.93	1.0873	5.00	3586
4/11/2000	16:26	47.24	12.86	368.47	0.332	1910	9345954	11.92	1.0873	5.00	3656
4/11/2000	16:27	47.36	12.83	362.33	0.341	1910	9299844	11.98	1.0874	5.00	3656
4/11/2000	16:28	47.27	12.83	362.06	0.337	1910	9317197	11.96	1.0871	5.00	3590
4/11/2000	16:29	47.47	12.94	362.34	0.334	1910	9343618	11.82	1.0881	4.99	3615
4/11/2000	16:30	47.46	12.91	357.53	0.336	1910	9340334	12.09	1.0875	5.00	3636
4/11/2000	16:31	47.38	12.86	349.96	0.341	1910	9283215	11.94	1.0870	5.00	3677
4/11/2000	16:32	47.46	12.85	349.04	0.341	1910	9271388	11.81	1.0868	5.00	3606
4/11/2000	16:33	47.43	12.82	345.58	0.343	1910	9228486	11.93	1.0867	5.00	3651
4/11/2000	16:34	47.12	12.66	340.68	0.344	1910	9228363	11.99	1.0866	5.00	3659
4/11/2000	16:35	47.14	12.64	336.74	0.355	1910	9183227	12.02	1.0872	5.00	3588
4/11/2000	16:36	47.06	12.78	334.57	0.350	1910	9157126	11.84	1.0866	5.00	3577
4/11/2000	16:37	47.06	12.75	328.79	0.349	1910	9098234	12.00	1.0861	5.01	3598
4/11/2000	16:38	47.00	12.80	330.21	0.348	1910	9074810	11.82	1.0862	5.01	3692
4/11/2000	16:39	47.11	12.82	327.49	0.347	1910	9029216	11.80	1.0864	5.01	3636
4/11/2000	16:40	47.01	12.78	320.03	0.348	1910	8992302	11.90	1.0866	5.01	3563
4/11/2000	16:41	47.28	12.80	320.09	0.347	1910	8976853	12.00	1.0868	5.01	3644
4/11/2000	16:42	47.18	12.90	322.31	0.342	1910	8964483	11.92	1.0868	5.01	3608
4/11/2000	16:43	47.24	12.86	324.26	0.341	1910	8981349	12.01	1.0867	5.02	3663
4/11/2000	16:44	47.29	12.92	330.66	0.338	1910	9041544	11.86	1.0880	5.02	3638
4/11/2000	16:45	47.56	12.88	335.89	0.339	1910	9085816	11.90	1.0877	5.02	3650
4/11/2000	16:46	47.60	12.86	340.34	0.336	1910	9156946	11.98	1.0874	5.02	3596
4/11/2000	16:47	47.65	12.72	341.10	0.339	1910	9157008	11.91	1.0871	5.02	3652
4/11/2000	16:48	47.31	12.80	347.40	0.345	1910	9321562	12.04	1.0872	5.02	3603
4/11/2000	16:49	47.33	12.82	352.32	0.347	1910	9321260	12.00	1.0874	5.02	3628
4/11/2000	16:50	47.13	12.81	351.02	0.347	1910	9299196	12.06	1.0876	5.02	3597
4/11/2000	16:51	47.30	12.77	349.21	0.345	1910	9299723	12.12	1.0878	5.02	3590
4/11/2000	16:52	47.31	12.82	360.17	0.346	1910	9299939	12.26	1.0880	5.02	3646
4/11/2000	16:53	47.61	12.86	373.60	0.343	1910	9299605	12.11	1.0882	5.02	3621
4/11/2000	16:54	47.66	12.82	363.88	0.345	1910	9163679	11.92	1.0884	5.02	3611
4/11/2000	16:55	47.36	12.77	368.89	0.345	1910	9129911	11.94	1.0886	5.02	3662
4/11/2000	16:56	47.20	12.64	369.61	0.363	1910	9177993	11.89	1.0871	5.02	3645
4/11/2000	16:57	46.84	12.37	364.60	0.378	1910	9217364	11.89	1.0869	5.02	3632
4/11/2000	16:58	46.64	12.17	359.81	0.389	1910	9168657	11.62	1.0867	5.02	3640

Test Run #3											
Date	Time CST	LOADMW MW	CO2C PERCENT	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	FUELFACT SCF/CMM	FLOWSCFH SCFH	DIFFERENTIAL PRESSURE PDI540	SLURRY DENSITY DI542	SLURRY PH AI542	TOTAL SLURRY FLOW
4/11/2000	16:59	46.39	12.24	348.05	0.388	1910	9140417	12.34	1.0880	5.02	3616
4/11/2000	17:00	46.29	12.38	349.04	0.389	1910	9161858	12.22	1.0877	5.02	3645
4/11/2000	17:01	46.18				1910	9245049	12.27	1.0875	5.02	3670
4/11/2000	17:02	46.26				1910	9245137	12.11	1.0872	5.02	3625
4/11/2000	17:03	46.53				1910	9245014	12.23	1.0869	5.02	3586
4/11/2000	17:04	46.49				1910	9344402	12.19	1.0871	5.02	3609
4/11/2000	17:05	46.59				1910	9387404	11.98	1.0873	5.01	3619
4/11/2000	17:06	46.79				1910	9344621	12.13	1.0885	5.01	3602
4/11/2000	17:07	46.96				1910	9332554	11.98	1.0896	5.01	3663
4/11/2000	17:08	47.07	12.57	352.20	0.352	1910	9318322	12.14	1.0892	5.01	3618
4/11/2000	17:09	47.22	12.62	359.62	0.351	1910	9261930	11.93	1.0889	5.01	3603
4/11/2000	17:10	47.07	12.53	357.62	0.353	1910	9246421	12.13	1.0885	5.01	3604
4/11/2000	17:11	46.81	12.58	352.78	0.356	1910	9184417	12.14	1.0881	5.01	3715
4/11/2000	17:12	46.88	12.59	355.47	0.354	1910	9266247	11.69	1.0888	5.01	3691
4/11/2000	17:13	47.10	12.59	350.80	0.359	1910	9288747	11.65	1.0894	5.01	3653
4/11/2000	17:14	47.27	12.59	344.52	0.359	1910	9223982	12.25	1.0892	5.01	3602
4/11/2000	17:15	47.39	12.66	347.58	0.355	1910	9223936	12.04	1.0889	5.01	3653
4/11/2000	17:16	47.30	12.81	357.00	0.351	1910	9294355	12.02	1.0886	5.01	3628
4/11/2000	17:17	47.35	12.77	355.74	0.354	1910	9244739	11.90	1.0886	5.01	3637
4/11/2000	17:18	47.34	12.74	346.77	0.353	1910	9047039	11.83	1.0887	5.01	3650
4/11/2000	17:19	47.44	12.68	346.02	0.354	1910	9051201	11.92	1.0887	5.01	3588
4/11/2000	17:20	47.50	12.75	354.71	0.350	1910	9162700	11.91	1.0887	5.01	3606
4/11/2000	17:21	47.45	12.77	356.38	0.346	1910	9155355	11.84	1.0886	5.01	3690
4/11/2000	17:22	47.40	12.58	342.61	0.353	1910	8954081	11.97	1.0886	5.01	3726
4/11/2000	17:23	47.42	12.68	347.66	0.357	1910	8954020	11.76	1.0885	5.01	3675
4/11/2000	17:24	47.34	12.74	351.99	0.364	1910	9049839	11.74	1.0885	5.01	3578
4/11/2000	17:25	47.11	12.73	354.19	0.367	1910	9091130	11.80	1.0886	5.01	3570
4/11/2000	17:26	47.15	12.75	352.02	0.372	1910	9043187	12.11	1.0888	5.01	3655
4/11/2000	17:27	47.05	12.72	348.59	0.374	1910	9035734	11.78	1.0880	5.01	3689
4/11/2000	17:28	46.89	12.77	346.84	0.373	1910	9040999	11.78	1.0891	5.00	3603
4/11/2000	17:29	46.95	12.74	341.51	0.378	1910	9047272	11.84	1.0901	5.00	3669
4/11/2000	17:30	47.04	12.73	332.64	0.381	1910	8986336	11.72	1.0895	5.00	3645
4/11/2000	17:31	47.09	12.74	331.39	0.384	1910	8948338	11.78	1.0895	5.01	3569
4/11/2000	17:32	47.08	12.77	329.98	0.380	1910	8938311	11.71	1.0895	5.01	3570
4/11/2000	17:33	47.16	12.74	327.06	0.382	1910	8899363	11.76	1.0896	5.01	3607
4/11/2000	17:34	47.25	12.60	321.60	0.384	1910	8887017	11.85	1.0896	5.01	3647
4/11/2000	17:35	47.19	12.76	323.56	0.383	1910	8871555	11.92	1.0891	5.01	3679
4/11/2000	17:36	47.20	12.80	324.01	0.379	1910	8871614	11.87	1.0888	5.02	3666
4/11/2000	17:37	47.05	12.79	325.50	0.381	1910	9006593	11.82	1.0894	5.02	3637
4/11/2000	17:38	47.11	12.77	320.93	0.384	1910	9013434	11.84	1.0892	5.02	3593
4/11/2000	17:39	47.09	12.74	316.73	0.390	1910	8983169	11.92	1.0889	5.02	3596
4/11/2000	17:40	47.27	12.75	313.97	0.391	1910	8981070	11.88	1.0887	5.03	3652
4/11/2000	17:41	47.19	12.69	314.37	0.393	1910	9130605	11.70	1.0884	5.03	3705
4/11/2000	17:42	47.18	12.81	317.03	0.385	1910	9195133	11.83	1.0882	5.03	3725
4/11/2000	17:43	47.26	12.78	318.09	0.388	1910	9216905	11.83	1.0882	5.03	3665
4/11/2000	17:44	47.23	12.78	320.14	0.386	1910	9223251	11.79	1.0882	5.04	3611
4/11/2000	17:45	47.17	12.77	325.44	0.382	1910	9287274	11.81	1.0882	5.04	3581
4/11/2000	17:46	47.13	12.69	332.22	0.382	1910	9365458	11.96	1.0883	5.04	3601
4/11/2000	17:47	47.12	12.76	334.48	0.387	1910	9293879	11.83	1.0893	5.04	3602
4/11/2000	17:48	47.11	12.70	332.54	0.395	1910	9206433	11.91	1.0895	5.04	3569
4/11/2000	17:49	47.10	12.70	333.15	0.394	1910	9206235	11.94	1.0895	5.05	3575
4/11/2000	17:50	47.05	12.71	333.81	0.392	1910	9128009	11.95	1.0887	5.05	3606
4/11/2000	17:51	47.16	12.74	337.15	0.395	1910	9123804	11.93	1.0893	5.04	3604
4/11/2000	17:52	47.08	12.71	338.09	0.393	1910	9129183	11.87	1.0900	5.04	3585
4/11/2000	17:53	47.31	12.67	339.19	0.393	1910	9129551	11.76	1.0900	5.04	3590
4/11/2000	17:54	47.02	12.72	342.04	0.392	1910	9109416	11.96	1.0900	5.04	3534
4/11/2000	17:55	47.05	12.70	341.74	0.396	1910	9096533	11.96	1.0897	5.04	3576
4/11/2000	17:56	47.18	12.61	340.73	0.398	1910	9147027	11.97	1.0893	5.04	3584
4/11/2000	17:57	47.02	12.53	339.94	0.398	1910	9178905	11.78	1.0897	5.03	3571
4/11/2000	17:58	46.96	12.56	343.13	0.395	1910	9126387	11.88	1.0900	5.03	3652
4/11/2000	17:59	47.12	12.65	341.84	0.394	1910	9035979	11.80	1.0903	5.03	3695

Test Run #3	DIFFERENTIAL	SLURRY	SLURRY	TOTAL

Date	Time CST	LOADMW MW	CO2C PERCENT	SO2LB/HR LB/HR	NOXLB/MM LB/MMBTU	FUELFACT SCF/CMM	FLOWSCFH SCFH	PRESSURE PDI540	DENSITY DI542	PH AI542	SLURRY FLOW
4/11/2000	18:00	47.13	12.69	343.96	0.388	1910	9008530	11.68	1.0905	5.03	3615
4/11/2000	18:01	47.09				1910	8959180	11.86	1.0898	5.03	3610
4/11/2000	18:02	47.21				1910	8957515	11.85	1.0891	5.03	3680
4/11/2000	18:03	47.24				1910	8865764	11.90	1.0888	5.02	3633
4/11/2000	18:04	47.23				1910	8864742	11.96	1.0885	5.02	3575
4/11/2000	18:05	47.08				1910	8805322	11.93	1.0877	5.02	3637
4/11/2000	18:06	47.16				1910	8805548	11.96	1.0880	5.02	3628
4/11/2000	18:07	47.09				1910	8893797	11.91	1.0883	5.02	3623
4/11/2000	18:08	47.13	12.68	343.45	0.390	1910	8975633	11.95	1.0886	5.02	3670
4/11/2000	18:09	47.21	12.62	347.97	0.390	1910	9114362	11.93	1.0889	5.01	3653
4/11/2000	18:10	47.25	12.68	353.96	0.385	1910	9178869	11.84	1.0891	5.01	3646
4/11/2000	18:11	47.32	12.77	357.93	0.382	1910	9194704	11.87	1.0883	5.01	3662
4/11/2000	18:12	47.25	12.80	362.58	0.380	1910	9266822	11.83	1.0884	5.01	3591
4/11/2000	18:13	47.10	12.78	363.09	0.378	1910	9228831	11.69	1.0885	5.01	3531
4/11/2000	18:14	47.11	12.75	356.99	0.380	1910	9123856	11.88	1.0885	5.01	3530
4/11/2000	18:15	47.04	12.82	357.74	0.380	1910	9124017	11.92	1.0886	5.00	3638
4/11/2000	18:16	47.05	12.77	348.93	0.375	1910	8979496	11.87	1.0887	5.00	3674
4/11/2000	18:17	47.12	12.81	347.31	0.371	1910	8967548	11.93	1.0889	5.00	3705
4/11/2000	18:18	47.12	12.80	350.26	0.365	1910	9091034	11.95	1.0898	5.00	3649
4/11/2000	18:19	47.01	12.80	347.70	0.361	1910	9091117	12.11	1.0895	5.00	3546
4/11/2000	18:20	47.06	12.83	348.55	0.355	1910	9157081	12.08	1.0905	4.99	3577
4/11/2000	18:21	46.88	12.75	342.89	0.353	1910	9200974	12.04	1.0902	5.00	3608
4/11/2000	18:22	47.05	12.60	335.82	0.351	1910	9203992	12.12	1.0905	5.00	3602
4/11/2000	18:23	47.12	12.76	338.50	0.341	1910	9206492	12.04	1.0902	5.00	3570
4/11/2000	18:24	47.17	12.81	337.11	0.338	1910	9213714	12.03	1.0909	5.00	3574
4/11/2000	18:25	47.14	12.80	335.23	0.338	1910	9233897	12.05	1.0914	5.01	3649
4/11/2000	18:26	47.26	12.79	331.16	0.339	1910	9206059	12.01	1.0910	5.01	3663
4/11/2000	18:27	47.35	12.91	332.18	0.338	1910	9129375	11.90	1.0907	5.01	3561
4/11/2000	18:28	47.41	12.85	327.21	0.342	1910	9129698	11.96	1.0912	5.01	3564
4/11/2000	18:29	47.41	12.75	319.39	0.349	1910	9184265	11.98	1.0906	5.02	3658
4/11/2000	18:30	47.28	12.72	315.40	0.351	1910	9200701	11.99	1.0900	5.02	3646
4/11/2000	18:31	47.38	12.79	318.74	0.346	1910	9196150	12.05	1.0894	5.02	3616
4/11/2000	18:32	47.29	12.74	318.40	0.352	1910	9195053	12.06	1.0887	5.02	3607
4/11/2000	18:33	47.24	12.75	321.37	0.352	1910	9241417	11.85	1.0874	5.03	3624
4/11/2000	18:34	47.18	12.76	327.77	0.345	1910	9327418	12.08	1.0873	5.03	3617

Averages Test #3		47.15	12.74	342.48	0.365	1910	9155082	11.94	1.0883	5.02	3626

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_{1c} = 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

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

$\%CO_2$ 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

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

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

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. In 1

COMPANY: M-DU
PLANT: Lewis & Clark
TEST LOCATION: Inlet
CLIENT: R. Patzman
OPERATOR: S. Nelezen
DATE: 4-11-00
CONTROL BOX: 38758 POT. NO.:
METER NO.:
METER CALIBRATION FACTOR: Y = 1.002 alter = 1.849
PITOT ID NO.: 5-3
PITOT TUBE COEFFICIENT: 0.84
PORT LENGTH: 9" in.
PORT SIZE: 3 in.
PORT TYPE:

IMPINGER H_2O
FINAL: ml/gm
INITIAL: ml/gm
GAIN: ml/gm

SILICA GEL:
FINAL WT: gm
INITIAL WT: gm
WT. GAIN: gm

TOTAL H_2O COLLECTED:
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: 28.24
FLUE PRESSURE in. H_2O: +14
FLUE PRESSURE in. Hg ABS:
PROBE LENGTH: 5' ft.
PROBE LINER MATERIAL: Glass
NOZZLE IDENTIFICATION NO:
CALIBRATED NOZZLE DIAMETER: 0.275
LEAK CHECK: PRE: POST: @ in. Hg
DUCT SHAPE: Circular DIAMETER:
DUCT AREA: sq. ft. L W
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 120 min. min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 24
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 18.7
O_2: 4.5

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

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

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT M001501
TEST RUN NO. Inlet 1
TEST LOCATION Inlet

DATE 4-11-00 PAGE 1 OF 3

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes	Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
A6	0.40		0839	352.006	1.16	383	33	35		4	Pre Leak: 0.008@13	254	253	33
5	0.44		0844		1.27	387	36	35		4	Pitot: ok	248	264	32
4	0.43		0849		1.25	385	39	36		4	Post Leak: 0.010@15	251	259	33
3	0.48		0854		1.41	385	43	38		4		252	261	35
2	0.45		0859		1.33	384	46	38		4		249	265	36
1	0.46		0904		1.36	386	48	39		4		250	265	37
			0909	370.943										
B6	0.39		0922		1.15	381	43	44		3		254	242	41
5	0.40		0927		1.19	380	48	44		3		270	262	40
4	0.43		0932		1.29	380	51	45		4		241	269	41
3	0.44		0937		1.32	381	52	46		4		241	271	43
2	0.43		0942		1.30	379	53	46		4		241	273	44
1	0.42		0947		1.27	377	54	47		4		240	268	45
			0952	388.833										
C6	0.40		1012		1.19	382	47	49		4		269	250	44
5	0.46		1017		1.38	381	51	49		5		256	250	39
4	0.48		1022		1.44	382	53	49		5		244	255	39
3	0.48		1027		1.45	381	56	50		6		243	264	41
2	0.46		1032		1.40	382	59	51		7		240	264	42
1	0.49		1037		1.50	383	61	52		10		238	266	43
			1042	407.493							SWITCHED FILTERS			
D6	0.27		1107		0.82	381	54	54		10		250	245	42
5	0.24		1112		0.72	387	56	54		15		249	248	41
4	0.25		1117		0.76	383	56	54		15		242	245	41
3	0.26		1122		0.79	384	56	54		15		238	250	41
2	0.27		1127		0.82	384	57	55		15		240	241	43
1	0.25		1132		0.76	384	57	55		15		239	246	43
			1137	413.754										

Y = 4.939 ΔH@/ΔY

© [illegible]rdi-P[illegible]ociat[illegible]

Isokinetic Sampling Field Data Sheet

Project Number : M001501

Client: M-DH Lewis & Clark Test Date: 4-11-00

Sample Location: Inlet Run #: 1

Impinger #	Type	Contents	Tare (grams)	Final (grams)	Net (grams)
1	Modified G/S	100 ml 1N KCl	746.8	927.1	
2	Modified G/S	100 ml 1N KCl	726.7	749.2	
3	G/S	100 ml 1N KCl	735.5	740.5	
4	Modified G/S	100 ml 5%HNO3/10% H2O2	743.3	746.5	
5	Modified G/S	100 ml 4%KMnO4/10% H2SO4	733.0	733.3	
6	Modified G/S	100 ml 4%KMnO4/10% H2SO4	723.7	724.0	
7	G/S	100 ml 4%KMnO4/10% H2SO4	732.7	733.1	
8	Modified G/S	Silica Gel	864.1	873.8	

Orsat Analysis			
Run #	O2 (%vol)	CO2 (%vol)	N2 (%vol)
1			
2			
3			
Air Audit			

Recovery Comments:

1st Impinger cloudy
2nd " "
3rd " "

MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 1a 6f 2

COMPANY: M-DU
PLANT: Lewis & Clark
TEST LOCATION: 1a 6f
CLIENT: R. Patzman
OPERATOR: S. Nolezen
DATE: 4-11-00
CONTROL BOX: 38758 POT. NO.:
METER NO.:
METER CALIBRATION FACTOR: Y = 1.002 ΔHei = 1.849
PITOT ID NO.:
PITOT TUBE COEFFICIENT: ~~0.48~~ 0.84
PORT LENGTH: 9" in.
PORT SIZE: 4" in.
PORT TYPE:

IMPINGER H_2O
FINAL: ml/gm
INITIAL: ml/gm
GAIN: ml/gm
TOTAL H_2O COLLECTED:
DESCRIPTION OF IMPINGER H_2O:

SILICA GEL:
FINAL WT: gm
INITIAL WT: gm
WT. GAIN: gm

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

COMMENTS & NOTES

THIMBLE NO: TARE WT:
FILTER NO: TARE WT:
BAROMETRIC PRESSURE in. Hg: 28.29
FLUE PRESSURE in. H_2O: +14
FLUE PRESSURE in. Hg ABS:
PROBE LENGTH: 5' ft.
PROBE LINER MATERIAL: Glass
NOZZLE IDENTIFICATION NO:
CALIBRATED NOZZLE DIAMETER: ~~0.275~~ 0.221
LEAK CHECK: PRE: POST: @ in. Hg
DUCT SHAPE: Round DIAMETER:
DUCT AREA: sq. ft. L W
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 120 min min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 24
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 15.8
O_2: 4.4

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 M001501
TEST RUN NO. Inlet 2
TEST LOCATION Inlet

DATE 4-11-00 PAGE 1 OF 3

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes	Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
A6	0.39		1248	414.209	1.17	385	55	55		4	Pre Leak:	244	238	44
5	0.39		1253		1.17	391	57	55		4	Pitot:	242	236	41
4	0.44		1258		0.55	391	57	55		3	Post Leak: 2.012@12	236	252	41
3	0.46		1303		0.57	390	57	55		3		236	243	41
2	0.50		1308		0.62	392	58	56		3		241	245	42
1	0.49		1313		0.62	390	60	57		3		240	260	42
			1318	428.488										
B6	0.41		1331		0.51	387	56	56		3		241	248	46
5	0.46		1336		0.58	387	57	56		3		246	250	44
4	0.52		1341		0.65	388	58	56		4		239	266	44
3	0.52		1346		0.65	390	60	57		4		243	269	46
2	0.49		1351		0.62	386	60	56		4		241	272	45
1	0.50		1356		0.63	385	60	56		4		241	273	45
			1401	441.709										
C6	0.45		1413		0.56	387	56	57		4		292	246	45
5	0.44		1418		0.55	383	58	57		4		285	266	45
4	0.51		1423		0.64	382	60	57		4		305	251	44
3	0.50		1428		0.63	387	61	57		4		243	229	44
2	0.51		1433		0.64	388	60	57		4		244	264	45
1	0.52		1438		0.65	389	59	56		4		239	282	45
			1443	454.829										
D6	0.29		1455		0.36	383	56	56		4		243	222	45
5	0.30		15:00		0.38	390	60	59		4		241	223	46
4	0.29		15:05		0.36	393	62	57		8		238	255	46
3	0.30		15:10		0.39	393	63	58		10		243	250	46
2	0.29		15:15		0.36	394	63	59		12		242	257	46
1	0.28		15:20		0.35	394	63	59		12		241	262	46
			1525	463.628										

5min/pt

X = ~~4.939~~ 2.054

Form 1026 [Rev. 5/27]

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Isokinetic Sampling Field Data Sheet

Project Number : M001501

Client: M-DU Lewis & Clark

Test Date: 4-11-00

Sample Location: Inlet

Run #: 2

Impinger #	Type	Contents	Tare (grams)	Final (grams)	Net (grams)
1	Modified G/S	100 ml 1N KCl	734.3	885.3	
2	Modified G/S	100 ml 1N KCl	758.9	766.0	
3	G/S	100 ml 1N KCl	755.5	756.5	
4	Modified G/S	100 ml 5%HNO3/10% H2O2	728.9	731.9	
5	Modified G/S	100 ml 4%KMnO4/10% H2SO4	731.5	731.8	
6	Modified G/S	100 ml 4%KMnO4/10% H2SO4	724.5	725.2	
7	G/S	100 ml 4%KMnO4/10% H2SO4	743.7	743.9	
8	Modified G/S	Silica Gel	887.9	896.0	

Orsat Analysis			
Run #	O2 (%vol)	CO2 (%vol)	N2 (%vol)
1			
2			
3			
Air Audit			

Recovery Comments:

1+2 milky

MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. 1 of 3

COMPANY: M-DU
PLANT: Lewis & Clark
TEST LOCATION: Inlet
CLIENT: R. Patzman
OPERATOR: S. Nelezen
DATE: 4/11-00
CONTROL BOX: 38758 POT. NO.:
METER NO.:
METER CALIBRATION FACTOR: γ=1.002 $\Delta H_{@}$ = 1.849
PITOT ID NO.:
PITOT TUBE COEFFICIENT: 0.84
PORT LENGTH: 9" in.
PORT SIZE: in.
PORT TYPE:

IMPINGER H_2O
FINAL: ml/gm
INITIAL: ml/gm
GAIN: ml/gm

SILICA GEL:
FINAL WT: gm
INITIAL WT: gm
WT. GAIN: gm

TOTAL H_2O COLLECTED:
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: 28.24
FLUE PRESSURE in. H_2O: +14
FLUE PRESSURE in. Hg ABS:
PROBE LENGTH: 5' ft.
PROBE LINER MATERIAL: Glass
NOZZLE IDENTIFICATION NO:
CALIBRATED NOZZLE DIAMETER: 0.221
LEAK CHECK: PRE: POST: @ in. Hg
DUCT SHAPE: round DIAMETER:
DUCT AREA: sq. ft. L W
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 120 min min
MINUTES PER POINT: 5
TOTAL NUMBER OF TRAVERSE POINTS: 24
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 15.0
O_2: 4.0

PITOT LEAK CHECK: PRE POST
$\Delta H_{@}$
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 M001501
TEST RUN NO. Inlet 3
TEST LOCATION Inlet

DATE 4-11-00 PAGE 1 OF 3

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes	Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
A6	0.30		1800	464.105	0.38	393	60	68		4	Leak Rate I = 0.01012	241	254	44
5	0.31		1805		0.40	397	72	67		4	Post Leak: 0.004@11	242	255	44
4	0.30		1810		0.38	399	72	68		4		238	258	44
3	0.29		1815		0.37	398	72	68		4		243	265	44
2	0.31		1820		0.39	401	74	64		4		242	264	44
1	0.29		1825		0.37	401	75	69		4		240	246	45
			1830	475.349		399	68	67		4		232	271	45
B6	0.49		1641		0.62	399	68	67		4		241	263	45
5	0.51		1646		0.64	401	69	67		4		240	271	46
4	0.52		1651		0.65	403	69	66		4		235	264	47
3	0.51		1656		0.64	401	68	65		4		245	268	46
2	0.52		1701		0.66	400	64	65		5		242	269	46
1	0.50		1706		0.63	399	64	65		5		243	269	45
			1711	489.379										50
C6	0.41		1722		0.52	389	65	63		4		237	265	51
5	0.40		1727		0.51	390	66	63		4		239	248	46
4	0.45		1732		0.57	390	66	63		4		240	230	44
3	0.45		1737		0.57	391	66	62		3		239	232	44
2	0.44		1742		0.62	390	65	61		3		240	245	43
1	0.45		1747		0.57	389	65	61		3		239	261	44
			1752	502.468			62	58						
D6	0.41		1802		0.51	395	61	59		4		237	228	44
5	0.45		1807		0.56	394	61	58		4		240	235	44
4	0.50		1812		0.62	398	61	59		4		243	236	44
3	0.51		1817		0.64	397	66	58		4		238	244	43
2	0.50		1822		0.62	399	60	58		4		240	270	42
1	0.51		1827		0.63	402	61	58		3		246	253	44
			1832	515.350										

X = 2.054 5mm/pt

Form 1026 (Rev. 5/27)

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Isokinetic Sampling Field Data Sheet

Project Number : M001501

Client: M-DU

Test Date: 4-11-00

Sample Location: Inlet

Run #: 3

Impinger #	Type	Contents	Tare (grams)	Final (grams)	Net (grams)
1	Modified G/S	100 ml 1N KCl	732.6	890.2	
2	Modified G/S	100 ml 1N KCl	735.8	742.9	
3	G/S	100 ml 1N KCl	730.6	731.5	
4	Modified G/S	100 ml 5%HNO3/10% H2O2	742.6	745.3	
5	Modified G/S	100 ml 4%KMnO4/10% H2SO4	730.5	730.2	
6	Modified G/S	100 ml 4%KMnO4/10% H2SO4	726.8	727.5	
7	G/S	100 ml 4%KMnO4/10% H2SO4	732.5	733.3	
8	Modified G/S	Silica Gel	864.8	870.3	

Orsat Analysis			
Run #	O2 (%vol)	CO2 (%vol)	N2 (%vol)
1			
2			
3			
Air Audit			

Recovery Comments:

Isokinetic Sampling Fi . Data Sheet

Project Number : M. 01501

Client: M-DU L+C

Test Date: 4-12-00

Sample Location: Inlet

Run #: Inlet Blank

Impinger #	Type	Contents	Tare (grams)	Final (grams)	Net (grams)
1	Modified G/S	100 ml 1N KCl	734.7	734.6	
2	Modified G/S	100 ml 1N KCl	750.9	751.2	
3	G/S	100 ml 1N KCl	735.3	735.3	
4	Modified G/S	100 ml 5%HNO3/10% H2O2	732.5	732.5	
5	Modified G/S	100 ml 4%KMnO4/10% H2SO4	729.9	729.9	
6	Modified G/S	100 ml 4%KMnO4/10% H2SO4	622.8	622.8	
7	G/S	100 ml 4%KMnO4/10% H2SO4	732.4	732.4	
8	Modified G/S	Silica Gel	856.6	856.6	

Orsat Analysis			
Run #	O2 (%vol)	CO2 (%vol)	N2 (%vol)
1			
2			
3			
Air Audit			

Recovery Comments:

MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. Stack 1

COMPANY: Montana-Dakota Utilities (M-DU)
PLANT: Lewis & Clark
TEST LOCATION: Stack
CLIENT: R. Patzman
OPERATOR: D. Hillesherm
DATE: 4-11-00
CONTROL BOX: 38758 60573 POT. NO.:
METER NO.: 7-2
METER CALIBRATION FACTOR: ~~Y=1.002~~ 0.998 Y=1.715
PITOT ID NO.:
PITOT TUBE COEFFICIENT: 0.84
PORT LENGTH: 9" in.
PORT SIZE: in.
PORT TYPE:

