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SECTION 1 OF 3

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7. Abstract

A multiphase program was initiated in 1994 to test commercially available melter technologies for the vitrification of the low-level waste (LLW) stream from defense wastes stored in underground tanks at the Hanford Site in southeastern Washington State. Phase 1 of the melter demonstration tests using simulated LLW was completed during fiscal year 1995. This document is the 100 kg melter offgas report on testing performed by GTS Duratek Inc. in Columbia, Maryland. GTS Duratek (one of the seven vendors selected) was chosen to demonstrate Joule heated melter technology under WHC subcontract number MMI-SVV-384215. The document contains the complete offgas report on the 100 kg melter as prepared by Parsons Engineering Science Inc. A summary of this report is also contained in the "GTS Duratek, Phase 1 Hanford Low-Level Waste Melter Tests: Final Report" (WHC-SD-WM-VI-027).

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PERFORMANCE TEST REPORT FOR THE 100 KG MELTER

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DECEMBER 1994

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EXECUTIVE SUMMARY

Source testing was conducted on the 100 kg melter operated by Catholic University's Vitreous State Laboratory. The testing was conducted during a pilot-scale study involving the vitrification of sludge. Particulate matter emission rates were highest at the melter exhaust and averaged 0.29 lb/hr. At the HEPA filter exhaust, the particulate matter emission rate averaged 0.004 lb/hr. Metals concentrations and emissions rates were measured at the melter exhaust and at the HEPA filter exhaust. The highest metals concentrations were observed in the melter exhaust while the HEPA filter exhaust was virtually clean with most metals reported by the laboratory as non-detectable. Sodium was the most prevalent metal in the melter exhaust (3866 μg/dscf).

Continuous emissions monitoring results for NO_x, SO_2, CO, and THC identified NO_x as the pollutant most prevalent at all of the sampling locations (melter exhaust, post-scrubber, post-demister, HEPA filter). The highest NO_x measurement observed was at the post-scrubber and was 5234 ppmv. However, NO_x measurements were biased by the presence of high concentrations of ammonia in the exhaust gas. Ammonia converts to NO when subjected to the NO_x measurement systems heated converter. NO_x measurements will be biased by 80 percent of the ammonia concentration in the gases to be measured.

Other pollutants were not present in significant quantities when compared to the NO_x concentrations. CO, THC, SO_2 were generally observed at levels below 100 ppmv. Baseline concentrations of NO_x, SO_2, CO, and THC at all locations were below 2 ppmv.

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SECTION 1

INTRODUCTION

This sampling and analysis report has been prepared by Parsons Engineering Science, Inc. (Parsons ES) for a source assessment program conducted on an experimental glass melter, operated by the Vitreous State Laboratory (VSL) of the Catholic University of America. The Director of the VSL is Dr. Pedro Macedo. This pilot-scale melter (100 kg) is located in Hannon Hall, Catholic University of America, Washington D.C., 20064. Process sampling results are presented and summarized in this report. Collected data will be used by the VSL as part of the performance evaluation program for the 100 kg melter.

During this source assessment, Parsons ES monitored the melter at different locations of the process and air pollution control system. Emission rates of sodium (Na), potassium (K), cesium (Cs), strontium (Sr), molybdenum (Mo), boron (B), and chromium (Cr) were measured. Particulate matter emission rates were also measured. Parsons ES periodically monitored several gas streams for nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), oxygen (O_2), and total hydrocarbons (THC).

The physical design and layout of the 100 kg melter prevents strict adherence to the source test methodologies prescribed by 40 CFR Part 60, Appendix A for compliance monitoring. Therefore, we modified the EPA Reference Methods of 40 CFR Part 60 and utilized other EPA source test methods to conduct a source assessment program of the 100 kg melter; these modifications were made to allow collection of samples in the most representative manner as possible, given the nature of the physical constraints of the system layout.

The 100 kg melter source assessment was conducted by a Parsons ES field crew of two engineers and two senior technicians with the assistance of VSL operators, on September 26 and 27, 1994. Analysis of samples for metals content was performed by Triangle Laboratories, Inc.

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SECTION 2

SOURCE DESCRIPTION

The 100 kg melter is an electrically-powered melter designed to vitrify certain types of hazardous materials of varied natures. During this testing, a surrogate sludge was fed to the melter to simulate the low-level radioactive or mixed waste for which this melter is being designed. Once the desired glass composition in the melter was obtained, the melter operated continuously for approximately three days, during which time the surrogate sludge was pumped into the unit. Source testing occured during the first twenty-seven hours of the melter demonstration.

The exhaust from the melter is treated by an air pollution control system. Exhaust air leaves the melter at temperatures between 500 and 800° C and passes through a quench and then to a caustic scrubber. Two demisters follow the caustic scrubber and after the gas passes through them, it is re-heated before being sent to a baghouse for final particle removal. Final gas cleaning is accomplished with a HEPA filter. A small volume of ambient air is added to the exhaust air prior to the HEPA filter to control the humidity and maintain HEPA filter performance.

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SECTION 3

SAMPLING LOCATIONS

Four sampling locations were selected by the VSL for the source assessment of the 100 kg melter. These locations are the melter exhaust, post-quench, post-demister, and HEPA filter exhaust.

The melter exhaust sampling location is pictured in Figure 3.1. A pipe "T" fitting was modified for use as a sampling port in the four-inch i.d. Inconel® pipe that ducts exhaust gas from the melter. The main sampling port is located at a bend, approximately two feet downstream from the melter exhaust stack. Due to the melter equipment arrangement, there are no sampling locations that meet the criteria for isokinetic sampling as described in EPA Reference Method 1 or 1A. Also, the small duct diameter precludes sampling traverses. Instead, a single point nominally in the center of the gas flow, was selected for the sampling nozzle location. An auxiliary sample point was installed downstream of the main sampling point for the collection of NO_x, SO_2, THC, CO, and O_2.

Sampling at the post-quench was performed at a sampling port located just down stream of the quench (Figure 3.2). A small tap suitable for sampling NO_x, SO_2, THC, CO, and O_2 was installed in the six-inch i.d. stainless steel pipe. This location was only used for extraction of samples for the CEM system.

Sampling at the post-demister was performed at a sampling port located just down stream of the demister (Figure 3.3). A small tap suitable for sampling NO_x, SO_2, THC, CO, and O_2 was installed in the eight-inch PVC pipe, prior to the reheat. Like the post-quench, this location was only used for CEM sampling.

The HEPA filter exhaust was sampled at the exhaust pipe after it leaves the filter and before it passes through the induced draft fan (Figure 3.4). The main sample location was selected as required by EPA Reference Method 1A. The exhaust duct is a 5-inch diameter steel pipe with a sampling port for isokinetic sampling located eight diameters downstream from the nearest disturbance and approximately four diameters upstream from the nearest disturbance.

*Inconel is a trademark of INCO Alloys International, Inc.

FIGURE 3.1
MELTER EXHAUST

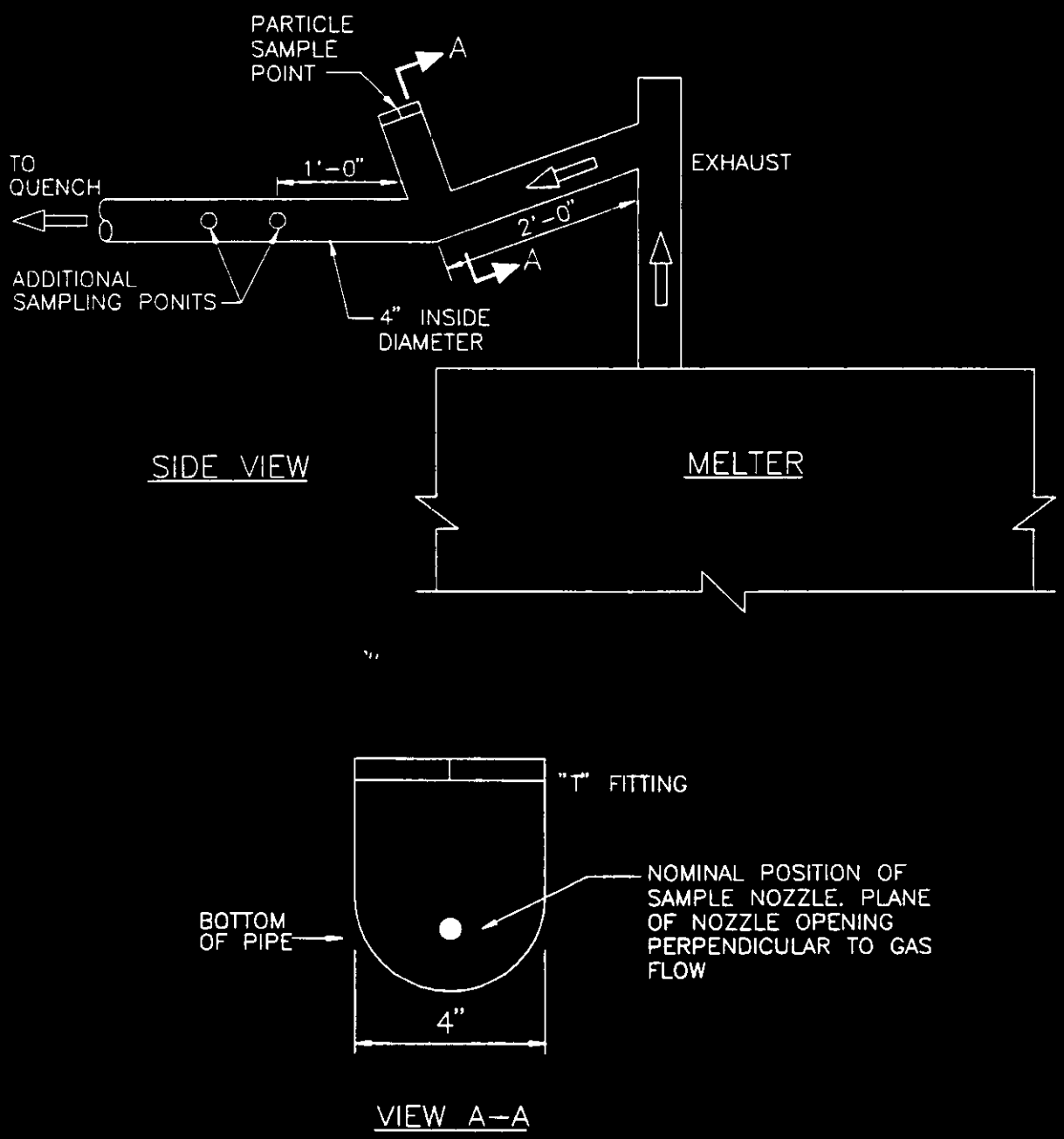


FIGURE 3.2
POST-QUENCH

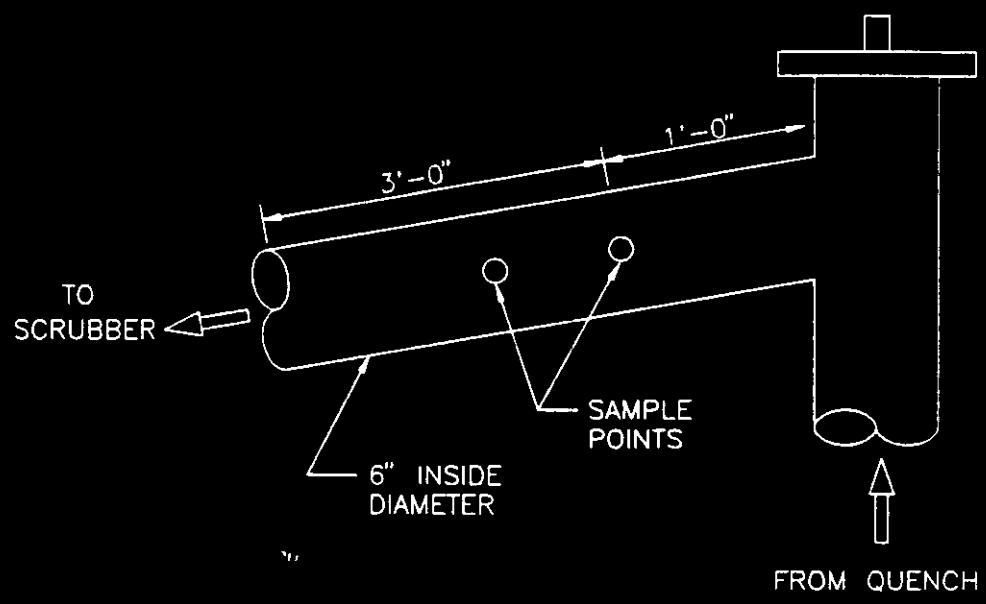


FIGURE 3.3
POST-DEMISTER

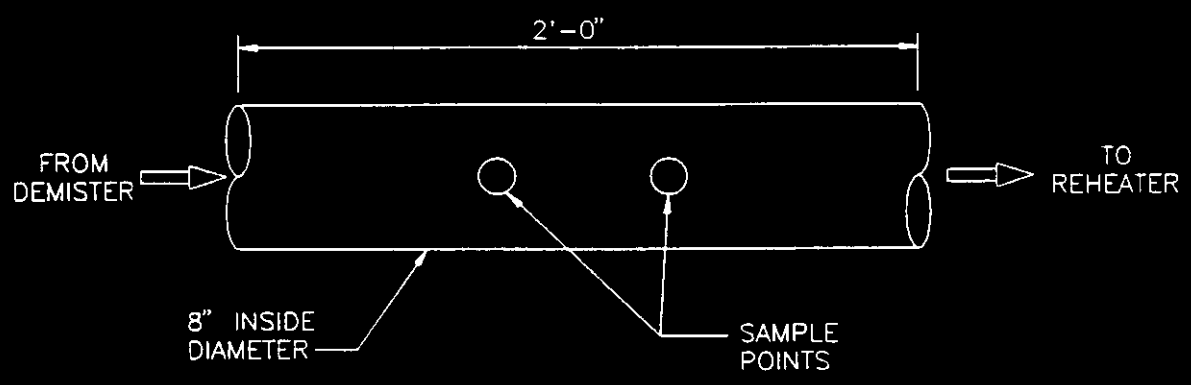
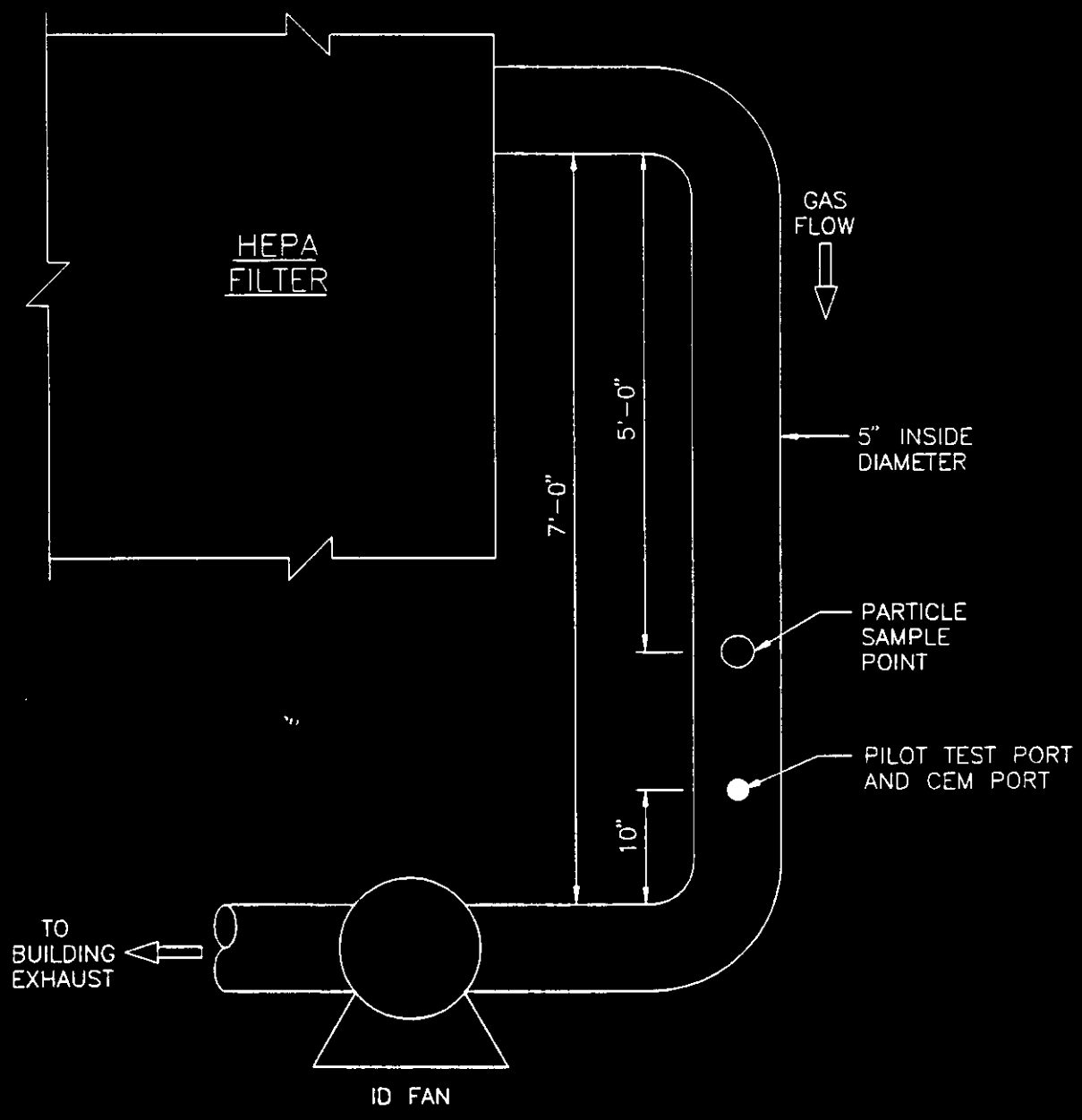


FIGURE 3.4
HEPA FILTER EXHAUST



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A pitot tube port was installed downstream of the main sampling port for velocity measurements with a standard pitot tube. As with the Melter Exhaust, a single sample point nominally in the center of the exhaust gas flow, was selected for the sampling nozzle.

The pitot tube port also served as an auxiliary sampling port for non-isokinetic sampling.

SECTION 4

TEST PROGRAM AND SAMPLING METHODS

As stated previously, the purpose of this source assessment program is to provide emissions data for the VSL's 100 kg melter. This test program collected emissions data from four sampling locations: the melter exhaust, the post-quench, post-demister, and HEPA filter exhaust. Particulate matter and metals samples were collected from the melter exhaust and HEPA filter exhaust locations. From all four locations, NO_x, SO_2, THC, CO, and O_2 were measured. Figure 4-1 is the sampling matrix for the source assessment program.

Particulate Matter and Metals Sampling

Particulate matter and metals were collected at the Melter Exhaust with a modification of the multiple-metals method from the ***Methods Manual for Compliance with the BIF Regulations (EPA/530-SW-91-010)***. The BIF metals methods was used in conjunction with EPA Method 1A at the HEPA Filter Exhaust sampling location.

With the BIF Metals Method, particulate and gaseous emissions are isokinetically withdrawn from the stack and collected on a quartz fiber filter and in an impinger solution. Metals in the particulate phase are captured on the filter and vapor-phase metals are collected in the impinger solution. This source assessment program used two impingers each containing 100 ml of a 5% nitric acid/10% hydrogen peroxide solution. The various fractions of the sampling trains are digested prior to analysis by inductively-coupled argon plasma (ICAP) spectroscopy. Generally, this method is used for the sampling and analysis of trace metals. Except for chromium, the metals targeted in this source assessment program are not usually selected for emissions monitoring. However, the selected analytical methodology, ICAP, provides the sensitivity and precision desired.

Prior to metals analysis of the sample filter, the filter was weighed to measure the mass of particulate matter collected.

As mentioned previously, the BIF Metals method was modified to accommodate the sample point configuration at the melter exhaust. Since the exhaust gas temperature

FIGURE 4-1

SAMPLE MATRIX FOR VSL 100 KG MELTER

Sample Location	Parameter	No. of Sample Runs	Sample Train ID	Sample Method
Melter Exhaust	Metals (Na, K, Cs, Cr, Mo, B, Sr)	3	1	Modified BIF-MMT
	Particles	3	1	Modified BIF-MMT
	NO/NOx, SOx, CO, O2, THC	Continuous	NA	EPA Methods for CEMS
Post-Quench	NO/NOx, SOx, CO, O2, THC	Continuous	NA	EPA Methods for CEMS
Post-Demister	NO/NOx, SOx, CO, O2, THC	Continuous	NA	EPA Methods for CEMS
Stack	Metals (Na, K, Cs, Cr, Mo, B, Sr)	3	2	Modified BIF-MMT
	Particles	3	2	Modified BIF-MMT
	NO/NOx, SOx, CO, O2, THC	Continuous	NA	EPA Methods for CEMS

exceeded the softening temperature of a conventional glass probe, the sampling nozzle and sampling probe were made from Inconel®. An equipment blank was collected from the nozzle/probe assembly to check for the possibility of contamination from the equipment.

A summary of the BIF Metals Method is presented in the appendices. Also included in the appendices are the summaries of EPA Reference Methods 1 and 5. These are the standard methods upon which the BIF Metals Method draws for the isokinetic and particle sampling guidelines. The source test protocol provides greater detail of the sampling methods.

CEM

At each of the four sampling locations, the exhaust gas was sampled and analyzed for NO_x, SO_2, THC, CO, and O_2. Stack gas samples for analysis by continuous emissions monitors were extracted from a single point at each sample location. Monitoring at each location was conducted on a rotating schedule that reflected the requirements of the VSL staff. Generally, monitoring was conducted at each location for 10 to 15 minutes of every hour during the testing. Two sample streams were extracted from the stack and transported to the mobile CEM laboratory through the use of self-regulating heated sample lines, which are designed to maintain gas temperature of 250 °F above the ambient temperature. One of the streams was conditioned to remove entrained particles and moisture and then sent to a stainless steel sampling manifold. Continuous samples for the oxygen, carbon monoxide, nitrogen oxide, and sulfur dioxide analyzers were extracted from the manifold, and the excess gases were vented to the atmosphere. The second stack gas stream was not conditioned, and was sent directly to the continuous hydrocarbon analyzer which analyzed the total hydrocarbon content of the sample with a flame ionization detector.

Instrument responses to calibration standards and sample gases were analyzed and recorded by a PC-driven data acquisition system (DAS). The DAS consists of an analog-to-digital signal converter and a personal computer which analyzed the instrument responses and converted the analog signals to the appropriate engineering units. The analyzer responses were read and recorded at thirty-second intervals on the PC's hard disk drive and on a computer print-out.

Stack Gas Oxygen Content

The oxygen content in the effluent gas was measured by a Horiba PMA-200 Paramagnetic Oxygen Analyzer in accordance with the procedures in EPA Method 3A. O_2 was analyzed on a dry basis and the instrument responses were recorded by the DAS. The PMA-200 has two operating ranges, 0 - 10, and 0 - 25 percent oxygen. During this test, the instrument was operated on the 0 - 25 percent range and calibrated with oxygen standards containing approximately 17.7 and 11.2 percent oxygen. Prior to each day of testing, the instrument was calibrated by introducing a zero gas and the upscale calibration standards directly to the analyzer. The sample line bias was checked by introducing the zero gas and the mid-range calibration standard into the sampling system immediately downstream of the probe. The oxygen measurement system response and drift was determined at the conclusion of each sampling run by introducing the zero and upscale calibration standard into the measurement system downstream of the probe.

Stack Gas Nitrogen Oxides Content

The nitrogen oxides content in the effluent gas was measured by a Thermo Environmental Model 10 $NO/NO_2/NO_X$ chemiluminescence analyzer in accordance with the procedures in EPA Method 7E. NO_X in the sample gas is converted to NO and detected by the chemiluminescent reaction with ozone. This analytical procedure is subject to interference from NH_3. There was an unanticipated elevated amount of NH_3 in the exhaust from the source tested. NH_3 concentrations were estimated to be as high as 2,000 ppmv which is significant since as much as 80 percent of that concentration can bias the NO_X measurements. NO_X was analyzed on a dry basis and the instrument responses were recorded by the DAS. The Model 10 has eight operating ranges, 0 - 2.5, 10, 25, 100, 250, 1,000, 2,500, and 10,000 ppm nitrogen oxides. During this test, the instrument was operated on the 0 - 250 ppm range and the zero to 1,000 ppm range and calibrated with nitric oxide standards containing approximately 225 and 150 ppm nitrogen oxide. The instrument was calibrated by introducing a zero gas and the upscale calibration standards directly to the analyzer. The sample line bias was checked by introducing the zero gas and the mid-range calibration standard into the sampling system immediately downstream of the probe. The nitrogen oxides measurement system response and drift were subsequently determined at the conclusion of each sampling run by introducing the zero and upscale calibration standard into the measurement system downstream of the probe.

Stack Gas Total Hydrocarbon Content

The THC content in the effluent gas was measured by a J.U.M. VE-7 Total Hydrocarbon Analyzer in accordance with the procedures in EPA Method 25A. Hydrocarbons in the sample stream were measured continuously by a Flame Ionization Detector. THC was analyzed on a wet basis and the instrumentation responses were recorded by the DAS. The VE-7 has five operating ranges, 0 - 10, 100, 1,000, 10,000 and 100,000 ppm hydrocarbons, and is calibrated using propane standards that correspond to approximately 30, 60, and 85 percent of the full-scale response. The VE-7 was operated at the 0-100 ppm range. Prior to testing, the instrument was calibrated by introducing a zero gas and the upscale calibration standards into the sampling system directly downstream of the sample probe. The THC measurement system response and drift were determined at the conclusion of each sampling run by introducing the zero and upscale calibration standard into the measurement system downstream of the probe.

Stack Gas Sulfur Dioxide Content

SO_2 measurements were made using the procedures outlined in EPA Method 6C. Method 6C is based on absorption of ultraviolet radiation by the SO_2 molecule. The amount of light absorbed is dependent upon the concentration of the compound present. The UV light beam is split after the light source, with one part passing through the sample cell, and the other part passing through the reference cell, which is filled with a non-absorbing gas. Each beam then passes through a narrow band pass filter into photomultiplier tubes for creation and amplification of the signals. The amount of absorbed light (found by difference in signal intensity) is proportional to the amount of absorbing species present.

The SO_2 analyzer used is a Horiba that operates on the principle of UV absorption. The analyzer has full-scale ranges of 0 to 100 and 0 to 500 ppm. SO_2 standards are SO_2 in air and are selected to correspond to approximately 55 and 85 percent of the instrument span range.

Summaries of the sampling methods are provide in the appendices.

Sampling Schedule

The source assessment program was conducted over two days, on September 26 and September 27, 1994. Three metals and three particle runs were conducted at both the melter exhaust and at the HEPA filter exhaust. Each metals sampling run lasted for approximately one hour. Metals samples were collected simultaneously at each location.

Exhaust samples each of the four sampling locations were directed to continuous emissions monitoring instruments at 15 minute intervals. After monitoring for approximately 15 minutes at each location , the exhaust from the next location was sampled. During each run, the first location monitored was the HEPA filter exhaust. The next location from where sample was drawn was the post-demister, then the post-scrubber, and finally the melter exhaust.

SECTION 5

QA/QC PROCEDURES

The main quality assurance and quality control (QA/QC) procedure for the 100 kg melter source assessment is the adherence to the test protocol. By following the approved source test protocol, complying with the applicable QA procedures for each sampling and analysis method, and documenting changes to the protocol, the quality of resulting performance test data can be evaluated.

Sampling Equipment

Further QA/QC is provided for by the routine calibration and maintenance of the stack testing equipment. All stack sampling equipment to be used in this testing effort is periodically calibrated according to the methodologies and frequencies established in the EPA Quality Assurance Manual. Routine maintenance dictated by the Quality Assurance Manual and good engineering practice ensures quality performance of the sampling equipment. Prior to field use, source test equipment is checked for proper performance and valid calibrations. Upon completion of a source test program, sampling equipment calibrations are re-checked to assess equipment performance during the source test.

