EVALUATION OF MERCURY EMISSIONS FROM COAL-FIRED FACILITIES WITH SCR AND FGD SYSTEMS

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ABSTRACT

CONSOL Energy Inc., Research & Development (CONSOL), with support from the U.S. Department of Energy, National Energy Technology Laboratory (DOE) and the Electric Power Research Institute (EPRI), is evaluating the effects of selective catalytic reduction (SCR) on mercury (Hg) capture in coal-fired plants equipped with an electrostatic precipitator (ESP) - wet flue gas desulfurization (FGD) combination or a spray dryer absorber – fabric filter (SDA-FF) combination. In this program CONSOL is determining mercury speciation and removal at 10 coal-fired facilities. The objectives are 1) to evaluate the effect of SCR on mercury capture in the ESP-FGD and SDA-FF combinations at coal-fired power plants, 2) evaluate the effect of catalyst degradation on mercury capture; 3) evaluate the effect of low load operation on mercury capture in an SCR-FGD system, and 4) collect data that could provide the basis for fundamental scientific insights into the nature of mercury chemistry in flue gas, the catalytic effect of SCR systems on mercury speciation and the efficacy of different FGD technologies for mercury capture.

This document, the seventh in a series of topical reports, describes the results and analysis of mercury sampling performed on a 1,300 MW unit burning a bituminous coal containing three percent sulfur. The unit was equipped with an ESP and a limestone-based wet FGD to control particulate and SO_2 emissions, respectively. At the time of sampling an SCR was not installed on this unit. Four sampling tests were performed in September 2003. Flue gas mercury speciation and concentrations were determined at the ESP outlet (FGD inlet), and at the stack (FGD outlet) using the Ontario Hydro method. Process stream samples for a mercury balance were collected to coincide with the flue gas measurements.

The results show that the FGD inlet flue gas oxidized**:**elemental mercury ratio was roughly 2:1, with 66% oxidized mercury and 34% elemental mercury. Mercury removal, on a coal-to-stack basis, was 53%. The average Hg concentration in the stack flue gas was 4.09 $\mu g/m^3$. The average stack mercury emission was 3.47 lb/TBtu. The mercury material balance closures ranged from 87% to 108%, with an average of 97%.

A sampling program similar to this one was performed on a similar unit (at the same plant) that was equipped with an SCR for NOx control. Comparison of the results from the two units show that the SCR increases the percentage of mercury that is in the oxidized form, which, in turn, lends to more of the total mercury being removed in the wet scrubber.

The principal purpose of this work is to develop a better understanding of the potential mercury removal "co-benefits" achieved by NOx, and SO_2 control technologies. It is expected that this data will provide the basis for fundamental scientific insights into the nature of mercury chemistry in flue gas, the catalytic effect of SCR systems on mercury speciation and the efficacy of different FGD technologies for mercury capture. Ultimately, this insight could help to design and operate SCR and FGD systems to maximize mercury removal.

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LIST OF ABBREVIATIONS

acfm	-	actual cubic feet per minute (wet)
am	-	morning
Btu	-	heating value in British Thermal Units
Ca/S	-	Calcium-sulfur ratio
cfm	-	cubic feet per minute
CO_2	-	carbon dioxide
CONSOL R&D	-	CONSOL Energy Inc., Research and Development
CVAA	-	cold vapor atomic absorption
DI	-	deionized water
dscf	-	dry standard cubic feet
dscfm	-	dry standard cubic feet per minute
EPA	-	U.S. Environmental Protection Agency
ESP	-	electrostatic precipitator
FGD	-	wet flue gas desulphurization
ft	-	feet
ft^2	-	square feet
ft^3	-	cubic feet
gm	-	grams
gpm	-	gallons per minute
gr	-	grains
HCl	-	hydrochloric acid
Hg	-	mercury
Hg^{part}	-	mercury in particulate form
Hg^{total}	-	total mercury in particulate, oxidized, and elemental forms
Hg^{++}	-	mercury in oxidized form
Hg^{o}	-	mercury in elemental form
HNO_3	-	nitric acid
H_2O	-	water
hr	-	hour
ICP-AES	-	inductively coupled plasma-atomic emission spectrometer
in	-	inch
KCl	-	potassium chloride
$KMnO_4$	-	potassium permanganate
L	-	liter
lb	-	pound
m	-	meter
m^3	-	cubic meter
mg	-	milligram, 10^{-3} gram

LIST OF ABBREVIATIONS (continued)

min	-	minute
mL	-	milliliter
M	-	molar, mol/L
MM	-	million
mol	-	mole
ng	-	nanogram, 10^{-9} gram
N_2	-	molecular nitrogen
NIST	-	National Institute of Standards and Technology
NO	-	nitric oxide
NO_2	-	nitrogen dioxide
O_2	-	molecular oxygen
O_3	-	ozone
pm	-	afternoon
PM	-	particulate matter
ppb	-	parts per billion
ppm	-	parts per million
ppmv	-	parts per million by volume
PRSD	-	percent relative standard deviation
QA	-	quality assurance
QC	-	quality control
rpm	-	revolutions per minute
scf	-	standard cubic feet (68EF and 29.92"Hg)
scfm	-	standard cubic feet per minute
SRM	-	Standard Reference Material
TBtu	-	trillion (10^{12}) BTU
temp	-	temperature
tph	-	tons per hour
wt	-	weight
vs	-	versus
EF	-	temperature in degrees Fahrenheit
~	-	approximately
<	-	less than
>	-	more than
µg	-	microgram, 10^{-6} gram

INTRODUCTION

The CONSOL Energy Inc. Research and Development (CONSOL R&D) is determining mercury speciation and removal at 10 coal-fired facilities with selective catalytic reduction (SCR) / flue gas desulfurization (FGD) combinations (Table 1). CONSOL R&D's Exploratory and Environmental Research Group conducted a series of flue gas mercury (Hg), measurements at Plant 5, on Unit 2, on September 25 and 26, 2003, in conjunction with the Electric Power Research Institute, Inc. (EPRI Agreement EP-P13687/C6810), under U. S. Department of Energy (DOE) Cooperative Agreement No. DE-FC26-02NT41589. The test program consisted of four sets of measurements across the FGD system. The Hg measurements were made using the Ontario-Hydro Flue Gas Hg Speciation Method at the FGD inlet and the Stack. The testing conducted by CONSOL R&D is documented in this report.

Table 1. Coal-fired Facilities in Program

Site #	MW	Air Pollution Control Devices	Coal	Ozone Unit
1	330	SCR / Spray Dryer / Baghouse	Bit	year round
2	245	SCR / Spray Dryer / Baghouse	Bit	year round
3	560	SCR / ESP/ Limestone FGD, inhibited oxidation	Bit	Yes
4 Unit 1	468	ESP/ Limestone FGD, natural oxidation	Bit	(1)
4 Unit 2	468	SCR / ESP/ Limestone FGD, natural oxidation	Bit	year round
5 Unit 1	1,300	SCR / ESP/ Limestone FGD, in-situ oxidation	Bit	Yes
5 Unit 2	1,300	ESP/ Limestone FGD, in-situ oxidation	Bit	(1)
6 (2)	544	SCR / ESP/ Limestone FGD, ex-situ oxidation	Bit	Yes
7 (2)	566	SCR / ESP/ Limestone FGD, ex-situ oxidation	Bit	Yes
8	684	SCR / ESP / Lime FGD, ex-situ oxidation	Bit	Yes
9	640	SCR / ESP/ Lime FGD, inhibited oxidation	Bit	Yes
10	1,300	SCR / ESP/ Lime FGD, inhibited oxidation	Bit	Yes

(1) SCR not installed when test were conducted
(2) Tests also conducted during non-ozone season while flue gases bypassed the SCR

HOST UTILITY DESCRIPTION

Plant 5 is a 2,600 MW pulverized bituminous coal-fired generation facility that operates two nearly identical 1,300 MW units. Each Unit utilizes an ESP and a wet limestone FGD to control the emissions of particulate matter and SO_2, respectively. There are three 50% scrubber modules per unit. The FGD slurry is oxidized in-situ to produce gypsum, which is sent to a nearby pond for stacking. At the time of sampling, Unit One had an SCR unit in operation, while construction was underway on an SCR for Unit Two.

MERCURY SAMPLING RESULTS

I. Test Matrix

The mercury measurements consisted of a total of four tests over two days. The test matrix is shown in Table 2.

Table 2. Sampling Test Matrix

Date	Activity	Hg Sampling		Process Sampling				
		FGD Inlet	Stack Outlet	Coal	ESP Ash	FGD Sludge	Limestone Slurry	Makeup Water
9/24/03	Setup	---	---	---	---	---	---	---
9/25/03	Test 1	X	X	X	X	X	X	X
9/26/03	Test 2	X	X	X	X	X	X	X
	Test 3	X	X	X	X	X	X	X
	Test 4	X	X	X	X	X	X	X
	Pack Demobilization	---	---	---	---	---	---	---

A total of eight flue gas mercury measurements were conducted using the Ontario Hydro Method (ASTM Method D-6784-02). All flue gas mercury tests were 120 minutes in duration. Details of sampling conditions are provided later in this report.

To calculate a material balance, CONSOL R&D and plant personnel obtained process samples concurrently within the gas sampling periods. Laboratory analyses were performed by CONSOL R&D and the results of analyses are included in this report.

II. Flue Gas Mercury Sampling Results

Figure 1 shows the mercury speciation for the four tests conducted at the FGD inlet and stack locations. All tests were made isokinetically. A complete listing of mercury analyses is in Appendix C. The results at each location are discussed below.

A. FGD Inlet

Four mercury measurements were conducted at the FGD inlet. However, the Test 1 oxidized mercury concentration was anomalously high (as much as 7 to 13 times higher than the other three tests). This indicates possible sample contamination. Therefore, the results from Test 1 are not included in the average concentration for the FGD inlet. Table 3 summarizes the mercury measurements at the FGD inlet. The results show that nearly 99.9% of the mercury was in the gas phase. The high percentage of gas phase mercury is expected due to the upstream particulate control device. Sixty-six percent of the total mercury was in the oxidized form. The average concentrations of the particulate, oxidized and elemental mercury measured at this location were 0.02, 8.89 and 4.65 $\mu g/m^3$, respectively. The average concentration of total mercury was 13.6 $\mu g/m^3$ and the average mass flow rate of mercury was 19.4 mg/sec. This is higher than the total mercury input flow rate from the coal. As described later in this report, the flue gas was sampled at only two sampling points at this location because a full sampling traverse could not be made. The higher-than-expected total mercury

concentration suggests that the mercury was not evenly distributed across the duct cross-section.

Table 3. Flue Gas Hg Speciation at the FGD Inlet

Date	Test No.	Hg Concentration, µg/m³ (dry std conditions)				Hg Flow, mg/sec			
		Hg^{part}	Hg^{++}	Hg^{0}	Hg^{total}	Hg^{part}	Hg^{++}	Hg^{0}	Hg^{total}
09/25/03	1	0.06[a]	78.2[a]	5.42[a]	83.7[a]	0.09[a]	114[a]	7.90[a]	122[a]
09/26/03	2	0.03	9.77	5.90	15.7	0.04	14.2	8.56	22.7
09/26/03	3	0.02	10.1	4.25	14.4	0.03	14.4	6.03	20.4
09/26/03	4	0.01	6.76	3.81	10.6	0.02	9.70	5.47	15.2
Average		0.02	8.89	4.65	13.6	0.03	12.8	6.69	19.4
Std. Deviation		0.01	1.86	1.10	2.66	0.01	2.65	1.64	3.88
PRSD		50	21	24	20	33	21	25	20

[a] – Result not included in averages

B. Stack

Four mercury measurements were conducted at the stack. Table 4 summarizes the results of measurements. Eighty-eight percent of the mercury in the stack flue gas was in the elemental form. The average concentrations of the particulate-bound, oxidized, and elemental mercury were 5.18×10^{-3}, 0.47, and 3.61 µg/m³, respectively. The average concentration of the total mercury was 4.09 µg/m³ and the average mass flow rate of mercury was 5.99 mg/sec.

Table 4. Flue Gas Hg Speciation at the Stack

Date	Test	Hg Concentration, µg/m³ (dry std conditions)				Hg Flow mg/sec			
		Hg^{part}	Hg^{++}	Hg^{0}	Hg^{total}	Hg^{part}	Hg^{++}	Hg^{0}	Hg^{total}
09/25/03	1	4.09×10^{-3}	0.42	3.78	4.21	6.09×10^{-3}	0.63	5.63	6.26
09/26/03	2	3.30×10^{-3}	0.41	3.58	3.99	4.82×10^{-3}	0.60	5.22	5.82
09/26/03	3	2.83×10^{-3}	0.63	3.34	3.97	4.09×10^{-3}	0.91	4.84	5.75
09/26/03	4	1.05×10^{-2}	0.42	3.75	4.19	1.54×10^{-2}	0.61	5.51	6.14
Average		5.18×10^{-3}	0.47	3.61	4.09	7.6×10^{-3}	0.69	5.30	5.99
Std. Deviation		3.58×10^{-3}	0.11	0.20	0.13	5.3×10^{-3}	0.15	0.35	0.25
PRSD		69.	23	5.6	3.1	69	22	6.6	4.1

III. Hg Removal Across FGD

Table 5 summarizes the flue gas mercury removal across the FGD. The coal-to-stack

average mercury removal was 53%. Comparing the mercury at the stack to the mercury at the FGD inlet, the average removal was 69%. This value is based on a high concentration of mercury at the FGD inlet, probably due to sampling only two points instead of the full duct cross-section. As discussed earlier, the FGD inlet sample in Test 1 was possibly contaminated and, thus, is not included in the average.

Table 5. Flue Gas Mercury Removal

Date	Test	System Mercury Reduction					
		Ontario Hydro Results, mg Hg^{total} /sec.			Coal Feed Based Reduction, mg Hg^{total} /sec		
		FGD Inlet	Stack Emissions	% Reduction	Coal Feed	Stack Emissions	% Reduction
09/25/03	1	122	6.26	95	12.5	6.26	50
09/26/03	2	22.7	5.82	74	12.4	5.82	53
09/26/03	3	20.4	5.75	72	13.8	5.75	58
09/26/03	4	15.2	6.14	60	12.4	6.14	50
Average		19.4[a]	5.99	69[a]	12.8	5.99	53
Standard Deviation		3.88	0.25	7.9	0.72	0.25	3.9
PRSD		20	4.1	12	5.6	4.1	7.5

[a] – Average does not include µg Hg^{total} /m^3 values from Test 1.

IV. Mercury Material Balance

An important criterion to gauge the overall quality of the tests is to conduct a mass balance to account for the mercury entering and leaving the plant during the tests. The mercury material balance closure (expressed as %) is value of the total mercury leaving the plant divided by the value of the total mercury entering the plant. The total mercury entering the plant is the sum of the amounts of mercury in the coal, limestone slurry ME (mist eliminator) wash water, and FGD makeup water. The total mercury leaving the plant is the sum of the amounts of mercury in mill rejects, bottom ash, ESP hopper ash, FGD slurry, and stack flue gas.

Table 6 summarizes the mercury material balance closure for the four tests conducted at the plant. The calculated mercury material balance closures ranged from 87% to 108%. The material balance closures for mercury for all four tests are within the QA/QC criterion of 70-130% for a single test, and the average value is 97%, which is within the QA/QC criterion of 80-120% for multiple tests.

The measurements, calculations, and assumptions for calculating the material balances are described later in this report.

Table 6. Material Balance Closure for Mercury.

Test No.	1	2	3	4
Hg input from Coal (mg/sec)	12.5	12.4	13.8	12.4
Hg input from limestone slurry (mg/sec)	0.14	0.14	0.14	0.14
Hg input from FGD make-up water (mg/sec)	0.11	0.12	0.11	0.11
Hg input to the system (mg/sec)	12.7	12.6	14.1	12.6
Hg output via boiler bottom ash (mg/sec)	0	0	0	0
Hg output via ESP hopper ash (mg/sec)	0.94	0.27	0.47	0.15
Hg output via FGD slurry (mg/sec)	6.53	6.74	5.99	5.42
Hg output via stack gas (mg/sec)	6.26	5.82	5.75	6.14
Hg output from the system (mg/sec)	13.7	12.8	12.2	11.7
Hg material balance closure (output/Input)	108%	102%	87%	93%
Average Hg Material Balance	**97%**			

IV. SCR/Non-SCR Test Comparison

A mercury sampling test program was performed in June 2004 on Unit 1 of the same plant, which is identical to Unit 2 except that Unit 1 is equipped with a Selective Catalytic Reduction (SCR) device for NOx control[1]. The purpose of performing the sampling program on both units at this plant was to compare mercury speciation and reduction with and without SCR.

The results show that the SCR does indeed increase the oxidation of the mercury. At the point where the flue gas enters the FGD, a greater percentage of the mercury is in the oxidized form in the unit with the SCR compared to the unit without the SCR. Table 7 shows the average mercury speciation of the flue gas in the FGD inlet duct for both units. The Unit 1 data are the averages of four sampling test runs; the unit 2 data are the averages of three runs. Because this location is downstream of the plant's ESP, there is very little particulate mercury.

[1] J. A. Withum, S. C. Tseng, J. E. Locke, "Topical Report No. 4," for U.S. DOE Cooperative Agreement No. DE-FC26-02NT41589, April 2005

Table 7. Comparison of Average Flue Gas Mercury Speciation at the FGD Inlet

	Unit 1 (with SCR)	Unit 2 (without SCR)
Hg^{part}	0.2%	0.2%
Hg^{++}	94.3%	65.5%
Hg^{0}	5.4%	34.3%

This higher level of oxidation resulted in substantially higher mercury removals in the scrubber. Table 8 shows that total mercury removal was 89% on the unit with SCR, but only 69% on the unit without SCR. The difference was due to the scrubber's inability to remove elemental mercury.

Table 8. Comparison of Average Mercury Reductions Across the FGD Scrubber

	Unit 1 (with SCR)			Unit 2 (without SCR)		
	FGD Inlet, mg Hg/sec	Stack, mg Hg/sec	Reduction	FGD Inlet, mg Hg/sec	Stack, mg Hg/sec	Reduction
Hg^{part}	0.03	0.003	90%	0.03	0.008	74%
Hg^{++}	12.5	0.62	95%	12.8	0.69	95%
Hg^{0}	0.72	0.90	-25%	6.69	5.30	21%
Total Hg	13.2	1.52	89%	19.4	5.99	69%

EXPERIMENTAL AND SAMPLING METHODS

CONSOL R&D performed flue gas mercury determinations using the Ontario-Hydro sampling method. As a quality assurance/quality control (QA/QC) measure, samples of coal, ESP ash, limestone slurry, FGD slurry, and makeup water were taken to determine the mercury material balance across the plant.

I. Flue Gas Sampling Locations and Sampling Points

Flue gases were sampled at two locations, the FGD inlet and stack. Figure 2 is a flow schematic indicating the sampling locations at this unit.

A. FGD Inlet

Figure 3 is a schematic of the FGD inlet sampling location. The FGD inlet duct is approximately 29 ft. deep and 48 ft. wide. A single point was sampled in each of two test ports in the duct. Each point was sampled for 60 minutes.

Four Hg measurements were performed at the FGD inlet. The sample train was prepared in EPA Method 17 configuration using an in-stack 47-mm quartz-fiber filter. The filter apparatus was attached to a heated probe that was connected to the impinger train with a flexible heated Teflon sample line. Each sample run was 120 minutes.

Preliminary pitot surveys conducted on the September 25, 2003, indicated that the gas flow was straight, not cyclonic. Hg measurements were conducted with the sampling nozzle oriented parallel to and directly into the flow.

Figure 4 is a photograph of the FGD inlet sampling location. Hg measurements were conducted isokinetically.

B. Stack

Figure 5 is a schematic of the stack sampling location. The stack is approximately 38.5 feet in diameter. A single point sampling was conducted in a single sample access port. Throughout the duration of the Ontario Hydro sampling period, velocity traverses were completed in four access ports, each with three traverse points, as determined by EPA Method 1.

Four 120-minute sample runs were performed at the stack sampling location. A standard EPA Method 5 sample train configuration was utilized for this location.

Preliminary pitot surveys conducted on the September 25, 2003, indicated that the gas flow was straight, not cyclonic nor swirling. Hg measurements were conducted with the nozzle oriented horizontally, directly into the flow.

Figure 6 is a photograph of the Hg sampling train on the stack. Hg measurements were conducted isokinetically.

II Flue Gas Mercury Measurements

Flue gas Hg measurements were performed using the Ontario-Hydro Hg speciation train. The sampling train schematic is shown in Figure 7. A description of the method follows.

The flue gas is extracted from the flue gas stream and pulled through a heated glass-lined probe and quartz filter. Total particulate matter mass loading is calculated from the solids collected prior to and on the filter. Where particle loading is high, the probe and filter temperature are maintained as close as practical to the flue gas temperature. In this test program, probe and filter temperatures were maintained at 325 ± 25 °F at the FGD inlet, and 250 ± 25 °F at the stack.

Mercury collected prior to and on the filter is assumed to be particulate Hg (Hg^{part}). The flue gas exits the quartz filter and passes through a series of chilled impingers. The first three impingers are filled with 100 mL of a 1M-potassium chloride (KCl) solution. It is assumed these impingers capture oxidized forms of Hg in the flue gas (Hg^{++}). The next impinger is filled with 100 mL of a 5% nitric acid and 10% H_2O_2 solution. The purpose of this impinger is to remove SO_2 from the flue gas to preserve the oxidizing strength of

the permanganate impingers. Hg collected in this impinger is assumed to be the elemental form (Hg^0). The next two impingers are filled with 100 mL of an acidic potassium permanganate ($KMnO_4$) solution. It is assumed that these impingers collect elemental mercury (Hg^0). The next impinger is blank to catch any excess moisture. The gas exits the impinger train through a silica gel-filled impinger that removes the moisture from the flue gas. The Hg species collected by the Ontario-Hydro sampling train component are listed in Table 9.

Table 9. Hg Speciation by Train Component

Train Component	Species Measured
Probe & Nozzle Rinse	Hg^{part}
Quartz Filter	Hg^{part}
KCl Impingers	Hg^{++}
HNO_3/H_2O_2 Impinger	Hg^0
$KMnO_4$ Impingers	Hg^0
HCl Rinse of $KMnO_4$ Impingers	Hg^0

The absorbing solutions were made fresh daily. The impingers were charged and the sampling components were transported to the required locations. The sampling trains were assembled, pre-heated, and checked for pitot and sample line leaks as detailed in EPA Methods 2 and 5, respectively. After passing the leak-check procedure, the sampling probes were inserted into their respective ducts, in-stack filters were allowed to heat to stack temperature, and sampling was initiated. Leak checks were also performed during port changes.

Oxygen readings were monitored at the outlet of the sampling train using a Teledyne Model Max 5 portable analyzer (electrochemical O_2 sensor). At the completion of the sampling period, the sample trains were checked for leaks, purged for 10 min, and then disassembled. The components were transported back to the lab trailer for recovery.

The Hg concentration of the individual impinger solutions was determined by a cold vapor atomic absorption (CVAA) spectrometer as specified in the methodology. The concentration of Hg on the solids was determined by acid digestion followed by CVAA.

The amount of mercury collected in the impinger solutions was determined as outlined in EPA Method 29 and the Ontario-Hydro Draft Method. An aliquot of the impinger solution is acidified and the mercury is determined by CVAA. The CVAA spectrometer is calibrated with commercial mercury standard. The calibration is verified using NIST Standard 1641D. The calibration is reassessed periodically by analyzing a quality control standard. The instrument is recalibrated as required. Each sample matrix is analyzed as a set and an individual calibration curve is used for each set. Depending

on sample type, selected samples are spiked with 2, 5, 10, or 15 ng/mL (ppb) of mercury and reanalyzed. Spike recovery must be within ±30% or the sample is diluted and reanalyzed. Selected samples are analyzed in duplicate. The duplicates must be within ±30% or the analyses are repeated.

Where sufficient solids are collected, particulate mercury is analyzed using a 0.5-1.0 gm ash sample with the direct combustion method (ASTM Method D6722). In cases where the particulate catch is low (primarily stack filters) the entire filter sample is digested with aqua-regia in pressure vessels prior to analysis by CVAA.

III. Coal Sampling and Analysis

A. Coal Samples

Plant 5 (Tests 1 and 2) and CONSOL personnel (Tests 1 to 4) collected coal samples from five coal bins, 2-3, 2-4, 2-6, 2-8, and 2-11. Each bin was sampled twice in a test. The first sample was taken during the first hour and the second was in the second hour of the test. The coal sample was taken from a six-inch port welded to the bottom of the coal bin, as shown in Figure 8, using a device provided by the plant. This device was made of a four-inch PVC pipe that could hold about two liters of coal. Listed in Table 10 are the coal samples collected from the five coal bins at Plant 5, Unit 2.

Table 10. List of Coal Samples

Test No.	Test Date	Sampling Time	Sample ID
1	09/25/03	15:30-15:50	Plant 4-U2-Coal-T1-1
		16:30-16:50	Plant 4-U2-Coal-T1-2
2	09/26/03	09:20-09:40	Plant 4-U2-Coal-T2-1
		10:30-10:50	Plant 4-U2-Coal-T2-2
3	09/26/03	12:35-12:55	Plant 4-U2-Coal-T3-1
		13:35-13:55	Plant 4-U2-Coal-T3-2
4	09/26/03	15:15-15:35	Plant 4-U2-Coal-T4-1
		16:30-16:50	Plant 4-U2-Coal-T4-2

B. Summary of the Results of Coal Analyses

Coal Samples were analyzed using a direct mercury analyzer following the procedures prescribed in ASTM Method D6722. Detailed results of the coal analyses for each test are presented in Appendix D and summarized in Table 11. The mercury contents in the coal ranged from 0.09 to 0.10 ppm.

Table 11. Coal Sample Analytical Summary

Sample ID/Analysis	Plant 4-U2-Coal-T1-1&2	Plant 4-U2-Coal-T2-1&2	Plant 4-U2-Coal-T3-1&2	Plant 4-U2-Coal-T4-1&2
Test No.	1	2	3	4
Test Date	09/25/03	09/26/03	09/26/03	09/26/03
Analytical No.	33348	33349	33350	33351
Ash (dry, %)	9.86	9.86	10.02	9.58
Moisture (as det'd, %)	4.71	4.40	4.64	4.53
V.M. (dry, %)	39.18	38.89	40.08	39.05
Fixed C (dry, %)	50.96	51.25	49.9	51.37
HHV (Btu/lb)	13,077	13,133	13,104	13,117
MAF (Btu/lb)	14,507	14,570	14,563	14,507
Sulfur, total (dry, %)	3.33	3.28	3.33	3.27
Carbon (dry, %)	72.96	73.11	72.73	73.14
Hydrogen (dry, %)	5.05	4.98	4.91	5.00
Nitrogen (dry, %)	1.54	1.51	1.47	1.53
Chlorine (dry, %)	0.17	0.167	0.143	0.178
Oxygen (dry, %), by diff	7.09	3.28	7.40	7.30
Mercury (as det'd, ppm)	0.09	0.09	0.10	0.09
Major Ash Element (dry, %)				
SiO_2	48.04	47.08	47.42	46.43
Al_2O_3	17.57	17.49	17.46	17.20
TiO_2	0.92	0.92	0.92	0.91
Fe_2O_3	18.33	20.08	19.42	20.36
CaO	5.22	5.62	5.80	5.60
MgO	0.87	0.86	0.87	0.84
Na_2O	0.78	0.70	0.71	0.67
K_2O	2.19	2.10	2.14	2.11
P_2O_5	0.10	0.12	0.14	0.14
SO_3	3.65	2.84	3.00	3.35

IV. Process Sample Collection

CONSOL R&D and plant personnel collected samples of limestone slurry, ESP hopper ash, FGD slurry, and FGD makeup water. CONSOL R&D completed comprehensive analyses using a direct mercury analyzer and following the procedures prescribed in ASTM Method D6722. Detailed results of the process material analyses are presented in Appendix D.

A. Limestone Slurry Samples

Plant operators collected limestone slurry samples from Unit 2 limestone slurry storage tank. Two bottles of approximately 500 mL of slurry samples were taken during each test. One was collected during the first hour and the other during the second hour of the test. After the samples were brought back to CONSOL R&D, the two samples collected in a test were mixed together to generate a composite sample for subsequent analyses. Listed in Table 12 are the limestone slurry samples.

Table 12. List of Limestone Slurry Samples

Test No.	Test Date	Sample Time	Sample ID on Bottle	Sample ID for Analysis
1	09/25/03	15:30	Plant 4-U2-LS-T1-1	Plant 4-U2-LS-T1
		16:30	Plant 4-U2-LS-T1-2	
2	09/26/03	9:30	Plant 4-U2-LS-T2-1	Plant 4-U2-LS-T2
		10:30	Plant 4-U2-LS-T2-2	
3	09/26/03	12:45	Plant 4-U2-LS-T3-1	Plant 4-U2-LS-T3
		13:45	Plant 4-U2-LS-T3-2	
4	09/26/03	15:30	Plant 4-U2-LS-T4-1	Plant 4-U2-LS-T4
		16:30	Plant 4-U2-LS-T4-2	

B. ESP Hopper Ash Samples

There are 64 ESP hoppers for Unit 2, arranged into four boxes. Hoppers in each box are arranged in four rows and each row has four hoppers. A schematic of the layout of these hoppers is shown in Figure 9. According to a plant engineer, the hoppers in the first row (closest to the boiler) collect about 70% of the total incoming ash and the second row of hoppers collect about 20%. The remaining two rows of hoppers collect the remaining 10% of the ash. During the tests, four hoppers (2A4-1, 2A4-3, 2B3-1, and 2B3-2) in the first row two hoppers (2A4-6 and 2B3-5) in the second row were sampled. The locations of these six hoppers are also indicated in Figure 9.

Each of the six hoppers was sampled twice at the clean-out port as shown in Figure 10. The first sample was collected during the first hour and the second sample was collected during the second hour of the test. About 1-2 pounds of ash were collected each time using an ash sampling thief which consisted of co-centric tubes with openings as shown in Figure 11. After removing the screw caps of the clean-out ports, the thief was inserted into the ash hoppers through the ports. The inner tube was rotated to allow the ash to drop into the tube. The inert tube was then rotated to close the openings and the thief was then pulled out of the port. The thief was then tilted to allow the ash to fall into a one-gallon sized plastic bag through the opening at the end of the thief. Listed in Table 13 are the ESP hopper ash samples.

Table 13. List of ESP Hopper Ash Samples

Test No.	Test Date	Hopper No.	Sample Time	Sample ID	Sample Time	Sample ID
1	09/25/03	2A4-1	15:36	Plant 4-U2-T1-ESP-2A41-1	16:26	Plant 4-U2-T1-ESP-2A41-2
		2A4-3	15:39	Plant 4-U2-T1-ESP-2A43-1	16:28	Plant 4-U2-T1-ESP-2A43-2
		2A4-6	15:53	Plant 4-U2-T1-ESP-2A46-1	16:30	Plant 4-U2-T1-ESP-2A46-2
		2B3-1	15:42	Plant 4-U2-T1-ESP-2B31-1	16:35	Plant 4-U2-T1-ESP-2B31-2
		2B3-2	15:45	Plant 4-U2-T1-ESP-2B32-1	16:36	Plant 4-U2-T1-ESP-2B32-2
		2B3-5	15:48	Plant 4-U2-T1-ESP-2B35-1	16:37	Plant 4-U2-T1-ESP-2B35-2
2	09/26/03	2A4-1	9:19	Plant 4-U2-T2-ESP-2A41-1	10:05	Plant 4-U2-T2-ESP-2A41-2
		2A4-3	9:21	Plant 4-U2-T2-ESP-2A43-1	10:07	Plant 4-U2-T2-ESP-2A43-2
		2A4-6	9:24	Plant 4-U2-T2-ESP-2A46-1	10:09	Plant 4-U2-T2-ESP-2A46-2
		2B3-1	9:27	Plant 4-U2-T2-ESP-2B31-1	10:11	Plant 4-U2-T2-ESP-2B31-2
		2B3-2	9:29	Plant 4-U2-T2-ESP-2B32-1	10:13	Plant 4-U2-T2-ESP-2B32-2
		2B3-5	9:32	Plant 4-U2-T2-ESP-2B35-1	10:15	Plant 4-U2-T2-ESP-2B35-2
3	09/26/03	2A4-1	12:14	Plant 4-U2-T3-ESP-2A41-1	13:10	Plant 4-U2-T3-ESP-2A41-2
		2A4-3	12:26	Plant 4-U2-T3-ESP-2A43-1	13:12	Plant 4-U2-T3-ESP-2A43-2
		2A4-6	No Sample Collected		13:14	Plant 4-U2-T3-ESP-2A46-2
		2B3-1	12:19	Plant 4-U2-T3-ESP-2B31-1	13:41	Plant 4-U2-T3-ESP-2B31-2
		2B3-2	12:21	Plant 4-U2-T3-ESP-2B32-1	13:45	Plant 4-U2-T3-ESP-2B32-2
		2B3-5	12:23	Plant 4-U2-T3-ESP-2B35-1	13:16	Plant 4-U2-T3-ESP-2B35-2
4	09/26/03	2A4-1	15:05	Plant 4-U2-T4-ESP-2A41-1	16:06	Plant 4-U2-T4-ESP-2A41-2
		2A4-3	15:07	Plant 4-U2-T4-ESP-2A43-1	16:08	Plant 4-U2-T4-ESP-2A43-2
		2A4-6	15:09	Plant 4-U2-T4-ESP-2A46-1	16:10	Plant 4-U2-T4-ESP-2A46-2
		2B3-1	15:10	Plant 4-U2-T4-ESP-2B31-1	16:12	Plant 4-U2-T4-ESP-2B31-2
		2B3-2	15:12	Plant 4-U2-T4-ESP-2B32-1	16:13	Plant 4-U2-T4-ESP-2B32-2
		2B3-5	15:13	Plant 4-U2-T4-ESP-2B35-1	16:15	Plant 4-U2-T4-ESP-2B35-2

C. FGD Slurry

FGD Slurry samples were taken from Modules 2A and 2B by CONSOL personnel. Module 2C was not in service. The layout of the scrubber modules is shown in Figure 12.

Each module is equipped with two slurry sampling pumps, one operating and one spare. Both pumps are located at the ground level near the module. The operating pump draws the scrubber slurry from the base of the module and re-circulates the slurry back into the module at a higher location. A rubber hose with a shut-off valve is teed into this recirculation line at the second level of the FGD building. Immediately after the valve was opened, the re-circulating slurry was allowed to discharge into the sink, also at the second level, for at least 20 seconds before two 500 mL of slurry samples were collected. Two slurry samples were collected in a test. The first sample was collected during the first hour and the second sample was collected during the second hour of the test. Shown in Figure 13 is a picture taken while the re-circulating slurry was discharging from the rubber hose into the sink.

All slurry samples collected during a test were mixed and stored in a 2-gallon plastic bucket. The sampling time and the LCD readouts from the two pH probes and two density meters installed near each scrubber module were also recorded. Listed in Table 14 are the slurry samples collected.

Table 14. List of Scrubber Slurry Samples

Test No.	Test Date	Module ID	Sample Time	pH (1)	pH (2)	Density (3)	Density (4)	Sample ID
1	09/25/03	2A	15:16	5.89	5.88	15.0	15.3	Plant 4-U2-FGD-T1
		2B	15:23	5.93	5.92	15.3	15.2	
		2A	16:07	5.84	5.83	15.0	15.0	
		2B	16:10	5.97	5.98	15.3	15.4	
2	09/26/03	2A	9:46	5.88	5.87	15.2	15.2	Plant 4-U2-FGD-T2
		2B	9:52	5.93	5.99	15.5	15.1	
		2A	10:27	5.88	5.87	14.4	14.9	
		2B	10:31	5.93	5.97	15.4	14.8	
3	09/26/03	2A	12:38	5.89	5.84	14.7	15.1	Plant 4-U2-FGD-T3
		2B	12:42	5.94	5.99	15.0	14.1	
		2A	13:27	5.85	5.80	14.9	14.9	
		2B	13:31	5.97	5.98	15.5	15.1	
4	09/26/03	2A	15:22	5.88	5.84	14.9	14.9	Plant 4-U2-FGD-T4
		2B	15:25	5.98	5.99	15.3	15.1	
		2A	16:37	5.82	5.78	15.0	15.0	
		2B	16:40	5.95	5.95	15.3	14.9	

(1) First pH meter
(2) Second pH meter
(3) First Density meter
(4) Second Density meter.

D. FGD Makeup/ME Wash Water Samples

The FGD makeup water and the ME wash water come from the same source; however, only the makeup water could be collected. The makeup water was collected twice from each module at the same time at the same location as the FGD slurry samples (see Figure 13). The first sample was collected during the first hour and the second sample was collected during the second hour of the test. About 250 mL of sample was collected each time. The samples were then kept in an ice-chest inside the trailer. After the samples were brought back to CONSOL R&D, the makeup water collected during a test was combined together to make a composite sample for subsequent analysis. Listed in Table 15 are the makeup water samples collected during the tests.

Table 15. List of Makeup/ME Wash Water Samples

Test No.	Test Date	Module ID	Sample Time	Sample ID on Each Bottle	Sample ID for analysis
1	09/25/03	2A	15:15	Plant 4-U2-H_2O-T1-2A-1	Plant 4-U2-H_2O-T1
		2B	15:20	Plant 4-U2-H_2O-T1-2B-1	
		2A	16:10	Plant 4-U2-H_2O-T1-2A-2	
		2B	16:15	Plant 4-U2-H_2O-T1-2B-2	
2	09/26/03	2A	9:45	Plant 4-U2-H_2O-T2-2A-1	Plant 4-U2-H_2O-T2
		2B	9:50	Plant 4-U2-H_2O-T2-2B-1	
		2A	10:26	Plant 4-U2-H_2O-T2-2A-2	
		2B	10:30	Plant 4-U2-H_2O-T2-2B-2	
3	09/26/03	2A	12:37	Plant 4-U2-H_2O-T3-2A-1	Plant 4-U2-H_2O-T3
		2B	12:41	Plant 4-U2-H_2O-T3-2B-1	
		2A	13:26	Plant 4-U2-H_2O-T3-2A-2	
		2B	13:31	Plant 4-U2-H_2O-T3-2B-2	
4	09/26/03	2A	15:21	Plant 4-U2-H_2O-T4-2A-1	Plant 4-U2-H_2O-T4
		2B	15:25	Plant 4-U2-H_2O-T4-2B-1	
		2A	16:36	Plant 4-U2-H_2O-T4-2A-2	
		2B	16:41	Plant 4-U2-H_2O-T4-2B-2	

V. Results of Analysis of Process Samples

Solid samples were analyzed using a direct mercury analyzer, following the procedures prescribed in ASTM Method D6722. Detailed results of the analyses of the process samples are compiled in Appendix D.

A. Limestone Slurry Samples

The limestone slurry samples were filtered to generate a solid residue (i.e., filter cake) and a filtrate sample. The dried residue and filtrate samples were then analyzed separately. Listed in Tables 16 and 17 are the results of analyses of the limestone slurry residue and filtrate samples. The mercury contents in the solid residue portion of the limestone slurry samples were at a constant level of 0.01 ppm and the concentrations of mercury in the liquid portion of the limestone slurry samples were all below the detection limit of 1.0 ppb.

Table 16. Results of Analyses of Limestone Slurry Residue Samples

Sample ID	Plant 4-U2-LS-T1-1&2	Plant 4-U2-LS-T2-1&2	Plant 4-U2-LS-T3-1&2	Plant 4-U2-LS-T4-1&2
Analytical No.	33340	33341	33342	33343
Ash (dry, %)	56.79	56.8	56.69	56.72
% solids in filter cake	70.05	80.13	80.17	80.26
% solids in air-dried sample	0.08	0.05	0.05	0.04
Sulfur, total (dry, %)	0.06	0.08	0.06	0.06
Chlorine (dry, %)	<0.02	<0.02	<0.02	<0.02
Mercury (as det'd, ppm)	0.01	0.01	0.01	0.01
Major Ash Element (dry, %)				
SiO_2	1.51	1.78	1.49	1.67
Al_2O_3	0.21	0.15	0.14	0.19
TiO_2	0.01	0.01	0.01	0.01
Fe_2O_3	0.16	0.15	0.15	0.17
CaO	54.54	54.22	54.84	54.34
MgO	1.94	2.11	2.23	2.15
Na_2O	0.01	0.02	0.01	0.01
K_2O	0.04	0.04	0.05	0.06
P_2O_5	0.04	0.04	0.01	0.04
SO_3	0.14	0.21	0.15	0.16

Table 17. Results of Analyses of Limestone Slurry Filtrate Samples

Sample ID	Plant 4-U2-LS-T1-1&2	Plant 4-U2-LS-T2-1&2	Plant 4-U2-LS-T3-1&2	Plant 4-U2-LS-T4-1&2
Analytical No.	33356	33357	33358	33359
Ca (µg/mL)	45.5	42.8	52.8	52.3
Mg (µg/mL)	13.2	16.2	17.4	17.1
Na (µg/mL)	26.0	62.4	29.8	31.8
SO_4 (µg/mL)	121	139	141	132
Cl (µg/mL)	28.5	50.0	47.0	48.0
Hg (ng/mL)	<1.0	<1.0	<1.0	<1.0

B. ESP Hopper Ash Samples

Listed in Tables 18, 19, 20, and 21 are the results of analyses of the ESP hopper ash samples collected during Tests 1, 2, 3, and 4, respectively. The mercury contents in the ash samples collected in Tests 1, 2, 3, and 4 ranged from 0.02 to 0.20, 0.01 to 0.08, 0.02 to 0.12, and 0.01 to 0.07 ppm, respectively and the carbon contents in the corresponding ash samples ranged from 0.33 to 20.46%, 0.33 to 4.07%, 0.26 to 4.69%, and 0.24 to 3.73%, respectively. For some unknown reasons, the mercury contents in the ash samples collected in Test 1 were the highest among the four tests conducted at this unit.

In tests conducted at other plants, CONSOL has observed that the mercury content of ESP ash samples tends to be correlated with the carbon content of the ESP ash samples. Figure 14 is a plot of the mercury content in the ash vs. the carbon content in the ESP ash samples. The value of R^2 for the linear regression line in Figure 14 is 0.826.