IMPINGER H_2O
FINAL: ml/gm
INITIAL: ml/gm
GAIN: ml/gm

SILICA GEL:
FINAL WT: gm
INITIAL WT: gm
WT. GAIN: gm

TOTAL H_2O COLLECTED:
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: 28.24
FLUE PRESSURE in. H_2O: -0.5
FLUE PRESSURE in. Hg ABS:
PROBE LENGTH: ~~5'~~ 7' ft.
PROBE LINER MATERIAL: Glass
NOZZLE IDENTIFICATION NO:
CALIBRATED NOZZLE DIAMETER: 0.313
LEAK CHECK: PRE: POST: @ in. Hg
DUCT SHAPE: Circular DIAMETER:
DUCT AREA: sq. ft. L W
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 120 min
MINUTES PER POINT: 6
TOTAL NUMBER OF TRAVERSE POINTS: 20
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 15.4
O_2: 4.8

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

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

Form 1053 [Rev. 6/97]

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT M001501
TEST RUN NO. Stack 1
TEST LOCATION 1

DATE 4-11-00 PAGE 1 OF 3

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes	Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
A 5	0.04		08:39	22.563	0.442	140	33	32°		2	Leak Rate I = 0.016 @ 8	243	252	41
4	0.09		8:45		.444	140	35°	32°		2	~~Vm = 22.563~~	246	251	41
3	.09		8:51		.445	140	36°	34°		2		244	251	42
2	.07		8:57		.347	140	37°	35°		2		246	251	41
1	.07		9:03		.347	140	37°	35°		2		246	249	42
				33.258										
			9:18											
B 5	.1				.494	142	37°	35°		2		245	249	43
4	.09		9:24		.444	141	36	36°		2		247	246	43
3	.09		9:30		.446	140	37°	35		2		245	247	42
2	.09		9:36		.446	140	37°	36°		2		245	240	42
1	.08		9:42		.396	140	37	37°		2		244	247	43
				44.475										
C 5	.09		9:52		.447	139°	38°	37°		2		246	255	42
4	.09		9:58		.447	140°	38°	38°		2		249	247	41
3	.09		10:04		.446	141°	39°	38°		2.5		247	250	42
2	.08		10:10		.398	140	39°	39°		2.5		247	251	42
1	.08		10:16		.399	140	41	40°		2.5		246	250	43
				55.685										
D 5	.08		11:04		.403	140	46°	47		2		246	252	42
4	.08		11:10		.404	140	47°	47		2.5		235	251	42
3	.06		11:16		.305	139	49	48		2		245	252	42
2	.06		11:22		.304	141	50	49		2		244	254	44
1	.05		11:28		.255	139	51	50		2		254	258	44
				66.079										

X = 5.979 6 minutes/point

Final leak = 0.014 @ 8

Form 1026 (Rev. 5/27)

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Isokinetic Sampling Field Data Sheet

Project Number : M001501

Client: McDonnell Lewis & Clark Test Date: 4-11-00

Sample Location: Stack Run #: 1

Impinger #	Type	Contents	Tare (grams)	Final (grams)	Net (grams)
1	Modified G/S	100 ml 1N KCl	751.5	981.1	
2	Modified G/S	100 ml 1N KCl	733.7	733.7	
3	G/S	100 ml 1N KCl	736.7	736.5	
4	Modified G/S	100 ml 5%HNO3/10% H2O2	750.0	751.1	
5	Modified G/S	100 ml 4%KMnO4/10% H2SO4	722.4	722.0	
6	Modified G/S	100 ml 4%KMnO4/10% H2SO4	732.0	732.0	
7	G/S	100 ml 4%KMnO4/10% H2SO4	749.9	749.6	
8	Modified G/S	Silica Gel	855.8	860.9	

Orsat Analysis			
Run #	O2 (%vol)	CO2 (%vol)	N2 (%vol)
1			
2			
3			
Air Audit			

Recovery Comments:

Added Empty impinger between 3 & 4

Tare = 521.2 Final = 520.8

MOSTARDI-PLATT ASSOCIATES, INC.
TEST SUPPORT DATA

TEST RUN NO. Stack 2

COMPANY: M-DU
PLANT: Lewis & Clark
TEST LOCATION: Stack
CLIENT: R. Patzman
OPERATOR: D. Hillsherm
DATE: 4-11-00
CONTROL BOX: 38758 POT. NO.:
METER NO.:
METER CALIBRATION FACTOR: γ = 1.002 ΔHei = 1.849
PITOT ID NO.: 7-2
PITOT TUBE COEFFICIENT: 0.84
PORT LENGTH: in.
PORT SIZE: in.
PORT TYPE:

IMPINGER H_2O SILICA GEL:
FINAL: ml/gm FINAL WT: gm
INITIAL: ml/gm INITIAL WT: gm
GAIN: ml/gm WT. GAIN: gm
TOTAL H_2O COLLECTED:
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: 28.24
FLUE PRESSURE in. H_2O: +14
FLUE PRESSURE in. Hg ABS:
PROBE LENGTH: ~~5'~~ 7' ft.
PROBE LINER MATERIAL: Glass
NOZZLE IDENTIFICATION NO:
CALIBRATED NOZZLE DIAMETER: 0.313
LEAK CHECK: PRE: POST: @ in. Hg
DUCT SHAPE: Circular DIAMETER:
DUCT AREA: sq. ft. L W
DISTURBANCE UPSTREAM: DOWNSTREAM:
TEST LENGTH: 120 min min
MINUTES PER POINT: 6
TOTAL NUMBER OF TRAVERSE POINTS: 20
GAS ANALYSIS (ORSAT/FYRITE):
CO_2: 15.6
O_2: 4.7

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

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

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FIELD DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT M001501
TEST RUN NO. Stack 2
TEST LOCATION Stack

DATE 4-11-00 PAGE 1 OF 3

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes	Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
A 5	0.07		12:48	66.685	.356	140	50	50		1	leak: .004@ 8	248	249	46
4	0.07		12:54		.354	140	48	50		1		244	248	41
3	0.07		13:00		.355	139	48	49		1		246	242	44
2	0.07		13:06		.354	139	47	48		1		241	247	43
1	0.06		13:12		.304	139	47	48		1		246	259	43
			13:18	76.549										
B 5	0.09		13:25		0.455	140	47	47		1		248	274	44
4	0.09		13:31		0.46	140	48	48		1		247	250	47
3	0.09		13:37		.456	140	49	48		1		244	241	49
2	0.09		13:43		.453	142	47	47		1		241	245	48
1	0.08		13:49		.406	139	49	47		1		248	252	50
			13:55	87.702										
C 5	0.08		14:02		.407	139	50	50		1		240	256	60
4	0.08		14:08		.409	140	53	52		1		246	252	54
3	0.07		14:14		.358	139	53	52		1		245	246	54
2	0.07		14:20		.358	139	53	52		1		246	252	54
1	0.07		14:26		.358	139	53	52		1		243	251	56
			14:32	98.004										
D 5	0.07		14:51		.359	139	54	57		1		247	253	60
4	0.07		14:57		.357	141	53	56		1		248	258	55
3	0.06		15:03		.308	139	55	58		1		251	252	53
2	0.06		15:09		.308	140	55	58		1		245	254	53
1	0.06		15:15		.308	140	55	56		1		248	251	53
			15:21	107.882							Leak Rate .0006@ 6			

6 min/pt X= 5.979

Form 1026 [Rev. 5/27]

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Isokinetic Sampling Field Data Sheet

Project Number : M001501

Client: M-DU

Test Date: 4-11-00

Sample Location: Stack

Run #: 2

Impinger #	Type	Contents	Tare (grams)	Final (grams)	Net (grams)
1	Modified G/S	100 ml 1N KCl	724.8	937.3	
2	Modified G/S	100 ml 1N KCl	741.6	744.8	
3	G/S	100 ml 1N KCl	741.8	742.1	
4	Modified G/S	100 ml 5%HNO3/10% H2O2	736.4	737.1	
5	Modified G/S	100 ml 4%KMnO4/10% H2SO4	735.8	735.6	
6	Modified G/S	100 ml 4%KMnO4/10% H2SO4	736.4	735.7	
7	G/S	100 ml 4%KMnO4/10% H2SO4	733.9	734.4	
8	Modified G/S	Silica Gel	856.9	865.7	

Orsat Analysis			
Run #	O2 (%vol)	CO2 (%vol)	N2 (%vol)
1			
2			
3			
Air Audit			

Recovery Comments:

Added empty impinger between KCl & HNO_3/H_2O_2

Tare = 634.0 final = 634.2

MOSTARDI PLATT ASSOCIATES, INC.

TEST SUPPORT DATA

TEST RUN NO. Stack 3

COMPANY: M-DU

PLANT: Lewis & Clark

TEST LOCATION: Stack

CLIENT: R. Patzman

OPERATOR: D. Hollesherm

DATE: 4-11-00

CONTROL BOX: 80573 POT. NO.:

METER NO.:

METER CALIBRATION FACTOR: Y=0.998 ΔH@=1.715

PITOT ID NO.:

PITOT TUBE COEFFICIENT: 0.84

PORT LENGTH: in.

PORT SIZE: in.

PORT TYPE:

IMPINGER H_2O

FINAL: ml/gm

INITIAL: ml/gm

GAIN: ml/gm

SILICA GEL:

FINAL WT: gm

INITIAL WT: gm

WT. GAIN: gm

TOTAL H_2O COLLECTED:

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: 28.24

FLUE PRESSURE in. H_2O: -0.5

FLUE PRESSURE in. Hg ABS:

PROBE LENGTH: 7' ft.

PROBE LINER MATERIAL: Glass

NOZZLE IDENTIFICATION NO:

CALIBRATED NOZZLE DIAMETER: 0.313

LEAK CHECK: PRE: POST: @ in. Hg

DUCT SHAPE: round DIAMETER:

DUCT AREA: sq. ft. L W

DISTURBANCE UPSTREAM: DOWNSTREAM:

TEST LENGTH: 120 min min

MINUTES PER POINT: 6

TOTAL NUMBER OF TRAVERSE POINTS: 20

GAS ANALYSIS (ORSAT/FYRITE):

CO_2: 15.6

O_2: 4.7

PITOT LEAK CHECK: PRE POST

ΔH@

SAMPLES REMOVED FROM SITE BY:

For computer data entry: Supervisor, please complete.

Do you want to enter a fuel analysis? Y ☐ N ☐

What value do you want to use? F = 9,780 F_c = 1,800 Other =

Circle to indicate "Yes" or add other value if not given.

Form 1053 [Rev. 6/97]

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FIELD TEST DATA SHEET
FOR ISOKINETIC SAMPLING

MOSTARDI-PLATT ASSOCIATES, INC.

PROJECT M001501
TEST RUN NO. Stack 3
TEST LOCATION Stack

DATE 4-11-00 PAGE 1 OF 3

Port-Point No.	Velocity Head (P) in. H_2O	$\sqrt{P}$	Clock Time 24 hr.	Meter Volume (Vm) ft^3	Orifice (H) in. H_2O	Stack Temp (t_s) °F	Meter Temp. (t_m) Inlet °F	Meter Temp. (t_m) Outlet °F	Meter Rate cfm	Pump Vacuum in. Hg	Notes	Probe Temp. °F	Filter Holder Temp. °F	Impinger Outlet Temp. °F
A 5	0.08		15:58	108.172	.414	139	58°	59°		1	leak: .006@9	250	252	62
4	0.07		16:04		.361	139	56	58		1.5		253	252	51
3	0.07		16:10		.359	139	54	56		1.5		254	252	49
2	0.06		16:16		.307	139	53	54		1		245	252	50
1	0.06		16:22		.307	140	53	54°		1		244	252	52
			16:28	117.244										
B 5	0.08		16:36		.407	140	51	52		1.5		245	252	60
4	0.08		16:42		.407	140	51	52		2		250	252	51
3	0.07		16:48		.356	140	50	52		2		247	252	51
2	0.07		16:54		.356	140	50	52		2		246	253	51
1	0.08		17:00		0.41	140	50	49		2		246	252	52
			17:06	128.831										
C 5	0.08		17:12		.406	141	50	48		2		247	253	55
4	0.08		17:18		.406	141	50	50		2		249	252	46
3	0.08		17:24		.406	141	50	50		2		248	251	45
2	0.08		17:30		.407	140	50	51		2		246	254	46
1	0.07		17:36		.354	141	48	49		2		250	252	47
			17:42	139.802										
D 5	0.07		17:56		.425	140	48	49		2		240	243	53
4	0.07		18:02		.354	139	47	49		2		243	245	45
3	0.07		18:08		.354	139	47	48		2		251	243	44
2	0.07		18:14		.354	139	47	49		2		241	242	44
1	0.06		18:20		.303	140	46	47		2		244	258	45
			18:26	150.0025							leak: .006 @ 10			

X = 5.979 6 mm/pt

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Isokinetic Sampling Field Data Sheet

Project Number : 1100150/

Client: M-DU

Test Date: 4-11-00

Sample Location: Stack

Run #: 3

Impinger #	Type	Contents	Tare (grams)	Final (grams)	Net (grams)
1	Modified G/S	100 ml 1N KCl	732.3	951.8	
2	Modified G/S	100 ml 1N KCl	130.9	134.1	
3	G/S	100 ml 1N KCl	751.6	752.1	
4	Modified G/S	100 ml 5%HNO3/10% H2O2	635.8	637.0	
5	Modified G/S	100 ml 4%KMnO4/10% H2SO4	723.2	723.2	
6	Modified G/S	100 ml 4%KMnO4/10% H2SO4	729.7	730.2	
7	G/S	100 ml 4%KMnO4/10% H2SO4	733.3	733.4	
8	Modified G/S	Silica Gel	860.9	865.6	

Orsat Analysis			
Run #	O2 (%vol)	CO2 (%vol)	N2 (%vol)
1			
2			
3			
Air Audit			

Recovery Comments:

Added empty impinger between KCl & HNO_3/H_2O_2

Tare = 655.9 Final = 656.8

Isokinetic Sampling Field Data Sheet

Project Number : M001501

Client: M-DU C+C

Test Date: 12-00

Sample Location: Stack

Run #: Stack Blank

Impinger #	Type	Contents	Tare (grams)	Final (grams)	Net (grams)
1	Modified G/S	100 ml 1N KCl	740.6	740.2	
2	Modified G/S	100 ml 1N KCl	731.1	737.0	
3	G/S	100 ml 1N KCl	735.5	735.4	
4	Modified G/S	100 ml 5%HNO3/10% H2O2	737.2	737.1	
5	Modified G/S	100 ml 4%KMnO4/10% H2SO4	731.0	730.9	
6	Modified G/S	100 ml 4%KMnO4/10% H2SO4	733.6	733.5	
7	G/S	100 ml 4%KMnO4/10% H2SO4	744.8	744.8	
8	Modified G/S	Silica Gel	859.6	859.3	

Orsat Analysis			
Run #	O2 (%vol)	CO2 (%vol)	N2 (%vol)
1			
2			
3			
Air Audit			

Recovery Comments:

Empty Impinger between KCl & HNO_3

Tare = 635.6 Final = 635.5

CALIBRATION PROCEDURES

PITOT TUBES

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

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

NOZZLES

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

TEMPERATURE SENSING DEVICES

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

DRY GAS METERS

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

ANALYTICAL BALANCE

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

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PITOT TUBE CALIBRATION

UNIT: 7-2 CALIBRATED BY: BR
DATE: 04/06/00

		A SIDE CALIBRATION		
RUN No.	dPstd "H20	dP(s) "H20	CP(s)	DEVIATION Cp(s)-Cp(A)
1	0.68	0.94	0.842	0.002
2	0.67	0.94	0.836	0.004
3	0.68	0.94	0.842	0.002
		Cp(A)	0.840	

		B SIDE CALIBRATION		
RUN No.	dPstd "H20	dP(s) "H20	CP(s)	DEVIATION Cp(s)-Cp(B)
1	0.68	0.95	0.838	0.000
2	0.68	0.95	0.838	0.000
3	0.68	0.95	0.838	0.000
		Cp(B)	0.838	

|Cp(A)-Cp(B)| must be less than or equal to 0.01. This pitot is acceptable
Avg Deviation (A) must be less than or equal to 0.01 This pitot is acceptable
Avg Deviation (B) must be less than or equal to 0.01 This pitot is acceptable

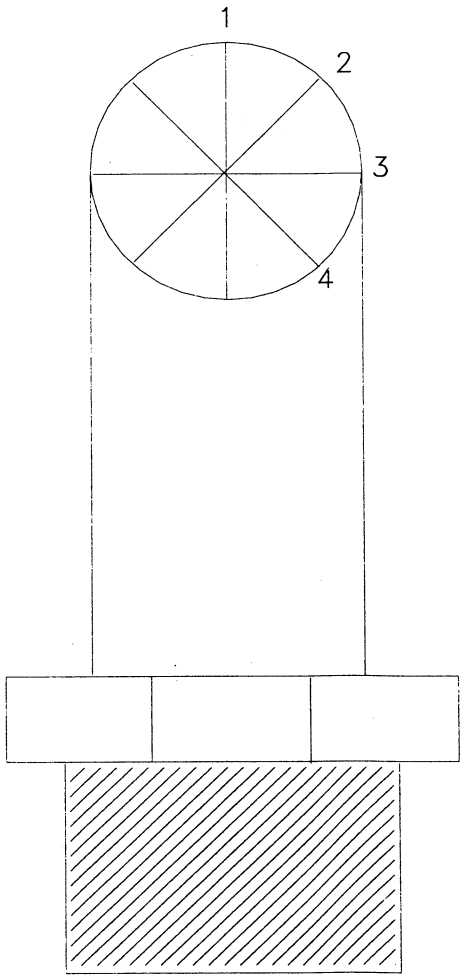
AVG DEVIATION (A)	0.00	|Cp(A)-Cp(B) |	0.00
AVG DEVIATION (B)	0.00	**Cp**	**0.839**

Nozzle Calibration

Date: 4/11/00

Nozzle ID No.: N/A

Analyst: SN



0.275	1
0.274	2
0.274	3
0.275	4

Average
0.275

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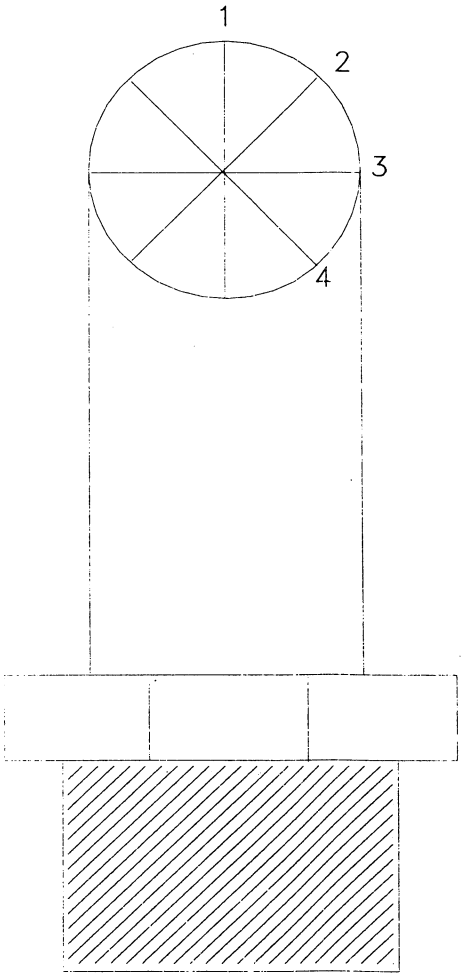
Nozzle Calibration

Date: 4/11/00

Nozzle ID No.: N/A

Analyst: DH



0.222	1
0.220	2
0.221	3
0.221	4

Average
0.221

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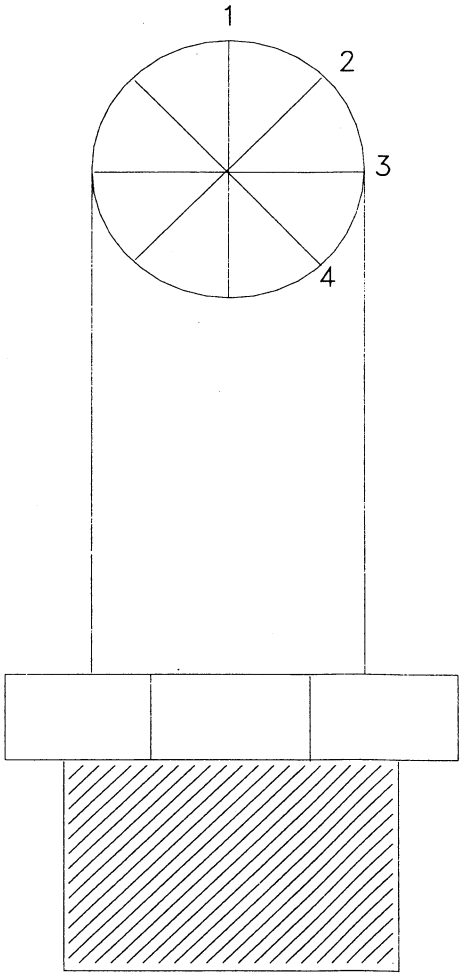
Nozzle Calibration

Date: 4/11/00

Nozzle ID No.: N/A

Analyst: DH



0.312	1
0.313	2
0.313	3
0.313	4

Average
0.313

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DRY GAS METER CALIBRATIONS

DATE: 2/17/00 Meter box: 80573

metric press: 30.00 Calibrated by KH

Orifice setting (dH) in. H2O		Gas volume Wet test meter (Vw) L	Wet test meter (Vw) ft^3		Dry gas meter (Vd) ft^3	Temperatures Wet test meter average (tw) C	Wet test meter average (tw) F	Dry gas meter average (td) F	Time min.	Yi	dH@i in. H2O
0.5	initial	282.59	5.331	initial	688.979	18.8	66	66	13.0	0.996	1.652
	final	433.56		final	694.324						
1	initial	114.48	5.743	initial	683.068	18.8	66	65	10.0	0.999	1.687
	final	277.13		final	688.793						
2	initial	922.20	6.375	initial	676.344	18.8	66	62	8.0	0.999	1.763
	final	1102.73		final	682.650						
3	initial	776.61	4.904	initial	671.309	18.8	66	58	5.0	0.998	1.759
	final	915.48		final	676.115						

Average: 0.998 1.715
Deviation: 0.002 0.064

Meter Yi must be +-.01 of Yavg and .98< Yavg <1.02 for each run.
The Yavg of this meter is acceptable.

Meter dH@ should be +- 0.15 of dH@avg for each run.
Recommended range of dH@avg is 1.69< dH@avg <2.09 (not required).
The d@Havg of this meter is acceptable.

Reduced Isokinetic Field Data

Plant:	Lewis & Clark Station	Bws(assumed):	0.13	Meter Box #:	38758
Sample Loc:	Inlet	MWs(assumed):	28.65	dH@i:	1.849
Run #:	1	MWd(assumed):	30.24	Gamma:	1.002
Date:	4/11/00	Pstatic ("H2O):	14.00	Pitot #:	5-3
Pbar ("Hg):	28.24	Probe Mat:	Glass	Cp:	0.84
Ps ("Hg):	29.27	Nozzle Mat:	Glass	X-Factor:	4.939
Sample time/pt:	5.0	Dn (in.):	0.275	# of Ports:	4

PORT:	A		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	8	39	383	0.40	33	35	4.0	254	253	33	352.006	1.16		0.58	352.006
5	8	44	387	0.44	36	35	4.0	248	264	32		1.27		0.61	354.893
4	8	49	385	0.43	39	36	4.0	251	259	33		1.25		0.61	357.933
3	8	54	385	0.48	43	38	4.0	252	261	35		1.41		0.64	360.959
2	8	59	384	0.45	46	38	4.0	249	265	36		1.33		0.63	364.182
1	9	4	386	0.46	48	39	4.0	250	265	37		1.36		0.64	367.324
	9	9									370.943				370.509
Run Time:		30	385	0.44	41	37	4.0	251	261	34	18.937	1.30	102.3		18.503

PORT:	B		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	9	22	381	0.39	43	44	3.0	254	242	41	370.943	1.15		0.58	370.943
5	9	27	380	0.40	48	44	3.0	270	262	40		1.19		0.60	373.855
4	9	32	380	0.43	51	45	4.0	241	269	41		1.29		0.62	376.836
3	9	37	381	0.44	52	46	4.0	241	271	43		1.32		0.63	379.944
2	9	42	379	0.43	53	46	4.0	241	273	44		1.30		0.62	383.093
1	9	47	377	0.47	54	47	4.0	240	268	45		1.43		0.65	386.215
	9	52									388.833				389.490
Run Time:		30	380	0.43	50	45	3.7	248	264	42	17.890	1.28	96.5		18.547

PORT:	C		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	10	12	382	0.40	47	49	4.0	269	250	44	388.833	1.19		0.59	388.833
5	10	17	381	0.46	51	49	5.0	256	250	39		1.38		0.64	391.804
4	10	22	382	0.48	53	49	5.0	244	255	39		1.44		0.66	395.017
3	10	27	381	0.48	56	50	6.0	243	264	41		1.45		0.66	398.310
2	10	32	382	0.46	59	51	7.0	240	264	42		1.40		0.65	401.625
1	10	37	383	0.49	61	52	10.0	238	266	43		1.50		0.68	404.886
	10	42									407.493				408.263
Run Time:		30	382	0.46	55	50	6.2	248	258	41	18.660	1.39	96.0		19.430

PORT:	D		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	11	7	381	0.27	54	54	10.0	250	245	42	407.493	0.82		0.50	407.493
5	11	12	387	0.24	56	54	15.0	249	248	41		0.72		0.47	409.969
4	11	17	383	0.25	56	54	15.0	242	245	41		0.76		0.48	412.304
3	11	22	384	0.26	56	54	15.0	238	250	41		0.79		0.49	414.694
2	11	27	384	0.27	57	55	15.0	240	241	43		0.82		0.50	417.128
1	11	32	384	0.25	57	55	15.0	239	246	43		0.76		0.48	419.615
	11	37									413.754				422.007
Run Time:		30	384	0.26	56	54	14.2	243	246	42	6.261	0.78	43.1		14.514
Post Test Leak Rate:				0.01 CFM @		15 "Hg									
Summary		120	383		50	47	7	247	257	40	61.748	1.19	#VALUE!	0	#VALUE!

Analytical Results

Plant:	Lewis & Clark Station	Tstd:	68	MWw:	28.83	
Sample Loc:	Inlet	Pstd:	29.92	An:	0.0004	sq. ft.
Date:	4/11/00	Vmstd:	60.824	%ISO:	87.1	
Run #:	1					

IMPINGER ANALYSIS

TYPE	CONTENTS	Wf (g)	Wi (g)	Net (g)
Modified Greenberg Smith	100 ml 0.1N KCl	927.1	746.8	180.3
Modified Greenberg Smith	100 ml 0.1N KCl	749.2	726.7	22.5
Greenberg Smith	100 ml 0.1N KCl	740.5	735.5	5.0
Modified Greenberg Smith	100ml 5%HNO3/10%H2O2	746.5	743.3	3.2
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	733.3	733.0	0.3
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	724.0	723.7	0.3
Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	733.1	732.7	0.4
Modified Greenberg Smith	Silica Gel	873.8	864.7	9.1
			TOTAL	221.1

Fixed Gas Analysis	
%CO2:	15.7
%O2:	4.5
%CO:	0.0
%N2	79.8
Fo	1.045
Bws:	0.146
DSCFM:	0

Concentration and Emission Rate Data

Particle-Bound Mercury			**Oxidized-Bound Mercury**			**Elemental Mercury**		
Sample Front-Half:		1.8 ug	Sample KCl:		26 ug	Sample HNO3/H2O2:		1.4 ug
Blank Front-Half:	<	0.010 ug	Blank KCl:	<	0.030 ug	Blank HNO3/H2O2:	<	0.050 ug
Net Front-Half:		1.8 ug	Net KCl:		26 ug	Net HNO3/H2O2:		1.4 ug
						Sample KMnO4:		17 ug
						Blank KMnO4:	<	0.030 ug
						Net KMnO4		17 ug
						Total Elemental:		18.4 ug

Total Mercury: 46.20 ug

	Concentration (ug/dscm)	Mass Flow Rate (gram/hr)
Particle Bound Hg	1.046	0.217
Oxidzed Hg	15.105	3.132
Elemental Hg	10.689	2.217
Total Hg	26.840	5.566

Flow Rate: 122120

VELOCITY TRAVERSE AND VOLUME FLOW RATE DATA

Plant:	Lewis & Clark Station	Time:	08:39-11:37
Sample Location:	Inlet		
Date:	4/11/00	Run #:	1

Duct Diameter (in.):	126.0	Ps ("Hg):	29.27
Rectangular Duct:	0.0	Bws:	0.146
Area (sq.ft.):	86.59	MWw:	28.83
		Tstd (F):	68
		Pstd ("Hg):	29.92
		Cp:	0.84

		Port: A			Port: B			Port: C			Port: D		
Point #	In. From Edge	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)
6	44.9	0.40	383	45.4	0.39	381	44.8	0.40	382	45.4	0.27	381	37.2
5	31.5	0.44	387	47.7	0.40	380	45.3	0.46	381	48.6	0.24	387	35.2
4	22.3	0.43	385	47.1	0.43	380	47.0	0.48	382	49.7	0.25	383	35.9
3	14.9	0.48	385	49.8	0.44	381	47.6	0.48	381	49.7	0.26	384	36.6
2	8.4	0.45	384	48.2	0.43	379	47.0	0.46	382	48.6	0.27	384	37.3
1	2.6	0.46	386	48.8	0.47	377	49.0	0.49	383	50.2	0.25	384	35.9

RESULTS:

Average Duct Velocity = 44.9 at 383 deg. F and 29.27 "Hg

Q	=	233.4	x1000	ACFM
Qstd	=	143.1	x1000	SCFM
Qstd(dry)	=	122.1	x1000	DSCFM

Reduced Isokinetic Field Data

Plant:	Lewis & Clark Station	Bws(assumed):	0.13	Meter Box #:	38758
Sample Loc:	Inlet	MWs(assumed):	28.65	dH@i:	1.849
Run #:	2	MWd(assumed):	30.24	Gamma:	1.002
Date:	4/11/00	Pstatic ("H2O):	14.00	Pitot #:	5-3
Pbar ("Hg):	28.24	Probe Mat:	Glass	Cp:	0.84
Ps ("Hg):	29.27	Nozzle Mat:	Glass	X-Factor:	2.054
Sample time/pt:	5.0	Dn (in.):	0.221	# of Ports:	4

PORT:	A		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	12	48	385	0.39	55	55	4.0	244	238	44	414.209	0.49		0.38	414.209
5	12	53	391	0.39	57	55	4.0	242	236	41		0.49		0.38	416.127
4	12	58	391	0.44	57	55	3.0	236	252	41		0.55		0.41	418.046
3	13	3	390	0.46	57	55	3.0	236	243	41		0.57		0.42	420.085
2	13	8	392	0.50	58	56	3.0	241	245	42		0.62		0.44	422.170
1	13	13	390	0.49	60	57	3.0	240	260	42		0.62		0.43	424.346
	13	18									428.488				426.510
Run Time:		30	390	0.45	57	56	3.3	240	246	42	14.279	0.56	116.1		12.301