Meter Boxes

Meter boxes used for source testing are subjected to multi-point calibrations once each year, or after repairs are made to the dry gas meter, orifice, or thermocouples. Meter boxes are assigned a unique ID number, and a calibration performed on meter boxes are recorded in the notebook. The dry gas meter and orifice are calibrated at five flow settings ranging from an orifice pressure of 0.5" WC to 4.0" WC. The meter box calibration factor (gamma,) is calculated for each flow setting and checked to ensure that no individual gamma differs from the average by more than 0.02. Similarly the ΔH@ value of the orifice is calculated for each flow setting and checked to ensure that no individual value differs from the average by more than 0.15. Dry gas meter thermocouples are checked against a mercury-in-glass thermocouples are considered unacceptable and are repaired or replaced if they do not read within 5.4°F at each of the calibration points.

Pitot Tubes

Standard pitot tubes are checked for conformance to the dimensional criteria described in Method 2 as they are received, and assigned a pitot tube coefficient, C_p, of 0.99. The pitot tube is checked prior to and at the conclusion of each sampling program for which the pitot tube is used.

Thermocouples

Stack temperature thermocouples are permanently attached to the sampling probes and are checked as received for accuracy. The thermocouples are checked against a mercury-in-glass thermometer at three temperatures: ice-point, ambient, and boiling H_2O point. Calibration and maintenance data for each stack thermocouple are recorded in the appropriate sampling probe notebook. Probe liner, filter box, sample gas, and condenser thermocouples are checked for accuracy at three water temperatures: icepoint, ambient, and boiling point. Parsons ES recognizes that the temperature of the probe liner, heated sample box, and sample gas temperature are generally maintained at temperatures of approximately 250°F. Since these temperatures are not used to calculate stack gas parameters or correct sample volumes, the calibration procedure is considered adequate when weighed against the danger of working with boiling oil. Each thermocouple is assigned a unique identification number and a notebook for recording calibration and maintenance data.

Sampling Nozzles

Parsons ES maintains a full range of sampling nozzles to conduct isokinetic sampling at a variety of exhaust gas velocities. Nozzles are stored in padded metal boxes to prevent damage during storage or transport. The internal diameter of the nozzle is measured using a set of dial, electronic, or vernier micrometer. The diameter used to calculate the nozzle area is determined from the average of three measurements of the nozzle in three different diameters. The nozzle is not used if an individual diameter differs from the average by more than 0.004 inch.

Summary (Table)

A summary of sampling equipment with corresponding calibration procedures, frequencies, and acceptance criteria can be found in Table 5-1.

Analytical Balances

Analytical balances are professionally cleaned and calibrated annually by certified balance technicians provided by the manufacturer. Following this professional calibration, a document is provided by the manufacturer, stating the model number, serial number and date of calibration. Additionally, a sticker noting the technician's name and the date of calibration is attached to the balance.

Each time the balance is used, a calibration check is performed using a set of Class S weights. The results of each calibration are recorded in a notebook which remains with the balance being used.

Continuous Emissions Monitors

The quality of collected CEM data is ensured by the adherence to the calibration and maintenance programs specified by the instrument manufacturers and in the EPA Reference Methods used during the monitoring. Calibration procedures are provided in greater detail in the appendices.

TABLE 5-1

CALIBRATION OF SAMPLING EQUIPMENT

Apparatus	Acceptable Limits	Frequency and Methods of Measurements	Corrective Action
Wet Test Meter (64 ft^3/hr cap.)	Y=1.00±0.01 for calibration range 7.5 to 65 ft^3/hr	Initially and annually by bell prover	Return to service center for corrective maintenance
Dry Gas Meter	Y tolerance for individual values ± 0.02 from average Y value	Calibration initially and annually against calibrated wet test meter at 0.50, 0.75, 1.0, 1.5, 2.0, and 4.0 in H_2O	Repair or replace as needed, recalibrate over full range of flow settings
	$Y_f = Y_i \pm 0.05Y_i$	Post-test calibration check after field use	Repair or replace as needed, recalibrate over full range of flow settings
	ΔH@ tolerance for individual values ± 0.20 from average ΔH@ value	Calibration initially and annually against calibrated wet test meter at 0.50, 0.75, 1.0, 1.5, 2.0 and 4.0 H_2O	Repair or replace as needed, recalibrate over full range of flow settings
Stack Thermocouple	1.5% of absolute temperature as indicated by ASTM mercury-in-glass thermometer	Initially and annually at ice-point, and boiling water point. Temperatures extrapolated to 1500°F	Adjust, determine calibration factor, or reject
Filter Heater Thermocouple	± 5.4°F as indicated by ASTM mercury-in-glass thermometer	Initially and annually at ice-point and boiling water point	Adjust, determine calibration factor, or reject
Condenser Outlet Thermocouple	± 2°F as indicated by ASTM mercury-in-glass thermometer	Initially and annually at ice-point and boiling water point	Adjust, determine calibration factor, or reject

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TABLE 5-1

CALIBRATION OF SAMPLING EQUIPMENT

(CONTINUED)

Apparatus	Acceptable Limits	Frequency and Methods of Measurements	Corrective Action
Dry Gas Meter Thermocouples	± 5.4°F as indicated by ASTM mercury-in-glass thermometer	Initially and annually at ice-point and boiling water point	Adjust, determine calibration factor, or reject
S-type Pitot Tube Assemblies	$C_p = 0.84$	Initially and after field usage be geometric calibration procedures	Realign or replace
Standard Pitot Tube	$C_p = 0.99$	Initially and after field usage be geometric calibration procedures	Realign or replace
Probe Nozzle	Tolerance 0.004 in. for three measurements, 120° apart	Prior to each field test	Reshape and resharpen, then recalibrate
Analytical Balance	± 0.1 mg with Class S wts.	Annually serviced by field tech.	Adjust and repair as needed
		Adjusted prior to each use with Class S wts. (60.0000 g or 100.0000 g)	Adjust as needed to calibrate weight, call for factory service as needed.

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SECTION 6

RESULTS AND DISCUSSION

This section provides the sampling results and discussion of the collected data. Results are presented in tables and summarized in the text. Field data, laboratory reports, and computer calculations are presented in the appendices.

Exhaust gas characteristics were observed to be very different at each sample location. The greatest differences were noted between the melter exhaust and the HEPA filter exhaust. Melter exhaust had a much higher particle mass loading than the HEPA filter exhaust. These differences are large enough that sample analysis and data evaluation procedures had to vary for the two locations. For example, the probe washes collected from sample trains used at the melter exhaust contained high concentrations of particle matter in the nitric acid portion of the rinsate. This was not observed for the HEPA filter exhaust samples. Therefore, part of the analytical procedure for the melter exhaust samples was a filtration of the nitric acid rinsate and gravimetric analysis of the particle mass retained on the filter. This procedure was not necessary for the HEPA filter exhaust samples because the particle concentrations and emission rates are extremely low.

HEPA filter exhaust samples were so clean that analytical results for many of the metals were below the instrument detection limits, just as the method reagent blanks. This is a difference from the results observed for the melter exhaust which had measurable concentrations of metals. Final results from the two sample locations were therefore treated differently. The melter exhaust samples were blank corrected while the HEPA filter exhaust samples that were below instrument detection limit were not. The reason for this was to avoid reporting "zero" emissions from the HEPA filter exhaust. A conservative approach is to consider the blanks as zero and then use the instrument detection limit for the metals results that the laboratory reported as non-detectable. Emission rates and concentrations are then reported as "less than" a value.

In the appendices to this report are the details of the analytical procedures and data handling procedures used in this project.

Particulate Matter Concentrations and Emission Rates

Particulate matter sampling results are provided in Tables 6.1 and 6.2. Table 6.1 provides the emission rates for the melter exhaust sampling location and Table 6.2 shows the HEPA filter exhaust sampling results.

The average particulate matter concentration and emission rate measured at the melter exhaust location was 0.43 gr/dscf and 0.29 lb/hr, respectively. At the HEPA Filter Exhaust location, the measured concentrations and emission rates averaged 0.0024 gr/dscf and 0.0040 lb/hr, respectively. The maximum emission rate measured was 0.50 lb/hr for Run #3 at the melter exhaust. The greatest grain loading observed, 0.75 gr/dscf, was also for Run #3 and from the melter exhaust location.

Because of the heavy particle loading in the melter exhaust and the possibility of incomplete sample recovery, an equipment blank was collected during the test program to evaluate the bias introduced by the sample train cleaning procedure. The equipment blank constituted a full sample train designated for use at the melter exhaust location. It was carried to the sample location, and then recovered and analyzed like a regular sample. The front half portion of the equipment blank showed a net weight gain of 0.0226 grams or 4.5% of the smallest sample weight observed for the Melter Exhaust (Run #2). This slight bias has not been applied to the melter exhaust sample results shown in Table 6.1. What the field blank demonstrates is that there is some bias (+ or −) in the particulate measurements due to the sampling methodology.

Another source of bias in the melter exhaust particulate emission rate measurements has been introduced because the melter exhaust sampling location does not meet either EPA Method 1 or EPA Method 1A isokinetic sampling location criterion. The velocity profile at this location is not well-characterized so an evaluation of the bias must begin with the melter exhaust system. Melter exhaust gas exits the furnace in a four-inch internal diameter pipe at a flowrate of roughly 177 acfm with an approximate velocity of 35 f/s.

The sample location is located at a disturbance, as described in Section 3, and six pipe diameters upstream of the sample location is another disturbance. Furthermore, the surface area of the sample nozzle exposed to the gas flow is large enough to introduce disturbance to

TABLE 6.1

SUMMARY OF TEST RESULTS FOR PARTICULATE MATTER AND METALS VITREOUS STATE LABORATORY 100 KILOGRAM MELTER EXHAUST

Sample Run No.	1	2	3	Average
Date	9/26/94	9/26/94	9/27/94	
Time	17:20	22:13	00:30	
Stack Temperature (°F)	609	609	609	609
Moisture (%)	5.98	6.03	8.11	6.70
O_2 (%)	20.5	19.9	20.5	20.3
Stack Gas Volumetric Flow Rate (acfm)	183	173	176	177
Stack Gas Volumetric Flow Rate (dscfm)	82	77	77	79
Isokinetic Ratio (%)	100.4	103.1	107.4	
Sample Volume (dscf)	37.774	36.661	38.152	37.529
Particulate Matter:				
Concentration (grains/dscf)	0.2050	0.3340	0.7509	0.4300
Emission Rate (lb/hour)	0.1436	0.2210	0.4964	0.2870
Boron				
Concentration (µg /dscf)	455	963.4	1956.7	1125
Emission Rate (lb/hour)	4.9E-03	9.81E-03	1.99E-02	1.2E-02
Chromium				
Concentration (µg /dscf)	14.57	30.7	60.0	35.1
Emission Rate (lb/hour)	1.57E-04	3.12E-04	6.12E-04	3.6E-04
Cesium				
Concentration (µg /dscf)	329	610	932	624
Emission Rate (lb/hour)	3.7E-03	6.21E-03	9.50E-03	6.73E-03

TABLE 6.1
(CONTINUED)

SUMMARY OF TEST RESULTS FOR PARTICULATE MATTER AND METALS VITREOUS STATE LABORATORY 100 KILOGRAM MELTER EXHAUST

Sample Run No.	1	2	3	Average
Molybdenum				
Concentration (µg /dscf)	21.7	50.9	99.5	57.4
Emission Rate (lb/hour)	2.36E-04	5.19E-04	1.01E-03	5.90E-04
Strontium				
Concentration (µg /dscf)	6.0	13.82	37.14	19.0
Emission Rate (lb/hour)	6.45E-05	1.41E-04	3.78E-04	1.95E-04
Potassium				
Concentration (µg/dscf)	1168	1838	2448	1818
Emission Rate (lb/hour)	1.27E-02	1.87E.02	2.49E-02	1.88E-02
Sodium				
Concentration (µg/dscf)	1826	3661	6111	3866
Emission Rate (lb/hour)	2.0E-02	3.73E-02	6.23E-02	4.0E-02

TABLE 6.2

SUMMARY OF TEST RESULTS FOR PARTICULATE MATTER AND METALS VITREOUS STATE LABORATORY HEPA FILTER EXHAUST

Sample Run No.	2	3	4	Average
Date	9/26/94	9/26/94	9/27/94	
Time	10:09	00:32	12:01	
Stack Temperature (°F)	90	103	102	98
Moisture (%)	2.61	2.74	2.70	2.68
O_2 (%)	20.9	20.6	20.9	20.8
Stack Gas Volumetric Flow Rate (acfm)	201	206	227	211
Stack Gas Volumetric Flow Rate (dscfm)	181	182	201	188
Isokinetic Ratio (%)	103.5	98.4	94.7	
Sample Volume (dscf)	42.111	40.127	41.573	41.270
Particulate Matter:				
Concentration (grains/dscf)	0.0018	0.0028	0.0027	0.0024
Emission Rate (lb/hour)	0.0028	0.0044	0.0047	0.0040
Boron				
Concentration (µg/dscf)	<125	<125	<125	<125
Emission Rate (lb/hour)	<2.9E-03	<2.96E-03	<3.2E-04	<2.1E-03
Chromium				
Concentration (µg/dscf)	<0.15	<0.11	<0.11	<0.12
Emission Rate (lb/hour)	<3.49E-06	<2.60E-06	<2.86E-06	<2.98E-06
Cessium				
Concentration (µg/dscf)	<0.95	<1.0	<0.96	<0.97
Emission Rate (lb/hour)	<2.3E-05	<2.4E-05	<2.6E-05	<2.4E-05

TABLE 6.2
(CONTINUED)

SUMMARY OF TEST RESULTS FOR PARTICULATE MATTER AND METALS VITREOUS STATE LABORATORY HEPA FILTER EXHAUST

Sample Run No.	2	3	4	Average
Molybdenum				
Concentration (µg/dscf)	<0.23	<0.47	<0.41	<0.37
Emission Rate (lb/hour)	<5.57E-06	<1.14E-05	<1.10E-05	<9.33E-06
Strontium				
Concentration (µg/dscf)	<0.10	<0.08	<0.07	<0.08
Emission Rate (lb/hour)	<2.46E-06	<1.85E-06	<1.96E-06	<2.09E-06
Potassium				
Concentration (µg/dscf)	<40	<40	<40	<40
Emission Rate (lb/hour)	<1.8E-04	<8.8E-04	<9.1E-04	<6.6E-4
Sodium				
Concentration (µg/dscf)	<70	<70	<70	<70
Emission Rate (lb/hour)	<1.2E-03	<1.2E-03	<8.3E-01	<1.4E-03

the flow of exhaust gas past the sampling nozzle. This suggests that the turbulent flow has eddies that can disrupt streamlines and bias the sample collection of particles with varying diameters.

Isokinetic sampling is designed to collect sample gas through the sampling nozzle at the same velocity the gas has in the stack. If the stack gas velocity is constantly changing at the sample nozzle due to eddies or an otherwise unsteady flow, than the sampling rate for collecting particulate matter may not be correct during some periods of testing. If gas samples are not collected at the isokinetic rate then the particulate matter measurements will be biased. The direction of the bias, whether it increases or decreases measured emission rates, depends on whether the particulate matter samples were collected at a rate greater or lesser than the desired isokinetic sampling rate. The bias direction also depends on the sizes of the particles being sampled. If you are collecting samples at a faster rate than required, then the larger diameter particles will be under-represented in the measurement.

Also, the melter exhaust flowrate was not observed to vary significantly, suggesting that the main cause of varying velocities at the nozzle location would be eddies in the gas flow. Smaller diameter particles are generally over represented in the collected samples if the sample collection rate is greater than isokinetic.

Metals Concentrations and Emission Rates

Tables 6.1 and 6.2 show the exhaust gas metals concentrations and emission rates. Emission rates and concentrations for the melter exhaust are shown in Table 6.1. Na, K, B, and Cs are present in the highest concentrations and have the greatest emission rates. The average emission rate for these compounds was 4.02 E-02 lb/hr, 1.88E-02 lb/hr, and 1.2E-02 lb/hr, and 6.43E-03 lb/hr. Concentrations of Na, K, B, Cs averaged 3,866 ug/dscf, 1818 ug/dscf, 1125 ug/dscf, and 624 ug/dscf. The Na concentration is 14.4% of the total suspended particle (TSP) concentration; the K concentration is 7.48% of the TSP concentration; B is 3.97% of the TSP particle concentration; and Cs is 2.4%. Cr, Mo, and Sr were found in the melter exhaust samples, but at significantly lower concentrations relative to Na, K, B, or Cs.

The metals concentrations measured at the melter exhaust may be biased by the sample location for the same reasons that particle concentrations may be biased. Metals that are

associated with particulate matter may have been overestimated or underestimated due to the physical dimensions of the sampling location, as described previously.

Exhaust gas samples collected after the HEPA filter contained mainly Na, K, and B (Table 6.2). The Na, K, B concentrations averaged <70 ug/dscf, <40 ug/dscf, and <125 ug/dscf. These averages have been blank corrected by subtracting the blank from the sample value and then taking the negative result and multiplying it by two and using the absolute value as a sample result. The calculated concentrations are then reported as "less than" values. It is likely that any Na, B, or K found in the HEPA filter exhaust is due to the glass filter and reagents, since the blank levels and sample levels are close in values.

The concentrations of Sr, Mo, Cr, and Cs are small compared to the concentration of the other metals. Sr, Mo, Cr, and Cs are present in the samples at concentrations that are either less than the detection limit or less than the reagent blank value. Emission rates and concentrations of Sr, Mo, Cr, and Cs presented in Table 6.2 are based on analytical results reported as less than the detection limits and they have not been blank corrected. This method of calculation provides an overestimate of the emission rates and concentrations.

Continuous Emissions Monitoring Results

Table 6.3 provides a summary of the CEM measurements made at each sample location. Exhaust gas from the melter was measured at each location prior to introducing any feed to the melter. These measurements are refered to as "baseline" measurements or concentrations. Baseline concentrations of NO_x, SO_2, CO, and THC were measured in the melter exhaust as less than ppmv. Measured NO_x concentrations ranged from 584 ppmv to 1336 ppmv, at the HEPA filter exhaust. NO_x concentrations at the melter exhaust varied from 2552 ppmv to 3610 ppmv. (As discussed previously, these measurements were biased upwards because of sample matrix interference). SO_2 concentrations ranged from a minimum of 0.2 ppmv at the HEPA filter exhaust to a maximum of 67.2 ppmv, at the Melter Exhaust. THC concentrations varied from 5.2 ppmv at the HEPA filter exhaust to a maximum of 32.4 ppmv at the melter exhaust. Measured CO concentrations were observed as high as 116 ppmv at the Post-Demister. O_2 concentrations did not change significantly from the 20.9% considered representative of ambient concentrations.

TABLE 6.3

CATHOLIC UNIVERSITY
CEM DATA SUMMARY
100 Kilogram Melter

Run #1 Date	Time	Location	O_2 (%)	CO (ppm)	Concentration NO_x (ppm)[1]	SO_2 (ppm)	THC (ppm)
9/26	18:06	Melter	21.0	38.3	3218	4.7	16.8
9/26	17:59	Post Scrubber	20.9	70.0	2573	3.8	25.6
9/26	17:39	Post Demister	20.9	40.1	886	2.0	11.2
9/26	17:22	HEPA Filter	21.1	19.5	584	0.2	5.3

Run #2 Date	Time	Location	O_2 (%)	CO (ppm)	Concentration NO_x (ppm)[1]	SO_2 (ppm)	THC (ppm)
9/26		Melter	N.D.*	N.D.*	N.D.*	N.D.*	N.D.*
9/26	22:47	Post Scrubber	20.3	94.0	3430	5.9	22.5
9/26	22:33	Post Demister	20.5	113.0	2051	7.2	21.3
9/26	22:18	HEPA Filter	21.0	5.9	974	1.5	5.2

Run #3 Date	Time	Location	O_2 (%)	CO (ppm)	Concentration NO_x (ppm)[1]	SO_2 (ppm)	THC (ppm)
9/27	01:12	Melter	20.4	97.0	2552	67.2	32.4
9/27	00:58	Post Scrubber	20.6	99.0	5234	18.9	28.2
9/27	00:45	Post Demister	20.8	116.0	2417	55.5	21.1
9/27	00:33	HEPA Filter	21.1	55.9	860	5.7	12.5

Run #4 Date	Time	Location	O_2 (%)	CO (ppm)	Concentration NO_x (ppm)[1]	SO_2 (ppm)	THC (ppm)
9/27	12:46	Melter	20.4	78.7	3610	19.7	18.0
9/27	12:36	Post Scrubber	20.8	4.5	3171	6.4	8.6
9/27	12:27	Post Demister	20.7	67.0	3055	28.8	10.3
9/27	12:15	HEPA Filter	20.8	43.6	1336	3.6	7.8

Baseline Date	Time	Location	O_2 (%)	CO (ppm)	Concentration NO_x (ppm)[1]	SO_2 (ppm)	THC (ppm)
9/26	13:34	Melter	20.9	0.2	0.0	0.0	1.4
9/26	13:28	Post Scrubber	20.9	0.3	0.0	1.1	1.6
9/26	13:23	Post Demister	20.7	0.1	0.0	2.0	2.5
9/26	13:16	HEPA Filter	20.7	0.0	0.0	0.1	1.7

* N.D. denotes no data.

1 The NO_x concentrations are biased by the high concentration of NH_3 present in the melter exhaust. The values are approximately 80 percent too high.

The design of the melter's air pollution control system had an impact on the pollutant concentrations observed at the HEPA filter exhaust. Ambient air is mixed with process exhaust prior to its passing through the HEPA filters, diluting the exhaust gas with ambient air prior to its being measured by the CEM system. The reduced values of NOx, CO, SO2, and THC observed at the HEPA filter exhaust are due to the dilution by the ambient air.

NO_x measurements collected at each location were biased upwards because of sample matrix interference with the NO_x analyzer. Furthermore, during the testing of the 100 kg melter, some differences between the Parsons ES CEM data and the VSL portable analyzer were noted. There was no immediately apparent reason for these differences. Since then, we have reviewed the data, discussed the instrumentation response with manufacturers' technical representatives, and come to some conclusions regarding the data. Basically, the oxygen, carbon monoxide, sulfur dioxide, and total hydrocarbon data are valid as collected and show that the melter emissions were seldom constant, changing over time, sometimes, quite rapidly.

Of most concern, and the most obvious differences between the portable and Parsons ES CEM instruments, were the NO_x readings. Apparently, although we do not have any of VSL-collected data, the VSL results were sometimes an order of magnitude lower than the Parsons ES data at the HEPA filter exhaust. Some readings obtained by Parsons ES were as high as 2500 ppmv, before correction for drift and calibration error and almost 3500 ppmv after correction. The tremendous range of observed reading (0-5200 ppmv) creates its own set of problems relating to analyzer calibration at the proper range. These problems were remedied after the high readings were observed. It now appears, from discussions with VSL personnel and manufacturer personnel, that much of disparity between Parsons ES and VSL data may come from NH_3.

Parsons ES uses a TECo Model 10 chemiluminescence analyzer with a stainless converter for the NO_2 to NO conversion. The manufacturer states that this converter will also convert NH_3 to NO at 80-85% efficiency up to 2000 ppm by volume NH_3. Further, the relatively high concentration of NH_3 would essentially contaminate the converter for some period of time. According to Dr. Matlack, it is entirely possible to have 2000 ppm or higher of NH_3 in the flue gas. We do not have sufficient data to determine the interference level any more precisely than this.

There are several possibilities for doing so, however. The NOx analyzer can be run by bypassing the converter. This is usually done to differentiate between NO and NO2, so the presence of large concentrations of NH_3 in the gas stream would have an unknown effect on the chemiluminescence reaction and on the components themselves. We could also put an ammonia scrubber ahead of the analyzer and compare the scrubbed with the unscrubbed results. A proper experiment would need to address other interferences and analyte removal or conversion processes. The third possibility is to use a NOx analyzer with a molybdenum converter. The MolyCon converts only 5-6% of the ammonia to NO and thus would reduce but not eliminate the interference problem.

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APPENDIX A

RAW FIELD DATA

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ES

ENGINEERING-SCIENCE, INC.

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PRELIMINARY VELOCITY TRAVERSE

#1

Plant: CATHOLIC UNIVERSITY
Date: 9-26-94
Location: Melter out
Stack I.D.: 4"
Barometric Pressure, in. Hg: 29.74
Stack Gauge Pressure, in. H_2O:
Operators: GDT
Pitot Tube I.D. Number: Meit 1
Temperature Readout I.D.: Omega
Pitot Tube Leak Check:

Sampling Location

Traverse Point Number	Velocity Head (P_s) in. H_2O	Stack Temp. (T_s), °F	Cyclonic Flow Check ° from Null
	0.165	609°	
	0.160		
	0.16		
	0.08		
	0.065		
	0.126		
Average			

Schematic of Traverse Point Layout

Traverse Point Number	Velocity Head (P_s) in. H_2O	Stack Temp. (T_s), °F	Cyclonic Flow Check ° from Null
Average			

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ENGINEERING-SCIENCE, INC.
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#1

PRELIMINARY VELOCITY TRAVERSE

Plant: Catholic university
Date: 9/26/94
Location: Hepatitis - out
Stack I.D.: 5"
Barometric Pressure, in. Hg: 29.74
Stack Gauge Pressure, in. H_2O:
Operators: GDH
Pitot Tube I.D. Number:
Temperature Readout I.D.:
Pitot Tube Leak Check: ✓

Sampling Location

Schematic of Traverse Point Layout

Traverse Point Number	Velocity Head (P_s) in. H_2O	Stack Temp. (T_s), °F	Cyclonic Flow Check ° from Null
A-1	0.205	~~107°~~ 118°	
2	0.188	~~107°~~ 118°	
3	0.18	~~10~~ 118°	
4	0.095	118°	
5	0.10	118°	
6	0.09	119°	
	0.142	118	
Average			

Traverse Point Number	Velocity Head (P_s) in. H_2O	Stack Temp. (T_s), °F	Cyclonic Flow Check ° from Null
B-1	.115	116	
2	120	117	
3	.105	117	
4	.160	117	
5	.165	117	
6	.170	117	
	0.139	117	
	↓		
	0.149	117.5	
Average			

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ES

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PRELIMINARY VELOCITY TRAVERSE

#2

Plant: Catholic university
Date: 9/26/94
Location: HEPA filter out
Stack I.D.: 5"
Barometric Pressure, in. Hg: 29.71
Stack Gauge Pressure, in. H_2O: -12" H_2O
Operators: SP, GDH
Pitot Tube I.D. Number: Apex 1
Temperature Readout I.D.: Apex-1. Stevex Temp readout
Pitot Tube Leak Check:

Sampling Location

Schematic of Traverse Point Layout

Traverse Point Number	Velocity Head (P_s) in. H_2O	Stack Temp. (T_s), °F	Cyclonic Flow Check ° from Null
A-1	0.16	103	
A-2	0.165	103	
A-3	0.155	103	
A-4	0.07	103	
A-5	0.08	103	
A-6	0.065	103	
Average			

Traverse Point Number	Velocity Head (P_s) in. H_2O	Stack Temp. (T_s), °F	Cyclonic Flow Check ° from Null
B-1	0.11	103	
B-2	0.13	103	
B-3	0.105	103	
B-4	0.16	103	
B-5	0.16	103	
B-6	0.16	103	
Avg:	0.126		
Average			

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#3 of 0018

PRELIMINARY VELOCITY TRAVERSE

Plant: Catholic Univer
Date: 9/27/94
Location: HEPA FILTER OUT
Stack I.D.:
Barometric Pressure, in. Hg:
Stack Gauge Pressure, in. H_2O:
Operators:
Pitot Tube I.D. Number:
Temperature Readout I.D.:
Pitot Tube Leak Check:

Sampling Location

Schematic of Traverse Point Layout

Traverse Point Number	Velocity Head (P_s) in. H_2O	Stack Temp. (T_s), °F	Cyclonic Flow Check ° from Null
A-1	0.155	103	
A-2	0.10		
A-3	0.155		
A-4	0.13		
A-5	0.14		
A-6	0.14		
Average			

Traverse Point Number	Velocity Head (P_s) in. H_2O	Stack Temp. (T_s), °F	Cyclonic Flow Check ° from Null
B-1	0.095	103	
B-2	0.07		
B-3	0.07		
B-4	0.09		
B-5	0.105		
B-6	0.105		
	0.1129	103	
Average			

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PRELIMINARY VELOCITY TRAVERSE