Table 18. Results of Analyses of the ESP Ash Samples Collected during Test 1

Sample ID	Plant 4-U2-T1-ESP-2A41-1	Plant 4-U2-T1-ESP-2A43-1	Plant 4-U2-T1-ESP-2A46-1	Plant 4-U2-T1-ESP-2B31-1	Plant 4-U2-T1-ESP-2B32-1	Plant 4-U2-T1-ESP-2B35-1	Plant 4-U2-T1-ESP-2A41-2	Plant 4-U2-T1-ESP-2A43-2	Plant 4-U2-T1-ESP-2A46-2	Plant 4-U2-T1-ESP-2B31-2	Plant 4-U2-T1-ESP-2B32-2	Plant 4-U2-T1-ESP-2B35-2
Analytical No.	33373	33374	33375	33376	33377	33378	33379	33380	33381	33382	33383	33384
Ash (dry, %)	95.29		98.06	86.34		89.57	98.41		99.05	94.22		91.52
Moisture (as det. %)	1.74	0.68	0.48	1.10	1.70	1.32	0.51	0.52	0.17	0.48	1.11	1.00
Sulfur, total (dry, %)	1.42		1.11	0.51		1.11	0.80		1.10	0.50		1.11
Carbon, total (dry, %)	1.54	1.42	0.66	12.21	20.46	7.12	0.72	1.72	0.33	4.68	10.62	5.95
Chlorine (dry, %)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury (as det. ppm)	0.08	0.04	0.03	0.13	0.20	0.13	0.03	0.04	0.02	0.07	0.11	0.11
Major Ash Element (dry, %)												
SiO_2	48.59		48.73	42.02		44.27	49.00		48.80	46.52		45.91
Al_2O_3	18.36		18.58	15.42		17.02	17.99		18.60	17.03		17.73
TiO_2	1.02		1.05	0.80		0.95	1.00		1.06	0.89		0.98
Fe_2O_3	16.30		15.69	16.96		14.95	16.85		15.39	17.33		15.76
CaO	4.63		5.20	4.75		4.42	4.96		5.26	5.40		4.95
MgO	0.87		0.90	0.74		0.85	0.85		0.91	0.82		0.87
Na_2O	0.78		0.83	0.50		0.64	0.80		0.85	0.63		0.71
K_2O	2.26		2.28	1.80		2.05	2.19		2.27	2.04		2.16
P_2O_5	0.15		0.18	0.20		0.18	0.10		0.18	0.20		0.19
SO_3	3.66		2.82	1.33		2.82	2.03		2.74	1.46		2.78

Table 19. Results of Analyses of the ESP Ash Samples Collected during Test 2

Sample ID	Plant 4-U2-T2-ESP-2A41-1	Plant 4-U2-T2-ESP-2A43-1	Plant 4-U2-T2-ESP-2A46-1	Plant 4-U2-T2-ESP-2B31-1	Plant 4-U2-T2-ESP-2B32-1	Plant 4-U2-T2-ESP-2B35-1	Plant 4-U2-T2-ESP-2A41-2	Plant 4-U2-T2-ESP-2A43-2	Plant 4-U2-T2-ESP-2A46-2	Plant 4-U2-T2-ESP-2B31-2	Plant 4-U2-T2-ESP-2B32-2	Plant 4-U2-T2-ESP-2B35-2
Analytical No.	33385	33386	33387	33391	33392	33393	33388	33389	33390	33394	33395	33396
Ash (dry, %)	99.05		99.00	99.22		98.76	98.27		98.99	98.11		93.39
Moisture (as det. %)	0.30	0.16	0.38	0.08	0.13	0.30	0.59	0.28	0.47	0.15	0.34	0.74
Sulfur, total (dry, %)	0.70		1.00	0.50		0.90	0.80		1.00	0.50		1.01
Carbon, total (dry, %)	0.38	0.50	0.33	0.49	1.00	0.47	0.68	0.85	0.33	1.35	3.70	4.07
Chlorine (dry, %)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury (as det. ppm)	0.02	0.02	0.02	0.02	0.02	0.01	0.03	0.02	0.02	0.02	0.05	0.08
Major Ash Element (dry, %)												
SiO_2	50.87		50.12	49.93		49.10	50.91		50.08	49.57		47.23
Al_2O_3	18.98		19.25	18.42		18.66	19.13		19.21	18.22		18.18
TiO_2	1.04		1.06	0.98		1.03	1.05		1.08	0.96		1.01
Fe_2O_3	16.44		15.80	18.42		16.98	16.39		15.45	18.28		16.00
CaO	4.92		5.28	6.01		5.95	4.62		5.14	5.84		5.06
MgO	0.90		0.93	0.88		0.92	0.91		0.94	0.87		0.90
Na_2O	0.80		0.86	0.76		0.80	0.80		0.87	0.76		0.75
K_2O	2.34		2.36	2.19		2.27	2.36		2.37	2.13		2.14
P_2O_5	0.14		0.18	0.12		0.20	0.15		0.19	0.13		0.15
SO_3	1.91		2.58	1.40		2.42	2.22		2.73	1.39		2.73

Table 20. Results of Analyses of the ESP Ash Samples Collected during Test 3

Sample ID	Plant 4-U2-T3-ESP-2A41-1	Plant 4-U2-T3-ESP-2A43-1	Plant 4-U2-T3-ESP-2B31-1	Plant 4-U2-T3-ESP-2B32-1	Plant 4-U2-T3-ESP-2B35-1	Plant 4-U2-T3-ESP-2A41-2	Plant 4-U2-T3-ESP-2A43-2	Plant 4-U2-T3-ESP-2A46-2	Plant 4-U2-T3-ESP-2B31-2	Plant 4-U2-T3-ESP-2B32-2	Plant 4-U2-T3-ESP-2B35-2
Analytical No.	33397	33398	33399	33400	33401	33402	33403	33404	33405	33406	33407
Ash (dry, %)	99.12		97.68		95.81	99.01		98.95	98.00		96.51
Moisture (as det. %)	0.25	0.10	0.25	0.43	0.44	0.35	0.06	0.20	0.23		0.42
Sulfur, total (dry, %)	0.60		0.50		0.90	0.60		0.90	1.10	1.20	0.90
Carbon, total (dry, %)	0.35	0.36	1.73	4.69	2.74	0.43	0.26	0.33	0.54	1.20	2.04
Chlorine (dry, %)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury (as det. ppm)	0.03	0.02	0.06	0.12	0.07	0.04	0.03	0.05	0.03	0.02	0.04
Major Ash Element (dry, %)											
SiO_2	51.87		50.15		48.82	51.90		50.96	48.72		49.40
Al_2O_3	19.25		18.32		18.73	19.39		19.58	18.17		18.75
TiO_2	1.03		0.94		1.03	1.04		1.06	0.95		1.01
Fe_2O_3	17.08		18.97		16.56	17.19		16.45	20.12		17.35
CaO	4.92		5.83		5.14	4.85		5.17	2.74		5.62
MgO	0.91		0.88		0.92	0.91		0.93	0.88		0.92
Na_2O	0.78		0.71		0.73	0.79		0.81	0.69		0.75
K_2O	2.33		2.14		2.26	2.32		2.27	2.11		2.23
P_2O_5	0.12		0.16		0.18	0.12		0.14	0.15		0.16
SO_3	1.65		1.31		2.44	1.63		2.27	2.79		2.40

Table 21. Results of Analyses of the ESP Ash Samples Collected during Test 4

Sample ID	Plant 4-U2-T4-ESP-2A41-1	Plant 4-U2-T4-ESP-2A43-1	Plant 4-U2-T4-ESP-2A46-1	Plant 4-U2-T4-ESP-2B31-1	Plant 4-U2-T4-ESP-2B32-1	Plant 4-U2-T4-ESP-2B35-1	Plant 4-U2-T4-ESP-2A41-2	Plant 4-U2-T4-ESP-2A43-2	Plant 4-U2-T4-ESP-2A46-2	Plant 4-U2-T4-ESP-2B31-2	Plant 4-U2-T4-ESP-2B32-2	Plant 4-U2-T4-ESP-2B35-2
Analytical No.	33408	33409	33410	33411	33412	33413	33414	33415	33416	33417	33418	33419
Ash (dry, %)	98.80		99.02	97.45		92.84	98.51		98.79	97.85		96.97
Moisture (as det. %)	0.43	0.19	0.15	0.18	0.12	0.56	0.38	0.10	0.12	0.16	0.11	0.25
Sulfur, total (dry, %)	0.80		1.00	1.10		1.01	0.70		0.90	0.90		0.80
Carbon, total (dry, %)	0.41	0.29	0.29	0.56	1.03	3.73	0.44	0.24	0.27	0.46	1.03	1.40
Chlorine (dry, %)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury (as det. ppm)	0.02	0.01	0.02	0.01	0.01	0.07	0.02	0.01	0.02	0.01	0.01	0.03
Major Ash Element (dry, %)												
SiO_2	50.99		50.83	49.18		48.22	50.53		51.02	48.76		48.82
Al_2O_3	18.96		19.62	18.34		18.39	18.87		19.79	18.05		18.61
TiO_2	1.02		1.07	0.95		1.02	1.03		1.10	0.95		1.02
Fe_2O_3	17.08		16.23	18.87		15.83	17.37		15.91	19.29		17.09
CaO	4.80		5.12	5.34		5.03	4.84		5.05	5.48		5.46
MgO	0.88		0.95	0.88		0.91	0.88		0.96	0.86		0.92
Na_2O	0.76		0.81	0.71		0.73	0.76		0.84	0.70		0.73
K_2O	2.23		2.36	2.12		2.14	2.22		2.36	2.09		2.28
P_2O_5	0.09		0.14	0.13		0.13	0.08		0.17	0.12		0.20
SO_3	2.05		2.50	2.84		2.70	1.99		2.43	2.48		2.12

C. FGD Slurry

Each slurry sample was filtered to generate a solid residue (or filter cake) and filtrate samples. The dried residue and filtrate samples were then analyzed separately. Listed in Tables 22 and 23 are the results of analyses of scrubber slurry residue and filtrate samples, respectively. The mercury contents in the solid residue portion of the FGD slurry samples ranged from 0.34 to 0.37 ppm and the concentrations of mercury in the liquid portion of the FGD slurry samples were all below the detection limit of 1.0 ng/mL.

Table 22. Results of Analyses of FGD Slurry Solids Samples

Sample ID	Plant 4-U2-FGD-T1	Plant 4-U2-FGD-T2	Plant 4-U2-FGD-T3	Plant 4-U2-FGD-T4
Analytical No.	51777	51778	51779	51780
Solids in FGD slurry sample (%)	16.6	14.3	16.3	17.0
Solids in filtered cake (%)	76.8	76.9	77.1	77.0
Moisture in air-dried filter cake (%)	23.2	23.1	22.9	23.0
Ash of dried filtered cake (dry, %)	97.9	97.7	98.0	98.0
Carbon, total (dry, %)	0.51	0.46	0.41	0.36
Sulfur, total (dry, %)	22.8	22.5	22.2	22.4
Chlorine (dry, %)	0.063	0.079	0.080	0.084
Mercury (as det. ppm)	0.368	0.417	0.366	0.340
Major Ash Element (%, dry)				
SiO_2	1.05	1.08	0.95	0.92
Al_2O_3	0.10	0.13	0.11	0.10
TiO_2	<0.01	<0.01	<0.01	<0.01
Fe_2O_3	0.09	0.11	0.10	0.09
CaO	33.2	34.6	33.6	33.2
MgO	0.39	0.46	0.42	0.39
Na_2O	<0.01	<0.01	<0.01	<0.01
K_2O	0.02	0.03	0.02	0.02
P_2O_5	<0.01	<0.01	<0.01	<0.02
SO_3	45.0	45.3	44.7	45.0

Table 23. Results of Analyses of FGD Slurry Filtrate Samples

Sample ID	Plant 4-U2-FGD-T1	Plant 4-U2-FGD-T2	Plant 4-U2-FGD-T3	Plant 4-U2-FGD-T4
Analytical No.	51781	51782	51783	51784
Ca (µg/mL)	485	427	465	447
Mg (µg/mL)	1053	1045	1046	1074
Na (µg/mL)	29.6	29.5	28.8	28.4
SO_4 (µg/mL)	2487	2230	2333	2389
Cl (µg/mL)	2260	2300	2260	2300
Hg (ng/mL)	< 1.0	< 1.0	< 1.0	< 1.0

D. FGD Makeup/ME Wash Water Samples

Table 24 summarizes the results of analyses of the FGD makeup/ME wash water samples. The concentrations of the mercury in the four water samples were all below the detection limit of 1.0 ppb.

Table 24. Results of Analyses of FGD Makeup /ME Wash Water Samples

Sample ID	Plant 4-U2-H_2O-T1	Plant 4-U2-H_2O-T2	Plant 4-U2-H_2O-T3	Plant 4-U2-H_2O-T4
Analytical No.	33352	33353	33354	33355
Ca (µg/mL)	27.8	30.2	30.5	36.1
Mg (µg/mL)	4.92	5.00	4.97	5.44
Na (µg/mL)	3.63	3.31	3.31	3.39
NH_3 (µg/mL)	< 5	< 5	< 5	< 5
NO_3 (µg/mL)	1,650	1,250	1,090	1,630
SO_4 (µg/mL)	22.5	21.8	21.8	35.5
Cl (µg/mL)	20.5	15.0	11.0	20.0
Hg (ng/mL)	< 1.0	< 1.0	< 1.0	< 1.0

QUALITY ASSURANCE/QUALITY CONTROL

The sampling and analysis QA/QC procedures are described below.

- Personnel specifically trained and experienced in power plant sampling methods, including the Ontario-Hydro Hg sampling method, conducted all sampling,
- The sampling equipment was maintained and calibrated as required,
- Consistent sample preparation and recovery procedures were used,
- Samples were logged and tracked under the direction of sample team Group Leader,
- Individual calibration curves were developed for each sample matrix,
- NIST Standard Reference Material (SRM) and lab QC samples were analyzed to verify calibration curves,
- Duplicates of selected samples were analyzed to assure repeatability,
- Analyses of selected "spiked" samples were analyzed to assure sample recovery, and
- Interim data were reviewed to assure sample completeness.

All samples were obtained using the procedures prescribed in EPA Method 5 and the Ontario-Hydro Method. Data were recorded on standard forms, which are included in Appendix A. The field data were reduced using standard "in-house" spreadsheets. Copies of the summary sheets are included in Appendix A. To assure consistency, all of the Ontario-Hydro train components were prepared and recovered under the supervision of a senior technician experienced in the Ontario-Hydro Hg speciation lab techniques. Copies of the recovery sheets are included in Appendix C.

The Ontario-Hydro sampling train analysis consisted of eight sub-samples. Each sub-sample analysis consisted of developing a calibration curve (absorbance versus Hg concentration in solution), checks of field and lab blanks, calibration checks with SRM and lab standards, selected duplicates, and selected sample spikes. The laboratory summaries for each of these runs are contained in Appendix C.

A total of 128 individual Ontario-Hydro Hg determinations were completed, including 27 calibration standards, 12 blank samples, 19 NIST SRM or lab QC checks, 9 sample spikes, and 9 duplicate analyses.

I. Blank Samples

A total of 12 blank liquid samples were analyzed. The average blank value was <1.0 ng/mL. The average blank value is much less than any individual Hg^{part}, Hg^{++}, or Hg^{0} determination in ng/mL and, more importantly, is much less than the Hg concentration detection limit (discussed later in this report). Consequently, in this report, blank concentrations were not subtracted out from any Hg determination.

II. NIST SRM Checks

Nineteen NIST SRM checks were conducted throughout the Hg determinations. Two standards were used in the determinations as detailed in Table 25.

Table 25. NIST SRM Analyses

NIST SRM	Standard Value (ng/mL)	Sample Fraction	Samples Analyzed	Average Result (ng/mL)	Percent of Standard	Standard Deviation (%)	Percent Relative Standard Deviation
1641D	8.0	Ontario Hydro Filters	3	8.1	101.3	0.2	2.5
		Ontario Hydro Liquids	15	8.4	105.0	0.14	1.7
1633b	149.0	Ontario Hydro Filters	1	150	100.6	NA	NA

III. Spike Sample Recoveries

A total of nine samples were spiked with a 2 or 10 ng/mL Hg standard and then re-analyzed to determine the percent spike recovery. The result of this QA/QC procedure was an average spike recovery of 95.6% recovery with a standard deviation of ±3.3%.

IV. Duplicate Analyses

A total of nine duplicate analyses were conducted periodically throughout the Hg determinations. The result of this QA/QC procedure was an average Hg determination that was within 3.1% of the original Hg determination, with a standard deviation of ±5.1%.

V. Flue Gas Hg Concentration Detection Limits

For liquid samples, the flue gas Hg concentration was calculated using the following equation:

$$Hg\left[\mu g / m^3\right] = \frac{\left(C_{imp}\ x V_{imp}\right)}{\left(V_{gas}\ x 1000\right)}$$

where: C_{imp} = Hg concentration of impinger solution (ng/mL or ppb)
V_{imp} = Liquid volume of impinger solution (mL)
V_{gas} = Flue gas sample volume (dry standard cubic meter or dscm)
1000 = Conversion factor (1000 ng per µg)

The flue gas Hg detection limit is reduced when the flue gas sample volume is increased or liquid volume of impinger solution is decreased. The CVAA is calibrated between 0 and 20 ng/mL. Over this range, the calibration curve between absorbance and concentration is linear. The lowest concentration standard used to develop the calibration curve is 0.500 ng/mL. In addition, the detection limit of the liquid CVAA analysis was <1.0 ng/mL. The prescribed sampling and recovery procedures result in final liquid volumes varying between 50 and 748 mL. The volume of flue gas collected varied between 2.169 and 2.523 dscm. The sampling variables result in sample-specific flue gas detection limit. The flue gas Hg detection limit for each sample matrix are listed in Table 26.

Table 26. Flue Gas Hg Detection Limits

Matrix	Maximum Liquid Volume (mL)	Minimum Gas Volume (dscm)	Flue Gas Detection Limit (µg/m^3)
Probe Rinse	164	2.169	0.08
KCl Impinger	748	2.169	0.34
HNO_3/H_2O_2 Impingers	178	2.169	0.08
$KMnO_4$ Impingers	247	2.169	0.11
HCl Rinse	50	2.169	0.02

Depending on the matrix, the flue gas Hg detection limit ranged from 0.02 to 0.34 µg/m^3. When compared with the total Hg concentrations of up to 39.6 µg/m^3, the flue gas detection limit is low enough to be insignificant in the flue gas calculations.

VI. Mercury Material Balance Closure

Conducting a mercury material balance closure around this unit is the best way to gauge the overall quality of the sampling program. To calculate the material balance closure for mercury, the mass flow rate of mercury in each stream entering and leaving the plant must be calculated. Streams entering the plant are coal, limestone slurry, FGD makeup water, and ME wash water. Streams leaving the plant are bottom ash, ESP hopper ash, FGD slurry, and stack flue gas. The mass flow rate of mercury in each stream is simply the product of the mass flow rate of each stream times the concentration of mercury in that stream.

A. Mercury Input from Coal

Summarized in Table 27 are the inputs of mercury from coal calculated based on the four coal samples collected during the tests. The mercury inputs from coal range from 12.4 to 13.8 mg/sec.

Table 27. Mercury Input from Coal

Test No.	**1**	**2**	**3**	**4**
Coal feed rate (kpph, as det'd)	1,100	1,090	1,098	1,091
Coal moisture content (%, as det'd)	4.71	4.40	4.64	4.53
Coal feed rate (kpph, dry)	1,048	1,042	1,047	1,042
Coal mercury content (ppm, as det'd)	0.09	0.09	0.10	0.09
Mercury input from the coal (mg/sec)	**12.5**	**12.4**	**13.8**	**12.4**

B. Mercury Input from Limestone Slurry

The mass flow rate of the limestone slurry entering the FGD in each test was calculated

based primarily on the amount of SO_2 removed by the FGD, which was the difference between the amount of SO_2 from coal (reported as S, see analytical results in Table 11) and the sum of the amounts of SO_2 measured in the bottom ash and the ESP hopper ash (reported as SO_3 in the major ash, see analytical results in Tables 18-21). Since no bottom ash sample was collected, the contribution of mercury from the bottom ash was not included in the calculations. In tests conducted at other plants, CONSOL found that the mass flow rates of mercury leaving the plants via the bottom ash streams were very small, in the order of one percent of less of the amounts of the mercury from coal. It was also assumed that the limestone utilization rate was 99 percent or the limestone consumption rate was one percent more than what was required to neutralize the acidic scrubbing liquor and to maintain the scrubbing liquor pH at a constant level. This assumption is a common design value.

Each limestone slurry sample was filtered to generate a separate solids and a filtrate sample. The amounts of mercury in the dried solids and filtrate samples were analyzed separately (see analytical results in Tables 16 and 17). The mass flow rates of mercury in the solids and filtrate portion of a limestone slurry sample was calculated. The sum of these two flow rates is the mercury input from the limestone slurry stream entering the FGD.

Summarized in Table 28 are the inputs of mercury from the four limestone slurry samples collected during the tests. The mercury inputs from the limestone slurry were very consistent from one test to another, at 0.14 mg/sec.

Table 28. Mercury Input from Limestone Slurry

Test No.	1	2	3	4
Coal feed rate (kpph, as det'd)	1,100	1,090	1,098	1,091
Coal moisture content (%, as det'd)	4.71	4.40	4.64	4.53
Coal sulfur content (%, dry)	3.33	3.28	3.33	3.27
FGD sulfur input from coal (kpph)	34.1	33.6	34.2	33.3
Ca/S ratio	1.01			
Limestone slurry required (kpph)	359	352	358	349
Limestone slurry mercury content (ppb)	3.20	3.21	3.21	3.21
Mercury input from slurry (mg/sec)	**0.14**	**0.14**	**0.14**	**0.14**

C. Mercury Input from FGD Makeup/ME Wash Water

The flow rate of the FGD makeup water was calculated based on the fact that a constant level of liquor in the scrubber modules had to be maintained. In other words, the flow rates of process streams entering the FGD must be balanced by the flow rates of process streams leaving the FGD.

The moisture-saturated stack flue gas and FGD slurry blowdown were the two streams leaving FGD. The flow rate of water via the stack flue gas was calculated based on the

flue gas moisture concentration (measured by the Ontario-Hydro Method during mercury sampling) and the measured flue gas flow rate. The flow rate of the FGD slurry blowdown stream was calculated based on the amounts of SO_2 removed and the properties of the FGD slurry sample (see Tables 22 and 23) collected in each test.

Four streams entered FGD, total moisture (free moisture and coal hydrogen) from coal, limestone slurry, ME wash water, and FGD makeup water. The plant stated that the FGD makeup water and ME wash water came from the same source. Therefore, the mercury inputs from these two streams were combined together.

The flow rate of water from coal was calculated based on the coal analysis data and coal consumption rate. The flow rate of limestone slurry was calculated based on the amount of sulfur removed by FGD and the limestone slurry properties (see Tables 16 and 17). The flow rates of the FGD makeup and ME wash water were calculated and their values ranged from 1,702 to 1,888 kpph. Since the mercury content in the makeup water was measured (see Table 24), the mercury input from the combined stream of FGD makeup/ME wash water was then calculated. Summarized in Table 29 are the inputs of mercury based on the four FGD makeup/ME wash water samples collected during the tests. The mercury inputs from the combined stream of the FGD makeup/ME wash water ranged from 0.11 to 0.12 mg/sec.

Table 29. Mercury Input from FGD Makeup/ME Wash Water

Test No.	1	2	3	4
Water output via stack gas, based on O.H data (kpph)	1,614	1,662	1,652	1,670
Water output via FGD slurry blowdown (kpph)	915	993	861	798
Total water output (kpph)	2539	2655	2513	2468
Water input from coal (moisture & hydrogen) (kpph)	528	515	514	518
Water input from limestone slurry (kpph)	257	252	256	249
FGD makeup/ME water flow rate (kpph)	1744	1888	1743	1702
Makeup/ME wash water mercury content (ng/mL)	0.50	0.50	0.50	0.50
Mercury input from makeup water (mg/sec)	**0.11**	**0.12**	**0.11**	**0.11**

D. Mercury output via FGD Slurry

Each FGD slurry sample was filtered to generate a solids residue and a filtrate samples, which were analyzed separately. The results of analyses of the solids and filtrate samples were previously reported in Tables 22 and 23, respectively.

Once the amounts of SO_2 removed by the FGD were calculated (see previous discussion in Section B), the mass flow rates of FGD slurry leaving the scrubber modules could then be calculated. Calcium oxide (CaO) was chosen as the tie-element, because its flow rates around the FGD must be balanced. Summarized in

Table 30 are the mercury inputs from FGD slurry for the tests conducted. The mercury outputs via the FGD slurry ranged from 5.42 to 6.74 mg/sec.

Table 30. Mercury Output via FGD Slurry

Test No.	1	2	3	4
SO_2 entering FGD (kpph)	68.3	67.2	68.5	66.7
Stack SO_2 emission rate (kpph)	3.59	3.58	3.83	3.70
SO_2 removed by FGD (kpph)	64.7	63.6	64.6	63.0
Limestone slurry required (kpph)	359	352	358	349
FGD slurry blowdown rate (kpph)	1097	1159	1028	961
Hg content in FGD slurry (ppm)	0.047	0.046	0.046	0.045
Hg output via FGD slurry (mg/sec)	**6.53**	**6.74**	**5.99**	**5.42**

E. Mercury Output via ESP Ash

More than one sample was collected from the ESP ash hoppers. The concentration of mercury in each sample was analyzed separated. The results of analysis of the ESP hopper ash samples were presented earlier in Tables 16 through 19. For material balance calculation purpose, the concentration of mercury in the "combined" ESP ash is calculated by the following formula as suggested by a plant engineer.

> 0.7*[average concentration of Hg in samples collected in the first field] + 0.3*[average concentration of Hg in samples collected in hoppers in the remaining fields]

Summarized in Table 31 are the outputs of mercury from each of the four ESP ash samples collected during the tests. The mercury outputs via the ESP ash stream for the four tests conducted ranged from 0.44 to 0.55 mg/sec.

Table 31. Mercury output via the ESP ash

Test No.	1	2	3	4
Coal feed rate (kpph, as det'd)	1,100	1,090	1,098	1,091
Coal moisture content (%, as det'd)	4.71	4.40	4.64	4.53
Coal ash content (dry, wt %)	9.86	9.86	10.02	9.58
Coal ash fraction going to ESP	0.8			
Coal ash going to ESP (kpph)	82.7	82.2	83.9	79.8
ESP ash moisture content (%)	0.93	0.28	0.23	0.21
ESP ash carbon content (%, dry)	5.97	1.14	1.24	0.64
Total mass captured in ESP Hoppers (kpph)	88.7	83.3	85.2	80.5
ESP ash Hg content (ppm, as det'd)	0.084	0.026	0.044	0.015
Hg output via ESP ash (mg/sec)	**0.94**	**0.27**	**0.47**	**0.15**

F. Mercury Output via Stack Flue Gas

The amount of Hg in the stack flue gas was calculated based on the Ontario-Hydro data. The results of the mercury output via the stack flue gas are summarized in Table 32. The mercury outputs via the stack flue gas ranged from 5.75 to 6.26 mg/sec.

Table 32. Mercury Output via Stack Flue Gas

Test No.	1	2	3	4
Hg concentration in Stack Gas (μg/m^3)	4.21	3.99	3.97	4.18
Stack gas flow rate (dry Nm^3/min)	89,200	87,600	86,800	88,200
Hg output via stack gas (lb/hr)	0.0497	0.0462	0.0456	0.0487
Hg flow rate at stack (mg/sec)	**6.26**	**5.82**	**5.75**	**6.14**

VII. Mercury Emission Rate

The heat input based mercury emission rate at the stack was calculated from the coal-firing rate, coal heating value, and the mass flow rate of mercury at the stack. The results are summarized in Table 33. The mercury emissions rates ranged from 3.33 to 3.63 lb/TBtu and the average emission rate was 3.47 lb/TBtu.

Table 33. Heat Input-based Mercury Emission Rate

Test No.	1	2	3	4
Coal firing rate (kpph, dry)	1,048	1,042	1,047	1,042
Heating value (Btu/lb, dry)	13,077	13,133	13,104	13,117
Boiler heat rate (mm Btu/hr)	13,702	13,679	13,718	13,661
Stack Hg emissions (lb/hr)	0.0497	0.0462	0.0456	0.0487
Stack Hg emissions (lb/TBtu)	3.63	3.38	3.33	3.57
Average Stack Hg emissions (lb/TBtu)	**3.47**			

A. Mercury Material Balance Closure

After the mercury mass flow rates of all the streams were obtained, the overall material balance closure for mercury was calculated. Summarized in Table 34 are the results of the material balance closures for mercury for the four tests conducted. The closures ranged from 87% to 108%, which are within the QA/QC criterion of 70-130% for a single test. The average value is 97%, which is within the QA/QC criterion of 80-120% for multiple tests.

Table 34. Summary of Material Balance Closure for Hg

Test No.	1	2	3	4
Hg input from Coal (mg/sec)	12.5	12.4	13.8	12.4
Hg input from limestone slurry solids (mg/sec)	0.13	0.13	0.13	0.13
Hg input from limestone slurry filtrate (mg/sec)	0.016	0.016	0.016	0.016
Hg input from FGD make-up water (mg/sec)	0.11	0.12	0.11	0.11
Hg input to the system (mg/sec)	12.7	12.6	14.1	12.6
Hg output from bottom ash (mg/sec)	0	0	0	0
Hg output from ESP hopper ash (mg/sec)	0.94	0.27	0.47	0.15
Hg output from FGD slurry solids (mg/sec)	6.47	6.68	5.94	5.37
Hg output from FGD slurry filtrate (mg/sec)	0.058	0.063	0.054	0.050
Hg output from stack gas (mg/sec)	6.26	5.82	5.75	6.14
Hg output from the system (mg/sec)	13.7	12.8	12.2	11.7
Hg material balance closure (Output/Input)	108%	102%	87%	93%
Average Hg Material Balance	**97% ± 9%**			

VIII. Material Balance Closure for SiO_2, Al_2O_3, and CaO

According to a plant engineer, about 20% of the coal ash ends up as bottom ash. No bottom ash samples were collected. Based on sampling resluts from Unit 1 at this plant, it was assumed that the concentrations of the three major ash oxides, SiO_2, Al_2O_3, and CaO were the same as those found in the coal ash analyses. Summarized in Tables 35, 36 and 37 are the results of the material balance closure calculations for these three oxides. The material balance closures for SiO_2, Al_2O_3, and CaO ranged from 103% to 106%, 104% to 107%, and 91% to 99% respectively. The average values of the material balance closures for SiO_2, Al_2O_3, and CaO were 106%, 106%, and 94% respectively.

The material balance closures for all of the three oxides are within the QA/QC criterion of 70-130% for a single test and the average material balance closures are within the QA/QC criterion of 80-120% for multiple tests.

The above results (that the material balance closures for mercury, SiO_2, Al_2O_3, and CaO fall in the acceptable range of 80-120%) indicate that the overall data quality is excellent.

Table 35. Summary of Material Balance Closure for SiO_2

Test No.	1	2	3	4
SiO_2 input from coal (kpph)	49.6	48.4	49.7	46.3
SiO_2 input from limestone slurry (kpph)	1.54	1.78	1.52	1.66
Total SiO_2 input (kpph)	51.2	50.1	51.3	48.0
SiO_2 output via bottom ash (kpph)	9.93	9.67	9.95	9.27
SiO_2 output via ESP hopper ash (kpph)	41.0	41.7	43.0	40.0
SiO_2 output via FGD sludge (kpph)	4.41	3.56	3.81	4.24
Total SiO_2 output (kpph)	52.6	53.0	54.4	50.7
SiO_2 material balance closure (Output/Input)	103%	106%	106%	106%
Average SiO_2 material balance closure	**106 ± 2%**			

Table 36. Summary of Material Balance Closure Al_2O_3

Test No.	1	2	3	4
Al_2O_3 input from coal (kpph)	18.2	18.0	18.3	17.2
Al_2O_3 input from limestone slurry (kpph)	0.21	0.15	0.14	0.19
Total Al_2O_3 input(kpph)	18.4	18.1	18.5	17.4
Al_2O_3 output via bottom ash (kpph)	3.63	3.59	3.66	3.43
Al_2O_3 output via ESP hopper ash (kpph)	15.3	15.5	16.0	15.0
Al_2O_3 output via FGD slurry (kpph)	0.16	0.19	0.17	0.15
Total Al_2O_3 output (kpph)	19.1	19.3	19.8	18.5
Al_2O_3 material balance closure (Output/Input)	104%	107%	107%	107%
Average Al_2O_3 material balance closure	**106 ± 2 %**			

Table 37. Summary of Material Balance Closure CaO

Test No.	1	2	3	4
CaO input from coal (kpph)	5.39	5.77	6.08	5.59
CaO input from limestone slurry solids (kpph)	55.6	54.4	55.9	54.0
CaO input from limestone slurry filtrate (kpph)	0.02	0.02	0.02	0.02
CaO input from FGD makeup (kpph)	0.15	0.15	0.12	0.14
Total CaO input (kpph)	61.1	60.3	62.1	59.7
CaO output via bottom ash (kpph)	1.08	1.15	1.22	1.12
CaO output via ESP hopper ash (kpph)	4.34	4.45	3.94	4.11
CaO output via FGD slurry solids (kpph)	54.5	51.8	50.8	48.8
CaO output via FGD slurry filtrate (kpph)	0.57	0.59	0.56	0.50
Total CaO output (kpph)	60.5	58.0	56.6	54.5
CaO material balance closure (Output/Input)	99%	96%	91%	91%
Average CaO material balance closure	**94% ± 4 %**			

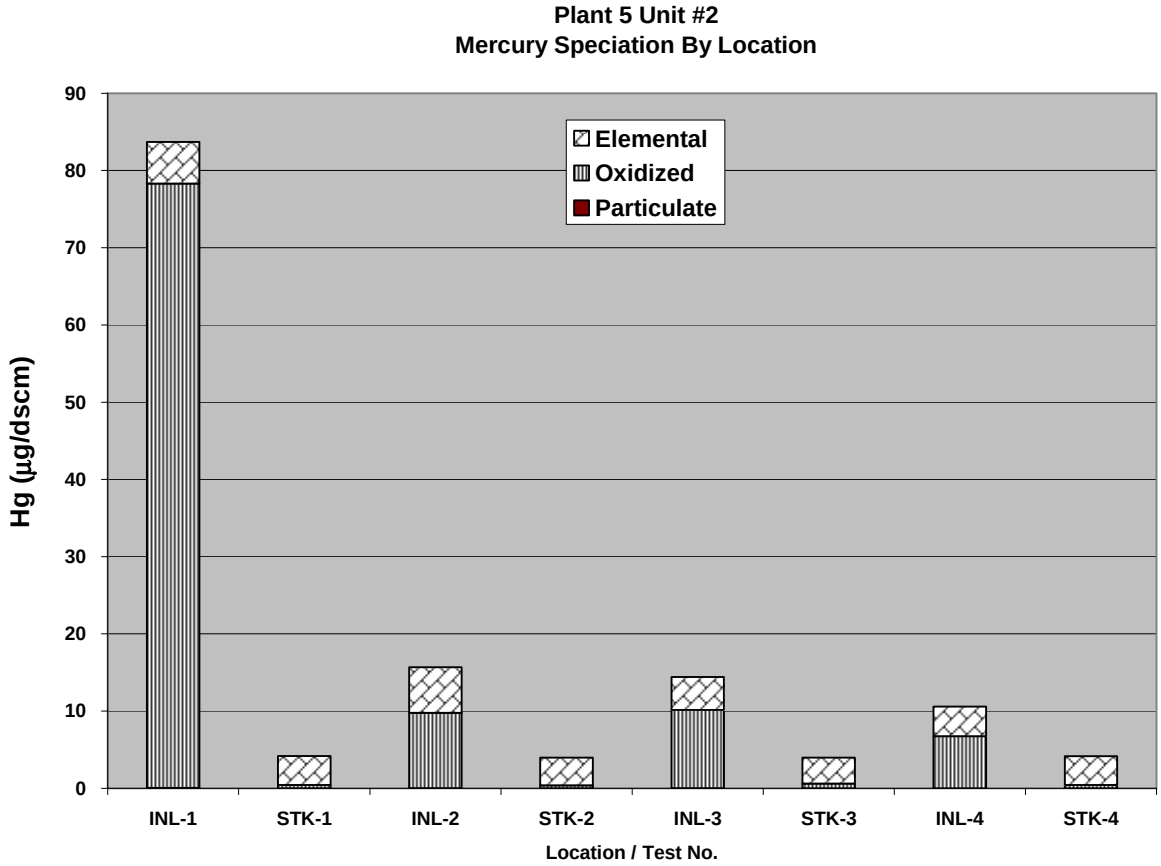


Figure 1. Flue gas mercury speciation at FGD inlet and stack.

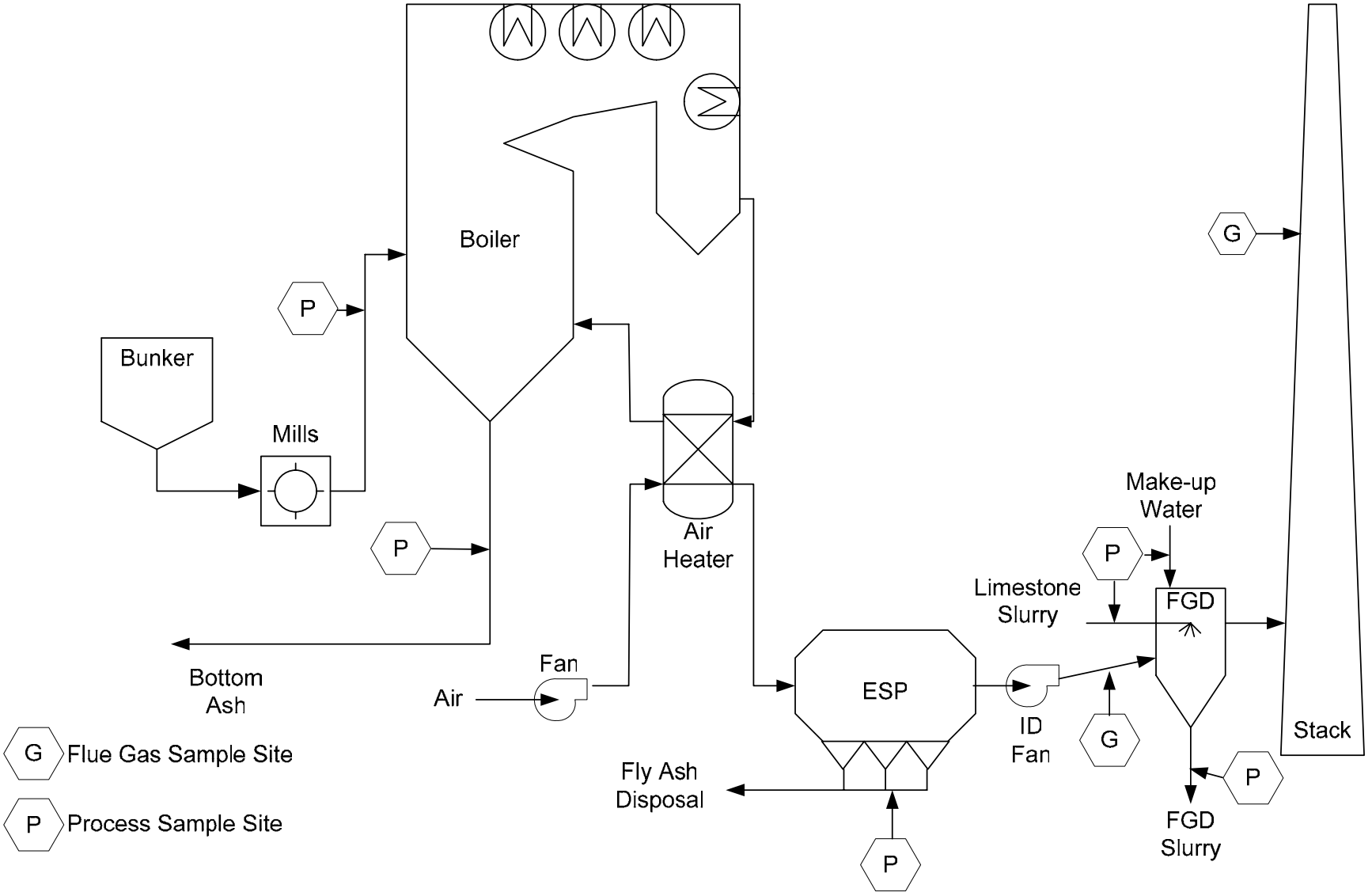
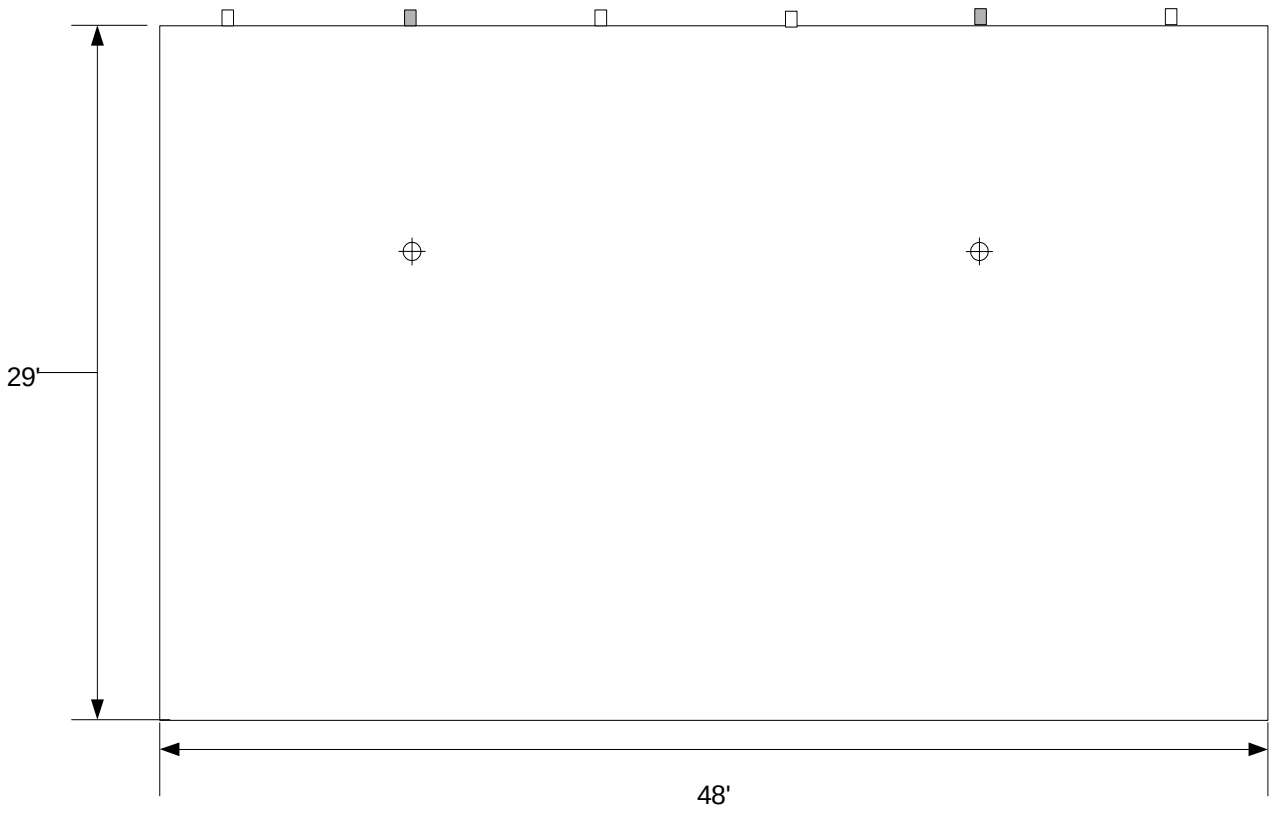


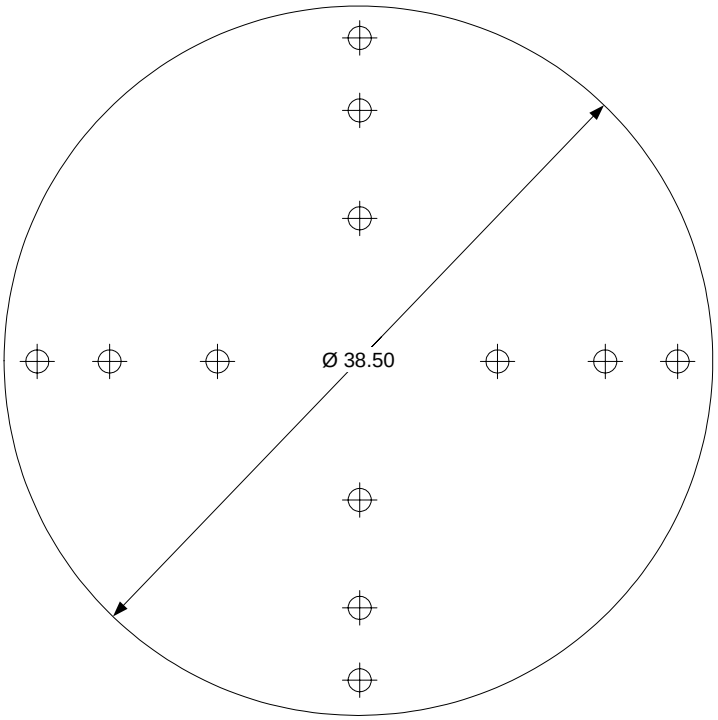
Figure 2. Process flow schematic.