PORT:	B		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	13	31	387	0.41	56	56	3.0	241	248	46	428.488	0.51		0.39	428.488
5	13	36	387	0.46	57	56	3.0	246	250	44		0.58		0.42	430.456
4	13	41	388	0.52	58	56	4.0	239	266	44		0.65		0.44	432.545
3	13	46	390	0.52	60	57	4.0	243	267	46		0.65		0.45	434.769
2	13	51	386	0.49	60	56	4.0	241	272	45		0.62		0.43	436.999
1	13	56	383	0.50	60	56	4.0	241	273	45		0.63		0.44	439.169
	14	1									441.709				441.365
Run Time:		30	387	0.48	59	56	3.7	242	263	45	13.221	0.61	102.7		12.877

PORT:	C		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	14	13	387	0.45	56	57	4.0	292	246	45	441.709	0.56		0.41	441.709
5	14	18	383	0.44	58	57	4.0	285	266	45		0.56		0.41	443.771
4	14	23	382	0.51	60	57	4.0	305	251	44		0.65		0.44	445.823
3	14	28	387	0.50	61	57	4.0	243	229	44		0.63		0.44	448.042
2	14	33	388	0.51	60	57	4.0	244	264	45		0.64		0.44	450.237
1	14	38	389	0.52	59	56	4.0	239	262	45		0.65		0.45	452.448
	14	43									454.829				454.675
Run Time:		30	386	0.49	59	57	4.0	268	253	45	13.120	0.62	101.2		12.966

PORT:	D		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	14	55	383	0.29	56	56	4.0	243	222	45	454.829	0.36		0.33	454.829
5	15	0	390	0.30	60	57	4.0	241	223	46		0.38		0.34	456.488
4	15	5	393	0.29	62	57	8.0	238	255	46		0.36		0.33	458.182
3	15	10	393	0.30	63	58	10.0	243	250	46		0.38		0.34	459.851
2	15	15	394	0.29	63	59	12.0	242	257	46		0.36		0.33	461.552
1	15	20	394	0.28	63	59	12.0	241	262	46		0.35		0.33	463.223
	15	25									463.628				464.865
Run Time:		30	391	0.29	61	58	8.3	241	245	46	8.799	0.37	87.7		10.036
Post Test Leak Rate:				0.012 CFM @		12 "Hg									
Summary		120	388		59	57	5	248	252	44	49.419	0.54	102.57	0	48.180

Analytical Results

Plant:	Lewis & Clark Station	Tstd:	68	MWw:	28.86	
Sample Loc:	Inlet	Pstd:	29.92	An:	0.0003	sq. ft.
Date:	4/11/00	Vmstd:	47.727	%ISO:	102.2	
Run #:	2					

IMPINGER ANALYSIS

TYPE	CONTENTS	Wf (g)	Wi (g)	Net (g)
Modified Greenberg Smith	100 ml 0.1N KCl	885.3	734.3	151.0
Modified Greenberg Smith	100 ml 0.1N KCl	766.0	758.9	7.1
Greenberg Smith	100 ml 0.1N KCl	756.5	755.5	1.0
Modified Greenberg Smith	100ml 5%HNO3/10%H2O2	731.9	728.9	3.0
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	731.8	731.5	0.3
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	725.2	724.5	0.7
Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	743.9	743.7	0.2
Modified Greenberg Smith	Silica Gel	896.0	887.9	8.1
			TOTAL	171.4

Fixed Gas Analysis	
%CO2:	15.8
%O2:	4.4
%C0:	0.0
%N2	79.8
Fo	1.044
Bws:	0.145
DSCFM:	0

Concentration and Emission Rate Data

Particle-Bound Mercury			**Oxidized-Bound Mercury**			**Elemental Mercury**		
Sample Front-Half:		2.1 ug	Sample KCl:		17 ug	Sample HNO3/H2O2:		0.52 ug
Blank Front-Half:	<	0.010 ug	Blank KCl:	<	0.030 ug	Blank HNO3/H2O2:	<	0.050 ug
Net Front-Half:		2.1 ug	Net KCl:		17 ug	Net HNO3/H2O2:		0.52 ug
						Sample KMnO4:		10 ug
						Blank KMnO4:	<	0.030 ug
						Net KMnO4		10 ug
						Total Elemental:		10.52 ug

Total Mercury: 29.62 ug

	Concentration (ug/dscm)	Mass Flow Rate (gram/hr)
Particle Bound Hg	1.555	0.334
Oxidzed Hg	12.586	2.703
Elemental Hg	7.789	1.673
Total Hg	21.930	4.710

Flow Rate: 126483

VELOCITY TRAVERSE AND VOLUME FLOW RATE DATA

Plant:	Lewis & Clark Station	Time:	12:48-15:25
Sample Location:	Inlet		
Date:	4/11/00	Run #:	2

Duct Diameter (in.):	126.0	Ps ("Hg):	29.27
Rectangular Duct:	0.0	Bws:	0.145
Area (sq.ft.):	86.59	MWw:	28.86
		Tstd (F):	68
		Pstd ("Hg):	29.92
		Cp:	0.84

		Port: A			Port: B			Port: C			Port: D		
Point #	In. From Edge	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)
6	44.9	0.39	385	44.9	0.41	387	46.0	0.45	387	48.2	0.29	383	38.6
5	31.5	0.39	391	45.0	0.46	387	48.8	0.44	383	47.6	0.30	390	39.5
4	22.3	0.44	391	47.8	0.52	388	51.9	0.51	382	51.2	0.29	393	38.9
3	14.9	0.46	390	48.9	0.52	390	51.9	0.50	387	50.8	0.30	393	39.5
2	8.4	0.50	392	51.0	0.49	386	50.3	0.51	388	51.4	0.29	394	38.9
1	2.6	0.49	390	50.4	0.50	383	50.7	0.52	389	51.9	0.28	394	38.2

RESULTS:

Average Duct Velocity = 46.8 at 388 deg. F and 29.27 "Hg

Q	=	242.9	x1000	ACFM
Qstd	=	147.9	x1000	SCFM
Qstd(dry)	=	126.5	x1000	DSCFM

Reduced Isokinetic Field Data

Plant:	Lewis & Clark Station	Bws(assumed):	0.13	Meter Box #:	38758
Sample Loc:	Inlet	MWs(assumed):	28.65	dH@i:	1.849
Run #:	3	MWd(assumed):	30.24	Gamma:	1.002
Date:	4/11/00	Pstatic ("H2O):	14.00	Pitot #:	5-3
Pbar ("Hg):	28.24	Probe Mat:	Glass	Cp:	0.84
Ps ("Hg):	29.27	Nozzle Mat:	Glass	X-Factor:	2.054
Sample time/pt:	5.0	Dn (in.):	0.221	# of Ports:	4

PORT:	A		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	16	0	393	0.30	66	68	4.0	241	254	44	464.105	0.38		0.34	464.105
5	16	5	397	0.31	72	67	4.0	242	255	44		0.40		0.35	465.815
4	16	10	399	0.30	72	68	4.0	238	258	44		0.38		0.34	467.570
3	16	15	398	0.29	72	68	4.0	243	265	44		0.37		0.34	469.293
2	16	20	401	0.31	74	64	4.0	242	264	44		0.39		0.35	470.989
1	16	25	401	0.29	75	69	4.0	240	246	45		0.37		0.34	472.746
	16	30									475.349				474.448
Run Time:		30	398	0.30	72	67	4.0	241	257	44	11.244	0.38	108.7		10.343

PORT:	B		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	16	41	399	0.49	68	67	4.0	241	263	45	475.349	0.62		0.44	475.349
5	16	46	401	0.51	69	67	4.0	240	271	46		0.64		0.45	477.535
4	16	51	403	0.52	69	66	4.0	235	269	47		0.65		0.45	479.768
3	16	56	401	0.51	68	65	4.0	245	268	46		0.64		0.45	482.019
2	17	1	400	0.52	69	65	5.0	242	269	46		0.66		0.45	484.247
1	17	6	399	0.50	69	65	5.0	243	269	45		0.63		0.44	486.503
	17	11									489.379				488.715
Run Time:		30	401	0.51	69	66	4.3	241	268	46	14.030	0.64	105.0		13.366

PORT:	C		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	17	22	389	0.41	65	63	4.0	237	265	51	489.379	0.52		0.40	489.379
5	17	27	390	0.40	66	63	4.0	239	248	46		0.51		0.40	491.379
4	17	32	390	0.45	66	63	4.0	240	230	44		0.57		0.42	493.358
3	17	37	391	0.45	66	62	3.0	239	232	44		0.57		0.42	495.456
2	17	42	390	0.44	65	61	3.0	240	245	43		0.56		0.41	497.553
1	17	47	389	0.45	65	61	3.0	239	261	44		0.57		0.42	499.624
	17	52									502.468				501.720
Run Time:		30	390	0.43	66	62	3.5	239	247	45	13.089	0.55	106.1		12.341

PORT:	D		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
6	18	2	395	0.41	61	59	4.0	237	228	44	502.468	0.51		0.40	502.468
5	18	7	394	0.45	61	58	4.0	240	235	44		0.56		0.41	504.446
4	18	12	398	0.50	61	59	4.0	243	236	44		0.62		0.44	506.520
3	18	17	397	0.51	66	58	4.0	238	244	43		0.64		0.44	508.700
2	18	22	399	0.50	60	58	4.0	240	270	42		0.62		0.44	510.925
1	18	27	402	0.51	61	58	3.0	246	253	44		0.63		0.44	513.100
	18	32									515.350				515.298
Run Time:		30	398	0.48	62	58	3.8	241	244	44	12.882	0.60	100.4		12.830
Post Test Leak Rate:				0.004 CFM @		11 "Hg									
Summary		120	397		67	63	4	240	254	45	51.245	0.54	104.84	0	48.881

Analytical Results

Plant:	Lewis & Clark Station	Tstd:	68	MWw:	28.86	
Sample Loc:	Inlet	Pstd:	29.92	An:	0.0003	sq. ft.
Date:	4/11/00	Vmstd:	48.795	%ISO:	104.5	
Run #:	3					

IMPINGER ANALYSIS

TYPE	CONTENTS	Wf (g)	Wi (g)	Net (g)
Modified Greenberg Smith	100 ml 0.1N KCl	890.2	732.6	157.6
Modified Greenberg Smith	100 ml 0.1N KCl	742.9	735.8	7.1
Greenberg Smith	100 ml 0.1N KCl	731.5	730.6	0.9
Modified Greenberg Smith	100ml 5%HNO3/10%H2O2	745.3	742.3	3.0
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	730.2	730.5	-0.3
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	727.5	726.8	0.7
Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	733.3	732.5	0.8
Modified Greenberg Smith	Silica Gel	870.3	864.8	5.5
			TOTAL	175.3

Fixed Gas Analysis	
%CO2:	15.8
%O2:	4.4
%C0:	0.0
%N2	79.8
Fo	1.044
Bws:	0.145
DSCFM:	0

Concentration and Emission Rate Data

Particle-Bound Mercury			**Oxidized-Bound Mercury**			**Elemental Mercury**		
Sample Front-Half:		1.8 ug	Sample KCl:		8 ug	Sample HNO3/H2O2:		1.0 ug
Blank Front-Half:	<	0.010 ug	Blank KCl:	<	0.030 ug	Blank HNO3/H2O2:	<	0.050 ug
Net Front-Half:		1.8 ug	Net KCl:		8 ug	Net HNO3/H2O2:		1.0 ug
						Sample KMnO4:		12 ug
						Blank KMnO4:	<	0.030 ug
						Net KMnO4		12 ug
						Total Elemental:		13 ug

Total Mercury: 22.80 ug

	Concentration (ug/dscm)	Mass Flow Rate (gram/hr)
Particle Bound Hg	1.304	0.280
Oxidzed Hg	5.793	1.244
Elemental Hg	9.414	2.021
Total Hg	16.511	3.545

Flow Rate: 126458

VELOCITY TRAVERSE AND VOLUME FLOW RATE DATA

Plant:	Lewis & Clark Station	Time:	16:00-18:32
Sample Location:	Inlet		
Date:	4/11/00	Run #:	3

Duct Diameter (in.):	126.0	Ps ("Hg):	29.27
Rectangular Duct:	0.0	Bws:	0.145
Area (sq.ft.):	86.59	MWw:	28.86
		Tstd (F):	68
		Pstd ("Hg):	29.92
		Cp:	0.84

		Port: A			Port: B			Port: C			Port: D		
Point #	In. From Edge	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)
6	44.9	0.30	393	39.5	0.49	399	50.7	0.41	389	46.1	0.41	395	46.3
5	31.5	0.31	397	40.3	0.51	401	51.8	0.40	390	45.6	0.45	394	48.4
4	22.3	0.30	399	39.7	0.52	403	52.3	0.45	390	48.3	0.50	398	51.2
3	14.9	0.29	398	39.0	0.51	401	51.8	0.45	391	48.3	0.51	397	51.7
2	8.4	0.31	401	40.4	0.52	400	52.2	0.44	390	47.8	0.50	399	51.2
1	2.6	0.29	401	39.0	0.50	399	51.2	0.45	389	48.3	0.51	402	51.8

RESULTS:

Average Duct Velocity = 47.2 at 397 deg. F and 29.27 "Hg

Q	=	245.2	x1000	ACFM
Qstd	=	147.9	x1000	SCFM
Qstd(dry)	=	126.5	x1000	DSCFM

Reduced Isokinetic Field Data

Plant:	Lewis & Clark Station	Bws(assumed):	0.24	Meter Box #:	80573
Sample Loc:	Main Stack	MWs(assumed):	27.36	dH@i:	1.715
Run #:	1	MWd(assumed):	30.24	Gamma:	0.998
Date:	4/11/00	Pstatic ("H2O):	-0.50	Pitot #:	7-2
Pbar ("Hg):	28.24	Probe Mat:	Glass	Cp:	0.84
Ps ("Hg):	28.20	Nozzle Mat:	Glass	X-Factor:	5.979
Sample time/pt:	6.0	Dn (in.):	0.313	# of Ports:	4

PORT:	A		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	8	39	140	0.09	33	32	2.0	243	252	41	22.563	0.44		0.37	22.563
4	8	45	140	0.09	35	32	2.0	246	251	41		0.44		0.37	24.789
3	8	51	140	0.09	36	34	2.0	244	251	42		0.44		0.37	27.023
2	8	57	140	0.07	37	35	2.0	246	251	41		0.35		0.33	29.262
1	9	3	140	0.07	37	35	2.0	246	249	42		0.35		0.33	31.241
	9	9									33.258				33.219
Run Time:		30	140	0.08	36	34	2.0	245	251	41	10.695	0.40	100.4		10.656

PORT:	B		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	9	18	142	0.10	37	35	2.0	245	249	43	33.258	0.49		0.39	33.258
4	9	24	141	0.09	36	36	2.0	247	246	43		0.44		0.37	35.619
3	9	30	140	0.09	37	35	2.0	245	247	42		0.45		0.37	37.856
2	9	36	140	0.09	37	36	2.0	245	240	42		0.45		0.37	40.100
1	9	42	140	0.08	37	37	2.0	244	247	43		0.40		0.35	42.343
	9	48									44.475				44.459
Run Time:		30	141	0.09	37	36	2.0	245	246	43	11.217	0.45	100.1		11.201

PORT:	C		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	9	52	139	0.09	38	37	2.0	246	255	42	44.475	0.45		0.37	44.475
4	9	58	140	0.09	38	38	2.0	249	247	41		0.45		0.37	46.725
3	10	4	141	0.09	39	38	2.5	247	250	42		0.45		0.38	48.973
2	10	10	140	0.08	39	39	2.5	247	251	42		0.40		0.35	51.224
1	10	16	140	0.08	41	40	2.5	246	250	43		0.40		0.36	53.348
	10	22									55.685				55.480
Run Time:		30	140	0.09	39	38	2.3	247	251	42	11.210	0.43	101.9		11.005

PORT:	D		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	11	4	140	0.08	46	47	2.0	246	252	42	55.685	0.40		0.36	55.685
4	11	10	140	0.08	47	47	2.5	235	251	42		0.40		0.36	57.839
3	11	16	139	0.06	49	48	2.0	245	252	42		0.30		0.31	59.996
2	11	22	141	0.06	50	49	2.0	244	254	44		0.30		0.31	61.874
1	11	28	139	0.05	51	50	2.0	254	258	44		0.26		0.29	63.752
	11	34									66.079				65.473
Run Time:		30	140	0.07	49	48	2.1	245	253	43	10.394	0.33	106.2		9.788
Post Test Leak Rate:				0.014 CFM @		8 "Hg									
Summary		120	140		40	39	2	246	250	42	43.516	0.40	#VALUE!	0	#VALUE!

Analytical Results

Plant:	Lewis & Clark Station	Tstd:	68	MWw:	28.08	
Sample Loc:	Main Stack	Pstd:	29.92	An:	0.0005	sq. ft.
Date:	4/11/00	Vmstd:	43.375	%ISO:	96.3	
Run #:	1					

IMPINGER ANALYSIS

TYPE	CONTENTS	Wf (g)	Wi (g)	Net (g)
Modified Greenberg Smith	100 ml 0.1N KCl	981.1	751.1	230.0
Modified Greenberg Smith	100 ml 0.1N KCl	733.7	733.7	0.0
Greenberg Smith	100 ml 0.1N KCl	736.5	736.7	-0.2
Greenberg Smith	Empty	520.8	521.2	-0.4
Modified Greenberg Smith	100ml 5%HNO3/10%H2O2	751.5	750.0	1.5
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	722.0	722.4	-0.4
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	732.0	732.0	0.0
Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	749.6	749.9	-0.3
Modified Greenberg Smith	Silica Gel	860.9	855.8	5.1
			TOTAL	235.3

Fixed Gas Analysis	
%CO2:	15.4
%O2:	4.8
%CO:	0.0
%N2	79.8
Fo	1.045
Bws:	0.204
DSCFM:	0

Concentration and Emission Rate Data

Particle-Bound Mercury			**Oxidized-Bound Mercury**			**Elemental Mercury**		
Sample Front-Half:		0.066 ug	Sample KCl:		0.55 ug	Sample HNO3/H2O2:		0.31 ug
Blank Front-Half:	<	0.010 ug	Blank KCl:	<	0.030 ug	Blank HNO3/H2O2:	<	0.050 ug
Net Front-Half:		0.066 ug	Net KCl:		0.55 ug	Net HNO3/H2O2:		0.31 ug
						Sample KMnO4:		15 ug
						Blank KMnO4:	<	0.030 ug
						Net KMnO4		15 ug
						Total Elemental:		15.31 ug

Total Mercury: 15.93 ug

	Concentration (ug/dscm)	Mass Flow Rate (gram/hr)
Particle Bound Hg	0.054	0.011
Oxidzed Hg	0.448	0.088
Elemental Hg	12.472	2.457
Total Hg	12.974	2.556

Flow Rate: 116033

VELOCITY TRAVERSE AND VOLUME FLOW RATE DATA

Plant:	Lewis & Clark Station	Time:	08:39-11:34
Sample Location:	Main Stack		
Date:	4/11/00	Run #:	1

Duct Diameter (in.):	174.0	Ps ("Hg):	28.20
Rectangular Duct:	0.0	Bws:	0.204
Area (sq.ft.):	165.1	MWw:	28.08
		Tstd (F):	68
		Pstd ("Hg):	29.92
		Cp:	0.84

		Port: A			Port: B			Port: C			Port: D		
Point #	In. From Edge	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)
5	59.5	0.09	140	18.8	0.10	142	19.8	0.09	139	18.7	0.08	140	17.7
4	39.3	0.09	140	18.8	0.09	141	18.8	0.09	140	18.8	0.08	140	17.7
3	25.4	0.09	140	18.8	0.09	140	18.8	0.09	141	18.8	0.06	139	15.3
2	14.3	0.07	140	16.5	0.09	140	18.8	0.08	140	17.7	0.06	141	15.3
1	4.5	0.07	140	16.5	0.08	140	17.7	0.08	140	17.7	0.05	139	14.0

RESULTS:

Average Duct Velocity = 17.7 at 140 deg. F and 28.20 "Hg

Q	=	175.7	x1000	ACFM
Qstd	=	145.7	x1000	SCFM
Qstd(dry)	=	116.0	x1000	DSCFM

Reduced Isokinetic Field Data

Plant:	Lewis & Clark Station	Bws(assumed):	0.24	Meter Box #:	80573
Sample Loc:	Main Stack	MWs(assumed):	27.36	dH@i:	1.715
Run #:	2	MWd(assumed):	30.24	Gamma:	0.998
Date:	4/11/00	Pstatic ("H2O):	-0.50	Pitot #:	7-2
Pbar ("Hg):	28.24	Probe Mat:	Glass	Cp:	0.84
Ps ("Hg):	28.20	Nozzle Mat:	Glass	X-Factor:	5.979
Sample time/pt:	6.0	Dn (in.):	0.313	# of Ports:	4

PORT:	A		Duct Data		Meter Data			Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	12	48	140	0.07	50	50	1.0	248	249	46	66.685	0.36		0.34	66.685
4	12	54	140	0.07	48	50	1.0	244	248	41		0.35		0.34	68.715
3	13	0	139	0.07	48	49	1.0	246	242	44		0.35		0.34	70.738
2	13	6	139	0.07	47	48	1.0	241	247	43		0.35		0.34	72.762
1	13	12	139	0.06	47	48	1.0	246	259	43		0.30		0.31	74.782
	13	18									76.549				76.652
Run Time:		30	139	0.07	48	49	1.0	245	249	43	9.864	0.34	99.0		9.967

PORT:	B		Duct Data		Meter Data			Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	13	25	140	0.09	47	47	1.0	248	274	44	76.549	0.45		0.38	76.549
4	13	31	140	0.09	48	48	1.0	247	250	47		0.46		0.38	78.838
3	13	37	140	0.09	49	48	1.0	244	241	49		0.46		0.38	81.131
2	13	43	142	0.09	47	47	1.0	241	245	48		0.45		0.38	83.429
1	13	49	139	0.08	49	47	1.0	248	252	50		0.41		0.36	85.714
	13	55									87.701				87.882
Run Time:		30	140	0.09	48	47	1.0	246	252	48	11.152	0.45	98.4		11.333

PORT:	C		Duct Data		Meter Data			Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	14	2	139	0.08	50	50	1.0	240	256	60	87.701	0.41		0.36	87.701
4	14	8	140	0.08	53	52	1.0	246	252	54		0.41		0.36	89.873
3	14	14	139	0.07	53	52	1.0	245	246	54		0.36		0.34	92.057
2	14	20	139	0.07	53	52	1.0	246	252	54		0.36		0.34	94.101
1	14	26	139	0.07	53	52	1.0	243	251	56		0.36		0.34	96.145
	14	32									98.004				98.189
Run Time:		30	139	0.07	52	52	1.0	244	251	56	10.303	0.38	98.2		10.488

PORT:	D		Duct Data		Meter Data			Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	14	51	139	0.07	54	57	1.0	247	253	60	98.004	0.36		0.34	98.004
4	14	57	141	0.07	53	56	1.0	248	258	55		0.36		0.34	100.052
3	15	3	139	0.06	55	58	1.0	251	252	53		0.31		0.32	102.093
2	15	9	140	0.06	55	58	1.0	245	254	53		0.31		0.32	103.993
1	15	15	140	0.06	55	56	1.0	248	251	53		0.31		0.32	105.891
	15	21									107.882				107.789
Run Time:		30	140	0.06	54	57	1.0	248	254	55	9.878	0.33	101.0		9.785
Post Test Leak Rate:				0.006 CFM @		6 "Hg									
Summary		120	140		51	51	1	246	252	50	41.197	0.37	#VALUE!	0	#VALUE!

Analytical Results

Plant:	Lewis & Clark Station	Tstd:	68	MWw:	28.03	
Sample Loc:	Main Stack	Pstd:	29.92	An:	0.0005	sq. ft.
Date:	4/11/00	Vmstd:	40.138	%ISO:	94.0	
Run #:	2					

IMPINGER ANALYSIS

TYPE	CONTENTS	Wf (g)	Wi (g)	Net (g)
Modified Greenberg Smith	100 ml 0.1N KCl	937.3	724.8	212.5
Modified Greenberg Smith	100 ml 0.1N KCl	744.8	741.6	3.2
Greenberg Smith	100 ml 0.1N KCl	742.1	741.8	0.3
Greenberg Smith	Empty	634.2	634.0	0.2
Modified Greenberg Smith	100ml 5%HNO3/10%H2O2	737.1	736.4	0.7
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	735.6	735.8	-0.2
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	735.7	736.4	-0.7
Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	734.4	733.9	0.5
Modified Greenberg Smith	Silica Gel	865.7	856.9	8.8
			TOTAL	225.3

Fixed Gas Analysis	
%CO2:	15.6
%O2:	4.7
%CO:	0.0
%N2	79.7
Fo	1.038
Bws:	0.209
DSCFM:	0

Concentration and Emission Rate Data

Particle-Bound Mercury			**Oxidized-Bound Mercury**			**Elemental Mercury**		
Sample Front-Half:	<	0.010 ug	Sample KCl:		0.36 ug	Sample HNO3/H2O2:		0.61 ug
Blank Front-Half:	<	0.010 ug	Blank KCl:	<	0.030 ug	Blank HNO3/H2O2:	<	0.050 ug
Net Front-Half:		0.005 ug	Net KCl:		0.36 ug	Net HNO3/H2O2:		0.61 ug
						Sample KMnO4:		14 ug
						Blank KMnO4:	<	0.030 ug
						Net KMnO4		14 ug
						Total Elemental:		14.61 ug

Total Mercury: 14.98 ug

	Concentration (ug/dscm)	Mass Flow Rate (gram/hr)
Particle Bound Hg	0.004	0.001
Oxidzed Hg	0.317	0.059
Elemental Hg	12.862	2.402
Total Hg	13.183	2.462

Flow Rate: 110001

VELOCITY TRAVERSE AND VOLUME FLOW RATE DATA

Plant:	Lewis & Clark Station	Time:	12:48-15:21
Sample Location:	Main Stack		
Date:	4/11/00	Run #:	2

Duct Diameter (in.):	174.0	Ps ("Hg):	28.20
Rectangular Duct:	0.0	Bws:	0.209
Area (sq.ft.):	165.1	MWw:	28.03
		Tstd (F):	68
		Pstd ("Hg):	29.92
		Cp:	0.84

		Port: A			Port: B			Port: C			Port: D		
Point #	In. From Edge	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)
5	59.5	0.07	140	16.6	0.09	140	18.8	0.08	139	17.7	0.07	139	16.5
4	39.3	0.07	140	16.6	0.09	140	18.8	0.08	140	17.7	0.07	141	16.6
3	25.4	0.07	139	16.5	0.09	140	18.8	0.07	139	16.5	0.06	139	15.3
2	14.3	0.07	139	16.5	0.09	142	18.8	0.07	139	16.5	0.06	140	15.3
1	4.5	0.06	139	15.3	0.08	139	17.7	0.07	139	16.5	0.06	140	15.3

RESULTS:

Average Duct Velocity = 16.9 at 140 deg. F and 28.20 "Hg

Q	=	167.6	x1000	ACFM
Qstd	=	139.1	x1000	SCFM
Qstd(dry)	=	110.0	x1000	DSCFM

Reduced Isokinetic Field Data

Plant:	Lewis & Clark Station	Bws(assumed):	0.24	Meter Box #:	80573
Sample Loc:	Main Stack	MWs(assumed):	27.36	dH@i:	1.715
Run #:	3	MWd(assumed):	30.24	Gamma:	0.998
Date:	4/11/00	Pstatic ("H2O):	-0.50	Pitot #:	7-2
Pbar ("Hg):	28.24	Probe Mat:	Glass	Cp:	0.84
Ps ("Hg):	28.20	Nozzle Mat:	Glass	X-Factor:	5.979
Sample time/pt:	6.0	Dn (in.):	0.313	# of Ports:	4

PORT:	A		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	15	58	139	0.08	58	59	1.0	250	252	62	108.172	0.41		0.37	108.172
4	16	4	139	0.07	56	58	1.5	253	252	51		0.36		0.34	110.378
3	16	10	139	0.07	54	56	1.5	254	252	49		0.36		0.34	112.434
2	16	16	139	0.06	53	54	1.0	245	252	50		0.31		0.32	114.483
1	16	22	140	0.06	53	54	1.0	244	252	52		0.31		0.32	116.375
	16	28									118.244				118.266
Run Time:		30	139	0.07	55	56	1.2	249	252	53	10.072	0.35	99.8		10.094

PORT:	B		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	16	36	140	0.08	51	52	1.5	245	252	60	118.244	0.41		0.36	118.244
4	16	42	140	0.08	51	52	2.0	250	252	51		0.41		0.36	120.419
3	16	48	140	0.07	50	52	2.0	247	252	51		0.36		0.34	122.594
2	16	54	140	0.07	50	52	2.0	246	253	51		0.36		0.34	124.624
1	17	0	140	0.08	50	49	2.0	246	252	52		0.41		0.36	126.655
	17	6									128.831				128.825
Run Time:		30	140	0.08	50	51	1.9	247	252	53	10.587	0.39	100.1		10.581

PORT:	C		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	17	12	141	0.08	50	48	2.0	247	253	55	128.831	0.41		0.36	128.831
4	17	18	141	0.08	50	50	2.0	249	252	46		0.41		0.36	131.000
3	17	24	141	0.08	50	50	2.0	248	251	45		0.41		0.36	133.169
2	17	30	140	0.08	50	51	2.0	246	254	46		0.41		0.36	135.337
1	17	36	141	0.07	48	49	2.0	250	252	47		0.35		0.34	137.508
	17	42									139.802				139.529
Run Time:		30	141	0.08	50	50	2.0	248	252	48	10.971	0.40	102.6		10.698

PORT:	D		Duct Data			Meter Data		Heater Data		Impinger	Meter	Theo.	Quick	Qm	Theo.
Point	Time		Td	dP	Tmi	Tmo	Vac.	Probe	Filter	Outlet	Volume	dH			Vm
#	hr	min	(F)	("H2O)	(F)	(F)	("Hg)	(F)	(F)	(F)	(CF)	("H2O)	%iso	(CFM)	(CF)
5	17	56	140	0.07	48	49	2.0	240	243	53	139.802	0.35		0.34	139.802
4	18	2	139	0.07	47	49	2.0	243	245	45		0.35		0.34	141.824
3	18	8	139	0.07	47	48	2.0	251	243	44		0.35		0.34	143.845
2	18	14	139	0.07	47	49	2.0	241	242	44		0.35		0.34	145.865
1	18	20	140	0.06	46	47	2.0	244	258	45		0.30		0.31	147.885
	18	26									150.025				149.750
Run Time:		30	139	0.07	47	48	2.0	244	246	46	10.223	0.34	102.8		9.948
Post Test Leak Rate:				0.006 CFM @		10 "Hg									
Summary		120	140		50	51	2	247	251	50	41.853	0.37	#VALUE!	0	#VALUE!