Plant: CATHOLIC U.
Date: 9-27-94
Location: HOOD CUT
Stack I.D.: 5
Barometric Pressure, in. Hg: 25.75
Stack Gauge Pressure, in. H_2O: -12" H2O
Operators: AR
Pitot Tube I.D. Number: APEX #1
Temperature Readout I.D.: APEX #1
Pitot Tube Leak Check: PRE RUN #4

Sampling Location

Schematic of Traverse Point Layout

Traverse Point Number	Velocity Head (P_s) in. H_2O	Stack Temp. (T_s), °F	Cyclonic Flow Check ° from Null
A1	0.18	102	
A2	0.18		
A3	0.17		
A4	0.17		
A5	0.13		
A6	0.11		
Average			

Traverse Point Number	Velocity Head (P_s) in. H_2O	Stack Temp. (T_s), °F	Cyclonic Flow Check ° from Null
B1	0.10		
B2	0.13		
B3	0.14		
B4	0.16		
B5	0.18		
B6	0.17		
	0.15		
Average			

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FIELD DATA

Plant Catholic University
Date 9/26/94
Sampling Location ~~Hepa filter out~~ Melter out
Sample Type Moisture
Run Number CU-M4 - Preliminary
Operator GDH, SP
Ambient Temperature ~~88~~ °F 86 °F
Barometric Pressure 29.74
Static Pressure (P_s)
Filter Number(s) N/A
Pretest Leak Rate = .005 cfm @ 15 in. Hg
Pretest Pitot Leak Check N/A
Pretest Orsat Leak Check N/A
Read and Record all Data Every 5 Minutes

Schematic of Traverse Point Layout

Probe Length and Type SS
Pitot Tube I.D. No.
Nozzle I.D. N/A
Assumed Moisture, % —
Temp. Readout S/N ES-1
Meter Box Number ES-1
Meter $H_@$ 1.771
C Factor N/A
Meter Gamma 1.040
Heater Box Setting N/A
Reference p N/A
Post Test Leak Rate = ___ cfm @ ___ in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (P_s) in. H_2O	Orifice Pres. Differential (H) in. H_2O Desired	Orifice Pres. Differential (H) in. H_2O Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. (6) Inlet ($T_{m_{in}}$) °F	Dry Gas Meter Temp. (7) Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg	Sample Box Temp. Filter Temp. °F	Impinger Temp. (5) °F
	0.00	1420	863.230	/	/	/	/	/	/	/	/	/
	0.05	25	865.545	/	1.77	1.77	/	77	80	3	/	60
	0.10	30	870.145	/	1.77	1.77	/	74	74	3.5	/	49
	0.15	35	873.730	/	1.77	1.77	/	77	75	4.0	/	46
	0.20	40	877.345	/	1.77	1.77	/	78	75	4.0	/	46
	0.25	45	880.965	/	1.77	1.77	/	81	76	4.0	/	47
	0.30	50	884.615	/	1.77	1.77	/	82	77	4.0	/	47
	0.30		21.385					78.17	76.17	3.75		49.17
								77.17				

FIELD DATA

Plant Catholic University
Date 9/26/94
Sampling Location HEPAFILTER OUT
Sample Type MMT
Run Number CU-MMT-0-01
Operator Keith, GDH
Ambient Temperature 86°F
Barometric Pressure 29.69
Static Pressure (P_s) ~~29.69~~
Filter Number(s) M005/41
Pretest Leak Rate = .013 cfm @ 15 in. Hg
Pretest Pitot Leak Check ✓
Pretest Orsat Leak Check
Read and Record all Data Every 5 Minutes

Schematic of Traverse Point Layout

Probe Length and Type 4' GLASS
Pitot Tube I.D. No. APEX #1
Nozzle I.D. 0.306
Assumed Moisture, % 2
Temp. Readout S/N APEX #1
Meter Box Number APEX #1
Meter $H_@$ 1.838
C Factor 1.5
Meter Gamma .996
Heater Box Setting ≈250°F
Reference p 0.145
Post Test Leak Rate = .002 cfm @ 5 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3 (826.872)	Velocity Head (P_s) in. H_2O	Orifice Pres. Differential (H) in. H_2O Desired	Orifice Pres. Differential (H) in. H_2O Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Dry Gas Meter Temp. Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg	Sample Box Temp. Filter Temp. °F	Impinger Temp. °F
A-3	0	1720			1.7	1.7	118	93	93	3	250	70
A-3	5	25	828.030	0.14	1.7	1.7	118	103	93	3	249	65
	10	30	831.49	0.14	1.7	1.7	118	103	94	1½	245	66
	15	35	834.79	0.14	1.7	1.7	118	103	94	2	248	68
	20	40	838.38	0.14	1.7	1.7	118	104	95	2	247	71
	25	45	841.91	0.14	1.7	1.7	118	103	95	2	242	73
	30	50	845.49	0.14	1.7	1.7	118	104	96	2	247	75
	35	55	849.10	0.14	1.7	1.7	118	105	96	2	244	69
	40	60	852.78	0.14	1.7	1.7	118	105	96	2	244	69
	45	1805	856.27	0.14	1.7	1.7	118	105	97	2	243	69
	50	10	859.87	0.14	1.7	1.7	118	105	97	2	246	68
	55	15	863.47	0.14	1.7	1.7	118	105	97	2	248	67
	60	20	867.262	0.14	1.7	1.7	118	105	97	2		

FIELD DATA

Plant Catholic University
Date 9/26/94
Sampling Location HEPA FILTER OUT
Sample Type MMT
Run Number CU-MMT-0-02
Operator Keith, GDH
Ambient Temperature 90°F
Barometric Pressure ~~28.90~~ 29.71
Static Pressure (P_s) -12" water
Filter Number(s) M008/91
Pretest Leak Rate = 0.02 cfm @ 15 in. Hg
Pretest Pitot Leak Check ✓
Pretest Orsat Leak Check
Read and Record all Data Every 5 Minutes

Schematic of Traverse Point Layout

Probe Length and Type 4' Glass
Pitot Tube I.D. No.
Nozzle I.D. 0.306
Assumed Moisture, %
Temp. Readout S/N Apex-1
Meter Box Number Apex-1
Meter $H_@$ 1.838
C Factor 1.5
Meter Gamma 0.996
Heater Box Setting ~250°F
Reference p ~~0.16~~ 0.130 SP
Post Test Leak Rate = 0.003 cfm @ 7 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (P_s) in. H_2O	Orifice Pres. Differential (H) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg	Sample Box Temp. Filter Temp. °F	Impinger Temp. °F
A-3	0	1005	872.841		1.8	1.8						
	5	14	876.27	0.126	~~1.6~~	~~1.6~~	90	89	85	6	250	71
	10	19	879.81	0.126	~~1.6~~	~~1.6~~ 1.8	90	90	89	5	249	63
	15	24	883.51	0.126	~~1.6~~	~~1.6~~ 1.8	90	92	89	5	249	64
	20	29	887.19	0.126	~~1.6~~	~~1.6~~ 1.8	90	93	89	5	248	65
	25	34	890.895	0.126	1.8	1.8	90	94	90	6	249	65
	30	39	894.59	0.126	1.8	1.8	90	95	91	6	248	65
	35	44	898.28	0.126	1.8	1.8	90	96	91	6	246	65
	40	49	901.96	0.126	1.8	1.8	90	96	92	6 1/2	249	65
	45	54	905.66	0.126	1.8	1.8	90	97	93	7	246	66
	50	59	909.45	0.126	1.8	1.8	90	97	93	7	249	67
	55	1104	913.90	0.126	1.8	1.8	90	98	94	6	250	68
	60	1109	918.99	0.126	1.8	1.8	90	98	94	6	248	67
			917.186									

FIELD DATA

Plant Catholic University
Date 9/26/94
Sampling Location HEPAFILTER OUT
Sample Type MMT
Run Number CU-MMT-O-Ø3
Operator Keith, GDH
Ambient Temperature 90°F
Barometric Pressure 29.74
Static Pressure (P_s) -12"/12°
Filter Number(s) M002-91
Pretest Leak Rate = .006 cfm @ 15 in. Hg
Pretest Pitot Leak Check ✓
Pretest Orsat Leak Check
Read and Record all Data Every 5 Minutes

Schematic of Traverse Point Layout

Probe Length and Type 4' Glass
Pitot Tube I.D. No.
Nozzle I.D. 0.306
Assumed Moisture, %
Temp. Readout S/N Apex-1
Meter Box Number Apex-1
Meter $H_@$ 1.839
C Factor 1.4
Meter Gamma 0.996
Heater Box Setting ~250°F
Reference p ~~0.130~~ 0.120
Post Test Leak Rate = 0.0 cfm @ 5 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (P_s) in. H_2O	Orifice Pres. Differential (H) in. H_2O Desired	Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg	Sample Box Temp. Filter Temp. °F	Impinger Temp. °F
A-3	0	0032	919.350			~~1.95~~						
	5	0037	921.24	0.13	1.80	1.80	103	92	93	3	262	71
	10	0042	924.88	0.13	1.80	1.80	103	98	93	3	289	62
	15	0047	928.59	0.13	1.80	1.80	103	99	93	3	285	64
	20	0052	932.32	0.13	1.80	1.80	103	100	94	3	244	67
	25	0057	935.99	0.13	1.80	1.80	103	100	94	3	229	70
	30	0102	939.81	0.13	1.80	1.80	103	100	95	3	243	74
	35	0107	943.38	0.13	1.80	1.80	103	101	95	3	246	76
	40	0112	947.04	0.13	1.80	1.80	103	101	96	3	245	75
	45	0117	950.73	0.13	1.80	1.80	103	101	96	3	244	69
	50	0122	954.46	0.13	1.80	1.80	103	102	96	3	244	62
	55	0127	958.21	0.13	1.80	1.80	103	102	97	3	244	61
	60	0132	961.95	0.13	~~1.95~~ 1.8	1.80	103	102	97	3	244	61

FIELD DATA

Plant Catholic Univ
Date Sept 22 1994
Sampling Location HEPA OUT
Sample Type Metals
Run Number CU-MMT-0-04
Operator GOH
Ambient Temperature 90°F
Barometric Pressure 29.75
Static Pressure (P_s)
Filter Number(s) M-0-10
Pretest Leak Rate = 0.017 cfm @ 15 in. Hg
Pretest Pitot Leak Check
Pretest Orsat Leak Check
Read and Record all Data Every 5 Minutes

Schematic of Traverse Point Layout

Probe Length and Type 4' glass
Pitot Tube I.D. No. Apex 1
Nozzle I.D. 0.306
Assumed Moisture, % 5
Temp. Readout S/N Apex 9
Meter Box Number Apex 1
Meter $H_@$ 1.838
C Factor 1.4
Meter Gamma 0.996
Heater Box Setting 250°F
Reference p ~~0.45~~ .12
Post Test Leak Rate = 0.01 cfm @ 12 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft³ (970.135)	Velocity Head (P_s) in. H_2O	Orifice Pres. Differential (H) in. H_2O Desired	Orifice Pres. Differential (H) in. H_2O Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Dry Gas Meter Temp. Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg	Sample Box Temp. Filter Temp. °F	Impinger Temp. °F
	0	1201	~~972.135~~	0.15								
	5	06	973.89	0.15	2.3	2.3	102	87	89	7	252	61
	10	1211	977.59	0.15	2.3	2.3	102	90	89	6	251	61
	15	1216	980.57	0.15	2.3	1.8	102	90	89	5	250	61
	20	1221	984.36	0.15	2.3	2.1	102	92	89	6	249	64
	25	1226	987.91	0.15	2.3	2.1	102	93	90	6	249	64
	30	1231	991.595	0.15	2.3	2.1	102	93	90	6	248	64
	35	1236	995.28	0.15	2.3	1.9	102	94	91	6	248	64
	40	1241	998.96	0.15	2.3	1.9	102	95	91	6	247	64
	45	1246	1002.52	0.15	2.3	1.9	102	95	92	6	248	64
	50	1251	1006.20	0.15	2.3	1.9	102	96	92	5½	249	64
	55	1256	009.89	0.15	2.3	1.8	102	96	93	5	249	64
	60	1301	013.824	0.15	2.3	1.8	102	97	93	5	249	65

FIELD DATA

Plant Catholic University
Date 9/26/94
Sampling Location Mellon out
Sample Type MMT
Run Number CU-MMT-I-01
Operator SP, GDM
Ambient Temperature 86°F
Barometric Pressure 29.69
Static Pressure (P_s) ~~29.69~~
Filter Number(s) M003/91
Pretest Leak Rate = 0.008 cfm @ 15 in. Hg
Pretest Pitot Leak Check
Pretest Orsat Leak Check
Read and Record all Data Every 5 Minutes

Schematic of Traverse Point Layout

Probe Length and Type 5' Incoloy
Pitot Tube I.D. No.
Nozzle I.D. 0.350
Assumed Moisture, % 5%
Temp. Readout S/N 25-1
Meter Box Number 25-1
Meter $H_@$ 1.77
C Factor 1.48
Meter Gamma 1.04
Heater Box Setting ~250°F
Reference p 0.16
Post Test Leak Rate = 0.01 cfm @ 7 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check

Traverse Point Number	Sampling Time, (min) / Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (P_s) in. H_2O	Orifice Pres. Differential (H) in. H_2O Desired	Orifice Pres. Differential (H) in. H_2O Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F	Dry Gas Meter Temp. Outlet ($T_{m_{out}}$) °F	Pump Vacuum in. Hg	Sample Box Temp. Filter Temp. °F	Impinger Temp. °F
	0 / 1720	884.910									
	5 / 25	887.900	0.130	1.45	1.45	609	74	74	2.5	186	59
	10 / 30	891.045	0.130	1.45	1.45	609	86	87	2.5	199	51
	15 / 35	894.210	0.130	1.45	1.45	609	88	87	2.5	204	53
	20 / 40	897.400	0.130	1.45	1.45	609	91	88	2.5	206	57
	25 / 45	900.415	0.130	1.45	1.45	609	92	89	2.5	206	60
	30 / 50	903.550	0.130	1.45	1.45	609	93	89	2.5	203	63
	35 / 55	906.785	0.130	1.45	1.45	609	95	90	3.0	203	66
	40 / 1800	909.990	0.130	1.45	1.45	609	96	91	3.0	204	67
	45 / 05	913.145	0.130	1.45	1.45	609	96	91	3.5	205	68
	50 / 10	916.395	0.130	1.45	1.45	609	95	90	4.0	235	67
	55 / 15	919.585	0.130	1.45	1.45	609	95	90	4.5	252	66
	60 / 20	922.899	0.130	1.45	1.45	609	96	91	5.0	252	68
	/										
	/										
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	/										
	/										
	/										

FIELD DATA

Plant Catholic University
Date 9/26/90
Sampling Location Melter out
Sample Type MMT
Run Number CU-MMT-I-02
Operator SP, GDH
Ambient Temperature 90°F
Barometric Pressure 29.71
Static Pressure (P_s) -12" Water
Filter Number(s) M-004/91
Pretest Leak Rate = 0.003 cfm @ 15 in. Hg
Pretest Pitot Leak Check
Pretest Orsat Leak Check
Read and Record all Data Every 5 Minutes

Schematic of Traverse Point Layout

Probe Length and Type 5' Incomel
Pitot Tube I.D. No.
Nozzle I.D. 0.350
Assumed Moisture, % 5%
Temp. Readout S/N ES-1
Meter Box Number ES-1
Meter $H_@$ 1.77
C Factor 1.48
Meter Gamma 1.04
Heater Box Setting ~250°F
Reference p 0.16
Post Test Leak Rate = 0.009 cfm @ 13 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft³	Velocity Head (P_s) in. H_2O	Orifice Pres. Differential (H) in. H_2O Desired	Orifice Pres. Differential (H) in. H_2O Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F (6)	Dry Gas Meter Temp. Outlet ($T_{m_{out}}$) °F (7)	Pump Vacuum in. Hg	Sample Box Temp. Filter Temp. °F (3)	Impinger Temp. °F (1)
A	0	22:13	923.440									
	5	22:18	927.275	0.116	1.25	1.25		88	88	3.5	244	57
	10	22:23	930.225	0.116	1.25	1.25		89	89	3.5	244	48
	15	22:28	933.295	0.116	1.25	1.25		90	89	4.0	245	49
	20	22:33	936.005	0.116	1.25	1.25		93	90	4.5	247	51
	25	22:38	939.335	0.116	1.25	1.25		94	90	5.0	248	52
	30	22:43	942.340	0.116	1.25	1.25		95	91	5.5	247	53
	35	22:48	945.375	0.116	1.25	1.25		95	91	7.0	248	53
	40	22:53	948.420	0.116	1.25	1.25		96	91	8.0	249	53
	45	22:58	951.435	0.116	1.25	1.25		97	92	9.0	250	54
	50	23:03	954.485	0.116	1.25	1.25		97	92	10.0	249	54
	55	23:08	957.495	0.116	1.25	1.25		98	93	11.0	248	54
	60	23:13	960.485	0.116	1.25	1.25		98	93	11.0	247	55

FIELD DATA

Plant Catholic University
Date ~~9/26/94~~ 9/27/94 SP
Sampling Location Melter out
Sample Type MMT
Run Number CU-MMT-I-Ø3
Operator SP, GDH
Ambient Temperature 90°F
Barometric Pressure 29.74
Static Pressure (P_s) -12" H_2O
Filter Number(s) M006/91
Pretest Leak Rate = .011 cfm @ 15 in. Hg
Pretest Pitot Leak Check ✓
Pretest Orsat Leak Check
Read and Record all Data Every 5 Minutes

Schematic of Traverse Point Layout

Probe Length and Type 5' Inconnel
Pitot Tube I.D. No.
Nozzle I.D. 0.350
Assumed Moisture, % 5
Temp. Readout S/N ES-1
Meter Box Number ES-1
Meter $H_@$ 1.77
C Factor 148
Meter Gamma 1.04
Heater Box Setting ~250°F
Reference p 0.16
Post Test Leak Rate = 0.004 cfm @ 19 in. Hg
Post Test Pitot Leak Check
Post Test Orsat Leak Check

Traverse Point Number	Sampling Time, (min)	Clock Time (24-hour clock)	Gas Meter Reading (V_m) ft^3	Velocity Head (P_s) in. H_2O	Orifice Pres. Differential (H) in. H_2O Desired	Orifice Pres. Differential (H) in. H_2O Actual	Stack Temp. (T_s) °F	Dry Gas Meter Temp. Inlet ($T_{m_{in}}$) °F (6)	Dry Gas Meter Temp. Outlet ($T_{m_{out}}$) °F (7)	Pump Vacuum in. Hg	Sample Box Temp. Filter Temp. °F (3)	Impinger Temp. °F (1)
A-3	0	0030	963.227									
	5	0044	966.635	0.12	1.4	1.4		91	91	3.0	222	67
	10	0049	969.715	0.12	1.4	1.4		91	90	3.5	243	55
	15	0054	972.965	0.12	1.4	1.4		93	91	4.5	248	53
	20	0059	976.050	0.12	1.4	1.4		94	91	6.0	250	53
	25	0104	979.195	0.12	1.4	1.4		95	92	8.0	247	53
	30	0109	982.435	0.12	1.4	1.4		96	93	9.0	245	53
	35	0114	985.615	0.12	1.4	1.4		96	92	10.5	247	55
	40	0119	988.795	0.12	1.4	1.4		97	93	11.5	246	55
	45	0124	991.935	0.12	1.4	1.4		98	94	13.0	245	55
	50	0129	994.985	0.12	1.4	1.4		98	94	14.0	248	55
	55	0134	997.990	0.12	1.4	1.4		98	94	15.0	249	56
	60	0139	1001.830	0.12	1.4	1.4		98	95	17.5	251	57

ENGINEERING-SCIENCE, INC.
A Subsidiary of The Parsons Corporation
Two Flint Hill, 10521 Rosehaven Street
Fairfax, VA 22030-2899
591-7575, Fax 703 591-1305

Sample Train Recovery Data

Plant: Catholic University Date: 9-26-94
Sampling Location: melter out
Clean-up person: GDK Field Team Leader: GDK
Sample Type: (M4) M5 M6 M5/8 M8 M17 M26 MM5 MMT Cr^{+6} Other:
Run Number: CU-M4-Preliminary Impinger Train ID:
Job Number:

Comments:

Front-half Data

Filter #: N/A Filter Media Type: N/A
Filter Description:
Filter #: Filter Media Type:
Filter Description:

Back-half Data

Impinger Purge –
Start Time: Flow Rate: Stop Time: Purge Gas:

	Impinger 1	Impinger 2	Impinger 3
Contents:	water	water	
Final Volume (ml):	116	104	0
Initial Volume (ml):	100	100	0
Net Volume (ml):	16	4	0

	Impinger 4	Impinger 5	Final Impinger
Contents:			
Final Volume (ml):			(g): 0
Initial Volume (ml):			(g): ~~658~~ 0
Net Volume (ml):			(g): 0

Total moisture collected (ml): 22

Description of impinger catch:

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Two Flint Hill, 10521 Rosehaven Street
Fairfax, VA 22030-2899
Tel 703 591-7575, Fax 703 591-1305

Sample Train Recovery Data

Plant: Catholic University Date: 9-27-94
Sampling Location: Incinerator outlet
Clean-up person: SDH Field Team Leader: SDH
Sample Type: M4 M5 M6 M5/8 M8 M17 M26 MM5 MMT Cr^{+6} Other:
Run Number: 0 - MMT-I-Field Blank Impinger Train ID:
Job Number:

Comments:

Front-half Data

Filter #: M007 /91 Filter Media Type: Quartz
Filter Description:
Filter #: Filter Media Type:
Filter Description:

Back-half Data

Impinger Purge –
Start Time: Flow Rate: Stop Time: Purge Gas:

	Impinger 1	Impinger 2	Impinger 3
Contents:	5% HNO_3 10% H_2O_2	5% HNO_3 10% H_2O_2	Empty
Final Volume (ml):	100	100	0
Initial Volume (ml):	100	100	0
Net Volume (ml):	0	0	0

	Impinger 4	Impinger 5	Final Impinger
Contents:			
Final Volume (ml):			(g): 0
Initial Volume (ml):			(g): 0
Net Volume (ml):			(g): 0

Total moisture collected (ml): 0

Description of impinger catch:

ENGINEERING-SCIENCE, INC.
A subsidiary of The Parsons Corporation
Two Flint Hill, 10521 Rosehaven Street
Fairfax, VA 22030-2899
703 591-7575, Fax 703 591-1305

Sample Train Recovery Data

Plant: Catholic University Date: 9-26-94
Sampling Location: Melter outlet
Clean-up person: CDH Field Team Leader: CDH
Sample Type: M4 M5 M6 M5/8 M8 M17 M26 MM5 (MMT) Cr^{+6} Other:
Run Number: CU-MMT-I-01 Impinger Train ID: (1)
Job Number:

Comments:

Front-half Data

Filter #: M003/91 Filter Media Type: Quartz Fiber
Filter Description:
Filter #: Filter Media Type:
Filter Description:

Back-half Data

Impinger Purge –
Start Time: Flow Rate: Stop Time: Purge Gas:

	Impinger 1	Impinger 2	Impinger 3
Contents:	5% HNO_3 10% H_2O_2	5% HNO_3 10% H_2O_2	Empty
Final Volume (ml):	112.0	130.0	60
Initial Volume (ml):	100	100	0
Net Volume (ml):	12	20	6

	Impinger 4	Impinger 5	Final Impinger
Contents:	~~Sat'd~~		Silicagel
Final Volume (ml):			(g): 714
Initial Volume (ml):			(g): 701
Net Volume (ml):			(g): 13

Total moisture collected (ml): 38+13 = 51

Description of impinger catch: 200 ml of Rinse Solution Used

SMPLRECV.WK3

ENGINEERING-SCIENCE, INC.
Subsidiary of The Parsons Corporation
Two Flint Hill, 10521 Rosehaven Street
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Sample Train Recovery Data

Plant: CATHOLIC UNIVERSITY Date: 9-26-94
Sampling Location: Melter outlet
Clean-up person: CDH Field Team Leader: CDH
Sample Type: M4 M5 M6 M5/8 M8 M17 M26 MM5 MMT Cr+6 Other:
Run Number: CU-MMT-I-02 Impinger Train ID: 4
Job Number:

Comments:

Front-half Data

Filter #: M004/91 Filter Media Type: QUARTZ
Filter Description: Quartz Filter (PALLFLEX)
Filter #: Filter Media Type:
Filter Description:

Back-half Data

Impinger Purge –
Start Time: Flow Rate: Stop Time: Purge Gas:

	Impinger 1	Impinger 2	Impinger 3
Contents:	5% - HNO_3 10% H_2O_2	5% HNO_3 / 10% H_2O_2	Empty
Final Volume (ml):	138	102	0
Initial Volume (ml):	100	100	0
Net Volume (ml):	38	2	0

	Impinger 4	Impinger 5	Final Impinger
Contents:			
Final Volume (ml):			(g): 728
Initial Volume (ml):			(g): 718
Net Volume (ml):			(g): 10

Total moisture collected (ml): 50

Description of impinger catch:

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Sample Train Recovery Data

Plant: Catholic University - USL Date: 9/20/94
Sampling Location: Incinerator Outlet
Clean-up person: C-DH/RHH Field Team Leader: C-DH
Sample Type: M4 M5 M6 M5/8 M8 M17 M26 MM5 MMT Cr^{+6} Other:
Run Number: CU-MMT-I-03-3 Impinger Train ID: [illegible]
Job Number:

Comments:

Front-half Data

Filter #: M002/91 Filter Media Type: Quartz
Filter Description: Quartz Filter
Filter #: Filter Media Type:
Filter Description:

Back-half Data

Impinger Purge –
Start Time: Flow Rate: Stop Time: Purge Gas:

	Impinger 1	Impinger 2	Impinger 3
Contents:	5% HNO_3/10% H_2O_2	5% HNO_3/10% H_2O_2	Empty
Final Volume (ml):	159.5	100 ml	0
Initial Volume (ml):	100 ml	100 ml	0
Net Volume (ml):	59.5	0	0

	Impinger 4	Impinger 5	Final Impinger
Contents:			
Final Volume (ml):			(g): 727
Initial Volume (ml):			(g): 715
Net Volume (ml):			(g): 12

Total moisture collected (ml): 71.5

Description of impinger catch: yellow tinge to solution in Impinger #1; NH_4 is a strong presence of bubbles and odor. Same observation is made for Impinger #2.