2 Sample Access Ports (shaded)
1 Sample Point Per Port
2 Total Sample Points
Sampling Point at 8 ft

Figure 3. FGD inlet sampling location.

Figure 4. Photograph of FGD inlet sampling location.



Sampling Platform – 475 ft. level

Velocity Traverse Point Locations

Point	Location
1	20.33
2	67.45
3	136.75

4 Access Ports
3 Velocity Points per Port
12 Total Velocity Points

Single point mercury sampling conducted

Figure 5. Stack sampling location

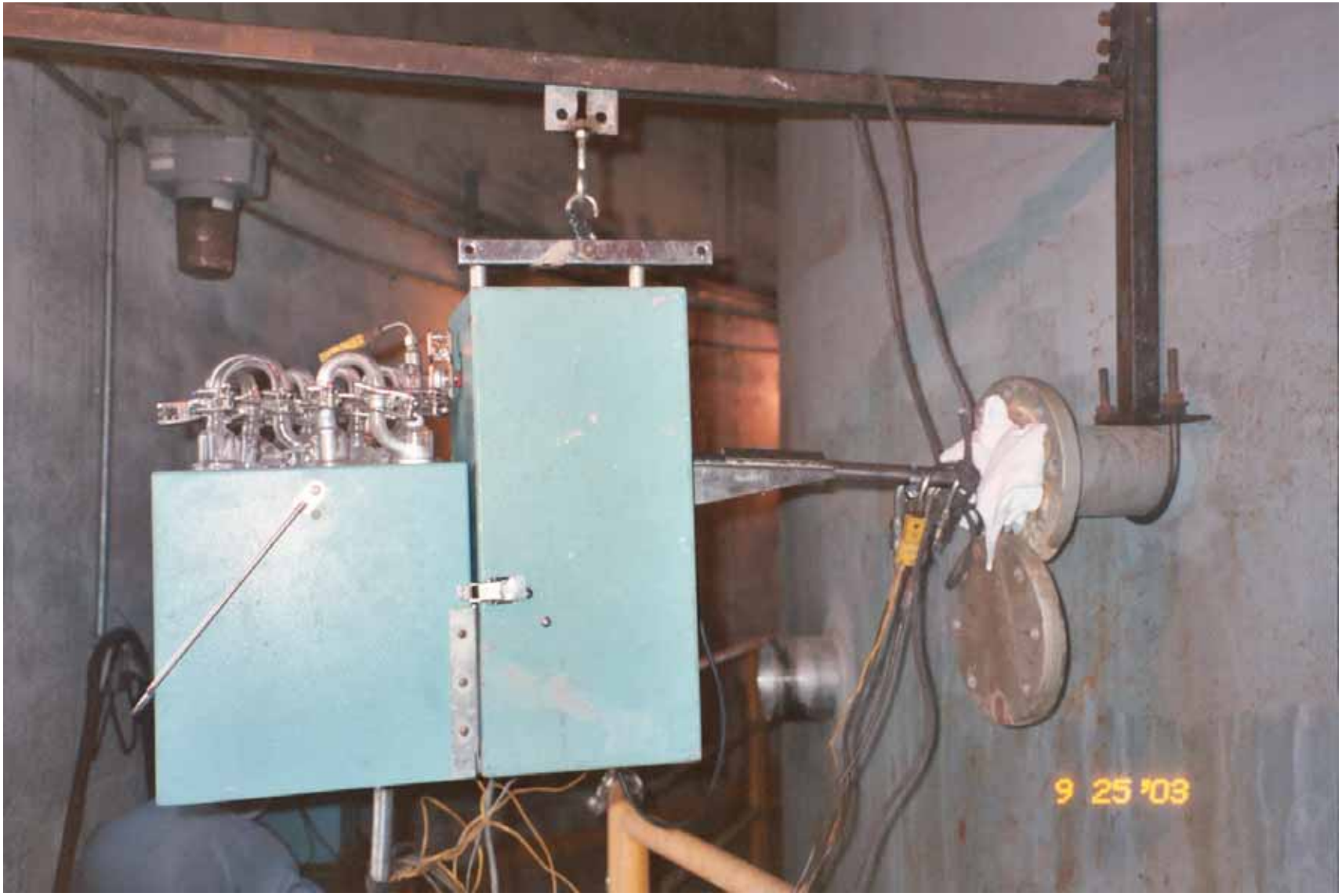


Figure 6. Stack mercury sampling train.

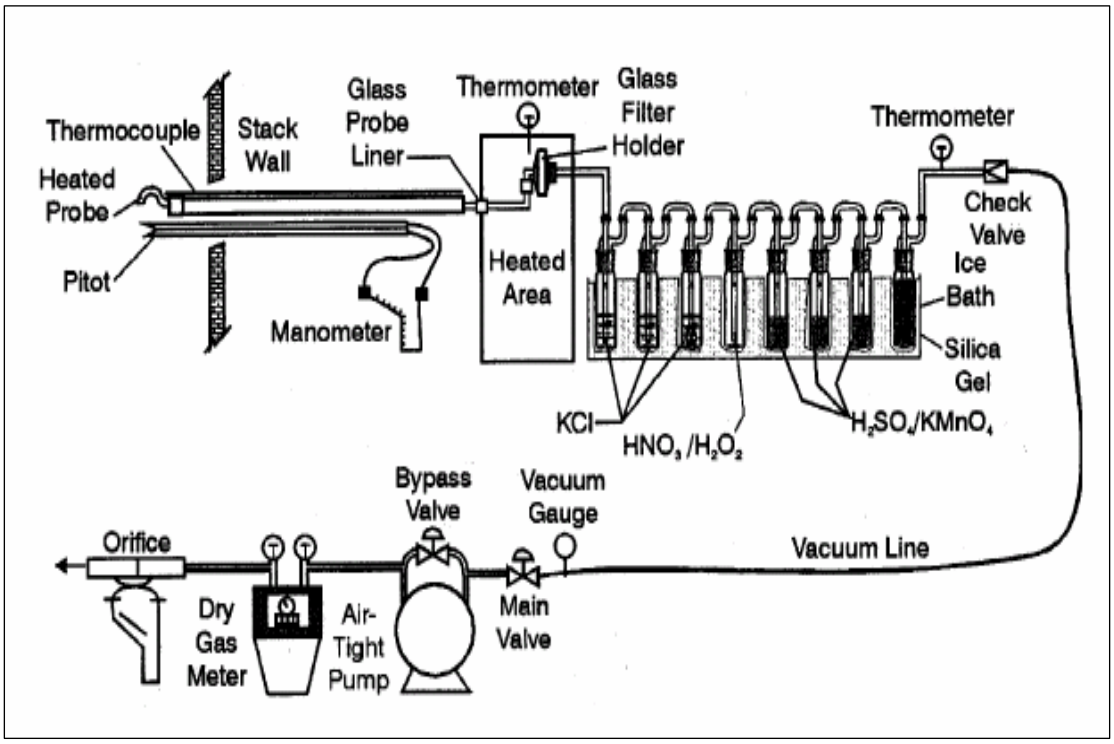


Figure 7. Schematic of Ontario-Hydro sampling train.

Figure 8. Coal sampling location.

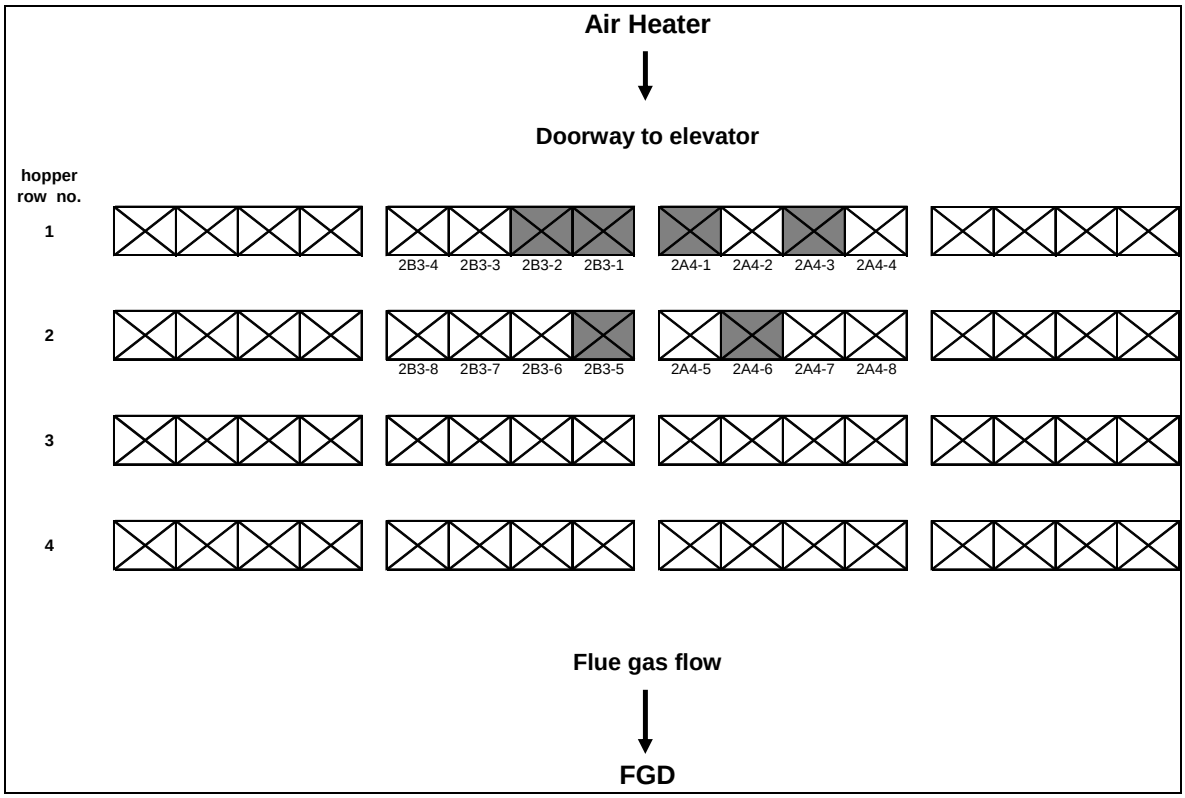


Figure 9. Layout of ESP ash hoppers

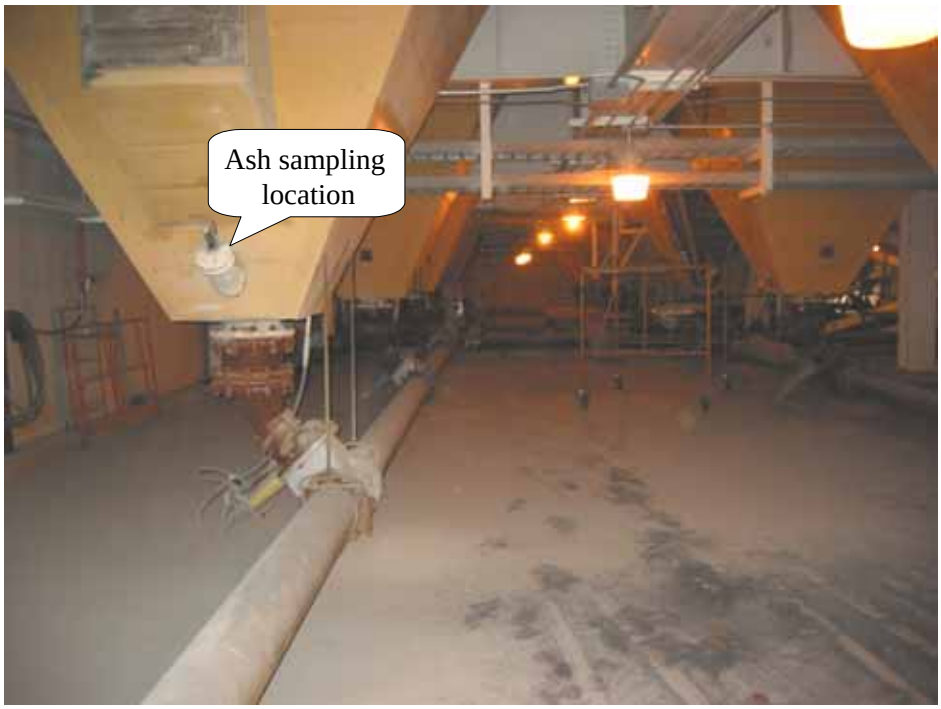


Figure 10. ESP hopper ash sampling port.

Figure 11. Ash sampling thief.

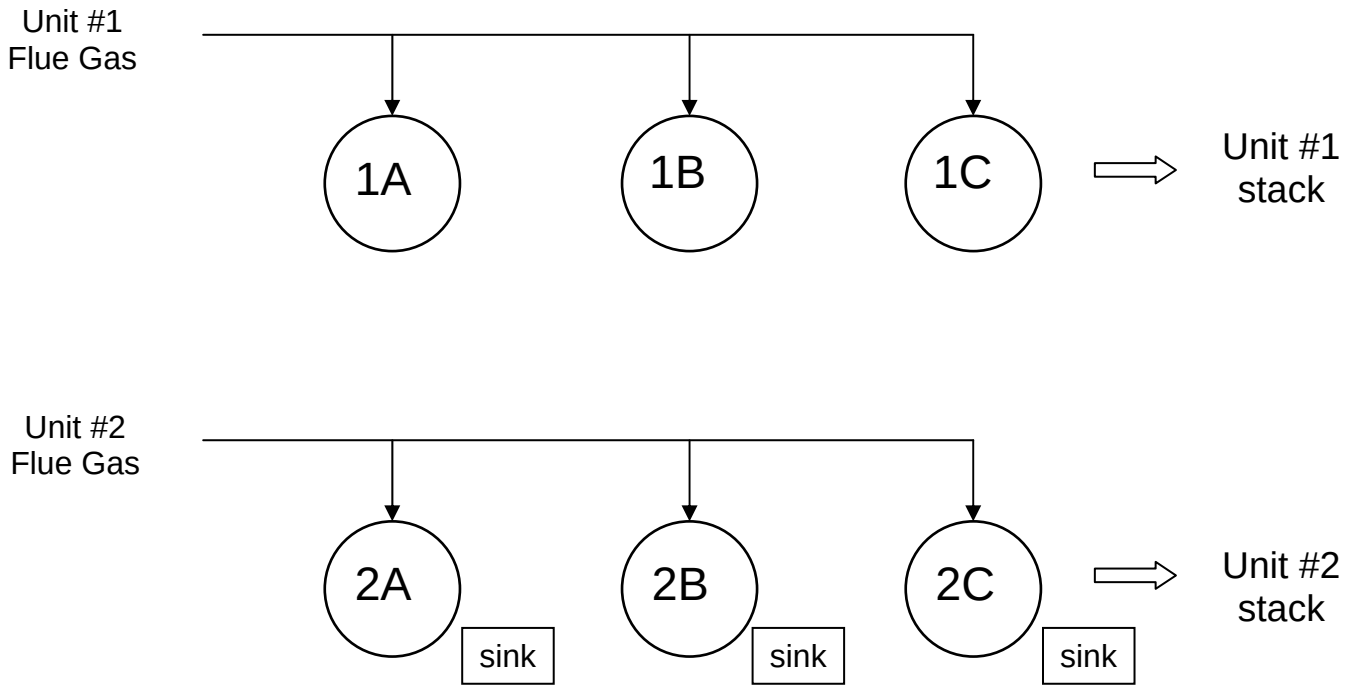


Figure 12. Unit 2 scrubber module layout.

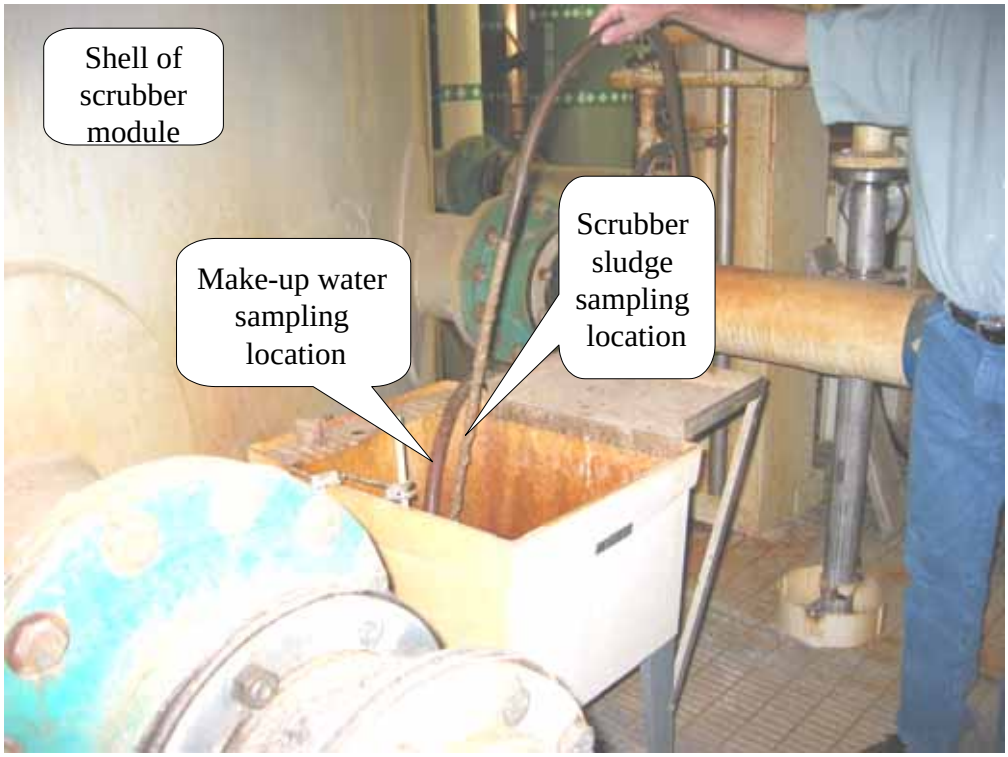


Figure 13. FGD slurry sampling location.

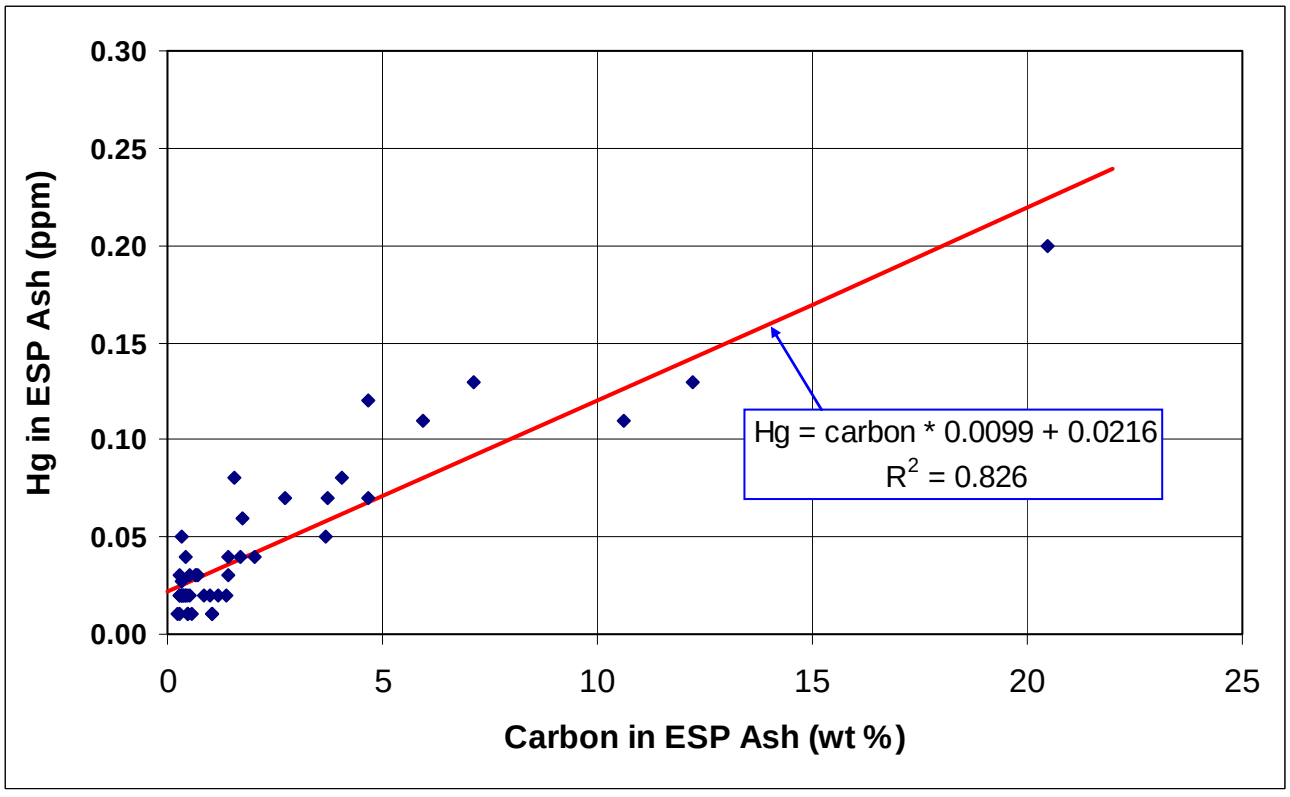


Figure 14. ESP ash mercury content vs. carbon content

APPENDIX A

Mercury Sampling Data

- Field Data Sheets
- Mercury Measurement Data Sheets

ONTARIO HYDRO Hg SAMPLING AND SPECIATION FIELD DATA SHEET

TEST ID	One (#1)	METER BOX	80872	CAL. DATA: delta H	1.649	Comments:	UNABLE TO INSERT PROBE IN PORT 3
PLANT	Plant 4	PITOT TUBE DESC	E-1	Y	1.012		DUE TO BUILDUP. CLEANED
LOCATION	Unit 2 FGD Inlet	PROBE LENGTH [ft]	10	C(p)	0.857		PRT 3 AND RESUMED TESTING
DATE	9/25/03	NOZZLE ID [inch]	0.249	FILTER BOX SETTING	325		AT 1638.
OPERATOR(S)	GLC/JCS	%H_2O (Assumed)	8	PROBE HTR SETTING	325		
AMBIENT TEMP [°F]	75°F	FILTER ID	1	DUCT X-SECTION	circ ?	rect ?	other:
BAR. PRESS. [" Hg]	29.65/29.59	K FACTOR	~~2.063~~ 2.40	DUCT DIMENSIONS	48x29	DUCT AREA	1392 ft²

TRAVERSE POINT [port-inch]	CLOCK TIME (24-hr)	SAMPLE TIME [minute]	STATIC PRES [" H_2O]	PITOT HEAD [" H_2O]	METER DIFF PRESSURE [" H_2O]	METER VACUUM [" Hg]	METER READING [ft³]	METER TEMP (6) [oF] (7) inlet	METER TEMP (6) [oF] (7) outlet	STACK TEMP (1) [°F]	PROBE TEMP (2) [°F]	FILTER BOX [°F]	LAST IMP TEMP (4) [°F]	METER EXHAUST O_2 [% vol]	METER EXHAUST CO_2 [% vol]
	1518	0					379.60								
PRT 5		10	9.83	0.73	1.6	4.5	386.43	81	78	319	335		58	6.4	13.8
"		20	9.73	0.73	1.6	5.0	393.65	83	78	317	330		62	6.3	13.9
"		30	9.72	0.72	1.5	4.5	400.65	84	78	317	327		66	6.2	14.0
"		40	9.60	0.72	1.5	4.5	407.65	84	78	317	332		62	6.3	13.9
	START						~~415.76~~								
PRT 3	1638	50	9.81	0.77	1.75	5.0	408.39 ~~415.76~~	82	80	322	324		55	6.4	13.8
"		60	9.70	0.77	1.75	5.5	423.18	85	80	322	325		60	6.4	13.8
"	*	70	9.71	0.77	1.85	6.0	430.72	86	80	322	320		62	6.4	13.8
"		80	9.73	0.77	1.85	6.0	438.30	86	80	322	320		62	6.5	13.7
"		90	9.84	0.78	1.85	6.0	445.92	87	81	322	328		61	6.6	13.6
PRT 2		100/90	9.78	0.77	1.85	6.5	453.60	88	81	322	315		62	6.6	13.6
"		110/100	9.78	0.78	1.85	6.5	461.25	90	82	322	320		64	6.5	13.7
"	STOP	120/110	9.83	0.77	1.85	7.0	469.97	92	84	322	325		65	6.5	13.7
"	1758	~~120~~													
				RMS											
			9.75	0.756	1.78		89.72	82.8		320.5				6.4	13.8

Sample Train Pre Test 1.01 ft³ @ 1 in. Hg
Leak Checks: Post Test _____ ft³ @ _____ in. Hg

Pitot Tube PreTest 0 @ 6 in. H_2O
Leak Checks: Post Test _____ @ _____ in. H_2O

CONSOLENERGY.

NOTE: Purge for 10 minutes at end of sampling.

* K-FACTOR ADJUSTED TO 2.40 @ 63 MINUTES INTO TEST (J. LOCKE) - (LOWER STACK TEMP)

ONTARIO HYDRO Hg SAMPLING AND SPECIATION FIELD DATA SHEET

TEST ID	One	METER BOX	N-1	CAL. DATA: delta H	1.969	Comments:	294.7 gm H_2O
PLANT	Plant 4	PITOT TUBE DESC	E-2	Y	0.989		
LOCATION	Unit 2 Stack	PROBE LENGTH [ft]	10'	C(p)	0.813		
DATE	9-25-03	NOZZLE ID [inch]	7/32 B 0.212	FILTER BOX SETTING	250		
OPERATOR(S)	RLO, KRC, BPS	%H_2O (Assumed)	17.5%	PROBE HTR SETTING	250		
AMBIENT TEMP [°F]	80	FILTER ID	1	DUCT X-SECTION	circ ?	rect ?	other:
BAR. PRESS. [" Hg]	29.65	K FACTOR	1.513	DUCT DIMENSIONS	38.5 ft	DUCT AREA	1164.16 ft²

BRUCE'S WATCH

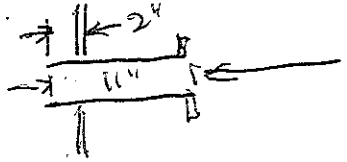
TRAVERSE POINT [port-inch]	CLOCK TIME START (24-hr)	SAMPLE TIME [minute]	STATIC PRES [" H_2O]	PITOT HEAD [" H_2O]	METER DIFF PRESSURE [" H_2O]	METER VACUUM [" Hg]	METER READING [ft³]	METER TEMP [oF] (6) inlet	METER TEMP [oF] (4) outlet	STACK TEMP (1) [°F]	PROBE TEMP (2) [°F]	FILTER BOX (3) [°F]	LAST IMP TEMP (5) [°F]	METER EXHAUST O_2 [% vol]	METER EXHAUST CO_2 [% vol]
	1516	0					669.10								
		10	-1.13	1.15	1.73	4	676.32	95	94	130	250	255	60	6.6	13.6
		20		1.15	1.73	4	683.51	98	95	131	251	254	64	6.6	13.6
		30		1.10	1.68	4	690.52	101	96	130	251	255	65	6.7	13.5
		40	-1.09	1.10	1.68	4	697.57	104	97	131	251	255	59	6.6	13.6
AT 50 MIN.		50		1.15	1.73	4	704.79	105	99	131	251	254	58	6.6	13.6
CHANGED K FACTOR		60		1.10	1.70	4	712.00	106	100	130	251	255	60	6.7	13.5
1.57 RLO		70		1.15	1.76	4.5	719.29	107	100	130	251	255	61	6.7	13.5
STOP	1736	80	-0.96	1.15	1.76	4.5	726.51	108	102	129	251	254	64	6.7	13.5
START	1700	90	-1.07	1.15	1.76	4	733.75	105	101	129	250	253	50	6.7	13.5
		100		1.20	1.84	4.5	741.15	108	102	129	250	254	52	6.7	13.5
		110		1.15	1.76	4.5	748.40	109	103	129	250	254	53	6.7	13.5
STOP	1740	120	-1.11	1.20	1.84	4.5	755.89	109	103	129	250	254	54	6.8	13.4
	END														
				PBS											
		120	-1.072	1.146	1.748		756.79	102		129.8				6.68	13.53

Sample Train Leak Checks: Pre Test <0.01 ft³ @ 10 in. Hg; Post Test <0.01 ft³ @ 10 in. Hg DEAD STOP

Pitot Tube Leak Checks: PreTest OK @ 7 in. H_2O; Post Test OK @ 7 in. H_2O

CONSOLENERGY.

NOTE: Purge for 10 minutes at end of sampling.



ONTARIO HYDRO Hg SAMPLING AND SPECIATION FIELD DATA SHEET

TEST ID	#2	METER BOX	80872	CAL. DATA: delta H	1.649	Comments:	ADJUSTED K-FACTOR AT MIDPOINT DUE TO RISING METER BOX TEMPS (NEW K = 2.5).		
PLANT	Plant 4	PITOT TUBE DESC.	E-1	Y	1.012				
LOCATION	Unit 2 FGD Inlet	PROBE LENGTH [ft]	10'	C(p)	0.857				
DATE	9/26/03	NOZZLE ID [inch]	0.249	FILTER BOX SETTING	N/A				
OPERATOR(S)	GLC/JCS/JL	%H_2O (Assumed)	8	PROBE HTR SETTING	315				
AMBIENT TEMP [°F]	75	FILTER ID	2	DUCT X-SECTION	circ ?	(rect ?)	other:		
BAR. PRESS. [" Hg]	29.53	K FACTOR	2.45	DUCT DIMENSIONS	48x29	DUCT AREA	1392 ft²		

TRAVERSE POINT [port-inch]	CLOCK TIME (24-hr)	SAMPLE TIME [minute]	STATIC PRES [" H_2O]	PITOT HEAD [" H_2O]	METER DIFF PRESSURE [" H_2O]	METER VACUUM [" Hg]	METER READING [ft³]	METER TEMP [°F] (6) inlet	METER TEMP [°F] (7) outlet	STACK TEMP (1) [°F]	PROBE TEMP (2) [°F]	FILTER BOX [°F]	LAST IMP TEMP (4) [°F]	METER EXHAUST O_2 [% vol]	METER EXHAUST CO_2 [% vol]
	916	0					484.00								
PORT 2		10		0.77	1.9	5.0	491.77	88	82	319	327		66	6.6	13.6
		20	10.0	0.77	1.9	5.0	499.64	92	84	320	318		71	6.6	13.6
		30		0.77	1.9	5.0	507.47	93	85	320	325		70	6.6	13.6
		40		0.77	1.9	5.0	515.28	98	88	320	332		64	6.5	13.6
		50	10.0	0.77	1.9	5.0	523.12	101	92	320	325		63	6.6	13.6
		~~60~~ 50		0.77	1.9	5.5	531.06	105	96	321	330		63	6.6	13.6
		~~50~~	*0 Leak @ 8" Hg *												
START	1021	~~70~~					531.20								
PORT 5		~~70~~ 60		0.74	1.85	5.5	538.83	107	101	313	325		60	6.6	13.6
(K=2.5)		80	10.1	0.74	1.85	5.5	546.68	108	102	313	325		62	6.6	13.6
		90		0.74	1.85	6.0	554.52	108	103	313	333		63	6.6	13.6
		100		0.74	1.85	6.0	562.35	109	103	314	325		65	6.7	13.5
		110	10.24	0.74	1.85	6.0	570.20	109	104	314	330		66	6.6	13.6
		120		0.74	1.85	6.0	578.12	109	104	314	325		71	6.6	13.6
			10.085	0.754			93.98	98.8		316.8				6.60	

Sample Train Leak Checks: Pre Test 0 ft³ @ 8 in. Hg; Post Test 0.012 ft³ @ 8 in. Hg

Pitot Tube Leak Checks: PreTest _____ @ _____ in. H_2O; Post Test _____ @ _____ in. H_2O

CONSOLENERGY

NOTE: Purge for 10 minutes at end of sampling.

ONTARIO HYDRO Hg SAMPLING AND SPECIATION FIELD DATA SHEET

TEST ID	2	METER BOX	1	CAL. DATA: delta H	1.969	Comments:			
PLANT	Plant 4	PITOT TUBE DESC.	T-2	Y	0.989				
LOCATION	Unit 2 Stack	PROBE LENGTH [ft]	10'	C(p)	0.813				
DATE	9-26-03	NOZZLE ID [inch]	7/32B 0.212	FILTER BOX SETTING					
OPERATOR(S)	RLO, KRC, BPS	%H_2O (Assumed)		PROBE HTR SETTING					
AMBIENT TEMP [°F]	~90° F	FILTER ID	2	DUCT X-SECTION	circ ?	rect ?	other:		
BAR. PRESS. [" Hg]	29.53	K FACTOR	1.65	DUCT DIMENSIONS	38.5 ft	DUCT AREA	1164.16 ft^2		

BRUCE'S WATCH -1.1 1.15

6.7 13.5

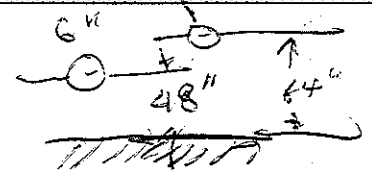
TRAVERSE POINT [port-inch]	CLOCK TIME START (24-hr)	SAMPLE TIME [minute]	STATIC PRES [" H_2O]	PITOT HEAD [" H_2O]	METER DIFF PRESSURE [" H_2O]	METER VACUUM [" Hg]	METER READING 763 [ft^3] H_2O	METER TEMP [oF] (6) inlet	METER TEMP [oF] (7) outlet	STACK TEMP [°F] (1)	PROBE TEMP [°F] (2)	FILTER BOX [°F] (3)	LAST IMP TEMP [°F] (5)	METER EXHAUST O_2 [% vol]	METER EXHAUST CO_2 [% vol]
	0917	0					763.80								
E		10	-1.19	1.10	1.80	4.5	770.52	90	88	129	250	254	52	6.7	13.5
A		20		1.10	1.80	4.5	777.82	94	89	130	250	255	51	6.7	13.5
S		30	-1.16	1.10	1.80	4.5	785.14	98	91	129	251	255	52	6.7	13.5
T		40		1.15	1.87	5	792.59	101	93	129	251	255	53	6.7	13.5
P		50	-1.05	1.15	1.87	5	800.02	102	95	129	251	255	52	6.6	13.6
O		60		1.15	1.87	5	807.50	104	96	130	251	255	53	6.7	13.5
R		70		1.15	1.87	5	814.99	105	97	130	251	254	54	6.7	13.5
T		80	-1.08	1.10	1.80	5	822.38	106	99	129	251	254	58	6.6	13.6
		90		1.10	1.80	5	829.77	107	100	130	251	254	59	6.6	13.6
		100	-1.03	1.15	1.87	5	837.28	109	101	130	251	255	61	6.7	13.5
		110		1.15	1.87	5	844.76	109	102	130	251	254	63	6.7	13.5
	1117	120	-1.02	1.15	1.87	5	852.25	110	103	130	251	253	63	6.7	13.5
	STOP														
				pms											
		120	-1.03	1.129	1.841		89.05	99.54		129.6				6.68	13.53

Sample Train Leak Checks: Pre Test <0.01 ft^3 @ 10 in. Hg; Post Test <0.01 ft^3 @ 10 in. Hg

Pitot Tube Leak Checks: PreTest OK @ 7 in. H_2O; Post Test ok @ 7 in. H_2O

CONSOLENERGY

NOTE: Purge for 10 minutes at end of sampling.



ONTARIO HYDRO Hg SAMPLING AND SPECIATION FIELD DATA SHEET

TEST ID	#3	METER BOX	80872	CAL. DATA: delta H	1.649	Comments:			
PLANT	Plant 4	PITOT TUBE DESC.	E-1	Y	1.012				
LOCATION	Unit 2 FGD Inlet	PROBE LENGTH [ft]	10'	C(p)	0.857				
DATE	9/26/13	NOZZLE ID [inch]	0.249	FILTER BOX SETTING	N/A				
OPERATOR(S)	GLC/JCS/JL	$\%H_2O$ (Assumed)	8	PROBE HTR SETTING	315				
AMBIENT TEMP [°F]	100	FILTER ID	3	DUCT X-SECTION	circ ?	(rect ?)	other:		
BAR. PRESS. [" Hg]	29.49	K FACTOR	2.5	DUCT DIMENSIONS	48x29	DUCT AREA	1392 ft²		

TRAVERSE POINT [port-inch]	CLOCK TIME (24-hr)	SAMPLE TIME [minute]	STATIC PRES [" H_2O]	PITOT HEAD [" H_2O]	METER DIFF PRESSURE [" H_2O]	METER VACUUM [" Hg]	METER READING [ft³]	METER TEMP (6) [oF] (7) inlet	METER TEMP (6) [oF] (7) outlet	STACK TEMP (1) [°F]	PROBE TEMP (2) [°F]	FILTER BOX [°F]	LAST IMP TEMP (4) [°F]	METER EXHAUST O_2 [% vol]	METER EXHAUST CO_2 [% vol]
	1210	0					586.40								
Port 5		10		0.74	1.85	4.5	594.29	105	103	316	325		65	6.4	13.8
		20	9.58	0.74	1.85	5.0	602.14	107	102	317	322		67	6.3	13.9
		30		0.73	1.80	5.0	609.90	107	102	317	321		68	6.5	13.7
		40	10.0	0.73	1.80	5.0	617.64	107	102	317	328		60	6.5	13.7
		50		0.73	1.80	5.0	625.34	107	102	317	322		60	6.4	13.8
		60	10.26	0.74	1.85	5.5	633.09	107	102	318	330		60	6.4	13.8
			*	0 leak @ 8 "Hg" *											
RESTART	1317						633.50								
Port 2		70		0.78	1.95	5.5	641.76	104	101	327	320		60	6.3	13.9
		80	9.48	0.78	1.95	6.0	649.73	105	101	327	321		65	6.3	13.9
		90		0.78	1.95	6.5	657.72	105	101	328	325		68	6.3	13.9
		100	9.74	0.78	1.95	6.5	665.66	107	101	328	322		69	6.3	13.9
		110		0.79	2.0	7.0	673.68	107	102	328	330		66	6.3	13.9
		120	9.80	0.78	1.95	7.0	681.60	107	102	328	326		72	6.3	13.9
			9.81	0.758	1.84		94.79	104		322.3				6.36	13.84

Sample Train Pre Test 0.01 ft³ @ 7 in. Hg
Leak Checks: Post Test 0.01 ft³ @ 7 in. Hg

Pitot Tube PreTest OK @ 7 in. H_2O
Leak Checks: Post Test OK @ 7 in. H_2O

CONSOLENERGY

NOTE: Purge for 10 minutes at end of sampling.