Analytical Results

Plant:	Lewis & Clark Station	Tstd:	68	MWw:	28.01	
Sample Loc:	Main Stack	Pstd:	29.92	An:	0.0005	sq. ft.
Date:	4/11/00	Vmstd:	40.781	%ISO:	96.2	
Run #:	3					

IMPINGER ANALYSIS

TYPE	CONTENTS	Wf (g)	Wi (g)	Net (g)
Modified Greenberg Smith	100 ml 0.1N KCl	951.8	732.3	219.5
Modified Greenberg Smith	100 ml 0.1N KCl	734.1	730.9	3.2
Greenberg Smith	100 ml 0.1N KCl	752.1	751.6	0.5
Greenberg Smith	Empty	656.8	655.9	0.9
Modified Greenberg Smith	100ml 5%HNO3/10%H2O2	637.0	635.8	1.2
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	723.2	723.2	0.0
Modified Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	730.2	729.7	0.5
Greenberg Smith	100 ml 4% KMnO4/10% H2SO4	733.4	733.3	0.1
Modified Greenberg Smith	Silica Gel	865.6	860.9	4.7
			TOTAL	230.6

Fixed Gas Analysis	
%CO2:	15.6
%O2:	4.7
%CO:	0.0
%N2	79.7
Fo	1.038
Bws:	0.210
DSCFM:	0

Concentration and Emission Rate Data

Particle-Bound Mercury			**Oxidized-Bound Mercury**			**Elemental Mercury**		
Sample Front-Half:	<	0.010 ug	Sample KCl:		0.52 ug	Sample HNO3/H2O2:		0.54 ug
Blank Front-Half:	<	0.010 ug	Blank KCl:	<	0.030 ug	Blank HNO3/H2O2:	<	0.050 ug
Net Front-Half:		0.005 ug	Net KCl:		0.52 ug	Net HNO3/H2O2:		0.54 ug
						Sample KMnO4:		16 ug
						Blank KMnO4:	<	0.030 ug
						Net KMnO4		16 ug
						Total Elemental:		16.54 ug

Total Mercury: 17.07 ug

	Concentration (ug/dscm)	Mass Flow Rate (gram/hr)
Particle Bound Hg	0.004	0.001
Oxidzed Hg	0.451	0.084
Elemental Hg	14.332	2.658
Total Hg	14.787	2.742

Flow Rate: 109218

VELOCITY TRAVERSE AND VOLUME FLOW RATE DATA

Plant:	Lewis & Clark Station	Time:	15:58-18:26
Sample Location:	Main Stack		
Date:	4/11/00	Run #:	3

Duct Diameter (in.):	174.0	Ps ("Hg):	28.20
Rectangular Duct:	0.0	Bws:	0.210
Area (sq.ft.):	165.1	MWw:	28.01
		Tstd (F):	68
		Pstd ("Hg):	29.92
		Cp:	0.84

		Port: A			Port: B			Port: C			Port: D		
Point #	In. From Edge	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)	dP ("H2O)	Ts (F)	Vd (ft/s)
5	59.5	0.08	139	17.7	0.08	140	17.7	0.08	141	17.7	0.07	140	16.6
4	39.3	0.07	139	16.5	0.08	140	17.7	0.08	141	17.7	0.07	139	16.5
3	25.4	0.07	139	16.5	0.07	140	16.6	0.08	141	17.7	0.07	139	16.5
2	14.3	0.06	139	15.3	0.07	140	16.6	0.08	140	17.7	0.07	139	16.5
1	4.5	0.06	140	15.3	0.08	140	17.7	0.07	141	16.6	0.06	140	15.3

RESULTS:

Average Duct Velocity = 16.8 at 140 deg. F and 28.20 "Hg

Q	=	166.7	x1000	ACFM
Qstd	=	138.3	x1000	SCFM
Qstd(dry)	=	109.2	x1000	DSCFM

MDN Lewis + Clark Sample log

Sample ID	Date Collected	Date Packed
SR1C01	4-11	4/18
SR1C02	4-11	↓
SR1C03	4-11	↓
SR1C04	4-11	↓
SR1C05	4-11	↓
IR1C01	4-11	4/18
IR1C02	4-4	↓
IR1C03	4-4	↓
IR1C04	4-11	↓
IR1C05	4-1	↓
SR2C01	4-11	4-18
SR2C02	4-11	↓
SR2C03	4-11	↓
SR2C04	4-11	↓
SR2C05	4-11	↓
IR2C01	4-11	4-18
IR2C02	4-4	↓
IR2C03	4-11	↓
IR2C04	4-11	↓
IR2C05	4-11	↓
SR3C01	4-11	4-18
SR3C02	4-11	↓
SR3C03	4-11	↓
SR3C04	4-11	↓
SR3C05	4-11	↓
IR3C01	4-4	4-18
IR3C02	4-11	↓
IR3C03	4-11	↓
IR3C04	4-11	↓
IR3C05	4-11	↓
C07	4-11	4-18
C08	4-4	↓
C09	4-11	↓
C10	4-11	↓
C11	4-11	↓
C12	4-11	↓

ALVIN No. 5500 Engineer's Computation Pad

M-DU Lewis & Clark Sample Log

Sample ID	Date Collected	Date Packed
SBC¢1	4-12	4-18
SBC¢2	4-12	↓
SBC¢3	4-12	↓
SBC¢4	4-12	↓
SBC¢5	4-12	↓
IBC¢1	4-12	4-18
IBC¢2	4-12	↓
IBC¢3	4-12	↓
IBC¢4	4-12	↓
IBC¢5	4-12	↓

No. 5505 Engineer's Computation Pad ALVIN

MOSTARDI-PLATT ASSOCIATES, INC.

Environmental Consultants

Reagent Blanks
Page 1 of 1

Read Instructions on Reverse Side Before Completing Form!

CHAIN-OF-CUSTODY RECORD

Project Number: M001501	Date Results Required: 5/18/00
Client: Montana - Dakota Utilities	TAT(Assessment Only)
Plant/Location: Lewis & Clark Station	LAB Use Only — PO Number: 4032 4023BR
Project Supervisor: Bruce Randall	LIMS Entry:

Sample Number	Date Sampled	Sample Point Identification	# of Conts	Grab/ Comp	Analysis Requested		Sub Lab
C07	4-11-00	0.1N HNO_3	1		Ontario - Hydro Hg		
C08	"	KCl	1				
C09	"	HNO_3/H_2O_2	1				
C10	"	$KMnO_4$	1				
C11	"	Hydroxyl Amine	1				
C12	"	filters	1				
		NOTHING BELOW THIS LINE					

Delivered by	Date/Time	Processed by	Date/Time	Received by Laboratory
Bruce Randall	4-18-00 1000			

Special Instructions:

MOSTARDI-PLATT ASSOCIATES, INC.

Environmental Consultants

Page 1 of 2
Run 3 + Blank trains

Read Instructions on Reverse Side Before Completing Form!

CHAIN-OF-CUSTODY RECORD

Project Number: M001501	Date Results Required: 5/18/00
Client: Montana - Dakota Utilities	TAT(Assessment Only)
Plant/Location: Lewis & Clark Station	LAB Use Only: PO Number: 4023
Project Supervisor: Bruce Randall	LIMS Entry:

Sample Number	Date Sampled	Sample Point Identification	# of Cons	Grab/ Comp	Analysis Requested	Sub Lab
SR3CØ3	4-11	Stack R3 KCl	1		Ontario - Hydro Hg	
SR3CØ5	4-11	" " $KMnO_4$	1			
IR3CØ3	"	Inlet " KCl	1			
IR3CØ5	"	" " $KMnO_4$	1			
SBCØ3	4-12-00	Stack Blank KCl	1			
SBCØ5	"	" " $KMnO_4$	1			
IBCØ3	"	Inlet " KCl	1			
IBCØ5	"	" " $KMnO_4$	1			
SR3CØ2	4-11	Stack R3 HNO_3				
SR3CØ4	"	" " HNO_3/H_2O_2				
IR3CØ2	"	Inlet " HNO_3				
IR3CØ4	"	" " HNO_3/H_2O_2				
SBCØ2	4-12	Stack Blank HNO_3				
SBCØ4	"	" " $HNO_3H_2O_2$				
IBCØ2	"	Inlet " HNO_3				
IBCØ4	"	" " HNO_3/H_2O_2				

Delivered by:	Date/Time	Processed by:	Date/Time	Received by Laboratory
Bruce Randall	4-18-00 0930			

Special Instructions:

MOSTARDI-PLATT ASSOCIATES, INC.

Environmental Consultants

Page 2 of 2
Run 3 + Blank Trains

Read Instructions on Reverse Side Before Completing Form!

CHAIN-OF-CUSTODY RECORD

Project Number: M001501	Date Results Required: 5/18/00
Client: Montana - Dakota Utilities	TAT(Assessment Only)
Plant/Location: Lewis & Clark Station	LAB Use Only: PO Number: 4023
Project Supervisor: Bruce Randall	LIMS Entry:

Sample Number	Date Sampled	Sample Point Identification	# of Conts	Grab/ Comp	Analysis Requested		Sub Lab
SR3C01	4-11	Stack R3 Filter	1		Ontario - Hydro Ltg		
IR3C01	4-11	Inlet " "	1				
SBC01	4-12	Stack Blank "	1				
IBC01	4-12	Inlet " "	1				
	NOTHING BELOW THIS LINE						

Delivered by:	Date/Time	Processed by:	Date/Time	Received by Laboratory:
Bruce Randall	4-18-00 0930	85		

Special Instructions:

MOSTARDI-PLATT ASSOCIATES, INC.

Environmental Consultants

Page 1 of 2
Runs 1 & 2

Read Instructions on Reverse Side Before Completing Form!

CHAIN-OF-CUSTODY RECORD

Project Number: M001501	Date Results Required: 5/18/00
Client: Montana-Dakota Utilities	TAT(Assessment Only)
Plant/Location: Lewis & Clark Station	LAB Use Only — PO Number: 4023
Project Supervisor: Bruce Randall	LIMS Entry:

Sample Number	Date Sampled	Sample Point Identification	# of Conts	Grab/ Comp	Analysis Requested	Sub Lab
SR1C03	4-11-00	Stack R1 ~~KMnO~~ KCl	1		Ontario-Hydro Hg	
~~R1~~ SR1C05	4-11-00	" " $KMnO_4$	1			
IR1C03	4-11-00	Inlet R1 KCl	1			
IR1C05	"	" " $KMnO_4$	1			
SR2C03	"	Stack R2 KCl	1			
SR2C05	"	" " $KMnO_4$	1			
IR2C03	"	Inlet R2 KCl	1			
IR2C05	"	" " $KMnO_4$	1			
SR1C02	"	Stack R1 HNO_3	1			
SR1C04	"	Stack R1 HNO_3/H_2O_2	1			
IR1C02	"	Inlet R1 HNO_3	1			
IR1C04	"	" " HNO_3/H_2O_2	1			
SR2C02	"	Stack R2 HNO_3	1			
SR2C04	"	" " HNO_3/H_2O_2	1			
IR2C04	"	Inlet R2 HNO_3/H_2O_2	1			
IR2C02	"	" " HNO_3	1			

Delivered by:	Date/Time	Processed by:	Date/Time	Received by Laboratory:
Bruce Randall	4-18-00 0900	86		

Special Instructions:

MOSTARDI-PLATT ASSOCIATES, INC.

Environmental Consultants

Page 2 of 2
Runs 1 & 2

Read Instructions on Reverse Side Before Completing Form!

CHAIN-OF-CUSTODY RECORD

Project Number: M001501	Date Results Required: 5/18/00
Client: Montana - Dakota Utilities	TAT(Assessment Only)
Plant/Location: Lewis & Clark Station	LAB Use Only: PO Number: 4023
Project Supervisor: Bruce Randall	LIMS Entry:

Sample Number	Date Sampled	Sample Point Identification	# of Conts	Grab/ Comp	Analysis Requested	Sub Lab
SR1C01	4-11	Stack R1 Filter	1		Ontario - Hydro Hg	
IR1C01	4-11	Inlet " "	1			
SR2C01	4-11	Stack R2 "	1			
IR2C01	4-11	Inlet R2 "	1			
		Nothing Below this line				

Delivered by:	Date/Time	Processed by:	Date/Time	Received by Laboratory:
Bruce Randall	4-18-00 0900	87		

Special Instructions:

MSU Lewis & Clark Station

Ontario-Hydro Mercury Testing Field log

4-10-00 onsite to set-up

Stack Traverse Points			Inlet traverse points		
5	66.0		6	53.9	
4	45.8	6 mm/pt	5	40.5	5 mm/pt
3	28.9		4	31.3	
2	20.8		3	23.9	
1	11.0		2	17.4	
			1	11.6	

4-11-00 onsite 0840 CST
Pbar = 28.74

Stack Consolr # 80573 γ = 20.998 $\Delta H_{@i}$ = 1.715
Inlet Console # 38758 γ = 1.002 $\Delta H_{@i}$ = 1.849

Stack x factor = 5.979
Inlet x factor = 4.939

Meter check

Stack	in	out	Inlet	in	out
V_i = 14.292	34	3431	V_i = 348.861	24	26
V_f = 21.856			V_f = 350.674	24	27
net = 7.556			net = 7.41		

Y_c = 0.9853
0.9681 < 0.9853 < 1.0279

Y_c = 0.9989
0.9720 < 0.9989 < 1.032

START first run @ 0839
Change out inlet filter after 3rd port
Run 1 complete @ 11

Change inlet Nozzle to 0.221" x = 2.054

PHILIP SERVICES

INORGANIC DATA PACKAGE
FOR
MOSTARDI-PLATT ASSOCIATES INC.

Project # M001501

Philip Analytical Services Corporation
5555 North Service Road
Burlington, ON L7L 5H7

Submission #0D0546

Prepared by: Shari Typer – CSR Initial : SLT

Approved by : Dr. Ron McLeod - Principal Scientist Initial : RM

PHILIP ANALYTICAL SERVICES
5555 North Service Road, Burlington, Ontario Canada L7L 5H7 Tel: (905) 332-8788 Fax: (905) 332-9169

1. CASE NARRATIVE

PROJECT NARRATIVE

PHILIP Analytical Services (Burlington ON)
Philip Project: AN000412
Philip Submission #:0D0546

Client: MOSTARDI-PLATT ASSOCIATES INC.
Client Project: M001501

I. SAMPLE RECEIPT/ANALYSIS

a) Sample Listing

Philip ID	Client Sample ID	Date Sampled	Date Received	Date Prepped	Run Date
Mercury via SW846 Method 7471A					
017427 00	NIST 1633b Reference	00/04/22	00/04/22	00/04/28	00/04/28
Draft ASTM Mercury Speciation Method (October 27, 1999 Revision)- Front Half Outlet					
017253 00	Method Blank	00/04/11	00/04/19	00/04/28	00/04/28
017254 00	Reagent Blank	00/04/11	00/04/19	00/04/28	00/04/28
017255 00	Stack Blank	00/04/12	00/04/19	00/04/28	00/04/28
017256 00	Stack Run #1	00/04/11	00/04/19	00/04/28	00/04/28
017257 00	Stack Run #2	00/04/11	00/04/19	00/04/28	00/04/28
017258 00	Stack Run #3	00/04/11	00/04/19	00/04/28	00/04/28
017259 00	Inlet Blank	00/04/12	00/04/19	00/04/28	00/04/28
017260 00	Inlet Run #1	00/04/11	00/04/19	00/04/28	00/04/28
017261 00	Inlet Run #2	00/04/11	00/04/19	00/04/28	00/04/28
017262 00	Inlet Run #3	00/04/11	00/04/19	00/04/28	00/04/28
Draft ASTM Mercury Speciation Method (October 27, 1999 Revision)- Hydroxylamine					
017253 00	Method Blank	00/04/11	00/04/19	00/04/26	00/04/26
017254 00	Reagent Blank	00/04/11	00/04/19	00/04/26	00/04/26
Draft ASTM Mercury Speciation Method (October 27, 1999 Revision)- KCl Impingers/Rinses					
017253 00	Method Blank	00/04/11	00/04/19	00/04/26	00/04/26
017254 00	Reagent Blank	00/04/11	00/04/19	00/04/27	00/04/27
017255 00	Stack Blank	00/04/12	00/04/19	00/04/26	00/04/26
017256 00	Stack Run #1	00/04/11	00/04/19	00/04/26	00/04/26
017257 00	Stack Run #2	00/04/11	00/04/19	00/04/26	00/04/26
017258 00	Stack Run #3	00/04/11	00/04/19	00/04/26	00/04/26
017259 00	Inlet Blank	00/04/12	00/04/19	00/04/26	00/04/26
017260 00	Inlet Run #1	00/04/11	00/04/19	00/04/26	00/04/26
017261 00	Inlet Run #2	00/04/11	00/04/19	00/04/26	00/04/26
017262 00	Inlet Run #3	00/04/11	00/04/19	00/04/26	00/04/26

Draft ASTM Mercury Speciation Method (October 27, 1999 Revision)- KMNO4 Impingers/Rinses

017253 00	Method Blank	00/04/11	00/04/19	00/04/27	00/04/27
017254 00	Reagent Blank	00/04/11	00/04/19	00/04/27	00/04/27
017255 00	Stack Blank	00/04/12	00/04/19	00/04/27	00/04/27
017256 00	Stack Run #1	00/04/11	00/04/19	00/04/27	00/04/27
017257 00	Stack Run #2	00/04/11	00/04/19	00/04/27	00/04/27
017258 00	Stack Run #3	00/04/11	00/04/19	00/04/27	00/04/27
017259 00	Inlet Blank	00/04/12	00/04/19	00/04/27	00/04/27
017260 00	Inlet Run #1	00/04/11	00/04/19	00/04/27	00/04/27
017261 00	Inlet Run #2	00/04/11	00/04/19	00/04/27	00/04/27
017262 00	Inlet Run #3	00/04/11	00/04/19	00/04/27	00/04/27

Draft ASTM Mercury Speciation Method (October 27, 1999 Revision)- HNO3/H202 Impingers/Rinses

017253 00	Method Blank	00/04/11	00/04/19	00/04/26	00/04/26
017254 00	Reagent Blank	00/04/11	00/04/19	00/04/26	00/04/26
017255 00	Stack Blank	00/04/12	00/04/19	00/04/26	00/04/26
017256 00	Stack Run #1	00/04/11	00/04/19	00/04/26	00/04/26
017257 00	Stack Run #2	00/04/11	00/04/19	00/04/26	00/04/26
017258 00	Stack Run #3	00/04/11	00/04/19	00/04/26	00/04/26
017259 00	Inlet Blank	00/04/12	00/04/19	00/04/26	00/04/26
017260 00	Inlet Run #1	00/04/11	00/04/19	00/04/26	00/04/26
017261 00	Inlet Run #2	00/04/11	00/04/19	00/04/26	00/04/26
017262 00	Inlet Run #3	00/04/11	00/04/19	00/04/26	00/04/26

Run Date is defined as the date of injection of the last calibration standard (12 hour or less) prior to the samples analyzed within that run sequence. Therefore the time of calibration injection that defines the run date is always within 12 hours of the time of sample injection.

b) Shipping Problems: none encountered

c) Documentation Problems: none encountered

II. SAMPLE PREP:

No problems encountered

III. SAMPLE ANALYSIS:

See also comments within the appropriate Certificate of Analysis.

a) Hold Times: all within recommended hold times

b) Instrument Calibration: all within control limits

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above.
In addition, I certify, that to the best of my knowledge and belief, the data as reported are true and accurate.
Release of the data contained in this data package has been authorized by the cognizant laboratory official or his/her designee, as verified by this signature.

Ronald A. McLeod, Principal Sci., Ph.D.,C.Chem.

Date

2. ANALYTICAL DATA REPORT

PHILIP SERVICES

Certificate of Analysis

CLIENT INFORMATION		LABORATORY INFORMATION	
Attention:	Bruce Randall	**Contact:**	Ron McLeod
Client Name:	MOSTARDI-PLATT ASSOCIATES INC.	**Project:**	AN000412
Project:	M001501	**Date Received:**	00/04/19
Project Desc:	Montana-Dakota Utilities	**Date Reported:**	00/05/01
Address:	1301 Corporate Center Drive Suite 177 Eagan, Minnesota 55121	**Submission No.:**	0D0546
		Sample No.:	017253-017262
Fax Number:	651-686-4434		
Phone Number:	651-686-0700		

NOTES: ***"-" = not analysed '<' = less than Method Detection Limit (MDL) 'NA' = no data available***
LOQ can by determined for all analytes by multiplying the appropriate MDL X 3.33
Solids data is based on dry weight except for biota analyses.
Organic analyses are not corrected for extraction recovery standards except for isotope dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)

Methods used by PASC are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', Nineteenth Edition. Other methods are based on the principles of MISA or EPA methodologies. New York State: ELAP Identification Number 10756.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at PASC for a period of three weeks from receipt of data or as per contract.

COMMENTS:

Certified by: _____

95

5555 North Service Road, Burlington, Ontario, Canada L7L 5L1 Tel: (905) 332-0788 Fax: (905) 332-0798

PASC - Certificate of Analysis

			Method Blank	Blank Spike #1	Blank Spike #1	Blank Spike #2	Blank Spike #2	Reagent Blank	Stack Blank
	Client ID:		Method Blank	Blank Spike #1	Blank Spike #1	Blank Spike #2	Blank Spike #2	Reagent Blank	Stack Blank
	Lab No.:		017253 00	017253 00	017253 00	017253 00	017253 00	017254 00	017255 00
	Date Sampled:		-	-	-	-	-	00/04/11	00/04/12
Component	**MDL**	**Units**			% Recoveries		% Recoveries		
Mercury - Filter (F.H. Outlet)	0.010	ug	<	0.10	100	0.10	100	<	<
Mercury - Hydroxylamine	0.010	"	<	0.10	100	0.10	100	<0.090	-
Mercury - KCl	0.030	"	<	0.30	100	0.29	98	<	<0.10
Mercury - KMnO4	0.030	"	<	0.32	110	0.32	110	<	0.55
Mercury - H202	0.010	"	<	0.10	100	0.10	100	<0.050	<0.25

PASC - Certificate of Analysis

	Client ID:		Stack Run #1	Stack Run #1	Stack Run #1	Stack Run #1	Stack Run #1	Stack Run #1	Stack Run #2	Stack Run #3	Inlet Blank
	Lab No.:		017256 00	017256 00	017256 00	017256 00	017256 00	017256 00	017257 00	017258 00	017259 00
	Date Sampled:		00/04/11	00/04/11	00/04/11	00/04/11	00/04/11	00/04/11	00/04/11	00/04/11	00/04/12
Component	**MDL**	**Units**		Duplicate	M. Spike	MS % Rec.	MS Dup	MSD % Rec.			
Mercury - Filter (F.H. Outlet)	0.010	ug	0.066	0.065	0.16	97	0.16	96	<	<	<
Mercury - Hydroxylamine	0.010	"	-	-	-	-	-	-	-	-	-
Mercury - KCl	0.030	"	0.55	0.56	1.6	100	1.6	100	0.36	0.52	0.15
Mercury - KMnO4	0.030	"	15	15	16	100	16	83	14	16	1.0
Mercury - H202	0.010	"	0.31	0.30	2.8	100	2.9	100	0.61	0.54	<0.25

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00008

PASC - Certificate of Analysis

	Client ID:		Inlet Run #1	Inlet Run #2	Inlet Run #3
	Lab No.:		017260 00	017261 00	017262 00
	Date Sampled:		00/04/11	00/04/11	00/04/11
Component	**MDL**	**Units**			
Mercury - Filter (F.H. Outlet)	0.010	ug	1.8	2.1	1.8
Mercury - Hydroxylamine	0.010	"	-	-	-
Mercury - KCl	0.030	"	26	17	8.0
Mercury - KMnO4	0.030	"	17	10	12
Mercury - H202	0.010	"	1.4	0.52	1.0

			NIST 1633b	
		Client ID:	Reference	
		Lab No.:	017427 00	
		Date Sampled:	00/04/22	
Component	**MDL**	**Units**	Observed	Theoretical
Mercury	0.04	mg/kg	0.142	0.141

99

00010

Batch Code:	**04281NFT**	
Mercury -Filter (FH Outlet)	017253 00	
	017254 00	
	017255 00	
	017256 00	
	017257 00	
	017258 00	
	017259 00	
	017260 00	
	017261 00	
	017262 00	
Run Date:	00/04/28	
Date of Sample Prep:	00/04/28	
Batch Code:	**04261NPO**	
Mercury - Hydroxylamine	017253 00	
	017254 00	
Run Date:	00/04/26	
Date of Sample Prep:	00/04/26	
Batch Code:	**04262NKC**	**04271BKC**
Mercury - KCl	017253 00	017254 00
	017255 00	
	017256 00	
	017257 00	
	017258 00	
	017259 00	
	017260 00	
	017261 00	
	017262 00	
Run Date:	00/04/26	00/04/27
Date of Sample Prep:	00/04/26	00/04/27
Batch Code:	**04271BMN**	
Mercury - KMnO4	017253 00	
	017254 00	
	017255 00	
	017256 00	
	017257 00	
	017258 00	
	017259 00	
	017260 00	
	017261 00	
	017262 00	
Run Date:	00/04/27	
Date of Sample Prep:	00/04/27	

Batch Code:	**04261NPO**
Mercury - H202	017253 00
	017254 00
	017255 00
	017256 00
	017257 00
	017258 00
	017259 00
	017260 00
	017261 00
	017262 00
Run Date:	00/04/26
Date of Sample Prep:	00/04/26

Batch Code:	**04281NFT**
Mercury	017427 00
Run Date:	00/04/28
Date of Sample Prep:	00/04/28

3. RAW DATA

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
017427	MOSTARDI	NIST 1633b Reference	Mercury	PV	0.14						00/04/28	1NFT	00/04/28	MG02	6.	6.	*0.1418*

1 Tests for NIS1633B with an MDL of 0.04 mg/kg Validated By cmb Control Chart Updated N/A IO Requirements met N/A

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00014

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
017253	MOSTARDI	MB R456	Mercury -	PV	-0.010	-99999.0	0.101	101.	0.103	103.	00/04/28	1NFT	00/04/28	MG02	17.	9.	*BLKIMP*
017254	MOSTARDI	Reagent Blank	Mercury -	PV	-0.010						00/04/28	1NFT	00/04/28	MG02	17.	9.	
017255	MOSTARDI	Stack Blank	Mercury -	PV	-0.010						00/04/28	1NFT	00/04/28	MG02	16.	9.	
017256	MOSTARDI	Stack Run #1	Mercury -	PV	0.066	0.065	0.163	97.	0.162	96.	00/04/28	1NFT	00/04/28	MG02	17.	9.	
017257	MOSTARDI	Stack Run #2	Mercury -	PV	-0.010						00/04/28	1NFT	00/04/28	MG02	17.	9.	
017258	MOSTARDI	Stack Run #3	Mercury -	PV	-0.010						00/04/28	1NFT	00/04/28	MG02	17.	9.	
017259	MOSTARDI	Inlet Blank	Mercury -	PV	-0.010						00/04/28	1NFT	00/04/28	MG02	16.	9.	
017260	MOSTARDI	Inlet Run #1	Mercury -	PV	1.810						00/04/28	1NFT	00/04/28	MG02	17.	9.	
017261	MOSTARDI	Inlet Run #2	Mercury -	PV	2.119						00/04/28	1NFT	00/04/28	MG02	17.	9.	
017262	MOSTARDI	Inlet Run #3	Mercury -	PV	1.813						00/04/28	1NFT	00/04/28	MG02	17.	9.	
BL0428	INTERNAL		Mercury -	PV	-0.010	-99999.0	0.101	101.	0.103	103.	00/04/28	1NFT	00/04/28	MG02	$$$	$$$	*BLKIMP*

11 Tests for OHFLT with an MDL of 0.010 ug Validated By cmb Control Chart Updated N/A IO Requirements met N/A

104

00015

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 00.04.28 W Run Code: MG02 Matrix: MP

Analyst: MG Units: µg (see comments) MDL: 0.01

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12			BL0428	INFT.		
13			"			
14			BL0428 S			
15			"			
16			BL0428 DS			
17			"			
18			17256			
19			"			
20			17256 D			
21			"			
22			17256 S			
23			"			
24			17256 DS			
25			"			
26			17253			
27			"			
28			17254			
29			"			
30			17255			
31			"			
32			CCV			
33			B			
34			D4			
35			17257			
36			"			
37			17258			
38			"			
39			17259			
40			"			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41		1/2	17260			
42			"			
43			17261			
44			"			
45			17262			
46			"			
47			17427			
48			"			
49			CCV			
50			B			
51			D4			
52						
53						
54						
55						
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Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

00017

Effective 000216

EPA 7470 WATER PREPARATION LOG - MERCURY

DG7470HG, DGHGLEACH, DG29*

Calibration Solutions:

#	I.D.	**Conc.	Spike	***Conc. Entered
1	Blank/Dummy	0 ppb	None	0.0
2	Standard 1	0 ppb	None	0.0
3	Standard 2	0.33	200 ul of 0.05 ppm IV working standard	0.5
4	Standard 3	0.67	400 ul of 0.05 ppm IV working standard	1.0
5	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
6	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
7	Standard 5	1.33	800 ul of 0.05 ppm IV working standard	2.0
8	Standard 6	1.67	1000 ul of 0.05 ppm IV working standard	2.5

STANDARDS MATRIX MATCHED WITH HF + AQUA REGIA

Check List

- Digest Code/labels
- Samples poured out
- Acids added
- Reagents added
- Samples spiked
- Bath at 95 degrees C
- Samples digested
- Hydroxylamine HCl added
- Samples shaken and bulked
- Rack order checked

000428 MI

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	9	ICV (Init. Calib. Verif.)	INFT	20 ml	30 ml	1 X	1.5 ppb = 600 ul of MES-ZENO 30/QCA (Ref Std)
	10	BL 0428	"	"	"	"	(Processed Blank)
	11	BL 0428 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
	12	BL 0428 DS					(Duplicate Blank Spike)
1	13	17256	"	"	"	"	FINAL VOL 100
1	14	17256 D	"	"	"	"	(Duplicate sample)
1	15	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
1	16	DS	"	"	"	"	(Duplicate Spiked sample)
2	17	17253	"	"	"	"	100
3	18	54	"	"	"	"	
4	19	55	"	"	"	"	
5	20	57	"	"	"	"	
6	21	58	"	"	"	"	
7	22	59	"	"	"	"	
8	23	60	"	"	"	"	500 mls
9	23	61	"	"	"	"	600 mls
10	24	62	"	"	"	"	800 mls
	25	CCV (Cont. Calib. Verif.)	-	20 ml	30 ml	1 X	1.0 ppb = 400 ul of MES-ZENO 30/QCA (Ref Std)
000428 MN	26	~~BL~~ 17472		20 ml	30 ml	"	~~(Processed Blank)~~ NIST 1633b REFERENCE 100 ml
	27	BL S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
	28	BL DS					(Duplicate Blank Spike)
1	29		"	"	"	"	
1	30	D	"	"	"	"	(Duplicate sample)
1	31	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
1	32	DS	"	"	"	"	(Duplicate Spiked sample)
2	33		"	"	"	"	
3	34		"	"	"	"	
4	35		"	"	"	"	
5	36		"	"	"	"	
6	37		"	"	"	"	
7	38		"	"	"	"	
8	39		"	"	"	"	
9	40		"	"	"	"	
10	41		"	"	"	"	
	42	CCV (Cont. Calib. Verif.)	"	20 ml	30 ml	1 X	1.0 ppb = 400 ul of MES-ZENO 30/QCA (Ref Std)