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Sample Train Recovery Data

Plant: Catholic University Date: 9-26-94
Sampling Location: HEPA Filter outlet
Clean-up person: GDH Field Team Leader:
Sample Type: M4 M5 M6 M5/8 M8 M17 M26 MM5 (MMT) Cr^{+6} Other:
Run Number: CU-MMT-0-01-1 Impinger Train ID: 2
Job Number:

Comments:

Front-half Data

Filter #: M005/91 Filter Media Type: Quartz Fiber (PALLFLEX)
Filter Description:
Filter #: Filter Media Type:
Filter Description:

Back-half Data

Impinger Purge –
Start Time: Flow Rate: Stop Time: Purge Gas:

	Impinger 1	Impinger 2	Impinger 3
Contents:	5% HNO_3/10% H_2O_2	5% HNO_3 - 10% H_2O_2	Empty
Final Volume (ml):	106.0	104.0	2.0
Initial Volume (ml):	100	100	0
Net Volume (ml):	6	4	2

	Impinger 4	Impinger 5	Final Impinger
Contents:			Silica Gel
Final Volume (ml):			(g): 768.0
Initial Volume (ml):			(g): 753
Net Volume (ml):			(g): 15

Total moisture collected (ml): 27 ml

Description of impinger catch:

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Sample Train Recovery Data

Plant: Catholic University Date: 9-26-94
Sampling Location: HEPA Filter outlet
Clean-up person: CDH Field Team Leader: CDH
Sample Type: M4 M5 M6 M5/8 M8 M17 M26 MM5 MMT Cr^{+6} Other:
Run Number: CU-MMT-0-02 Impinger Train ID: 3
Job Number:

Comments:

Front-half Data

Filter #: M008/91 Filter Media Type: Quartz Fiber (Purified)
Filter Description:
Filter #: Filter Media Type:
Filter Description:

Back-half Data

Impinger Purge –
Start Time: Flow Rate: Stop Time: Purge Gas:

	Impinger 1	Impinger 2	Impinger 3
Contents:	5% HNO_3 / 10% H_2O_2	5% HNO_3 - 10% H_2O_2	Empty
Final Volume (ml):	105.0	108.0	0
Initial Volume (ml):	100	100	0
Net Volume (ml):	5	8	0

	Impinger 4	Impinger 5	Final Impinger
Contents:			Silica Gel
Final Volume (ml):			(g): 709
Initial Volume (ml):			(g): 698
Net Volume (ml):			(g): 11

Total moisture collected (ml): 24

Description of impinger catch: Clear

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Sample Train Recovery Data

Plant: Catholic University Date: 9-26-94
Sampling Location: [illegible] Outlet
Clean-up person: [illegible] Field Team Leader: [illegible]
Sample Type: M4 M5 M6 M5/8 M8 M17 M26 MM5 MMT Cr^{+6} Other:
Run Number: [illegible] MMT-C-03-3 Impinger Train ID:
Job Number:

Comments:

Front-half Data

Filter #: IM006/91 Filter Media Type: Quartz
Filter Description: [illegible] Media (Pallflex)
Filter #: Filter Media Type:
Filter Description:

Back-half Data

Impinger Purge –
Start Time: Flow Rate: Stop Time: Purge Gas:

	Impinger 1	Impinger 2	Impinger 3
Contents:	5% HNO_3/10% H_2O_2	5% HNO_3/10% H_2O_2	Empty
Final Volume (ml):	104	108	2
Initial Volume (ml):	100	100	0
Net Volume (ml):	4	8	2

	Impinger 4	Impinger 5	Final Impinger
Contents:			
Final Volume (ml):			(g): 778
Initial Volume (ml):			(g): 768
Net Volume (ml):			(g): 10

Total moisture collected (ml): 24

Description of impinger catch:

ES
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Sample Train Recovery Data

Plant: Catholic University Date: 9/26/94
Sampling Location: HEPA Exhaust
Clean-up person: Field Team Leader: CDH
Sample Type: M4 M5 M6 M5/8 M8 M17 M26 MM5 MMT Cr^{+6} Other:
Run Number: CU-MMT-0-04-4 Impinger Train ID:
Job Number:

Comments:

Front-half Data

Filter #: M010/9~~4~~2 Filter Media Type: Quartz
Filter Description:
Filter #: Filter Media Type:
Filter Description:

Back-half Data

Impinger Purge –
Start Time: Flow Rate: Stop Time: Purge Gas:

	Impinger 1	Impinger 2	Impinger 3
Contents:	5% HNO_3 / 10% H_2O_2	5% HNO_3 / 10% H_2O_2	Empty
Final Volume (ml):	107 mL	104 mL	2 mL
Initial Volume (ml):	100	100	Ø
Net Volume (ml):	7 mL	4 mL	2 mL

	Impinger 4	Impinger 5	Final Impinger
Contents:			
Final Volume (ml):			(g): 720.5
Initial Volume (ml):			(g): 709
Net Volume (ml):			(g): 11.5

Total moisture collected (ml): 24.5 mL

Description of impinger catch:

Run Title: CATHOLIC UNIVERSITY
Date: 15/31/127

Time	O2	CO	CO2	NOX	SO2	THC
10:23:59	21.01	1.4	-0.03	-31.	0.4	-4.5
10:24:29	21.02	1.4	-0.00	-31.	0.4	-4.9
10:24:59	21.17	1.9	-0.01	-31.	0.4	-4.5
10:25:29	21.17	1.9	-0.03	-31.	0.4	-4.0
10:25:59	21.17	1.4	-0.04	-31.	0.4	-3.7
10:26:29	21.16	1.4	-0.02	-31.	0.4	-3.4
10:26:59	21.17	1.9	-0.04	-31.	0.4	-3.1
10:27:29	21.17	1.9	-0.06	-31.	0.3	-2.9
10:27:59	21.17	1.9	-0.06	-31.	0.4	-2.8
10:28:29	21.17	1.4	-0.06	-31.	0.4	-2.6
10:29:00	21.18	1.4	-0.05	-31.	0.5	-2.5
10:29:30	21.18	1.4	-0.02	-31.	0.5	-2.4
10:30:00	21.19	1.4	-0.04	-31.	0.5	-2.4
10:30:30	21.19	1.9	-0.06	-31.	0.5	-2.3
10:31:00	21.20	1.9	-0.06	-31.	0.5	-2.3
10:31:30	21.20	1.9	-0.06	-31.	0.5	-2.3
10:32:00	21.21	1.9	0.00	-31.	0.5	-2.3
10:32:30	21.21	1.4	-0.00	-31.	0.4	-2.3
10:33:00	21.21	0.9	0.00	-31.	0.4	-2.3
10:33:30	21.22	0.9	-0.01	-31.	0.4	-2.2
10:34:01	21.22	1.4	-0.04	-31.	0.4	-2.2
10:34:31	21.23	1.4	-0.06	-31.	0.4	-2.2
10:35:01	21.23	1.4	0.00	-31.	0.4	-2.3
10:35:31	21.24	1.4	-0.00	-31.	0.4	-2.3
10:36:01	21.24	0.9	-0.02	-31.	0.4	-2.2
10:36:31	21.25	0.9	-0.01	-31.	0.4	-2.2
10:37:01	21.25	1.9	0.00	-31.	0.4	-2.2
10:37:31	21.25	1.4	-0.05	-31.	0.4	-2.1
10:38:01	21.26	1.4	-0.05	-31.	0.4	-2.1
10:38:31	21.26	1.4	-0.05	-31.	0.4	-2.1
10:39:02	21.27	0.9	-0.05	-31.	0.4	-2.1
10:39:32	21.27	1.4	-0.06	-31.	0.4	-2.0
10:40:02	21.28	0.9	-0.00	-31.	0.4	-2.0
10:40:32	21.28	0.4	-0.01	-31.	0.4	-2.0
10:41:02	21.28	1.4	-0.01	-31.	0.4	-2.0
10:41:32	21.29	1.4	-0.05	-31.	0.4	-2.0
10:42:02	21.29	0.9	-0.05	-31.	0.4	-1.9
10:42:32	21.30	1.4	-0.05	-31.	0.4	-1.9
10:43:02	21.30	1.4	-0.00	-31.	0.4	-1.9
10:43:32	21.30	1.8	-0.01	-31.	0.4	-1.9
10:44:03	21.31	0.9	-0.05	-31.	0.4	-1.9
10:44:33	21.31	1.4	-0.05	-21.	0.4	-1.9
10:45:03	21.32	1.4	0.01	-31.	0.4	-1.9
10:45:33	21.32	0.4	-0.04	-21.	0.4	-1.9
10:46:03	21.32	1.4	-0.03	-31.	0.4	-1.9
10:46:33	21.33	1.4	-0.00	-21.	0.4	-1.9
10:47:03	21.33	1.4	0.00	-21.	0.4	-1.9
10:47:33	21.33	1.4	-0.00	-31.	0.4	-1.9
10:48:03	17.36	2.4	0.00	-21.	0.4	-1.8
10:48:33	0.88	1.8	-0.01	-21.	0.2	-1.8

10:49:04	0.64	0.9	-0.06	-2L	0.2	-1.8
10:49:34	0.61	0.9	-0.04	-2L	0.1	-1.8
10:49:55 ZERO O2 CO CO2 SO2 NOX DIRECT						
10:50:04	0.60	0.9	-0.01	-2L	0.1	-1.8
10:50:34	0.07	-0.2	-0.00	-2L	0.1	-1.8
10:51:04	0.06	-0.2	-0.06	-2L	0.1	-1.8
10:51:34	0.06	-0.2	-0.07	-2L	0.1	-1.8
10:52:04	0.06	-0.2	-0.02	-2L	0.1	-1.8
10:52:34	0.05	0.4	-0.03	-3L	0.1	-1.8
10:53:04	0.05	0.4	-0.06	0	0.1	-1.8
10:53:34	0.01	-0.2	-0.00	0	0.1	-1.8
10:54:05	-0.00	0.4	-0.07	0	0.1	-1.8
10:54:35	-0.01	-0.2	-0.01	0	0.1	-1.8
10:55:05	-0.02	-0.2	-0.06	1	0.1	-1.8
10:55:35	-0.02	-0.2	-0.01	0	0.1	-1.8
10:56:03 SPAN O2 17.72 CO 451 CO2 17.09 DIRECT						
10:56:05	-0.03	-0.2	-0.01	0	0.1	-1.8
10:56:35	4.95	1.8	0.09	1	0.1	-1.8
10:57:05	16.22	119.0	2.49	1	0.1	-1.8
10:57:35	17.71	279.4	4.59	1	0.0	-1.8
10:58:05	17.70	403.1	5.32	0	-0.2	-1.8
10:58:35	17.70	442.0	5.65	1	-0.3	-1.8
10:59:05	17.70	442.6	5.22	1	-0.4	-1.8
10:59:36	17.72	366.9	5.44	1	-0.5	-1.8
11:00:06	17.72	364.4	5.55	1	-0.5	-1.8
11:00:36	17.73	365.8	5.74	1	-0.5	-1.8
11:01:06	17.73	366.8	5.63	1	-0.5	-1.8
11:01:36	17.74	365.8	5.68	1	-0.6	-1.8
11:02:06	17.75	366.4	5.51	1	-0.7	-1.8
11:02:36	17.76	364.8	7.30	1	-0.6	-1.8
11:03:06	17.76	365.8	7.78	1	-0.7	-1.8
11:03:36	17.76	364.4	7.68	1	-0.7	-1.8
11:04:07	17.77	364.3	7.51	1	-0.7	-1.8
11:04:37	17.77	365.8	7.57	1	-0.7	-1.8
11:05:07	17.78	363.8	7.80	1	-0.7	-1.8
11:05:37	17.77	365.3	8.37	1	-0.7	-1.8
11:06:07	17.77	365.8	7.85	1	-0.7	-1.8
11:06:37	17.78	363.3	8.04	1	-0.7	-1.8
11:07:07	17.77	365.8	8.09	1	-0.6	-1.8
11:07:37	17.78	365.8	6.52	1	-0.6	-1.8
11:08:07	17.78	380.0	6.47	1	-0.6	-1.8
11:08:37	17.79	453.4	6.32	1	-0.6	-1.8
11:09:08	17.78	453.4	0.32	1	-0.6	-1.8
11:09:38	17.78	454.9	0.30	1	-0.5	-1.8
11:10:08	17.79	452.5	0.64	1	-0.5	-1.8
11:10:38	17.79	455.5	0.72	1	-0.5	-1.8
11:11:08	17.79	453.9	0.36	1	-0.5	-1.8
11:11:38	17.78	453.0	6.74H	1	-0.5	-1.8
11:12:08	17.79	453.5	6.72H	1	-0.4	-1.8
11:12:38	17.79	453.4	8.11H	1	-0.4	-1.8
11:13:08	17.79	455.0	10.75H	1	-0.4	-1.8
11:13:38	17.80	452.0	13.22H	1	-0.4	-1.8
11:14:09	17.80	455.5	13.60H	1	-0.4	-1.8
11:14:39	17.80	455.9	13.99H	1	-0.4	-1.8
11:15:09	17.80	454.5	14.27H	1	-0.4	-1.8
11:15:39	17.80	454.5	14.04H	1	-0.4	-1.8
11:16:09	17.80	453.4	14.07H	1	-0.4	-1.8
11:16:39	17.80	455.4	13.94H	1	-0.4	-1.8
11:17:09	17.80	454.5	13.48H	1	-0.4	-1.8

11:18:09	17.79	454.5	14.04H	1	-0.4	-1.8
11:18:39	17.80	459.0	14.08H	1	-0.4	-1.8
11:19:09	17.80	453.9	14.03H	1	-0.4	-1.8
11:19:40	17.80	453.4	14.04H	1	-0.3	-1.8
11:20:10	17.80	454.5	14.01H	1	-0.3	-1.8
11:20:40	17.80	455.0	14.20H	1	-0.3	-1.8
11:21:10	17.80	455.0	13.96H	1	-0.3	-1.8
11:21:40	17.80	455.9	14.18H	1	-0.3	-1.8
11:22:10	17.79	453.9	14.33H	1	-0.3	-1.8
11:22:40	17.80	457.0	14.54H	1	-0.3	-1.8
11:23:10	17.80	454.5	12.38H	1	-0.3	-1.8
11:23:40	17.80	453.5	12.46H	1	-0.3	-1.8
11:24:10	16.24	444.0	9.53H	2	-0.3	-1.8
11:24:28 MID O2 11.54 CO 251						
11:24:41	11.73	317.9	9.32H	1	-0.2	-1.8
11:25:11	11.62	257.0	9.25H	1	-0.2	-1.8
11:25:41	11.61	253.0	9.10H	1	-0.2	-1.8
11:26:11	11.61	253.9	8.72H	1	-0.2	-1.8
11:26:41	11.61	253.4	8.72H	2	-0.3	-1.8
11:27:11	12.09	242.8	7.32H	2	-0.3	-1.8
11:27:41	10.33	110.2	1.46H	2	0.0	-1.8
11:27:45 LOW CO 90.7						
11:28:11	0.12	84.2	0.02	2	-0.1	-1.8
11:28:41	-0.05	90.7	-0.00	2	-0.2	-1.8
11:28:56	-0.06	91.2	-0.01	2	-0.2	-1.8
11:29:12	-0.07	90.7	-0.05	2	-0.2	-1.8
11:29:27	-0.08	90.7	-0.05	2	-0.2	-1.8
11:29:42	-0.07	93.2	-0.06	2	-0.3	-1.8
11:29:57	0.03	75.2	0.02	2	-0.1	-1.8
11:30:12	5.07	50.7	-0.03	648	0.6	-1.8
11:30:27	0.58	19.7	-0.05	690	1.7	-1.8
11:30:42	0.00	10.3	0.00	691	1.0	-1.8
11:30:57	-0.06	1.8	-0.06	704	0.6	-1.8
11:31:12	-0.07	0.3	0.00	699	0.6	-1.8
11:31:27	-0.07	-0.2	-0.06	704	0.5	-1.8
11:31:42	-0.08	-0.2	-0.07	726	0.4	-1.8
11:31:57	-0.08	-0.2	-0.06	843	0.4	-1.8
11:32:12	-0.09	-0.2	-0.03	849	0.3	-1.8
11:32:27 SPAN NOX 849						
11:32:27	-0.08	-0.2	-0.04	849	0.2	-1.8
11:32:42	-0.09	-0.2	0.01	850	0.2	-1.8
11:32:57	-0.09	-0.2	-0.07	858	0.1	-1.8
11:33:12	-0.10	-0.2	-0.01	858	0.1	-1.8
11:33:27	-0.10	-0.2	-0.02	846	0.1	-1.8
11:33:42	-0.10	-0.2	-0.05	853	0.1	-1.8
11:33:57	-0.10	-0.2	-0.00	847	0.1	-1.8
11:34:13	-0.10	-0.2	0.01	849	0.1	-1.8
11:34:22 447 PPM NOX						
11:34:28	-0.10	-0.2	0.01	849	0.1	-1.8
11:34:43	0.45	-0.2	-0.02	461	0.1	-1.8
11:34:58	1.06	0.3	-0.02	410	0.4	-1.8
11:35:13	0.04	0.3	-0.07	452	0.4	-1.8
11:35:28	-0.08	0.3	0.01	457	0.2	-1.8
11:35:43	-0.11	0.3	-0.06	462	0.1	-1.8
11:35:58	-0.10	0.3	-0.01	461	0.2	-1.8
11:36:13	-0.11	0.8	-0.02	465	0.2	-1.8
11:36:28	-0.11	0.8	-0.07	461	0.2	-1.8
11:36:43	-0.11	0.8	-0.05	457	0.1	-1.8
11:36:58	-0.12	0.8	-0.03	455	0.1	-1.8

11:37:13	-0.11	0.8	0.01	35		
11:37:28	-0.07	0.8	0.01	35	0.1	-1.8
11:37:43	4.56	1.8	-0.04	119	0.3	-1.8
11:37:58	17.24	1.3	0.01	22	7.7	-1.8
11:38:13	20.44	0.8	-0.06	7	23.0	-1.8
11:38:28	20.91	0.3	-0.02	5	31.2	-1.8
11:38:43	20.97	0.3	-0.02	5	33.9	-1.8
11:38:52 SO2 163 DIRECT						
11:38:59	20.98	-0.2	-0.04	4	35.0	-1.8
11:39:14	21.00	0.3	-0.02	4	35.4	-1.8
11:39:29	21.00	0.3	-0.05	4	35.6	-1.8
11:39:44	21.01	0.3	-0.06	4	35.8	-1.8
11:39:59	21.01	0.3	-0.05	4	36.0	-1.8
11:40:14	21.02	-0.2	0.01	4	36.0	-1.8
11:40:29	21.02	0.3	0.00	4	178.4	-1.8
11:40:44	21.02	-0.2	-0.03	4	178.8	-1.8
11:40:59	21.02	-0.2	-0.03	4	178.9	-1.8
11:41:14	21.03	-0.2	-0.06	4	158.2	-1.8
11:41:29	21.03	-0.2	-0.00	4	163.1	-1.8
11:41:44	21.03	-0.2	-0.07	4	163.1	-1.8
11:41:59	21.03	-0.2	0.01	4	[illegible]	-1.8
11:42:14	21.02	0.3	0.01	4	154.7	-1.8
11:42:29	20.96	0.3	0.01	4	101.2	-1.8
11:42:44	20.91	1.3	-0.01	4	44.4	-1.8
11:42:59	20.84	1.8	-0.01	4	22.6	-1.8
11:43:14	20.80	1.8	-0.05	4	13.3	-1.8
11:43:29	20.83	1.8	-0.00	3	29.9	-1.8
11:43:44	20.89	0.8	-0.06	3	64.8	-1.8
11:43:48 86.8 PPM SO2						
11:44:00	20.90	0.3	0.01	3	81.0	-1.8
11:44:15	20.90	-0.2	-0.07	3	84.8	-1.8
11:44:30	20.90	-0.2	0.01	3	86.0	-1.8
11:44:45	20.90	-0.2	-0.01	3	86.3	-1.8
11:45:00	20.90	-0.2	-0.01	3	86.4	-1.8
11:45:15	20.90	-0.2	-0.05	3	86.5	-1.8
11:45:30	20.90	-0.2	-0.08	3	86.6	-1.8
11:45:45	20.92	-0.2	-0.07	3	86.2	-1.8
11:46:00	20.91	-0.2	0.01	3	71.1	-1.8
11:46:15	20.89	0.8	-0.05	4	40.1	-1.8
11:46:30	20.85	0.8	-0.02	4	18.4	-1.8
11:46:45	20.83	1.8	-0.02	4	10.6	-1.8
11:47:00	20.83	1.8	-0.06	4	7.2	-1.8
11:47:15	20.81	1.8	0.01	4	5.9	-1.8
11:47:30	20.81	1.8	-0.06	4	5.1	-1.8
11:47:45	20.81	1.8	-0.01	4	4.7	-1.8
11:48:00	20.80	1.8	0.00	4	4.4	-1.8
11:48:15	20.81	1.8	0.00	4	4.2	-1.8
11:48:30	20.81	1.8	-0.01	4	4.0	-1.8
11:48:45	20.80	1.8	-0.06	4	3.9	-1.8
11:49:01	20.80	1.3	0.02	4	3.8	-1.8
11:49:16	20.80	1.3	-0.04	4	3.7	-1.8
11:49:31	20.80	1.8	-0.05	4	3.6	-1.8
11:49:46	20.79	1.3	0.01	3	3.5	-1.8
11:50:01	20.79	1.3	-0.04	4	3.4	-1.8
11:50:16	20.79	1.3	0.01	3	3.3	-1.8
11:50:31	20.79	1.3	-0.00	3	3.3	-1.8
11:50:46	20.79	1.3	-0.06	4	3.2	-1.8
11:51:01	20.79	1.3	-0.07	4	3.2	-1.8
11:51:16	20.79	1.3	-0.02	4	3.1	-1.8
11:51:31	20.79	1.3	-0.06	4	3.1	-1.8

11:52:01	20.79	1.3	-0.05	3	3.0	-1.8
11:52:16	20.79	1.3	-0.05	4	3.0	-1.8
11:52:31	20.79	1.3	0.01	4	3.0	-1.8
11:52:46	20.79	1.3	-0.05	3	2.9	-1.8
11:53:01	20.79	1.3	-0.07	4	2.9	-1.8
11:53:16	20.79	1.3	-0.05	4	2.9	-1.8
11:53:31	20.80	1.3	-0.04	4	2.9	-1.8
11:53:46	20.79	1.3	-0.00	3	2.9	-1.8
11:54:01	20.80	1.3	-0.07	3	2.8	-1.8
11:54:17	20.80	1.3	0.00	3	2.8	-1.8
11:54:32	20.80	1.3	-0.06	4	2.8	-1.8
11:54:47	20.80	1.3	0.01	3	2.8	-1.8
11:55:02	20.79	1.3	-0.06	4	2.8	-1.8
11:55:17	20.78	1.3	-0.00	3	2.8	-1.8
11:55:32	20.79	1.3	-0.06	4	2.8	-1.8
11:55:47	20.78	1.3	-0.06	3	2.7	-1.8
11:56:02	20.79	1.3	-0.07	3	2.7	-1.8
11:56:17	20.79	1.3	-0.07	4	2.7	-1.8
11:56:32	20.79	1.3	-0.07	3	2.7	-1.8
11:56:47	20.79	1.3	-0.07	3	2.7	-1.8
11:57:02	20.80	1.3	0.01	3	2.7	-1.8
11:57:17	20.80	1.3	-0.06	3	2.7	-1.8
11:57:32	20.80	1.3	-0.00	3	2.7	-1.8
11:57:47	20.80	1.3	-0.06	3	2.7	-1.8
11:58:02	20.80	1.3	-0.02	4	2.7	-1.8
11:58:17	20.80	1.3	-0.01	3	2.6	-1.8
11:58:32	20.80	1.3	-0.04	3	2.6	-1.8
11:58:47	20.80	1.3	-0.03	4	2.6	-1.8
11:59:02	20.80	1.3	-0.05	4	2.6	-1.8
11:59:18	20.80	1.3	-0.03	4	2.6	-1.8
11:59:33	20.80	1.3	-0.02	3	2.6	-1.8
11:59:48	20.81	1.3	-0.05	4	2.6	-1.8
12:00:03	20.80	1.3	0.00	3	2.6	-1.8
12:00:18	20.80	1.3	-0.06	4	2.6	-1.8
12:00:33	20.80	0.8	0.01	3	2.6	-1.8
12:00:48	20.80	1.3	0.01	3	2.6	-1.8
12:01:03	20.81	0.8	0.01	3	2.6	-1.8
12:01:18	20.81	0.8	0.01	3	2.6	-1.8
12:01:33	20.81	0.8	0.01	3	2.6	-1.8
12:01:48	20.82	0.8	-0.01	3	2.6	-1.8
12:02:03	20.81	0.8	-0.06	3	2.6	-1.8
12:02:18	20.81	0.8	-0.02	3	2.6	-1.8
12:02:33	20.81	0.8	-0.02	3	2.6	-1.8
12:02:48	20.80	1.3	-0.05	3	2.6	-1.8
12:03:03	20.80	1.3	0.00	3	2.6	-1.8
12:03:18	20.81	0.8	-0.07	3	2.6	-1.8
12:03:33	20.80	0.8	-0.00	3	2.6	-1.8
12:03:48	20.80	0.8	-0.05	3	2.6	-1.8
12:03:58	ZERO THC					
12:04:03	20.80	0.8	-0.06	3	2.6	-1.8
12:04:19	20.80	0.8	-0.06	3	2.6	-1.8
12:04:34	20.80	0.8	-0.05	3	2.6	-1.8
12:04:49	20.80	0.8	-0.01	3	2.6	-1.8
12:05:04	20.80	0.8	-0.07	3	2.6	-1.8
12:05:19	20.80	0.8	-0.00	3	2.5	-1.8
12:05:34	20.80	0.8	-0.02	3	2.6	-1.8
12:05:49	20.80	0.8	-0.07	3	2.6	-1.8
12:06:04	20.79	0.8	-0.01	3	2.6	-1.8
12:06:19	20.79	0.8	-0.06	3	2.6	-1.8

12:06:49	20.79	0.8	-0.02	3	2.6	-0.0
12:07:04	20.79	0.8	0.00	3	2.6	0.0
12:07:05 ZERO THC						
12:07:19	20.78	0.8	-0.02	3	2.6	-0.0
12:07:34	20.77	1.3	-0.07	3	2.6	-0.0
12:07:49	20.76	0.8	-0.07	3	2.6	-0.0
12:08:04	20.72	0.8	0.00	3	2.6	-0.0
12:08:19	20.71	0.8	-0.04	3	2.6	-0.0
12:08:34	20.68	0.8	-0.04	3	2.6	-0.0
12:08:49	20.67	0.8	-0.06	3	2.6	-0.0
12:09:04	20.65	0.8	-0.06	3	2.6	-0.0
12:09:20	20.63	0.8	-0.06	3	2.7	-0.0
12:09:35	20.62	1.3	-0.06	3	2.7	-0.0
12:09:50	20.60	0.8	-0.01	3	2.7	-0.0
12:09:59 84.2 PPM THC THROUGH SYSTEM						
12:10:05	20.59	0.8	0.00	3	2.6	-0.0
12:10:20	20.57	0.8	-0.02	3	2.7	-0.0
12:10:35	20.56	0.8	-0.07	3	2.6	-0.0
12:10:50	20.55	0.8	-0.07	3	2.6	-0.0
12:11:05	20.53	0.8	-0.03	3	2.6	-0.0
12:11:20	20.53	0.8	-0.02	3	2.6	-0.0
12:11:35	20.52	0.8	-0.06	3	2.6	-0.0
12:11:50	20.50	0.8	-0.03	4	3.4	-0.0
12:12:05	20.54	2.3	-0.02	3	6.6	-0.0
12:12:20	20.51	2.3	0.00	3	5.4	-0.0
12:12:35	20.45	2.3	-0.02	3	3.9	-0.0
12:12:50	20.41	1.8	-0.07	3	3.1	-0.0
12:13:05	20.37	1.3	-0.04	4	2.8	-0.0
12:13:20	20.35	1.3	-0.02	3	2.7	-0.0
12:13:35	20.32	0.8	0.01	3	2.6	-0.0
12:13:50	20.30	0.8	0.01	3	2.6	-0.0
12:14:05	20.27	0.8	-0.05	3	2.6	-0.0
12:14:21	20.25	0.8	0.00	3	2.6	-0.0
12:14:36	20.23	0.8	-0.07	4	2.6	-0.0
12:14:51	20.21	0.8	-0.01	3	2.6	-0.0
12:15:06	20.20	0.8	-0.01	3	2.6	-0.0
12:15:21	20.17	0.8	-0.07	3	2.6	-0.0
12:15:36	20.16	0.8	-0.06	3	2.6	-0.0
12:15:51	20.14	0.8	-0.06	4	2.6	4.4
12:16:06	20.13	0.8	0.00	3	2.6	6.0
12:16:21	20.12	0.8	0.00	4	2.5	9.2
12:16:36	20.08	0.8	-0.00	3	2.5	86.4H
12:16:51	20.04	0.8	-0.02	4	2.6	70.5H
12:17:06	20.01	0.8	0.01	3	2.6	88.9H
12:17:21	19.97	0.8	0.00	4	2.5	100.3H
12:17:36	19.93	0.8	-0.07	4	2.5	72.4H
12:17:51	19.90	0.8	0.01	3	2.5	47.9H
12:18:06	19.88	0.8	-0.04	4	2.5	47.7H
12:18:21	19.85	0.8	-0.04	4	2.5	43.4H
12:18:36	19.84	0.8	-0.06	4	2.5	76.0H
12:18:51	19.83	0.8	-0.05	4	2.5	30.6H
12:19:06	19.81	0.8	-0.06	4	2.5	0.4
12:19:22	19.79	0.8	-0.07	4	2.5	0.2
12:19:37	19.77	0.8	-0.06	4	2.5	1.5
12:19:52	19.76	0.8	0.00	4	2.5	4.5
12:20:07	19.74	0.8	-0.06	4	2.5	0.6
12:20:22	19.73	0.8	0.01	4	2.5	6.1
12:20:37	19.72	0.8	-0.06	4	2.5	2.0
12:20:52	19.70	0.8	-0.00	4	2.5	1.9