ONTARIO HYDRO Hg SAMPLING AND SPECIATION FIELD DATA SHEET

TEST ID	3	METER BOX	1	CAL. DATA: delta H	1.969	Comments:			
PLANT	Plant 4	PITOT TUBE DESC	E-2	Y	0.989				
LOCATION	Unit 2 Stack	PROBE LENGTH [ft]	10'	C(p)	0.843				
DATE	9/26/03	NOZZLE ID [inch]	0.212	7/32" FILTER BOX SETTING					
OPERATOR(S)	RLO, KRC, BPS	%H_2O (Assumed)		PROBE HTR SETTING					
AMBIENT TEMP [°F]		FILTER ID	3	DUCT X-SECTION	circ ?	rect ?	other:		
BAR. PRESS. [" Hg]	29.49	K FACTOR	1.65	DUCT DIMENSIONS	38.5 ft	DUCT AREA	1164.16 ft²		

BRUCE'S WATCH

TRAVERSE POINT [port-inch]	CLOCK TIME (24-hr)	SAMPLE TIME [minute]	STATIC PRES [" H_2O]	PITOT HEAD [" H_2O]	METER DIFF PRESSURE [" H_2O]	METER VACUUM [" Hg]	METER READING [ft³]	METER TEMP [oF] inlet (6)	METER TEMP [oF] outlet (7)	STACK TEMP [°F] (1)	PROBE TEMP [°F] (2)	FILTER BOX [°F] (3)	LAST IMP TEMP [°F] (5)	METER EXHAUST O_2 [% vol]	METER EXHAUST CO_2 [% vol]
	1213 START	0					858.60								
F		10		1.10	1.80	4.5	866.07	102	101	129	251	256	70	6.6	13.6
A		20	-1.00	1.10	1.80	4.5	873.56	106	102	129	250	252	70	6.7	13.5
S		30		1.10	1.80	4.5	881.01	108	103	130	250	251	67	6.7	13.5
T		40		1.10	1.80	4.5	888.47	109	104	130	250	250	61	6.6	13.6
P		50	-1.04	1.10	1.80	4.5	895.80	110	104	130	251	253	54	6.6	13.6
O		60		1.15	1.87	4.5	903.26	110	104	130	250	253	53	6.7	13.5
R		70		1.10	1.80	4.5	910.70	111	105	129	251	253	54	6.7	13.5
T		80	-1.11	1.10	1.80	5	918.09	111	105	130	251	252	56	6.7	13.5
		90		1.10	1.80	5	925.50	111	106	130	251	252	58	6.7	13.5
		100		1.10	1.80	5	932.88	112	106	129	251	252	56	6.6	13.6
		110	-1.10	1.10	1.80	5	940.26	112	106	129	251	252	55	6.6	13.6
	1413	120		1.10	1.80	5	947.61	112	106	129	252	252	56	6.6	13.6
	Stop														
				~~1.10~~											
		120	-1.07	1.104	1.806		89.01	106.9		129.5				6.65	13.65

Sample Train Pre Test <0.01 ft³ @ 10 in. Hg — Pitot Tube PreTest OK @ 6 in. H_2O

Leak Checks: Post Test <0.01 ft³ @ 10 in. Hg — Leak Checks: Post Test OK @ 7 in. H_2O

CONSOLENERGY

NOTE: Purge for 10 minutes at end of sampling.

10 min purge after test

ONTARIO HYDRO Hg SAMPLING AND SPECIATION FIELD DATA SHEET

TEST ID	#4	METER BOX	80872	CAL. DATA: delta H	1.649	Comments:	TEST ON HOLD @ 1525		
PLANT	Plant 4	PITOT TUBE DESC.	E-1	Y	1.012		RESUMED TEST @ 1557		
LOCATION	Unit 2 FGD Inlet	PROBE LENGTH [ft]	10'	C(p)	0.857				
DATE	9/26/03	NOZZLE ID [inch]	0.249	FILTER BOX SETTING	N/A				
OPERATOR(S)	GLC/JCS	%H_2O (Assumed)	8	PROBE HTR SETTING	315				
AMBIENT TEMP [°F]	100	FILTER ID	4	DUCT X-SECTION	circ ?	(rect ?)	other:		
BAR. PRESS. [" Hg]	29.36	K FACTOR	2.5	DUCT DIMENSIONS	48x29	DUCT AREA	1392 ft²		

TRAVERSE POINT [port-inch]	CLOCK TIME (24-hr)	SAMPLE TIME [minute]	STATIC PRES [" H_2O]	PITOT HEAD [" H_2O]	METER DIFF PRESSURE [" H_2O]	METER VACUUM [" Hg]	METER READING [ft³]	METER TEMP (6) [oF] (7) inlet	METER TEMP (6) [oF] (7) outlet	STACK TEMP (1) [°F]	PROBE TEMP (2) [°F]	FILTER BOX [°F]	LAST IMP TEMP (4) [°F]	METER EXHAUST O_2 [% vol]	METER EXHAUST CO_2 [% vol]
	1500	0					689.70								
PORT 2		10		0.80	2.0	5.0	697.63	101	100	330	305		60	6.3	13.9
		20	9.32	0.80	2.0	5.5	705.70	103	99	330	295		58	6.4	13.8
SOP @ 1525.4		25.4/30		0.80	2.0	6.0	710.19	104	100	330	328		57	6.4	13.8
RESTART @ 1557		30/40					713.78								
		40	9.50	0.80	2.0	6.0	721.82	101	98	330	335		60	6.3	13.9
		50		0.80	2.0	6.0	729.89	102	98	330	322		64	6.4	13.8
		60	9.46	0.80	2.0	6.5	738.075	103	98	330	328		68	6.4	13.8
PORT 5			* O LEAK @ 9" Hg *				738.40								
START: 1637		70/80		0.76	1.9	5.5	746.15	102	98	320	320		63	6.6	13.6
		80	10.20	0.76	1.9	6.0	754.14	102	98	321	322		65	6.5	13.7
		90		0.75	1.9	6.5	762.03	102	98	321	326		66	6.6	13.6
		100	10.18	0.75	1.9	6.5	769.90	102	98	320	328		67	6.6	13.6
		110		0.75	1.9	6.5	777.73	102	98	321	332		66	6.5	13.7
		120		0.75	1.9	7.0	785.71	102	97	321	328		68	6.6	13.6
				MS	3.										
			9.732	0.776	1.95		92.095	102.25		325.3				6.47	13.73

Sample Train Pre Test 0 ft³ @ 9 in. Hg
Leak Checks: Post Test 0 ft³ @ 9 in. Hg

Pitot Tube PreTest _____ @ _____ in. H_2O
Leak Checks: Post Test _____ @ _____ in. H_2O

CONSOLENERGY

NOTE: Purge for 10 minutes at end of s

ONTARIO HYDRO Hg SAMPLING AND SPECIATION FIELD DATA SHEET

TEST ID	4	METER BOX	1	CAL. DATA: delta H	1.969	Comments:			
PLANT	Plant 4	PITOT TUBE DESC.	E-2	Y	0.989				
LOCATION	Unit 2 Stack	PROBE LENGTH [ft]	10'	C(p)	0.813				
DATE	9/26/03	NOZZLE ID [inch]	0.212	FILTER BOX SETTING					
OPERATOR(S)	BLO, KRS, BPS	%H_2O (Assumed)		PROBE HTR SETTING					
AMBIENT TEMP [°F]		FILTER ID	4	DUCT X-SECTION	circ ?	rect ?	other:		
BAR. PRESS. [" Hg]	29.41	K FACTOR		DUCT DIMENSIONS	38.5 ft	DUCT AREA	1164.16 ft²		

BRUCE'S WATCH

TRAVERSE POINT [port-inch]	CLOCK TIME (24-hr)	SAMPLE TIME [minute]	STATIC PRES [" H_2O]	PITOT HEAD [" H_2O]	METER DIFF PRESSURE [" H_2O]	METER VACUUM [" Hg]	METER READING [ft³]	METER TEMP [oF] inlet (6)	METER TEMP [oF] outlet (7)	STACK TEMP [°F] (1)	PROBE TEMP [°F] (2)	FILTER BOX [°F] (3)	LAST IMP TEMP [°F] (5)	METER EXHAUST O_2 [% vol]	METER EXHAUST CO_2 [% vol]
	1500 START	0					953.90								
		10	-1.07	1.10	1.80	4	961.37	106	104	130	252	254	70	7.1	13.1
STOP	1520	20		1.10	1.80	4	968.77	109	104	131	252	254	63	7.2	13.0
RE START	1558	30		1.10	1.80	4	~~972.10~~ 979.50	109	105	131	249	252	59	6.7	13.5
E		40	-1.06	1.10	1.80	4	986.80	111	106	130	251	252	61	6.7	13.5
A		50		1.10	1.80	5	994.12	113	107	130	250	253	52	6.6	13.6
S		60		1.15	1.87	5	001.64	114	108	130	250	253	53	6.7	13.5
T		70	-1.11	1.15	1.87	5	009.14	114	108	130	251	252	52	6.8	13.4
P		80		1.15	1.87	5	016.61	114	108	131	251	252	54	6.8	13.4
O		90	-1.08	1.10	1.80	5	023.91	114	108	130	251	252	55	6.8	13.4
R		100		1.10	1.80	5	031.25	114	108	131	251	252	57	6.8	13.4
T		110	-1.11	1.10	1.80	5	038.56	114	109	130	251	252	58	6.8	13.4
STOP	1738	120		1.10	1.80	5	045.95	115	109	130	251	252	60	6.8	13.4
				PRE											
		120	-1.09	1.112	1.818		84.65	109.6		130.3				6.82	13.38

Sample Train Pre Test 20.01 ft³ @ 10 in. Hg
Leak Checks: Post Test 0.01 ft³ @ 10 in. Hg

Pitot Tube PreTest OK @ 6 in. H_2O
Leak Checks: Post Test OK @ 7 in. H_2O

CONSOLENERGY

NOTE: Purge for 10 minutes at end of sampling.

STOPPED TEST AT 1520 HRS. TO CORRECT LEAK FOUND IN PROBE. RESTARTED TEST AT 1558 HRS. (GOOD LEAK CHECK)

Purged for 10 min after test

Plant 4 Method 2 Volumetric Flow Data
Velocity & Temperature Traverse

Location	Stack	Duct Width	38.5 ft	Bar,"Hg	29.59
Date	9/25/07	Duct Depth	NA ft	Static, "H_2O	
Time	1530 - 1648	Duct Area	1164.2 ft^2	Dry Bulb °F	
Tube I.D.	S-19A	% O_2		Wet Bulb °F	
C-Factor		% CO_2		% H_2O	
Operator(s)		% N_2		W.M.Wt	

PORT/ POINT	Distance [in. From Wall]	Temp [°F]	Delta P [" H_2O]	Velocity [fps]	Null Yaw [°CW]	Axial Vel [fps]
A-1 North	~~40~~ 20.3	128	0.958			
A-2	~~126~~ 67.5	128	1.121			
A-3	~~40~~ 136.8	129	1.144			
A-4	~~126~~					
B-1	~~40~~ 20.3	127	0.727			
B-2 West	~~126~~ 67.5	128	0.866			-0.744
B-3	~~40~~ 136.8	128	1.077			
B-4	~~126~~					
C-1	~~40~~ 20.3	127	1.143			
C-2 South	~~126~~ 67.5	127	1.209			-0.958
C-3	~~40~~ 136.8	127	1.300			
C-4	~~126~~					
D-1	~~40~~ 20.3	126	1.161			
D-2 East	~~126~~ 67.5	127	1.375			-0.954
D-3	~~40~~ 136.8	127	1.400			
D-4	~~126~~					
Average						
Maximum						
Minimum						
SDEV						

DATA SUMMARY		
	(Measured)	(Axial)
Velocity, fps		
Velocity, fpm		
ACFM		
SCFM		
DSCFM		
Ex Air Free		

Plant 4 Method 2 Volumetric Flow Data
Velocity & Temperature Traverse

Location	Stack	Duct Width	38.5 ft	Bar,"Hg	29.52
Date	9/26/03	Duct Depth	NA ft	Static, "H_2O	
Time	1006-1110	Duct Area	1164.2 ft^2	Dry Bulb °F	
Tube I.D.	S-19A	% O_2		Wet Bulb °F	
C-Factor		% CO_2		% H_2O	
Operator(s)	KC, RLO	% N_2		W.M.Wt	

PORT/ POINT	Distance [in. From Wall]	Temp [°F]	Delta P [" H_2O]	Velocity [fps]	Null Yaw [°CW]	Axial Vel [fps]
A-1	40	127	1.327			
A-2 East	126	127	1.365			
A-3	40	127	1.334			
A-4	126					
B-1	40	127	1.062			
B-2 South	126	127	1.113			
B-3	40	128	1.352			
B-4	126					
C-1	40	127	0.743			
C-2 West	126	127	0.814			
C-3	40	128	1.043			
C-4	126					
D-1	40	128	0.883			
D-2 North	126	128	1.099			
D-3	40	128	0.999			
D-4	126					
Average						
Maximum						
Minimum						
SDEV						

Static ↓

-1.064

-0.9986

-0.643

-1.014

DATA SUMMARY		
	(Measured)	(Axial)
Velocity, fps		
Velocity, fpm		
ACFM		
SCFM		
DSCFM		
Ex Air Free		

09/19/03

Velocity & Temperature Traverse

Location	Plant 4 Stack	Duct Dia		in	Bar,"Hg	29.52
Date	09/26/03	Duct Dia	0.0	ft	Static, "H_2O	-0.930
Time	Run 2	Duct Area	1164.2	ft^2	Dry Bulb °F	127.4
Tube I.D.	S-19	% O_2	6.7		Wet Bulb °F	127.4
C_P	0.788	% CO_2	13.5		% H_20	14.59
Operator(s)	RLO, KC	% N_2	79.8		W.M.Wt	29.03

Ports labeled from sampling port to far wall

PORT/ POINT	Distance [' From Wall]	Temp [—uo˜F]	Delta P [" H—d2˜O]	Velocity [fps]	Null Yaw [—uo˜CW]	Axial Vel [fps]
A-1		127	1.327	64.31		64.31
A-2		127	1.365	65.23		65.23
A-3		127	1.334	64.48		64.48
B-1		127	1.062	57.53		57.53
B-2		127	1.113	58.90		58.90
B-3		128	1.352	64.97		64.97
C-1		127	0.743	48.12		48.12
C-2		127	0.819	50.52		50.52
C-3		128	1.043	57.06		57.06
D-1		128	0.883	52.51		52.51
D-2		128	1.099	58.58		58.58
D-3		128	0.999	55.85		55.85
Average		127.4	1.095	58.2	#DIV/0!	58.2
Maximum		128.0	1.365	65.2	0.0	65.2
Minimum		127.0	0.743	48.1	0.0	48.1
SDEV		0.5	0.206	5.6	#DIV/0!	5.6

DATA SUMMARY		
	(Measured)	(Axial)
Velocity, fps	58.17	58.17
Velocity, fpm	3490	3490
ACFM	4063439	4063439
SCFM	3593805	3593805
DSCFM	3069399	3069399
Ex Air Free	2088366	2088366

12/09/03

Plant 4 Method 2 Volumetric Flow Data
Velocity & Temperature Traverse

Location	Stack	Duct Width	38.5 ft	Bar,"Hg	29.49
Date	9/26/03	Duct Depth	NA ft	Static, "H_2O	
Time	1245 - 1355	Duct Area	1164.2 ft^2	Dry Bulb °F	
Tube I.D.	S-19A	% O_2		Wet Bulb °F	
C-Factor		% CO_2		% H_2O	
Operator(s)	KC; RW	% N_2		W.M.Wt	

PORT/ POINT	Distance [in. From Wall]	Temp [°F]	Delta P [" H_2O]	Velocity [fps]	Null Yaw [°CW]	Axial Vel [fps]	
A-1	40	~~120~~ 129	0.978				
A-2 North	126	128	1.046				-1.074
A-3	40	128	1.091				
A-4	126						
B-1	40	128	0.729				
B-2 West	126	128	0.923				-0.697
B-3	40	128	0.840				
B-4	126						
C-1	40	127	0.934				
C-2 South	126	127	1.205				-0.926
C-3	40	128	1.307				
C-4	126						
D-1	40	127	1.249				
D-2 East	126	127	1.296				-1.103
D-3	40	129	1.339				
D-4	126						
Average							
Maximum							
Minimum							
SDEV							

DATA SUMMARY		
	(Measured)	(Axial)
Velocity, fps		
Velocity, fpm		
ACFM		
SCFM		
DSCFM		
Ex Air Free		

Velocity & Temperature Traverse

Location	Plant 4 Stack	Duct Dia	in	Bar,"Hg	29.49
Date	09/26/03	Duct Dia	0.0 ft	Static, "H_2O	-0.950
Time	Run 3	Duct Area	1164.2 ft^2	Dry Bulb °F	127.7
Tube I.D.	S-19	% O_2	6.7	Wet Bulb °F	127.4
C_P	0.788	% CO_2	13.7	% H_20	14.60
Operator(s)	RLO, KC	% N_2	79.7	W.M.Wt	29.04

Ports labeled from sampling port to far wall

PORT/ POINT	Distance [' From Wall]	Temp [—uo˜F]	Delta P [" H—d2˜O]	Velocity [fps]	Null Yaw [—uo˜CW]	Axial Vel [fps]
A-1		129	0.978	55.32		55.32
A-2		128	1.046	57.16		57.16
A-3		128	1.091	58.38		58.38
B-1		128	0.724	47.56		47.56
B-2		128	0.928	53.84		53.84
B-3		128	0.840	51.23		51.23
C-1		127	0.934	53.97		53.97
C-2		127	1.205	61.30		61.30
C-3		128	1.307	63.90		63.90
D-1		127	1.249	62.41		62.41
D-2		127	1.296	63.58		63.58
D-3		127	1.339	64.62		64.62
Average		127.7	1.078	57.8	#DIV/0!	57.8
Maximum		129.0	1.339	64.6	0.0	64.6
Minimum		127.0	0.724	47.6	0.0	47.6
SDEV		0.6	0.194	5.3	#DIV/0!	5.3

DATA SUMMARY		
	(Measured)	(Axial)
Velocity, fps	57.77	57.77
Velocity, fpm	3466	3466
ACFM	4035570	4035570
SCFM	3563826	3563826
DSCFM	3043432	3043432
Ex Air Free	2075067	2075067

12/09/03

Plant 4 Method 2 Volumetric Flow Data
Velocity & Temperature Traverse

Location	Stack	Duct Width	38.5 ft	Bar,"Hg	29.36
Date	9/26/03	Duct Depth	NA ft	Static, "H_2O	
Time	1630-1710	Duct Area	1164.2 ft^2	Dry Bulb °F	
Tube I.D.	S-19A	% O_2		Wet Bulb °F	
C-Factor		% CO_2		% H_2O	
Operator(s)		% N_2		W.M.Wt	

PORT/ POINT	Distance [in. From Wall]	Temp [°F]	Delta P [" H_2O]	Velocity [fps]	Null Yaw [°CW]	Axial Vel [fps]
A-1	40	128	1.239			
A-2 East	126	128	1.318			
A-3	40	128	1.283			
A-4	126					
B-1	40	128	1.158			
B-2 South	126	128	1.261			
B-3	40	128	1.426			
B-4	126					
C-1	40	128	0.648			
C-2 West	126	128	0.959			
C-3	40	128	1.032			
C-4	126					
D-1	40	128	1.107			
D-2 North	126	128	1.110			
D-3	40	128	1.010			
D-4	126					
Average						
Maximum						
Minimum						
SDEV						

Static

-0.973

-1.023

-0.810

-0.946

DATA SUMMARY		
	(Measured)	(Axial)
Velocity, fps		
Velocity, fpm		
ACFM		
SCFM		
DSCFM		
Ex Air Free		

Velocity & Temperature Traverse

Location	Plant 4 Stack	Duct Dia		in	Bar,"Hg	29.36
Date	09/26/03	Duct Dia	0.0	ft	Static, "H_2O	-0.950
Time	Run 4	Duct Area	1164.2	ft^2	Dry Bulb °F	128.0
Tube I.D.	S-19	% O_2	6.8		Wet Bulb °F	127.4
C_P	0.788	% CO_2	13.4		% H_20	14.66
Operator(s)	RLO, KC	% N_2	79.8		W.M.Wt	29.00

Ports labeled from sampling port to far wall

PORT/ POINT	Distance [' From Wall]	Temp [—uo˜F]	Delta P [" H—d2˜O]	Velocity [fps]	Null Yaw [—uo˜CW]	Axial Vel [fps]
A-1		128	1.239	62.39		62.39
A-2		128	1.318	64.35		64.35
A-3		128	1.283	63.49		63.49
B-1		128	1.158	60.32		60.32
B-2		128	1.261	62.94		62.94
B-3		128	1.426	66.94		66.94
C-1		128	0.648	45.12		45.12
C-2		128	0.959	54.89		54.89
C-3		128	1.032	56.94		56.94
D-1		128	1.107	58.98		58.98
D-2		128	1.11	59.06		59.06
D-3		128	1.010	56.33		56.33
Average		128.0	1.129	59.3	#DIV/0!	59.3
Maximum		128.0	1.426	66.9	0.0	66.9
Minimum		128.0	0.648	45.1	0.0	45.1
SDEV		0.0	0.196	5.5	#DIV/0!	5.5

DATA SUMMARY		
	(Measured)	(Axial)
Velocity, fps	59.31	59.31
Velocity, fpm	3559	3559
ACFM	4143166	4143166
SCFM	3640612	3640612
DSCFM	3106908	3106908
Ex Air Free	2093075	2093075

12/09/03

PLANT 5 Unit #2 - Hg SAMPLING PROGRAM - ONTARIO HYDRO SAMPLING TRAIN DATA

Location			FGD Inlet Unit 2	Stack Unit 2	FGD Inlet Unit 2	Stack Unit 2	FGD Inlet Unit 2	Stack Unit 2	FGD Inlet Unit 2	Stack Unit 2
Date			09/25/2003	09/25/2003	09/26/2003	09/26/2003	09/26/2003	09/26/2003	09/26/2003	09/26/2003
Start Time			1518	1516	916	917	1210	1213	1500	1500
Stop Time			1758	1740	1021	1117	1317	1413	1737	1738
Test Number			INL-1	STK-1	INL-2	STK-2	INL-3	STK-3	INL-4	STK-4
Sample Type			OH-Hg	OH-Hg	OH-Hg	OH-Hg	OH-Hg	OH-Hg	OH-Hg	OH-Hg
Y factor of dry gas meter	-		1.012	0.989	1.012	0.989	1.012	0.989	1.012	0.989
Gas Volume	-	ft^3	89.72	86.79	93.98	89.05	94.79	89.01	92.10	84.65
Delta H of dry gas meter	-	" H_2O	1.78	1.75	1.90	1.84	1.89	1.81	1.95	1.82
Meter Temperature	-	°F	82.8	102.0	98.8	99.5	104.0	106.9	100.3	109.6
C Factor of pitot tube	-		0.857	0.788	0.857	0.788	0.857	0.788	0.857	0.788
Nozzle Diameter	-	inches	0.249	0.212	0.249	0.212	0.249	0.212	0.249	0.212
A n (area of nozzle)	-	ft^2	0.00034	0.00025	0.00034	0.00025	0.00034	0.00025	0.00034	0.00025
Area of Stack (Single of Dual)	-	ft^2	1392.0	1164.2	1392.0	1164.2	1392.0	1164.2	1392.0	1164.2
H_2O Weight	-	gm	159.9	294.7	181.0	308.5	172.6	304.8	182.7	301.3
Sample Time	-	minutes	120	120	120	120	120	120	120	120
Barometric Pressure	-	" Hg	29.65	29.65	29.53	29.53	29.49	29.49	29.36	29.41
Static Pressure	-	" H_2O	9.75	-1.07	10.09	-1.08	9.81	-1.07	9.73	-1.09
% Oxygen	-		6.4	6.7	6.6	6.7	6.4	6.7	6.5	6.8
% Carbon Dioxide	-		13.8	13.5	13.6	13.5	13.8	13.7	13.7	13.4
% N_2 + CO	-		79.8	79.8	79.8	79.8	79.8	79.7	79.8	79.8
Stack Temp (Dry Bulb)	-	°F	321	126	317	127	322	128	325	128
Stack Temp (Wet Bulb)	-	°F	320.5	126.1	316.8	127.4	322.3	127.7	325.3	128.0
"S" sample (rms vel head)	-	" H_2O	0.756	1.123	0.754	1.095	0.758	1.078	0.776	1.129
Dust Wt.	-	gm	0.0140	0.0015	0.0073	0.0105	0.0109	0.0172	0.0249	0.0087
Sample Volume	-	DSCF	87.88	80.23	89.08	82.37	88.90	81.14	86.58	76.60
Sample Volume	-	dscm	2.489	2.272	2.523	2.333	2.518	2.298	2.452	2.169
ABS ST PRES	-	" Hg	30.37	29.57	30.27	29.45	30.21	29.41	30.08	29.33
ABS ST TEMP	-	°R	781	586	777	587	782	588	785	588
H_2O - % by Vol	-	vapor	7.9	14.7	8.7	15.0	8.4	15.0	9.0	15.6
Water Volume	-	std ft^3	7.53	13.88	8.53	14.53	8.13	14.36	8.61	14.19
Dry Molecular Weight	-	lb/lb-mole	30.46	30.43	30.44	30.43	30.47	30.45	30.46	30.41
Wet Molecular Weight	-	lb/lb-mole	29.48	28.60	29.35	28.56	29.42	28.58	29.33	28.47
% EXCESS AIR	-		43.6	46.4	45.6	46.6	43.2	46.2	44.3	47.9
Dry Mole Frac.	-		0.921	0.853	0.913	0.850	0.916	0.850	0.910	0.844
Wet Mole Frac.	-		0.079	0.147	0.087	0.150	0.084	0.150	0.090	0.156
Gas Velocity, Direct	-	ft/sec	59.48	59.43	59.48	58.91	59.84	58.49	60.90	60.06
ACFM	-		4967858	4151224	4967984	4114525	4997717	4085227	5085992	4195346
DSCFM	-		3141649	3150967	3116340	3094548	3120589	3065488	3126610	3115700
DSCFM (rounded)			3141600	3151000	3116300	3094500	3120600	3065500	3126600	3115700
DSCMM			88971	89235	88255	87638	88375	86815	88546	88237
Excess Air Free DSCFM	-		2179613	2143864	2132233	2102516	2170975	2090105	2158707	2098998

Impinger Components Wts & Volumes	INL-1	STK-1	INL-2	STK-2	INL-3	STK-3	INL-4	STK-4
Filter Wt., g	0.1482	0.4102	0.0073	0.3375	0.0109	0.3303	0.0249	0.3297
ng Hg/filter	150	9.3	67.8	7.7	50.7	6.5	33.3	22.7
total ug	0.15	9.30E-03	0.07	7.70E-03	0.05	6.50E-03	0.03	2.27E-02
ug/dscm	0.06	4.09E-03	0.03	3.30E-03	0.02	2.83E-03	0.01	1.05E-02
Probe Rinse volume, ml	114	85	137	79	159	86	164	79
Analytical Hg, ng/ml	865.0	2.7	5.1	2.6	1.2	1.2	6.7	2.0
ug/dscm	39.62	0.10	0.28	0.09	0.08	0.04	0.45	0.07
Heated Umbilical Line Rinse volume, ml	60	NA	82	NA	104	NA	70	NA
Analytical Hg, ng/ml	2.2		<1.0		<1.0		<1.0	
ug/dscm	0.05		<0.03		<0.04		<0.03	
KCl volume, ml	596	736	612	748	610	743	621	746
Analytical Hg, ng/ml	161.0	<1.0	39	<1.0	41.4	1.8	24.8	<1.0
ug/dscm	38.56	<0.32	9.46	<0.32	10.03	0.58	6.28	<0.34
Nitric/Peroxide volume, ml	176	177	175	177	175	178	175	175
Analytical Hg, ng/ml	20.9	<1.0	5.3	<1.0	4.9	<1.0	4.1	<1.0
ug/dscm	1.48	<0.08	0.37	<0.08	0.34	<0.08	0.29	<0.08
KMnO4 volume, ml	245	244	247	245	246	246	246	244
Analytical Hg, ng/ml	39.8	34.30	56.3	33.10	39.8	30.30	34.9	32.40
ug/dscm	3.92	3.68	5.51	3.48	3.89	3.24	3.50	3.64
KMnO4-Acid Rinse volume, ml	50	50	50	50	50	50	50	50
Analytical Hg, ng/ml	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0
ug/dscm	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Particulate, ug/dscm	0.06	4.09E-03	0.03	3.30E-03	0.02	2.83E-03	0.01	1.05E-02
Particulate, mg/sec	0.09	6.09E-03	0.04	4.82E-03	0.03	4.09E-03	0.02	1.54E-02
Percent of Total	0.07	0.10	0.17	0.08	0.14	0.07	0.13	0.25
Oxidized Fraction, ug/dscm	78.24	0.42	9.77	0.41	10.15	0.63	6.76	0.42
Oxidized Fraction, mg/sec	114.11	0.63	14.17	0.60	14.39	0.91	9.70	0.61
Percent of Total	93.46	10.09	62.24	10.25	70.39	15.78	63.84	9.98
Elemental Fraction, ug/dscm	5.42	3.78	5.90	3.58	4.25	3.34	3.81	3.75
Elemental Fraction, mg/sec	7.90	5.63	8.56	5.22	6.03	4.84	5.47	5.51
Percent of Total	6.47	89.82	37.58	89.67	29.47	84.15	36.03	89.77
Total ug/dscm	83.71	4.21	15.70	3.99	14.42	3.97	10.59	4.18
Total mg/sec	122.10	6.26	22.77	5.82	20.45	5.75	15.19	6.14
%Reduction, O-H		94.9%		74.4%		71.9%		59.6%
% Reduction, coal-to-stack		50%		53%		58%		50%

APPENDIX B

Plant 5, Unit 2 Process Data

TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 (%)	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)	CUS-127: (CU:U2) F287001C - 2C ABS SLUR FEED FLOW (GPM)
25-Sep-2003 15:00:00.000 CDT	1,313.04	3.05	3.04	2.62	4.12	4.23	4.1	69.3	266.69	147.33
25-Sep-2003 15:01:00.000 CDT	1,316.26	3.02	3.04	2.61	4.14	4.32	4.08	69.18	266.69	147.33
25-Sep-2003 15:02:00.000 CDT	1,319.48	3.04	2.96	2.56	4.16	4.37	4.15	69.42	266.7	147.33
25-Sep-2003 15:03:00.000 CDT	1,316.57	3.16	3.05	2.51	4.21	4.38	4.21	70.03	266.7	147.33
25-Sep-2003 15:04:00.000 CDT	1,312.66	3.2	3.17	2.59	4.23	4.38	4.17	70.28	266.7	147.33
25-Sep-2003 15:05:00.000 CDT	1,313.85	3.16	2.99	2.68	4.18	4.39	4.17	70.19	266.7	147.33
25-Sep-2003 15:06:00.000 CDT	1,315.04	3.07	2.83	2.69	4.19	4.39	4.18	70.09	266.71	147.33
25-Sep-2003 15:07:00.000 CDT	1,316.24	3.11	2.8	2.62	4.23	4.4	4.14	70.02	266.71	147.33
25-Sep-2003 15:08:00.000 CDT	1,316.47	3.19	2.91	2.62	4.22	4.45	4.14	70	266.71	147.32
25-Sep-2003 15:09:00.000 CDT	1,315.74	3.16	3.06	2.55	4.21	4.48	4.28	69.97	266.71	147.32
25-Sep-2003 15:10:00.000 CDT	1,315.02	3.13	2.97	2.47	4.2	4.45	4.34	69.94	266.72	147.32
25-Sep-2003 15:11:00.000 CDT	1,314.29	3.1	2.89	2.58	4.19	4.43	4.21	69.92	266.72	147.32
25-Sep-2003 15:12:00.000 CDT	1,313.39	3.07	2.85	2.59	4.19	4.4	4.16	69.89	266.72	147.32
25-Sep-2003 15:13:00.000 CDT	1,312.33	3.04	2.83	2.52	4.19	4.39	4.17	69.86	266.72	147.32
25-Sep-2003 15:14:00.000 CDT	1,311.27	3.04	2.9	2.52	4.15	4.4	4.19	69.85	266.72	147.32
25-Sep-2003 15:15:00.000 CDT	1,310.21	3.09	2.88	2.5	4.11	4.4	4.27	69.84	266.73	147.32
25-Sep-2003 15:16:00.000 CDT	1,311.64	3.02	2.76	2.47	4.12	4.41	4.23	69.83	266.73	147.32
25-Sep-2003 15:17:00.000 CDT	1,315.58	2.97	2.81	2.44	4.12	4.35	4.11	69.82	266.73	147.32
25-Sep-2003 15:18:00.000 CDT	1,317.30	3.04	2.9	2.51	4.11	4.3	4.09	69.79	266.73	147.32
25-Sep-2003 15:19:00.000 CDT	1,316.79	3.06	2.86	2.58	4.11	4.31	4.01	69.77	266.74	147.32
25-Sep-2003 15:20:00.000 CDT	1,316.29	3.03	2.79	2.56	4.1	4.32	4.14	69.74	266.74	147.31
25-Sep-2003 15:21:00.000 CDT	1,315.78	3.01	2.78	2.58	4.15	4.43	4.33	69.72	266.74	147.31
25-Sep-2003 15:22:00.000 CDT	1,315.27	2.99	2.82	2.56	4.17	4.47	4.3	69.69	266.74	147.31
25-Sep-2003 15:23:00.000 CDT	1,314.77	3	2.81	2.48	4.11	4.35	4.2	69.67	266.75	147.31
25-Sep-2003 15:24:00.000 CDT	1,314.26	2.97	2.8	2.54	4.06	4.31	4.15	69.68	266.75	147.31
25-Sep-2003 15:25:00.000 CDT	1,313.75	2.92	2.79	2.57	4.04	4.33	4.21	69.72	266.75	147.31
25-Sep-2003 15:26:00.000 CDT	1,313.24	2.94	2.79	2.48	4.05	4.36	4.18	69.76	266.75	147.31
25-Sep-2003 15:27:00.000 CDT	1,313.40	2.96	2.8	2.45	4.11	4.38	4.25	69.8	266.76	147.31
25-Sep-2003 15:28:00.000 CDT	1,314.22	2.98	2.8	2.48	4.16	4.46	4.43	69.76	266.76	147.31
25-Sep-2003 15:29:00.000 CDT	1,315.04	3	2.77	2.49	4.17	4.49	4.38	69.63	266.76	147.31
25-Sep-2003 15:30:00.000 CDT	1,315.87	3.02	2.77	2.44	4.12	4.42	4.31	69.57	266.76	147.31
25-Sep-2003 15:31:00.000 CDT	1,316.69	3.04	2.8	2.45	4.2	4.39	4.4	69.56	266.77	147.31
25-Sep-2003 15:32:00.000 CDT	1,316.40	3.04	2.77	2.51	4.26	4.4	4.39	69.56	266.77	147.3
25-Sep-2003 15:33:00.000 CDT	1,315.00	3.05	2.73	2.5	4.26	4.46	4.28	69.56	266.77	147.3
25-Sep-2003 15:34:00.000 CDT	1,313.61	3.02	2.7	2.46	4.3	4.5	4.31	69.55	266.77	147.3
25-Sep-2003 15:35:00.000 CDT	1,313.26	2.95	2.79	2.49	4.3	4.47	4.39	69.55	266.78	147.3
25-Sep-2003 15:36:00.000 CDT	1,313.95	3	2.9	2.56	4.22	4.45	4.32	69.63	266.78	147.3
25-Sep-2003 15:37:00.000 CDT	1,314.65	3.12	2.84	2.58	4.14	4.42	4.21	69.79	266.78	147.3
25-Sep-2003 15:38:00.000 CDT	1,315.12	3.09	2.79	2.51	4.16	4.43	4.21	69.96	266.78	147.3
25-Sep-2003 15:39:00.000 CDT	1,315.38	2.99	2.82	2.55	4.18	4.44	4.31	69.93	266.79	147.3
25-Sep-2003 15:40:00.000 CDT	1,315.64	2.96	2.81	2.62	4.2	4.5	4.42	69.71	266.79	147.3
25-Sep-2003 15:41:00.000 CDT	1,315.90	2.94	2.81	2.62	4.15	4.53	4.32	69.49	266.79	147.3
25-Sep-2003 15:42:00.000 CDT	1,315.14	2.93	2.86	2.62	4.09	4.4	4.12	69.42	266.79	147.3
25-Sep-2003 15:43:00.000 CDT	1,313.37	2.98	2.83	2.6	4.09	4.34	4.21	69.51	266.8	147.29
25-Sep-2003 15:44:00.000 CDT	1,311.59	3.03	2.79	2.56	4.09	4.37	4.33	69.59	266.8	147.29
25-Sep-2003 15:45:00.000 CDT	1,312.38	3.03	2.81	2.52	4.18	4.45	4.28	69.5	266.8	147.29
25-Sep-2003 15:46:00.000 CDT	1,315.73	2.99	2.83	2.53	4.26	4.46	4.25	69.47	266.8	147.29
25-Sep-2003 15:47:00.000 CDT	1,316.37	3.01	2.81	2.54	4.23	4.47	4.31	69.65	266.81	147.29
25-Sep-2003 15:48:00.000 CDT	1,314.28	3.11	2.92	2.51	4.22	4.48	4.44	69.84	266.81	147.29
25-Sep-2003 15:49:00.000 CDT	1,312.19	3.1	2.95	2.6	4.24	4.47	4.45	69.93	266.81	147.29
25-Sep-2003 15:50:00.000 CDT	1,312.70	2.98	2.86	2.66	4.26	4.57	4.42	69.92	266.81	147.29
25-Sep-2003 15:51:00.000 CDT	1,315.80	2.94	2.87	2.56	4.28	4.62	4.35	69.9	266.81	147.29
25-Sep-2003 15:52:00.000 CDT	1,316.52	3.06	2.88	2.49	4.34	4.62	4.24	69.89	266.82	147.29
25-Sep-2003 15:53:00.000 CDT	1,314.83	3.15	2.85	2.54	4.34	4.58	4.21	69.88	266.82	147.29

TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 (%)	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)	CUS-127: (CU:U2) F287001C - 2C ABS SLUR FEED FLOW (GPM)
25-Sep-2003 15:54:00.000 CDT	1,313.15	3.11	2.82	2.6	4.24	4.57	4.17	69.87	266.82	147.29
25-Sep-2003 15:55:00.000 CDT	1,312.66	3.08	2.84	2.57	4.15	4.58	4.28	69.86	266.82	147.28
25-Sep-2003 15:56:00.000 CDT	1,313.37	3.07	2.85	2.53	4.12	4.51	4.34	69.85	266.83	147.28
25-Sep-2003 15:57:00.000 CDT	1,314.07	3.1	2.87	2.55	4.17	4.44	4.21	69.83	266.83	147.28
25-Sep-2003 15:58:00.000 CDT	1,313.34	3.03	2.89	2.64	4.22	4.46	4.23	69.83	266.83	147.28
25-Sep-2003 15:59:00.000 CDT	1,311.20	2.97	2.91	2.64	4.27	4.57	4.39	69.85	266.83	147.28
25-Sep-2003 16:00:00.000 CDT	1,312.57	3.01	2.89	2.56	4.29	4.58	4.46	69.77	266.84	147.28
25-Sep-2003 16:01:00.000 CDT	1,317.46	3.05	2.83	2.58	4.19	4.49	4.35	69.62	266.84	147.28
25-Sep-2003 16:02:00.000 CDT	1,317.54	3.11	2.77	2.58	4.1	4.39	4.18	69.74	266.84	147.28
25-Sep-2003 16:03:00.000 CDT	1,312.80	3.18	2.88	2.61	4.15	4.4	4.23	70.13	266.84	147.28
25-Sep-2003 16:04:00.000 CDT	1,310.97	3.18	2.98	2.69	4.18	4.51	4.41	70.28	266.85	147.28
25-Sep-2003 16:05:00.000 CDT	1,312.04	3.12	2.98	2.59	4.15	4.49	4.39	70.19	266.85	147.28
25-Sep-2003 16:06:00.000 CDT	1,313.11	3.12	3.02	2.56	4.12	4.43	4.27	70.1	266.85	147.28
25-Sep-2003 16:07:00.000 CDT	1,314.18	3.13	2.96	2.65	4.18	4.46	4.16	70.02	266.85	147.27
25-Sep-2003 16:08:00.000 CDT	1,315.25	3.1	2.96	2.69	4.19	4.48	4.13	69.93	266.86	147.27
25-Sep-2003 16:09:00.000 CDT	1,313.51	3.16	3.01	2.69	4.21	4.53	4.21	69.77	266.86	147.27
25-Sep-2003 16:10:00.000 CDT	1,313.21	3.24	3.01	2.65	4.28	4.61	4.37	69.56	266.86	147.27
25-Sep-2003 16:11:00.000 CDT	1,317.14	3.26	3.08	2.58	4.24	4.63	4.45	69.34	266.86	147.27
25-Sep-2003 16:12:00.000 CDT	1,321.07	3.27	3.06	2.51	4.2	4.61	4.49	69.13	266.87	147.27
25-Sep-2003 16:13:00.000 CDT	1,321.67	3.34	3.04	2.61	4.19	4.59	4.45	69.32	266.87	147.27
25-Sep-2003 16:14:00.000 CDT	1,318.94	3.38	3.1	2.73	4.19	4.58	4.32	69.5	266.87	147.27
25-Sep-2003 16:15:00.000 CDT	1,316.21	3.36	3.13	2.7	4.2	4.59	4.35	69.26	266.87	147.27
25-Sep-2003 16:16:00.000 CDT	1,314.99	3.41	3.14	2.6	4.24	4.6	4.43	69.02	266.88	147.27
25-Sep-2003 16:17:00.000 CDT	1,315.27	3.47	3.15	2.52	4.28	4.61	4.44	69.07	266.88	147.27
25-Sep-2003 16:18:00.000 CDT	1,315.55	3.39	3.1	2.52	4.28	4.6	4.43	69.41	266.88	147.26
25-Sep-2003 16:19:00.000 CDT	1,315.83	3.25	3.07	2.57	4.19	4.5	4.46	69.58	266.88	147.26
25-Sep-2003 16:20:00.000 CDT	1,316.11	3.28	3.13	2.59	4.13	4.42	4.41	69.57	266.89	147.26
25-Sep-2003 16:21:00.000 CDT	1,316.39	3.38	3.14	2.59	4.15	4.46	4.38	69.56	266.89	147.26
25-Sep-2003 16:22:00.000 CDT	1,316.67	3.37	3.09	2.64	4.13	4.55	4.39	69.55	266.89	147.26
25-Sep-2003 16:23:00.000 CDT	1,317.04	3.35	3.04	2.64	4.12	4.59	4.43	69.54	266.89	147.26
25-Sep-2003 16:24:00.000 CDT	1,317.49	3.34	2.99	2.57	4.17	4.57	4.43	69.52	266.89	147.26
25-Sep-2003 16:25:00.000 CDT	1,317.93	3.33	2.94	2.55	4.19	4.59	4.34	69.51	266.9	147.26
25-Sep-2003 16:26:00.000 CDT	1,318.11	3.3	2.93	2.57	4.18	4.58	4.32	69.5	266.9	147.26
25-Sep-2003 16:27:00.000 CDT	1,318.01	3.18	2.99	2.6	4.17	4.58	4.3	69.48	266.9	147.26
25-Sep-2003 16:28:00.000 CDT	1,317.91	3.17	3.01	2.62	4.17	4.52	4.32	69.47	266.9	147.26
25-Sep-2003 16:29:00.000 CDT	1,317.81	3.28	3	2.58	4.16	4.43	4.32	69.46	266.91	147.26
25-Sep-2003 16:30:00.000 CDT	1,317.58	3.35	3	2.47	4.15	4.45	4.24	69.44	266.91	147.25
25-Sep-2003 16:31:00.000 CDT	1,317.24	3.42	2.92	2.43	4.13	4.44	4.29	69.43	266.91	147.25
25-Sep-2003 16:32:00.000 CDT	1,316.89	3.4	2.88	2.49	4.11	4.45	4.4	69.41	266.91	147.25
25-Sep-2003 16:33:00.000 CDT	1,316.55	3.37	2.89	2.58	4.14	4.47	4.4	69.4	266.92	147.25
25-Sep-2003 16:34:00.000 CDT	1,316.20	3.34	2.9	2.58	4.14	4.44	4.34	69.39	266.92	147.25
25-Sep-2003 16:35:00.000 CDT	1,315.85	3.37	2.97	2.54	4.13	4.41	4.29	69.37	266.92	147.25
25-Sep-2003 16:36:00.000 CDT	1,315.51	3.46	3.04	2.55	4.19	4.45	4.31	69.39	266.92	147.25
25-Sep-2003 16:37:00.000 CDT	1,315.16	3.46	3.04	2.63	4.25	4.44	4.3	69.44	266.93	147.25
25-Sep-2003 16:38:00.000 CDT	1,314.81	3.43	3.04	2.67	4.25	4.33	4.15	69.49	266.93	147.25
25-Sep-2003 16:39:00.000 CDT	1,314.47	3.41	3.04	2.6	4.17	4.3	4.13	69.54	266.93	147.25
25-Sep-2003 16:40:00.000 CDT	1,314.12	3.4	3.05	2.53	4.09	4.36	4.24	69.51	266.93	147.25
25-Sep-2003 16:41:00.000 CDT	1,315.04	3.35	3.05	2.55	4.15	4.42	4.36	69.4	266.94	147.25
25-Sep-2003 16:42:00.000 CDT	1,317.23	3.33	3.05	2.61	4.28	4.47	4.37	69.36	266.94	147.24
25-Sep-2003 16:43:00.000 CDT	1,315.49	3.36	3.05	2.61	4.26	4.45	4.33	69.38	266.94	147.24
25-Sep-2003 16:44:00.000 CDT	1,312.86	3.43	3.09	2.62	4.15	4.39	4.32	69.41	266.94	147.24
25-Sep-2003 16:45:00.000 CDT	1,313.26	3.4	3.05	2.55	4.11	4.38	4.25	69.44	266.95	147.24
25-Sep-2003 16:46:00.000 CDT	1,313.65	3.44	3.01	2.51	4.13	4.37	4.26	69.46	266.95	147.24
25-Sep-2003 16:47:00.000 CDT	1,314.04	3.48	3.05	2.53	4.15	4.37	4.43	69.49	266.95	147.24

TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 (%)	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)	CUS-127: (CU:U2) F287001C - 2C ABS SLUR FEED FLOW (GPM)
25-Sep-2003 16:48:00.000 CDT	1,314.44	3.44	3.03	2.5	4.15	4.41	4.52	69.52	266.95	147.24
25-Sep-2003 16:49:00.000 CDT	1,314.83	3.44	2.97	2.48	4.13	4.44	4.46	69.54	266.96	147.24
25-Sep-2003 16:50:00.000 CDT	1,315.23	3.45	2.9	2.54	4.1	4.47	4.31	69.57	266.96	147.24
25-Sep-2003 16:51:00.000 CDT	1,315.62	3.46	2.88	2.61	4.13	4.5	4.24	69.59	266.96	147.24
25-Sep-2003 16:52:00.000 CDT	1,316.01	3.43	2.92	2.58	4.15	4.46	4.33	69.62	266.96	147.24
25-Sep-2003 16:53:00.000 CDT	1,316.41	3.46	2.95	2.5	4.11	4.41	4.4	69.64	266.97	147.23
25-Sep-2003 16:54:00.000 CDT	1,316.80	3.5	2.99	2.42	4.14	4.41	4.36	69.67	266.97	147.23
25-Sep-2003 16:55:00.000 CDT	1,317.20	3.46	3.02	2.48	4.17	4.42	4.39	69.67	266.97	147.23
25-Sep-2003 16:56:00.000 CDT	1,317.59	3.47	3.02	2.55	4.13	4.42	4.37	69.65	266.97	147.23
25-Sep-2003 16:57:00.000 CDT	1,317.98	3.44	2.98	2.57	4.14	4.48	4.36	69.63	266.97	147.23
25-Sep-2003 16:58:00.000 CDT	1,317.39	3.42	2.94	2.53	4.16	4.41	4.31	69.61	266.98	147.23
25-Sep-2003 16:59:00.000 CDT	1,315.81	3.46	2.88	2.5	4.12	4.36	4.22	69.58	266.98	147.23
25-Sep-2003 17:00:00.000 CDT	1,315.76	3.46	2.9	2.53	4.08	4.38	4.3	69.56	266.98	147.23
25-Sep-2003 17:01:00.000 CDT	1,317.30	3.46	2.94	2.57	4.07	4.46	4.42	69.54	266.98	147.23
25-Sep-2003 17:02:00.000 CDT	1,318.83	3.39	2.99	2.6	4.18	4.5	4.42	69.52	266.99	147.23
25-Sep-2003 17:03:00.000 CDT	1,315.93	3.36	3.05	2.68	4.3	4.48	4.34	69.52	266.99	147.23
25-Sep-2003 17:04:00.000 CDT	1,312.78	3.46	3.05	2.71	4.21	4.51	4.31	69.53	266.99	147.23
25-Sep-2003 17:05:00.000 CDT	1,313.81	3.47	3.04	2.66	4.05	4.33	4.22	69.55	266.99	147.22
25-Sep-2003 17:06:00.000 CDT	1,314.84	3.45	3.04	2.6	4.02	4.29	4.23	69.57	267	147.22
25-Sep-2003 17:07:00.000 CDT	1,315.87	3.49	3.04	2.55	4.07	4.47	4.37	69.59	267	147.22
25-Sep-2003 17:08:00.000 CDT	1,316.89	3.53	3.01	2.49	4.1	4.52	4.46	69.6	267	147.22
25-Sep-2003 17:09:00.000 CDT	1,317.27	3.52	2.95	2.44	4.1	4.46	4.44	69.52	267	147.22
25-Sep-2003 17:10:00.000 CDT	1,316.98	3.46	2.92	2.4	4.1	4.4	4.33	69.35	267.01	147.22
25-Sep-2003 17:11:00.000 CDT	1,316.70	3.46	2.86	2.37	4.1	4.42	4.3	69.18	267.01	147.22
25-Sep-2003 17:12:00.000 CDT	1,316.42	3.51	2.73	2.43	4.19	4.43	4.29	69.01	267.01	147.22
25-Sep-2003 17:13:00.000 CDT	1,316.32	3.61	2.73	2.49	4.23	4.45	4.34	68.9	267.01	147.22
25-Sep-2003 17:14:00.000 CDT	1,316.39	3.65	2.75	2.58	4.24	4.52	4.44	68.86	267.02	147.22
25-Sep-2003 17:15:00.000 CDT	1,316.46	3.59	2.67	2.62	4.27	4.51	4.46	68.82	267.02	147.22
25-Sep-2003 17:16:00.000 CDT	1,316.53	3.53	2.67	2.65	4.29	4.47	4.45	68.78	267.02	147.22
25-Sep-2003 17:17:00.000 CDT	1,312.78	3.54	2.74	2.75	4.35	4.45	4.36	69.27	267.02	147.21
25-Sep-2003 17:18:00.000 CDT	1,310.47	3.62	2.81	2.72	4.36	4.52	4.34	69.72	267.03	147.21
25-Sep-2003 17:19:00.000 CDT	1,313.43	3.7	2.88	2.71	4.37	4.59	4.41	69.62	267.03	147.21
25-Sep-2003 17:20:00.000 CDT	1,313.45	3.75	2.85	2.83	4.33	4.52	4.41	69.52	267.03	147.21
25-Sep-2003 17:21:00.000 CDT	1,313.81	3.67	2.81	2.87	4.35	4.52	4.49	69.41	267.03	147.21
25-Sep-2003 17:22:00.000 CDT	1,317.47	3.58	2.79	2.76	4.33	4.5	4.53	69.44	267.04	147.21
25-Sep-2003 17:23:00.000 CDT	1,317.28	3.59	2.8	2.63	4.25	4.53	4.44	69.59	267.04	147.21
25-Sep-2003 17:24:00.000 CDT	1,313.27	3.69	2.77	2.58	4.27	4.57	4.45	69.74	267.04	147.21
25-Sep-2003 17:25:00.000 CDT	1,313.68	3.76	2.74	2.62	4.29	4.5	4.46	69.59	267.04	147.21
25-Sep-2003 17:26:00.000 CDT	1,318.53	3.7	2.77	2.61	4.22	4.43	4.44	69.15	267.05	147.21
25-Sep-2003 17:27:00.000 CDT	1,319.11	3.68	2.74	2.6	4.17	4.39	4.38	69.03	267.05	147.21
25-Sep-2003 17:28:00.000 CDT	1,315.43	3.64	2.75	2.68	4.25	4.39	4.32	69.22	267.05	147.21
25-Sep-2003 17:29:00.000 CDT	1,311.74	3.63	2.8	2.75	4.39	4.51	4.36	69.41	267.05	147.2
25-Sep-2003 17:30:00.000 CDT	1,310.87	3.62	2.82	2.76	4.44	4.61	4.4	69.53	267.05	147.2
25-Sep-2003 17:31:00.000 CDT	1,312.79	3.59	2.85	2.72	4.35	4.59	4.54	69.57	267.06	147.2
25-Sep-2003 17:32:00.000 CDT	1,314.72	3.6	2.88	2.72	4.33	4.57	4.59	69.6	267.06	147.2
25-Sep-2003 17:33:00.000 CDT	1,316.65	3.62	2.84	2.71	4.34	4.58	4.47	69.64	267.06	147.2
25-Sep-2003 17:34:00.000 CDT	1,315.37	3.64	2.8	2.65	4.27	4.51	4.34	69.6	267.06	147.2
25-Sep-2003 17:35:00.000 CDT	1,310.88	3.6	2.78	2.59	4.27	4.49	4.25	69.49	267.07	147.2
25-Sep-2003 17:36:00.000 CDT	1,310.71	3.58	2.77	2.54	4.26	4.48	4.12	69.28	267.07	147.2
25-Sep-2003 17:37:00.000 CDT	1,314.86	3.58	2.71	2.48	4.2	4.4	4.2	68.96	267.07	147.2
25-Sep-2003 17:38:00.000 CDT	1,319.00	3.53	2.69	2.46	4.14	4.41	4.37	68.94	267.07	147.2
25-Sep-2003 17:39:00.000 CDT	1,318.75	3.57	2.78	2.59	4.2	4.52	4.33	69.24	267.08	147.2
25-Sep-2003 17:40:00.000 CDT	1,314.09	3.69	2.84	2.67	4.29	4.56	4.3	69.36	267.08	147.19
25-Sep-2003 17:41:00.000 CDT	1,312.16	3.76	2.89	2.64	4.23	4.53	4.34	69.3	267.08	147.19

TimeTag	22JI–57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 (%)	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)	CUS-127: (CU:U2) F287001C - 2C ABS SLUR FEED FLOW (GPM)
25-Sep-2003 17:42:00.000 CDT	1,312.94	3.73	2.94	2.67	4.23	4.54	4.29	69.24	267.08	147.19
25-Sep-2003 17:43:00.000 CDT	1,313.72	3.68	2.94	2.7	4.32	4.49	4.22	69.28	267.09	147.19
25-Sep-2003 17:44:00.000 CDT	1,314.50	3.69	2.87	2.68	4.36	4.44	4.29	69.42	267.09	147.19
25-Sep-2003 17:45:00.000 CDT	1,315.29	3.7	2.9	2.6	4.41	4.51	4.3	69.25	267.09	147.19
25-Sep-2003 17:46:00.000 CDT	1,313.99	3.71	3.01	2.62	4.46	4.61	4.25	69.24	267.09	147.19
25-Sep-2003 17:47:00.000 CDT	1,310.61	3.72	2.96	2.72	4.44	4.61	4.34	69.29	267.1	147.19
25-Sep-2003 17:48:00.000 CDT	1,310.47	3.76	2.85	2.71	4.4	4.62	4.44	68.92	267.1	147.19
25-Sep-2003 17:49:00.000 CDT	1,313.56	3.76	2.81	2.69	4.42	4.58	4.42	69.07	267.1	147.19
25-Sep-2003 17:50:00.000 CDT	1,314.67	3.69	2.87	2.68	4.44	4.57	4.35	69.43	267.1	147.19
25-Sep-2003 17:51:00.000 CDT	1,313.81	3.73	3.01	2.63	4.42	4.61	4.37	69.48	267.11	147.19
25-Sep-2003 17:52:00.000 CDT	1,312.95	3.77	2.96	2.66	4.41	4.59	4.35	69.2	267.11	147.18
25-Sep-2003 17:53:00.000 CDT	1,312.08	3.67	2.85	2.67	4.38	4.58	4.27	68.95	267.11	147.18
25-Sep-2003 17:54:00.000 CDT	1,312.74	3.58	2.84	2.65	4.34	4.61	4.42	69.06	267.11	147.18
25-Sep-2003 17:55:00.000 CDT	1,314.92	3.62	2.84	2.67	4.36	4.59	4.39	69.16	267.12	147.18
25-Sep-2003 17:56:00.000 CDT	1,314.30	3.8	2.84	2.73	4.37	4.57	4.33	69.51	267.12	147.18
25-Sep-2003 17:57:00.000 CDT	1,310.89	3.89	2.88	2.79	4.43	4.61	4.49	69.8	267.12	147.18
25-Sep-2003 17:58:00.000 CDT	1,309.73	3.84	2.91	2.88	4.44	4.6	4.54	69.79	267.12	147.18
25-Sep-2003 17:59:00.000 CDT	1,310.83	3.78	2.87	2.71	4.35	4.55	4.41	69.77	267.13	147.18
25-Sep-2003 18:00:00.000 CDT	1,311.92	3.78	2.91	2.54	4.3	4.49	4.36	69.75	267.13	147.18

TimeTag	22JI–57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI–49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI–49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI–49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI–49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI–49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI–49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
25-Sep-2003 15:16:00.000 CDT	1,311.64	3.02	2.76	2.47	4.12	4.41	4.23	69.83	351.12	266.73
25-Sep-2003 15:17:00.000 CDT	1,315.58	2.97	2.81	2.44	4.12	4.35	4.11	69.82	351.12	266.73
25-Sep-2003 15:18:00.000 CDT	1,317.30	3.04	2.9	2.51	4.11	4.3	4.09	69.79	351.12	266.73
25-Sep-2003 15:19:00.000 CDT	1,316.79	3.06	2.86	2.58	4.11	4.31	4.01	69.77	351.12	266.74
25-Sep-2003 15:20:00.000 CDT	1,316.29	3.03	2.79	2.56	4.1	4.32	4.14	69.74	351.12	266.74
25-Sep-2003 15:21:00.000 CDT	1,315.78	3.01	2.78	2.58	4.15	4.43	4.33	69.72	351.12	266.74
25-Sep-2003 15:22:00.000 CDT	1,315.27	2.99	2.82	2.56	4.17	4.47	4.3	69.69	351.12	266.74
25-Sep-2003 15:23:00.000 CDT	1,314.77	3	2.81	2.48	4.11	4.35	4.2	69.67	351.12	266.75
25-Sep-2003 15:24:00.000 CDT	1,314.26	2.97	2.8	2.54	4.06	4.31	4.15	69.68	351.12	266.75
25-Sep-2003 15:25:00.000 CDT	1,313.75	2.92	2.79	2.57	4.04	4.33	4.21	69.72	351.12	266.75
25-Sep-2003 15:26:00.000 CDT	1,313.24	2.94	2.79	2.48	4.05	4.36	4.18	69.76	351.12	266.75
25-Sep-2003 15:27:00.000 CDT	1,313.40	2.96	2.8	2.45	4.11	4.38	4.25	69.8	351.12	266.76
25-Sep-2003 15:28:00.000 CDT	1,314.22	2.98	2.8	2.48	4.16	4.46	4.43	69.76	351.12	266.76
25-Sep-2003 15:29:00.000 CDT	1,315.04	3	2.77	2.49	4.17	4.49	4.38	69.63	351.12	266.76
25-Sep-2003 15:30:00.000 CDT	1,315.87	3.02	2.77	2.44	4.12	4.42	4.31	69.57	351.12	266.76
25-Sep-2003 15:31:00.000 CDT	1,316.69	3.04	2.8	2.45	4.2	4.39	4.4	69.56	351.12	266.77
25-Sep-2003 15:32:00.000 CDT	1,316.40	3.04	2.77	2.51	4.26	4.4	4.39	69.56	351.12	266.77
25-Sep-2003 15:33:00.000 CDT	1,315.00	3.05	2.73	2.5	4.26	4.46	4.28	69.56	351.12	266.77
25-Sep-2003 15:34:00.000 CDT	1,313.61	3.02	2.7	2.46	4.3	4.5	4.31	69.55	351.12	266.77
25-Sep-2003 15:35:00.000 CDT	1,313.26	2.95	2.79	2.49	4.3	4.47	4.39	69.55	351.12	266.78
25-Sep-2003 15:36:00.000 CDT	1,313.95	3	2.9	2.56	4.22	4.45	4.32	69.63	351.12	266.78
25-Sep-2003 15:37:00.000 CDT	1,314.65	3.12	2.84	2.58	4.14	4.42	4.21	69.79	351.12	266.78
25-Sep-2003 15:38:00.000 CDT	1,315.12	3.09	2.79	2.51	4.16	4.43	4.21	69.96	351.12	266.78
25-Sep-2003 15:39:00.000 CDT	1,315.38	2.99	2.82	2.55	4.18	4.44	4.31	69.93	351.12	266.79
25-Sep-2003 15:40:00.000 CDT	1,315.64	2.96	2.81	2.62	4.2	4.5	4.42	69.71	351.12	266.79
25-Sep-2003 15:41:00.000 CDT	1,315.90	2.94	2.81	2.62	4.15	4.53	4.32	69.49	351.12	266.79
25-Sep-2003 15:42:00.000 CDT	1,315.14	2.93	2.86	2.62	4.09	4.4	4.12	69.42	351.12	266.79
25-Sep-2003 15:43:00.000 CDT	1,313.37	2.98	2.83	2.6	4.09	4.34	4.21	69.51	351.12	266.8
25-Sep-2003 15:44:00.000 CDT	1,311.59	3.03	2.79	2.56	4.09	4.37	4.33	69.59	351.12	266.8
25-Sep-2003 15:45:00.000 CDT	1,312.38	3.03	2.81	2.52	4.18	4.45	4.28	69.5	351.12	266.8
25-Sep-2003 15:46:00.000 CDT	1,315.73	2.99	2.83	2.53	4.26	4.46	4.25	69.47	351.12	266.8
25-Sep-2003 15:47:00.000 CDT	1,316.37	3.01	2.81	2.54	4.23	4.47	4.31	69.65	351.13	266.81
25-Sep-2003 15:48:00.000 CDT	1,314.28	3.11	2.92	2.51	4.22	4.48	4.44	69.84	351.13	266.81
25-Sep-2003 15:49:00.000 CDT	1,312.19	3.1	2.95	2.6	4.24	4.47	4.45	69.93	351.13	266.81
25-Sep-2003 15:50:00.000 CDT	1,312.70	2.98	2.86	2.66	4.26	4.57	4.42	69.92	351.13	266.81
25-Sep-2003 15:51:00.000 CDT	1,315.80	2.94	2.87	2.56	4.28	4.62	4.35	69.9	351.13	266.81
25-Sep-2003 15:52:00.000 CDT	1,316.52	3.06	2.88	2.49	4.34	4.62	4.24	69.89	351.13	266.82
25-Sep-2003 15:53:00.000 CDT	1,314.83	3.15	2.85	2.54	4.34	4.58	4.21	69.88	351.13	266.82
25-Sep-2003 15:54:00.000 CDT	1,313.15	3.11	2.82	2.6	4.24	4.57	4.17	69.87	351.13	266.82
25-Sep-2003 15:55:00.000 CDT	1,312.66	3.08	2.84	2.57	4.15	4.58	4.28	69.86	351.13	266.82
25-Sep-2003 15:56:00.000 CDT	1,313.37	3.07	2.85	2.53	4.12	4.51	4.34	69.85	351.13	266.83
25-Sep-2003 15:57:00.000 CDT	1,314.07	3.1	2.87	2.55	4.17	4.44	4.21	69.83	351.13	266.83
25-Sep-2003 15:58:00.000 CDT	1,313.34	3.03	2.89	2.64	4.22	4.46	4.23	69.83	351.13	266.83
25-Sep-2003 15:59:00.000 CDT	1,311.20	2.97	2.91	2.64	4.27	4.57	4.39	69.85	351.13	266.83
25-Sep-2003 16:00:00.000 CDT	1,312.57	3.01	2.89	2.56	4.29	4.58	4.46	69.77	351.13	266.84
25-Sep-2003 16:01:00.000 CDT	1,317.46	3.05	2.83	2.58	4.19	4.49	4.35	69.62	351.13	266.84
25-Sep-2003 16:02:00.000 CDT	1,317.54	3.11	2.77	2.58	4.1	4.39	4.18	69.74	351.13	266.84
25-Sep-2003 16:03:00.000 CDT	1,312.80	3.18	2.88	2.61	4.15	4.4	4.23	70.13	351.13	266.84
25-Sep-2003 16:04:00.000 CDT	1,310.97	3.18	2.98	2.69	4.18	4.51	4.41	70.28	351.13	266.85
25-Sep-2003 16:05:00.000 CDT	1,312.04	3.12	2.98	2.59	4.15	4.49	4.39	70.19	351.13	266.85
25-Sep-2003 16:06:00.000 CDT	1,313.11	3.12	3.02	2.56	4.12	4.43	4.27	70.1	351.13	266.85
25-Sep-2003 16:07:00.000 CDT	1,314.18	3.13	2.96	2.65	4.18	4.46	4.16	70.02	351.13	266.85
25-Sep-2003 16:08:00.000 CDT	1,315.25	3.1	2.96	2.69	4.19	4.48	4.13	69.93	351.13	266.86
25-Sep-2003 16:09:00.000 CDT	1,313.51	3.16	3.01	2.69	4.21	4.53	4.21	69.77	351.13	266.86
25-Sep-2003 16:10:00.000 CDT	1,313.21	3.24	3.01	2.65	4.28	4.61	4.37	69.56	351.13	266.86

TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
25-Sep-2003 16:11:00.000 CDT	1,317.14	3.26	3.08	2.58	4.24	4.63	4.45	69.34	351.13	266.86
25-Sep-2003 16:12:00.000 CDT	1,321.07	3.27	3.06	2.51	4.2	4.61	4.49	69.13	351.13	266.87
25-Sep-2003 16:13:00.000 CDT	1,321.67	3.34	3.04	2.61	4.19	4.59	4.45	69.32	351.13	266.87
25-Sep-2003 16:14:00.000 CDT	1,318.94	3.38	3.1	2.73	4.19	4.58	4.32	69.5	351.13	266.87
25-Sep-2003 16:15:00.000 CDT	1,316.21	3.36	3.13	2.7	4.2	4.59	4.35	69.26	351.13	266.87
25-Sep-2003 16:16:00.000 CDT	1,314.99	3.41	3.14	2.6	4.24	4.6	4.43	69.02	351.13	266.88
25-Sep-2003 16:17:00.000 CDT	1,315.27	3.47	3.15	2.52	4.28	4.61	4.44	69.07	351.13	266.88
25-Sep-2003 16:18:00.000 CDT	1,315.55	3.39	3.1	2.52	4.28	4.6	4.43	69.41	351.13	266.88
25-Sep-2003 16:19:00.000 CDT	1,315.83	3.25	3.07	2.57	4.19	4.5	4.46	69.58	351.13	266.88
25-Sep-2003 16:20:00.000 CDT	1,316.11	3.28	3.13	2.59	4.13	4.42	4.41	69.57	351.13	266.89
25-Sep-2003 16:21:00.000 CDT	1,316.39	3.38	3.14	2.59	4.15	4.46	4.38	69.56	351.13	266.89
25-Sep-2003 16:22:00.000 CDT	1,316.67	3.37	3.09	2.64	4.13	4.55	4.39	69.55	351.13	266.89
25-Sep-2003 16:23:00.000 CDT	1,317.04	3.35	3.04	2.64	4.12	4.59	4.43	69.54	351.13	266.89
25-Sep-2003 16:24:00.000 CDT	1,317.49	3.34	2.99	2.57	4.17	4.57	4.43	69.52	351.13	266.89
25-Sep-2003 16:25:00.000 CDT	1,317.93	3.33	2.94	2.55	4.19	4.59	4.34	69.51	351.13	266.9
25-Sep-2003 16:26:00.000 CDT	1,318.11	3.3	2.93	2.57	4.18	4.58	4.32	69.5	351.13	266.9
25-Sep-2003 16:27:00.000 CDT	1,318.01	3.18	2.99	2.6	4.17	4.58	4.3	69.48	351.13	266.9
25-Sep-2003 16:28:00.000 CDT	1,317.91	3.17	3.01	2.62	4.17	4.52	4.32	69.47	351.13	266.9
25-Sep-2003 16:29:00.000 CDT	1,317.81	3.28	3	2.58	4.16	4.43	4.32	69.46	351.13	266.91
25-Sep-2003 16:30:00.000 CDT	1,317.58	3.35	3	2.47	4.15	4.45	4.24	69.44	351.13	266.91
25-Sep-2003 16:31:00.000 CDT	1,317.24	3.42	2.92	2.43	4.13	4.44	4.29	69.43	351.13	266.91
25-Sep-2003 16:32:00.000 CDT	1,316.89	3.4	2.88	2.49	4.11	4.45	4.4	69.41	351.13	266.91
25-Sep-2003 16:33:00.000 CDT	1,316.55	3.37	2.89	2.58	4.14	4.47	4.4	69.4	351.13	266.92
25-Sep-2003 16:34:00.000 CDT	1,316.20	3.34	2.9	2.58	4.14	4.44	4.34	69.39	351.13	266.92
25-Sep-2003 16:35:00.000 CDT	1,315.85	3.37	2.97	2.54	4.13	4.41	4.29	69.37	351.13	266.92
25-Sep-2003 16:36:00.000 CDT	1,315.51	3.46	3.04	2.55	4.19	4.45	4.31	69.39	351.13	266.92
25-Sep-2003 16:37:00.000 CDT	1,315.16	3.46	3.04	2.63	4.25	4.44	4.3	69.44	351.13	266.93
25-Sep-2003 16:38:00.000 CDT	1,314.81	3.43	3.04	2.67	4.25	4.33	4.15	69.49	351.13	266.93
25-Sep-2003 16:39:00.000 CDT	1,314.47	3.41	3.04	2.6	4.17	4.3	4.13	69.54	351.13	266.93
25-Sep-2003 16:40:00.000 CDT	1,314.12	3.4	3.05	2.53	4.09	4.36	4.24	69.51	351.13	266.93
25-Sep-2003 16:41:00.000 CDT	1,315.04	3.35	3.05	2.55	4.15	4.42	4.36	69.4	351.13	266.94
25-Sep-2003 16:42:00.000 CDT	1,317.23	3.33	3.05	2.61	4.28	4.47	4.37	69.36	351.13	266.94
25-Sep-2003 16:43:00.000 CDT	1,315.49	3.38	3.05	2.61	4.26	4.45	4.33	69.38	351.13	266.94
25-Sep-2003 16:44:00.000 CDT	1,312.86	3.43	3.09	2.62	4.15	4.39	4.32	69.41	351.13	266.94
25-Sep-2003 16:45:00.000 CDT	1,313.26	3.4	3.05	2.55	4.11	4.38	4.25	69.44	351.13	266.95
25-Sep-2003 16:46:00.000 CDT	1,313.65	3.44	3.01	2.51	4.13	4.37	4.26	69.46	351.13	266.95
25-Sep-2003 16:47:00.000 CDT	1,314.04	3.48	3.05	2.53	4.15	4.37	4.43	69.49	351.13	266.95
25-Sep-2003 16:48:00.000 CDT	1,314.44	3.44	3.03	2.5	4.15	4.41	4.52	69.52	351.13	266.95
25-Sep-2003 16:49:00.000 CDT	1,314.83	3.44	2.97	2.48	4.13	4.44	4.46	69.54	351.13	266.96
25-Sep-2003 16:50:00.000 CDT	1,315.23	3.45	2.9	2.54	4.1	4.47	4.31	69.57	351.13	266.96
25-Sep-2003 16:51:00.000 CDT	1,315.62	3.46	2.88	2.61	4.13	4.5	4.24	69.59	351.13	266.96
25-Sep-2003 16:52:00.000 CDT	1,316.01	3.43	2.92	2.58	4.15	4.46	4.33	69.62	351.13	266.96
25-Sep-2003 16:53:00.000 CDT	1,316.41	3.46	2.95	2.5	4.11	4.41	4.4	69.64	351.14	266.97
25-Sep-2003 16:54:00.000 CDT	1,316.80	3.5	2.99	2.42	4.14	4.41	4.36	69.67	351.14	266.97
25-Sep-2003 16:55:00.000 CDT	1,317.20	3.46	3.02	2.48	4.17	4.42	4.39	69.67	351.14	266.97
25-Sep-2003 16:56:00.000 CDT	1,317.59	3.47	3.02	2.55	4.13	4.42	4.37	69.65	351.14	266.97
25-Sep-2003 16:57:00.000 CDT	1,317.98	3.44	2.98	2.57	4.14	4.48	4.36	69.63	351.14	266.97
25-Sep-2003 16:58:00.000 CDT	1,317.39	3.42	2.94	2.53	4.16	4.41	4.31	69.61	351.14	266.98
25-Sep-2003 16:59:00.000 CDT	1,315.81	3.46	2.88	2.5	4.12	4.36	4.22	69.58	351.14	266.98
25-Sep-2003 17:00:00.000 CDT	1,315.78	3.46	2.9	2.53	4.08	4.38	4.3	69.56	351.14	266.98
25-Sep-2003 17:01:00.000 CDT	1,317.30	3.46	2.94	2.57	4.07	4.46	4.42	69.54	351.14	266.98
25-Sep-2003 17:02:00.000 CDT	1,318.83	3.39	2.99	2.6	4.18	4.5	4.42	69.52	351.14	266.99
25-Sep-2003 17:03:00.000 CDT	1,315.93	3.36	3.05	2.68	4.3	4.48	4.34	69.52	351.14	266.99
25-Sep-2003 17:04:00.000 CDT	1,312.78	3.46	3.05	2.71	4.21	4.51	4.31	69.53	351.14	266.99
25-Sep-2003 17:05:00.000 CDT	1,313.81	3.47	3.04	2.66	4.05	4.33	4.22	69.55	351.14	266.99

TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
25-Sep-2003 17:06:00.000 CDT	1,314.84	3.45	3.04	2.6	4.02	4.29	4.23	69.57	351.14	267
25-Sep-2003 17:07:00.000 CDT	1,315.87	3.49	3.04	2.55	4.07	4.47	4.37	69.59	351.14	267
25-Sep-2003 17:08:00.000 CDT	1,316.89	3.53	3.01	2.49	4.1	4.52	4.46	69.6	351.14	267
25-Sep-2003 17:09:00.000 CDT	1,317.27	3.52	2.95	2.44	4.1	4.46	4.44	69.52	351.14	267
25-Sep-2003 17:10:00.000 CDT	1,316.98	3.46	2.92	2.4	4.1	4.4	4.33	69.35	351.14	267.01
25-Sep-2003 17:11:00.000 CDT	1,316.70	3.46	2.86	2.37	4.1	4.42	4.3	69.18	351.14	267.01
25-Sep-2003 17:12:00.000 CDT	1,316.42	3.51	2.73	2.43	4.19	4.43	4.29	69.01	351.14	267.01
25-Sep-2003 17:13:00.000 CDT	1,316.32	3.61	2.73	2.49	4.23	4.45	4.34	68.9	351.14	267.01
25-Sep-2003 17:14:00.000 CDT	1,316.39	3.65	2.75	2.58	4.24	4.52	4.44	68.86	351.14	267.02
25-Sep-2003 17:15:00.000 CDT	1,316.46	3.59	2.67	2.62	4.27	4.51	4.46	68.82	351.14	267.02
25-Sep-2003 17:16:00.000 CDT	1,316.53	3.53	2.67	2.65	4.29	4.47	4.45	68.78	351.14	267.02
25-Sep-2003 17:17:00.000 CDT	1,312.78	3.54	2.74	2.75	4.35	4.45	4.36	69.27	351.14	267.02
25-Sep-2003 17:18:00.000 CDT	1,310.47	3.62	2.81	2.72	4.36	4.52	4.34	69.72	351.14	267.03
25-Sep-2003 17:19:00.000 CDT	1,313.43	3.7	2.88	2.71	4.37	4.59	4.41	69.62	351.14	267.03
25-Sep-2003 17:20:00.000 CDT	1,313.45	3.75	2.85	2.83	4.33	4.52	4.41	69.52	351.14	267.03
25-Sep-2003 17:21:00.000 CDT	1,313.81	3.67	2.81	2.87	4.35	4.52	4.49	69.41	351.14	267.03
25-Sep-2003 17:22:00.000 CDT	1,317.47	3.58	2.79	2.76	4.33	4.5	4.53	69.44	351.14	267.04
25-Sep-2003 17:23:00.000 CDT	1,317.28	3.59	2.8	2.63	4.25	4.53	4.44	69.59	351.14	267.04
25-Sep-2003 17:24:00.000 CDT	1,313.27	3.69	2.77	2.58	4.27	4.57	4.45	69.74	351.14	267.04
25-Sep-2003 17:25:00.000 CDT	1,313.68	3.76	2.74	2.62	4.29	4.5	4.46	69.59	351.14	267.04
25-Sep-2003 17:26:00.000 CDT	1,318.53	3.7	2.77	2.61	4.22	4.43	4.44	69.15	351.14	267.05
25-Sep-2003 17:27:00.000 CDT	1,319.11	3.68	2.74	2.6	4.17	4.39	4.38	69.03	351.14	267.05
25-Sep-2003 17:28:00.000 CDT	1,315.43	3.64	2.75	2.68	4.25	4.39	4.32	69.22	351.14	267.05
25-Sep-2003 17:29:00.000 CDT	1,311.74	3.63	2.8	2.75	4.39	4.51	4.36	69.41	351.14	267.05
25-Sep-2003 17:30:00.000 CDT	1,310.87	3.62	2.82	2.76	4.44	4.61	4.4	69.53	351.14	267.05
25-Sep-2003 17:31:00.000 CDT	1,312.79	3.59	2.85	2.72	4.35	4.59	4.54	69.57	351.14	267.06
25-Sep-2003 17:32:00.000 CDT	1,314.72	3.6	2.88	2.72	4.33	4.57	4.59	69.6	351.14	267.06
25-Sep-2003 17:33:00.000 CDT	1,316.65	3.62	2.84	2.71	4.34	4.58	4.47	69.64	351.14	267.06
25-Sep-2003 17:34:00.000 CDT	1,315.37	3.64	2.8	2.65	4.27	4.51	4.34	69.6	351.14	267.06
25-Sep-2003 17:35:00.000 CDT	1,310.88	3.6	2.78	2.59	4.27	4.49	4.25	69.49	351.14	267.07
25-Sep-2003 17:36:00.000 CDT	1,310.71	3.58	2.77	2.54	4.26	4.48	4.12	69.28	351.14	267.07
25-Sep-2003 17:37:00.000 CDT	1,314.86	3.58	2.71	2.48	4.2	4.4	4.2	68.96	351.14	267.07
25-Sep-2003 17:38:00.000 CDT	1,319.00	3.53	2.69	2.46	4.14	4.41	4.37	68.94	351.14	267.07
25-Sep-2003 17:39:00.000 CDT	1,318.75	3.57	2.78	2.59	4.2	4.52	4.33	69.24	351.14	267.08
25-Sep-2003 17:40:00.000 CDT	1,314.09	3.69	2.84	2.67	4.29	4.56	4.3	69.36	351.14	267.08
25-Sep-2003 17:41:00.000 CDT	1,312.16	3.76	2.89	2.64	4.23	4.53	4.34	69.3	351.14	267.08
25-Sep-2003 17:42:00.000 CDT	1,312.94	3.73	2.94	2.67	4.23	4.54	4.29	69.24	351.14	267.08
25-Sep-2003 17:43:00.000 CDT	1,313.72	3.68	2.94	2.7	4.32	4.49	4.22	69.28	351.14	267.09
25-Sep-2003 17:44:00.000 CDT	1,314.50	3.69	2.87	2.68	4.36	4.44	4.29	69.42	351.14	267.09
25-Sep-2003 17:45:00.000 CDT	1,315.29	3.7	2.9	2.6	4.41	4.51	4.3	69.25	351.14	267.09
25-Sep-2003 17:46:00.000 CDT	1,313.99	3.71	3.01	2.62	4.46	4.61	4.25	69.24	351.14	267.09
25-Sep-2003 17:47:00.000 CDT	1,310.61	3.72	2.96	2.72	4.44	4.61	4.34	69.29	351.14	267.1
25-Sep-2003 17:48:00.000 CDT	1,310.47	3.76	2.85	2.71	4.4	4.62	4.44	68.92	351.14	267.1
25-Sep-2003 17:49:00.000 CDT	1,313.56	3.76	2.81	2.69	4.42	4.58	4.42	69.07	351.14	267.1
25-Sep-2003 17:50:00.000 CDT	1,314.67	3.69	2.87	2.68	4.44	4.57	4.35	69.43	351.14	267.1
25-Sep-2003 17:51:00.000 CDT	1,313.81	3.73	3.01	2.63	4.42	4.61	4.37	69.48	351.14	267.11
25-Sep-2003 17:52:00.000 CDT	1,312.95	3.77	2.96	2.66	4.41	4.59	4.35	69.2	351.14	267.11
25-Sep-2003 17:53:00.000 CDT	1,312.08	3.67	2.85	2.67	4.38	4.58	4.27	68.95	351.14	267.11
25-Sep-2003 17:54:00.000 CDT	1,312.74	3.58	2.84	2.65	4.34	4.61	4.42	69.06	351.14	267.11
25-Sep-2003 17:55:00.000 CDT	1,314.92	3.62	2.84	2.67	4.36	4.59	4.39	69.16	351.14	267.12
25-Sep-2003 17:56:00.000 CDT	1,314.30	3.8	2.84	2.73	4.37	4.57	4.33	69.51	351.14	267.12
25-Sep-2003 17:57:00.000 CDT	1,310.89	3.69	2.86	2.79	4.43	4.61	4.49	69.8	351.14	267.12
25-Sep-2003 17:58:00.000 CDT	1,309.73	3.84	2.91	2.88	4.44	4.6	4.54	69.79	351.15	267.12

TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
26-Sep-2003 09:16:00.000 CDT	1,313.94	3.5	3.53	2.77	4.05	4.16	3.97	70.32	351.29	269.35
26-Sep-2003 09:17:00.000 CDT	1,313.49	3.43	3.51	2.79	4	4.13	3.85	70.2	351.29	269.35
26-Sep-2003 09:18:00.000 CDT	1,316.96	3.41	3.49	2.72	3.97	4.11	3.89	70.09	351.29	269.35
26-Sep-2003 09:19:00.000 CDT	1,317.44	3.44	3.49	2.76	4.08	4.15	3.95	69.97	351.29	269.35
26-Sep-2003 09:20:00.000 CDT	1,314.93	3.48	3.53	2.86	4.05	4.18	3.96	70.02	351.29	269.35
26-Sep-2003 09:21:00.000 CDT	1,312.42	3.46	3.54	2.83	3.95	4.15	3.92	70.23	351.29	269.36
26-Sep-2003 09:22:00.000 CDT	1,309.91	3.38	3.51	2.9	3.95	4.13	3.94	70.44	351.29	269.36
26-Sep-2003 09:23:00.000 CDT	1,310.38	3.36	3.49	2.9	3.94	4.1	4.14	70.56	351.29	269.36
26-Sep-2003 09:24:00.000 CDT	1,313.84	3.39	3.45	2.77	3.94	4.07	4.21	70.59	351.29	269.36
26-Sep-2003 09:25:00.000 CDT	1,317.29	3.31	3.4	2.64	3.94	4.09	4.06	70.62	351.29	269.37
26-Sep-2003 09:26:00.000 CDT	1,318.27	3.3	3.38	2.5	3.89	4.16	3.95	70.52	351.29	269.37
26-Sep-2003 09:27:00.000 CDT	1,316.76	3.42	3.39	2.74	3.89	4.21	3.93	70.29	351.29	269.37
26-Sep-2003 09:28:00.000 CDT	1,315.26	3.41	3.34	2.93	4.02	4.22	3.98	70.05	351.29	269.37
26-Sep-2003 09:29:00.000 CDT	1,313.76	3.32	3.22	2.77	4.12	4.24	4.05	69.96	351.29	269.38
26-Sep-2003 09:30:00.000 CDT	1,314.12	3.33	3.17	2.83	4.12	4.29	4.19	70.02	351.29	269.38
26-Sep-2003 09:31:00.000 CDT	1,316.35	3.42	3.18	2.8	4.05	4.26	4.18	70.07	351.29	269.38
26-Sep-2003 09:32:00.000 CDT	1,316.98	3.46	3.19	2.7	3.98	4.18	4.06	70.13	351.29	269.38
26-Sep-2003 09:33:00.000 CDT	1,316.01	3.44	3.25	2.68	3.97	4.19	3.99	70.18	351.29	269.39
26-Sep-2003 09:34:00.000 CDT	1,315.04	3.42	3.31	2.58	3.97	4.2	4.02	70.24	351.29	269.39
26-Sep-2003 09:35:00.000 CDT	1,314.90	3.41	3.31	2.49	4.04	4.2	4.03	70.29	351.29	269.39
26-Sep-2003 09:36:00.000 CDT	1,315.60	3.42	3.25	2.53	4.06	4.21	4.06	70.35	351.29	269.39
26-Sep-2003 09:37:00.000 CDT	1,315.45	3.38	3.21	2.62	3.95	4.21	4.11	70.4	351.29	269.4
26-Sep-2003 09:38:00.000 CDT	1,314.48	3.37	3.25	2.72	3.92	4.2	4.04	70.46	351.29	269.4
26-Sep-2003 09:39:00.000 CDT	1,313.50	3.42	3.26	2.57	3.9	4.17	4.1	70.08	351.29	269.4
26-Sep-2003 09:40:00.000 CDT	1,313.11	3.45	3.24	2.31	3.86	4.16	4.16	69.75	351.29	269.4
26-Sep-2003 09:41:00.000 CDT	1,313.29	3.43	3.22	2.47	3.88	4.18	4.07	69.88	351.29	269.41
26-Sep-2003 09:42:00.000 CDT	1,313.47	3.37	3.2	2.56	3.9	4.2	4.06	70.02	351.29	269.41
26-Sep-2003 09:43:00.000 CDT	1,313.65	3.35	3.19	2.48	3.96	4.22	4.11	70.16	351.29	269.41
26-Sep-2003 09:44:00.000 CDT	1,313.83	3.37	3.18	2.45	3.91	4.16	4.16	70.3	351.29	269.41
26-Sep-2003 09:45:00.000 CDT	1,314.01	3.38	3.18	2.49	3.87	4.12	4.16	70.44	351.29	269.42
26-Sep-2003 09:46:00.000 CDT	1,312.47	3.4	3.19	2.53	3.92	4.17	4.1	70.41	351.29	269.42
26-Sep-2003 09:47:00.000 CDT	1,314.76	3.37	3.19	2.56	3.91	4.14	4.05	70.23	351.29	269.42
26-Sep-2003 09:48:00.000 CDT	1,317.36	3.29	3.16	2.52	3.86	4.1	4	70.41	351.29	269.42
26-Sep-2003 09:49:00.000 CDT	1,314.74	3.26	3.2	2.44	3.81	4.11	4.05	70.5	351.29	269.43
26-Sep-2003 09:50:00.000 CDT	1,316.32	3.28	3.21	2.46	3.8	4.11	4.11	70.14	351.29	269.43
26-Sep-2003 09:51:00.000 CDT	1,316.68	3.3	3.16	2.47	3.82	4.11	3.95	69.91	351.3	269.43
26-Sep-2003 09:52:00.000 CDT	1,311.62	3.28	3.18	2.49	3.88	4.1	3.94	69.83	351.3	269.43
26-Sep-2003 09:53:00.000 CDT	1,311.05	3.26	3.16	2.5	3.9	4.13	4.06	69.64	351.3	269.43
26-Sep-2003 09:54:00.000 CDT	1,314.97	3.28	3.18	2.52	3.87	4.16	4.04	69.79	351.3	269.44
26-Sep-2003 09:55:00.000 CDT	1,318.89	3.3	3.19	2.54	3.85	4.13	3.96	70.37	351.3	269.44
26-Sep-2003 09:56:00.000 CDT	1,319.16	3.33	3.18	2.55	3.84	4.13	4.01	70.52	351.3	269.44
26-Sep-2003 09:57:00.000 CDT	1,315.79	3.35	3.22	2.57	3.86	4.17	4.03	70.26	351.3	269.44
26-Sep-2003 09:58:00.000 CDT	1,312.41	3.32	3.22	2.53	3.88	4.16	3.95	69.99	351.3	269.45
26-Sep-2003 09:59:00.000 CDT	1,312.95	3.23	3.18	2.49	3.87	4.09	3.88	69.73	351.3	269.45
26-Sep-2003 10:00:00.000 CDT	1,317.40	3.2	3.18	2.5	3.84	4.02	3.85	69.46	351.3	269.45
26-Sep-2003 10:01:00.000 CDT	1,321.85	3.24	3.2	2.56	3.81	3.98	3.89	69.42	351.3	269.45
26-Sep-2003 10:02:00.000 CDT	1,323.38	3.28	3.22	2.62	3.85	4.04	3.94	69.61	351.3	269.46
26-Sep-2003 10:03:00.000 CDT	1,320.08	3.38	3.24	2.64	3.9	4.06	3.94	69.79	351.3	269.46
26-Sep-2003 10:04:00.000 CDT	1,314.88	3.41	3.2	2.63	3.89	3.99	3.9	69.76	351.3	269.46
26-Sep-2003 10:05:00.000 CDT	1,313.72	3.38	3.15	2.59	3.78	3.96	3.89	69.52	351.3	269.46
26-Sep-2003 10:06:00.000 CDT	1,316.62	3.35	3.15	2.55	3.73	3.97	3.78	69.27	351.3	269.47

TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
26-Sep-2003 10:07:00.000 CDT	1,319.52	3.34	3.19	2.55	3.82	3.88	3.68	69.14	351.3	269.47
26-Sep-2003 10:08:00.000 CDT	1,319.37	3.42	3.21	2.5	3.83	3.82	3.69	69.13	351.3	269.47
26-Sep-2003 10:09:00.000 CDT	1,316.16	3.5	3.29	2.44	3.74	3.9	3.82	69.12	351.3	269.47
26-Sep-2003 10:10:00.000 CDT	1,312.96	3.53	3.38	2.46	3.74	3.96	3.86	69.11	351.3	269.48
26-Sep-2003 10:11:00.000 CDT	1,313.20	3.45	3.31	2.53	3.83	3.99	3.8	69.08	351.3	269.48
26-Sep-2003 10:12:00.000 CDT	1,316.88	3.43	3.23	2.6	3.79	3.9	3.74	69.28	351.3	269.48
26-Sep-2003 10:13:00.000 CDT	1,315.35	3.44	3.22	2.62	3.71	3.83	3.7	69.72	351.3	269.48
26-Sep-2003 10:14:00.000 CDT	1,308.61	3.45	3.3	2.58	3.71	3.9	3.69	69.72	351.3	269.49
26-Sep-2003 10:15:00.000 CDT	1,308.24	3.52	3.32	2.49	3.72	3.82	3.76	69.27	351.3	269.49
26-Sep-2003 10:16:00.000 CDT	1,314.25	3.49	3.21	2.41	3.72	3.73	3.77	69.1	351.3	269.49
26-Sep-2003 10:17:00.000 CDT	1,316.96	3.43	3.18	2.37	3.72	3.8	3.77	69.2	351.3	269.49
26-Sep-2003 10:18:00.000 CDT	1,316.38	3.35	3.23	2.38	3.72	3.87	3.87	69.3	351.3	269.5
26-Sep-2003 10:19:00.000 CDT	1,315.79	3.32	3.21	2.38	3.8	3.94	3.89	69.41	351.3	269.5
26-Sep-2003 10:20:00.000 CDT	1,315.20	3.42	3.19	2.45	3.84	3.96	3.85	69.51	351.3	269.5
26-Sep-2003 10:21:00.000 CDT	1,314.62	3.52	3.17	2.62	3.85	3.86	3.8	69.62	351.3	269.5
26-Sep-2003 10:22:00.000 CDT	1,314.03	3.47	3.08	2.57	3.86	3.79	3.75	69.41	351.3	269.51
26-Sep-2003 10:23:00.000 CDT	1,313.70	3.37	3.11	2.37	3.85	3.81	3.68	69.19	351.3	269.51
26-Sep-2003 10:24:00.000 CDT	1,313.62	3.39	3.17	2.35	3.85	3.79	3.65	69.26	351.3	269.51
26-Sep-2003 10:25:00.000 CDT	1,313.68	3.33	3.16	2.38	3.73	3.78	3.68	69.34	351.3	269.51
26-Sep-2003 10:26:00.000 CDT	1,313.86	3.29	3.14	2.36	3.73	3.85	3.7	69.42	351.3	269.51
26-Sep-2003 10:27:00.000 CDT	1,314.04	3.35	3.12	2.38	3.78	3.81	3.6	69.76	351.3	269.52
26-Sep-2003 10:28:00.000 CDT	1,314.22	3.41	3.1	2.34	3.75	3.78	3.5	70.03	351.3	269.52
26-Sep-2003 10:29:00.000 CDT	1,314.40	3.42	3.08	2.28	3.73	3.88	3.55	69.93	351.3	269.52
26-Sep-2003 10:30:00.000 CDT	1,314.58	3.36	3.07	2.38	3.79	3.84	3.63	69.84	351.3	269.52
26-Sep-2003 10:31:00.000 CDT	1,314.76	3.31	3.08	2.43	3.82	3.75	3.63	69.74	351.3	269.53
26-Sep-2003 10:32:00.000 CDT	1,314.94	3.35	3.08	2.35	3.75	3.72	3.52	69.65	351.3	269.53
26-Sep-2003 10:33:00.000 CDT	1,315.12	3.39	3.05	2.28	3.66	3.7	3.42	69.61	351.3	269.53
26-Sep-2003 10:34:00.000 CDT	1,315.30	3.34	3.09	2.32	3.56	3.67	3.4	69.62	351.3	269.53
26-Sep-2003 10:35:00.000 CDT	1,316.45	3.29	3.11	2.37	3.59	3.68	3.48	69.64	351.3	269.54
26-Sep-2003 10:36:00.000 CDT	1,318.56	3.24	3.08	2.38	3.68	3.78	3.5	69.66	351.3	269.54
26-Sep-2003 10:37:00.000 CDT	1,318.06	3.29	3.08	2.41	3.61	3.78	3.54	69.68	351.3	269.54
26-Sep-2003 10:38:00.000 CDT	1,314.94	3.37	3.09	2.4	3.6	3.8	3.56	69.7	351.3	269.54
26-Sep-2003 10:39:00.000 CDT	1,313.95	3.32	3.09	2.41	3.73	3.86	3.61	69.72	351.3	269.55
26-Sep-2003 10:40:00.000 CDT	1,315.08	3.32	3.1	2.44	3.79	3.79	3.65	69.65	351.3	269.55
26-Sep-2003 10:41:00.000 CDT	1,316.22	3.36	3.1	2.41	3.68	3.71	3.57	69.5	351.3	269.55
26-Sep-2003 10:42:00.000 CDT	1,314.25	3.34	3.11	2.4	3.47	3.63	3.57	69.71	351.3	269.55
26-Sep-2003 10:43:00.000 CDT	1,309.17	3.39	3.15	2.47	3.47	3.67	3.59	69.83	351.3	269.56
26-Sep-2003 10:44:00.000 CDT	1,307.68	3.39	3.23	2.38	3.63	3.68	3.58	69.51	351.3	269.56
26-Sep-2003 10:45:00.000 CDT	1,315.03	3.3	3.14	2.25	3.62	3.68	3.5	69.68	351.3	269.56
26-Sep-2003 10:46:00.000 CDT	1,317.24	3.27	3.15	2.24	3.62	3.76	3.51	70.34	351.3	269.56
26-Sep-2003 10:47:00.000 CDT	1,309.03	3.31	3.2	2.3	3.74	3.83	3.67	70.46	351.3	269.57
26-Sep-2003 10:48:00.000 CDT	1,307.57	3.3	3.04	2.42	3.8	3.84	3.66	70.05	351.3	269.57
26-Sep-2003 10:49:00.000 CDT	1,312.85	3.23	2.91	2.48	3.79	3.72	3.56	69.65	351.3	269.57
26-Sep-2003 10:50:00.000 CDT	1,315.14	3.23	2.98	2.41	3.74	3.61	3.53	69.55	351.3	269.57
26-Sep-2003 10:51:00.000 CDT	1,314.42	3.23	3.12	2.25	3.7	3.65	3.58	69.76	351.3	269.58
26-Sep-2003 10:52:00.000 CDT	1,313.71	3.25	3.12	2.1	3.72	3.85	3.58	69.66	351.3	269.58
26-Sep-2003 10:53:00.000 CDT	1,313.00	3.28	3.15	2.19	3.66	3.75	3.55	69.5	351.3	269.58
26-Sep-2003 10:54:00.000 CDT	1,312.29	3.29	3.19	2.35	3.56	3.56	3.53	69.61	351.3	269.58
26-Sep-2003 10:55:00.000 CDT	1,312.88	3.28	3.16	2.35	3.5	3.56	3.48	69.78	351.3	269.59
26-Sep-2003 10:56:00.000 CDT	1,314.78	3.26	3.19	2.38	3.48	3.56	3.6	70.03	351.3	269.59
26-Sep-2003 10:57:00.000 CDT	1,311.99	3.37	3.29	2.45	3.51	3.56	3.68	70.27	351.31	269.59

TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
26-Sep-2003 10:58:00.000 CDT	1,310.07	3.44	3.28	2.42	3.63	3.75	3.64	70.26	351.31	269.59
26-Sep-2003 10:59:00.000 CDT	1,313.70	3.38	3.18	2.36	3.62	3.79	3.66	70	351.31	269.6
26-Sep-2003 11:00:00.000 CDT	1,317.34	3.33	3.12	2.38	3.41	3.57	3.54	69.94	351.31	269.6
26-Sep-2003 11:01:00.000 CDT	1,316.60	3.34	3.11	2.36	3.31	3.54	3.44	70.09	351.31	269.6
26-Sep-2003 11:02:00.000 CDT	1,311.50	3.41	3.1	2.29	3.38	3.62	3.53	70.23	351.31	269.6
26-Sep-2003 11:03:00.000 CDT	1,309.72	3.4	3.09	2.3	3.49	3.71	3.62	70.21	351.31	269.6
26-Sep-2003 11:04:00.000 CDT	1,311.26	3.3	3.01	2.25	3.59	3.68	3.56	70.02	351.31	269.61
26-Sep-2003 11:05:00.000 CDT	1,312.80	3.27	2.97	2.13	3.64	3.59	3.53	69.92	351.31	269.61
26-Sep-2003 11:06:00.000 CDT	1,314.33	3.32	3.02	2.2	3.55	3.51	3.55	69.89	351.31	269.61
26-Sep-2003 11:07:00.000 CDT	1,314.43	3.36	3.06	2.38	3.53	3.52	3.49	69.87	351.31	269.61
26-Sep-2003 11:08:00.000 CDT	1,313.09	3.4	3.1	2.38	3.64	3.58	3.47	69.85	351.31	269.62
26-Sep-2003 11:09:00.000 CDT	1,311.75	3.42	3.11	2.28	3.7	3.61	3.45	69.82	351.31	269.62
26-Sep-2003 11:10:00.000 CDT	1,310.41	3.45	3.04	2.19	3.69	3.77	3.54	69.8	351.31	269.62
26-Sep-2003 11:11:00.000 CDT	1,311.89	3.44	2.98	2.13	3.66	3.76	3.59	69.77	351.31	269.62
26-Sep-2003 11:12:00.000 CDT	1,316.19	3.4	3.08	2.11	3.63	3.65	3.53	69.75	351.31	269.63
26-Sep-2003 11:13:00.000 CDT	1,315.42	3.43	3.1	2.12	3.62	3.69	3.46	69.94	351.31	269.63
26-Sep-2003 11:14:00.000 CDT	1,309.60	3.42	3	2.17	3.65	3.74	3.5	70.35	351.31	269.63
26-Sep-2003 11:15:00.000 CDT	1,308.31	3.39	3.04	2.22	3.68	3.71	3.52	70.33	351.31	269.63
26-Sep-2003 11:16:00.000 CDT	1,311.56	3.39	3.15	2.18	3.66	3.62	3.48	69.87	351.31	269.64
26-Sep-2003 11:17:00.000 CDT	1,314.81	3.32	3.15	2.13	3.59	3.57	3.51	69.75	351.31	269.64

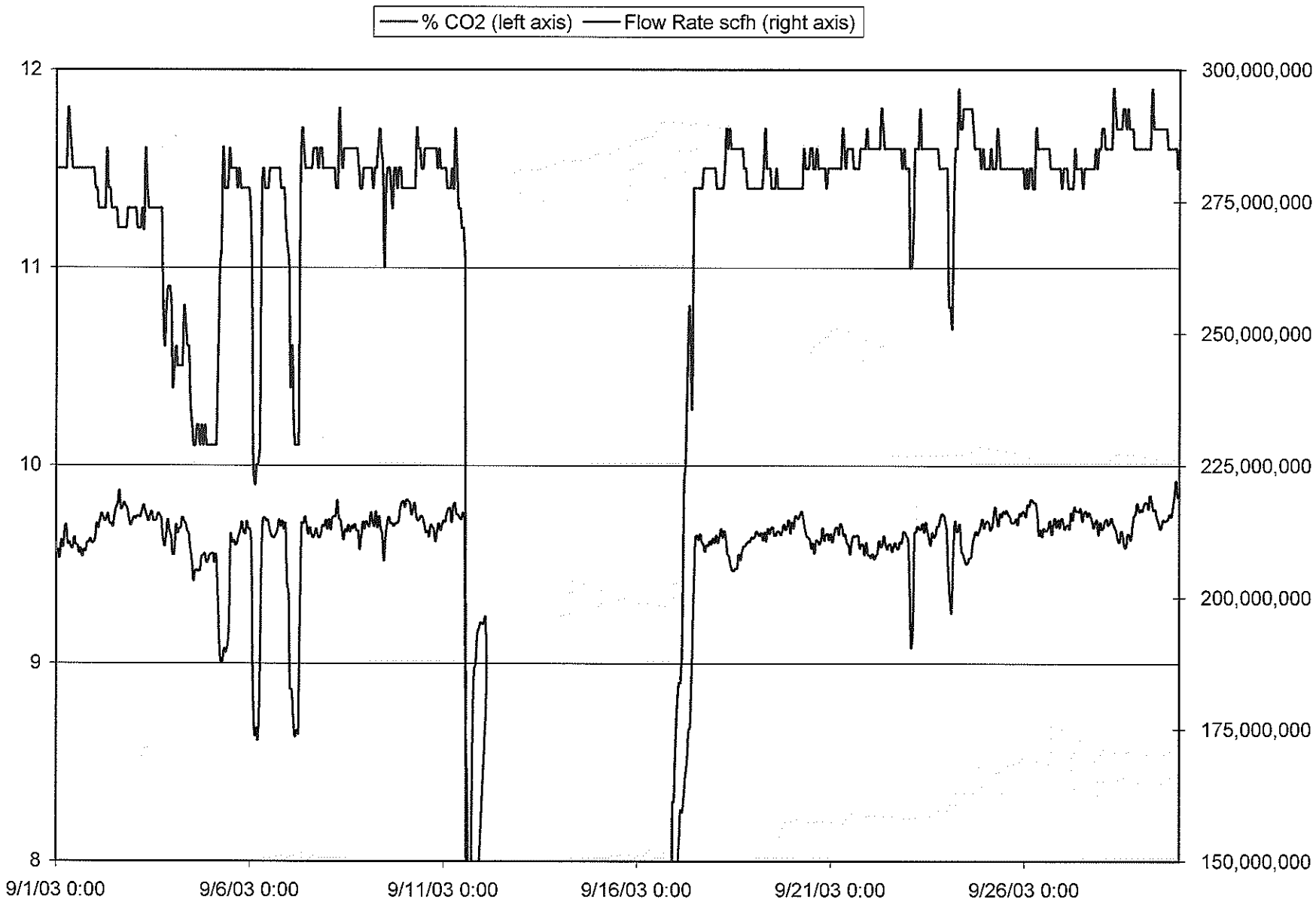
TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
26-Sep-2003 12:10:00.000 CDT	1,318.55	3.47	3.11	2.38	3.49	3.59	3.46	70.11	351.32	269.77
26-Sep-2003 12:11:00.000 CDT	1,318.99	3.49	3.17	2.42	3.65	3.59	3.51	70.01	351.32	269.77
26-Sep-2003 12:12:00.000 CDT	1,319.42	3.59	3.2	2.46	3.65	3.56	3.51	69.61	351.32	269.77
26-Sep-2003 12:13:00.000 CDT	1,319.86	3.59	3.19	2.42	3.56	3.59	3.51	69.49	351.32	269.77
26-Sep-2003 12:14:00.000 CDT	1,320.30	3.6	3.22	2.45	3.53	3.55	3.5	69.66	351.32	269.78
26-Sep-2003 12:15:00.000 CDT	1,319.35	3.61	3.22	2.52	3.55	3.48	3.43	69.83	351.32	269.78
26-Sep-2003 12:16:00.000 CDT	1,317.00	3.57	3.23	2.51	3.63	3.6	3.46	70	351.32	269.78
26-Sep-2003 12:17:00.000 CDT	1,314.66	3.59	3.26	2.5	3.69	3.65	3.52	70.04	351.32	269.78
26-Sep-2003 12:18:00.000 CDT	1,314.87	3.57	3.17	2.49	3.7	3.57	3.52	69.95	351.32	269.79
26-Sep-2003 12:19:00.000 CDT	1,317.63	3.61	3.19	2.47	3.7	3.61	3.46	69.86	351.32	269.79
26-Sep-2003 12:20:00.000 CDT	1,317.93	3.66	3.24	2.55	3.7	3.63	3.36	69.86	351.32	269.79
26-Sep-2003 12:21:00.000 CDT	1,315.78	3.62	3.19	2.6	3.71	3.51	3.37	69.97	351.32	269.79
26-Sep-2003 12:22:00.000 CDT	1,313.62	3.57	3.18	2.56	3.75	3.52	3.41	70.08	351.32	269.8
26-Sep-2003 12:23:00.000 CDT	1,311.47	3.57	3.25	2.55	3.75	3.59	3.49	69.96	351.32	269.8
26-Sep-2003 12:24:00.000 CDT	1,311.57	3.61	3.21	2.55	3.67	3.49	3.53	69.62	351.32	269.8
26-Sep-2003 12:25:00.000 CDT	1,313.93	3.61	3.15	2.48	3.65	3.44	3.43	69.66	351.32	269.8
26-Sep-2003 12:26:00.000 CDT	1,310.81	3.58	3.17	2.43	3.61	3.47	3.42	70.1	351.32	269.81
26-Sep-2003 12:27:00.000 CDT	1,308.61	3.56	3.11	2.39	3.65	3.57	3.46	70.21	351.32	269.81
26-Sep-2003 12:28:00.000 CDT	1,312.81	3.53	3.05	2.25	3.78	3.66	3.32	69.98	351.32	269.81
26-Sep-2003 12:29:00.000 CDT	1,317.01	3.5	2.98	2.32	3.8	3.64	3.32	69.75	351.32	269.81
26-Sep-2003 12:30:00.000 CDT	1,316.10	3.6	2.98	2.44	3.82	3.68	3.46	69.62	351.32	269.82
26-Sep-2003 12:31:00.000 CDT	1,310.07	3.64	3.04	2.41	3.81	3.74	3.51	69.59	351.32	269.82
26-Sep-2003 12:32:00.000 CDT	1,309.39	3.6	3.04	2.38	3.76	3.72	3.47	69.3	351.32	269.82
26-Sep-2003 12:33:00.000 CDT	1,314.04	3.64	2.99	2.34	3.71	3.63	3.45	69.21	351.32	269.82
26-Sep-2003 12:34:00.000 CDT	1,316.15	3.67	3.03	2.36	3.69	3.63	3.47	69.55	351.32	269.83
26-Sep-2003 12:35:00.000 CDT	1,315.69	3.67	3.16	2.42	3.69	3.64	3.49	69.88	351.32	269.83
26-Sep-2003 12:36:00.000 CDT	1,315.24	3.68	3.22	2.45	3.7	3.56	3.44	70.01	351.32	269.83
26-Sep-2003 12:37:00.000 CDT	1,314.78	3.65	3.21	2.44	3.67	3.56	3.4	69.91	351.32	269.83
26-Sep-2003 12:38:00.000 CDT	1,314.33	3.61	3.17	2.41	3.7	3.55	3.44	69.82	351.32	269.84
26-Sep-2003 12:39:00.000 CDT	1,313.88	3.67	3.1	2.34	3.84	3.55	3.43	69.73	351.32	269.84
26-Sep-2003 12:40:00.000 CDT	1,313.42	3.72	3.06	2.36	3.84	3.64	3.48	69.64	351.32	269.84
26-Sep-2003 12:41:00.000 CDT	1,312.97	3.72	3.11	2.46	3.68	3.63	3.5	69.55	351.32	269.84
26-Sep-2003 12:42:00.000 CDT	1,312.51	3.66	3.13	2.45	3.65	3.53	3.51	69.53	351.32	269.84
26-Sep-2003 12:43:00.000 CDT	1,312.06	3.67	3.15	2.33	3.69	3.53	3.64	69.58	351.32	269.85
26-Sep-2003 12:44:00.000 CDT	1,312.06	3.65	3.19	2.38	3.7	3.49	3.49	69.64	351.32	269.85
26-Sep-2003 12:45:00.000 CDT	1,312.53	3.6	3.16	2.48	3.7	3.5	3.47	69.7	351.32	269.85
26-Sep-2003 12:46:00.000 CDT	1,312.99	3.64	3.14	2.47	3.7	3.5	3.66	69.75	351.32	269.85
26-Sep-2003 12:47:00.000 CDT	1,313.19	3.67	3.11	2.4	3.6	3.42	3.6	69.81	351.32	269.86
26-Sep-2003 12:48:00.000 CDT	1,313.13	3.61	3.09	2.34	3.53	3.43	3.48	69.83	351.32	269.86
26-Sep-2003 12:49:00.000 CDT	1,313.06	3.6	3.09	2.35	3.49	3.55	3.47	69.83	351.32	269.86
26-Sep-2003 12:50:00.000 CDT	1,313.00	3.63	3.13	2.32	3.45	3.47	3.56	69.82	351.32	269.86
26-Sep-2003 12:51:00.000 CDT	1,312.94	3.6	3.13	2.38	3.59	3.4	3.53	69.81	351.32	269.87
26-Sep-2003 12:52:00.000 CDT	1,312.87	3.53	3.09	2.43	3.69	3.57	3.39	69.94	351.32	269.87
26-Sep-2003 12:53:00.000 CDT	1,313.28	3.56	3.12	2.42	3.69	3.62	3.5	70.2	351.32	269.87
26-Sep-2003 12:54:00.000 CDT	1,314.16	3.59	3.14	2.37	3.61	3.56	3.57	70.3	351.32	269.87
26-Sep-2003 12:55:00.000 CDT	1,315.03	3.51	3.09	2.27	3.52	3.5	3.47	70.24	351.32	269.88
26-Sep-2003 12:56:00.000 CDT	1,315.91	3.51	3.07	2.27	3.6	3.47	3.47	70.18	351.32	269.88
26-Sep-2003 12:57:00.000 CDT	1,316.79	3.59	3.07	2.47	3.8	3.61	3.42	70.12	351.32	269.88
26-Sep-2003 12:58:00.000 CDT	1,317.66	3.6	3.07	2.65	3.85	3.67	3.5	70.07	351.32	269.88
26-Sep-2003 12:59:00.000 CDT	1,315.84	3.6	3.14	2.6	3.76	3.58	3.56	70.01	351.32	269.89
26-Sep-2003 13:00:00.000 CDT	1,311.32	3.66	3.22	2.51	3.79	3.61	3.57	69.95	351.32	269.89

TimeTag	22JI–57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI–49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI–49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI–49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI–49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI–49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI–49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
26-Sep-2003 13:01:00.000 CDT	1,312.01	3.68	3.17	2.49	3.79	3.6	3.61	69.9	351.32	269.89
26-Sep-2003 13:02:00.000 CDT	1,317.93	3.72	3.13	2.56	3.73	3.55	3.57	69.84	351.32	269.89
26-Sep-2003 13:03:00.000 CDT	1,319.71	3.83	3.25	2.64	3.76	3.62	3.49	69.99	351.32	269.9
26-Sep-2003 13:04:00.000 CDT	1,317.36	3.89	3.36	2.65	3.78	3.62	3.51	70.34	351.32	269.9
26-Sep-2003 13:05:00.000 CDT	1,315.00	3.8	3.34	2.6	3.81	3.57	3.5	70.33	351.32	269.9
26-Sep-2003 13:06:00.000 CDT	1,315.05	3.69	3.26	2.57	3.76	3.57	3.45	69.97	351.32	269.9
26-Sep-2003 13:07:00.000 CDT	1,317.50	3.74	3.2	2.49	3.7	3.57	3.54	69.81	351.32	269.91
26-Sep-2003 13:08:00.000 CDT	1,319.95	3.74	3.16	2.41	3.7	3.57	3.53	69.86	351.33	269.91
26-Sep-2003 13:09:00.000 CDT	1,319.13	3.72	3.2	2.48	3.69	3.65	3.54	69.9	351.33	269.91
26-Sep-2003 13:10:00.000 CDT	1,315.04	3.76	3.23	2.53	3.69	3.7	3.59	69.94	351.33	269.91
26-Sep-2003 13:11:00.000 CDT	1,313.24	3.75	3.18	2.52	3.75	3.63	3.56	69.96	351.33	269.92
26-Sep-2003 13:12:00.000 CDT	1,313.73	3.73	3.18	2.5	3.79	3.66	3.53	69.96	351.33	269.92
26-Sep-2003 13:13:00.000 CDT	1,314.22	3.76	3.15	2.41	3.75	3.69	3.51	69.97	351.33	269.92
26-Sep-2003 13:14:00.000 CDT	1,314.71	3.78	3.16	2.33	3.72	3.69	3.48	69.97	351.33	269.92
26-Sep-2003 13:15:00.000 CDT	1,319.32	3.74	3.24	2.32	3.74	3.74	3.54	69.97	351.33	269.92
26-Sep-2003 13:16:00.000 CDT	1,320.50	3.7	3.26	2.32	3.76	3.72	3.57	69.97	351.33	269.93
26-Sep-2003 13:17:00.000 CDT	1,316.88	3.71	3.22	2.32	3.72	3.61	3.6	69.97	351.33	269.93
26-Sep-2003 13:18:00.000 CDT	1,316.02	3.77	3.18	2.38	3.7	3.57	3.52	69.97	351.33	269.93
26-Sep-2003 13:19:00.000 CDT	1,315.16	3.78	3.19	2.43	3.7	3.58	3.43	69.97	351.33	269.93
26-Sep-2003 13:20:00.000 CDT	1,314.30	3.82	3.26	2.39	3.7	3.6	3.51	69.94	351.33	269.94
26-Sep-2003 13:21:00.000 CDT	1,313.44	3.79	3.28	2.43	3.7	3.57	3.48	69.88	351.33	269.94
26-Sep-2003 13:22:00.000 CDT	1,314.31	3.68	3.25	2.44	3.76	3.59	3.47	69.83	351.33	269.94
26-Sep-2003 13:23:00.000 CDT	1,316.89	3.66	3.27	2.42	3.78	3.56	3.51	69.84	351.33	269.94
26-Sep-2003 13:24:00.000 CDT	1,317.77	3.64	3.31	2.43	3.7	3.5	3.49	69.93	351.33	269.95
26-Sep-2003 13:25:00.000 CDT	1,316.94	3.66	3.31	2.46	3.67	3.55	3.48	70.02	351.33	269.95
26-Sep-2003 13:26:00.000 CDT	1,316.12	3.71	3.28	2.42	3.67	3.67	3.46	70.07	351.33	269.95
26-Sep-2003 13:27:00.000 CDT	1,315.30	3.72	3.2	2.38	3.68	3.66	3.45	70.09	351.33	269.95
26-Sep-2003 13:28:00.000 CDT	1,318.46	3.68	3.22	2.4	3.65	3.47	3.43	70.11	351.33	269.96
26-Sep-2003 13:29:00.000 CDT	1,320.37	3.7	3.31	2.4	3.63	3.47	3.47	70.12	351.33	269.96
26-Sep-2003 13:30:00.000 CDT	1,317.03	3.7	3.36	2.49	3.67	3.56	3.5	70.35	351.33	269.96
26-Sep-2003 13:31:00.000 CDT	1,313.68	3.68	3.36	2.46	3.7	3.55	3.48	70.42	351.33	269.96
26-Sep-2003 13:32:00.000 CDT	1,314.66	3.71	3.3	2.4	3.65	3.54	3.49	70.13	351.33	269.97
26-Sep-2003 13:33:00.000 CDT	1,319.95	3.7	3.25	2.42	3.63	3.53	3.5	69.83	351.33	269.97
26-Sep-2003 13:34:00.000 CDT	1,319.97	3.66	3.28	2.44	3.68	3.56	3.44	69.81	351.33	269.97
26-Sep-2003 13:35:00.000 CDT	1,314.73	3.67	3.32	2.46	3.72	3.64	3.44	70.07	351.33	269.97
26-Sep-2003 13:36:00.000 CDT	1,312.92	3.73	3.36	2.48	3.77	3.64	3.49	70.18	351.33	269.98
26-Sep-2003 13:37:00.000 CDT	1,314.54	3.74	3.33	2.43	3.74	3.56	3.51	70.12	351.33	269.98
26-Sep-2003 13:38:00.000 CDT	1,316.16	3.68	3.29	2.4	3.65	3.48	3.42	70.06	351.33	269.98
26-Sep-2003 13:39:00.000 CDT	1,317.19	3.73	3.33	2.45	3.62	3.4	3.37	70	351.33	269.98
26-Sep-2003 13:40:00.000 CDT	1,317.62	3.75	3.31	2.46	3.63	3.45	3.35	69.94	351.33	269.99
26-Sep-2003 13:41:00.000 CDT	1,318.04	3.66	3.24	2.42	3.65	3.54	3.32	69.88	351.33	269.99
26-Sep-2003 13:42:00.000 CDT	1,318.47	3.62	3.2	2.38	3.67	3.55	3.34	69.82	351.33	269.99
26-Sep-2003 13:43:00.000 CDT	1,318.90	3.58	3.21	2.39	3.68	3.46	3.42	69.77	351.33	269.99
26-Sep-2003 13:44:00.000 CDT	1,319.32	3.59	3.23	2.46	3.74	3.49	3.49	69.75	351.33	270
26-Sep-2003 13:45:00.000 CDT	1,319.75	3.66	3.27	2.5	3.75	3.55	3.49	69.77	351.33	270
26-Sep-2003 13:46:00.000 CDT	1,319.86	3.72	3.31	2.5	3.69	3.51	3.43	69.79	351.33	270
26-Sep-2003 13:47:00.000 CDT	1,319.64	3.79	3.35	2.51	3.68	3.65	3.45	69.81	351.33	270
26-Sep-2003 13:48:00.000 CDT	1,319.32	3.78	3.3	2.55	3.78	3.66	3.53	69.83	351.33	270.01
26-Sep-2003 13:49:00.000 CDT	1,318.89	3.71	3.24	2.57	3.8	3.58	3.55	69.85	351.33	270.01
26-Sep-2003 13:50:00.000 CDT	1,318.47	3.67	3.24	2.51	3.76	3.65	3.57	69.88	351.33	270.01
26-Sep-2003 13:51:00.000 CDT	1,318.04	3.68	3.24	2.45	3.79	3.61	3.58	69.9	351.33	270.01

TimeTag	22JI–57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI–49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI–49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI–49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI–49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI–49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI–49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
26-Sep-2003 13:52:00.000 CDT	1,317.14	3.69	3.24	2.44	3.74	3.52	3.52	70	351.33	270.01
26-Sep-2003 13:53:00.000 CDT	1,315.75	3.73	3.26	2.47	3.69	3.47	3.45	70.19	351.33	270.02
26-Sep-2003 13:54:00.000 CDT	1,314.36	3.76	3.3	2.47	3.65	3.5	3.44	70.18	351.33	270.02
26-Sep-2003 13:55:00.000 CDT	1,312.97	3.73	3.35	2.42	3.64	3.59	3.48	69.96	351.33	270.02
26-Sep-2003 13:56:00.000 CDT	1,315.77	3.7	3.31	2.37	3.68	3.62	3.48	69.74	351.33	270.02
26-Sep-2003 13:57:00.000 CDT	1,317.73	3.67	3.24	2.36	3.65	3.59	3.41	69.84	351.33	270.03
26-Sep-2003 13:58:00.000 CDT	1,314.65	3.64	3.24	2.39	3.65	3.56	3.41	70.28	351.33	270.03
26-Sep-2003 13:59:00.000 CDT	1,311.57	3.58	3.24	2.42	3.69	3.56	3.48	70.36	351.33	270.03
26-Sep-2003 14:00:00.000 CDT	1,311.49	3.55	3.23	2.43	3.69	3.58	3.47	70.07	351.33	270.03
26-Sep-2003 14:01:00.000 CDT	1,314.43	3.6	3.23	2.42	3.69	3.54	3.39	69.79	351.33	270.04
26-Sep-2003 14:02:00.000 CDT	1,317.37	3.63	3.19	2.42	3.69	3.53	3.35	69.76	351.33	270.04
26-Sep-2003 14:03:00.000 CDT	1,315.41	3.64	3.17	2.46	3.69	3.53	3.37	69.97	351.33	270.04
26-Sep-2003 14:04:00.000 CDT	1,312.14	3.66	3.19	2.55	3.75	3.56	3.45	70.18	351.33	270.04
26-Sep-2003 14:05:00.000 CDT	1,312.45	3.75	3.22	2.58	3.79	3.61	3.53	70.23	351.33	270.05
26-Sep-2003 14:06:00.000 CDT	1,312.77	3.82	3.23	2.56	3.74	3.59	3.44	70.12	351.33	270.05
26-Sep-2003 14:07:00.000 CDT	1,313.08	3.77	3.22	2.48	3.74	3.57	3.41	70	351.33	270.05
26-Sep-2003 14:08:00.000 CDT	1,313.39	3.72	3.21	2.47	3.76	3.55	3.45	69.89	351.33	270.05
26-Sep-2003 14:09:00.000 CDT	1,313.71	3.77	3.25	2.47	3.75	3.61	3.42	70.03	351.33	270.06
26-Sep-2003 14:10:00.000 CDT	1,314.09	3.8	3.34	2.49	3.73	3.6	3.43	70.42	351.33	270.06
26-Sep-2003 14:11:00.000 CDT	1,314.54	3.72	3.35	2.45	3.72	3.54	3.47	70.54	351.33	270.06
26-Sep-2003 14:12:00.000 CDT	1,314.99	3.69	3.3	2.37	3.7	3.54	3.44	70.38	351.33	270.06
26-Sep-2003 14:13:00.000 CDT	1,316.46	3.73	3.24	2.39	3.7	3.55	3.46	70.22	351.34	270.07

TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
26-Sep-2003 15:00:00.000 CDT	1,310.35	3.78	3.26	2.56	3.75	3.5	3.34	70	351.34	270.18
26-Sep-2003 15:01:00.000 CDT	1,311.96	3.75	3.24	2.62	3.78	3.51	3.37	69.94	351.34	270.18
26-Sep-2003 15:02:00.000 CDT	1,309.91	3.72	3.23	2.64	3.75	3.48	3.49	70.24	351.34	270.18
26-Sep-2003 15:03:00.000 CDT	1,307.05	3.69	3.29	2.56	3.72	3.58	3.47	70.43	351.34	270.19
26-Sep-2003 15:04:00.000 CDT	1,308.84	3.66	3.32	2.45	3.69	3.57	3.39	70.15	351.34	270.19
26-Sep-2003 15:05:00.000 CDT	1,310.63	3.63	3.25	2.4	3.72	3.47	3.38	69.87	351.34	270.19
26-Sep-2003 15:06:00.000 CDT	1,312.42	3.62	3.23	2.42	3.79	3.48	3.41	69.75	351.34	270.19
26-Sep-2003 15:07:00.000 CDT	1,314.21	3.61	3.26	2.43	3.74	3.55	3.4	69.78	351.34	270.2
26-Sep-2003 15:08:00.000 CDT	1,314.44	3.64	3.25	2.45	3.67	3.56	3.42	69.81	351.34	270.2
26-Sep-2003 15:09:00.000 CDT	1,313.10	3.7	3.26	2.47	3.74	3.64	3.48	69.84	351.34	270.2
26-Sep-2003 15:10:00.000 CDT	1,311.76	3.7	3.31	2.5	3.78	3.69	3.47	69.87	351.34	270.2
26-Sep-2003 15:11:00.000 CDT	1,311.58	3.66	3.3	2.46	3.73	3.63	3.45	69.9	351.34	270.21
26-Sep-2003 15:12:00.000 CDT	1,312.56	3.64	3.21	2.3	3.8	3.66	3.43	69.93	351.34	270.21
26-Sep-2003 15:13:00.000 CDT	1,313.54	3.64	3.11	2.27	3.85	3.63	3.44	69.96	351.34	270.21
26-Sep-2003 15:14:00.000 CDT	1,310.81	3.64	3.11	2.36	3.77	3.55	3.47	69.99	351.34	270.21
26-Sep-2003 15:15:00.000 CDT	1,308.30	3.64	3.21	2.5	3.81	3.65	3.51	70.04	351.34	270.22
26-Sep-2003 15:16:00.000 CDT	1,309.71	3.59	3.25	2.63	3.89	3.71	3.45	70.12	351.34	270.22
26-Sep-2003 15:17:00.000 CDT	1,311.11	3.62	3.24	2.58	3.9	3.64	3.37	70.19	351.34	270.22
26-Sep-2003 15:18:00.000 CDT	1,312.52	3.66	3.24	2.52	3.9	3.67	3.41	70.22	351.34	270.22
26-Sep-2003 15:19:00.000 CDT	1,311.80	3.67	3.3	2.57	3.91	3.68	3.47	70.19	351.35	270.23
26-Sep-2003 15:20:00.000 CDT	1,308.95	3.7	3.35	2.62	3.81	3.59	3.48	70.17	351.35	270.23
26-Sep-2003 15:21:00.000 CDT	1,309.08	3.65	3.32	2.66	3.7	3.55	3.4	70.14	351.35	270.23
26-Sep-2003 15:22:00.000 CDT	1,312.19	3.64	3.3	2.61	3.68	3.63	3.39	69.86	351.35	270.23
26-Sep-2003 15:23:00.000 CDT	1,315.30	3.61	3.27	2.46	3.78	3.64	3.47	69.72	351.35	270.24
26-Sep-2003 15:24:00.000 CDT	1,315.31	3.6	3.24	2.43	3.91	3.56	3.41	69.97	351.35	270.24
26-Sep-2003 15:25:00.000 CDT	1,312.20	3.67	3.22	2.52	3.82	3.56	3.35	70.21	351.35	270.24
26-Sep-2003 15:26:00.000 CDT	1,309.09	3.66	3.22	2.52	3.7	3.56	3.38	70.17	351.35	270.24
26-Sep-2003 15:27:00.000 CDT	1,309.46	3.56	3.21	2.49	3.67	3.59	3.47	69.83	351.35	270.25
26-Sep-2003 15:28:00.000 CDT	1,313.29	3.56	3.21	2.52	3.64	3.5	3.43	69.79	351.35	270.25
26-Sep-2003 15:29:00.000 CDT	1,317.12	3.53	3.2	2.46	3.64	3.46	3.31	70.05	351.35	270.25
26-Sep-2003 15:30:00.000 CDT	1,316.25	3.53	3.2	2.41	3.68	3.56	3.39	70.3	351.35	270.25
26-Sep-2003 15:31:00.000 CDT	1,310.67	3.64	3.24	2.42	3.72	3.58	3.43	70.43	351.35	270.25
26-Sep-2003 15:32:00.000 CDT	1,308.12	3.64	3.32	2.53	3.76	3.59	3.37	70.43	351.35	270.26
26-Sep-2003 15:33:00.000 CDT	1,308.60	3.57	3.31	2.64	3.8	3.49	3.31	70.43	351.35	270.26
26-Sep-2003 15:34:00.000 CDT	1,309.09	3.6	3.26	2.72	3.77	3.47	3.34	70.42	351.35	270.26
26-Sep-2003 15:35:00.000 CDT	1,309.57	3.62	3.28	2.6	3.8	3.54	3.41	70.42	351.35	270.26
26-Sep-2003 15:36:00.000 CDT	1,310.05	3.66	3.28	2.38	3.85	3.54	3.36	70.42	351.35	270.27
26-Sep-2003 15:37:00.000 CDT	1,310.54	3.65	3.27	2.37	3.75	3.42	3.32	70.42	351.35	270.27
26-Sep-2003 15:38:00.000 CDT	1,311.02	3.58	3.2	2.42	3.7	3.4	3.35	70.41	351.35	270.27
26-Sep-2003 15:39:00.000 CDT	1,311.50	3.62	3.16	2.48	3.68	3.46	3.39	70.41	351.35	270.27
26-Sep-2003 15:40:00.000 CDT	1,311.98	3.61	3.19	2.47	3.66	3.45	3.42	70.41	351.35	270.28
26-Sep-2003 15:41:00.000 CDT	1,312.47	3.62	3.22	2.41	3.64	3.48	3.45	70.41	351.35	270.28
26-Sep-2003 15:42:00.000 CDT	1,312.95	3.63	3.22	2.39	3.64	3.51	3.48	70.39	351.35	270.28
26-Sep-2003 15:43:00.000 CDT	1,312.69	3.6	3.25	2.42	3.66	3.54	3.5	70.36	351.35	270.28
26-Sep-2003 15:44:00.000 CDT	1,311.70	3.56	3.32	2.45	3.68	3.51	3.49	70.33	351.35	270.29
26-Sep-2003 15:45:00.000 CDT	1,310.70	3.58	3.33	2.48	3.7	3.5	3.4	70.3	351.35	270.29
26-Sep-2003 15:46:00.000 CDT	1,310.75	3.61	3.34	2.48	3.61	3.46	3.29	70.26	351.35	270.29
26-Sep-2003 15:47:00.000 CDT	1,311.85	3.57	3.27	2.44	3.59	3.41	3.36	70.23	351.35	270.29
26-Sep-2003 15:48:00.000 CDT	1,312.95	3.56	3.26	2.46	3.74	3.47	3.39	70.2	351.35	270.3
26-Sep-2003 15:49:00.000 CDT	1,313.11	3.55	3.3	2.52	3.81	3.46	3.38	70.17	351.35	270.3
26-Sep-2003 15:50:00.000 CDT	1,312.33	3.55	3.26	2.56	3.69	3.37	3.36	70.14	351.35	270.3