Comments * FILTER + PROBE RINSE DIGESTED 8HRS @ 85°C HOT BATH WITH HF + AQUA REGIA AS PER ONTARIO HYDRO METHOD

** concentration based on 30 ml final volume, *** concentration based on 20 ml final volume

Other Applicable Test Codes: DG29HG-1B, DG29HG-2B, DG29HG-3A, DG29HG-3B, DG29HG-3C

DG29HGI, DG29HGF, DG101AA1, DG101AA2

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	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	43	BL		"	"	"	(Processed Blank)
	44	BL S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
	45	BL DS					(Duplicate Blank Spike)
1	46		"	"	"	"	
1	47	D	"	"	"	"	(Duplicate sample)
1	48	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
1	49	DS	"	"	"	"	(Duplicate Spiked sample)
2	50		"	"	"	"	
3	51		"	"	"	"	
4	52		"	"	"	"	
5	53		"	"	"	"	
6	54		"	"	"	"	
7	55		"	"	"	"	
8	56		"	"	"	"	
9	57		"	"	"	"	
10	58		"	"	"	"	
	57	CCV (Cont. Calib. Verif.)	"	20 ml	30 ml	1 X	1.0 ppb = 400 ul of MES-ZENO 30/QCA (Ref Std)

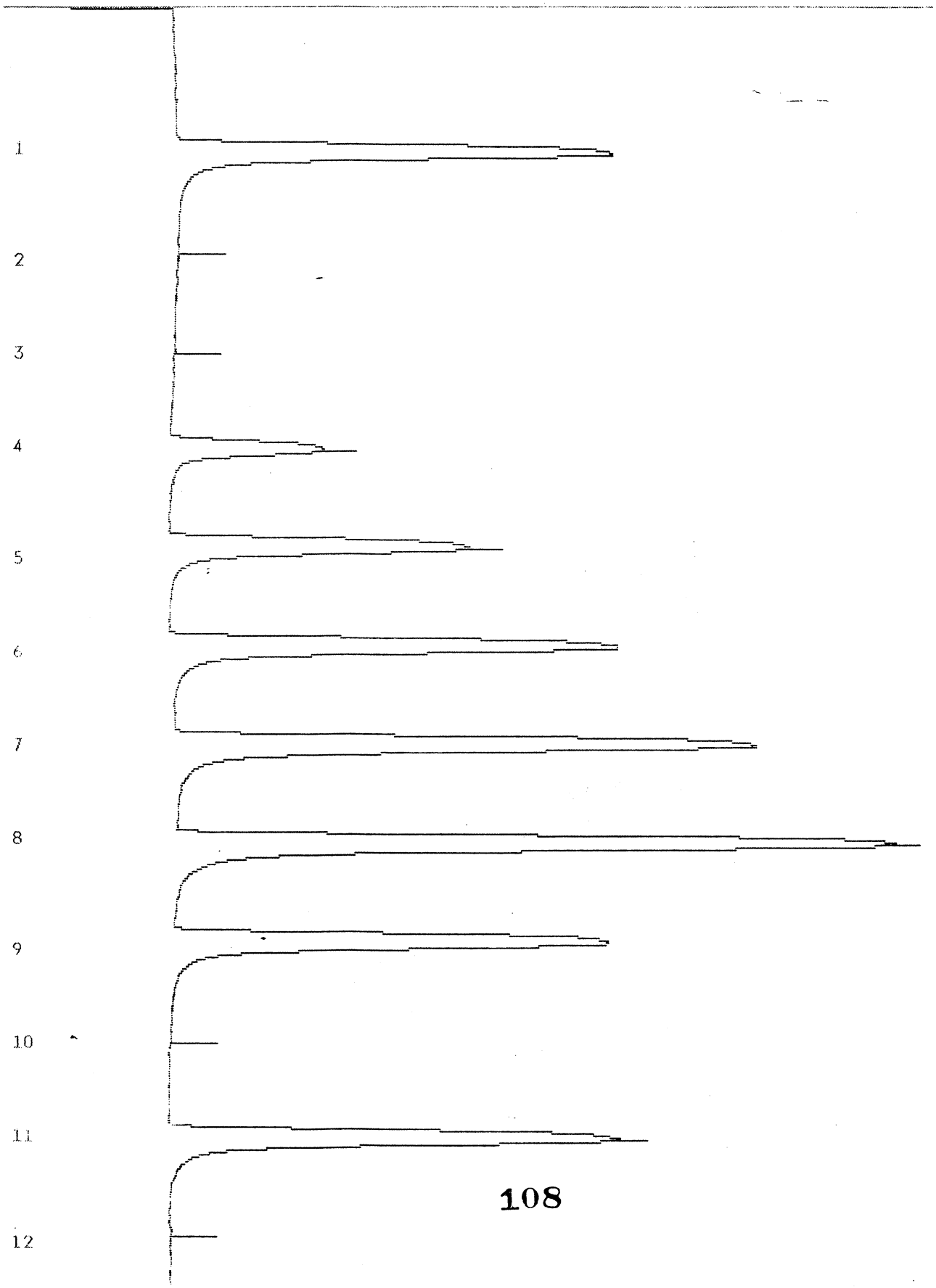
Procedure/Methodology:

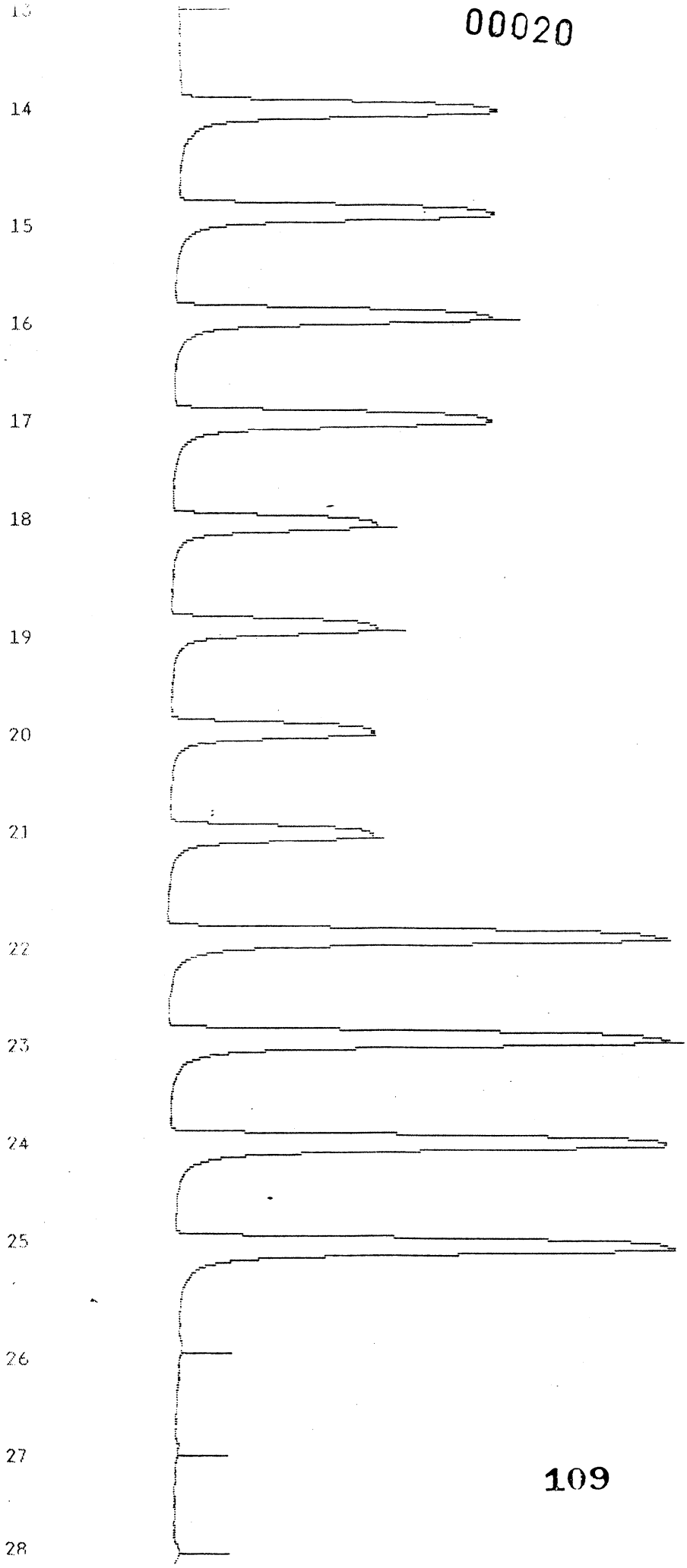
1 Prepare 25 ppm Intermediate Calibration Standard (if required) by pipetting 625 ul., of 1000 ppm Stock to 25 ml final volume of 2% HNO_3
2 Prepare 0.05 ppm Working standard daily by pipetting 200 ul., of 25 ppm Intermediate to 100 ml final volume of 2% HNO_3
3 Using the LIMS Screen "SCNDIG" enter the required samples into LIMS
4 Using the labeling program, "DIGLBL", retreive the "SCNDIG" list and create labels for the required samples.
5 Label the falcon tubes appropriately
6 Include one External Reference Material sample per run
7 Incude one Organic Mercury Control Standard per run
8 Transfer a 20 ml. aliquot of well mixed sample into the designated falcon tube
9 Spike the tubes as indicated in the comment sector of the digestion sheet
10 Add 0.5 ml. of conc. Nitric Acid (HNO_3), and 1 ml. of conc. Sulphuric acid, (H_2SO_4), to each tube
11 Add 3 ml. Of 6% $KMnO_4$, purple colour must remain for at least 15 minutes
12 Add 1.5 ml. of 5% potassium persulphate, ($K_2S_2O_8$), to each tube
13 Mix samples, cap loosely and place in a water bath @ 95 degrees C for 2 hours
14 Remove tubes and allow to cool to room temperature
15 Add 1.0 ml. 20% Hydroxylamine Hydrochloride to each tube
16 Recap tubes and shake until $KMnO_4$ is destroyed and sample becomes colourless
17 Dilute the sample to a final volume of 30 ml.

Supplier/Lot Information	Supplier	Lot -	Expiry Date
Stock Calibration Standard	Inorganic Ventures	1 HG 02023	01/04/01
Intermediate Cal Standard	Internal	00 04 05 A	00 05 05
Stock Reference Standard	High Purity	836309	00 FEB
External Reference Material	SPEX		
Organic Mercury Control Standard	Aldrich		
6% potassium permanganate	Internal		
5% potassium persulphate	Internal		
20% hydroxylamine hydrochloride	Internal		
AQUAREGIA HNO_3 / HCl	Anachemia	100010 / 419100	00/06/17
H_2SO_4 HF	Anachemia	519170	00/06/17
Bath Temps: 1 / 85 C	Time ON: 9 AM	Time OFF: 5 PM	
Prepared By: M. Ahiapingo	Date: 000428	Checked by: M. Ahiapingo	

Philip Analytical Services-Burlington

RUN DATE: 04-29-2000 CHART DATE: 04-29-2000
CHART SPEED: 30
DATA FILE NAME: C:\DP4\DATA\000428W.DAT

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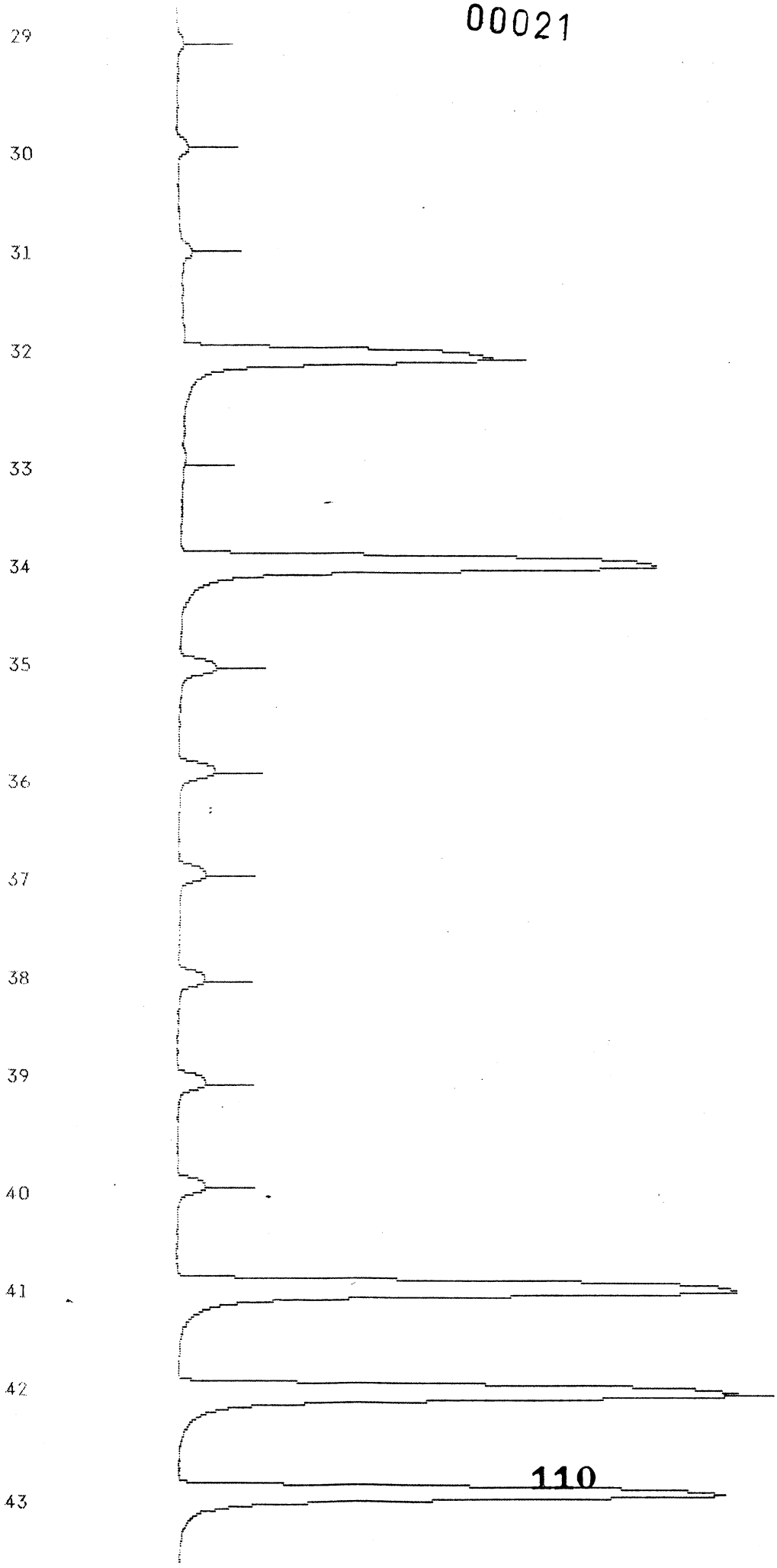
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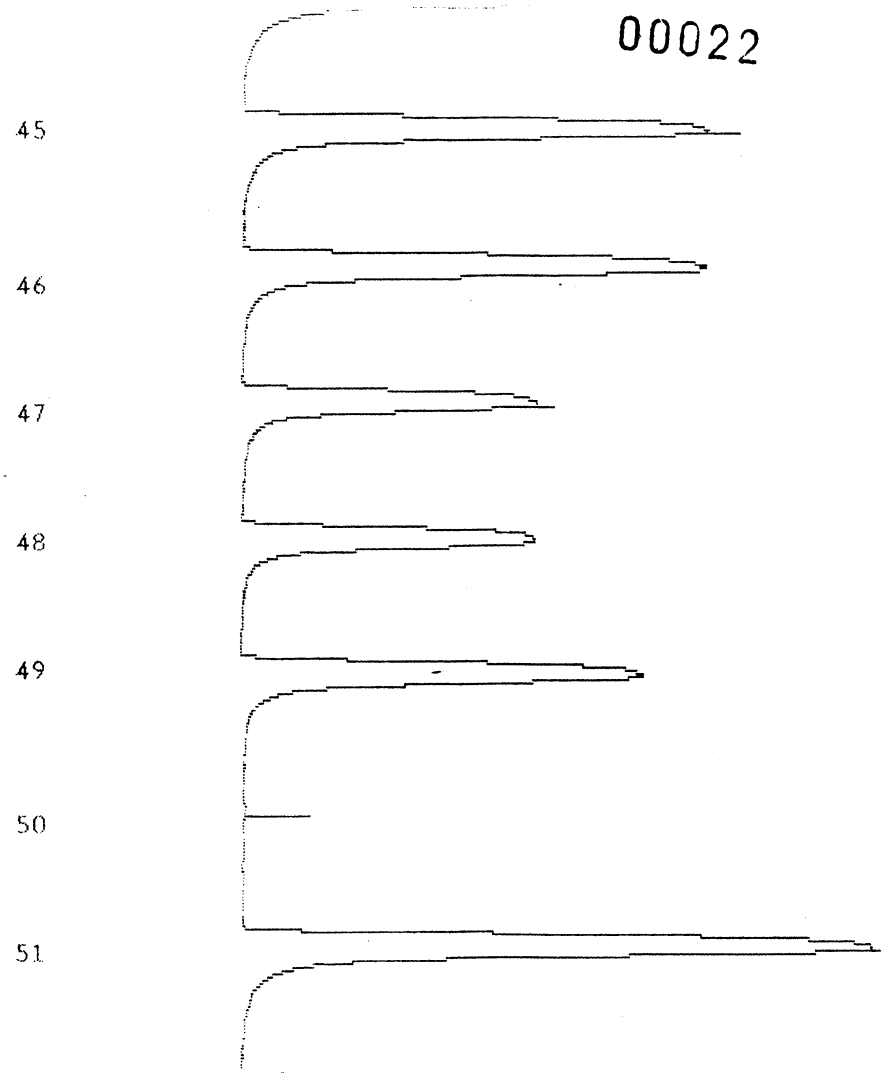
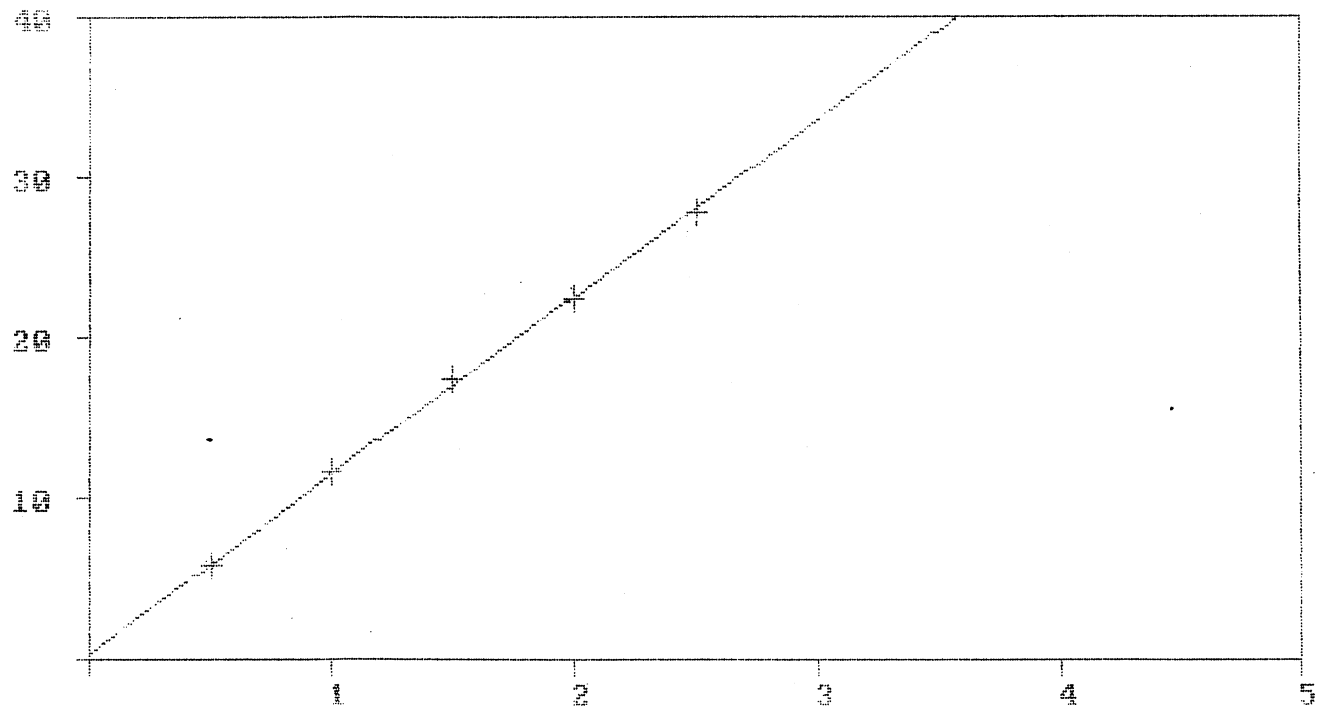


CHANNEL NAME: LOC
RUN NAME: 000428W



DATA TYPE: FIA
CALIBRATION ORDER: 1
INTERCEPT = 0.33
SLOPE = 11.07553

CORRELATION: .9995963

CHANNEL NAME: LDC
RUN DATE: 04-29-2000
SAMPLE TABLE NAME: 000428W
METHOD NAME: HG-W-20

00023

µg/L

CUP#	SAMPLE ID	DIL	WGT	HEIGHT/AREA		CONCENTRATION	EF
1	PRIMER	1	1	16.9		1.496	s
2	DUMMY	1	1	0.0		-0.030	I
3	S1: 0	1	1	0.0		-0.028	I
4	S2: .5	1	1	5.9		0.501	
5	S3: 1	1	1	11.6		1.020	
6	S4: 1.5	1	1	17.4		1.540	
7	S5: 2	1	1	22.4		1.994	
8	S6: 2.5	1	1	27.7		2.473	
9	ICV	1	1	16.8	TLG	1.487	99%
10	B	1	1	0.0		-0.030	b
11	D4	1	1	17.4		1.540	d
12	BL0428-1NFT 17253	1	1	0.0	<0.01	-0.026	I
13	BL0428-1NFT	1	1	0.0		-0.028	I
14	BL0428S	1	1	11.6	0.101	1.020	101%
15	BL0428S	1	1	11.6		1.017	
16	BL0428DS	1	1	11.7	0.103	1.024	103%
17	BL0428DS	1	1	11.8		1.035	
18	17256	1	1	7.6	0.066	0.656	
19	17256	1	1	7.6		0.658	
20	17256D	1	1	7.5	0.065	0.647	
21	17256D	1	1	7.5		0.649	
22	17256S	1	1	18.3	0.163	1.626	97%
23	17256S	1	1	18.4		1.628	
24	17256DS	1	1	18.2	0.162	1.613	96%
25	17256DS	1	1	18.3		1.622	
26	17253	1	1	0.0	<0.01	-0.030	I
27	17253	1	1	0.0		-0.030	I
28	17254	1	1	0.1	<0.01	-0.023	I
29	17254	1	1	0.1		-0.021	I
30	17255	1	1	0.3	<0.01	-0.003	I
31	17255	1	1	0.3		-0.003	s
32	CCV	1	1	11.3		0.991	99%
33	B	1	1	0.0		-0.030	b
34	D4	1	1	17.4		1.540	d
35	17257	1	1	1.1	<0.01	0.072	
36	17257	1	1	1.1		0.074	
37	17258	1	1	0.8	<0.01	0.043	
38	17258	1	1	0.8		0.041	
39	17259	1	1	0.8	<0.01	0.045	
40	17259	1	1	0.8		0.045	
41	17260	2	1	20.3	1.810	3.613	
42	17260	2	1	20.4		3.627	
43	17261	2	1	19.8	2.119	3.516	
44	17261	2	1	20.0		3.547	
45	17262	2	1	12.9	1.813	2.264	
46	17262	2	1	12.9		2.268	s
47	* 17427-NIST 1633b	1	1	8.2	0.142µg/g	0.707	
48	17427	1	1	8.2		0.711	
49	CCV	1	1	11.2		0.982	
50	B	1	1	0.0		-0.030	b
51	D4	1	1	17.4		1.540	d

INTERCEPT: 0.33
LINEAR COEF: 11.07553
CORRELATION COEF: .9995963

$* \; 0.709 \frac{\mu g}{L} \times \frac{0.1 L}{0.5 g} = 0.1418 \mu g/g$

enon umber	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
17253	MOSTARDI	MB R456	Mercury -	PV	-0.0100	-99999.0	0.1000	100.	0.1000	100.	00/04/26	1NPO	00/04/26	MG02	15.	7.	*BLKIMP*
17254	MOSTARDI	Reagent Blank	Mercury -	PV	-0.0500						00/04/26	1NPO	00/04/26	MG02	15.	7.	*DDL*
17255	MOSTARDI	Stack Blank	Mercury -	PV	-0.2500						00/04/26	1NPO	00/04/26	MG02	14.	7.	*DDL*
17256	MOSTARDI	Stack Run #1	Mercury -	PV	0.3120	0.3040	2.8120	100.	2.9010	104.	00/04/26	1NPO	00/04/26	MG02	15.	7.	
17257	MOSTARDI	Stack Run #2	Mercury -	PV	0.6060						00/04/26	1NPO	00/04/26	MG02	15.	7.	
17258	MOSTARDI	Stack Run #3	Mercury -	PV	0.5350						00/04/26	1NPO	00/04/26	MG02	15.	7.	
17259	MOSTARDI	Inlet Blank	Mercury -	PV	-0.2500						00/04/26	1NPO	00/04/26	MG02	14.	7.	*DDL*
17260	MOSTARDI	Inlet Run #1	Mercury -	PV	1.3930						00/04/26	1NPO	00/04/26	MG02	15.	7.	
17261	MOSTARDI	Inlet Run #2	Mercury -	PV	0.5210						00/04/26	1NPO	00/04/26	MG02	15.	7.	
17262	MOSTARDI	Inlet Run #3	Mercury -	PV	1.0370						00/04/26	1NPO	00/04/26	MG02	15.	7.	
L0426	INTERNAL		Mercury -	PV	-0.0100	-99999.0	0.1000	100.	0.1000	100.	00/04/26	1NPO	00/04/26	MG02	$$$	$$$	*BLKIMP*

11 Tests for OHPOX with an MDL of 0.010 ug Validated By cmb Control Chart Updated N/A IO Requirements met N/A

113

00024

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
)17253	MOSTARDI	MB R456	Mercury -	PV	-0.010	-99999.0	0.100	100.	0.100	100.	00/04/26	1NPO	00/04/26	MG02	15.	7.	*BLKIMP*
)17254	MOSTARDI	Reagent Blank	Mercury -	PV	-0.090						00/04/26	1NPO	00/04/26	MG02	15.	7.	
3L0426	INTERNAL		Mercury -	PV	-0.010	-99999.0	0.100	100.	0.100	100.	00/04/26	1NPO	00/04/26	MG02	$$$	$$$	*BLKIMP*

3 Tests for OHHYX with an MDL of 0.010 ug Validated By cmb Control Chart Updated N/A IO Requirements met N/A

114

00025

Xenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
)17253	MOSTARDI	MB R456	Mercury -	PV	-0.030	-99999.0	0.302	101.	0.293	98.	00/04/26	2NKC	00/04/26	MG02	15.	7.	
)17255	MOSTARDI	Stack Blank	Mercury -	PV	-0.100						00/04/26	2NKC	00/04/26	MG02	14.	7.	
)17256	MOSTARDI	Stack Run #1	Mercury -	PV	0.549	0.559	1.568	101.	1.575	102.	00/04/26	2NKC	00/04/26	MG02	15.	7.	
)17257	MOSTARDI	Stack Run #2	Mercury -	PV	0.362						00/04/26	2NKC	00/04/26	MG02	15.	7.	
)17258	MOSTARDI	Stack Run #3	Mercury -	PV	0.524						00/04/26	2NKC	00/04/26	MG02	15.	7.	
)17259	MOSTARDI	Inlet Blank	Mercury -	PV	0.145						00/04/26	2NKC	00/04/26	MG02	14.	7.	
)17260	MOSTARDI	Inlet Run #1	Mercury -	PV	26.127						00/04/26	2NKC	00/04/26	MG02	15.	7.	
)17261	MOSTARDI	Inlet Run #2	Mercury -	PV	16.782						00/04/26	2NKC	00/04/26	MG02	15.	7.	
)17262	MOSTARDI	Inlet Run #3	Mercury -	PV	7.958						00/04/26	2NKC	00/04/26	MG02	15.	7.	
3L0426	INTERNAL		Mercury -	PV	-0.030	-99999.0	0.302	101.	0.293	98.	00/04/26	2NKC	00/04/26	MG02	$$$	$$$	

10 Tests for OHKCL with an MDL of 0.030 ug Validated By cmb Control Chart Updated N/A IO Requirements met N/A

115

00026

LDC AUTOSAMPLER RUN LOG (MERCURY)

00027

1/2

Date: 00.04.26 WA Run Code: MG02 Matrix: IMP

Analyst: MG Units: µg (see comments) MDL: 0.01 / 0.03

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12			WS 378			
13			ORG. REF.			
14			BL0426	INPO.		
15			"			
16			BL0426 S			
17			"			
18			BL0426 DS			
19			"			
20	10		17256			
21			"			
22			17256 D			
23			"			
24			17256 S			
25			"			
26			17256 DS			
27			"			
28			17254			
29			"			
30			17255			
31			"			
32			17257			
33			"			
34			CCV			
35			B			
36			D4			
37	10		17258			
38			"			
39			17259			
40			"			
41	10		17260			
42			"			
43			17261			
44			"			
45			17262			
46			"			
47			17254	HYX		
48			"			
49			BL0426	ZNKC		
50			"			
51			BL0426 S			
52			"			
53			BL0426 DS			
54			"			
55			17256			
56			"			
57			CCV			
58			B			
59			D4			
60			17256 D			
61			"			
62			17256 S			
63			"			
64			17256 DS			
65			"			
66			17255			
67			"			
68			17257			
69			"			
70			17258			
71			"			
72			17259			
73			"			
74		1/20	17260			
75		↓	"			
76		1/10	17261			
77		↓	"			
78		1/4	17262			
79		↓	"			
80			CCV			

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

LDC AUTOSAMPLER RUN LOG (MERCURY) 00028

/2

Date: 00.04.26 WA Run Code: MG02 Matrix: IMP

Analyst: MG. Units: µg (see comments) MDL: _____

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12						
13						
14						
15						
16						
17						
18						
19						
20						
21			B			
22			D4			
23			BL0426			
24			"			
25			BL0426 S			
26			"			
27			BL0426 DS			
28			"			
29			9454			
30			"			
31			9454 D			
32			"			
33			9454 S			
34			"			
35			9454 DS			
36			"			
37			9455			
38			"			
39			9456			
40			"			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41			9457			
42			"			
43			CCV			
44			B			
45			D4			
46		1/4	9458			
47		↓	"			
48			9459			
49			"			
50			BL0426	3NIP		
51			BL0426 S			
52			BL0426 DS			
53	10		15952			
54			15953			
55	5		15954			
56			CCV			
57			B			
58			D4			
59			BL0426	STC 1		
60			BL0426 S			
61			17743			
62			17743 D			
63			743 S			
64			745			
65			747			
66			17591			
67			592			
68		1/50	597			
69			17794			
70			17910			
71			LEACH BLK	0426		
72			WS 378			
73			ORG. REF			
74			CCV			
75			B			
76			D4			
77						
78						
79						
80						