12:21:22	19.70	0.8	-0.02	4	2.5	35.9H
12:21:37	19.69	0.8	0.00	4	2.5	0.4
12:21:52	19.68	0.8	0.00	4	2.5	4.2
12:22:07	19.67	0.8	0.01	4	2.5	-0.1
12:22:22	19.66	0.8	-0.07	4	2.5	6.2
12:22:37	19.66	0.8	0.00	4	2.5	12.7H
12:22:52	19.65	0.8	-0.05	4	2.5	6.2
12:23:07	19.65	0.8	-0.05	4	2.5	8.5
12:23:22	19.65	0.8	0.01	4	2.5	1.2
12:23:37	19.65	0.8	-0.06	4	2.5	0.3
12:23:52	19.64	0.8	-0.02	4	2.5	8.1
12:24:07	19.65	0.8	-0.06	4	2.5	1.1
12:24:23	19.65	0.8	-0.06	4	2.5	0.3
12:24:38	19.65	0.8	-0.06	4	2.5	0.4
12:25:08	19.63	0.8	-0.01	4	2.5	-0.4
12:25:38	19.65	0.8	-0.03	4	2.5	-0.4
12:26:08	19.65	0.8	-0.07	4	2.5	-10.6L
12:26:38	19.66	0.8	-0.05	4	2.5	1.9
12:27:08	19.65	0.8	-0.04	4	2.5	64.6H
12:27:38	19.65	0.8	-0.00	4	2.5	8.8
12:28:08	19.65	0.8	0.01	4	2.5	21.2H
12:28:38	19.65	0.8	-0.03	4	2.5	6.0
12:29:08	19.67	0.8	0.01	4	2.6	1.1
12:29:38	19.66	0.8	0.01	4	2.6	0.3
12:30:09	19.65	0.8	-0.01	4	2.6	1.1
12:30:39	19.66	0.8	-0.04	4	2.6	2.3
12:31:09	19.66	0.8	-0.07	4	2.6	2.3
12:31:39	19.66	0.8	-0.07	4	2.6	2.1
12:32:09	19.66	0.8	-0.06	4	2.6	102.4H
12:32:39	19.68	0.8	-0.07	4	2.6	95.8H
12:33:09	19.69	0.8	0.01	4	2.5	99.6H
12:33:39	19.70	0.8	-0.07	4	2.5	85.7H
12:34:09	19.71	0.8	-0.06	4	2.3	84.3H
12:34:39	19.73	1.3	-0.05	4	2.3	11.9H
12:35:10	19.73	1.3	-0.07	4	2.0	54.7H
12:35:40	19.74	1.3	-0.04	4	2.1	54.5H
12:35:55	19.75	1.8	-0.05	4	2.2	50.8H
12:36:10	19.76	1.8	0.00	4	2.3	0.3
12:36:25	19.75	1.8	-0.07	4	2.3	6.6
12:36:40	19.76	1.8	0.01	4	2.3	3.7
12:36:55	19.78	1.8	-0.07	4	2.3	4.0
12:37:10	19.77	1.8	0.01	4	2.3	1.1
12:37:25	19.78	1.8	-0.07	4	2.3	4.5
12:37:40	19.78	1.8	-0.06	4	2.3	47.4H
12:37:55	19.79	1.8	-0.05	4	2.3	47.6H
12:38:10	19.79	1.8	0.01	4	2.4	48.0H
12:38:25	19.80	1.8	0.01	4	2.3	47.9H
12:38:40	19.81	1.8	-0.04	4	2.4	72.6H
12:38:55	19.80	1.8	0.01	4	2.4	73.2H
12:39:10	19.81	1.8	-0.05	4	2.4	73.3H
12:39:25	19.82	1.8	-0.02	4	2.4	73.3H
12:39:26	19.82	1.8	-0.02	4	2.4	73.3H
12:39:26	19.82	1.8	-0.02	4	2.4	73.3H
12:39:26	19.82	1.8	-0.02	4	2.4	73.3H
12:39:26	19.82	1.8	-0.02	4	2.4	73.3H
12:39:26	19.82	1.8	-0.02	4	2.4	73.3H
12:39:26	19.82	1.8	-0.02	4	2.4	73.3H
12:39:26	19.82	1.8	-0.02	4	2.4	73.3H
12:39:26	19.82	1.8	-0.02	4	2.4	73.3H

12:39:27	19.82	1.8	-0.02	4	2.4	73.3H
12:39:27	19.82	1.8	-0.02	4	2.4	73.3H
12:39:27	19.82	1.8	-0.02	4	2.4	73.3H
12:39:28	19.82	1.8	-0.02	4	2.4	73.3H
12:39:28	19.82	1.8	-0.02	4	2.4	73.3H
12:39:28	19.82	1.8	-0.02	4	2.4	73.3H
12:39:29	19.82	1.8	-0.02	4	2.4	73.3H
12:39:31	19.82	1.8	-0.02	4	2.4	73.3H
12:39:34	19.82	1.8	-0.02	4	2.4	73.3H
12:39:36	19.82	1.8	-0.02	4	2.4	73.3H
12:39:41	19.82	1.3	-0.06	4	2.4	73.2H
12:39:41	19.82	1.3	-0.06	4	2.4	73.2H
12:39:57	19.82	1.8	-0.06	4	2.4	73.2H
12:40:12	19.82	1.3	-0.07	4	2.4	73.1H
12:40:27	19.83	1.3	-0.07	4	2.4	73.0H
12:40:57	19.86	1.3	-0.04	5	2.4	73.0H
12:41:12	19.88	1.8	0.00	5	3.7	72.9H
12:41:27	19.89	7.7	-0.07	5	4.5	72.8H
12:41:42	19.89	9.2	-0.01	5	5.4	72.8H
12:41:57	19.91	7.2	-0.05	5	6.9	72.8H
12:42:12	19.91	4.7	-0.02	4	6.1	72.7H
12:42:27	19.90	1.3	-0.04	5	4.9	72.6H
12:42:42	19.90	0.8	-0.03	5	4.3	72.6H
12:42:52 CAL THC 84.2 THROUGH SYS						
12:42:57	19.80	20.2	0.10	5	4.0	72.5H
12:43:12	17.88	98.2	1.03H	4	3.1	82.8H
12:43:27	17.18	281.3	1.20H	5	2.6	84.6H
12:43:42	17.09	341.3	1.89H	5	2.4	16.9H
12:43:57	17.06	402.5	5.46H	5	2.4	84.4H
12:44:12	17.05	413.9	5.14H	5	2.4	84.3H
12:44:27	17.05	418.5	6.65H	5	2.4	84.3H
12:44:42	17.05	419.9	6.73H	5	2.4	84.2H
12:44:53 55.7 THC						
12:44:57	17.04	419.9	8.95H	5	2.4	84.1H
12:45:12	17.05	418.2	9.91H	5	2.4	83.9H
12:45:28	17.06	418.5	9.89H	5	2.4	83.9H
12:45:43	17.06	417.9	8.91H	5	2.4	83.1H
12:45:58	17.06	417.4	9.78H	5	2.4	55.1H
12:46:13	17.06	417.9	10.42H	5	2.3	54.7H
12:46:16 ZERO BIAS THROUGH SYS O2 CO SO2 NOX						
12:46:28	17.06	417.4	10.54H	5	2.1	54.6H
12:46:43	16.69	419.9	9.76H	5	2.1	54.5H
12:46:58	4.45	301.3	2.22H	5	2.7	54.4H
12:47:13	0.61	211.8	0.17	5	3.1	54.4H
12:47:28	0.06	78.2	-0.04	5	3.3	54.3H
12:47:36 31.0 THC						
12:47:43	0.01	19.2	-0.05	5	3.3	54.5H
12:47:58	-0.01	7.2	-0.06	5	3.4	54.1H
12:48:13	-0.01	1.3	-0.03	5	3.3	31.9H
12:48:28	-0.02	0.8	-0.04	5	3.3	29.6H
12:48:43	-0.03	0.8	-0.01	5	3.3	29.4H
12:48:58	-0.04	0.8	-0.06	5	3.2	29.3H
12:49:07 ZERO THC THROUGH SYS						
12:49:13	-0.04	0.8	-0.00	5	3.1	29.2H
12:49:28	-0.04	0.8	-0.03	5	3.1	29.2H
12:49:43	-0.04	0.8	-0.05	5	3.1	29.2H
12:49:48 11.54 BIAS O2 251 PPM CO						
12:49:58	-0.04	1.3	0.03	5	3.0	29.1H
12:50:13	8.66	108.7	3.84H	5	2.6	-1.4

12:50:44	10.98	234.7	6.21H	5	1.9	-1.9
12:50:59	10.97	246.4	3.11H	5	1.8	-1.9
12:51:14	10.97	253.4	6.20H	5	1.8	-2.0
12:51:29	10.97	253.9	6.46H	5	1.8	-2.0
12:51:44	10.98	254.5	6.71H	5	1.9	-2.1
12:51:59	10.98	[illegible]	6.50H	5	1.9	-2.1
12:52:14	10.98	255.9	6.39H	5	1.9	-2.1
12:52:18 86.8 PPM SO2 BIAS						
12:52:29	10.99	255.4	6.51H	5	1.9	-2.1
12:52:44	10.98	256.5	6.58H	5	2.0	0.1
12:52:59	13.27	226.8	3.52H	5	2.2	0.1
12:53:14	18.86	115.6	0.32	5	7.5	0.1
12:53:29	19.77	66.8	0.00	5	24.9	0.0
12:53:44	19.89	13.2	-0.03	5	39.5	[illegible]
12:53:59	19.91	4.2	-0.04	5	46.3	0.0
12:54:14	19.92	0.8	-0.04	5	51.2	0.0
12:54:29	19.93	0.3	0.02	5	54.3	0.0
12:54:44	19.94	0.3	-0.03	5	56.4	0.0
12:54:59	19.95	0.3	-0.02	5	58.3	0.0
12:55:14	19.96	0.3	-0.02	5	59.6	0.0
12:55:30	19.96	0.3	-0.02	5	60.9	0.0
12:55:45	19.96	0.3	-0.02	5	62.1	0.0
12:56:00	19.97	0.3	0.00	5	63.7	-0.0
12:56:15	19.97	0.3	-0.01	5	65.9	-0.0
12:56:30	19.98	0.3	0.01	5	66.4	0.0
12:56:45	19.98	0.3	0.01	5	67.0	-0.0
12:57:00	19.98	0.3	-0.06	5	67.6	-0.0
12:57:15	19.98	0.3	-0.01	5	68.2	-0.0
12:57:30	19.99	0.3	-0.05	5	69.0	-0.0
12:57:45	19.99	0.3	-0.03	5	69.5	0.0
12:58:00	19.99	0.3	-0.02	5	69.9	0.1
12:58:15	20.00	0.3	-0.05	5	70.3	0.2
12:58:30	20.00	0.3	0.00	5	71.0	0.8
12:58:45	20.01	0.3	-0.02	5	71.7	23.8H
12:59:00	20.00	0.3	-0.02	5	72.3	19.9H
12:59:15	20.01	0.3	-0.06	5	72.9	22.5H
12:59:30	20.00	0.3	-0.06	5	73.4	20.3H
12:59:45	20.01	0.3	-0.07	5	74.0	19.4H
13:00:00	20.01	0.3	-0.01	5	74.6	9.5
13:00:15	20.02	-0.3	-0.06	5	74.9	13.7H
13:00:31	20.02	0.3	-0.03	5	75.4	18.2H
13:00:46	20.02	-0.3	-0.03	5	75.9	19.4H
13:01:01	20.02	-0.3	-0.03	5	76.5	17.4H
13:01:16	20.02	0.3	-0.01	5	77.2	1.3
13:01:31	20.02	-0.3	-0.02	5	77.8	0.7
13:01:38 447 NOX BIAS						
13:01:46	20.03	-0.3	0.00	5	78.5	0.5
13:02:01	20.03	-0.3	0.01	5	79.2	0.4
13:02:16	19.59	0.3	-0.04	369	73.7	0.4
13:02:31	4.91	0.3	-0.00	438	40.9	0.3
13:02:46	0.68	0.8	-0.07	450	20.3	0.3
13:03:01	0.11	0.8	-0.04	446	10.9	0.3
13:03:16	0.06	0.8	0.01	444	7.8	0.3
13:03:31	0.04	0.8	-0.07	442	6.0	0.3
13:03:46	0.03	0.8	-0.02	448	4.9	0.3
13:04:01	0.02	0.8	-0.02	424	4.3	0.3
13:04:16	0.02	0.8	0.01	30	3.7	0.3
13:04:31	0.00	0.8	-0.01	8	3.2	0.2
13:04:46	-0.01	0.3	-0.07	6	2.8	0.2

13:05:16	-0.01	0.3	0.00	6	2.4	0.3
13:05:32	-0.02	0.3	-0.06	6	2.3	0.3
13:05:47	-0.02	0.3	-0.06	5	2.2	0.2
13:06:02	-0.02	0.3	0.00	5	2.1	0.3
13:06:17	-0.03	0.3	-0.02	5	2.0	0.3
13:06:32	-0.03	0.3	-0.07	5	2.0	0.3
13:06:47	-0.03	0.3	-0.05	5	2.0	0.2
13:07:02	-0.03	0.3	-0.04	5	2.0	0.3
13:07:17	-0.03	0.3	0.01	5	2.0	0.3
13:07:32	-0.03	0.3	-0.00	5	2.0	0.2
13:07:47	-0.03	0.3	-0.02	5	2.0	0.3
13:08:02	-0.03	0.3	-0.02	5	2.0	0.3
13:08:17	-0.03	0.3	-0.07	5	2.0	0.2
13:08:32	-0.03	0.3	0.00	5	1.9	0.3
13:08:47	-0.03	0.3	-0.02	5	1.9	0.2
13:09:02	-0.03	0.3	-0.06	5	1.9	0.2
13:09:17	-0.03	0.3	-0.06	5	1.9	0.2
13:09:32	-0.03	0.3	-0.07	5	1.9	0.2
13:09:47	-0.03	0.3	-0.04	5	1.8	0.2
13:10:02	-0.03	0.3	-0.06	4	1.8	0.2
13:10:17	-0.03	0.3	-0.06	4	1.7	0.2
13:10:32	-0.03	0.3	-0.01	4	1.7	0.2
13:10:48	-0.03	0.3	-0.04	4	1.7	0.3
13:11:03	-0.04	0.3	-0.03	4	1.7	0.2
13:11:18	-0.03	0.3	-0.02	4	1.7	0.2
13:11:33	-0.03	0.3	-0.05	4	1.7	0.2
13:11:48	-0.03	0.3	-0.07	4	1.7	0.2
13:12:03	-0.03	0.3	-0.07	4	1.6	0.3
13:12:18	-0.03	0.3	-0.07	4	1.6	0.2
13:12:33	-0.03	0.3	-0.07	4	1.6	0.2
13:12:48	-0.03	0.3	-0.07	4	1.6	0.2
13:13:03	-0.03	0.3	-0.00	4	1.6	0.2
13:13:18	-0.03	0.3	-0.04	4	1.6	0.2
13:13:33	-0.03	0.3	-0.06	4	1.6	0.2
13:13:48	-0.04	0.3	0.01	4	1.6	0.2
13:14:03	-0.03	0.3	-0.07	4	1.6	0.2
13:14:18	-0.03	0.3	-0.01	5	1.6	0.2
13:14:33	9.19	0.3	-0.02	5	2.2	3.2
13:14:48	18.94	0.3	0.01	5	2.7	2.9
13:15:18	20.04	0.3	-0.04	5	2.5	2.5
13:15:48	20.08	0.3	-0.07	5	2.3	2.3

13:16:18	20.09	0.3	0.01	5	2.2	2.1
13:16:49	20.10	0.3	-0.07	5	2.2	2.0
13:17:19	20.10	0.3	-0.05	5	2.1	1.9
13:17:49	20.12	0.3	-0.03	5	2.1	1.9
13:18:19	20.12	0.3	-0.03	5	2.2	1.8
13:18:49	20.12	0.3	-0.04	5	2.2	1.8
13:19:19	20.14	0.3	-0.05	5	2.2	1.7
13:19:49	20.14	0.3	-0.07	5	2.2	1.7
13:20:19	20.15	0.3	-0.02	5	2.2	1.6
13:20:49	20.14	0.4	0.01	4	2.2	1.5
13:21:19	20.16	0.3	-0.06	5	2.2	1.6
13:21:49	20.18	0.3	-0.07	4	2.1	1.5
13:22:19	20.18	0.3	-0.04	4	2.1	1.5
13:22:28	SWITCH TO POST DEMISTER					
13:22:49	20.19	0.3	-0.07	4	2.2	26.7H
13:23:19	20.20	0.3	-0.04	4	2.4	6.3
13:23:49	20.21	0.8	-0.00	4	2.4	3.2
13:24:20	20.21	0.8	-0.00	4	2.5	2.4
13:24:50	20.22	0.3	-0.04	4	2.7	2.2
13:25:20	20.23	0.4	0.01	4	2.9	2.0
13:25:50	20.24	0.8	0.00	4	2.8	2.0
13:26:20	20.25	0.8	-0.00	4	2.8	1.9
13:26:50	20.26	0.8	-0.01	4	2.7	1.9
13:27:20	20.27	0.3	-0.05	4	2.5	1.9
13:27:50	20.28	0.8	0.01	4	2.6	1.8
13:28:20	20.28	0.8	-0.05	4	2.8	1.8
13:28:35	SWITCH TO BASELINE POST QUENCH					
13:28:50	20.29	0.8	-0.02	4	3.1	1.8
13:29:21	20.29	0.8	-0.05	4	4.5	1.9
13:29:51	20.30	0.8	-0.05	4	4.1	1.8
13:30:21	20.31	0.8	0.01	4	3.5	1.8
13:30:51	20.31	0.8	-0.01	4	3.1	1.7
13:31:21	20.32	0.8	-0.02	4	3.1	1.6
13:31:51	20.32	0.8	-0.06	4	3.0	1.6
13:32:21	20.33	0.8	0.01	4	2.9	1.5
13:32:51	20.33	0.8	-0.06	4	2.7	1.4
13:33:21	20.33	0.8	-0.05	4	2.6	1.4
13:33:51	20.34	0.8	-0.02	4	2.5	1.4
13:34:21	20.33	0.8	-0.07	4	2.3	1.3

13:34:31 BASELINE AT [illegible]

13:34:52	20.35	0.8	0.01	4	2.3	1.6
13:35:22	20.35	0.4	0.00	4	3.8	11.9H
13:35:52	20.35	0.8	0.00	4	3.1	3.1
13:36:22	20.35	0.8	-0.07	4	2.3	2.5
13:36:52	20.35	0.8	-0.03	4	2.1	2.4
13:37:22	20.36	0.8	-0.01	4	2.0	2.5
13:37:52	20.36	0.8	-0.04	4	2.0	2.5
13:38:22	20.36	0.8	-0.01	4	2.1	2.4
13:38:52	20.37	0.8	0.01	4	2.1	2.1
13:39:22	20.37	0.8	-0.01	4	2.2	1.8
13:39:53	20.37	0.8	-0.07	4	2.1	1.7
13:40:23	20.37	0.8	-0.02	4	2.1	1.8
13:40:53	20.38	0.8	-0.00	4	2.1	1.6
13:41:23	20.38	0.8	-0.04	4	2.1	1.5
13:41:53	20.39	0.8	-0.02	4	2.1	1.5
13:42:23	20.39	0.8	-0.01	4	2.1	1.4
13:42:53	20.39	0.3	0.01	4	2.1	1.4
13:43:23	20.40	0.8	0.00	4	2.1	1.4
13:43:53	20.40	0.8	-0.02	4	2.1	1.4
13:44:23	20.40	0.3	-0.00	4	2.2	1.4
13:44:54	20.40	0.8	-0.07	4	2.3	1.4
13:45:24	20.38	0.8	-0.03	4	2.3	1.4
13:45:54	20.38	0.8	-0.01	4	2.4	1.3
13:46:24	20.38	0.8	-0.07	4	2.4	1.2
13:46:54	20.37	0.8	-0.01	4	2.4	1.2
13:47:24	20.37	0.8	-0.01	4	2.5	1.1
13:47:54	20.36	0.8	-0.04	4	2.5	1.1
13:48:24	20.37	0.8	-0.03	4	2.5	1.1
13:48:54	20.37	0.8	-0.01	4	2.6	1.0
13:49:25	20.36	0.8	-0.04	4	2.6	1.0
13:49:55	20.36	0.8	-0.05	4	2.6	1.0
13:50:25	20.36	0.8	-0.04	4	2.6	0.9
13:50:55	20.36	0.8	-0.03	4	2.6	0.9
13:51:25	20.37	0.8	-0.02	4	2.6	0.9
13:51:55	20.36	0.8	-0.05	4	2.6	0.8
13:52:25	20.36	0.8	-0.03	4	2.6	0.8
13:52:55	20.37	0.8	-0.00	4	2.6	0.8
13:53:25	20.37	0.8	-0.01	4	2.6	0.8
13:53:55	20.37	0.8	-0.07	4	2.6	0.7
13:54:25	20.38	0.8	-0.05	4	2.6	0.8
13:54:56	20.37	0.8	-0.04	4	2.6	0.7
13:55:26	20.37	0.8	-0.03	4	2.6	0.7
13:55:56	20.37	0.8	-0.03	4	2.5	0.7
13:56:26	20.37	0.8	-0.04	4	2.6	0.6
13:56:56	20.37	0.8	-0.07	4	2.6	0.6
13:57:26	20.38	0.8	0.00	4	2.6	0.6
13:57:56	20.38	0.8	-0.04	4	2.6	0.6
13:58:26	20.38	0.8	-0.07	4	2.6	0.6
13:58:56	20.38	0.8	-0.02	4	2.5	0.6
13:59:27	20.37	0.8	0.00	4	2.6	0.6
13:59:57	20.38	0.8	-0.07	4	2.6	0.6
14:00:27	20.38	0.8	-0.06	5	2.6	0.6
14:00:57	20.38	0.8	0.00	5	2.6	0.6
14:01:27	20.38	0.8	0.00	4	2.6	0.5

14:01:32 END BASELINE

14:02:27	20.38	0.8	-0.07	5	2.6	0.5
14:02:57	20.38	0.8	0.00	5	2.5	0.5
14:03:27	20.39	0.8	0.01	5	2.5	0.5
14:03:57	20.38	0.8	0.00	5	2.5	0.5
14:04:27	20.38	0.8	-0.01	4	2.5	0.6
14:04:58	20.39	0.3	-0.01	4	2.5	0.6
14:05:28	20.40	0.3	-0.05	4	2.4	0.6
14:05:58	20.40	0.3	-0.06	5	2.5	0.6
14:06:28	20.41	0.3	-0.07	5	2.5	0.6
14:06:58	20.41	0.3	-0.06	5	2.5	0.6
14:07:28	20.41	0.8	-0.07	5	2.5	0.6
14:07:58	20.41	0.3	-0.02	5	2.5	0.6
14:08:28	20.41	0.8	-0.03	5	2.5	0.6
14:08:58	20.41	0.3	-0.01	5	2.5	0.6
14:09:28	20.41	0.8	0.00	5	2.5	0.6
14:09:59	20.42	0.8	-0.04	6	2.6	0.6
14:10:29	20.42	0.8	-0.07	5	2.5	0.6
14:10:59	20.41	0.3	-0.03	5	2.6	0.6
14:11:29	20.41	0.8	-0.07	5	2.6	0.5
14:11:59	20.42	0.3	-0.07	5	2.6	0.6
14:12:29	20.41	0.8	-0.06	5	2.6	0.5
14:12:59	20.42	0.8	-0.03	5	2.6	0.5
14:13:29	20.42	0.8	-0.04	33	2.6	0.9
14:13:59	20.37	4.2	-0.04	140	2.8	1.9
14:14:29	20.30	17.7	-0.06	277	3.2	2.7
14:14:59	20.24	35.7	-0.06	381	4.3	3.1
14:15:30	20.23	44.7	-0.02	355	4.9	2.9
14:16:00	20.25	43.1	-0.06	355	4.9	3.2
14:16:30	20.23	43.1	-0.04	368	5.1	3.1
14:17:00	20.25	43.1	0.01	314	5.0	3.6
14:17:30	20.25	41.1	0.01	309	4.7	3.5
14:18:00	20.27	40.2	-0.04	302	4.5	4.3
14:18:30	20.26	41.1	-0.06	317	4.6	4.3
14:19:00	20.25	44.7	-0.03	351	4.9	4.2
14:19:30	20.26	45.2	-0.06	335	5.0	4.2

14:19:35 BEGIN FEED TO MELTER MEASURE AT HEPA FILTER EXHAUST

14:20:01	20.27	42.7	-0.05	329	4.9	4.6

14:20:04 BEGIN MOISTURE RUN

14:20:31	20.25	43.6	-0.02	345	5.0	4.5
14:21:01	20.26	45.2	0.01	338	5.1	4.4
14:21:31	20.28	43.6	0.00	331	5.0	4.2
14:22:01	20.27	41.6	0.00	344	5.1	4.2
14:22:31	20.28	41.1	-0.06	342	5.2	4.5
14:23:01	20.28	41.1	-0.02	359	5.3	4.7
14:23:31	20.27	41.6	0.00	357	5.5	4.6
14:24:01	20.28	40.7	0.01	401	5.6	4.9
14:24:31	20.29	42.2	-0.06	367	5.9	4.6
14:25:02	20.29	38.2	-0.03	349	5.6	4.2
14:25:32	20.31	35.2	0.01	351	5.4	4.3
14:26:02	20.31	33.7	-0.03	356	5.5	4.3
14:26:32	20.30	33.7	-0.05	370	5.6	4.0
14:27:02	20.31	33.7	-0.03	359	5.7	4.5
14:27:32	20.31	33.2	-0.06	320	5.5	3.4
14:28:02	20.31	29.7	-0.04	344	5.2	4.1
14:28:32	20.30	30.7	-0.00	352	5.4	4.2
14:29:02	20.31	32.2	0.01	348	5.4	4.1

14:30:03	20.32	27.7	-0.01	300	5.1	3.1
14:30:33	20.34	25.2	-0.06	281	4.8	3.4
14:31:03	20.33	24.2	-0.04	291	4.7	3.4
14:31:33	20.33	24.2	-0.02	320	4.9	3.8
14:32:03	20.33	26.2	-0.05	314	5.0	4.1
14:32:33	20.32	27.2	0.01	332	4.9	4.9
14:33:03	20.31	29.7	-0.04	283	5.2	2.8
14:33:33	20.35	23.2	-0.05	280	4.5	4.0
14:34:03	20.33	24.2	0.01	292	4.6	3.2
14:34:33	20.34	23.7	-0.07	280	4.6	3.5
14:35:04	20.34	23.2	-0.06	307	4.6	3.5
14:35:34	20.34	22.2	-0.00	269	4.7	3.6
14:36:04	20.33	22.7	-0.01	311	4.6	4.4
14:36:34	20.32	27.7	-0.06	315	4.9	4.2
14:37:04	20.33	26.7	-0.05	287	4.7	3.6
14:37:34	20.35	23.2	0.01	278	4.5	3.7
14:38:04	20.34	22.2	-0.04	291	4.5	4.2
14:38:34	20.33	25.7	0.00	297	4.7	3.3
14:39:04	20.34	25.2	0.01	302	4.6	3.5
14:39:34	20.34	23.6	-0.01	262	4.5	3.1
14:40:04	20.35	22.2	-0.04	261	4.2	4.1
14:40:35	20.33	24.7	-0.01	275	4.2	3.7
14:41:05	20.34	25.2	-0.06	254	4.2	3.1
14:41:35	20.35	22.2	-0.00	246	4.1	3.2
14:42:05	20.34	22.2	-0.06	287	4.1	4.4
14:42:35	20.32	27.2	-0.04	335	4.6	3.9
14:43:05	20.32	29.2	-0.02	352	4.8	11.4H
14:43:35	20.13	61.8	-0.02	806	9.5	9.7
14:44:05	20.17	79.7	0.01	632	12.4	6.1
14:44:35	20.24	52.8	-0.05	574	10.2	6.3
14:45:05	20.27	43.6	-0.06	534	9.0	6.0
14:45:36	20.28	39.6	-0.01	492	8.3	6.0
14:46:06	20.29	37.6	-0.01	449	7.3	5.9
14:46:36	20.30	36.6	-0.04	464	6.9	6.1
14:47:06	20.29	37.6	-0.06	450	7.0	6.5
14:47:36	20.29	38.6	-0.02	438	6.7	6.1
14:48:06	20.30	36.6	0.01	402	6.4	5.2
14:48:36	20.30	33.2	0.01	389	5.8	6.1
14:49:06	20.30	34.7	-0.01	395	5.8	6.4
14:49:36	20.30	37.1	-0.06	395	5.8	5.6
14:50:07	20.31	35.2	-0.03	357	5.8	3.9
14:50:37	20.35	26.7	-0.01	312	5.2	3.6
14:51:07	20.35	22.2	-0.06	323	4.9	4.6
14:51:37	20.35	23.2	0.01	301	4.8	4.0
14:52:07	20.35	21.2	-0.05	260	4.5	2.4
14:52:37	20.37	14.7	-0.06	233	4.2	2.1
14:53:07	20.38	11.7	-0.00	250	3.9	3.9
14:53:37	20.34	16.3	-0.01	304	4.3	4.6
14:54:07	20.35	21.6	-0.02	275	4.5	3.4
14:54:37	20.36	19.2	-0.05	328	4.4	4.8
14:55:07	20.33	22.7	0.01	354	5.0	4.6
14:55:38	20.33	26.2	-0.05	323	5.1	3.4
14:56:08	20.34	22.7	-0.03	287	4.7	2.8
14:56:38	20.34	18.3	-0.05	266	4.4	2.6
14:57:08	20.36	16.3	0.01	267	4.3	2.6
14:57:38	20.35	15.7	-0.03	278	4.3	2.5
14:58:08	20.35	16.3	-0.04	286	4.4	2.5
14:58:38	20.35	16.3	0.01	287	4.5	2.8
14:59:08	20.35	17.2	0.01	287	4.5	2.9