TimeTag	22JI--57-224: (CU:U2) GEN 2 TOTAL GROSS (MW)	22AI--49-200A1: (CU:U2) FURN OXYGEN -A1 (%)	22AI--49-200A2: (CU:U2) FURN OXYGEN -A2 (%)	22AI--49-200B1: (CU:U2) FURN OXYGEN -B1 (%)	22AI--49-200B2: (CU:U2) FURN OXYGEN -B2 (%)	22AI--49-200C1: (CU:U2) FURN OXYGEN -C1 (%)	22AI--49-200C2: (CU:U2) FURN OXYGEN -C2 ()	22TOTFF: (CU:U2) TOTAL FUEL FLOW ()	CUS-118: (CU:U2) F287001A - 2A ABSORB SLUR FEED F (GPM)	CUS-126: (CU:U2) F287001B - 2B ABS SLUR FEED FLOW (GPM)
26-Sep-2003 15:51:00.000 CDT	1,311.54	3.54	3.26	2.49	3.54	3.34	3.31	70.11	351.35	270.3
26-Sep-2003 15:52:00.000 CDT	1,312.17	3.54	3.26	2.35	3.54	3.36	3.4	70.03	351.35	270.31
26-Sep-2003 15:53:00.000 CDT	1,314.21	3.54	3.28	2.29	3.6	3.42	3.45	69.9	351.35	270.31
26-Sep-2003 15:54:00.000 CDT	1,316.26	3.57	3.26	2.3	3.67	3.51	3.43	69.99	351.35	270.31
26-Sep-2003 15:55:00.000 CDT	1,316.57	3.64	3.28	2.31	3.7	3.52	3.46	70.31	351.35	270.31
26-Sep-2003 15:56:00.000 CDT	1,315.16	3.72	3.33	2.36	3.71	3.44	3.37	70.4	351.35	270.32
26-Sep-2003 15:57:00.000 CDT	1,313.76	3.67	3.32	2.56	3.76	3.45	3.31	70.26	351.35	270.32
26-Sep-2003 15:58:00.000 CDT	1,312.35	3.56	3.26	2.6	3.76	3.41	3.27	70.12	351.35	270.32
26-Sep-2003 15:59:00.000 CDT	1,314.45	3.58	3.26	2.48	3.71	3.33	3.21	69.98	351.35	270.32
26-Sep-2003 16:00:00.000 CDT	1,316.42	3.69	3.28	2.4	3.71	3.37	3.24	69.93	351.35	270.33
26-Sep-2003 16:01:00.000 CDT	1,314.76	3.66	3.25	2.4	3.71	3.47	3.32	69.98	351.35	270.33
26-Sep-2003 16:02:00.000 CDT	1,313.09	3.49	3.22	2.42	3.71	3.5	3.43	70.03	351.35	270.33
26-Sep-2003 16:03:00.000 CDT	1,311.43	3.42	3.23	2.41	3.71	3.41	3.37	70.08	351.35	270.33
26-Sep-2003 16:04:00.000 CDT	1,313.11	3.46	3.28	2.54	3.71	3.38	3.27	70.13	351.35	270.34
26-Sep-2003 16:05:00.000 CDT	1,315.20	3.5	3.28	2.55	3.68	3.39	3.32	70.17	351.35	270.34
26-Sep-2003 16:06:00.000 CDT	1,314.35	3.5	3.24	2.45	3.6	3.4	3.44	70.22	351.35	270.34
26-Sep-2003 16:07:00.000 CDT	1,313.50	3.55	3.2	2.43	3.59	3.41	3.48	70.27	351.35	270.34
26-Sep-2003 16:08:00.000 CDT	1,312.65	3.63	3.26	2.41	3.55	3.42	3.43	70.32	351.35	270.34
26-Sep-2003 16:09:00.000 CDT	1,311.79	3.61	3.29	2.4	3.5	3.4	3.41	70.37	351.35	270.35
26-Sep-2003 16:10:00.000 CDT	1,310.94	3.43	3.2	2.42	3.51	3.35	3.44	70.41	351.35	270.35
26-Sep-2003 16:11:00.000 CDT	1,310.09	3.42	3.17	2.38	3.5	3.34	3.47	70.46	351.35	270.35
26-Sep-2003 16:12:00.000 CDT	1,310.90	3.53	3.2	2.38	3.46	3.39	3.39	70.49	351.35	270.35
26-Sep-2003 16:13:00.000 CDT	1,313.35	3.51	3.16	2.36	3.49	3.39	3.36	70.5	351.35	270.36
26-Sep-2003 16:14:00.000 CDT	1,315.80	3.55	3.05	2.33	3.51	3.33	3.39	70.52	351.35	270.36
26-Sep-2003 16:15:00.000 CDT	1,316.20	3.58	3.12	2.39	3.48	3.27	3.28	70.53	351.35	270.36
26-Sep-2003 16:16:00.000 CDT	1,314.54	3.62	3.18	2.49	3.52	3.28	3.28	70.54	351.35	270.36
26-Sep-2003 16:17:00.000 CDT	1,312.87	3.61	3.17	2.55	3.64	3.35	3.32	70.55	351.35	270.37
26-Sep-2003 16:18:00.000 CDT	1,312.86	3.54	3.18	2.38	3.69	3.39	3.35	70.29	351.35	270.37
26-Sep-2003 16:19:00.000 CDT	1,314.50	3.55	3.11	2.21	3.67	3.38	3.42	70.09	351.35	270.37
26-Sep-2003 16:20:00.000 CDT	1,316.14	3.64	3.12	2.22	3.65	3.38	3.41	70.2	351.35	270.37
26-Sep-2003 16:21:00.000 CDT	1,315.67	3.61	3.27	2.33	3.65	3.38	3.46	70.32	351.35	270.38
26-Sep-2003 16:22:00.000 CDT	1,313.09	3.51	3.32	2.44	3.67	3.32	3.38	70.43	351.35	270.38
26-Sep-2003 16:23:00.000 CDT	1,310.50	3.49	3.23	2.46	3.55	3.21	3.21	70.55	351.35	270.38
26-Sep-2003 16:24:00.000 CDT	1,309.78	3.52	3.14	2.45	3.41	3.16	3.23	70.66	351.35	270.38
26-Sep-2003 16:25:00.000 CDT	1,310.92	3.54	3.09	2.41	3.54	3.27	3.33	70.59	351.36	270.39
26-Sep-2003 16:26:00.000 CDT	1,312.06	3.56	3.14	2.38	3.67	3.41	3.38	70.32	351.36	270.39
26-Sep-2003 16:27:00.000 CDT	1,313.20	3.59	3.21	2.43	3.64	3.43	3.39	70.06	351.36	270.39
26-Sep-2003 16:28:00.000 CDT	1,314.34	3.61	3.25	2.49	3.61	3.4	3.39	70.14	351.36	270.39
26-Sep-2003 16:29:00.000 CDT	1,315.48	3.68	3.32	2.56	3.57	3.43	3.47	70.58	351.36	270.4
26-Sep-2003 16:30:00.000 CDT	1,315.86	3.65	3.35	2.52	3.59	3.41	3.58	70.76	351.36	270.4
26-Sep-2003 16:31:00.000 CDT	1,315.48	3.66	3.32	2.42	3.67	3.39	3.53	70.68	351.36	270.4
26-Sep-2003 16:32:00.000 CDT	1,315.10	3.7	3.32	2.45	3.7	3.48	3.49	70.6	351.36	270.4
26-Sep-2003 16:33:00.000 CDT	1,318.62	3.58	3.26	2.36	3.7	3.61	3.49	70.53	351.36	270.41
26-Sep-2003 16:34:00.000 CDT	1,320.84	3.54	3.22	2.42	3.74	3.7	3.52	70.45	351.36	270.41
26-Sep-2003 16:35:00.000 CDT	1,317.84	3.58	3.26	2.47	3.77	3.62	3.59	70.38	351.36	270.41
26-Sep-2003 16:36:00.000 CDT	1,314.84	3.59	3.31	2.36	3.74	3.57	3.55	70.3	351.36	270.41
26-Sep-2003 16:37:00.000 CDT	1,314.01	3.58	3.35	2.41	3.71	3.53	3.46	70.22	351.36	270.42
26-Sep-2003 16:38:00.000 CDT	1,315.36	3.56	3.37	2.44	3.64	3.4	3.42	70.15	351.36	270.42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11
10
9
8
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250,000,000
225,000,000
200,000,000
175,000,000
150,000,000
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9/16/03 0:00
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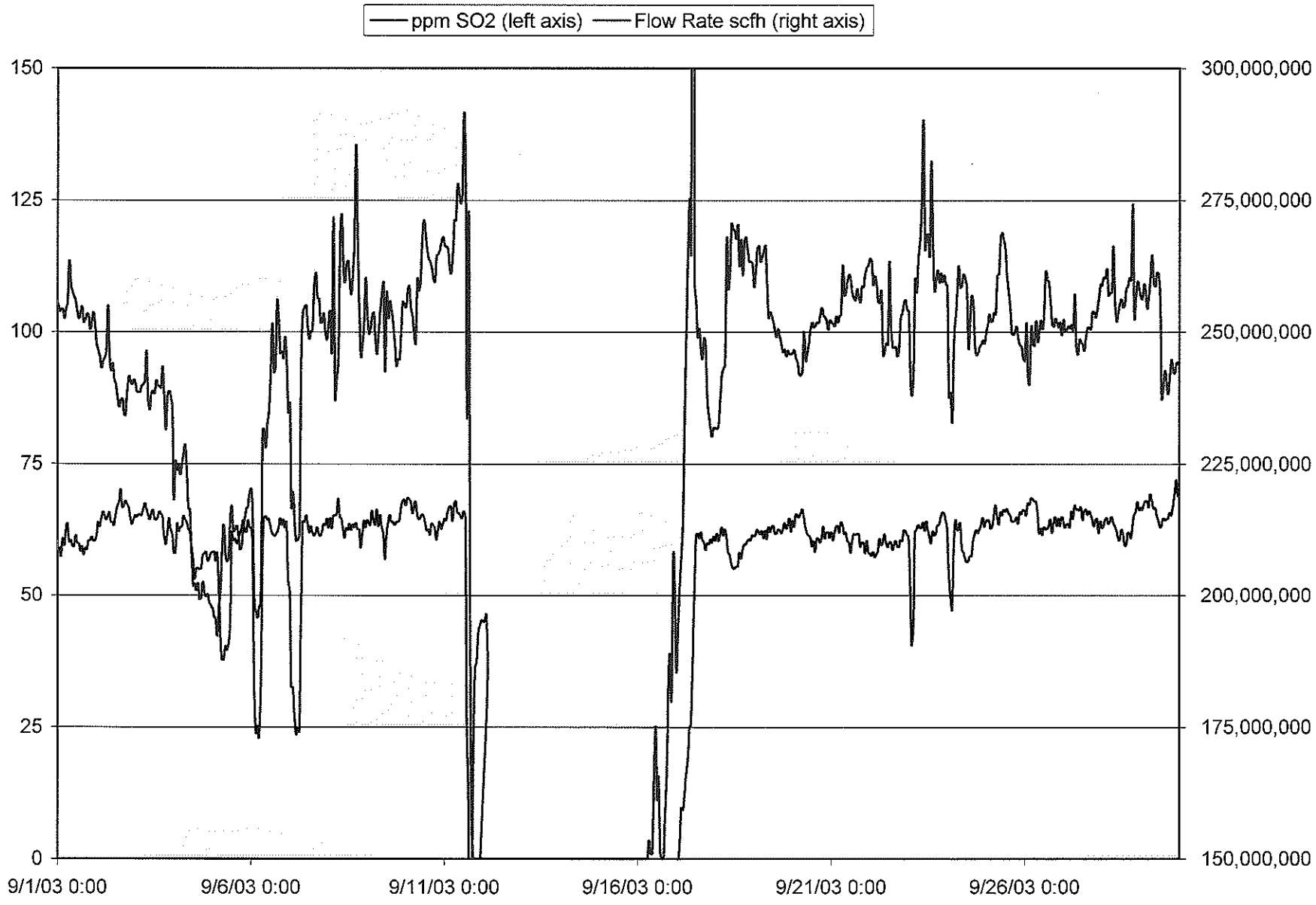
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Flow Rate scfh (right axis)
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125
100
75
50
25
0
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275,000,000
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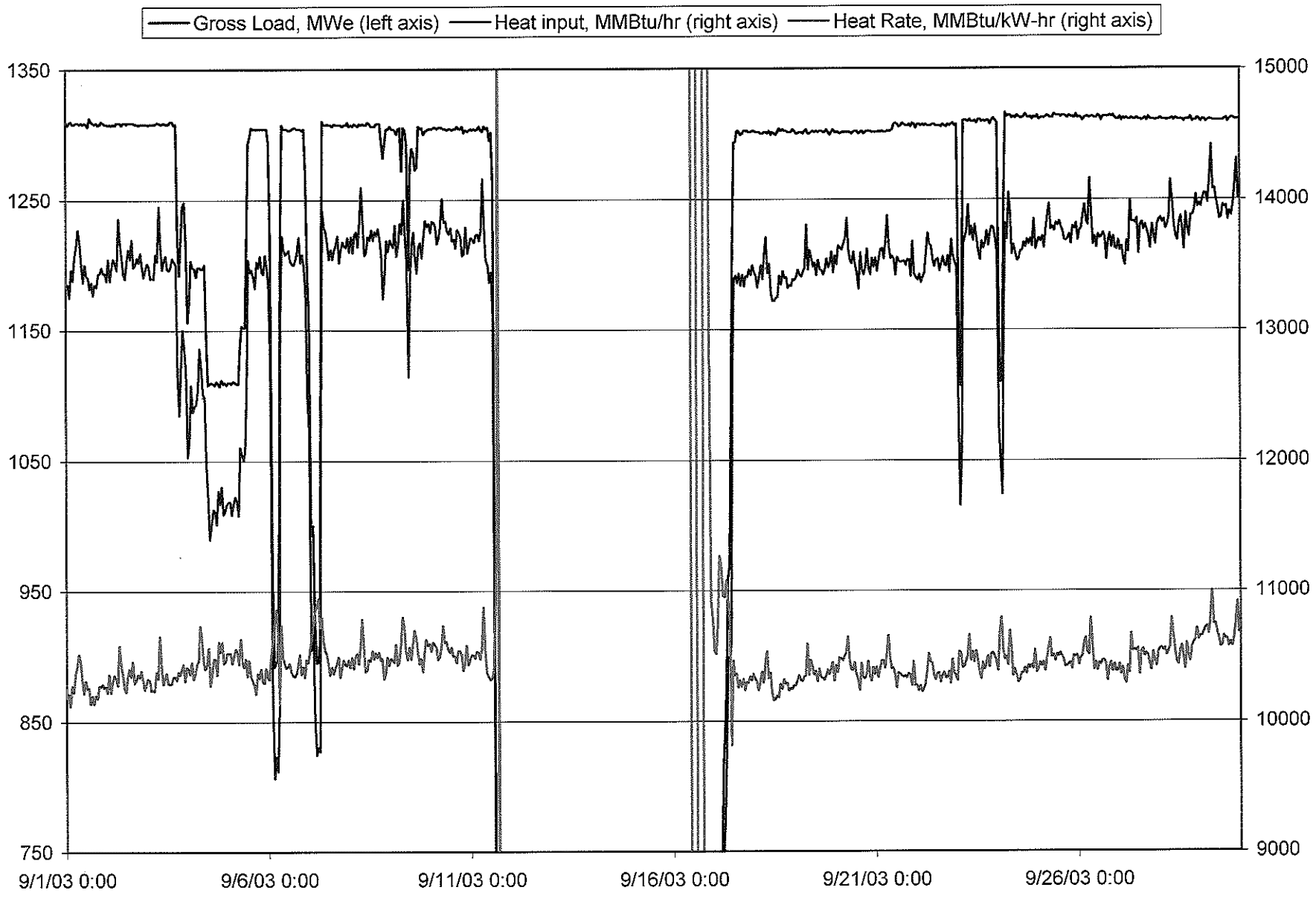
9/26/03 0:00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Heat Rate, MMBtu/kW-hr (right axis)
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1150
1050
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14000
13000
12000
11000
10000
9000
9/1/03 0:00
9/6/03 0:00
9/11/03 0:00
9/16/03 0:00
9/21/03 0:00
9/26/03 0:00

APPENDIX C

Flue Gas Hg Data

- Summary of Ontario-Hydro Impinger Analyses Data Sheets
- Recovery Data Sheets

SCR/FGD MERCURY SAMPLING PROGRAM -

Ontario Hydro Hg Sampling Train Recovery Data

Date: 9-25-03 Test ID: 1

Unit 2 FGD Inlet:

Bottle #	Description	Analytical No.	Initial Vol mL	Final Vol mL	ppb Hg	Total ug of Hg
S	Filter/Solids	33178				150 ug/filter
1	Probe & Filter Rinse	33124		114	864	98610.0
2	Heated Line Rinse	33125		60	2.2	132.0
3	KCl Impingers 150	33126	300	596	161	95956.0
4	HNO_3/H_2O_2 Impinger 75	33127	100	176	20.9	3678.4
5	$KMnO_4$ Impingers 50	33128	200	245	39.8	9751.0
6	Acid Rinse of $KMnO_4$	33129		50	<1.0	<50
7	Silica Gel			20.9 g.	NA	NA

Total Particulate Wt. 0.0140 grams
Filter Net Wt. 0.0140 grams
Filter Tare Wt. 0.1482 grams

Condensate Total 159.9 mL

Stack:

Bottle #	Description	Analytical No.	Initial Vol mL	Final Vol mL	ppb Hg	Total ug of Hg
S	Filter/Solids	33179				9.3 ug/filter
1	Probe & Filter Rinse	33130		85	2.7	229.5
2	KCl Impingers 150	33131	300	736	<1.0	<736
3	HNO_3/H_2O_2 Impinger 75	33132	100	177	<1.0	<177
4	$KMnO_4$ Impingers 50	33133	200	244	34.3	8369.2
5	Acid Rinse of $KMnO_4$	33134		50	<1.0	<50
6	Silica Gel			15.7 g.	NA	NA

Total Particulate Wt. 0.0015 grams
Filter Net Wt. 0.0015 grams
Filter Tare Wt. 0.4102 grams

Condensate Total 294.7 mL

Recovered By: Jr Beckham Date: 9-25-03

SCR/FGD MERCURY SAMPLING PROGRAM -

Ontario Hydro Hg Sampling Train Recovery Data

Date: 9-26-03 Test ID: 2

Unit 2 FGD Inlet:

Bottle #	Description	Analytical No.	Initial Vol mL	Final Vol mL	ppb Hg	Total ug of Hg
S	Filter/Solids	33180				
1	Probe & Filter Rinse	33135		137	5.1	698.7
2	Heated Line Rinse	33136		82	<1.0	<82
3	KCl Impingers 150	33137	300	612	39.0	23868.0
4	HNO_3/H_2O_2 Impinger 75	33138	100	175	5.3	927.5
5	$KMnO_4$ Impingers 50	33139	200	247	56.3	13906.1
6	Acid Rinse of $KMnO_4$	33140		50	<1.0	<50.0
7	Silica Gel			25.0 g.	NA	NA

Total Particulate Wt. 0.0073 grams
Filter Net Wt. 0.0073 grams
Filter Tare Wt. 0.1467 grams

Condensate Total 181.0 mL

Stack:

Bottle #	Description	Analytical No.	Initial Vol mL	Final Vol mL	ppb Hg	Total ug of Hg
S	Filter/Solids	33181				
1	Probe & Filter Rinse	33141		79	2.6	205.4
2	KCl Impingers 150	33142	300	748	<1.0	<748
3	HNO_3/H_2O_2 Impinger 75	33143	100	177	<1.0	<177
4	$KMnO_4$ Impingers 50	33144	200	245	33.1	8109.5
5	Acid Rinse of $KMnO_4$	33145		50	1.1	55
6	Silica Gel			16.5 g.	NA	NA

Total Particulate Wt. 0.0105 grams
Filter Net Wt. 0.0105 grams
Filter Tare Wt. 0.4105 grams

Condensate Total 308.5 mL

Recovered By: J. Bedillion Date: 9-26-03

SCR/FGD MERCURY SAMPLING PROGRAM -

Ontario Hydro Hg Sampling Train Recovery Data

Date: 9-26-03 Test ID: 3

Unit 2 FGD Inlet:

Bottle #	Description	Analytical No.	Initial Vol mL	Final Vol mL	ppb Hg	Total ug of Hg
S	Filter/Solids	33182				
1	Probe & Filter Rinse	33146		159	1.2	190.8
2	Heated Line Rinse	33147		104	<1.0	<104
3	KCl Impingers 150	33148	300	610	41.4	25254.0
4	HNO_3/H_2O_2 Impinger 75	33149	100	175	4.9	857.5
5	$KMnO_4$ Impingers 50	33150	200	246	39.8	9790.8
6	Acid Rinse of $KMnO_4$	33151		50	<1.0	<50
7	Silica Gel			19.6 g.	NA	NA

Total Particulate Wt. 0.0109 grams
Filter Net Wt. 0.0109 grams
Filter Tare Wt. 0.1477 grams

Condensate Total 172.6 mL

Stack:

Bottle #	Description	Analytical No.	Initial Vol mL	Final Vol mL	ppb Hg	Total ug of Hg
S	Filter/Solids	33183				
1	Probe & Filter Rinse	33152		86	1.2	103.2
2	KCl Impingers 150	33153	300	743	1.8	1337.4
3	HNO_3/H_2O_2 Impinger 75	33154	100	178	<1.0	<178
4	$KMnO_4$ Impingers 50	33155	200	246	30.3	7453.8
5	Acid Rinse of $KMnO_4$	33156		50	<1.0	<50
6	Silica Gel			15.8 g.	NA	NA

Total Particulate Wt. 0.0172 grams
Filter Net Wt. 0.0172 grams
Filter Tare Wt. 0.4067 grams

Condensate Total 304.8 mL

Recovered By: Jr Brilleaux Date: 9-26-03

SCR/FGD MERCURY SAMPLING PROGRAM -

Ontario Hydro Hg Sampling Train Recovery Data

Date: 9-26-03 Test ID: 4

Unit 2 FGD Inlet:

Bottle #	Description	Analytical No.	Initial Vol mL	Final Vol mL	ppb Hg	Total ug of Hg
S	Filter/Solids	33184				
1	Probe & Filter Rinse	33157		164	6.7	1098.8
2	Heated Line Rinse	33158		70	<1.0	<70.0
3	KCl Impingers 150	33159	300	621	24.8	15400.8
4	HNO_3/H_2O_2 Impinger 75	33160	100	175	4.1	717.5
5	$KMnO_4$ Impingers 50	33161	200	246	34.9	8585.4
6	Acid Rinse of $KMnO_4$	33162		50	<1.0	<50.0
7	Silica Gel			18.7 g.	NA	NA

Total Particulate Wt. 0.0249 grams Condensate Total 182.7 mL
Filter Net Wt. 0.0249 grams
Filter Tare Wt. 0.1477 grams

Stack:

Bottle #	Description	Analytical No.	Initial Vol mL	Final Vol mL	ppb Hg	Total ug of Hg
S	Filter/Solids	33185				
1	Probe & Filter Rinse	33163		79	2.0	158.0
2	KCl Impingers 150	33164	300	746	<1.0	<746
3	HNO_3/H_2O_2 Impinger 75	33165	100	175	<1.0	<175
4	$KMnO_4$ Impingers 50	33166	200	244	32.4	7905.6
5	Acid Rinse of $KMnO_4$	33167		50	<1.0	<50.0
6	Silica Gel			16.3 g.	NA	NA

Total Particulate Wt. 0.0087 grams Condensate Total 301.3 mL
Filter Net Wt. 0.0087 grams
Filter Tare Wt. 0.4152 grams

Recovered By: Jo Bellion Date: 9-26-03

PROJECT NO.	Number	Test #	Date	Location	Operator	Sample ID #	Sample description	Impinger No.	Analytical #	ng/ml or ppb	
1621-087-001	8	1	9/25/03	Stack	Keith		Probe		33130	2.7	
1621-087-001	15	2	9/26/03	FGDInlet	Gary		Probe		33135	5.1	
1621-087-001	21	2	9/26/03	Stack	Keith		Probe		33141	2.6	
1621-087-001	28	3	9/26/03	FGDInlet	Gary		Probe		33146	1.2	
1621-087-001	34	3	9/26/03	Stack	Keith		Probe		33152	1.2	
1621-087-001	41	4	9/26/03	FGDInlet	Gary		Probe		33157	6.7	
1621-087-001	47	4	9/26/03	Stack	Keith		Probe		33163	2	
1621-087-001	2	1	9/25/03	FGDInlet	Gary		Probe		33124	865	**run on x20 dilution**
Duplicates and Spikes											
1621-087-001	34	3	9/26/03	Stack	Keith		Probe		33152	1.1	duplicate **good within 20%**
1621-087-001	34	3	9/26/03	Stack	Keith		Probe		33152	NA	spike good, 93%, spike = 2ppb

Continuing Calibration Verification	**ng/ml or ppb**		
1641d 8 ppb	8.5	106%	good
1641d 8ppb	8.1	101%	good
1641d 8ppb	8.6	108%	good

PROJECT NO.	Number	Test #	Date	Location	Operator	Sample ID #	Sample description	Impinger No.	Analytical #	ng/filter
1621-087-001	63		9/26/03	Blanks			2" Filter		33186	< 5.0
1621-087-001	64		9/26/03	Blanks			3" Filter		33187	11.8
1621-087-001	1	1	9/25/03	FGDInlet	Gary		Filter		33178	150
1621-087-001	9	1	9/25/03	Stack	Keith		Filter		33179	9.3
1621-087-001	14	2	9/26/03	FGDInlet	Gary		Filter		33180	67.8
1621-087-001	22	2	9/26/03	Stack	Keith		Filter		33181	7.7
1621-087-001	27	3	9/26/03	FGDInlet	Gary		Filter		33182	50.7
1621-087-001	35	3	9/26/03	Stack	Keith		Filter		33183	6.5
1621-087-001	40	4	9/26/03	FGDInlet	Gary		Filter		33184	33.3
1621-087-001	48	4	9/26/03	Stack	Keith		Filter		33185	22.7

NIST Standard	ng/mg or ppm	
NIST 1633B	0.15	good, 106%
0.141ppm		

Continuing Calibration Verification	ng/ml or ppb		
1641d 8 ppb	8.3	104%	good
1641d 8ppb	8.1	101%	good
1641d 8ppb	7.9	99%	good

PROJECT NO.	Number	Test #	Date	Location	Operator	Sample ID #	Sample description	Impinger No.	Analytical #	ng/ml or ppb		
1621-087-001	4	1	9/25/03	FGDInlet	Gary		KCL	1-2-3	33126	161		
1621-087-001	10	1	9/25/03	Stack	Keith		KCL	1-2-3	33131	< 1.0		
1621-087-001	17	2	9/26/03	FGDInlet	Gary		KCL	1-2-3	33137	39		
1621-087-001	23	2	9/26/03	Stack	Keith		KCL	1-2-3	33142	< 1.0		
1621-087-001	30	3	9/26/03	FGDInlet	Gary		KCL	1-2-3	33148	41.4		
1621-087-001	36	3	9/26/03	Stack	Keith		KCL	1-2-3	33153	1.8		
1621-087-001	43	4	9/26/03	FGDInlet	Gary		KCL	1-2-3	33159	24.8		
1621-087-001	49	4	9/26/03	Stack	Keith		KCL	1-2-3	33164	< 1.0		
1621-087-001	53		9/25/03	Blanks			KCL	1-2-3	33168	< 1.0		
1621-087-001	57	1	9/25/03	Blanks			KCL	1-2-3	33172	< 1.0		
Duplicates and Spikes												
1621-087-001	10	1	9/25/03	Stack	Keith		KCL	1-2-3	33131	< 1.0	duplicate	good within 20%
1621-087-001	10	1	9/25/03	Stack	Keith		KCL	1-2-3	33131	NA	spike	good, 98%, spike = 10ppb
1621-087-001	17	2	9/26/03	FGDInlet	Gary		KCL	1-2-3	33137	37.9	duplicate	good within 20%
1621-087-001	17	2	9/26/03	FGDInlet	Gary		KCL	1-2-3	33137	NA	spike	good, 97%, spike = 10ppb

Continuing Calibration Verification	**ng/ml or ppb**		
1641d 8 ppb	8.6	108%	good
1641d 8ppb	8.4	105%	good
1641d 8ppb	8.3	104%	good

PROJECT NO.	Number	Test #	Date	Location	Operator	Sample ID #	Sample description	Impinger No.	Analytical #	ng/ml or ppb		
1621-087-001	5	1	9/25/03	FGDInlet	Gary		HNO_3/H_2O_2	4	33127	20.9		
1621-087-001	11	1	9/25/03	Stack	Keith		HNO_3/H_2O_2	4	33132	< 1.0		
1621-087-001	18	2	9/26/03	FGDInlet	Gary		HNO_3/H_2O_2	4	33138	5.3		
1621-087-001	24	2	9/26/03	Stack	Keith		HNO_3/H_2O_2	4	33143	< 1.0		
1621-087-001	31	3	9/26/03	FGDInlet	Gary		HNO_3/H_2O_2	4	33149	4.9		
1621-087-001	37	3	9/26/03	Stack	Keith		HNO_3/H_2O_2	4	33154	< 1.0		
1621-087-001	44	4	9/26/03	FGDInlet	Gary		HNO_3/H_2O_2	4	33160	4.1		
1621-087-001	50	4	9/26/03	Stack	Keith		HNO_3/H_2O_2	4	33165	< 1.0		
1621-087-001	54		9/25/03	Blanks			HNO_3/H_2O_2	4	33169	< 1.0		
1621-087-001	58	1	9/25/03	Blanks			HNO_3/H_2O_2	4	33173	< 1.0		
Duplicates and Spikes												
1621-087-001	11	1	9/25/03	Stack	Keith		HNO_3/H_2O_2	4	33132	< 1.0	duplicate	good within 20%
1621-087-001	11	1	9/25/03	Stack	Keith		HNO_3/H_2O_2	4	33132	NA	spike	good, 90%, spike = 2ppb
1621-087-001	44	4	9/26/03	FGDInlet	Gary		HNO_3/H_2O_2	4	33160	3.5	duplicate	good within 20%
1621-087-001	44	4	9/26/03	FGDInlet	Gary		HNO_3/H_2O_2	4	33160	NA	spike	good, 92%, spike = 2ppb

Continuing Calibration Verification	**ng/ml or ppb**		
1641d 8 ppb	8.5	106%	good
1641d 8ppb	8.4	105%	good
1641d 8ppb	8.3	104%	good

PROJECT NO.	Number	Test #	Date	Location	Operator	Sample ID #	Sample description	Impinger No.	Analytical #	ng/ml or ppb		
1621-087-001	6	1	9/25/03	FGDInlet	Gary		$KMNO_4$	5-6	33128	39.8		
1621-087-001	12	1	9/25/03	Stack	Keith		$KMNO_4$	5-6	33133	34.3		
1621-087-001	19	2	9/26/03	FGDInlet	Gary		$KMNO_4$	5-6	33139	56.3		
1621-087-001	25	2	9/26/03	Stack	Keith		$KMNO_4$	5-6	33144	33.1		
1621-087-001	32	3	9/26/03	FGDInlet	Gary		$KMNO_4$	5-6	33150	39.8		
1621-087-001	38	3	9/26/03	Stack	Keith		$KMNO_4$	5-6	33155	30.3		
1621-087-001	45	4	9/26/03	FGDInlet	Gary		$KMNO_4$	5-6	33161	34.9		
1621-087-001	51	4	9/26/03	Stack	Keith		$KMNO_4$	5-6	33166	32.4		
1621-087-001	55		9/25/03	Blanks			$KMNO_4$	5-6	33170	<1.0		
1621-087-001	59	1	9/25/03	Blanks			$KMNO_4$	5-6	33174	< 1.0		
1621-087-001	61	2-3	9/26/03	Blanks			$KMNO_4$	5-6	33176	< 1.0		
1621-087-001	62	4	9/26/03	Blanks			$KMNO_4$	5-6	33177	< 1.0		
Duplicates and Spikes												
1621-087-001	32	3	9/26/03	FGDInlet	Gary		$KMNO_4$	5-6	33150	39.5	duplicate	good within 20%
1621-087-001	32	3	9/26/03	FGDInlet	Gary		$KMNO_4$	5-6	33150	NA	spike	good, 98%, spike = 10ppb
1621-087-001	51	4	9/26/03	Stack	Keith		$KMNO_4$	5-6	33166	32.8	duplicate	good within 20%
1621-087-001	51	4	9/26/03	Stack	Keith		$KMNO_4$	5-6	33166	NA	spike	good, 97%, spike = 10ppb

Continuing Calibration Verification	**ng/ml or ppb**		
1641d 8 ppb	8.4	105%	good
1641d 8ppb	8.4	105%	good
1641d 8ppb	8.2	103%	good

PROJECT NO.	Number	Test #	Date	Location	Operator	Sample ID #	Sample description	Impinger No.	Analytical #	ng/ml or ppb		
1621-087-001	7	1	9/25/03	FGDInlet	Gary		Final Rinse		33129	< 1.0		
1621-087-001	13	1	9/25/03	Stack	Keith		Final Rinse		33134	< 1.0		
1621-087-001	20	2	9/26/03	FGDInlet	Gary		Final Rinse		33140	< 1.0		
1621-087-001	26	2	9/26/03	Stack	Keith		Final Rinse		33145	1.1		
1621-087-001	33	3	9/26/03	FGDInlet	Gary		Final Rinse		33151	< 1.0		
1621-087-001	39	3	9/26/03	Stack	Keith		Final Rinse		33156	< 1.0		
1621-087-001	46	4	9/26/03	FGDInlet	Gary		Final Rinse		33162	< 1.0		
1621-087-001	52	4	9/26/03	Stack	Keith		Final Rinse		33167	< 1.0		
1621-087-001	56		9/25/03	Blanks			Final Rinse		33171	< 1.0		
1621-087-001	60	1	9/26/03	Blanks			Final Rinse		33175	< 1.0		
1621-087-001	3	1	9/25/03	FGDInlet	Gary		Heated Line		33125	2.2		
1621-087-001	16	2	9/26/03	FGDInlet	Gary		Heated Line		33136	< 1.0		
1621-087-001	29	3	9/26/03	FGDInlet	Gary		Heated Line		33147	< 1.0		
1621-087-001	42	4	9/26/03	FGDInlet	Gary		Heated Line		33158	< 1.0		
Duplicates and Spikes												
1621-087-001	7	1	9/25/03	FGDInlet	Gary		Final Rinse		33129	< 1.0	duplicate	good within 20%
1621-087-001	7	1	9/25/03	FGDInlet	Gary		Final Rinse		33129	NA	spike	good, 100%, spike = 2ppb
1621-087-001	16	2	9/26/03	FGDInlet	Gary		Heated Line		33136	< 1.0	duplicate	good within 20%
1621-087-001	16	2	9/26/03	FGDInlet	Gary		Heated Line		33136	NA	spike	good, 95%, spike = 2ppb

Continuing Calibration Verification	**ng/ml or ppb**		
1641d 8 ppb	8.5	106%	good
1641d 8ppb	8.4	105%	good
1641d 8ppb	8.4	105%	good

APPENDIX D

Process Material Data

- Coal Analysis Data Sheets
- ESP Hopper Ash Analysis Data Sheets
- Limestone Slurry Analysis Data Sheets
- FGD Slurry Analysis Data Sheets
- FGD Make-up Water Analysis Data Sheets

CONSOL ENERGY INC.
RESEARCH & DEVELOPMENT
ANALYTICAL LABORATORY
4000 BROWNSVILLE ROAD, SOUTH PARK, PA 15129

DESCRIPTION COAL

SAMPLE NUMBER PLT 4-U2-COAL-T1-1&2

DATE LOGGED 10/10/03
DATE COMPLETED 10/23/03
PROJECT NUMBER 1621-87 -1
ANALYTICAL NUMBER 033348

ANALYSIS REPORT

PROXIMATE (Dry)%	
Ash	9.86
Volatile Matter	39.18
Fixed Carbon	50.96
Sulfur, Total	3.33
BTU/lb	13077
MAF BTU/lb	14507

ULTIMATE (Dry)%	
Carbon	72.96
Hydrogen	5.05
Nitrogen	1.54
Chlorine	0.170
Sulfur, Total	3.33
Ash	9.86
Oxygen (DIFF)	7.09

MAJOR ASH ELEM % Ignited at 50 C	
SiO2	48.04
Al2O3	17.57
TiO2	0.92
Fe2O3	18.33
CaO	5.22
MgO	0.87
Na2O	0.78
K2O	2.19
P2O5	0.10
SO3	3.65
UND	2.33

MISC. (As Det.)

MERCURY 0.09 PPM

AS DETERMINED MOISTURE: 4.71 %

DISTRIBUTION:
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J. LOCKE

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DESCRIPTION *COAL*

SAMPLE NUMBER PLT 4-U2-COAL-T2-1&2

DATE LOGGED *10/10/03*
DATE COMPLETED *10/23/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033349

ANALYSIS REPORT

PROXIMATE (Dry)%	
Ash	9.86
Volatile Matter	38.89
Fixed Carbon	51.25
Sulfur, Total	3.28
BTU/lb	13133
MAF BTU/lb	14570

ULTIMATE (Dry)%	
Carbon	73.11
Hydrogen	4.98
Nitrogen	1.51
Chlorine	0.167
Sulfur, Total	3.28
Ash	9.86
Oxygen (DIFF)	7.09

MAJOR ASH ELEM % Ignited at 50 C	
SiO2	47.08
Al2O3	17.49
TiO2	0.92
Fe2O3	20.08
CaO	5.62
MgO	0.86
Na2O	0.70
K2O	2.10
P2O5	0.12
SO3	2.84
UND	2.19

MISC. (As Det.)

MERCURY 0.09 PPM

AS DETERMINED MOISTURE: 4.40 %

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DESCRIPTION COAL

SAMPLE NUMBER PLT 4-U2-COAL-T3-1&2

DATE LOGGED 10/10/03
DATE COMPLETED 10/23/03
PROJECT NUMBER 1621-87 -1
ANALYTICAL NUMBER 033350

ANALYSIS REPORT

PROXIMATE (Dry)%	
Ash	10.02
Volatile Matter	40.08
Fixed Carbon	49.90
Sulfur, Total	3.33
BTU/lb	13104
MAF BTU/lb	14563

ULTIMATE (Dry)%	
Carbon	72.73
Hydrogen	4.91
Nitrogen	1.47
Chlorine	0.143
Sulfur, Total	3.33
Ash	10.02
Oxygen (DIFF)	7.40

MAJOR ASH ELEM % Ignited at 50 C	
SiO2	47.42
Al2O3	17.46
TiO2	0.92
Fe2O3	19.42
CaO	5.80
MgO	0.87
Na2O	0.71
K2O	2.14
P2O5	0.14
SO3	3.00
UND	2.12

MISC. (As Det.)