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

EPA 7470 WATER PREPARATION LOG - ~~MERCURY~~ 00029

DG7470HG, DGHGLEACH, DG29*

Calibration Solutions:

#	I.D.	**Conc.	Spike	***Conc. Entered
1	Blank/Dummy	0 ppb	None	0.0
2	Standard 1	0 ppb	None	0.0
3	Standard 2	0.33	200 ul of 0.05 ppm IV working standard	0.5
4	Standard 3	0.67	400 ul of 0.05 ppm IV working standard	1.0
5	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
6	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
7	Standard 5	1.33	800 ul of 0.05 ppm IV working standard	2.0
8	Standard 6	1.67	1000 ul of 0.05 ppm IV working standard	2.5

Check List

- ✓ Digest Code/labels
- ✓ Samples poured out
- ✓ Acids added
- ✓ Reagents added
- ✓ Samples spiked
- ✓ Bath at 95 degrees C
- ✓ Samples digested
- ✓ Hydroxylamine HCl added
- ✓ Samples shaken and bulked
- ✓ Rack order checked

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	9	ICV (Init. Calib. Verif.)	INP0	20 ml	30 ml	1 X	1.5 ppb = 600 ul of MES-ZENO 30/QCA (Ref Std)
	10	BL 0426	"	"	"	"	(Processed Blank)
	11	BL 0426 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
	12	BL 0426 DS					(Duplicate Blank Spike)
1	13	17256	"	1 mls	15 mls	10X	250 mls
1	14	D	"	"	"	"	(Duplicate sample)
1	15	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
1	16	DS	"	"	"	"	(Duplicate Spiked sample)
2	17	17254	"	"	"	"	50 mls
3	18	55	"	"	"	"	250 mls
4	19	57	"	"	"	"	
5	20	58	"	"	"	"	
6	21	59	"	"	"	"	
7	22	60	"	"	"	"	
8	23	61	"	"	"	"	
9	23	62	"	"	"	"	
10	24	17264	"	"	"	"	HYDROXYLAMINE 90 mls
	25	CCV (Cont. Calib. Verif.)	-	20 ml	30 ml	1 X	1.0 ppb = 400 ul of MES-ZENO 30/QCA (Ref Std)
	26	BL 0426	2NKC	20 ml	30 ml	"	(Processed Blank)
	27	BL 0426 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
	28	BL 0426 DS					(Duplicate Blank Spike)
1	29	17252	"	"	"	"	1000 mls
1	30	D	"	"	"	"	(Duplicate sample)
1	31	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
1	32	DS	"	"	"	"	(Duplicate Spiked sample)
2	33	~~17254~~ MG 00027	"	"	"	"	~~48 mls~~
3	34	55	"	"	"	"	1000 mls
4	35	57	"	"	"	"	
5	36	58	"	"	"	"	
6	37	59	"	"	"	"	
7	38	60	"	"	"	"	
8	39	61	"	"	"	"	
9	40	62	"	"	"	"	
10	41		"	"	"	"	
	42	CCV (Cont. Calib. Verif.)	"	20 ml	30 ml	1 X	1.0 ppb = 400 ul of MES-ZENO 30/QCA (Ref Std)

Comments

** concentration based on 30 ml final volume, *** concentration based on 20 ml final volume

Other Applicable Test Codes: DG29HG-1B, DG29HG-2B, DG29HG-3A, DG29HG-3B, DG29HG-3C

DG29HGI, DG29HGF, DG101AA1, DG101AA2

Philip Analytical Services-Burlington

00030

EPA 7470 WATER PREPARATION LOG - MERCURY

DG7470HG, DGHGLEACH, DG29*

Calibration Solutions:

#	I.D.	**Conc.	Spike	***Conc. Entered
1	Blank/Dummy	0 ppb	None	0.0
2	Standard 1	0 ppb	None	0.0
3	Standard 2	0.33	200 ul of 0.05 ppm IV working standard	0.5
4	Standard 3	0.67	400 ul of 0.05 ppm IV working standard	1.0
5	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
6	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
7	Standard 5	1.33	800 ul of 0.05 ppm IV working standard	2.0
8	Standard 6	1.67	1000 ul of 0.05 ppm IV working standard	2.5

Check List

- ✓ Digest Code/labels
- ✓ Samples poured out
- ✓ Acids added
- ✓ Reagents added
- ✓ Samples spiked
- ✓ Bath at 95 degrees C
- ✓ Samples digested
- ✓ Hydroxylamine HCl added
- ✓ Samples shaken and bulked
- ✓ Rack order checked

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	9	ICV (Init. Calib. Verif.)	3KJ1P	20 ml	30 ml	1 X	1.5 ppb = 600 ul of MES-ZENO 30/QCA (Ref Std)
	10	BL 0426	"	"	"	"	(Processed Blank)
	11	BL 0426 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
	12	BL 0426 DS					(Duplicate Blank Spike)
1	13	15952	"	1 ml	15"	10x	
1	14	D	"	"	"	"	(Duplicate sample)
1	15	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
1	16	00426 MW DS	"	"	"	"	(Duplicate Spiked sample)
2	17	53	"	20 mls	30 mls	1 X	
3	18	54	"	4 mls	"	5 X	
4	19		"	"	"	"	
5	20		"	"	"	"	
6	21		"	"	"	"	
7	22		"	"	"	"	
8	23		"	"	"	"	
9	23		"	"	"	"	
10	24		"	"	"	"	
	25	CCV (Cont. Calib. Verif.)	"	20 ml	30 ml	1 X	1.0 ppb = 400 ul of MES-ZENO 30/QCA (Ref Std)
	26	BL		20 ml	30 ml	"	(Processed Blank)
	27	BL S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
	28	BL DS					(Duplicate Blank Spike)
1	29		"	"	"	"	
1	30	D	"	"	"	"	(Duplicate sample)
1	31	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
1	32	DS	"	"	"	"	(Duplicate Spiked sample)
2	33		"	"	"	"	
3	34		"	"	"	"	
4	35		"	"	"	"	
5	36		"	"	"	"	
6	37		"	"	"	"	
7	38		"	"	"	"	
8	39		"	"	"	"	
9	40		"	"	"	"	
10	41		"	"	"	"	
	42	CCV (Cont. Calib. Verif.)	"	20 ml	30 ml	1 X	1.0 ppb = 400 ul of MES-ZENO 30/QCA (Ref Std)

Comments

** concentration based on 30 ml final volume, *** concentration based on 20 ml final volume

Other Applicable Test Codes: DG29HG-1B, DG29HG-2B, DG29HG-3A, DG29HG-3B, DG29HG-3C

DG29HGI, DG29HGF, DG101AA1, DG101AA2

Philip Analytical Services-Burlington

RUN DATE: 04-27-2000 CHART DATE: 04-27-2000
CHART SPEED: 30
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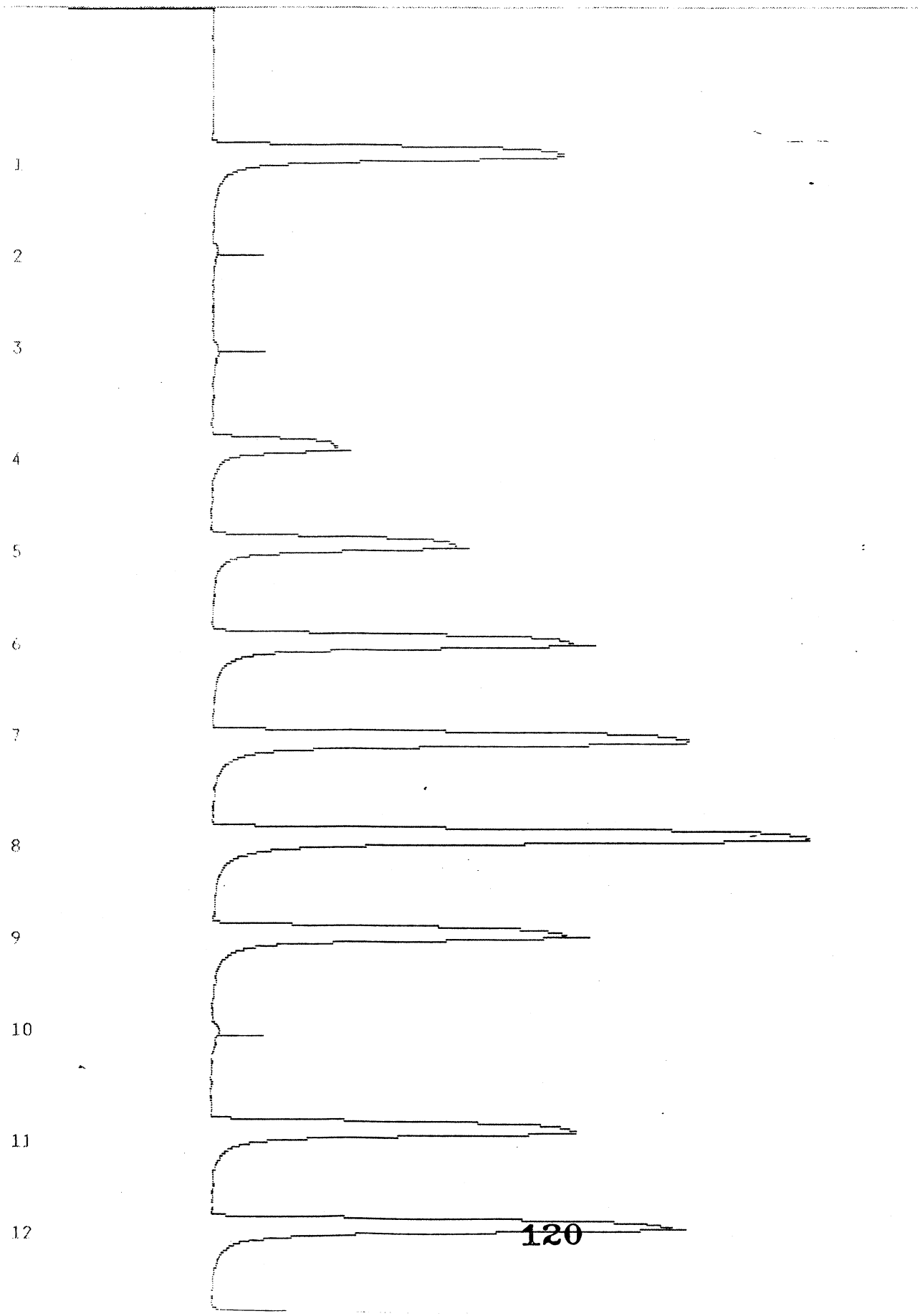

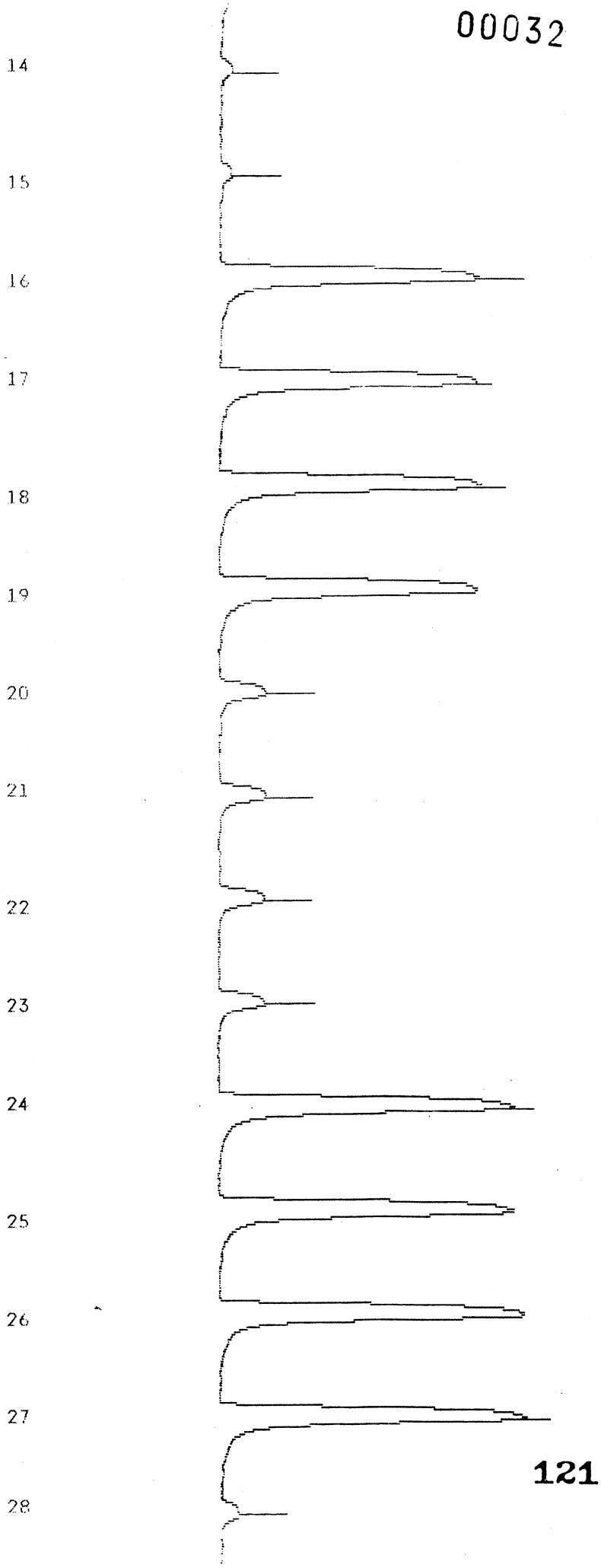
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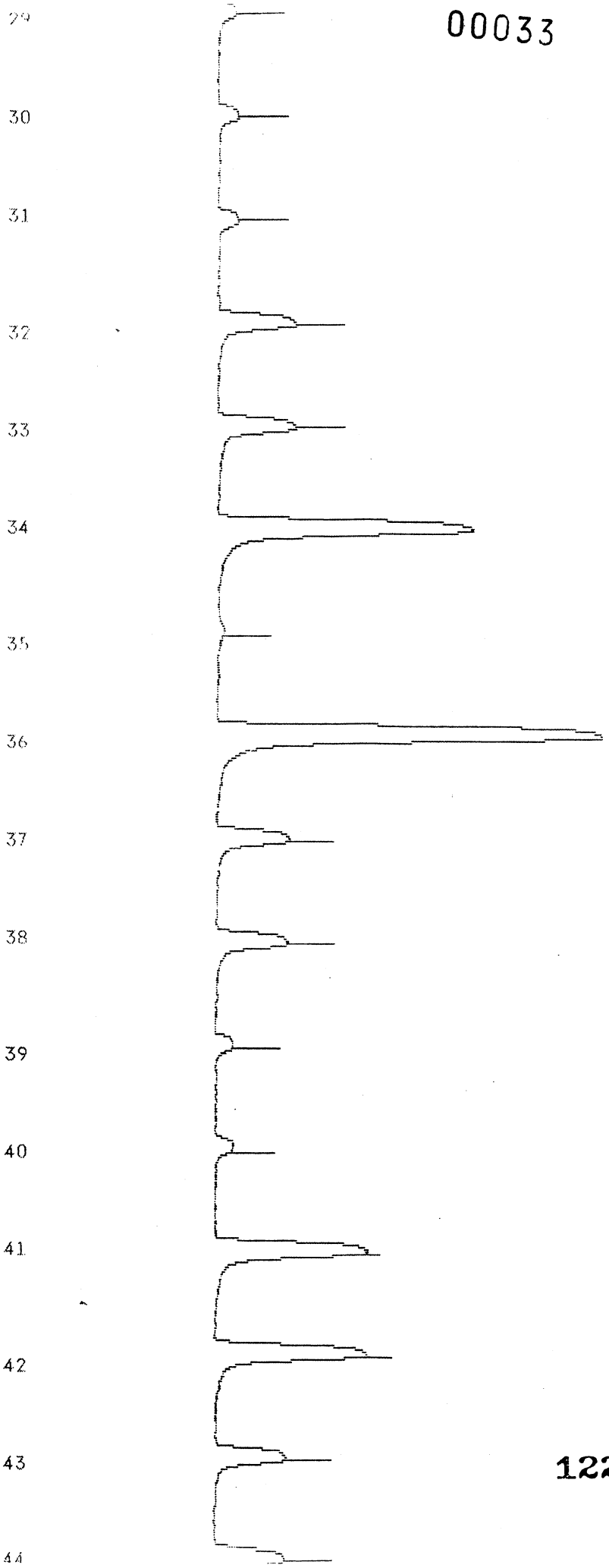
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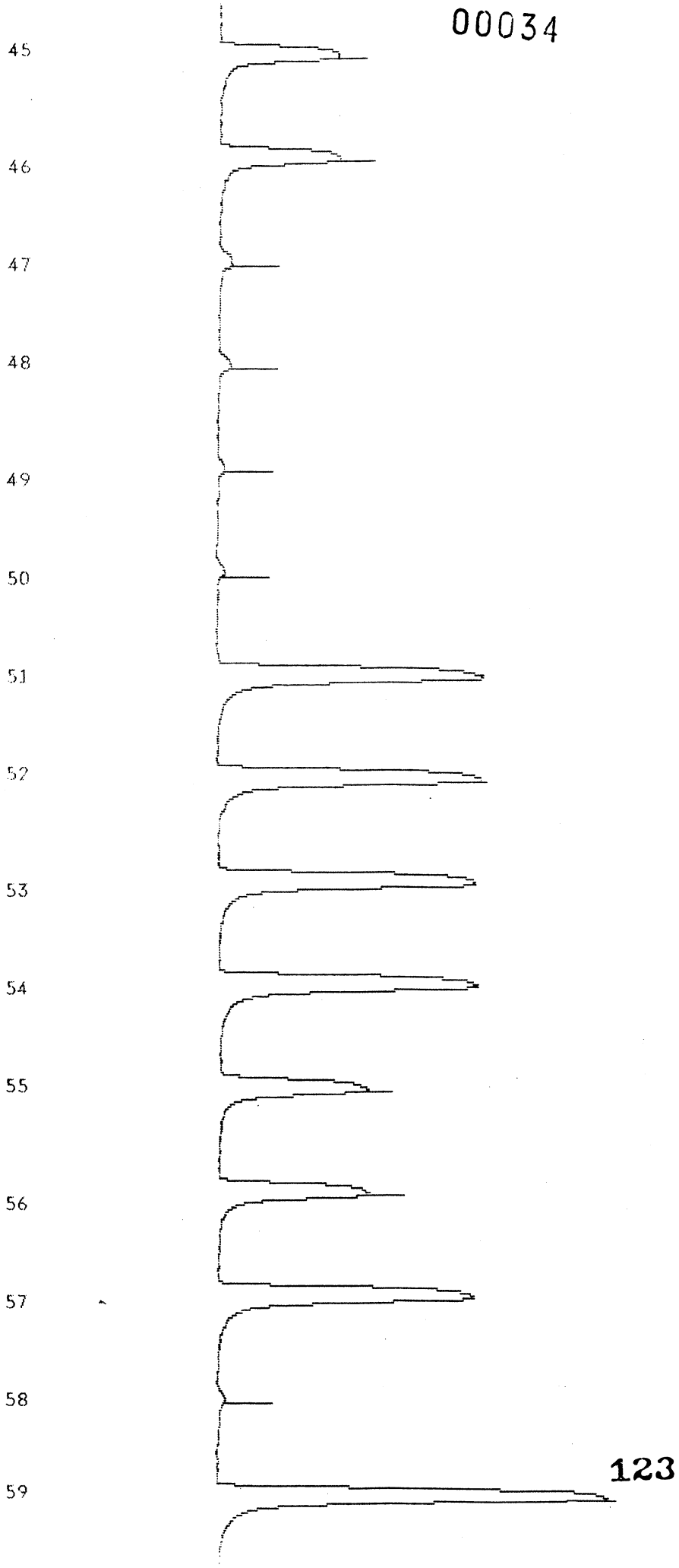
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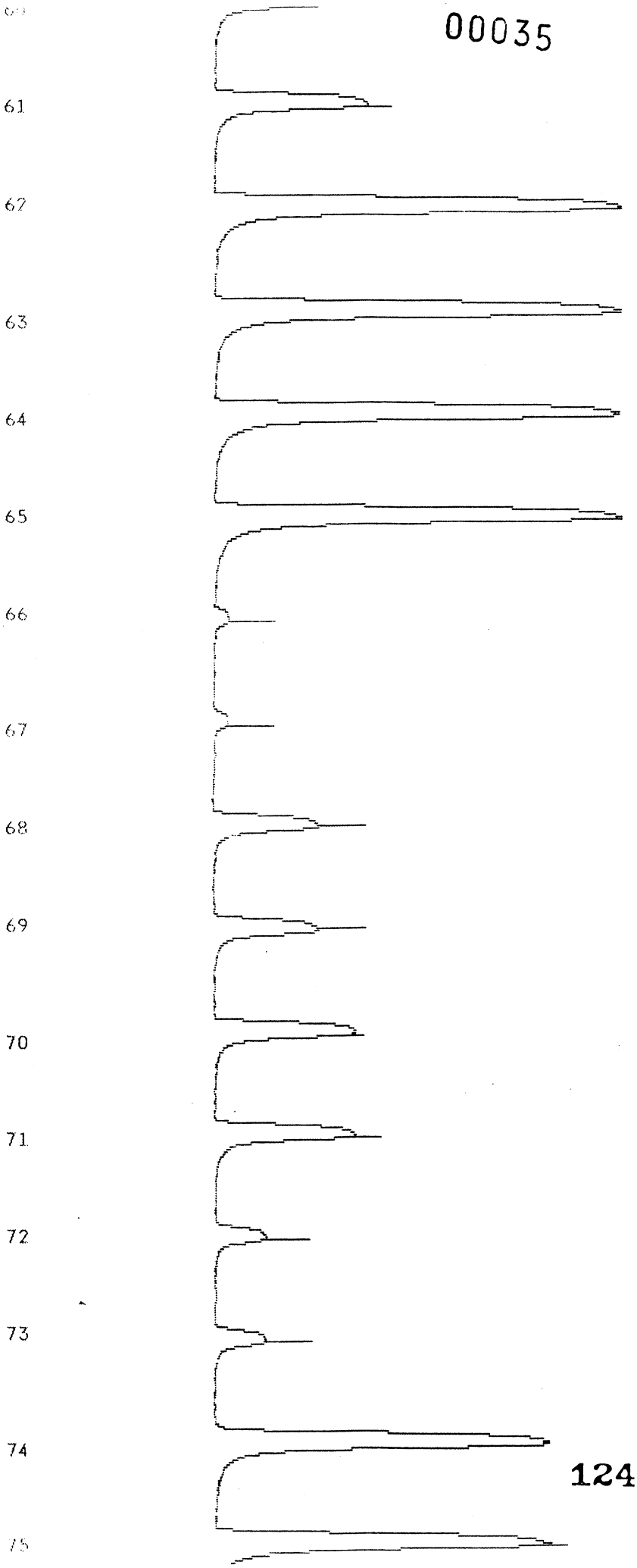
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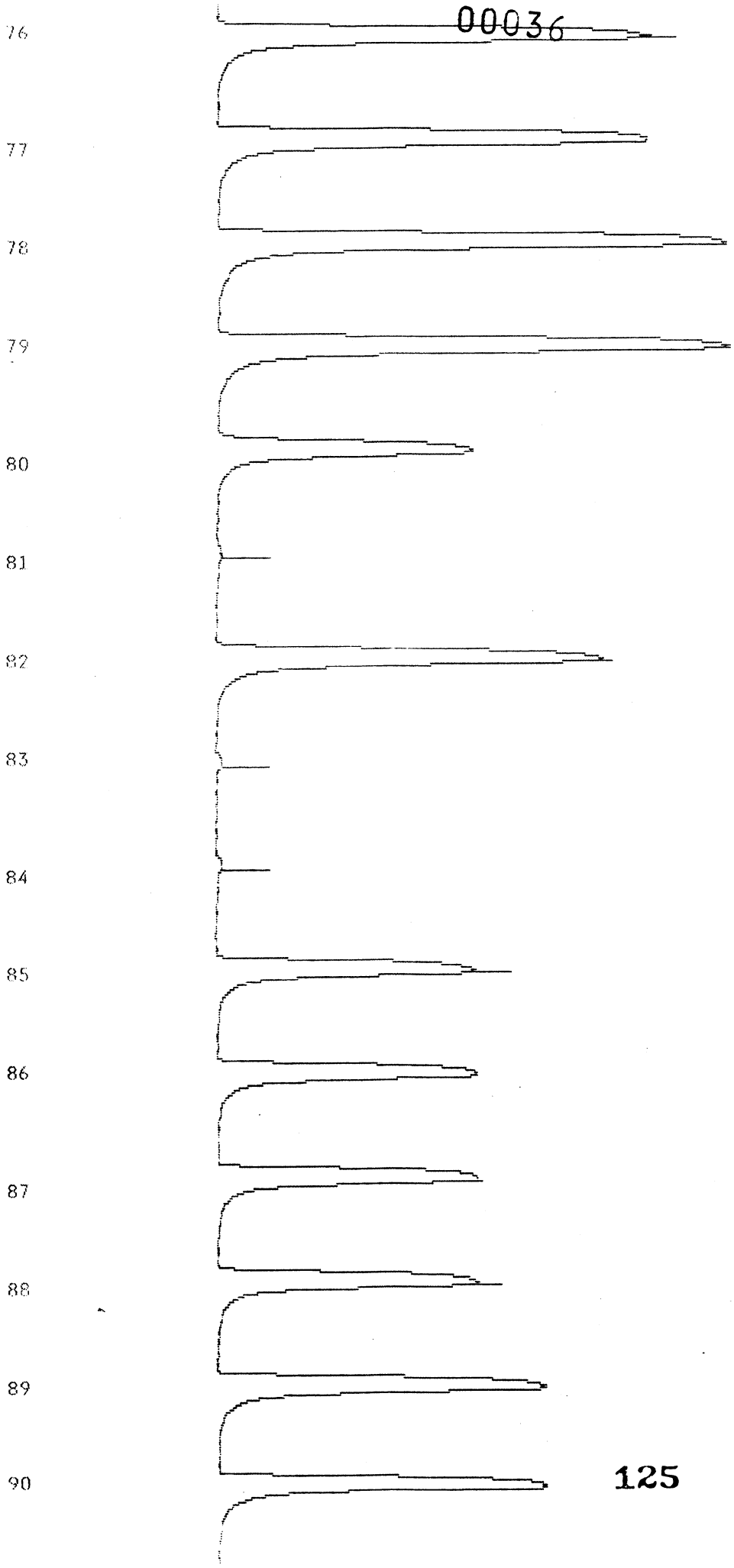
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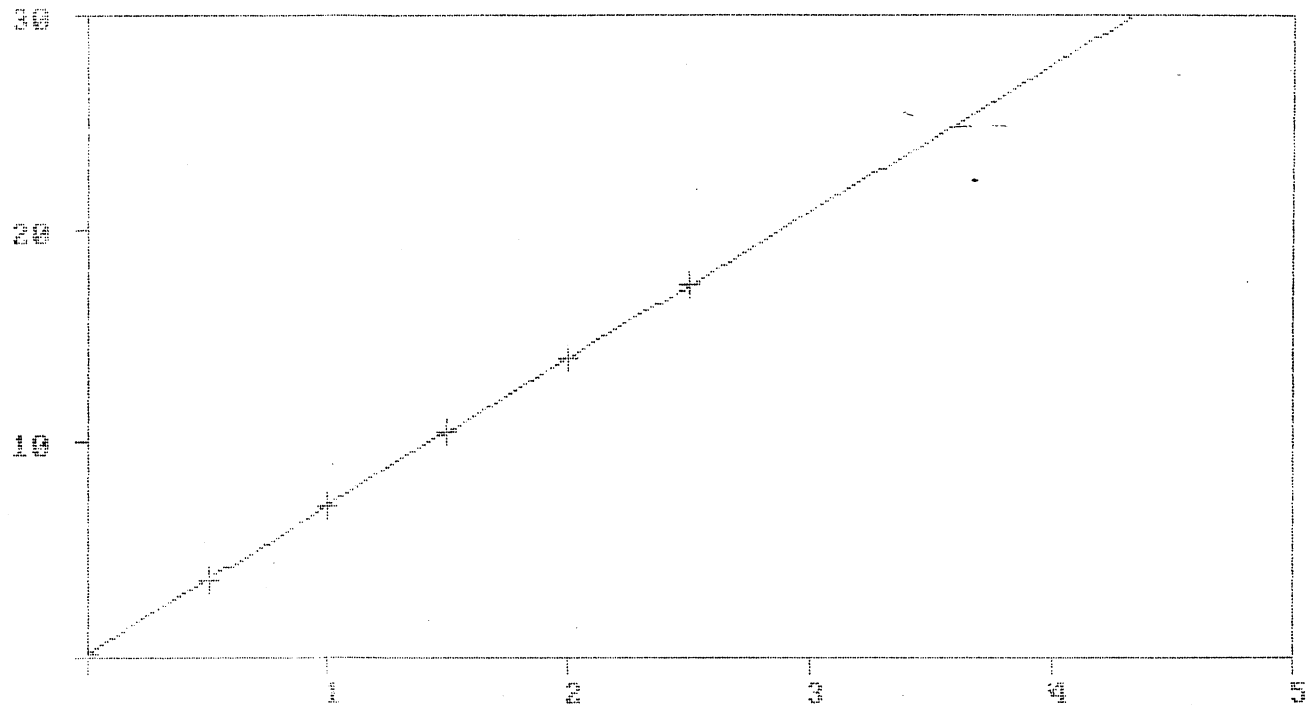
CHANNEL NAME: LDC
RUN NAME: 000426WA



DATA TYPE: FIA
CALIBRATION ORDER: 1
INTERCEPT = 0.18
SLOPE = 6.862724

CORRELATION: .9999903

CHANNEL NAME: LDC
RUN DATE: 04-27-2000
SAMPLE TABLE NAME: 000426WA
METHOD NAME: HGWATER

CUP#	SAMPLE ID	DIL	WGT	HEIGHT/AREA		CONCENTRATION µg/L	EF
1	PRIMER	1	1	10.2		1.465	s
2	DUMMY	1	1	0.1		-0.016	I
3	S1: 0	1	1	0.1		-0.005	I
4	S2: .5	1	1	3.6		0.504	
5	S3: 1	1	1	7.1		1.006	
6	S4: 1.5	1	1	10.5		1.497	
7	S5: 2	1	1	13.9		1.998	
8	S6: 2.5	1	1	17.3		2.500	
9	ICV	1	1	10.2		1.458	97%
10	B	1	1	0.0		-0.026	b
11	D4	1	1	10.5		1.497	d
12	WS 378	1	1	13.3		1.913	96%
13	ORG REF	1	1	14.3		2.059	103%
14	BL0426-1NPO 17253	1	1	0.1	<0.01	-0.016	I
15	BL0426-1NPO	1	1	0.0		-0.019	I
16	BL0426S	1	1	7.1	0.100	1.002	100%
17	BL0426S	1	1	7.0		0.988	
18	BL0426DS	1	1	7.0	0.100	0.999	100%

00038

21	17256	10	1	1.1		1.267		
22	17256D	10	1	1.0	0.304	1.161		
23	17256D	10	1	1.1		1.267		
24	17256S	10	1	7.9	2.812	11.266	100%	
25	17256S	10	1	7.9		11.231		
26	17256DS	10	1	8.1	2.901	11.587	104%	
27	17256DS	10	1	8.2		11.622		
28	17254	10	1	0.2	mt <0.050	0.093		I
29	17254	10	1	0.2		0.058		I
30	17255	10	1	0.3	<0.250	0.200		I
31	17255	10	1	0.3		0.236		s
32	17257	10	1	1.9	0.606	2.442		
33	17257	10	1	1.8		2.406		
34	CCV	1	1	6.8		0.963	96%	
35	B	1	1	0.0		-0.026		b
36	D4	1	1	10.5		1.497		d
37	17258	10	1	1.7	0.535	2.157		
38	17258	10	1	1.6		2.121		
39	17259	10	1	0.2	<0.250	0.093		I
40	17259	10	1	0.2		0.093		I
41	17260	10	1	4.0	1.393	5.609		
42	17260	10	1	4.0		5.537		
43	17261	10	1	1.6	0.521	2.050		
44	17261	10	1	1.6		2.121		
45	17262	10	1	3.0	1.037	4.114		
46	17262	10	1	3.1		4.185		s
47	17254-HYX	10	1	0.1	<0.090	-0.085		I
48	17254-HYX	10	1	0.1		-0.085		I
49	BL0426-2NKC 17253	1	1	0.0	<0.03	-0.026		I
50	BL0426-2NKC	1	1	0.0		-0.023		I
51	BL0426S	1	1	7.2	0.302	1.016	101%	
52	BL0426S	1	1	7.0		0.999		
53	BL0426DS	1	1	6.8	0.293	0.970	98%	
54	BL0426DS	1	1	6.9		0.981		
55	17256	1	1	4.0	0.549	0.550		
56	17256	1	1	3.9		0.547		
57	CCV	1	1	6.8		0.963	96%	
58	B	1	1	0.0		-0.026		b
59	D4	1	1	10.5		1.497		d
60	17256D	1	1	4.0	0.559	0.554		
61	17256D	1	1	4.1		0.564		s
62	17256S	1	1	11.0	1.568	1.571	101%	
63	17256S	1	1	10.9		1.564		
64	17256DS	1	1	11.0	1.575	1.571	102%	
65	17256DS	1	1	11.0		1.579		
66	17255	1	1	0.2	<0.100	-0.001		I
67	17255	1	1	0.2		0.006		I
68	17257	1	1	2.7	0.362	0.369		
69	17257	1	1	2.6		0.354		
70	17258	1	1	3.8	0.524	0.525		
71	17258	1	1	3.8		0.522		
72	17259	1	1	1.2	0.145	0.145		
73	17259	1	1	1.2		0.145		
74	17260	20	1	9.1	26.127	26.020		
75	17260	20	1	9.2		26.234		
76	17261	10	1	11.7	16.782	16.853		s
77	17261	10	1	11.6		16.711		
78	17262	4	1	13.7	7.958	7.908		
79	17262	4	1	13.9		8.008		
80	CCV	1	1	6.9		0.977	98%	
81	B	1	1	0.0		-0.026		b
82	D4	1	1	10.5		1.497		d
83	BL0426-AVOG	1	1	0.0	<0.01	-0.026		I
84	BL0426-AVOG	1	1	0.0		-0.023		I

127

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
017254	MOSTARDI	Reagent Blank	Mercury -	PV	-0.030						00/04/27	1BKC	00/04/27	MG01	16.	8.	