15:00:08	20.32	24.7	-0.04	370	4.8	5.9
15:00:38	20.29	33.7	0.01	384	5.4	5.1
15:01:09	20.29	35.2	0.01	375	5.5	5.3
15:01:39	20.28	34.7	-0.06	399	5.6	5.7
15:02:09	20.29	34.7	-0.04	358	5.8	3.5
15:02:39	20.32	28.2	-0.02	324	5.3	3.0
15:03:09	20.33	21.2	-0.01	308	5.0	2.9
15:03:39	20.33	19.7	0.00	318	4.8	4.1
15:04:09	20.31	23.7	0.01	334	5.0	4.0
15:04:39	20.31	25.7	-0.04	320	5.0	3.3
15:05:09	20.33	22.7	0.01	293	4.8	3.1
15:05:40	20.32	20.7	0.01	281	4.6	3.1
15:06:10	20.34	19.7	-0.04	276	4.4	2.9
15:06:40	20.34	18.3	-0.06	268	4.4	2.9
15:07:10	20.34	17.3	-0.03	253	4.3	2.9
15:07:40	20.34	16.8	-0.04	248	4.1	3.0
15:08:10	20.34	17.7	-0.02	254	4.1	3.4
15:08:40	20.33	19.7	-0.01	259	4.2	3.8
15:09:10	20.33	21.7	-0.00	267	4.2	3.8
15:09:40	20.32	22.7	-0.06	284	4.3	4.5
15:10:10	20.32	25.2	-0.06	308	4.3	4.0
15:10:41	20.32	25.2	-0.06	286	4.2	3.5
15:11:11	20.33	22.3	-0.02	270	4.0	3.4
15:11:41	20.33	21.2	0.01	269	3.8	3.4
15:12:11	20.34	20.7	0.01	260	3.4	3.7
15:12:41	20.33	21.7	-0.05	270	3.5	4.6
15:13:11	20.31	23.7	-0.03	286	3.7	5.0
15:13:41	20.32	25.7	-0.04	272	3.9	5.0
15:14:11	20.32	25.2	-0.03	258	3.8	4.6
15:14:41	20.34	22.7	-0.00	246	3.7	4.1
15:15:11	20.35	19.8	-0.06	239	3.6	3.9
15:15:42	20.34	17.8	-0.06	234	3.5	4.0
15:16:12	20.34	17.3	-0.03	243	3.6	4.4
15:16:42	20.34	19.3	-0.01	251	3.6	4.8
15:17:12	20.33	21.2	0.01	264	3.7	5.1
15:17:42	20.33	22.2	-0.04	277	3.8	4.9
15:18:12	20.33	22.2	-0.01	282	4.0	4.9
15:18:42	20.33	22.2	0.00	282	4.0	4.6
15:19:12	20.34	21.2	-0.01	282	4.0	4.5
15:19:42	20.34	20.2	-0.04	287	4.0	4.6
15:20:12	20.35	20.2	-0.06	291	4.0	4.5
15:20:43	20.35	20.2	-0.01	301	4.0	4.7
15:21:13	20.34	20.7	-0.06	301	4.1	4.6
15:21:43	20.35	20.2	-0.06	301	4.1	4.3
15:22:13	20.34	17.7	-0.02	299	4.1	4.1
15:22:43	20.34	16.8	-0.01	425	4.1	14.1H
15:23:13	20.20	50.2	-0.04	688	8.1	11.9H
15:23:43	20.21	62.3	-0.03	610	9.7	9.1
15:24:13	20.26	49.7	-0.02	531	8.3	9.1
15:24:43	20.27	42.7	0.00	500	7.3	8.9
15:25:13	20.28	40.2	0.01	487	6.7	9.2
15:25:43	20.28	39.6	-0.05	486	6.4	9.5
15:26:14	20.29	39.2	-0.01	476	6.3	9.0
15:26:44	20.30	38.2	0.02	459	6.2	9.5
15:27:14	20.29	40.2	0.01	474	6.2	9.5
15:27:44	20.30	40.7	-0.00	459	6.2	8.8
15:28:14	20.30	39.2	-0.01	466	6.0	8.8
15:28:44	20.30	39.2	-0.04	480	6.1	8.6
15:29:14	20.31	37.6	-0.03	487	6.1	9.5

15:30:14	20.31	36.7	0.01	487	6.2	9.0
15:30:45	20.31	35.2	0.02	507	6.4	9.0
15:31:15	20.32	35.2	-0.05	549	6.8	10.1H
15:31:45	20.30	39.2	-0.04	536	7.3	9.8
15:32:15	20.31	39.6	-0.02	497	7.0	10.3H
15:32:45	20.31	39.6	-0.00	496	6.5	11.3H
15:33:15	20.32	42.2	0.00	461	6.3	11.2H
15:33:45	20.31	41.6	-0.06	430	5.7	11.0
15:34:15	20.32	41.6	-0.04	391	5.2	10.7
15:34:45	20.32	37.2	0.02	66	4.5	6.7
15:35:12 CHECK ZERO DIRECT TO O2 CO SO2 NOX						
15:35:15	0.48	10.7	-0.06	15	1.5	5.6
15:35:46	-0.02	0.8	-0.04	12	0.7	5.6
15:36:16	-0.05	0.3	0.00	10	0.3	5.5
15:36:46	-0.07	0.3	-0.07	8	-0.2	5.3
15:37:16	-0.07	0.3	-0.03	8	-0.2	5.2
15:37:46	-0.09	0.3	0.01	7	-0.3	5.1
15:38:16	-0.09	[illegible]	0.01	[illegible]	[illegible]	4.9
15:38:29 11.54 O2 251 CO						
15:38:46	10.27	114.7	0.25	7	-0.8	4.8
15:39:16	11.29	230.8	0.28	7	-1.2L	4.7
15:39:46	11.30	255.0	0.26	7	-1.3L	4.7
15:40:16	11.30	256.0	0.20	6	-1.2L	4.6
15:40:47	11.30	255.5	0.20	6	-1.1L	4.4
15:41:17	[illegible]	255.5	0.20	6	-1.0	4.3
15:41:41 447 PPM NOX DIRECT						
15:41:47	10.39	247.0	0.15	251	-0.0	4.2
15:42:17	0.13	91.7	0.01	454	4.8	4.1
15:42:47	-0.07	12.3	0.00	459	1.4	4.1
15:43:17	-0.09	0.8	-0.00	460	1.0	3.9
15:43:47	-0.10	0.8	-0.05	[illegible]	1.0	3.9
15:44:17	7.10	3.3	-0.04	142	4.1	4.1
15:44:39 BACK TO OUTLET OF HEPA FILTER						
15:44:47	20.44	9.2	-0.02	244	3.6	4.4
15:45:17	20.52	5.7	-0.01	268	3.2	4.6
15:45:47	20.51	4.7	0.00	287	3.4	4.7
15:46:18	20.49	4.7	-0.01	287	3.5	4.9
15:46:48	20.49	4.3	-0.02	311	3.6	5.0
15:47:18	20.49	4.3	-0.05	353	3.5	4.9
15:47:48	20.48	4.7	-0.05	386	3.6	4.9
15:48:18	20.48	4.7	-0.04	382	3.5	4.8
15:48:48	20.48	5.2	-0.06	348	3.4	4.6
15:49:18	20.45	5.7	-0.07	316	3.0	5.9
15:49:48	20.41	11.7	-0.01	344	2.8	7.1
15:50:18	20.40	19.3	-0.04	351	3.1	6.1
15:50:48	20.40	18.3	-0.06	344	3.2	5.5
15:51:19	20.40	15.7	-0.02	338	3.2	5.3
15:51:49	20.40	14.8	-0.00	346	3.2	6.1
15:52:19	20.39	18.3	-0.02	359	3.3	6.3
15:52:49	20.37	21.7	0.01	398	3.5	7.6
15:53:19	20.36	26.7	0.01	412	3.8	7.9
15:53:49	20.35	29.7	0.01	412	4.0	6.9
15:54:19	20.36	27.7	0.01	389	3.9	6.0
15:54:49	20.38	21.7	0.01	367	3.7	4.5
15:55:19	20.40	16.3	-0.08	374	3.6	6.1
15:55:49	20.36	20.7	-0.04	395	3.6	6.8
15:56:20	20.35	28.3	-0.08	398	3.7	7.4

15:57:20	20.34	32.7	-0.01	421	4.2	6.5
15:57:50	20.38	30.3	-0.06	362	3.8	5.3
15:58:20	20.40	21.2	-0.04	337	3.4	5.1
15:58:50	20.41	17.3	-0.01	322	3.1	4.5
15:59:20	20.41	15.7	-0.00	317	3.0	4.5
15:59:50	20.42	15.2	0.01	333	3.0	4.9
16:00:20	20.41	17.3	-0.01	356	3.1	4.8
16:00:50	20.41	18.3	0.01	386	3.3	4.8
16:01:20	20.41	17.7	-0.01	408	3.5	4.8
16:01:51	20.42	18.3	-0.06	398	3.6	4.4
16:02:21	20.42	16.8	0.01	384	3.5	3.6
16:02:51	20.43	13.7	-0.03	377	3.4	3.7
16:03:21	20.44	12.3	0.01	350	3.2	3.9
16:03:51	20.45	11.2	-0.01	311	3.0	3.2
16:04:21	20.47	8.3	-0.03	292	2.8	3.6
16:04:51	20.46	7.2	-0.06	302	2.7	4.6
16:05:21	20.45	11.2	-0.07	315	2.7	5.6
16:05:51	20.43	16.8	0.01	321	2.7	5.9
16:06:22	20.43	20.7	0.00	339	2.7	5.9
16:06:52	20.42	21.7	0.01	318	2.7	4.6
16:07:22	20.44	17.7	-0.00	319	2.7	3.7
16:07:52	20.45	11.7	-0.03	326	2.7	3.3
16:08:22	20.45	8.3	-0.05	325	2.7	3.2
16:08:52	20.45	6.7	-0.07	348	2.8	3.2
16:09:22	20.45	7.2	-0.05	354	2.8	3.0
16:09:52	20.44	6.7	-0.01	369	2.8	3.0
16:10:22	20.44	6.3	-0.02	377	2.9	3.1
16:10:52	20.44	6.3	-0.06	369	3.0	3.2
16:11:23	20.44	5.7	-0.06	370	3.0	3.2
16:11:53	20.45	5.2	-0.03	384	3.1	3.1
16:12:23	20.45	5.2	0.01	400	3.2	3.0
16:12:53	20.45	4.7	-0.05	401	3.3	3.0
16:13:23	20.46	5.2	0.00	402	3.2	3.0
16:13:53	20.45	6.3	-0.00	414	3.2	3.1
16:14:23	20.45	6.7	-0.05	418	3.3	3.2
16:14:53	20.44	7.7	-0.05	432	3.4	3.3
16:15:23	20.44	8.7	-0.02	436	3.4	3.3
16:15:53	20.44	8.3	-0.01	436	3.5	3.4
16:16:24	20.44	8.3	-0.06	428	3.4	3.3
16:16:54	20.43	8.3	-0.03	438	3.4	3.3
16:17:24	20.43	7.7	-0.03	446	3.5	3.3
16:17:54	20.44	7.7	-0.01	460	3.6	3.6
16:18:24	20.43	8.3	-0.06	464	3.6	3.5
16:18:54	20.43	8.3	0.00	474	3.7	3.5
16:19:24	20.43	8.7	-0.02	475	3.8	3.4
16:19:54	20.44	7.7	0.00	464	3.8	3.3
16:20:24	20.43	7.7	-0.05	472	3.7	3.4
16:20:54	20.42	9.7	0.00	459	3.4	3.7
16:21:25	20.41	13.2	-0.04	461	3.1	4.1
16:21:55	20.39	16.3	0.00	472	3.1	4.5
16:22:25	20.38	19.3	-0.04	477	3.2	5.1
16:22:55	20.38	21.7	-0.04	477	3.3	5.0
16:23:25	20.37	22.7	-0.06	477	3.4	5.1
16:23:55	20.36	23.7	-0.06	470	3.3	5.2
16:24:25	20.36	25.7	-0.06	472	3.3	5.3
16:24:55	20.36	25.7	-0.05	481	3.3	5.2
16:25:25	20.37	24.7	-0.05	467	3.2	5.2
16:25:55	20.37	23.7	0.01	477	3.0	5.2
16:26:26	20.38	23.7	0.00	478	3.0	5.3

16:26:56	20.38	23.7	-0.06	470	2.9	5.4
16:27:26	20.38	24.2	-0.06	467	2.9	5.4
16:27:56	20.38	24.2	-0.02	463	2.9	5.4
16:28:26	20.38	23.2	0.01	452	2.9	6.2
16:28:56	20.38	25.7	-0.01	444	2.9	6.3
16:29:26	20.39	25.7	-0.02	456	2.9	6.2
16:29:56	20.38	26.2	0.01	450	2.9	5.4
16:30:26	20.39	25.2	-0.02	454	3.0	5.5
16:30:56	20.39	23.7	-0.06	450	3.0	5.3
16:31:27	20.39	24.3	-0.02	443	3.0	4.7
16:31:57	20.40	23.2	0.00	440	3.0	5.2
16:32:27	20.39	22.2	-0.04	453	3.0	4.7
16:32:57	20.41	20.2	-0.02	449	3.0	4.9
16:33:27	20.40	19.8	-0.04	442	3.0	4.8
16:33:57	20.40	20.2	-0.06	442	3.0	4.4
16:34:27	20.41	17.8	0.00	475	3.0	4.9
16:34:57	20.40	19.3	-0.01	474	3.2	4.5
16:35:27	20.40	19.8	0.01	487	3.2	4.9
16:35:57	20.40	19.8	-0.00	525	3.4	5.0
16:36:27	20.40	21.2	-0.05	512	3.6	5.2
16:36:58	20.39	22.7	-0.05	482	3.5	4.6
16:37:28	20.40	20.7	0.01	477	3.4	4.7
16:37:58	20.40	19.8	-0.00	481	3.3	5.1
16:38:28	20.40	21.7	-0.02	494	3.3	4.4
16:38:58	20.42	18.8	-0.06	501	3.4	4.9
16:39:28	20.42	18.3	-0.06	528	3.5	4.7
16:39:58	20.42	19.3	-0.04	542	3.7	5.1
16:40:28	20.41	20.7	-0.00	548	3.8	4.6
16:40:58	20.43	18.8	-0.06	551	3.9	4.6
16:41:28	20.43	17.3	-0.04	551	3.9	4.3
16:41:59	20.43	16.8	-0.04	571	3.9	4.0
16:42:29	20.45	15.3	-0.04	567	4.0	3.9
16:42:59	20.45	13.3	-0.03	553	3.9	3.5
16:43:29	20.45	11.2	0.00	547	3.8	3.6
16:43:59	20.45	10.8	0.00	532	3.7	3.4
16:44:29	20.46	10.3	-0.04	519	3.5	3.3
16:44:59	20.47	8.8	-0.05	517	3.5	3.3
16:45:29	20.47	8.8	0.01	512	3.4	3.3
16:45:59	20.47	8.3	0.01	523	3.4	3.3
16:46:29	20.47	8.8	-0.06	531	3.4	3.6
16:47:00	20.46	10.8	0.01	531	3.5	3.6
16:47:30	20.45	12.3	-0.06	540	3.5	4.2
16:48:00	20.44	15.8	-0.03	553	3.6	4.2
16:48:30	20.45	16.8	0.01	547	3.6	4.5
16:49:00	20.43	18.3	0.00	560	3.7	4.5
16:49:30	20.44	19.3	-0.00	557	3.8	3.9
16:50:00	20.45	16.8	-0.04	533	3.7	4.1
16:50:30	20.44	16.8	-0.06	533	3.6	4.6
16:51:00	20.44	20.7	-0.06	523	3.5	4.8
16:51:30	20.43	22.7	0.01	525	3.4	4.3
16:52:01	20.45	20.3	-0.02	529	3.5	4.4
16:52:31	20.46	18.3	-0.06	539	3.5	4.5
16:53:01	20.46	18.3	-0.05	550	3.6	4.5
16:53:31	20.46	18.3	-0.01	552	3.6	3.8
16:54:01	20.48	14.3	-0.05	570	3.8	3.9
16:54:31	20.48	12.8	0.01	570	3.8	3.6
16:55:01	20.49	11.3	-0.06	571	3.8	3.6
16:55:31	20.50	9.2	-0.02	565	3.8	3.9
16:56:01	20.49	10.8	0.01	564	3.7	4.0
16:56:31	20.49	13.3	-0.01	572	3.7	4.0

16:57:02	20.49	13.8	-0.01	566	3.7	3.8
16:57:32	20.49	13.3	0.01	565	3.7	3.6
16:58:02	20.50	11.7	-0.01	566	3.6	3.5
16:58:32	20.51	9.7	-0.06	570	3.7	3.4
16:59:02	20.52	8.8	-0.03	582	3.7	3.5
16:59:32	20.51	9.7	-0.06	588	3.7	3.9
17:00:02	20.49	13.8	-0.06	603	3.8	4.3
17:00:32	20.49	17.3	-0.06	599	3.9	4.0
17:01:02	20.50	15.7	-0.05	597	3.8	3.9
17:01:32	20.50	14.3	-0.05	585	3.8	3.7
17:02:02	20.50	12.3	-0.00	568	3.7	3.7
17:02:33	20.49	12.3	0.01	576	3.6	3.8
17:03:03	20.49	12.8	0.01	593	3.7	3.6
17:03:33	20.50	12.3	-0.00	599	3.8	3.6
17:04:03	20.51	11.3	0.01	597	3.8	3.8
17:04:33	20.50	11.7	-0.01	609	3.8	3.7
17:05:03	20.51	10.8	-0.06	621	4.0	3.7
17:05:33	20.52	9.2	-0.06	631	4.1	4.1
17:06:03	20.53	9.3	-0.06	644	4.2	4.2
17:06:33	20.53	9.3	-0.01	655	4.3	4.3
17:07:03	20.53	9.3	-0.01	678	4.4	4.2
17:07:34	20.52	10.3	-0.05	648	4.4	4.6
17:08:04	20.51	11.7	-0.02	621	4.1	4.8
17:08:34	20.51	13.3	-0.05	614	3.9	5.2
17:09:04	20.49	15.8	-0.06	619	3.8	4.7
17:09:34	20.49	16.3	-0.02	635	3.9	4.7
17:10:04	20.48	16.3	0.01	624	3.9	4.4
17:10:34	20.49	15.8	-0.05	605	3.9	4.4
17:11:04	20.54	12.8	0.01	572	3.4	6.3
17:11:34	20.48	20.7	-0.04	602	3.5	5.7
17:12:04	20.48	25.2	-0.04	580	3.5	5.3
17:12:35	20.51	20.3	-0.03	525	3.3	4.4
17:13:05	20.49	16.3	-0.06	588	3.3	5.3
17:13:35	20.48	19.8	0.01	569	3.4	4.6
17:14:05	20.50	18.8	-0.03	557	3.3	4.6
17:14:35	20.51	16.8	-0.05	557	3.3	4.8
17:15:05	20.50	16.8	-0.01	561	3.2	5.3
17:15:35	20.49	20.3	-0.01	558	3.2	4.6
17:16:05	20.52	17.3	-0.04	564	3.2	4.2
17:16:35	20.53	12.3	-0.06	567	3.2	3.5
17:17:05	20.57	7.7	-0.03	578	3.2	3.4
17:17:36	20.57	5.2	0.01	576	3.2	4.0
17:18:06	20.55	8.3	-0.01	582	3.2	4.2
17:18:36	20.57	12.3	-0.03	534	3.0	4.1
17:19:06	20.56	12.8	-0.03	548	2.9	4.1
17:19:36	20.56	14.3	-0.02	544	2.9	3.6
17:20:06	20.57	13.3	-0.01	535	2.9	3.2
17:20:36	20.57	10.8	0.00	531	2.9	4.4

17:20:53 ON LINE RUN #1 CATHOLIC UNIVERSITY 100(KG) MELTER

17:21:06	20.50	14.8	-0.01	604	3.2	7.0
17:21:36	20.45	29.3	0.01	596	3.5	6.5
17:22:07	20.50	32.8	-0.02	545	3.3	4.1

17:22:22 START AT HEPA FILTER EXHAUST RUN #1 9/26/94

17:22:37	20.51	18.8	-0.07	547	3.3	3.7
17:23:07	20.54	11.3	-0.06	534	3.3	3.6
17:23:37	20.56	7.7	-0.02	540	3.2	3.5
17:24:07	20.56	6.8	-0.02	566	3.3	3.6
17:24:37	20.55	7.7	-0.06	562	3.2	5.3
17:25:07	20.48	17.8	-0.06	594	3.0	6.5
17:25:37	20.50	29.3	-0.05	568	2.6	4.1
17:26:07	20.56	16.8	-0.02	574	2.4	3.8
17:26:37	20.58	8.8	-0.05	578	2.0	3.9
17:27:08	20.56	8.8	-0.00	574	2.0	4.4
17:27:38	20.55	12.8	-0.00	578	1.8	4.5
17:28:08	20.55	15.3	-0.04	593	1.7	4.9
17:28:38	20.53	16.8	-0.06	594	1.5	5.1
17:29:08	20.52	19.3	-0.01	614	1.5	5.8
17:29:38	20.51	23.7	-0.02	624	0.9	6.5
17:30:08	20.49	27.7	-0.05	624	1.1	7.4
17:30:38	20.48	30.8	-0.06	618	1.3	7.1
17:31:08	20.49	31.7	-0.02	608	1.4	7.4
17:31:38	20.50	31.3	-0.04	605	1.5	7.4
17:32:09	20.50	31.7	-0.05	590	1.6	6.9
17:32:39	20.52	29.7	-0.04	594	1.6	5.6
17:33:09	20.54	23.7	-0.02	603	1.8	5.2
17:33:39	20.54	19.8	-0.01	603	2.1	5.0
17:34:09	20.54	18.3	0.00	623	2.2	5.2
17:34:39	20.54	19.3	-0.06	635	2.4	5.2
17:35:09	20.53	20.3	-0.05	633	2.5	5.3
17:35:39	20.53	22.7	-0.03	633	2.5	5.9
17:36:09	20.52	25.2	-0.04	633	2.6	5.5
17:36:39	20.53	23.2	-0.04	632	2.7	4.8
17:37:09	20.53	19.8	-0.04	632	2.8	5.1
17:37:40	20.53	20.3	-0.06	622	2.8	5.2
17:38:10	20.44	21.2	-0.06	623	2.8	5.2

17:38:25 SWITCH TO POST DEMISTER RUN #1

17:38:40	20.54	20.7	-0.06	639	2.9	5.2
17:39:10	20.54	20.3	-0.06	634	3.0	5.2
17:39:40	20.56	17.3	0.01	743	2.8	10.8
17:40:10	20.33	38.7	0.00	864	4.5	10.8
17:40:40	20.35	61.3	0.01	789	4.9	11.3
17:41:10	20.36	52.3	0.01	798	4.7	14.4
17:41:40	20.34	58.8	0.01	809	4.7	11.0
17:42:10	20.35	60.8	-0.01	803	4.8	10.5
17:42:41	20.33	57.8	0.01	800	4.7	11.0
17:43:11	20.35	57.8	-0.04	811	4.8	12.8
17:43:41	20.34	57.3	-0.06	805	4.7	10.1
17:44:11	20.34	55.8	-0.03	812	4.5	10.2
17:44:41	20.35	55.3	-0.01	820	4.2	9.2
17:45:11	20.39	44.2	-0.06	820	4.0	7.7
17:45:41	20.41	38.2	-0.06	840	3.8	8.2
17:46:11	20.41	35.3	-0.04	847	3.6	8.6
17:46:41	20.41	36.7	0.01	898	3.4	8.4
17:47:11	20.41	38.2	-0.02	911	3.3	7.8
17:47:42	20.42	36.2	0.01	881	3.1	7.8
17:48:12	20.42	35.7	-0.00	897	2.8	11.4

17:48:42	20.40	40.7	-0.02	915	2.8	9.0
17:49:12	20.42	43.2	-0.06	919	2.8	9.0
17:49:42	20.43	38.7	-0.04	945	2.9	10.2
17:50:12	20.42	36.2	0.01	961	3.1	10.2
17:50:42	20.41	37.7	0.01	957	3.2	9.6
17:51:12	20.43	36.2	-0.04	942	3.1	9.5
17:51:42	20.43	34.3	-0.05	950	3.1	9.8
17:52:12	20.43	32.8	-0.00	973	3.1	9.8
17:52:43	20.43	31.3	0.00	970	3.2	9.3
17:53:13	20.43	29.7	-0.03	979	3.2	8.8
17:53:43	20.43	29.3	-0.03	1013	3.2	9.4
17:54:13	20.43	28.8	-0.03	1007	3.4	9.3
17:54:43	20.44	25.7	0.00	1015	3.4	12.5
17:55:13	20.42	31.3	-0.01	1024	3.5	14.6
17:55:43	20.39	41.7	-0.02	1024	3.8	11.9

17:56:05 SWITCH TO POST-QUENCH RUN #1

17:56:13	20.40	41.7	-0.06	1024	3.8	13.2
17:56:43	20.41	40.7	-0.06	1024	3.9	12.3
17:57:14	20.46	36.7	-0.05	815	3.5	11.5
17:57:44	20.40	35.7	-0.06	1045	3.1	19.9
17:58:14	20.35	53.8	-0.02	901	3.7	21.1
17:58:44	20.37	55.8	-0.01	957	4.0	23.0
17:59:14	20.35	61.8	-0.00	1228	4.2	25.2
17:59:44	20.34	74.8	-0.06	1721	4.5	27.3
18:00:14	20.35	79.8	-0.05	2176	4.9	27.3
18:00:44	20.31	84.3	-0.01	2472	5.1	28.7
18:01:14	20.35	83.3	0.00	2560H	5.1	27.3
18:01:44	20.34	77.8	0.01	2560H	5.7	24.7
18:02:14	20.35	70.3	-0.03	2560H	5.6	20.7
18:02:44	20.45	45.7	-0.06	2560H	5.3	19.6
18:03:15	20.39	42.2	-0.06	3136H	5.5	29.8
18:03:45	20.29	76.3	-0.06	3031H	6.4	31.5