MERCURY 0.10 PPM

AS DETERMINED MOISTURE: 4.64 %

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DESCRIPTION COAL

SAMPLE NUMBER PLT 4-U2-COAL-T4-1&2

DATE LOGGED 10/10/03
DATE COMPLETED 10/23/03
PROJECT NUMBER 1621-87 -1
ANALYTICAL NUMBER 033351

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	9.58
Volatile Matter	39.05
Fixed Carbon	51.37
Sulfur, Total	3.27
BTU/lb	13117
MAF BTU/lb	14507

ULTIMATE	(Dry)%
Carbon	73.14
Hydrogen	5.00
Nitrogen	1.53
Chlorine	0.178
Sulfur, Total	3.27
Ash	9.58
Oxygen (DIFF)	7.30

MAJOR ASH ELEM	%
Ignited at 50 C	
SiO2	46.43
Al2O3	17.20
TiO2	0.91
Fe2O3	20.36
CaO	5.60
MgO	0.84
Na2O	0.67
K2O	2.11
P2O5	0.14
SO3	3.35
UND	2.39

MISC. (As Det.)

MERCURY 0.09 PPM

AS DETERMINED MOISTURE: 4.53 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2B31-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033376**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	86.34
Sulfur, Total	0.51

MISC. (As Det.)

MERCURY 0.13 PPM

ULTIMATE	(Dry)%
Carbon	12.21
Chlorine	<0.01
Sulfur, Total	0.51
Ash	86.34

MAJOR ASH ELEM	(Dry)%
SiO2	42.02
Al2O3	15.42
TiO2	0.80
Fe2O3	16.96
CaO	4.75
MgO	0.74
Na2O	0.50
K2O	1.80
P2O5	0.20
SO3	1.33
UND	15.48

MOISTURE: 1.10 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2B31-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033382**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	94.22
Sulfur, Total	0.50

MISC. (As Det.)

MERCURY	0.07 PPM

ULTIMATE	(Dry)%
Carbon	4.68
Chlorine	<0.01
Sulfur, Total	0.50
Ash	94.22

MAJOR ASH ELEM	(Dry)%
SiO2	46.52
Al2O3	17.03
TiO2	0.89
Fe2O3	17.33
CaO	5.40
MgO	0.82
Na2O	0.63
K2O	2.04
P2O5	0.20
SO3	1.46
UND	7.68

AS DETERMINED MOISTURE: 0.48 %

DISTRIBUTION:
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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2B32-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033377**

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	20.46
MERCURY	0.20 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 1.97 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2B32-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033383

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	10.62
MERCURY	0.11 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 1.11 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2B35-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033378**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	89.57
Sulfur, Total	1.11

MISC. (As Det.)

MERCURY	0.13 PPM

ULTIMATE	(Dry)%
Carbon	7.12
Chlorine	<0.01
Sulfur, Total	1.11
Ash	89.57

MAJOR ASH ELEM	(Dry)%
SiO2	44.27
Al2O3	17.02
TiO2	0.95
Fe2O3	14.95
CaO	4.42
MgO	0.85
Na2O	0.64
K2O	2.05
P2O5	0.18
SO3	2.82
UND	11.85

AS DETERMINED MOISTURE: 1.32 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2B35-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033384**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	91.52
Sulfur, Total	1.11

MISC. (As Det.)

MERCURY	0.11 PPM

ULTIMATE	(Dry)%
Carbon	5.95
Chlorine	<0.01
Sulfur, Total	1.11
Ash	91.52

MAJOR ASH ELEM	(Dry)%
SiO2	45.91
Al2O3	17.73
TiO2	0.98
Fe2O3	15.76
CaO	4.95
MgO	0.87
Na2O	0.71
K2O	2.16
P2O5	0.19
SO3	2.78
UND	7.96

AS DETERMINED MOISTURE: 1.00 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2A41-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033373**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	95.29
Sulfur, Total	1.42

MISC. (As Det.)

MERCURY	0.08 PPM

ULTIMATE	(Dry)%
Carbon	1.54
Chlorine	<0.01
Sulfur, Total	1.42
Ash	95.29

MAJOR ASH ELEM	(Dry)%
SiO2	48.59
Al2O3	18.36
TiO2	1.02
Fe2O3	16.30
CaO	4.63
MgO	0.87
Na2O	0.78
K2O	2.26
P2O5	0.15
SO3	3.66
UND	3.38

AS DETERMINED MOISTURE: 1.74 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2A41-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033379**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	98.41
Sulfur, Total	0.80

MISC. (As Det.)

MERCURY	0.03 PPM

ULTIMATE	(Dry)%
Carbon	0.72
Chlorine	<0.01
Sulfur, Total	0.80
Ash	98.41

MAJOR ASH ELEM	(Dry)%
SiO2	49.00
Al2O3	17.99
TiO2	1.00
Fe2O3	16.85
CaO	4.96
MgO	0.85
Na2O	0.80
K2O	2.19
P2O5	0.10
SO3	2.03
UND	4.23

AS DETERMINED MOISTURE: 0.51 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2A43-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033374**

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	1.42
MERCURY	0.04 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 0.68 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2A43-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033380

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	1.72
MERCURY	0.04 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 0.52 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2A46-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033375**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	98.06
Sulfur, Total	1.11

MISC. (As Det.)

MERCURY	0.03 PPM

ULTIMATE	(Dry)%
Carbon	0.66
Chlorine	<0.01
Sulfur, Total	1.11
Ash	98.06

MAJOR ASH ELEM	(Dry)%
SiO2	48.73
Al2O3	18.58
TiO2	1.05
Fe2O3	15.69
CaO	5.20
MgO	0.90
Na2O	0.83
K2O	2.28
P2O5	0.18
SO3	2.82
UND	3.74

AS DETERMINED MOISTURE: 0.48 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T1-ESP-2A46-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033381**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	99.05
Sulfur, Total	1.10

MISC. (As Det.)

MERCURY	0.02 PPM

ULTIMATE	(Dry)%
Carbon	0.33
Chlorine	<0.01
Sulfur, Total	1.10
Ash	99.05

MAJOR ASH ELEM	(Dry)%
SiO2	48.80
Al2O3	18.60
TiO2	1.06
Fe2O3	15.39
CaO	5.26
MgO	0.91
Na2O	0.85
K2O	2.27
P2O5	0.18
SO3	2.74
UND	3.94

AS DETERMINED MOISTURE: 0.17 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2B31-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033391**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	99.22
Sulfur, Total	0.50

MISC. (As Det.)

MERCURY	0.02 PPM

ULTIMATE	(Dry)%
Carbon	0.49
Chlorine	<0.01
Sulfur, Total	0.50
Ash	99.22

MAJOR ASH ELEM	(Dry)%
SiO2	49.93
Al2O3	18.42
TiO2	0.98
Fe2O3	18.42
CaO	6.01
MgO	0.88
Na2O	0.76
K2O	2.19
P2O5	0.12
SO3	1.40
UND	0.89

AS DETERMINED MOISTURE: 0.08 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2B31-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033394**

ANALYSIS REPORT

PROXIMATE (Dry)%		ULTIMATE (Dry)%		MAJOR ASH ELEM (Dry)%	
Ash	98.11	Carbon	1.35	SiO2	49.57
Sulfur, Total	0.50	Chlorine	<0.01	Al2O3	18.22
		Sulfur, Total	0.50	TiO2	0.96
MISC. (As Det.)		Ash	98.11	Fe2O3	18.28
				CaO	5.84
MERCURY	0.02 PPM			MgO	0.87
				Na2O	0.76
				K2O	2.13
				P2O5	0.13
				SO3	1.39
				UND	1.85

AS DETERMINED MOISTURE: 0.15 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2B32-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033392**

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	1.00
MERCURY	0.02 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 0.13 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2B32-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033395

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	3.70
MERCURY	0.05 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 0.34 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2B35-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033393**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	98.76
Sulfur, Total	0.90

MISC. (As Det.)

MERCURY	0.01 PPM

ULTIMATE	(Dry)%
Carbon	0.47
Chlorine	<0.01
Sulfur, Total	0.90
Ash	98.76

MAJOR ASH ELEM	(Dry)%
SiO2	49.10
Al2O3	18.66
TiO2	1.03
Fe2O3	16.98
CaO	5.95
MgO	0.92
Na2O	0.80
K2O	2.27
P2O5	0.20
SO3	2.42
UND	1.67

AS DETERMINED MOISTURE: 0.30 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2B35-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033396

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	93.39
Sulfur, Total	1.01

MISC. (As Det.)

MERCURY	0.08 PPM

ULTIMATE	(Dry)%
Carbon	4.07
Chlorine	<0.01
Sulfur, Total	1.01
Ash	93.39

MAJOR ASH ELEM	(Dry)%
SiO2	47.23
Al2O3	18.18
TiO2	1.01
Fe2O3	16.00
CaO	5.06
MgO	0.90
Na2O	0.75
K2O	2.14
P2O5	0.15
SO3	2.73
UND	5.85

AS DETERMINED MOISTURE: 0.74 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2A41-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033385

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	99.05
Sulfur, Total	0.70

MISC. (As Det.)

MERCURY 0.02 PPM

ULTIMATE	(Dry)%
Carbon	0.38
Chlorine	<0.01
Sulfur, Total	0.70
Ash	99.05

MAJOR ASH ELEM	(Dry)%
SiO2	50.87
Al203	18.98
TiO2	1.04
Fe203	16.44
CaO	4.92
MgO	0.90
Na20	0.80
K20	2.34
P205	0.14
SO3	1.91
UND	1.66

AS DETERMINED MOISTURE: 0.30 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2A41-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033388

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	98.27
Sulfur, Total	0.80

MISC. (As Det.)

MERCURY	0.03 PPM

ULTIMATE	(Dry)%
Carbon	0.68
Chlorine	<0.01
Sulfur, Total	0.80
Ash	98.27

MAJOR ASH ELEM	(Dry)%
SiO2	50.91
Al2O3	19.13
TiO2	1.05
Fe2O3	16.39
CaO	4.62
MgO	0.91
Na2O	0.80
K2O	2.36
P2O5	0.15
SO3	2.22
UND	1.46

AS DETERMINED MOISTURE: 0.59 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2A43-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033386

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	0.50
MERCURY	0.02 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 0.16 %

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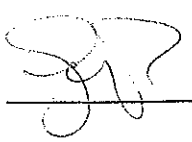
Approved for transmittal 

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2A43-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033389

ANALYSIS REPORT

MISC. (As Det.)

MERCURY	0.02 PPM

ULTIMATE (Dry)%

Carbon	0.85
Chlorine	<0.01

AS DETERMINED MOISTURE: 0.28 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2A46-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033387**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	99.00
Sulfur, Total	1.00

MISC. (As Det.)

MERCURY	0.02 PPM

ULTIMATE	(Dry)%
Carbon	0.33
Chlorine	<0.01
Sulfur, Total	1.00
Ash	99.00

MAJOR ASH ELEM	(Dry)%
SiO2	50.12
Al2O3	19.25
TiO2	1.06
Fe2O3	15.80
CaO	5.28
MgO	0.93
Na2O	0.86
K2O	2.36
P2O5	0.18
SO3	2.58
UND	1.58

AS DETERMINED MOISTURE: 0.38 %

DISTRIBUTION:
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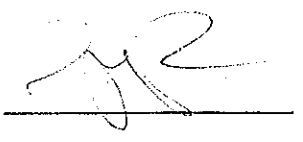
Approved for transmittal 

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4000 BROWNSVILLE ROAD, SOUTH PARK, PA 15129

DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T2-ESP-2A46-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033390**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	98.99
Sulfur, Total	1.00

MISC. (As Det.)

MERCURY	0.02 PPM

ULTIMATE	(Dry)%
Carbon	0.33
Chlorine	<0.01
Sulfur, Total	1.00
Ash	98.99

MAJOR ASH ELEM	(Dry)%
SiO2	50.08
Al2O3	19.21
TiO2	1.08
Fe2O3	15.45
CaO	5.14
MgO	0.94
Na2O	0.87
K2O	2.37
P2O5	0.19
SO3	2.73
UND	1.94

AS DETERMINED MOISTURE: 0.47 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2A46-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033404**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	98.95
Sulfur, Total	0.90

MISC. (As Det.)

MERCURY 0.05 PPM

ULTIMATE	(Dry)%
Carbon	0.33
Chlorine	<0.01
Sulfur, Total	0.90
Ash	98.95

MAJOR ASH ELEM	(Dry)%
SiO2	50.96
Al2O3	19.58
TiO2	1.06
Fe2O3	16.45
CaO	5.17
MgO	0.93
Na2O	0.81
K2O	2.27
P2O5	0.14
SO3	2.27
UND	0.36

AS DETERMINED MOISTURE: 0.20 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2B31-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033405**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	98.00
Sulfur, Total	1.10

MISC. (As Det.)

MERCURY	0.03 PPM

ULTIMATE	(Dry)%
Carbon	0.54
Chlorine	<0.01
Sulfur, Total	1.10
Ash	98.00

MAJOR ASH ELEM	(Dry)%
SiO2	48.72
Al2O3	18.17
TiO2	0.95
Fe2O3	20.12
CaO	5.74
MgO	0.88
Na2O	0.69
K2O	2.11
P2O5	0.15
SO3	2.79
UND	-0.32

AS DETERMINED MOISTURE: 0.23 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2B31-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033399**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	97.68
Sulfur, Total	0.50

MISC. (As Det.)

MERCURY	0.06 PPM

ULTIMATE	(Dry)%
Carbon	1.73
Chlorine	<0.01
Sulfur, Total	0.50
Ash	97.68

MAJOR ASH ELEM	(Dry)%
SiO2	50.15
Al2O3	18.32
TiO2	0.94
Fe2O3	18.97
CaO	5.83
MgO	0.88
Na2O	0.71
K2O	2.14
P2O5	0.16
SO3	1.31
UND	0.59

AS DETERMINED MOISTURE: 0.25 %

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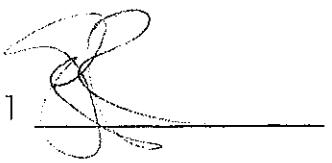
Approved for transmittal 

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2B32-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033400**

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	4.69
MERCURY	0.12 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 0.43 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2B32-2

DATE LOGGED 10/13/03
DATE COMPLETED 11/05/03
PROJECT NUMBER 1621-87 -1
ANALYTICAL NUMBER 033406

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	1.20
MERCURY	0.02 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 0.08 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2B35-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033401**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	95.81
Sulfur, Total	0.90

MISC. (As Det.)

MERCURY	0.07 PPM

ULTIMATE	(Dry)%
Carbon	2.74
Chlorine	<0.01
Sulfur, Total	0.90
Ash	95.81

MAJOR ASH ELEM	(Dry)%
SiO2	48.82
Al2O3	18.73
TiO2	1.03
Fe2O3	16.56
CaO	5.14
MgO	0.92
Na2O	0.73
K2O	2.26
P2O5	0.18
SO3	2.44
UND	3.19

AS DETERMINED MOISTURE: 0.44 %

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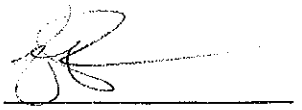
Approved for transmittal 

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2B35-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033407**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	96.51
Sulfur, Total	0.90

MISC. (As Det.)

MERCURY	0.04 PPM

ULTIMATE	(Dry)%
Carbon	2.04
Chlorine	<0.01
Sulfur, Total	0.90
Ash	96.51

MAJOR ASH ELEM	(Dry)%
SiO2	49.40
Al2O3	18.75
TiO2	1.01
Fe2O3	17.35
CaO	5.62
MgO	0.92
Na2O	0.75
K2O	2.23
P2O5	0.16
SO3	2.40
UND	1.41

AS DETERMINED MOISTURE: 0.42 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2A41-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033397

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	99.12
Sulfur, Total	0.60

MISC. (As Det.)

MERCURY	0.27 PPM

ULTIMATE	(Dry)%
Carbon	0.35
Chlorine	<0.01
Sulfur, Total	0.60
Ash	99.12

MAJOR ASH ELEM	(Dry)%
SiO2	51.87
Al2O3	19.25
TiO2	1.03
Fe2O3	17.08
CaO	4.92
MgO	0.91
Na2O	0.78
K2O	2.33
P2O5	0.12
SO3	1.65
UND	0.06

AS DETERMINED MOISTURE: 0.25 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2A41-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033402**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	99.01
Sulfur, Total	0.60

MISC. (As Det.)

MERCURY	0.04 PPM

ULTIMATE	(Dry)%
Carbon	0.43
Chlorine	<0.01
Sulfur, Total	0.60
Ash	99.01

MAJOR ASH ELEM	(Dry)%
SiO2	51.90
Al2O3	19.39
TiO2	1.04
Fe2O3	17.19
CaO	4.85
MgO	0.91
Na2O	0.79
K2O	2.32
P2O5	0.12
SO3	1.63
UND	-0.14

AS DETERMINED MOISTURE: 0.35 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2A43-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033398

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	0.36
MERCURY	0.02 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 0.10 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T3-ESP-2A43-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033403

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	0.26
MERCURY	0.03 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 0.06 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2B31-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033411**

ANALYSIS REPORT

PROXIMATE (Dry)%	
Ash	97.45
Sulfur, Total	1.10

MISC. (As Det.)

MERCURY 0.01 PPM

ULTIMATE (Dry)%	
Carbon	0.56
Chlorine	<0.01
Sulfur, Total	1.10
Ash	97.45

MAJOR ASH ELEM (Dry)%	
SiO2	49.18
Al2O3	18.34
TiO2	0.98
Fe2O3	18.87
CaO	5.34
MgO	0.88
Na2O	0.71
K2O	2.12
P2O5	0.13
SO3	2.84
UND	0.61

AS DETERMINED MOISTURE: 0.18 %

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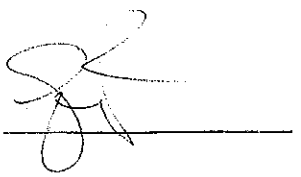
Approved for transmittal 

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2B31-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033417

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	97.85
Sulfur, Total	0.90

MISC. (As Det.)

MERCURY	0.01 PPM

ULTIMATE	(Dry)%
Carbon	0.46
Chlorine	<0.01
Sulfur, Total	0.90
Ash	97.85

MAJOR ASH ELEM	(Dry)%
SiO2	48.76
Al2O3	18.05
TiO2	0.95
Fe2O3	19.29
CaO	5.48
MgO	0.86
Na2O	0.70
K2O	2.09
P2O5	0.12
SO3	2.48
UND	1.22

AS DETERMINED MOISTURE: 0.16 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2B32-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033412

ANALYSIS REPORT

MISC. (As Det.)

MERCURY	0.01 PPM

ULTIMATE (Dry)%

Carbon	1.03
Chlorine	<0.01

AS DETERMINED MOISTURE: 0.12 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2B32-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033418

ANALYSIS REPORT

MISC. (As Det.)

MERCURY	0.01 PPM

ULTIMATE (Dry)%

Carbon	1.03
Chlorine	<0.01

AS DETERMINED MOISTURE: 0.11 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2B35-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033413

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	92.84
Sulfur, Total	1.01

MISC. (As Det.)

MERCURY	0.07 PPM

ULTIMATE	(Dry)%
Carbon	3.73
Chlorine	<0.01
Sulfur, Total	1.01
Ash	92.84

MAJOR ASH ELEM	(Dry)%
SiO2	48.22
Al2O3	18.39
TiO2	1.02
Fe2O3	15.83
CaO	5.03
MgO	0.91
Na2O	0.73
K2O	2.14
P2O5	0.13
SO3	2.70
UND	4.90

AS DETERMINED MOISTURE: 0.56 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2B35-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033419

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	96.97
Sulfur, Total	0.80

MISC. (As Det.)

MERCURY 0.03 PPM

ULTIMATE	(Dry)%
Carbon	1.40
Chlorine	<0.01
Sulfur, Total	0.80
Ash	96.97

MAJOR ASH ELEM	(Dry)%
SiO2	48.82
Al203	18.61
TiO2	1.02
Fe203	17.09
CaO	5.46
MgO	0.92
Na2O	0.73
K2O	2.28
P2O5	0.20
SO3	2.12
UND	2.75

AS DETERMINED MOISTURE: 0.25 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2A41-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033408**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	98.80
Sulfur, Total	0.80

MISC. (As Det.)

MERCURY 0.02 PPM

ULTIMATE	(Dry)%
Carbon	0.41
Chlorine	<0.01
Sulfur, Total	0.80
Ash	98.80

MAJOR ASH ELEM	(Dry)%
SiO2	50.99
Al2O3	18.96
TiO2	1.02
Fe2O3	17.08
CaO	4.80
MgO	0.88
Na2O	0.76
K2O	2.23
P2O5	0.09
SO3	2.05
UND	1.14

AS DETERMINED MOISTURE: 0.43 %

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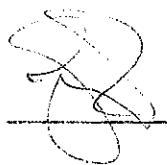
Approved for transmittal 

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2A41-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033414

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	98.51
Sulfur, Total	0.70

MISC. (As Det.)

MERCURY	0.02 PPM

ULTIMATE	(Dry)%
Carbon	0.44
Chlorine	<0.01
Sulfur, Total	0.70
Ash	98.51

MAJOR ASH ELEM	(Dry)%
SiO2	50.53
Al2O3	18.87
TiO2	1.03
Fe2O3	17.37
CaO	4.84
MgO	0.88
Na2O	0.76
K2O	2.22
P2O5	0.08
SO3	1.99
UND	1.43

AS DETERMINED MOISTURE: 0.38 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2A43-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033409

ANALYSIS REPORT

MISC. (As Det.)

MERCURY	0.01 PPM

ULTIMATE (Dry)%

Carbon	0.29
Chlorine	<0.01

AS DETERMINED MOISTURE: 0.19 %

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4000 BROWNSVILLE ROAD, SOUTH PARK, PA 15129

DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2A43-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033415**

ANALYSIS REPORT

MISC. (As Det.)		ULTIMATE	(Dry)%
		Carbon	0.24
MERCURY	0.01 PPM	Chlorine	<0.01

AS DETERMINED MOISTURE: 0.10 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2A46-1

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033410**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	99.02
Sulfur, Total	1.00

MISC. (As Det.)

MERCURY	0.02 PPM

ULTIMATE	(Dry)%
Carbon	0.29
Chlorine	<0.01
Sulfur, Total	1.00
Ash	99.02

MAJOR ASH ELEM	(Dry)%
SiO2	50.83
Al203	19.62
TiO2	1.07
Fe203	16.23
CaO	5.12
MgO	0.95
Na20	0.81
K20	2.36
P205	0.14
SO3	2.50
UND	0.37

AS DETERMINED MOISTURE: 0.15 %

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DESCRIPTION *UNIT #2 ESP HOPPER ASH PLANT 4*

SAMPLE NUMBER U2-T4-ESP-2A46-2

DATE LOGGED *10/13/03*
DATE COMPLETED *11/05/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER **033416**

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	98.79
Sulfur, Total	0.90

MISC. (As Det.)

MERCURY	0.02 PPM

ULTIMATE	(Dry)%
Carbon	0.27
Chlorine	<0.01
Sulfur, Total	0.90
Ash	98.79

MAJOR ASH ELEM	(Dry)%
SiO2	51.02
Al2O3	19.79
TiO2	1.10
Fe2O3	15.91
CaO	5.05
MgO	0.96
Na2O	0.84
K2O	2.36
P2O5	0.17
SO3	2.43
UND	0.37

AS DETERMINED MOISTURE: 0.12 %

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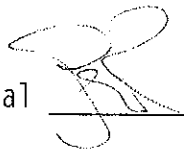
Approved for transmittal 

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DESCRIPTION *LIMESTONE SLURRY SOLIDS*

SAMPLE NUMBER *U2-LS-T1-1&2*

DATE LOGGED *10/10/03*
DATE COMPLETED *11/10/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033340

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	56.79
Total Sulfur	0.06

ULTIMATE	(Dry)%
Chlorine	<0.02
Ash	56.79

MAJOR ASH ELEM	(Dry)%
SiO2	1.51
Al2O3	0.21
TiO2	0.01
Fe2O3	0.16
CaO	54.54
MgO	1.94
Na2O	0.01
K2O	0.04
P2O5	0.04
SO3	0.14
UND	41.40

MISC. (As Det.)

MERCURY 0.01 PPM
% SOLIDS See Bruce Slifer

AS DETERMINED MOISTURE: 0.08 %

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DESCRIPTION *LIMESTONE SLURRY SOLIDS*

SAMPLE NUMBER *U2-LS-T2-1&2*

DATE LOGGED *10/10/03*
DATE COMPLETED *11/10/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033341

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	56.80
Total Sulfur	0.08

ULTIMATE	(Dry)%
Chlorine	<0.02
Ash	56.80

MAJOR ASH ELEM	(Dry)%
SiO2	1.78
Al2O3	0.15
TiO2	0.01
Fe2O3	0.15
CaO	54.22
MgO	2.11
Na2O	0.02
K2O	0.04
P2O5	0.04
SO3	0.21
UND	41.27

MISC. (As Det.)

MERCURY 0.01 PPM
% SOLIDS 2 See Bruce Slifer

AS DETERMINED MOISTURE: 0.05 %

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DESCRIPTION *LIMESTONE SLURRY SOLIDS*

SAMPLE NUMBER *U2-LS-T3-1&2*

DATE LOGGED *10/10/03*
DATE COMPLETED *11/10/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033342

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	56.69
Total Sulfur	0.06

ULTIMATE	(Dry)%
Chlorine	<0.02
Ash	56.69

MAJOR ASH ELEM	(Dry)%
SiO2	1.49
Al2O3	0.14
TiO2	0.01
Fe2O3	0.15
CaO	54.84
MgO	2.23
Na2O	0.01
K2O	0.05
P2O5	0.01
SO3	0.15
UND	40.92

MISC. (As Det.)

MERCURY 0.01 PPM
% SOLIDS

? See Bruce Slifer

AS DETERMINED MOISTURE: 0.05 %

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DESCRIPTION *LIMESTONE SLURRY SOLIDS*

SAMPLE NUMBER *U2-LS-T4-1&2*

DATE LOGGED *10/10/03*
DATE COMPLETED *11/10/03*
PROJECT NUMBER *1621-87 -1*
ANALYTICAL NUMBER 033343

ANALYSIS REPORT

PROXIMATE	(Dry)%
Ash	56.72
Total Sulfur	0.06

ULTIMATE	(Dry)%
Chlorine	<0.02
Ash	56.72

MAJOR ASH ELEM	(Dry)%
SiO2	1.67
Al203	0.19
TiO2	0.01
Fe203	0.17
CaO	54.34
MgO	2.15
Na20	0.01
K20	0.06
P205	0.04
SO3	0.16
UND	41.20

MISC. (As Det.)

MERCURY 0.01 PPM
% SOLIDS ~ See Bruce Slide

AS DETERMINED MOISTURE: 0.04 %

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FGD SLURRY SOLIDS **UNIT 2 TEST 1**

Date Completed: 05/19/2005
Date Received: 4/29/05
Submitted by: S. TSENG

Project No.: 1621 - 087 - 001
Analytical No.: **20051777**

Sample No.: FGDS-1

Proximate (Dry)	%
Ash	97.91
Volatile Matter	
Fixed Carbon	
BTU/lb	
MAF BTU/lb	

Grindability

HGI	
At Moisture %	19.63
	0.00

Sulfur Form (Dry)

Pyritic Sulfur	
Sulfate	
Organic	
Sulfur, Total	22.78

Misc.

Analysis	Value

Ultimate (Dry)	%
Carbon	0.51
Hydrogen	
Nitrogen	
Chlorine	0.0627
Sulfur, Total	22.78
Ash	97.91
Oxygen (DIFF)	

Free Swelling Index

FSI

Trace Elements

Hg	0.368 ppm
Fluorine	

Ash Fusion Reducing Temp. °F
I.D.
Soft.
Hemi.
Fluid

Ash Fusion Oxidizing Temp. °F

I.D.
Soft.
Hemi.
Fluid

Major Ash Elem.
Ignited at ad

SiO2	1.05
Al2O3	0.12
TiO2	0.00
Fe2O3	0.10
CaO	34.26
MgO	0.37
Na2O	0.01
K2O	0.03
P2O5	0.00
SO3	45.77
Undetermined	18.29

As Determined Moisture 9.63 %

These values have been reviewed and are approved for transmission.

Distribution:

Approved: _____

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FGD SLURRY SOLIDS **UNIT 2 TEST 2**

Date Completed: 05/19/2005
Date Received: 4/29/05
Submitted by: S. TSENG

Project No.: 1621 - 087 - 001
Analytical No.: **20051778**

Sample No.: FGDS-2

Proximate (Dry)	%
Ash	97.72
Volatile Matter	
Fixed Carbon	
BTU/lb	
MAF BTU/lb	

Grindability

HGI	
At Moisture %	19.44
	0.00

Sulfur Form (Dry)

Pyritic Sulfur	
Sulfate	
Organic	
Sulfur, Total	22.48

Misc.

Analysis	Value

Ultimate (Dry)	%
Carbon	0.46
Hydrogen	
Nitrogen	
Chlorine	0.0792
Sulfur, Total	22.48
Ash	97.72
Oxygen (DIFF)	

Free Swelling Index

FSI

Trace Elements

Hg	0.417 ppm
Fluorine	

Ash Fusion Reducing Temp. °F

I.D.	
Soft.	
Hemi.	
Fluid	

Ash Fusion Oxidizing Temp. °F

I.D.	
Soft.	
Hemi.	
Fluid	

Major Ash Elem.
Ignited at ad

SiO2	1.08
Al2O3	0.13
TiO2	0.00
Fe2O3	0.11
CaO	34.60
MgO	0.46
Na2O	0.00
K2O	0.03
P2O5	0.00
SO3	45.27
Undetermined	18.32

As Determined Moisture 9.44 %

These values have been reviewed and are approved for transmission.

Distribution:

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FGD SLURRY SOLIDS **UNIT 2 TEST 3**

Date Completed: 05/19/2005
Date Received: 4/29/05
Submitted by: S. TSENG

Project No.: 1621 - 087 - 001
Analytical No.: **20051779**

Sample No.: FGDS-3

Proximate (Dry)	%
Ash	97.95
Volatile Matter	
Fixed Carbon	
BTU/lb	
MAF BTU/lb	

Ultimate (Dry)	%
Carbon	0.41
Hydrogen	
Nitrogen	
Chlorine	0.0803
Sulfur, Total	22.23
Ash	97.95
Oxygen (DIFF)	

Ash Fusion Reducing Temp. °F

I.D.	
Soft.	
Hemi.	
Fluid	

Grindability

HGI	
At Moisture %	19.58
	0.00

Free Swelling Index

FSI

Ash Fusion Oxidizing Temp. °F

I.D.	
Soft.	
Hemi.	
Fluid	

Trace Elements

Hg	0.366 ppm
Fluorine	

Sulfur Form (Dry)

Pyritic Sulfur	
Sulfate	
Organic	
Sulfur, Total	22.23

Major Ash Elem.
Ignited at ad

SiO2	0.95
Al2O3	0.11
TiO2	0.00
Fe2O3	0.10
CaO	33.64
MgO	0.42
Na2O	0.00
K2O	0.02
P2O5	0.00
SO3	44.71
Undetermined	20.05

Misc.

Analysis	Value

As Determined Moisture 9.58 %

These values have been reviewed and are approved for transmission.

Distribution:

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FGD SLURRY SOLIDS **UNIT 2 TEST 4**

Date Completed: 05/19/2005
Date Received: 4/29/05
Submitted by: S. TSENG

Project No.: 1621 - 087 - 001
Analytical No.: **20051780**

Sample No.: FGDS-4

Proximate (Dry)	%
Ash	98.02
Volatile Matter	
Fixed Carbon	
BTU/lb	
MAF BTU/lb	

Ultimate (Dry)	%
Carbon	0.36
Hydrogen	
Nitrogen	
Chlorine	0.0843
Sulfur, Total	22.43
Ash	98.02
Oxygen (DIFF)	

Ash Fusion Reducing Temp. °F

I.D.	
Soft.	
Hemi.	
Fluid	

Ash Fusion Oxidizing Temp. °F

I.D.	
Soft.	
Hemi.	
Fluid	

Grindability

HGI	
At Moisture %	19.69
	0.00

Free Swelling Index

FSI

Trace Elements

Sulfur Form (Dry)

Pyritic Sulfur	
Sulfate	
Organic	
Sulfur, Total	22.43

Major Ash Elem.
Ignited at ad

SiO2	0.92
Al2O3	0.10
TiO2	0.00
Fe2O3	0.09
CaO	33.17
MgO	0.39
Na2O	0.00
K2O	0.02
P2O5	0.00
SO3	45.03
Undetermined	20.28

Misc.

Analysis	Value
Hg	0.340 ppm
Fluorine	

As Determined Moisture 9.69 %

These values have been reviewed and are approved for transmission.

Distribution:

Approved: _____

Velocity & Temperature Traverse

Location	Plant 4 Stack	Duct Dia	in	Bar,"Hg	29.59
Date	09/25/03	Duct Dia	0.0 ft	Static, "H_2O	-0.885
Time	Run 1	Duct Area	1164.2 ft^2	Dry Bulb °F	126.1
Tube I.D.	S-19	% O_2	6.7	Wet Bulb °F	126.1
C_P	0.788	% CO_2	13.5	% H_20	14.05
Operator(s)	RLO, KC	% N_2	79.8	W.M.Wt	29.10

Ports labeled from sampling port to far wall

PORT/ POINT	Distance [' From Wall]	Temp [—uo˜F]	Delta P [" H—d2˜O]	Velocity [fps]	Null Yaw [—uo˜CW]	Axial Vel [fps]
A-1		128	0.958	54.56		54.56
A-2		128	1.121	59.02		59.02
A-3		129	1.144	59.67		59.67
B-1		127	0.727	47.49		47.49
B-2		120	0.866	51.52		51.52
B-3		120	1.077	57.45		57.45
C-1		127	1.143	59.54		59.54
C-2		127	1.209	61.24		61.24
C-3		127	1.300	63.50		63.50
D-1		126	1.161	59.96		59.96
D-2		127	1.375	65.31		65.31
D-3		127	1.400	65.90		65.90
Average		126.1	1.123	58.8	#DIV/0!	58.8
Maximum		129.0	1.400	65.9	0.0	65.9
Minimum		120.0	0.727	47.5	0.0	47.5
SDEV		2.8	0.190	5.2	#DIV/0!	5.2

DATA SUMMARY		
	(Measured)	(Axial)
Velocity, fps	58.76	58.76
Velocity, fpm	3526	3526
ACFM	4104575	4104575
SCFM	3647499	3647499
DSCFM	3134950	3134950
Ex Air Free	2132966	2132966

12/09/03

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FGD SLURRY FILTRATE **UNIT 2 TEST 1**

Sample No.: FGD-LIG-1
Date Received: 04/29/2005
Date Completed: 06/01/2005

Analytical No.: **20051781**
Project No.: 1621 -087 -001

Submitter: S. TSENG

Water Result
(mg/L unless noted otherwise)

Parameter	Value	Value	Units	Avg Value
pH				
Acidity, $CaCO_3$				
Alkalinity, $CaCO_3$				
Hydroxide, $CaCO_3$				
Carbonate, $CaCO_3$				
Bicarbonate, $CaCO_3$				
Total Suspended Solids				
Total Dissolved Solids				
Specific Conductivity				
Hardness				
Turbidity				
Osmotic Pressure				
Dissolved Oxygen				
Ammonia, N				
Total Elements				
Aluminum				
Calcium	485.2			
Iron	.2497			
Magnesium	1053			
Manganese				
Potassium	5.700			
Phosphorous				
Silicon				
Sodium	29.63			
Chromium				
Anions:				
Sulfate	2487			
Chloride	2260	2275		
Nitrate, N				
Nitrite, N				
Bromide				
Fluoride				

Quality Control Calculations

Ion Sum	6328.28
Cation Sum	112.25
Anion Sum	115.76
Ion Balance	1.85
% Ion Imbalance	-1.54

Mercury <1.0 ppb

These values have been reviewed and are approved for transmission.

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FGD SLURRY FILTRATE **UNIT 2 TEST 2**

Sample No.: FGD-LIQ-2
Date Received: 04/29/2005
Date Completed: 06/02/2005

Analytical No.: **20051782**
Project No.: 1621 -087 -001

Submitter: S. TSENG

Water Result
(mg/L unless noted otherwise)

Parameter	Value	Value	Units	Avg Value
pH				
Acidity, $CaCO_3$				
Alkalinity, $CaCO_3$				
Hydroxide, $CaCO_3$				
Carbonate, $CaCO_3$				
Bicarbonate, $CaCO_3$				
Total Suspended Solids				
Total Dissolved Solids				
Specific Conductivity				
Hardness				
Turbidity				
Osmotic Pressure				
Dissolved Oxygen				
Ammonia, N				
Total Elements				
Aluminum				
Calcium	427			
Iron	1011			
Magnesium	1045			
Manganese				
Potassium	5.858			
Phosphorous				
Silicon				
Sodium	29.45			
Chromium				
Anions:				
Sulfate	2230			
Chloride	2300			
Nitrate, N				
Nitrite, N				
Bromide				
Fluoride				

Quality Control Calculations

Ion Sum	6037.41
Cation Sum	108.68
Anion Sum	111.32
Ion Balance	1.44
% Ion Imbalance	-1.20

Mercury <1.0 ppb

These values have been reviewed and are approved for transmission.

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FGD SLURRY FILTRATE **UNIT 2 TEST 3**

Sample No.: FGD-LIQ-3
Date Received: 04/29/2005
Date Completed: 06/02/2005

Analytical No.: **20051783**
Project No.: 1621 -087 -001

Submitter: S. TSENG

Water Result
(mg/L unless noted otherwise)

Parameter	Value	Value	Units	Avg Value
pH				
Acidity, $CaCO_3$				
Alkalinity, $CaCO_3$				
Hydroxide, $CaCO_3$				
Carbonate, $CaCO_3$				
Bicarbonate, $CaCO_3$				
Total Suspended Solids				
Total Dissolved Solids				
Specific Conductivity				
Hardness				
Turbidity				
Osmotic Pressure				
Dissolved Oxygen				
Ammonia, N				
Total Elements				
Aluminum				
Calcium	465.4			
Iron	.1253			
Magnesium	1046			
Manganese				
Potassium	5.676			
Phosphorous				
Silicon				
Sodium	28.84			
Chromium				
Anions:				
Sulfate	2333			
Chloride	2260			
Nitrate, N				
Nitrite, N				
Bromide				
Fluoride				

Quality Control Calculations

Ion Sum	6139.04
Cation Sum	110.65
Anion Sum	112.34
Ion Balance	0.91
% Ion Imbalance	-0.76

Mercury <1.0 ppb

These values have been reviewed and are approved for transmission.

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FGD SLURRY FILTRATE **UNIT 2 TEST 4**

Sample No.: FGD-LIQ-4
Date Received: 04/29/2005
Date Completed: 06/02/2005

Analytical No.: **20051784**
Project No.: 1621 -087 -001

Submitter: S. TSENG

Water Result
(mg/L unless noted otherwise)

Parameter	Value	Value	Units	Avg Value
pH				
Acidity, $CaCO_3$				
Alkalinity, $CaCO_3$				
Hydroxide, $CaCO_3$				
Carbonate, $CaCO_3$				
Bicarbonate, $CaCO_3$				
Total Suspended Solids				
Total Dissolved Solids				
Specific Conductivity				
Hardness				
Turbidity				
Osmotic Pressure				
Dissolved Oxygen				
Ammonia, N				
Total Elements				
Aluminum				
Calcium	446.9			
Iron	.1654			
Magnesium	1074			
Manganese				
Potassium	5.550			
Phosphorous				
Silicon				
Sodium	28.42			
Chromium				
Anions:				
Sulfate	2389			
Chloride	2300			
Nitrate, N				
Nitrite, N				
Bromide				
Fluoride				

Quality Control Calculations

Ion Sum	6244.04
Cation Sum	112.01
Anion Sum	114.63
Ion Balance	1.39
% Ion Imbalance	-1.16

Mercury <1.0 ppb

These values have been reviewed and are approved for transmission.

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SOUTH PARK, PENNSYLVANIA 15129

TO: S. TSENG

PROJECT NUMBER 1621-87 -1

DATE LOGGED 10/10/03
DATE COMPLETED / /

DESCRIPTION FGD MAKE-UP WATER
SAMPLE NUMBER U2-H2O-T1
ANALYTICAL NUMBER 033352

		WATER ANALYSIS		
ANALYSIS	UNITS	VALUE	VALUE	DUP AVG
Calcium		27.8		
Magnesium		4.92		
Sodium		3.63		
Ammonia as NH3	ppm	<5		
Chloride		20.0	21.0	20.5
Nitrate as N		1650		
Sulfate		22.5		
MERCURY	ng/ml	<1.0		

Note: All units mg/L unless specified

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TO: S. TSENG

PROJECT NUMBER 1621-87 -1

DATE LOGGED 10/10/03
DATE COMPLETED 11/07/03

DESCRIPTION FGD MAKE-UP WATER
SAMPLE NUMBER U2-H2O-T2
ANALYTICAL NUMBER 033353

		WATER ANALYSIS		
ANALYSIS	UNITS	VALUE	VALUE	DUP AVG
Calcium		30.2		
Magnesium		5.00		
Sodium		3.31		
Ammonia as NH3	ppm	<5		
Chloride		15.0		
Nitrate as N		1250		
Sulfate		21.8		
MERCURY	ng/ml	<1.0		

Note: All units mg/L unless specified

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TO: S. TSENG

PROJECT NUMBER 1621-87 -1

DATE LOGGED 10/10/03
DATE COMPLETED / /

DESCRIPTION FGD MAKE-UP WATER
SAMPLE NUMBER U2-H2O-T3
ANALYTICAL NUMBER 033354

		WATER ANALYSIS		
ANALYSIS	UNITS	VALUE	VALUE	DUP AVG
Calcium		30.5		
Magnesium		4.97		
Sodium		3.31		
Ammonia as NH3	ppm	<5		
Chloride		11.0		
Nitrate as N		1090		
Sulfate		21.8		
MERCURY	ng/ml	<1.0		

Note: All units mg/L unless specified

CONSOL ENERGY INC.
RESEARCH & DEVELOPMENT
ANALYTICAL LABORATORY
SOUTH PARK, PENNSYLVANIA 15129

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PROJECT NUMBER 1621-87 -1

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DESCRIPTION FGD MAKE-UP WATER
SAMPLE NUMBER U2-H2O-T4
ANALYTICAL NUMBER 033355

		WATER ANALYSIS		
ANALYSIS	UNITS	VALUE	VALUE	DUP AVG
Calcium		36.1		
Magnesium		5.44		
Sodium		3.39		
Ammonia as NH3	ppm	<5		
Chloride		20.0		
Nitrate as N		1630		
Sulfate		35.5		
MERCURY	ng/ml	<1.0		

Note: All units mg/L unless specified