1 Tests for OHKCL with an MDL of 0.030 ug Validated By cmb Control Chart Updated N/A IO Requirements met N/A

128

00039

Zenon Number	Client	Client ID	Parameter	TS	Result	Dup.	Spike	% Rec.	Dup. Spk	% Rec.	Batch Date	Batch Code	Run Date	Run Code	Day Old	Day In	Analyst's Comments
017253	MOSTARDI	MB R456	Mercury -	PV	-0.030	-99999.0	0.322	107.	0.322	107.	00/04/27	1BMN	00/04/27	MG01	16.	8.	
017254	MOSTARDI	Reagent Blank	Mercury -	PV	-0.030						00/04/27	1BMN	00/04/27	MG01	16.	8.	
017255	MOSTARDI	Stack Blank	Mercury -	PV	0.553						00/04/27	1BMN	00/04/27	MG01	15.	8.	
017256	MOSTARDI	Stack Run #1	Mercury -	PV	15.083	15.194	16.136	100.	15.970	83.	00/04/27	1BMN	00/04/27	MG01	16.	8.	
017257	MOSTARDI	Stack Run #2	Mercury -	PV	14.445						00/04/27	1BMN	00/04/27	MG01	16.	8.	
017258	MOSTARDI	Stack Run #3	Mercury -	PV	15.956						00/04/27	1BMN	00/04/27	MG01	16.	8.	
017259	MOSTARDI	Inlet Blank	Mercury -	PV	1.038						00/04/27	1BMN	00/04/27	MG01	15.	8.	
017260	MOSTARDI	Inlet Run #1	Mercury -	PV	16.538						00/04/27	1BMN	00/04/27	MG01	16.	8.	
017261	MOSTARDI	Inlet Run #2	Mercury -	PV	10.198						00/04/27	1BMN	00/04/27	MG01	16.	8.	
017262	MOSTARDI	Inlet Run #3	Mercury -	PV	11.756						00/04/27	1BMN	00/04/27	MG01	16.	8.	
BL0427	INTERNAL		Mercury -	PV	-0.030	-99999.0	0.322	107.	0.322	107.	00/04/27	1BMN	00/04/27	MG01	$$$	$$$	

11 Tests for OHMN4 with an MDL of 0.030 ug Validated By cmb Control Chart Updated N/A IO Requirements met N/A

129

00040

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 00.04.27 W Run Code: MG01 Matrix: IMP 1/2

Analyst: MG Units: µg (see comments) MDL: 0.03

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12			WS 378			
13			ORG REF			
14			BL0427	1BMN		
15			"			
16			BL0427 S			
17			"			
18			BL0427 DS			
19			"			
20		1/8	17256			
21		↓	"			
22			17256 D			
23			"			
24			17256 S			
25			"			
26			17256 DS			
27			"			
28			17254			
29			"			
30			17255			
31			"			
32		1/8	17257			
33		↓	"			
34			CCV			
35			B			
36			D4			
37		1/8	17258			
38		↓	"			
39			17259			
40			"			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41		1/8	17260			
42		↓	"			
43		1/5	17261			
44		↓	"			
45		1/8	17262			
46		↓	"			
47			BL0427	2B3B		
48			"			
49			BL0427 S			
50			"			
51			BL0427 DS			
52			"			
53			15511			
54			"			
55			15511D			
56			"			
57			CCV			
58			B			
59			D4			
60			15511 S			
61			"			
62			15511 DS			
63			"			
64			15510			
65			"			
66			16128			
67			"			
68			16621			
69			"			
70			17846			
71			"			
72			17847			
73			"			
74			17848			
75			"			
76			17848 D			
77			"			
78			17848 S			
79			"			
80			CCV			

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

00042

LDC AUTOSAMPLER RUN LOG (MERCURY)

Date: 00.04.27 Run Code: MG01 Matrix: IMP./WATER 2/2

Analyst: MG Units: µg/L (see comments) MDL: 0.03/0.05

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
1			Primer (ICV)			
2			Dummy (Blk)			
3			Std 1 (S1)	0.0		
4			Std 2 (S2)	0.5		
5			Std 3 (S3)	1.0		
6			Std 4 (S4)	1.5		
7			Std 5 (S5)	2.0		
8			Std 6 (S6)	2.5		
9			ICV			
10			B (Std 1)			
11			D4 (Std 4)			
12						
13						
14						
15						
16						
17						
18						
19						
20						
21			B			
22			D4			
23			17848 DS			
24			"			
25			17849			
26			"			
27			17850			
28			"			
29			17254	KMnO4		
30			"			
31			BL0427	STD1		
32			"			
33			BL0427 S			
34			"			
35			BL0427 DS			
36			"			
37			18075			
38			"			
39			18075 D			
40			"			

Cup	Dig. F.	Dil. F.	Zenon ID	Init. Conc.	F. Conc.	% R
41			18075 S			
42			"			
43			CCV			
44			B			
45			D4			
46			18075 DS			
47			"			
48			18127			
49			128			
50			129			
51			130			
52			131			
53			132 18079 MA			
54		1/20	17597			
55			WS 378			
56			ORG. REF			
57			CCV			
58			B			
59			D4			
60						
61						
62						
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79						
80						

Comments: *** "HG-347" and "MISA12" units are expressed in mg/L not ug/L

ICV = 1.5 ug/L, CCV = 1.0 ug/L, Blank Spike = 1.0 ug/L for liquid samples.

ICV = 1.5 mg/kg, CCV = 1.0 mg/kg, Blank Spike = 1.0 mg/kg for solid samples.

Effective 000216

EPA 7470 WATER PREPARATION LOG - MERCURY

DG7470HG, DGHGLEACH, DG29*

Calibration Solutions:

#	I.D.	**Conc.	Spike	***Conc. Entered
1	Blank/Dummy	0 ppb	None	0.0
2	Standard 1	0 ppb	None	0.0
3	Standard 2	0.33	200 ul of 0.05 ppm IV working standard	0.5
4	Standard 3	0.67	400 ul of 0.05 ppm IV working standard	1.0
5	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
6	Standard 4	1.0	600 ul of 0.05 ppm IV working standard	1.5
7	Standard 5	1.33	800 ul of 0.05 ppm IV working standard	2.0
8	Standard 6	1.67	1000 ul of 0.05 ppm IV working standard	2.5

Check List

- ✓ Digest Code/labels
- ✓ Samples poured out
- ✓ Acids added
- ✓ Reagents added
- ✓ Samples spiked
- ✓ Bath at 95 degrees C
- ✓ Samples digested
- ✓ Hydroxylamine HCl added
- ✓ Samples shaken and bulked
- ✓ Rack order checked

	#	Sample I.D.	B.Code	Init.Vol.	F. Vol.	Dil	Comment
	9	ICV (Init. Calib. Verif.)	1BMN	20 ml	30 ml	1 X	1.5 ppb = 600 ul of MES-ZENO 30/QCA (Ref Std)
	10	BL 0427	"	"	"	"	(Processed Blank) 17253MB
	11	BL 0427 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
	12	BL 0427 DS					(Duplicate Blank Spike)
1	13	17256	"	"	"	"	FV=1000ml (6ml of 6% KMnO4 add
1	14	D	"	"	"	"	(Duplicate sample)
1	15	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
1	16	DS	"	"	"	"	(Duplicate Spiked sample)
2	17	17254	"	"	"	"	FV= 45ml
3	18	55	"	"	"	"	FV= 1000ml
4	19	57	"	"	"	"	= 1000ml
5	20	58	"	"	"	"	=
6	21	59	"	"	"	"	=
7	22	60	"	"	"	"	=
8	23	61	"	"	"	"	=
9	23	62	"	"	"	"	=
10	24	17254	1BKC	"	"	"	48 ml.
	25	CCV (Cont. Calib. Verif.)	-	20 ml	30 ml	1 X	1.0 ppb = 400 ul of MES-ZENO 30/QCA (Ref Std)
	26	BL 0427	2B3B	20 ml	30 ml	"	(Processed Blank)
	27	BL 0427 S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
	28	BL 0427 DS					(Duplicate Blank Spike)
1	29	15511	"	"	"	"	FV=1200ml
1	30	D	"	"	"	"	(Duplicate sample)
1	31	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
1	32	DS	"	"	"	"	(Duplicate Spiked sample)
2	33	15510/16620	"	"	"	"	
3	34	16123	"	"	"	"	(6ml of 6% KMnO4 added)
4	35	16621	"	"	"	"	
5	36	17846	"	"	"	"	FV=500ml
6	37	847	"	"	"	"	
7	38	848	"	"	"	"	FULL QC
8	39	849	"	"	"	"	
9	40	850	"	"	"	"	
10	41		"	"	"	"	
	42	CCV (Cont. Calib. Verif.)	-	20 ml	30 ml	1 X	1.0 ppb = 400 ul of MES-ZENO 30/QCA (Ref Std)

Comments

** concentration based on 30 ml final volume, *** concentration based on 20 ml final volume

Other Applicable Test Codes: DG29HG-1B, DG29HG-2B, DG29HG-3A, DG29HG-3B, DG29HG-3C

DG29HGI, DG29HGF, DG101AA1, DG101AA2

Philip Analytical Services-Burlington

	#	Sample I.D.	B.Code	Ink.Vol.	F.Vol.	Dil	Comment
	43	BL		"	"	"	(Processed Blank)
	44	BL S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
	45	BL DS					(Duplicate Blank Spike)
1	46		"	"	"	"	
1	47	D	"	"	"	"	(Duplicate sample)
1	48	S	"	"	"	"	1 ppb = 400 ul. of 0.05 ppm IV Working Cal Std
1	49	DS	"	"	"	"	(Duplicate Spiked sample)
2	50		"	"	"	"	
3	51		"	"	"	"	
4	52		"	"	"	"	
5	53		"	"	"	"	
6	54		"	"	"	"	
7	55		"	"	"	"	
8	56		"	"	"	"	
9	57		"	"	"	"	
10	58		"	"	"	"	
	57	CCV (Cont. Calib. Verif.)	"	20 ml	30 ml	1 X	1.0 ppb = 400 ul of MES-ZENO 30/QCA (Ref Std)

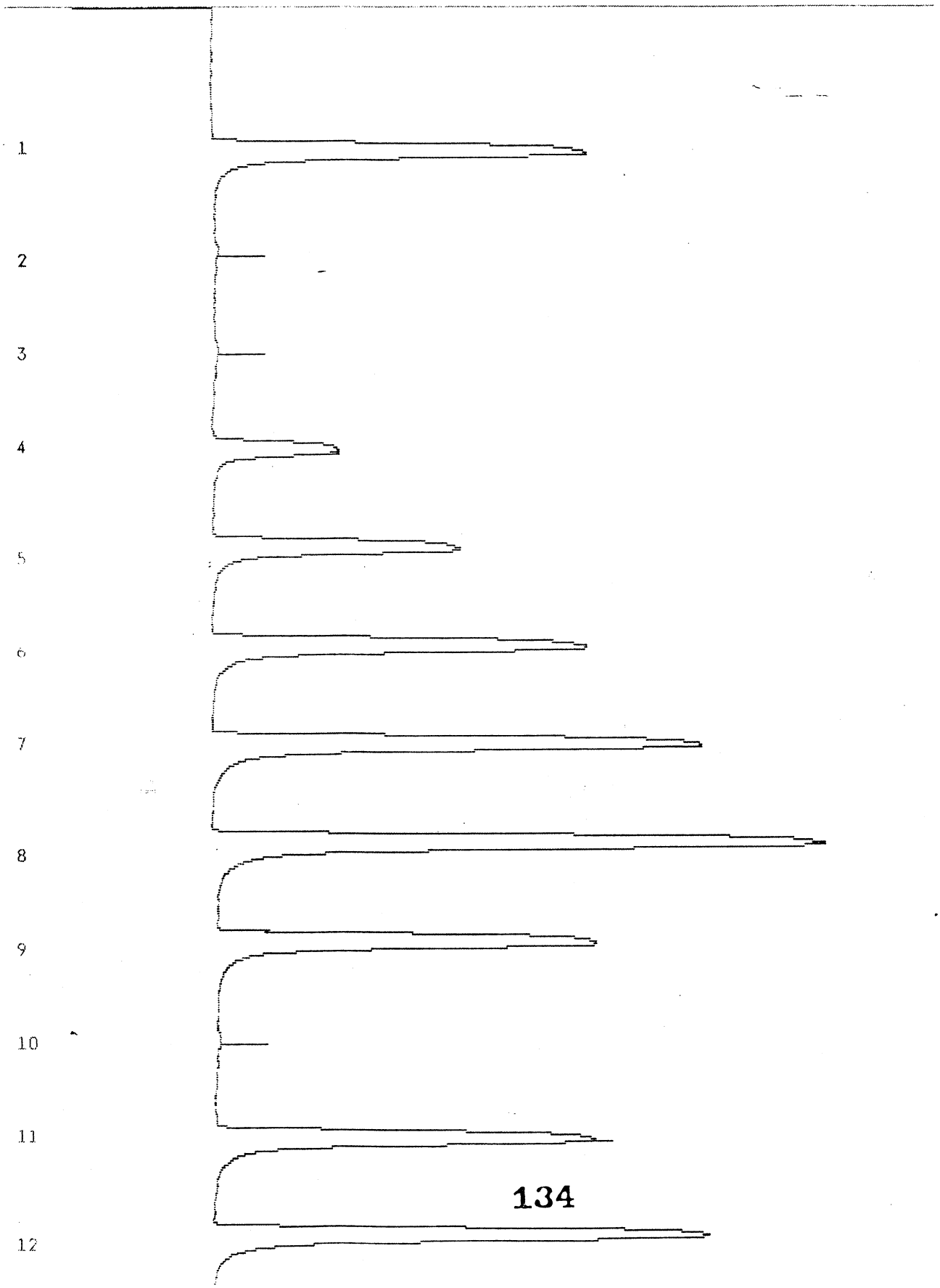
Procedure/Methodology:

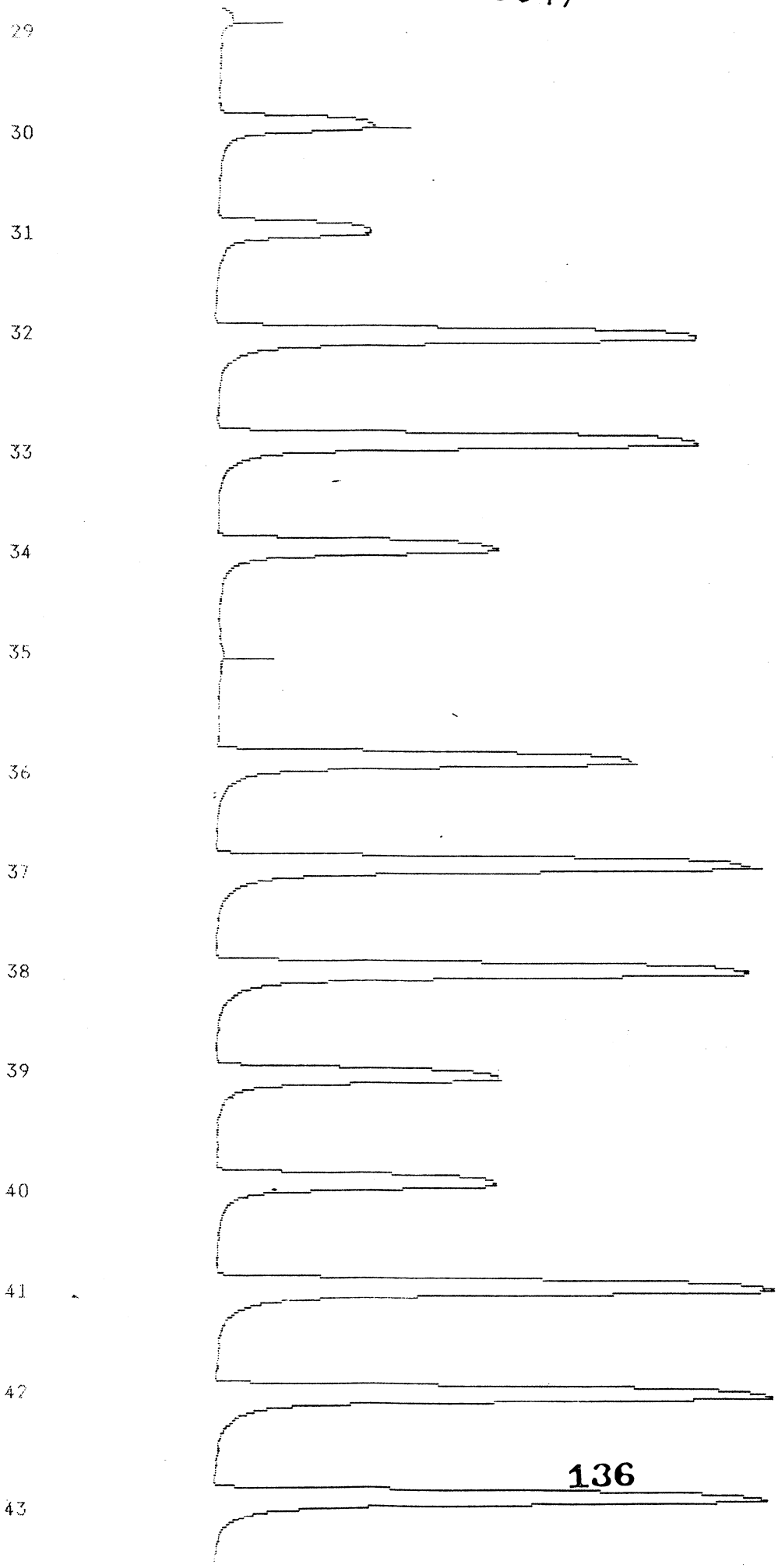
1 Prepare 25 ppm Intermediate Calibration Standard (if required) by pipetting 625 ul., of 1000 ppm Stock to 25 ml final volume of 2% HNO_3
2 Prepare 0.05 ppm Working standard daily by pipetting 200 ul., of 25 ppm Intermediate to 100 ml final volume of 2% HNO_3
3 Using the LIMS Screen "SCNDIG" enter the required samples into LIMS
4 Using the labeling program, "DIGLBL", retreive the "SCNDIG" list and create labels for the required samples.
5 Label the falcon tubes appropriately
6 Include one External Reference Material sample per run
7 Incude one Organic Mercury Control Standard per run
8 Transfer a 20 ml. aliquot of well mixed sample into the designated falcon tube
9 Spike the tubes as indicated in the comment sector of the digestion sheet
10 Add 0.5 ml. of conc. Nitric Acid (HNO_3), and 1 ml. of conc. Sulphuric acid, (H_2SO_4), to each tube
11 Add 3 ml. Of 6% $KMnO_4$, purple colour must remain for at least 15 minutes
12 Add 1.5 ml. of 5% potassium persulphate, ($K_2S_2O_8$), to each tube
13 Mix samples, cap loosely and place in a water bath @ 95 degrees C for 2 hours
14 Remove tubes and allow to cool to room temperature
15 Add 1.0 ml. 20% Hydroxylamine Hydrochloride to each tube
16 Recap tubes and shake until $KMnO_4$ is destroyed and sample becomes colourless
17 Dilute the sample to a final volume of 30 ml.

Supplier/Lot Information	Supplier	Lot-	Expiry Date
Stock Calibration Standard	Inorganic Ventures	PHG-02023	01/04/01
Intermediate Cal Standard	Internal	00/04/05 A	00/05/05
Stock Reference Standard	High Purity	836309	00 Feb.
External Reference Material	SPEX	conc. 12 (00.04.18)	00.06.18
Organic Mercury Control Standard	Aldrich	06811 HR	01/02/07
6% potassium permangaaate	Internal	00.04.24 A	00.06.24
5% potassium persulphate	Internal	00.03.30	00.05.30
20% hydroxylamine hydrochloride	Internal	00.04.13 A	00.06.13
HNO_3	Anachemia	1100010	00/06/20
H_2SO_4	Anachemia	319090	00/06/19
Bath Temps: 1 195°C	Time ON: 9:40 AM	Time OFF: 11:40 AM	
Prepared By: AA	Date: 00.04.27	Checked by:	

Philip Analytical Services-Burlington

RUN DATE: 04-28-2000 CHART DATE: 04-28-2000
CHART SPEED: 30
DATA FILE NAME: C:\DP4\DATA\000427W.DAT

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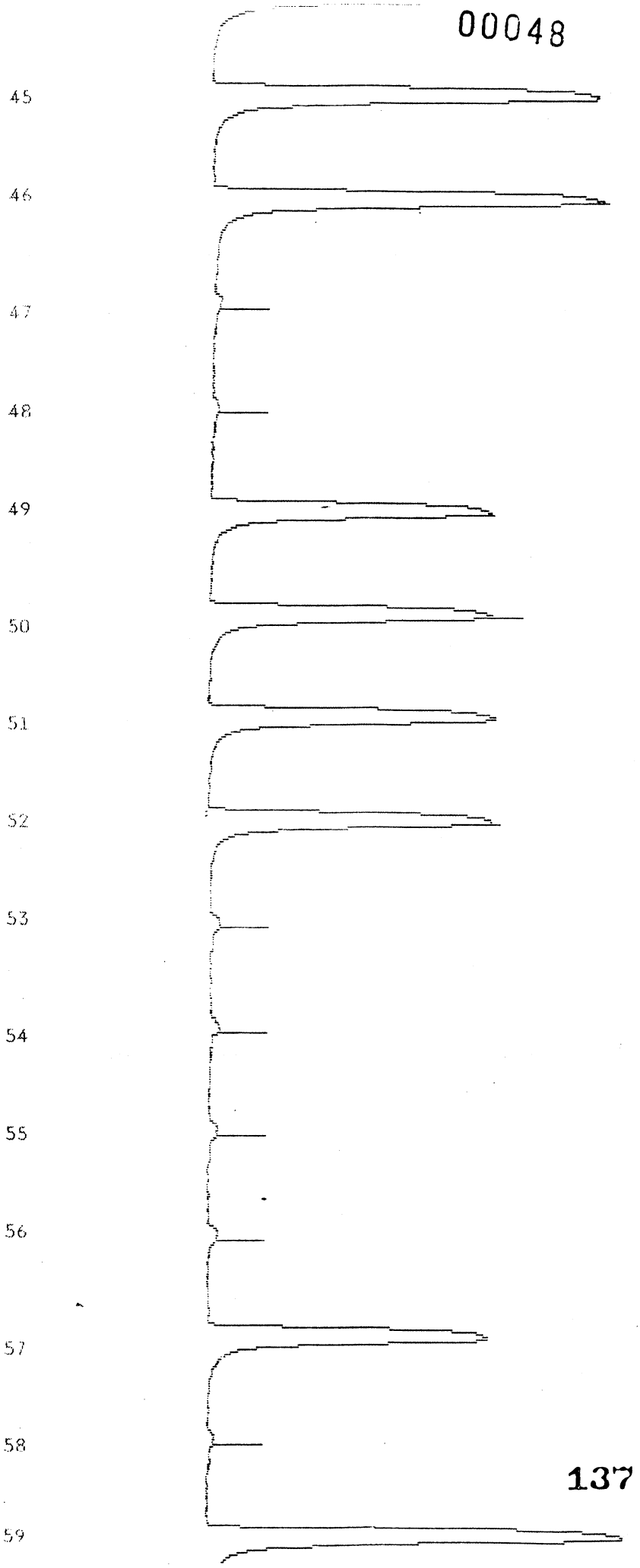
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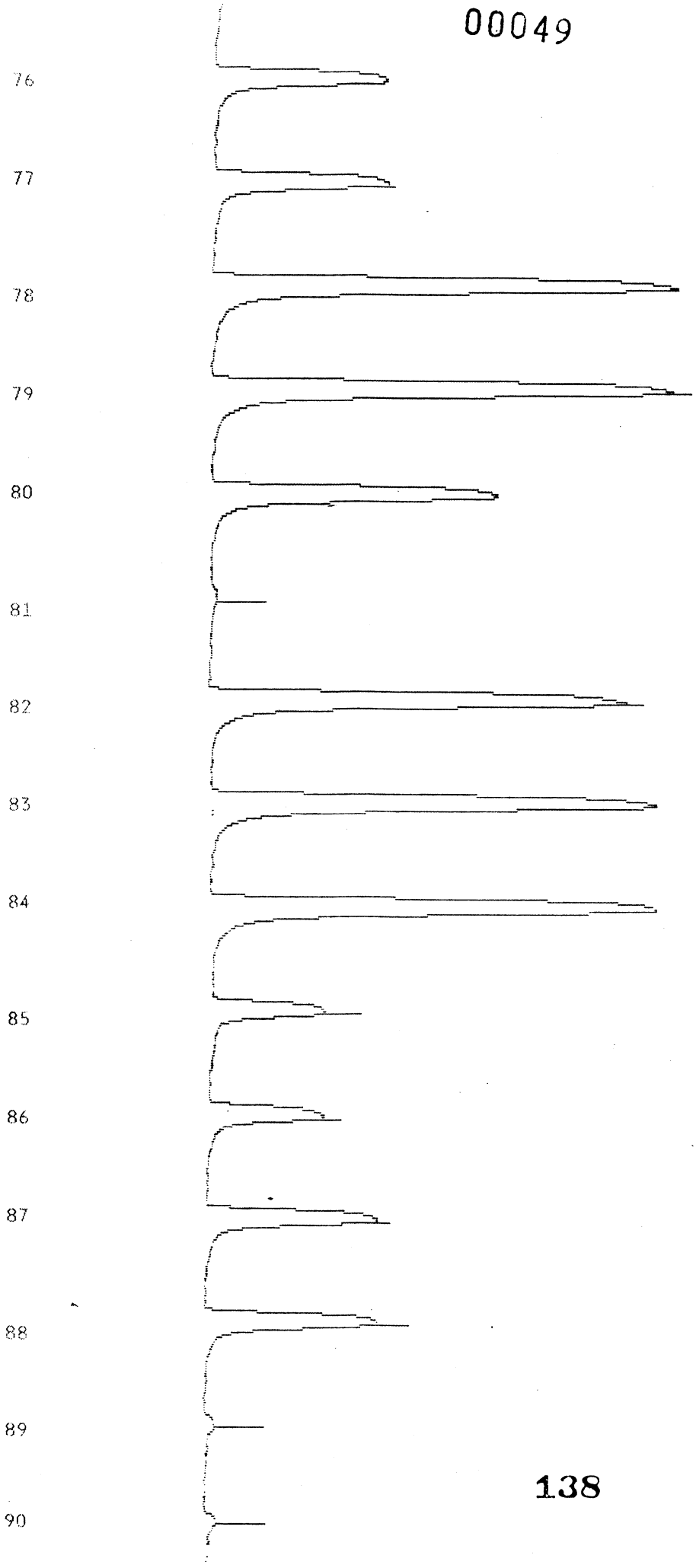
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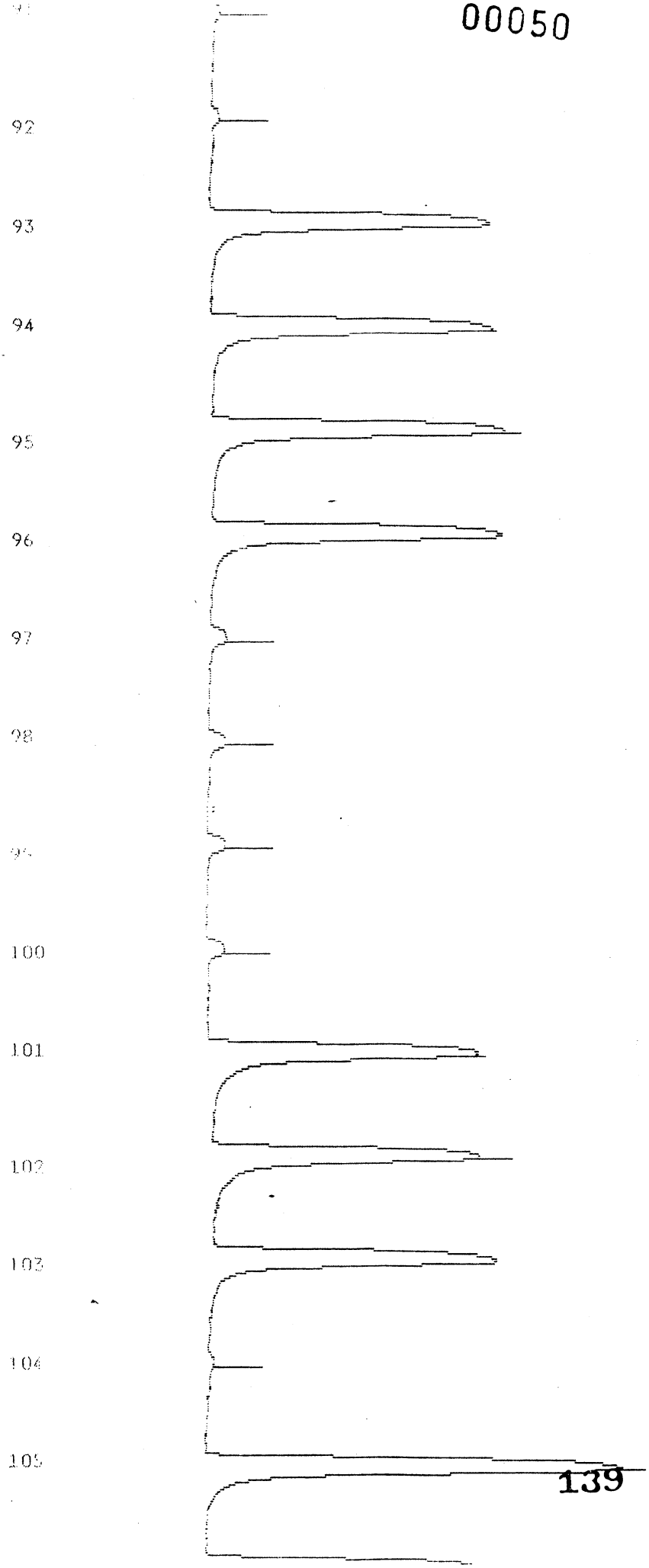
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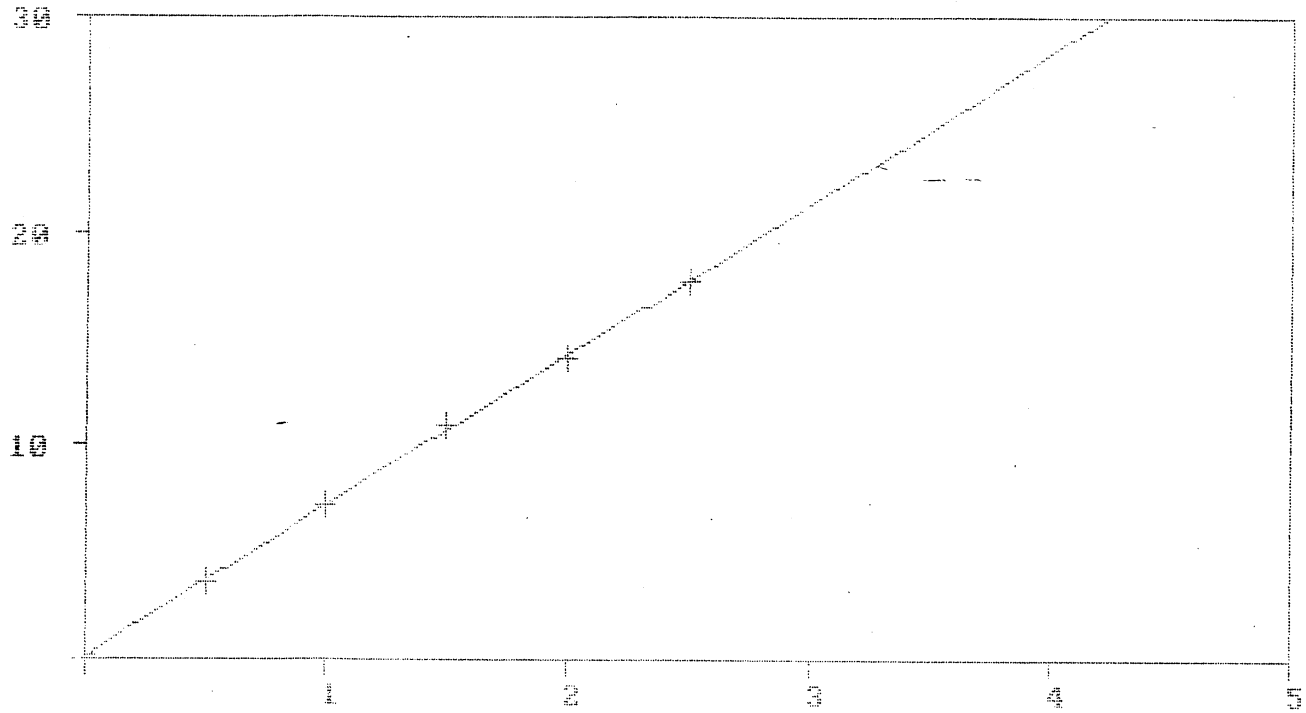
RUN NAME: 000427W