18:04:05 CHANGE NOX RANGE TO 2500 THEN10000

18:04:15	20.30	90.3	0.01	2979H	6.6	28.6
18:04:45	20.31	84.8	0.01	3038H	6.7	26.7
18:05:15	20.34	75.8	-0.00	3129	6.7	19.5
18:05:45	20.40	50.7	-0.02	3225	6.3	21.6
18:06:15	20.36	57.3	-0.01	3194	6.4	20.3
18:06:45	20.40	52.3	0.01	3264	6.1	19.1
18:07:15	20.41	42.7	-0.01	3275	6.2	16.8
18:07:46	20.43	38.2	0.01	3333	6.4	18.2
18:08:16	20.43	37.2	0.00	3304	6.5	18.3
18:08:46	20.42	38.7	-0.02	3229	6.6	17.5
18:09:16	20.41	41.2	-0.02	3232	6.5	17.0
18:09:46	20.43	40.7	-0.02	3246	6.5	17.5
18:10:16	20.42	38.7	-0.04	3223	6.6	19.0
18:10:46	20.43	38.7	0.00	3248	6.7	16.9
18:11:16	20.44	34.3	-0.02	3246	6.8	16.4
18:11:46	20.41	36.2	-0.06	3247	6.9	16.3
18:12:16	20.40	39.7	0.01	3260	7.0	18.7
18:12:46	20.39	45.2	0.01	3194	7.1	16.8
18:13:17	20.40	45.7	-0.02	3247	7.1	18.5
18:13:47	20.42	43.7	-0.02	3226	7.3	22.4
18:14:17	20.39	48.7	-0.01	3248	7.3	21.8

18:14:41 ON TO MELTER_EXHAUST RUN #1

18:14:47	20.36	54.3	0.06	3173	7.5	17.0
18:15:17	20.64	32.8	-0.00	3170	6.1	11.2
18:15:47	20.70	4.8	0.02	3304	4.4	7.3
18:16:17	20.70	0.8	-0.04	3271	3.6	5.2
18:16:47	20.71	0.8	-0.00	3088	2.9	4.0
18:17:17	20.71	0.8	-0.03	2660	2.4	3.3
18:17:48	20.72	0.8	-0.05	2305	2.0	2.7
18:18:18	20.46	12.8	0.08	2095	3.3	8.6
18:18:48	20.44	34.3	0.02	1794	4.5	12.1
18:19:18	20.45	37.2	0.06	1752	4.8	14.4
18:19:48	20.46	39.2	0.07	1876	5.1	15.1
18:20:18	20.47	36.7	0.08	2223	5.3	16.5
18:20:48	20.44	40.2	0.03	2610	5.6	18.9
18:21:18	20.46	42.2	0.08	2853	5.2	16.4
18:21:48	20.45	39.7	0.04	3064	5.2	18.3
18:22:18	20.46	38.7	0.02	3168	4.7	17.1
18:22:49	20.47	33.7	0.08	3329	4.3	16.2
18:23:19	20.44	31.2	0.07	3390	4.4	17.7
18:23:49	20.43	34.8	0.09	3398	4.3	19.0
18:24:19	20.41	39.7	0.04	3418	3.9	20.2
18:24:49	20.43	42.2	0.07	3505	4.3	18.6
18:25:19	20.43	30.8	0.03	3681	4.1	17.1
18:25:49	20.42	25.7	0.03	3835	4.5	17.7
18:26:19	20.42	26.7	0.05	3863	4.9	17.7
18:26:49	20.38	27.7	0.08	3917	5.3	16.9
18:27:19	20.38	27.2	0.05	3860	6.0	16.6
18:27:50	20.39	26.7	0.06	3821	6.1	16.8
18:28:20	20.40	26.3	0.02	3793	6.2	16.4
18:28:31 END RUN #1						
18:28:50	20.40	23.7	0.08	3696	6.5	15.3
18:29:20	20.40	21.7	0.06	3641	6.6	14.6
18:29:50	12.90	20.2	-0.02	2282	4.8	13.2
18:30:00 BEGIN BIAS CHECKS ZERO O2 CO SO2 NOX						
18:30:20	11.28	13.7	-0.02	1538	2.4	13.1
18:30:35 ZERO THC ALSO W/AIR						
18:30:50	0.20	2.3	-0.05	230	1.7	16.8
18:31:20	0.09	0.3	-0.06	98	1.6	4.3
18:31:50	0.09	0.3	0.00	42	1.6	2.9
18:32:20	0.07	0.3	-0.01	24	1.6	2.3
18:32:50	0.07	0.3	-0.06	332	1.7	2.0
18:33:21	0.06	0.3	0.01	29	1.7	1.6
18:33:51	0.06	0.3	-0.02	26	1.8	1.3
18:34:21	0.07	0.3	-0.04	23	1.7	1.1
18:34:51	0.06	0.3	-0.03	21	1.2	1.0
18:35:21	[illegible]	0.3	0.01	[illegible]	[illegible]	0.8
18:35:51	0.07	0.3	-0.00	127	0.8	0.7
18:35:51 BIAS O2 CO 11.54 251						
18:36:21	10.86	137.4	2.30H	614	-0.1	0.7
18:36:51	11.47	218.9	2.55H	556	-0.5	0.6
18:37:21	11.48	253.0	2.46H	529	-0.5	0.6
18:37:51	11.49	255.0	9.38H	507	-0.6	21.0
18:37:56 BIAS THC 31.0 PPM						
18:38:22	11.50	255.5	9.75H	493	-0.8	37.8
18:38:52	11.50	256.0	10.48H	476	-0.9	38.2
18:39:22	11.50	255.0	8.11H	465	-1.2L	35.9

18:39:52	11.51	254.6	7.97H	455	-1.1L	35.9
18:40:22	11.50	255.0	10.91H	443	-1.2L	36.0
18:40:52	11.51	255.5	8.79H	448	-1.2L	36.0
18:41:01 BIAS NOX 447 PPM						
18:41:22	9.69	233.3	0.44	962	0.9	36.1
18:41:52	0.27	40.2	-0.04	817	0.6	36.1
18:42:22	0.13	3.3	-0.04	743	0.5	36.2
18:42:52	0.12	0.8	0.01	670	0.5	36.1
18:43:23	0.11	0.8	-0.06	600	0.7	0.6
18:43:53	0.11	0.8	-0.02	562	0.7	0.5
18:44:23	0.10	0.8	-0.00	524	0.8	0.4
18:44:53	0.10	0.8	-0.05	504	0.8	0.4
18:45:23	0.10	0.8	-0.02	498	0.9	0.5
18:45:28 NOW BIAS NOX 447						
18:45:53	0.10	0.8	-0.01	484	1.0	0.6
18:46:23	0.10	0.8	-0.06	481	1.0	0.6
18:46:53	0.10	0.8	0.01	478	1.1	0.5
18:47:23	0.10	0.8	-0.01	581	1.0	0.4
18:47:54	0.06	0.3	-0.00	28	0.3	0.3
18:47:54 ZERO NOX DIRECT RE-CAL						
18:48:24	0.02	0.3	-0.06	16	-0.4	0.3
18:48:54	0.02	0.3	-0.00	14	-0.5	0.2
18:49:09	0.02	0.3	-0.03	10	-0.5	0.2
18:49:24	0.02	0.3	-0.07	7	-0.5	0.2
18:49:39	0.02	0.3	-0.02	6	-0.5	0.2
18:49:54	0.02	0.3	-0.07	2	-0.5	0.2
18:50:09	0.01	0.3	-0.07	2	-0.5	0.2
18:50:24	0.01	0.3	0.01	1	-0.5	0.2
18:50:39	0.01	0.3	-0.03	1	-0.5	0.2
18:50:54	0.01	0.3	-0.07	1	-0.4	0.2
18:51:09	0.14	0.3	-0.03	405	0.7	0.2
18:51:18 SPAN NOX 849 DIRECT						
18:51:24	0.13	0.3	-0.03	753	7.3	0.2
18:51:39	0.05	0.3	-0.00	819	6.7	0.2
18:51:54	0.04	-0.2	-0.01	810	3.8	0.1
18:52:09	0.04	0.3	0.01	849	2.1	0.1
18:52:24	0.04	0.3	-0.07	850	1.5	0.1
18:52:39	0.03	-0.2	-0.01	857	1.2	0.1
18:52:55	0.03	-0.2	-0.03	847	1.1	0.1
18:53:10	0.04	-0.2	-0.06	856	1.1	0.1
18:53:25	0.03	0.3	0.01	859	1.1	0.1
18:53:40	0.04	-0.2	-0.05	856	1.1	0.1
18:53:55	0.03	0.3	-0.01	848	1.1	0.1
18:54:10	0.04	-0.2	-0.04	857	1.1	0.1
18:54:25	0.04	-0.2	-0.03	854	1.1	0.1
18:54:40	0.04	-0.2	-0.05	856	1.1	0.1
18:54:55	0.04	-0.2	-0.05	855	1.1	0.0
18:55:10	0.04	0.3	-0.07	851	1.1	0.0
18:55:25	0.04	-0.2	0.01	843	1.1	0.0
18:55:40	0.04	-0.2	-0.05	846	1.1	0.0
18:55:55	0.04	-0.2	-0.03	855	1.1	0.0
18:56:10	0.04	0.3	-0.02	816	1.2	0.0
18:56:13 MID NOX 449						
18:56:25	0.04	0.3	-0.03	500	1.4	0.0
18:56:40	0.03	0.3	-0.07	457	1.3	0.0
18:56:55	0.03	0.3	-0.07	453	0.9	0.0
18:57:10	0.03	0.8	-0.03	451	0.6	0.0
18:57:25	0.02	0.8	-0.02	453	0.5	0.0
18:57:40	0.02	0.8	0.00	446	0.4	0.1
18:57:56	0.03	0.8	-0.01	449	0.4	0.0

18:58:11	0.03	0.8	-0.06	449	0.5	0.1
18:58:26	0.00	0.8	-0.03	543	0.5	-0.0
18:58:41	0.19	0.8	0.02	785	1.2	23.9
18:58:56	9.17	1.8	-0.03	741	1.8	1.2
18:59:11	11.53	2.3	0.01	983	2.1	0.4
18:59:26	3.69	1.8	0.01	984	2.2	0.2
18:59:41	2.98	1.3	-0.02	985	2.2	0.1
18:59:56	2.99	0.8	-0.02	963	2.2	0.1
19:00:11	3.01	0.8	-0.06	945	2.2	0.1
19:00:26	2.99	0.8	0.01	938	2.2	0.1
19:00:41	3.00	0.8	-0.04	920	2.1	0.0
19:00:56	2.99	0.8	-0.05	909	2.2	-0.0
19:01:11	2.98	0.8	0.00	903	2.2	0.0
19:01:26	2.98	0.8	-0.05	879	2.2	-0.0
19:01:41	2.97	0.8	-0.04	870	2.2	-0.0
19:01:56	2.97	0.8	0.00	864	2.2	-0.0
19:02:11	2.96	0.8	-0.01	852	2.2	-0.0
19:02:26	2.90	0.8	-0.04	839	2.2	-0.0
19:02:41	2.86	0.8	-0.06	823	2.2	-0.1
19:02:57	2.85	0.8	-0.06	814	2.2	-0.0
19:03:12	2.82	0.8	-0.03	808	2.2	-0.1
19:03:27	2.83	0.8	-0.06	797	2.2	-0.1
19:03:42	2.84	0.8	0.00	789	2.2	-0.1
19:03:57	2.84	0.8	-0.02	781	2.2	-0.1
19:04:12	2.84	0.8	-0.06	779	2.2	-0.1
19:04:27	2.84	0.8	-0.02	755	2.2	-0.1
19:04:42	2.83	0.8	-0.06	754	2.2	-0.1
19:04:57	2.83	0.8	-0.06	744	2.2	-0.1
19:05:12	2.83	0.8	-0.06	726	2.3	-0.1
19:05:27	2.82	0.8	-0.05	721	2.3	-0.0
19:05:42	2.82	0.8	-0.00	714	2.3	0.0
19:05:57	2.82	0.8	-0.06	710	2.3	0.2
19:06:12	2.81	0.8	-0.04	699	2.2	0.2
19:06:27	2.80	0.8	0.00	689	2.2	42.4
19:06:42	2.79	0.8	-0.01	676	2.3	42.4
19:06:57	2.74	0.8	-0.05	708	2.3	40.0
19:07:12	0.63	0.8	0.00	596	2.1	37.9
19:07:27	0.18	0.8	-0.02	573	2.0	38.2
19:07:42	0.14	0.8	-0.07	560	1.9	39.2
19:07:57	0.13	0.8	-0.05	549	1.9	39.1
19:08:13	0.13	0.8	0.00	535	1.9	37.3
19:08:28	0.13	0.8	-0.03	535	1.9	38.9
19:08:43	0.13	0.8	-0.06	530	1.9	40.4
19:08:58	0.13	0.8	-0.05	526	2.0	44.5
19:09:13	0.13	0.8	-0.01	522	1.9	48.4
19:09:28	0.12	0.8	-0.00	521	2.0	53.5
19:09:43	0.13	0.8	-0.03	518	2.0	51.4
19:09:58	0.13	0.8	-0.07	516	2.0	47.8
19:10:13	0.12	0.8	-0.01	513	2.0	46.3
19:10:28	0.13	0.8	0.00	512	2.0	44.9
19:10:43	0.13	0.8	-0.06	513	2.0	44.9
19:10:58	0.12	0.8	-0.06	509	2.0	43.9
19:11:13	0.13	0.8	-0.03	509	2.0	42.4
19:11:28	0.13	0.8	-0.05	513	2.0	40.0
19:11:43	0.13	0.8	-0.01	509	2.0	41.5
19:11:58	0.13	0.8	-0.06	509	2.0	43.3
19:12:13	0.12	0.8	-0.00	506	2.0	41.7
19:12:28	0.12	0.8	-0.04	508	2.0	43.0
19:12:43	0.13	0.8	-0.00	507	2.0	43.0
19:12:58	0.12	0.8	-0.03	507	2.0	43.4

19:13:14	0.13	0.8	-0.05	505	2.0	43.4
19:13:29	0.13	0.8	-0.02	505	2.0	44.5
19:13:44	0.13	0.8	-0.01	507	2.0	40.1
19:13:59	0.12	0.8	-0.00	503	2.0	38.6
19:14:14	0.13	0.8	-0.04	501	2.0	40.7
19:14:29	0.14	0.8	-0.07	472	2.1	43.3
19:14:44	0.10	0.8	-0.07	451	1.9	39.8
19:14:59	0.09	0.8	-0.06	444	1.6	39.9
19:15:14	0.09	0.8	-0.02	445	1.4	37.9
19:15:29	0.09	0.8	0.00	445	1.1	37.1
19:15:30 DIRECT NOX 447 PPM						
19:15:44	0.09	0.8	-0.06	442	0.9	38.8
19:15:59	0.05	0.8	-0.06	465	0.8	38.6
19:16:14	0.11	0.8	-0.02	511	0.9	38.8
19:16:29	1.85	0.8	-0.06	245	1.2	40.2
19:16:44	13.99	0.8	-0.01	577	1.6	42.7
19:16:59	2.36	0.8	-0.01	580	1.4	47.5
19:17:14	0.35	0.8	-0.06	551	1.2	48.3
19:17:29	0.15	0.8	-0.03	535	1.0	45.3
19:17:44	0.13	0.8	-0.00	525	1.0	45.0
19:17:59	0.13	0.8	-0.06	516	1.0	46.7
19:18:15	0.13	0.8	-0.02	518	1.0	44.9
19:18:30	0.12	0.8	-0.00	510	1.0	37.4
19:18:45	0.12	0.8	-0.02	508	1.0	42.5
19:19:00	0.13	0.8	-0.05	503	0.9	54.3
19:19:15	0.14	0.8	-0.03	173	1.1	45.4
19:19:30	1.65	1.3	-0.06	242	1.8	40.9
19:19:45	1.70	1.8	-0.06	451	2.0	40.9
19:20:00	0.34	1.3	-0.04	350	1.9	41.3
19:20:15	0.32	1.3	-0.01	359	1.8	53.7
19:20:30	0.27	0.8	-0.01	201	1.6	44.7
19:20:45	0.20	0.8	-0.04	115	1.3	41.5
19:21:00	0.15	0.8	-0.07	137	1.0	40.6
19:21:15	0.13	0.3	-0.01	285	1.0	40.6
19:21:17 NOX BIAS 447						
19:21:30	2.43	0.3	-0.00	442	1.3	39.8
19:21:45	5.98	0.8	-0.06	521	1.7	44.5
19:22:00	2.25	0.8	-0.03	558	1.8	44.3
19:22:15	0.37	0.8	0.00	549	1.7	45.8
19:22:30	0.18	0.8	-0.03	537	1.7	47.9
19:22:45	0.14	0.8	-0.06	536	1.7	50.5
19:23:00	0.14	0.8	-0.02	522	1.7	47.7
19:23:16	0.14	0.8	-0.06	517	1.7	48.0
19:23:31	0.14	0.8	-0.06	515	1.7	44.2
19:23:46	0.13	0.8	-0.01	513	1.7	43.9
19:24:01	0.14	0.8	-0.00	511	1.7	42.3
19:24:16	0.14	0.8	-0.02	506	1.7	43.1
19:24:31	0.13	0.8	-0.03	511	1.8	46.8
19:24:46	0.13	0.8	-0.06	529	1.8	50.0
19:25:01	0.28	0.8	0.00	521	1.8	46.0
19:25:16	0.17	0.8	-0.06	515	1.8	46.2
19:25:31	0.15	0.8	-0.03	506	1.8	53.3
19:25:46	0.14	0.8	-0.00	505	1.8	51.2
19:26:01	0.14	0.8	-0.07	503	1.8	50.3
19:26:16	0.14	0.8	-0.05	503	1.8	47.8
19:26:31	0.14	0.8	-0.06	498	1.8	46.3
19:26:46	0.14	0.8	-0.05	499	1.9	49.2
19:27:01	0.14	0.8	-0.06	502	1.9	40.9
19:27:16	0.13	0.8	-0.05	498	1.9	42.7
19:27:31	0.14	0.8	-0.02	497	1.9	41.3

19:27:46	0.14	0.8	-0.03	498	1.9	42.8
19:28:01	0.14	0.8	-0.06	494	1.9	47.1
19:28:17	0.14	0.8	0.00	495	1.9	44.5
19:28:32	0.13	0.8	-0.03	493	1.9	49.2
19:28:47	0.14	0.8	-0.01	498	1.9	48.8
19:29:02	0.13	0.8	-0.05	495	1.9	49.0
19:29:17	0.13	0.8	-0.04	494	2.0	45.8
19:29:32	0.14	0.8	-0.00	493	2.0	47.5
19:29:47	0.14	0.8	-0.04	492	2.0	46.3
19:30:02	0.14	0.8	-0.02	490	2.0	48.8
19:30:17	0.14	0.8	0.00	495	2.0	48.8
19:30:32	0.14	0.8	-0.01	490	2.0	45.4
19:30:47	0.14	0.8	-0.04	492	2.0	49.8
19:31:02	0.14	0.8	-0.06	489	2.0	48.9
19:31:17	0.15	0.8	-0.01	490	2.0	49.6
19:31:32	0.14	0.8	-0.02	485	2.1	51.4
19:31:47	0.14	0.8	-0.05	[illegible]	2.1	50.7
19:32:02	0.14	0.8	-0.01	481	2.1	44.7
19:32:17	0.15	0.8	-0.06	489	2.1	49.4
19:32:32	0.15	0.8	-0.06	488	2.1	55.3
19:32:47	0.14	0.8	-0.04	489	2.1	47.2
19:33:02	0.14	0.8	-0.02	504	2.1	44.3
19:33:18	0.83	0.8	-0.00	518	2.4	42.7
19:33:33	5.59	0.8	-0.01	132	2.6	40.2
19:33:43 NOX CYL DEAD BIAS W/849 NOX						
19:33:48	18.69	0.8	-0.03	348	2.5	37.8
19:34:03	9.23	0.8	-0.06	865	3.9	33.5
19:34:18	0.98	0.3	-0.01	889	3.7	37.1
19:34:33	0.26	0.3	-0.06	891	3.0	38.6
19:34:48	0.18	0.3	-0.03	889	2.6	42.2
19:35:03	0.18	0.3	-0.00	881	2.5	39.8
19:35:18	0.17	0.3	-0.04	885	2.4	38.5
19:35:33	0.17	0.3	0.00	880	2.4	36.1
19:35:48 849 PPM NOX DIRECT						
19:35:48	0.16	0.3	-0.03	845	2.5	34.6
19:36:03	0.13	0.3	-0.07	840	2.3	38.8
19:36:18	0.12	0.3	-0.03	836	2.2	38.4
19:36:33	0.12	0.3	-0.00	838	2.1	38.1
19:36:48	0.12	-0.2	-0.01	838	2.1	40.7
19:37:03	0.11	-0.2	-0.03	836	2.1	37.0
19:37:18	0.12	-0.2	-0.07	845	2.1	34.6
19:37:33	0.12	0.3	-0.05	835	2.1	31.8
19:37:48	0.12	-0.2	-0.01	847	2.1	32.7
19:38:03	0.12	0.3	-0.00	850	2.0	30.4
19:38:18	0.11	0.3	-0.01	719	2.1	37.9
19:38:34	0.11	-0.2	-0.06	746	2.1	35.1
19:38:49	0.12	-0.2	-0.06	849	2.0	35.4
19:39:04	0.11	-0.2	-0.00	859	2.0	34.4
19:39:19	0.12	-0.2	0.00	846	2.0	35.3
19:39:34	0.11	-0.2	-0.00	853	2.0	39.0
19:39:45 ZERO N OX DIRECT						
19:39:49	0.11	-0.2	-0.03	555	2.0	34.5
19:40:04	0.10	0.3	-0.04	35	1.7	33.2
19:40:19	0.08	0.3	-0.07	5	1.3	32.9
19:40:34	0.07	0.3	-0.06	4	1.1	30.9
19:40:49	0.08	0.3	-0.02	3	1.0	35.3
19:41:04	0.07	0.3	0.00	2	1.0	39.0
19:41:19 ZERO BIAS						
19:41:19	0.08	0.3	0.01	2	1.0	38.6
19:41:34	0.04	-0.2	-0.01	808	1.0	38.4

19:41:49	0.16	0.3	-0.01	874	1.6	37.8
19:42:04	3.48	0.8	-0.06	191	2.6	35.3
19:42:19	15.46	0.8	0.00	110	2.9	32.1
19:42:34	3.52	0.8	-0.05	105	2.4	32.5
19:42:49	0.39	0.3	-0.06	101	2.0	30.9
19:43:04	0.16	0.3	-0.06	97	1.9	30.6
19:43:20	0.14	0.3	-0.04	93	1.9	31.6
19:43:35	0.14	0.3	-0.00	88	1.9	31.5
19:43:50	0.13	0.3	-0.03	86	1.9	31.4
19:44:05	0.14	0.3	-0.06	81	1.9	31.4
19:44:20	0.14	0.3	-0.06	79	1.9	30.7
19:44:35	0.14	0.3	-0.01	76	1.9	30.6
19:44:50	0.14	0.3	-0.06	75	1.9	30.9
19:45:05	-0.04	0.3	-0.03	71	1.9	31.9
19:45:20	0.14	0.3	-0.01	68	1.9	31.6
19:45:35	0.01	0.3	-0.06	67	1.9	30.6
19:45:50	0.14	0.3	-0.02	66	1.8	29.8
19:46:05	0.14	0.3	-0.06	63	1.8	29.5
19:46:20	0.14	0.3	-0.06	62	1.9	30.5
19:46:35	0.14	0.3	-0.02	60	1.9	29.7
19:46:50	0.14	0.3	-0.00	59	1.9	31.4
19:47:05	0.14	0.3	-0.04	58	1.9	31.8
19:47:20	0.14	0.3	-0.00	57	1.8	32.4
19:47:35	0.14	0.3	-0.06	57	1.9	33.3
19:47:50	0.14	0.3	-0.04	56	1.9	33.2
19:48:05	0.14	0.3	-0.01	55	1.9	33.7
19:48:21	0.15	0.3	-0.06	53	1.9	33.1
19:48:36	0.14	0.3	-0.02	53	1.9	33.4
19:48:51	0.14	0.3	-0.01	52	1.9	31.4
19:49:06	0.14	0.3	-0.02	53	1.9	34.6
19:49:21	0.14	0.3	-0.06	51	1.9	36.1
19:49:36	0.15	0.3	-0.05	52	1.9	37.6
19:49:51	0.14	0.3	-0.03	51	1.9	39.3
19:50:06	0.14	0.3	-0.01	51	1.9	39.4
19:50:21	0.14	0.3	-0.00	50	1.9	43.0
19:50:36	0.14	0.3	-0.04	49	1.9	42.1
19:50:51	0.14	0.3	-0.06	49	1.9	40.0
19:51:06	0.14	0.3	-0.02	48	1.9	39.8
19:51:21	0.15	0.3	-0.01	48	1.9	51.7
19:51:36	0.14	0.3	-0.01	47	1.9	48.2
19:51:51	0.14	0.3	-0.02	47	1.9	48.3
19:52:06	0.15	0.3	-0.06	46	2.0	47.4
19:52:21	0.15	0.3	-0.07	46	2.0	50.4
19:52:36	0.14	0.3	-0.03	45	1.9	46.5
19:52:51	0.14	0.3	-0.06	45	1.9	47.4
19:53:06	0.14	0.3	-0.01	45	1.9	42.8
19:53:22	0.14	0.3	-0.03	44	2.0	39.7
19:53:37	0.14	0.3	-0.07	44	2.0	32.4
19:53:52	0.14	0.3	-0.02	44	1.9	35.9
19:54:07	0.14	0.3	-0.06	43	1.9	35.2
19:54:22	0.15	0.3	-0.05	42	2.0	37.5
19:54:37	0.14	0.3	-0.01	43	2.0	37.2
19:54:52	0.15	0.3	-0.00	42	2.0	34.6
19:55:07	0.14	0.3	-0.00	41	2.0	37.8
19:55:22	0.14	0.3	-0.06	40	2.0	38.9
19:55:37	0.14	0.3	-0.01	41	2.0	39.0
19:55:52	0.14	0.3	-0.06	41	1.9	38.6
19:56:07	0.15	0.3	-0.02	40	2.0	40.8
19:56:22	0.15	0.3	-0.02	40	2.0	40.9
19:56:37	0.14	0.3	-0.06	39	2.0	39.1