DATA TYPE: FIA CALIBRATION ORDER: 1
INTERCEPT = 0.12 SLOPE = 7.046922

CORRELATION: .9998273

CHANNEL NAME: LOC
RUN DATE: 04-28-2000
SAMPLE TABLE NAME: 000427W
METHOD NAME: HGWATER

CUP#	SAMPLE ID	DIL	WGT	HEIGHT/AREA		CONCENTRATION (µg/L)	EF
1	PRIMER	1	1	10.9		1.528	s
2	DUMMY	1	1	0.1		-0.003	I
3	S1: 0	1	1	0.1		-0.003	I
4	S2: .5	1	1	3.6		0.489	
5	S3: 1	1	1	7.2		1.005	
6	S4: 1.5	1	1	10.9		1.532	
7	S5: 2	1	1	14.1		1.982	
8	S6: 2.5	1	1	17.7		2.495	
9	ICV	1	1	11.0		1.539	103%
10	B	1	1	0.0		-0.017	b
11	D4	1	1	10.9		1.532	d
12	WS 3/8	1	1	14.3	TLG	2.017	101%
13	ORG REF	1	1	15.8		2.232	111%
14	BL0427-18MN 17253	1	1	0.0	<0.03	-0.010	I
15	BL0427-18MN	1	1	0.0		-0.010	I
16	BL0427S	1	1	7.7	0.322	1.071	s
17	BL0427S	1	1 140	7.7		1.078	107%
18	BL0427OS	1	1	7.7	0.322	1.071	107%
19	BL0427OS	1	1	7.7		1.078	
20	1725A	8	1	13.4	15.083	15.083	

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23	17256D	8	1	14.5	15.174	15.166		
24	17256S	8	1	14.3	16.136	16.081	100%	
25	17256S	8	1	14.4		16.191		
26	17256DS	8	1	14.2	15.970	16.025	83%	
27	17256DS	8	1	14.1		15.914		
28	17254	1	1	0.3	<0.03	0.021	I	
29	17254	1	1	0.2		0.017	I	
30	17255	1	1	4.1	0.553	0.558		
31	17255	1	1	4.0		0.548	s	
32	17257	8	1	12.9	14.445	14.473		
33	17257	8	1	12.8		14.417		
34	CCV	1	1	7.5		1.043	104%	
35	B	1	1	0.0		-0.017	b	
36	D4	1	1	10.9		1.532	d	
37	17258	8	1	14.1	15.956	15.914		
38	17258	8	1	14.2		15.997		
39	17259	1	1	7.4	1.038	1.040		
40	17259	1	1	7.4		1.036		
41	17260	8	1	14.7	16.538	16.580		
42	17260	8	1	14.7		16.496		
43	17261	5	1	14.5	10.198	10.206		
44	17261	5	1	14.5		10.189		
45	17262	8	1	10.5	11.756	11.728		
46	17262	8	1	10.5		11.783	s	
47	BL0427-2838 15510,16620.	1	1	0.0	<0.05	-0.017	I	
48	BL0427-2838 17846	1	1	0.0		-0.010	I	
49	BL0427S	1	1	7.5	0.526	1.047	105%	
50	BL0427S	1	1	7.6		1.057		
51	BL0427DS	1	1	7.6	0.530	1.067	106%	
52	BL0427DS	1	1	7.5		1.054		
53	15511	1	1	0.1	<0.120	0.000	I	
54	15511	1	1	0.1		-0.007	I	
55	15511D	1	1	0.1	<0.120	-0.007	I	
56	15511D	1	1	0.1		-0.007	I	
57	CCV	1	1	7.5		1.043	104%	
58	B	1	1	0.0		-0.017	b	
59	D4	1	1	10.9		1.532	d	
60	15511S	1	1	7.9	1.319	1.099	110%	
61	15511S	1	1	7.9		1.099	s	
62	15511DS	1	1	7.8	1.300	1.088	108%	
63	15511DS	1	1	7.7		1.078		
64	15510	1	1	0.0	<0.120	-0.010	I	
65	15510	1	1	0.0		-0.017	I	
66	16128	1	1	7.5	1.258	1.054		
67	16128	1	1	7.5		1.043		
68	16621	1	1	8.3	1.396	1.165		
69	16621	1	1	8.3		1.161		
70	17846	1	1	0.0	<0.05	-0.014	I	
71	17846	1	1	0.0		-0.010	I	
72	14847	1	1	0.0	<0.05	-0.010	I	
73	14847	1	1	0.1		-0.007	I	
74	17848	1	1	4.4	0.303	0.610		
75	17848	1	1	4.4		0.603		
76	17848D	1	1	4.4	0.306	0.610	s	
77	17848D	1	1	4.4		0.614		
78	17848S	1	1	12.2	0.851	1.709	109%	
79	17848S	1	1	12.1		1.695		
80	CCV	1	1	7.4		1.040	104%	
81	B	1	1	0.0		-0.017	b	
82	D4	1	1	10.9		1.532	d	
83	17848DS	1	1	11.7	0.820	1.643	103%	
84	17848DS	1	1	11.6		1.636		
85	17849	1	1	2.8	0.191	0.378		
86	17849	1	1	2.8		0.385		

00053

89	17254-KMNO4	1		1	0.0	<0.03	-0.010	I
90	17254-KMNO4	1		1	0.0		-0.010	I
91	BL0427-STB1	1		1	0.0	<0.05	-0.017	s
92	BL0427-STB1 M600, 18074	1		1	0.0		-0.017	I
93	BL0427S	1		1	7.3	1.024	1.019	102%
94	BL0427S	1		1	7.4		1.029	
95	BL0427DS	1		1	7.6	1.061	1.061	106%
96	BL0427DS	1		1	7.6		1.061	
97	18075	1		1	0.2	<0.05	0.014	I
98	18075	1		1	0.3		0.021	I
99	18075D	1		1	0.3	<0.05	0.021	I
100	18075D	1		1	0.3		0.021	I
101	18075S	1		1	7.0	0.969	0.970	97%
102	18075S	1		1	6.9		0.967	
103	CCV	1		1	7.5		1.043	104%
104	B	1		1	0.0		-0.017	b
105	D4	1		1	10.9		1.532	d
106	18075DS	1		1	6.9	0.969	0.967	97%
107	18075DS	1		1	7.0		0.970	
108	18127	1		1	0.0		-0.014	I
109	18128	1		1	0.1		-0.007	I
110	18129	1		1	0.1		-0.003	I
111	18130	1		1	0.1		-0.007	I
112	18131	1		1	0.1		0.004	I
113	18132	1		1	0.1		-0.003	I
114	18079	1		1	0.2		0.017	I
115	17597	20		1	6.3		17.469	
116	WS 378	1		1	14.4		2.031	101%
117	ORG REF	1		1	15.6		2.197	110%
118	CCV	1		1	7.4		1.033	103%
119	B	1		1	0.0		-0.017	b
120	D4	1		1	10.9		1.532	d

INTERCEPT: 0.12 LINEAR COEF: 7.046922
CORRELATION COEF: .9998273

4. SHIPPING/RECEIVING DOCUMENTS

Airbills (No. of shipments)
Chain-of-Custody Records
Sample Log-In Sheets
Miscellaneous Shipping/Receiving Records (describe or list)
NOTICE OF SAMPLE RECEIPT.

00055

US SAMPLE LOG IN SHEET

Lab Name: Philip Analytical Services Corporation, Burlington Laboratory

Received By (Print Name): Kimmo

Received By (Signature):

Client Project ID:

REMARKS:	Condition of Samples/Sample Shipment:
Custody Seal(s) Present ___ Absent ✓	Samples rec'd intact
Chain of Custody Records Present ✓ Absent ___	
Airbill Present ✓ Absent ___	
Airbill No. 1254E 1302210049279	
9251	
9260	
Does Information on Custody Records and Samples Agree? Yes ✓ No ___	
Date Received at Lab 4-19-00	
Time Received 1:30 p	

Temperature of Coolers

Cooler ID:	Temperature
3 cooler	20°C 20°C 20°C

Relinquished By: [signature]

Date: 4-12-00

Logbook No: ___

Logbook Page No. ___

MOSTARDI-PLATT ASSOCIATES, INC.

Environmental Consultants

Reagent Blanks
Page 1 of 1

NB-17253

Read Instructions on Reverse Side Before Completing Form!

CHAIN-OF-CUSTODY RECORD

Project Number: M001501	Date Results Required: 5/18/00
Client: Montana-Dakota Utilities	TAT(Assessment Only)
Plant/Location: Lewis & Clark Station	LAB Use Only — PO Number: ~~4032~~ 4023 BR
Project Supervisor: Bruce Randall	LIMS Entry:

Sample Number	Date Sampled	Sample Point Identification	# of Conts	Grab/ Comp	Analysis Requested	Sub Lab
17254 C07	4-11-00	0.1N HNO3 ✓	1		Ontario-Hydro Hg	
C08	"	KCl ✓	1		5000 AEXS	
C09	"	HNO3/H2O2 ✓	1		PPP	
C10	"	KMnO4 ✓	1			
C11	"	Hydroxyl Amine ✓	1			
C12	"	Filters ✓	1	(3)		
		NOTHING BELOW THIS LINE				

Delivered by:	Date/Time	Processed by:	Date/Time	Received by Laboratory:
Bruce Randall	4-18-00 1000	145	00 4/19 1:30	PASL

Special Instructions:

MOSTARDI-PLATT ASSOCIATES, INC.

Environmental Consultants

page 1 of 2
Runs 1 & 2

Read Instructions on Reverse Side Before Completing Form!

CHAIN-OF-CUSTODY RECORD

Project Number: M001501	Date Results Required: 5/18/00
Client: Montana - Dakota Utilities	TAT(Assessment Only)
Plant/Location: Lewis & Clark Station	LAB Use Only — PO Number: 4023
Project Supervisor: Bruce Randall	LIMS Entry: ~~4023~~

Sample Number	Date Sampled	Sample Point Identification	# of Conts	Grab/ Comp	Analysis Requested	Sub Lab
SR1C03	4-11-00	Stack R1 ~~KMn~~ KCl ✓	1		Ontario - Hydro Hg	17256
~~R1~~ SR1C05	4-11-00	" " $KMnO_4$ ✓	1			
IR1C03	4-11-00	Inlet R1 KCl ✓	1		For R1 & R2 Contains	17260
IR1C05	"	" " $KMnO_4$ ✓	1			"
SR2C03	"	Stack R2 KCl ✓	1		ILG+2, SO2+2, PPD	17257
SR2C05	"	" " $KMnO_4$ ✓	1			"
IR2C03	"	Inlet R2 KCl ✓	1			17261
IR2C05	"	" " $KMnO_4$ ✓	1			"
SR1C02	"	Stack R1 HNO_3 ✓	1			17256
SR1C04	"	Stack R1 HNO_3/H_2O_2 ✓	1			"
IR1C02	"	Inlet R1 HNO_3 ✓	1			17260
IR1C04	"	" " HNO_3/H_2O_2 ✓	1			"
SR2C02	"	Stack R2 HNO_3 ✓	1			17257
SR2C04	"	" " HNO_3/H_2O_2 ✓	1			"
IR2C04	"	Inlet R2 HNO_3/H_2O_2 ✓	1			17261
IR2C02	"	" " HNO_3 ✓	1			"

Delivered by:	Date/Time	Processed by:	Date/Time	Received by Laboratory:
Bruce Randall	4-18-00 0900	146	000419 1:30	[illegible]

Special Instructions:

MOSTARDI-PLATT ASSOCIATES, INC.

Environmental Consultants

Page 2 of 2
Runs 1 & 2

Read Instructions on Reverse Side Before Completing Form!

CHAIN-OF-CUSTODY RECORD

Project Number: M001501	Date Results Required: 5/18/00
Client: Montana - Dakota Utilities	TAT(Assessment Only)
Plant/Location: Lewis & Clark Station	LAB Use Only — PO Number: 4023
Project Supervisor: Bruce Randall	LIMS Entry:

Sample Number	Date Sampled	Sample Point Identification	# of Conts	Grab/ Comp	Analysis Requested	Sub Lab
SR1C01	4-11	Stack R1 Filter	1		Ontario - Hydro Hg	17257
IR1C01	4-11	Inlet " "	1			17260
SR2C01	4-11	Stack R2 "	1			17257
IR2C01	4-11	Inlet R2 "	1			17261
		Nothing Below this line				

Delivered by:	Date/Time	Processed by:	Date/Time	Received by Laboratory:
Bruce Randall	4-18-00 0900	147	04/19 1:30	

Special Instructions:

[redacted]

MOSTARDI-PLATT ASSOCIATES, INC.

Environmental Consultants

Page 1 of 2
Run 3 + Blank trains

Read Instructions on Reverse Side Before Completing Form!

CHAIN-OF-CUSTODY RECORD

Project Number: M001501	Date Results Required: 5/18/00
Client: Montana-Dakota Utilities	TAT(Assessment Only)
Plant/Location: Lewis & Clark Station	LAB Use Only — PO Number: 4023
Project Supervisor: Bruce Randall	LIMS Entry:

Sample Number	Date Sampled	Sample Point Identification	# of Cons	Grab/ Comp	Analysis Requested	Sub Lab
SR3CØ3	4-11	Stack R3 KCl	1		Ontario-Hydro Hg	17258
SR3CØ5	4-11	" " $KMnO_4$	1			"
IR3CØ3	"	Inlet " KCl	1		For R3 + Blanks	17262
IR3CØ5	"	" " $KMnO_4$	1			"
SBCØ3	4-12-00	Stack Blank KCl	1		ILL-72, SO2-72, PPD	17255
SBCØ5	"	" " $KMnO_4$	1			"
IBCØ3	"	Inlet " KCl	1			17259
IBCØ5	"	" " $KMnO_4$	1			"
SR3CØ2	4-11	Stack R3 HNO_3				17255
SR3CØ4	"	" " HNO_3/H_2O_2				"
IR3CØ2	"	Inlet " HNO_3				17262
IR3CØ4	"	" " HNO_3/H_2O_2				"
SBCØ2	4-12	Stack Blank HNO_3				17255
SBCØ4	"	" " $HNO_3H_2O_2$				"
IBCØ2	"	Inlet " HNO_3				17259
IBCØ4	"	" " HNO_3/H_2O_2				"

Delivered by:	Date/Time	Processed by:	Date/Time	Received by Laboratory:
Bruce Randall	4-18-00 0930	148	0949	

Special Instructions:

MOSTARDI-PLATT ASSOCIATES, INC.

Environmental Consultants

Page 2 of 2
Run 3 + Blank Trains

Read Instructions on Reverse Side Before Completing Form!

CHAIN-OF-CUSTODY RECORD

Project Number: M001501	Date Results Required: 5/18/00
Client: Montana - Dakota Utilities	TAT(Assessment Only)
Plant/Location: Lewis & Clark Station	LAB Use Only — PO Number: 4023
Project Supervisor: Bruce Randall	LIMS Entry:

Sample Number	Date Sampled	Sample Point Identification	# of Conts	Grab/ Comp	Analysis Requested	Sub Lab
SR3C01	4-11	Stack R3 Filter	1		Ontario - Hydro Hg	17258
IR3C01	4-11	Inlet " "	1			17262
SBC01	4-12	Stack Blank "	1			17255
IBC01	4-12	Inlet " "	1			17259
	NOTHING BELOW THIS LINE					

Delivered by:	Date/Time	Processed by:	Date/Time	Received by Laboratory:
Bruce Randall	4-18-00 0930	149	14M	

Special Instructions:

00067

* must be complete within 3 weeks.
(log for 10 day TAT)

PLEASE FAX NOTICE OF SHIPMENT TO

PHILIP ANALYTICAL SERVICES CORPORATION

FAX #: 1 - (905) – 332 – 9169

Attention: Ron McLeod ext.236 (or) Ancy Sebastian ext 223

US COURIER ADDRESS:	MAILING ADDRESS:
Philip Analytical Services Corporation **1-800-668-0639 – Ext. 236** c/o UPS Depot. 265 Cayauga Rd Cheektowaga, NY 14225 U.S.A.	Philip Analytical Services Corporation 5555 North Service Road Burlington, ON L7L 5H7 Canada **1-(905)-332-8788 or 1-(800)-668-0639**

Client Name: Mostardi Platt Associates

Project Contact: Bruce Randall (651-686-0700)

will be sending today 04 / 18 / 00 a shipment to Buffalo
(mm/dd/yy)

Courier: UPS

Weigh Bill Number(s): 1Z 54E 150 22 1004 925 1
1Z 54E 150 22 1004 926 0
1Z 54E 150 22 1004 927 9

Total # of pieces in shipment: 3

Additional Information:

150

** TOTAL PAGE.03 **

** TX STATUS REPORT ** AS OF APR 22 2000 11:46 PAGE.01

PHILIP ANALYTICAL

	DATE	TIME	TO/FROM	MODE	MIN/SEC	PGS	JOB#	STATUS
24	04/22	11:45	16516864434	EC--S	00'18"	001	161	OK

NOTICE OF SAMPLE RECEIPT-PHILIP ANALYTICAL SERVICES

Attention: Bruce Randall
Client: MOSTARDI-PLATT ASSOCIATES INC.
Re Client Project: M001501
FAX #: 651-686-4434
Phone #: 651-686-0700

Samples for: 'OH' 1/4 method
were received in good condition unless
indicated below.

SAMPLE LISTING

Philip ID #	Sample ID	Date Sampled	Date Received
017254	Reagent Blank	00/04/11	00/04/19
017255	Stack Blank	00/04/12	00/04/19
017256	Stack Run #1	00/04/11	00/04/19
017257	Stack Run #2	00/04/11	00/04/19
017258	Stack Run #3	00/04/11	00/04/19
017259	Inlet Blank	00/04/12	00/04/19
017260	Inlet Run #1	00/04/11	00/04/19
017261	Inlet Run #2	00/04/11	00/04/19
017262	Inlet Run #3	00/04/11	00/04/19

Comments:

Date 00/04/22

NOTICE OF SAMPLE RECEIPT-PHILIP ANALYTICAL SERVICES

Attention: Bruce Randall
Client: MOSTARDI-PLATT ASSOCIATES INC.
Re Client Project: M001501
FAX #: 651-686-4434
Phone #: 651-686-0700

Samples for: 'CH' Hg method
were received in good condition unless
indicated below.

SAMPLE LISTING

Philip ID #	Sample ID	Date Sampled	Date Received
017254	Reagent Blank	00/04/11	00/04/19
017255	Stack Blank	00/04/12	00/04/19
017256	Stack Run #1	00/04/11	00/04/19
017257	Stack Run #2	00/04/11	00/04/19
017258	Stack Run #3	00/04/11	00/04/19
017259	Inlet Blank	00/04/12	00/04/19
017260	Inlet Run #1	00/04/11	00/04/19
017261	Inlet Run #2	00/04/11	00/04/19
017262	Inlet Run #3	00/04/11	00/04/19

Comments: _____

Date 00/04/22

MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 N. Front St. - New Ulm, MN 56073 - 800-782-3557 - Fax 507-359-2890
1411 S. 12th St. - Bismarck, ND 58502 - 800-279-6885 - Fax 701-258-9724
710 S. 14th St. - Grand Forks, ND 58201 - 800-272-7645 - Fax 701-772-0028
35 W. Lincoln Way - Nevada, IA 50201 - 800-362-0855 - Fax 515-382-3885

MEMBER ACIL

Sample Number: 00-C568

Report Date: 4/18/00

Craig Herbert
Montana-Dakota Utilities Co.
PO Box 808
Sidney MT 59270

Work Order #: 89-192
P.O. #: M2193-000A
Date Collected: 4/11/00

Sample Description: 4M-00
Sample Site: Lewis and Clark

• PROXIMATE •

ANALYTE	AS RECEIVED	DRY BASIS
Total Moisture	37.42 wt. %	
Ash	9.57 wt. %	15.29 wt. %
Volatile Matter	26.18 wt. %	41.83 wt. %
Fixed Carbon	26.83 wt. %	42.88 wt. %
BTU/lb	6525 BTU/lb	10427 BTU/lb
Total Sulfur	0.56 wt. %	0.89 wt. %

• ULTIMATE •

ANALYTE	AS RECEIVED	DRY BASIS
Total Moisture	37.42 wt. %	
Ash	9.57 wt. %	15.29 wt. %
Total Sulfur	0.56 wt. %	0.89 wt. %
Chlorine	< 0.01 wt. %	< 0.02 wt. %

• SULFUR FORMS •

ANALYTE	AS RECEIVED	DRY BASIS
Total Sulfur	0.56 wt. %	0.89 wt. %

• ASH FUSION •

ANALYTE	REDUCING	OXIDIZING

• MINERAL ANALYSIS OF ASH •

ANALYTE	DRY BASIS

• MISCELLANEOUS •

ANALYTE	AS RECEIVED	DRY BASIS
Mercury, Trace ug/g	0.067 ug/g	0.107 ug/g

This is an exact copy of the original document.
by SZ date 15 APR 00

Approved By: D. Zarda

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

AN EQUAL OPPORTUNITY EMPLOYER

MINNESOTA VALLEY TESTING LABORATORIES, INC.

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1411 S. 12th St. - Bismarck, ND 58502 - 800-279-6885 - Fax 701-258-9724
710 S. 14th St. - Grand Forks, ND 58201 - 800-272-7645 - Fax 701-772-0028
35 W. Lincoln Way - Nevada, IA 50201 - 800-362-0855 - Fax 515-382-3885

MEMBER ACIL

Sample Number: 00-C569

Report Date: 4/18/00

Craig Herbert
Montana-Dakota Utilities Co.
PO Box 808
Sidney MT 59270

Work Order #: 89-192
P.O. #: M2193-000A
Date Collected: 4/11/00

Sample Description: 5M-00
Sample Site: Lewis and Clark

• PROXIMATE •

ANALYTE	AS RECEIVED	DRY BASIS
Total Moisture	37.35 wt. %	
Ash	9.51 wt. %	15.18 wt. %
Volatile Matter	25.50 wt. %	40.70 wt. %
Fixed Carbon	27.64 wt. %	44.12 wt. %
BTU/lb	6538 BTU/lb	10435 BTU/lb
Total Sulfur	0.44 wt. %	0.70 wt. %

• ULTIMATE •

ANALYTE	AS RECEIVED	DRY BASIS
Total Moisture	37.35 wt. %	
Ash	9.51 wt. %	15.18 wt. %
Total Sulfur	0.44 wt. %	0.70 wt. %
Chlorine	< 0.01 wt. %	< 0.02 wt. %

• SULFUR FORMS •

ANALYTE	AS RECEIVED	DRY BASIS
Total Sulfur	0.44 wt. %	0.70 wt. %

• ASH FUSION •

ANALYTE	REDUCING	OXIDIZING

• MINERAL ANALYSIS OF ASH •

ANALYTE	DRY BASIS

• MISCELLANEOUS •

ANALYTE	AS RECEIVED	DRY BASIS
Mercury, Trace ug/g	0.076 ug/g	0.121 ug/g

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the original document.
by SZ date 18Apr00

Approved By: D. Zander

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same as any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

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710 S. 14th St. - Grand Forks, ND 58201 - 800-272-7645 - Fax 701-772-0028
35 W. Lincoln Way - Nevada, IA 50201 - 800-362-0855 - Fax 515-382-3885

MEMBER ACIL

Sample Number: 00-C567

Report Date: 4/18/00

Craig Herbert
Montana-Dakota Utilities Co.
PO Box 808
Sidney MT 59270

Work Order #: 89-192
P.O. #: M2193-000A
Date Collected: 4/11/00

Sample Description: 6M-00
Sample Site: Lewis and Clark

*** PROXIMATE ***

ANALYTE	AS RECEIVED	DRY BASIS
Total Moisture	37.03 wt. %	
Ash	10.02 wt. %	15.91 wt. %
Volatile Matter	25.52 wt. %	40.53 wt. %
Fixed Carbon	27.43 wt. %	43.57 wt. %
BTU/lb	6543 BTU/lb	10391 BTU/lb
Total Sulfur	0.55 wt. %	0.87 wt. %

*** ULTIMATE ***

ANALYTE	AS RECEIVED	DRY BASIS
Total Moisture	37.03 wt. %	
Ash	10.02 wt. %	15.91 wt. %
Total Sulfur	0.55 wt. %	0.87 wt. %
Chlorine	< 0.01 wt. %	< 0.02 wt. %

*** SULFUR FORMS ***

ANALYTE	AS RECEIVED	DRY BASIS
Total Sulfur	0.55 wt. %	0.87 wt. %

*** ASH FUSION ***

ANALYTE	REDUCING	OXIDIZING

*** MINERAL ANALYSIS OF ASH ***

ANALYTE	DRY BASIS

*** MISCELLANEOUS ***

ANALYTE	AS RECEIVED	DRY BASIS
Mercury, Trace ug/g	0.082 ug/g	0.130 ug/g

This is an exact copy of
the original document.
by SZ date 18 APR 00

Approved By: D. Zarda

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LIST OF PARTICIPANTS

Name	Organization	Project Role
Rick Patzman	M-DU	Corporate Environmental Engineer
George Gasper	M-DU L&C	Plant Contact/Process Monitor
Bruce Randall	Mostardi-Platt	Project Director/Test Team Leader
Shawn Nelezen	Mostardi-Platt	Inlet Sample Team Leader
David Hillesheim	Mostardi-Platt	Main Stack Sample Team Leader
George Kvarta	Mostardi-Platt	Inlet Sample Technician
Jason Linkimer	Mostardi-Platt	Main Stack Sample Technician
Ron McLeod	Philip Services	Speciated Hg Sample Analysis