19:56:52	0.15	0.3	-0.05	39	2.0	40.5
19:57:07	0.14	0.3	-0.07	39	2.0	46.6
19:57:22	0.14	0.3	-0.05	39	2.0	45.8
19:57:37	0.15	0.3	-0.02	38	2.0	46.4
19:57:52	0.14	0.3	-0.01	38	2.0	46.2
19:58:07	0.14	0.3	-0.01	37	2.0	45.0
19:58:23	0.14	0.3	-0.00	38	2.0	65.0
19:58:38	0.14	0.3	-0.04	38	2.0	45.2
19:58:53	0.15	0.3	-0.07	37	2.0	45.8
19:59:08	0.14	0.3	-0.03	37	2.0	47.7
19:59:23	0.14	0.3	-0.00	36	2.0	51.3
19:59:38	0.14	0.3	-0.05	36	2.0	49.5
19:59:53	0.14	0.3	-0.06	36	2.0	47.4
20:00:08	0.14	0.3	-0.00	36	2.0	45.4
20:00:23	0.15	0.3	-0.06	35	2.0	45.5
20:00:38	0.14	0.3	0.00	36	2.0	47.4
20:00:53	0.14	0.3	-0.01	35	2.0	43.4
20:01:08	0.15	0.3	-0.05	35	2.0	43.2
20:01:23	0.14	0.3	-0.06	35	2.0	39.8
20:01:38	0.15	0.3	-0.07	34	2.0	39.7
20:01:53	0.15	0.3	-0.03	34	2.0	41.3
20:02:08	0.14	0.3	-0.04	34	2.0	41.4
20:02:23	0.14	0.3	-0.01	33	2.0	38.5
20:02:38	0.15	0.3	-0.03	34	2.0	34.9
20:02:53	0.14	0.3	-0.06	33	2.0	37.8
20:03:08	0.14	0.3	-0.01	33	2.0	36.5
20:03:24	0.14	0.3	-0.02	33	2.0	28.4
20:03:39	0.15	0.3	-0.04	32	2.0	27.0
20:03:54	0.15	0.3	-0.04	32	2.0	16.9
20:04:09	0.14	0.3	-0.05	32	2.0	41.1
20:04:24	0.15	0.3	-0.05	32	2.0	12.3
20:04:39	0.14	0.3	-0.05	31	2.0	5.8
20:04:54	0.15	0.3	-0.06	32	2.0	24.5
20:05:09	0.15	0.3	-0.00	31	2.0	20.8
20:05:24	0.14	0.3	-0.06	31	2.0	22.3
20:05:39	0.14	0.3	0.00	30	2.0	22.3
20:05:54	0.14	0.3	-0.04	30	2.0	21.4
20:06:09	0.15	0.3	-0.01	30	2.0	19.9
20:06:24	0.14	0.3	-0.00	30	2.0	20.0
20:06:39	0.14	0.3	0.01	30	2.0	19.5
20:06:54	0.14	0.3	0.00	9	2.0	16.3
20:07:09	0.11	0.3	-0.01	4	1.7	25.8
20:07:15 ZERO NOX DIRECT NO NO ADJUSTMENTS						
20:07:24	0.11	0.3	-0.02	3	1.5	22.0
20:07:39	0.11	0.3	-0.06	1	1.4	26.2
20:07:54	0.11	0.3	-0.04	1	1.3	25.2
20:08:09	0.11	0.3	-0.04	0	1.3	24.2
20:08:25	0.11	0.3	-0.05	72	1.1	24.7
20:08:25 849 PPM DIRECT						
20:08:40	0.14	0.3	-0.03	805	2.4	42.6
20:08:55	0.15	-0.2	-0.01	840	3.0	24.5
20:09:10	0.14	-0.2	0.00	848	2.3	20.1
20:09:25	0.14	-0.2	-0.02	837	1.7	22.6
20:09:40	0.15	-0.2	-0.06	841	1.5	20.7
20:09:55	0.14	-0.2	-0.06	836	1.3	20.6
20:10:10	0.15	-0.2	-0.04	845	1.1	19.8
20:10:25	0.15	-0.2	-0.01	845	1.1	15.3
20:10:40	0.11	-0.2	-0.01	25	1.1	16.1
20:10:42 BIAS NOX 849						
20:10:55	0.15	0.3	-0.05	31	0.9	14.5

20:11:10	7.51	0.3	-0.04	47	0.8	11.7
20:11:25	13.24	0.3	-0.06	809	1.3	14.5
20:11:40	2.47	0.3	-0.01	827	1.7	18.8
20:11:55	1.20	0.3	-0.03	848	1.8	12.3
20:12:10	0.62	0.3	-0.06	869	1.7	12.5
20:12:25	0.24	0.3	-0.00	855	1.3	10.8
20:12:40	0.21	-0.2	-0.04	857	1.2	17.0
20:12:55	0.20	0.3	-0.06	860	1.0	13.9
20:13:10	0.20	0.3	-0.06	855	0.8	12.5
20:13:25	0.20	0.3	-0.04	882	0.8	9.3
20:13:33 ZERO BIAS NOX						
20:13:41	0.20	0.3	-0.00	858	0.9	7.4
20:13:56	0.20	0.3	0.00	856	1.0	8.2
20:14:11	0.33	0.3	-0.03	105	1.0	7.3
20:14:26	0.20	0.3	-0.01	39	0.7	5.6
20:14:41	0.17	0.3	-0.07	35	0.7	10.1
20:14:56	0.16	0.3	-0.02	34	0.7	7.7
20:15:11	0.17	0.3	-0.03	33	0.7	5.8
20:15:26	0.17	0.3	-0.04	32	0.8	6.3
20:15:41	0.16	0.3	-0.04	32	0.8	15.8
20:15:56	0.16	0.3	-0.01	31	0.9	8.5
20:16:11	0.17	0.3	0.00	31	0.9	8.8
20:16:26	0.17	0.3	-0.01	30	0.9	8.1
20:16:41	0.17	0.3	-0.02	30	1.0	15.8
20:16:56	0.17	0.3	-0.02	30	1.0	12.6
20:17:11	0.16	0.3	-0.06	29	1.0	9.9
20:17:26	0.16	0.3	-0.00	28	1.0	13.8
20:17:41	0.17	0.3	-0.06	30	1.0	2.2
20:17:56	1.47	0.3	0.00	73	1.2	3.9
20:18:11	15.29	0.8	0.03	604	1.8	4.0
20:18:26	19.76	4.8	0.04	779	2.6	4.4
20:18:42	20.61	7.2	0.05	862	3.4	4.7
20:18:57	20.70	10.8	0.04	951	3.7	5.0
20:19:12	20.71	11.2	0.05	1019	3.8	5.1
20:19:27	20.71	12.3	-0.02	1024	3.8	5.4
20:19:42	20.72	12.8	-0.02	1024	3.9	9.0
20:19:57	20.69	16.8	0.06	1024	4.2	14.3
20:20:12	20.63	24.7	0.06	1024	4.8	21.7
20:20:27	20.52	56.3	0.07	1024	6.5	22.8
20:20:42	20.42	79.8	0.15	572	8.6	21.2
20:20:57	20.40	115.7	0.09	566	10.7	19.2
20:21:12	20.44	117.9	0.10	554	11.7	17.7
20:21:27	20.48	111.2	0.08	1364	11.7	16.9
20:21:42	20.51	96.8	0.09	1356	11.4	16.1
20:21:57	20.53	90.8	0.07	1362	11.2	15.0
20:22:02 END CAL. ON OUTLET OF HEPA						
20:22:12	20.55	85.7	0.09	1346	10.9	14.8
20:22:27	20.56	78.8	0.05	1359	10.7	15.3
20:22:42	20.56	75.7	0.09	1346	10.6	14.2
20:22:57	20.55	73.7	0.06	1349	10.4	14.4
20:23:12	20.56	73.3	0.05	1341	10.2	14.6
20:23:27	20.57	73.3	0.09	1326	10.0	13.7
20:23:43	20.57	73.3	0.08	1298	9.9	15.3
20:23:58	20.57	74.3	0.06	1254	9.8	16.9
20:24:13	20.57	76.3	0.06	1215	9.5	16.9
20:24:28	20.56	77.3	0.03	1199	9.2	17.1
20:24:43	20.58	77.3	0.04	1173	8.9	17.7
20:24:58	20.59	76.3	0.09	1152	8.8	16.5

20:25:13	20.60	71.7	0.04	1143	8.6	14.2
20:25:28	20.62	67.8	0.04	1174	8.5	14.8
20:25:43	20.63	65.3	0.08	1170	8.5	13.9
20:25:58	20.65	59.8	0.03	1160	8.4	11.7
20:26:13	20.67	55.8	0.03	1153	8.2	11.5
20:26:28	20.69	48.7	0.06	1149	7.8	10.8
20:26:43	20.69	45.2	0.04	1189	7.6	10.6
20:26:58	20.70	44.7	0.01	1214	7.8	11.2
20:27:13	20.70	43.7	0.01	1205	7.9	10.3
20:27:28	20.71	42.2	0.03	1214	8.0	10.0
20:27:43	20.71	39.2	0.04	1211	8.1	9.6
20:27:58	20.73	37.2	0.01	1239	8.1	9.6
20:28:13	20.73	35.7	0.05	1264	8.3	9.8
20:28:28	20.73	35.2	0.01	1247	8.6	10.3
20:28:44	20.74	36.2	0.04	1237	8.7	10.1
20:28:59	20.74	36.7	0.05	1226	8.6	10.2
20:29:14	20.75	37.2	0.05	1223	8.5	10.0
20:29:29	20.75	37.7	0.02	1212	8.4	9.8
20:29:44	20.76	36.2	0.01	1195	8.2	8.9
20:29:59	20.77	34.3	0.02	1166	7.9	8.5
20:30:14	20.79	28.8	0.04	1156	7.5	6.9
20:30:29	20.81	25.7	-0.02	1134	6.9	6.4
20:30:44	20.82	19.3	0.03	1171	6.4	6.2
20:30:59	20.82	17.3	0.00	1191	6.3	7.1
20:31:14	20.82	16.8	0.02	1184	6.4	7.3
20:31:29	20.82	17.8	0.00	1160	6.4	6.8
20:31:44	20.83	17.8	0.03	1157	6.2	6.8
20:31:59	20.83	17.3	0.02	1136	6.0	6.2
20:32:14	20.84	14.8	0.03	1137	5.7	6.3
20:32:29	20.84	13.7	0.02	1120	5.6	5.9
20:32:44	20.85	12.8	0.03	1119	5.3	6.6
20:32:59	20.86	12.3	-0.03	1088	5.2	5.9
20:33:14	20.88	10.3	-0.01	1098	4.9	5.5
20:33:29	20.88	8.8	0.02	1120	4.8	5.6
20:33:45	20.89	6.3	-0.03	1113	4.7	5.6
20:34:00	20.89	5.7	-0.03	1140	4.7	5.6
20:34:15	20.87	5.7	0.01	1141	4.7	5.5
20:34:30	20.87	5.7	0.02	1146	4.6	5.5
20:34:45	20.88	5.7	-0.01	1144	4.6	5.6
20:35:00	20.88	6.3	-0.03	1151	4.6	5.6
20:35:15	20.88	6.8	-0.04	1169	4.6	5.7
20:35:30	20.88	7.2	-0.03	1191	4.7	5.9
20:35:45	20.87	10.3	0.00	1325	5.0	11.0
20:36:00	20.81	16.3	-0.02	1289	6.2	11.1
20:36:15	20.80	26.7	0.03	1198	6.8	8.3
20:36:30	20.84	27.2	0.00	1161	6.5	6.7
20:36:45	20.86	18.8	-0.03	1175	5.8	6.2
20:37:00	20.89	14.3	0.02	1185	5.3	5.9
20:37:15	20.88	9.7	-0.04	1204	5.1	5.8
20:37:30	20.89	8.3	-0.03	1219	5.0	5.8
20:37:45	20.89	7.7	0.02	1210	5.0	5.7
20:38:00	20.89	7.7	0.01	1247	5.1	5.7
20:38:15	20.89	7.2	-0.02	1255	5.2	5.7
20:38:30	20.89	7.7	0.01	1271	5.3	6.0
20:38:46	20.89	9.2	-0.04	1280	5.5	6.9
20:39:01	20.88	10.8	0.01	1294	5.7	7.5
20:39:16	20.86	14.8	0.01	1264	6.0	7.4
20:39:31	20.87	15.8	-0.03	1256	6.1	6.3
20:39:46	20.87	14.3	-0.04	1268	6.0	6.9
20:40:01	20.86	13.7	-0.03	1295	6.0	8.4

20:40:16	20.85	16.8	0.01	1297	6.3	8.8
20:40:31	20.84	18.8	0.02	1292	6.6	9.0
20:40:46	20.84	22.3	0.03	1278	6.9	9.3
20:41:01	20.84	23.7	-0.03	1267	6.9	8.3
20:41:16	20.85	22.7	0.02	1245	6.8	7.7
20:41:31	20.85	21.2	-0.03	1240	6.6	7.2
20:41:46	20.86	17.8	0.03	1233	6.4	6.8
20:42:01	20.86	16.8	-0.03	1267	6.2	7.8
20:42:16	20.84	17.8	0.03	1262	6.2	8.6
20:42:31	20.83	19.8	-0.02	1250	6.5	8.3
20:42:46	20.83	21.7	0.01	1243	6.5	8.2
20:43:01	20.84	21.7	0.01	1251	6.5	8.3
20:43:16	20.83	23.2	0.04	1500	6.9	15.4
20:43:31	20.70	32.3	0.08	1483	9.3	17.8
20:43:46	20.65	56.3	0.05	1411	11.9	15.1
20:44:02	20.68	63.8	0.05	1328	12.3	13.7
20:44:17	20.71	61.8	0.01	1300	11.6	12.1
20:44:32	20.74	55.8	0.04	1269	10.5	11.8
20:44:47	20.76	47.2	-0.01	1272	9.8	12.0
20:45:02	20.76	44.7	0.03	1275	9.2	12.1
20:45:17	20.76	43.7	-0.00	1298	9.0	12.2
20:45:32	20.77	43.7	-0.02	1295	9.0	12.6
20:45:47	20.76	44.7	-0.01	1304	8.9	12.7
20:46:02	20.76	45.2	0.00	1284	8.8	12.7
20:46:17	20.75	45.7	0.04	1280	8.6	12.1
20:46:32	20.77	44.7	-0.02	1271	8.5	12.4
20:46:47	20.76	44.2	0.01	1287	8.4	12.1
20:47:02	20.76	43.7	0.02	1274	8.3	12.5
20:47:17	20.77	43.7	-0.02	1277	8.2	12.1
20:47:32	20.76	43.2	0.03	1285	8.1	12.1
20:47:47	20.77	42.7	0.00	1266	8.0	11.4
20:48:02	20.77	42.7	0.01	1268	7.8	11.6
20:48:17	20.77	42.2	-0.01	1260	7.7	11.3
20:48:32	20.77	42.2	-0.00	1255	7.6	10.6
20:48:47	20.77	41.2	-0.02	1251	7.5	10.6
20:49:03	20.77	39.6	0.04	1258	7.4	9.9
20:49:18	20.78	38.2	-0.01	1241	7.2	9.8
20:49:33	20.78	36.7	-0.02	1237	7.1	10.0
20:49:48	20.77	37.2	0.03	1232	7.1	10.5
20:50:03	20.77	38.7	0.02	1244	7.1	11.1
20:50:18	20.76	40.2	-0.02	1253	7.3	11.2
20:50:33	20.76	42.7	0.04	1261	7.4	11.3
20:50:48	20.76	43.2	-0.01	1269	7.6	11.3
20:51:03	20.76	43.7	-0.01	1259	7.7	11.1
20:51:18	20.76	43.7	-0.01	1232	7.7	11.2
20:51:33	20.76	43.7	-0.01	1246	7.6	11.1
20:51:48	20.76	43.7	0.02	1237	7.5	10.8
20:52:03	20.77	43.2	0.04	1241	7.3	11.0
20:52:18	20.77	43.2	0.04	1228	7.3	11.2
20:52:33	20.76	44.2	0.00	1253	7.3	10.9
20:52:48	20.76	45.2	0.02	1254	7.4	11.5
20:53:03	20.76	46.2	0.04	1238	7.5	10.5
20:53:18	20.78	45.2	0.04	1230	7.4	10.5
20:53:33	20.77	42.2	0.04	1254	7.3	11.3
20:53:48	20.78	42.2	-0.01	1262	7.4	11.0
20:54:04	20.78	42.2	0.00	1284	7.5	11.0
20:54:19	20.78	41.6	-0.01	1262	7.7	10.4
20:54:34	20.78	40.7	-0.01	1271	7.6	10.8
20:54:49	20.77	40.7	0.01	1259	7.5	10.9
20:55:04	20.77	41.7	0.02	1243	7.4	10.6

20:55:19	20.78	41.6	0.05	1222	7.2	9.6
20:55:34	20.80	38.2	0.04	1228	6.9	9.4
20:55:49	20.79	36.2	0.02	1231	6.8	10.5
20:56:04	20.79	34.8	-0.01	1201	6.7	10.0
20:56:19	20.81	34.3	0.04	1161	6.4	8.7
20:56:34	20.83	29.2	0.02	1154	6.0	7.7
20:56:49	20.84	26.7	0.02	1163	5.5	8.0
20:57:04	20.83	25.2	-0.02	1182	5.3	9.1
20:57:19	20.83	26.7	-0.03	1178	5.2	9.4
20:57:34	20.82	30.3	-0.03	1182	5.2	9.7
20:57:49	20.81	31.2	0.01	1199	5.3	10.0
20:58:04	20.81	31.7	0.01	1180	5.6	8.2
20:58:19	20.83	29.7	0.03	1274	5.6	8.3
20:58:34	20.78	33.2	0.05	1371	6.3	16.0
20:58:49	20.70	41.6	0.03	1296	7.9	14.4
20:59:05	20.70	57.3	0.03	1242	8.3	12.4
20:59:20	20.73	58.8	0.02	1240	8.0	11.9
20:59:35	20.74	54.3	0.05	1240	7.8	11.9
20:59:50	20.75	51.7	-0.01	1239	7.7	12.0
21:00:05	20.76	49.2	-0.00	1242	7.6	11.9
21:00:20	20.76	48.7	0.01	1251	7.5	12.0
21:00:35	20.76	46.2	0.04	1296	7.5	11.3
21:00:50	20.76	44.7	0.03	1307	7.9	12.0
21:01:05	20.78	41.6	0.04	1263	8.2	10.9
21:01:20	20.80	39.6	-0.01	1267	7.9	10.4
21:01:35	20.80	35.7	0.04	1244	7.7	10.4
21:01:50	20.82	33.7	-0.02	1247	7.4	10.2
21:02:05	20.82	31.7	0.04	1237	7.1	10.2
21:02:20	20.82	31.2	-0.01	1248	6.9	10.1
21:02:35	20.82	30.3	0.02	1205	6.7	9.1
21:02:50	20.84	28.7	0.03	1186	6.5	7.5
21:03:05	20.86	22.2	0.00	1160	6.0	6.6
21:03:20	20.87	18.8	-0.00	1161	5.6	6.1
21:03:35	20.87	13.7	-0.03	1152	5.2	5.9
21:03:50	20.88	12.3	0.03	1149	5.0	5.9
21:04:06	20.89	10.3	-0.04	1150	4.8	5.8
21:04:21	20.89	10.3	0.02	1158	4.6	5.8
21:04:36	20.90	9.7	-0.04	1148	4.5	5.7
21:04:51	20.90	9.2	0.02	1149	4.5	5.5
21:05:06	20.91	8.3	-0.04	1152	4.4	5.4
21:05:21	20.91	7.7	0.00	1174	4.3	5.3
21:05:36	20.91	7.2	-0.01	1165	4.3	5.1
21:05:51	20.91	6.7	-0.00	1155	4.3	5.1
21:06:06	20.91	6.3	-0.03	1144	4.4	5.0
21:06:21	20.92	5.7	-0.03	1140	4.4	4.9
21:06:36	20.93	4.2	-0.04	1122	4.3	4.8
21:06:51	20.94	3.8	0.00	1131	4.2	4.6
21:07:06	20.94	2.8	-0.04	1139	4.1	4.5
21:07:21	20.95	2.3	0.01	1127	4.1	4.5
21:07:36	20.95	1.8	-0.05	1130	4.2	4.4
21:07:51	20.95	1.8	0.00	1102	4.2	4.3
21:08:06	20.95	1.3	-0.01	1125	4.1	4.2
21:08:21	20.95	1.3	0.00	1129	4.2	4.3
21:08:36	20.95	1.3	0.00	1134	4.5	4.7
21:08:51	20.95	1.3	0.01	1137	4.7	5.2
21:09:07	20.96	1.3	-0.01	1130	4.8	5.4
21:09:22	20.95	1.3	-0.01	1138	4.9	5.6
21:09:37	20.96	1.3	-0.05	1162	4.9	5.6
21:09:52	20.96	1.3	-0.01	1177	4.9	5.8
21:10:07	20.95	1.3	-0.00	1198	4.9	5.9

21:10:22	20.96	1.3	-0.05	1225	5.0	6.0
21:10:37	20.95	1.3	-0.05	1251	5.0	6.0
21:10:52	20.95	1.3	-0.05	1262	5.0	6.0
21:11:07	20.96	1.3	-0.05	1291	5.0	6.1
21:11:22	20.96	1.3	-0.05	1287	5.0	6.1
21:11:37	20.96	1.3	-0.02	1304	5.0	6.1
21:11:52	20.96	1.3	-0.04	1335	4.9	6.0
21:12:07	20.95	1.3	-0.00	1364	5.0	6.0
21:12:22	20.96	1.3	-0.05	1352	5.0	6.1
21:12:37	20.95	1.3	-0.03	1380	5.1	6.1
21:12:52	20.95	1.3	0.01	1386	5.1	6.1
21:13:07	20.95	1.3	-0.03	1415	5.2	6.0
21:13:22	20.95	1.3	-0.04	1377	5.2	6.0
21:13:37	20.95	1.3	-0.05	1375	5.1	6.1
21:13:52	20.95	1.3	-0.05	1355	4.9	6.0
21:14:07	20.95	1.3	-0.04	1341	4.7	6.0
21:14:23	20.95	1.3	-0.04	1324	4.5	6.0
21:14:38	20.94	1.3	-0.01	1337	4.3	6.1
21:14:53	20.94	1.3	-0.05	1322	4.2	6.0
21:15:08	20.94	1.3	0.00	1333	4.0	6.0
21:15:23	20.94	0.8	-0.04	1322	4.0	5.9
21:15:38	20.94	0.8	-0.03	1319	3.9	6.0
21:15:53	20.94	0.8	-0.01	1328	3.9	5.9
21:16:08	20.94	0.8	0.01	1314	3.9	5.9
21:16:23	20.94	0.8	0.01	1327	3.8	5.9
21:16:38	20.94	0.8	-0.01	1333	3.8	5.8
21:16:53	20.94	0.8	-0.00	1326	3.8	5.9
21:17:08	20.94	0.8	-0.03	1330	3.8	5.9
21:17:23	20.94	0.8	-0.01	1361	3.8	6.0
21:17:38	20.94	0.8	-0.05	1378	3.9	6.0
21:17:53	20.94	0.8	-0.00	1363	3.9	6.0
21:18:08	20.95	0.8	-0.05	1334	3.9	6.1
21:18:23	20.94	0.8	-0.03	1346	3.9	6.0
21:18:38	20.95	0.8	-0.06	1327	3.8	6.0
21:18:53	20.94	0.8	-0.05	1187	3.6	2.7
21:19:08	20.95	0.8	-0.01	1188	3.1	1.8
21:19:24	20.93	0.3	-0.01	1138	2.8	1.6
21:19:39	20.93	0.3	-0.00	1080	2.8	1.4
21:19:54	20.93	0.3	-0.04	999	2.7	1.4
21:20:09	20.93	0.3	-0.02	937	2.7	1.3
21:20:24	20.93	0.3	-0.04	858	2.7	1.2
21:20:39	20.93	0.3	-0.00	816	2.7	1.2
21:20:54	20.12	0.3	-0.06	756	2.6	1.2
21:21:09	20.93	0.3	-0.01	717	2.5	1.2
21:21:24	20.71	0.3	-0.05	681	2.6	1.0
21:21:39	20.94	0.3	-0.05	642	2.6	1.1
21:21:54	20.94	0.3	-0.03	621	2.6	1.1
21:22:09	20.95	0.3	-0.06	591	2.3	1.1
21:22:24	20.95	0.3	-0.05	570	2.5	1.1
21:22:39	20.96	0.3	-0.03	540	2.5	1.1
21:22:54	20.98	0.3	-0.03	521	2.5	1.0
21:23:09	20.84	0.3	-0.04	504	2.5	1.0
21:23:24	20.95	0.3	-0.00	481	2.5	1.0
21:23:39	20.95	0.3	-0.06	460	2.5	1.0
21:23:54	20.95	0.3	-0.00	446	2.5	1.0
21:24:09	20.96	0.3	-0.02	428	2.5	1.0
21:24:40	20.96	0.3	-0.02	402	2.5	0.9
21:25:10	20.97	0.3	-0.01	377	2.5	0.9
21:25:40	20.95	0.3	-0.04	353	2.5	0.7
21:26:10	20.97	0.3	-0.06	330	2.5	0.8

21:26:40	20.93	0.3	-0.05	314	2.4	0.8
21:27:10	20.97	0.3	-0.06	297	1.9	0.7
21:27:40	20.83	0.3	-0.05	279	2.3	0.8
21:28:10	20.97	0.3	-0.01	266	2.4	0.8
21:28:40	20.98	0.3	-0.03	252	2.5	0.8
21:29:10	20.98	0.3	-0.05	238	2.5	0.8
21:29:40	20.98	0.3	-0.02	224	2.5	0.8
21:30:11	20.98	0.3	-0.05	212	2.5	0.7
21:30:41	20.98	0.3	0.00	199	2.5	0.8
21:31:11	20.98	0.3	-0.05	188	2.5	0.8
21:31:41	20.97	0.3	-0.05	184	2.4	0.8
21:32:11	20.98	0.3	-0.03	174	2.4	0.8
21:32:41	20.99	0.3	-0.04	165	2.4	1.4
21:33:11	20.99	0.3	-0.02	155	2.4	0.8
21:33:41	20.99	0.3	-0.00	148	2.4	0.8
21:34:11	20.97	0.3	-0.04	140	2.4	0.9
21:34:42	20.96	0.3	-0.00	335	2.4	0.8
21:35:12	21.00	0.3	-0.05	130	2.4	0.8
21:35:42	20.98	0.3	-0.03	126	2.4	0.8
21:36:12	21.01	0.3	-0.01	119	2.4	0.9
21:36:42	21.01	0.3	-0.06	113	2.0	0.8
21:37:12	21.02	0.3	-0.02	110	1.9	0.8
21:37:42	21.04	0.3	-0.05	106	1.6	0.8
21:38:12	21.04	0.3	-0.05	101	1.5	0.8
21:38:42	21.04	0.3	-0.04	98	1.3	0.9
21:39:12	20.99	0.3	-0.02	94	1.2	0.8
21:39:42	21.04	0.3	-0.03	93	1.1	0.8
21:40:13	21.04	0.3	-0.01	89	1.1	0.8
21:40:43	21.01	0.3	-0.04	87	1.2	0.8
21:41:13	21.05	0.3	-0.00	84	1.3	0.8
21:41:43	21.03	0.3	-0.00	81	1.3	0.8
21:42:13	21.06	0.3	-0.01	78	1.4	0.8
21:42:43	21.05	0.3	0.00	84	1.4	0.8
21:43:13	21.06	0.3	-0.03	75	1.5	0.8
21:43:43	21.06	0.3	-0.06	71	1.5	0.8
21:44:13	21.06	0.3	-0.05	67	1.6	0.8
21:44:43	21.00	0.3	0.01	64	1.6	0.9
21:45:14	20.91	0.8	0.02	58	1.7	0.9
21:45:44	20.84	1.3	-0.00	53	1.7	0.9
21:46:14	20.94	0.8	0.01	50	1.8	0.8
21:46:44	20.96	0.8	-0.03	47	1.8	0.8
21:47:14	20.96	0.8	-0.05	44	1.8	0.8
21:47:44	20.83	0.8	-0.04	41	1.9	0.9
21:48:14	20.80	1.3	0.02	38	1.9	0.9
21:48:44	20.97	0.8	-0.02	36	1.9	0.8
21:49:14	20.99	0.8	-0.02	35	1.9	0.8
21:49:44	20.93	0.8	-0.02	43	2.0	0.8
21:50:15	10.12	1.8	-0.04	53	2.2	0.9
21:50:45	20.21	0.8	-0.01	61	2.3	0.9
21:51:15	20.95	0.3	-0.03	64	2.5	8.8
21:51:45	20.97	0.3	-0.05	66	2.5	26.1
21:52:15	20.97	0.3	-0.06	65	2.6	31.8
21:52:45	20.96	0.3	-0.05	53	2.6	33.0
21:53:15	20.98	0.3	-0.01	35	2.3	1.1
21:53:45	21.02	0.3	-0.05	32	2.2	0.9
21:54:15	21.03	0.3	-0.01	31	2.1	0.8
21:54:45	20.94	6.8	0.04	397	3.2	7.7
21:55:15	20.90	23.2	0.03	401	5.0	7.3
21:55:46	20.92	25.7	0.00	486	5.1	7.9
21:56:16	20.91	24.3	0.03	619	4.9	8.6

21:56:46	20.91	22.7	-0.02	719	5.0	8.2
21:57:16	20.64	20.7	0.00	795	4.8	7.8
21:57:46	20.91	19.8	0.03	857	4.7	7.9
21:58:16	20.92	19.3	0.03	885	4.6	8.0
21:58:46	20.92	19.8	-0.02	942	4.6	8.3
21:59:16	20.98	16.8	-0.05	668	3.9	2.0
21:59:46	21.03	3.3	-0.06	631	2.4	1.4
22:00:17	21.01	0.3	-0.05	505	2.3	1.1
22:00:47	21.01	0.3	-0.03	409	2.3	1.0
22:01:17	21.01	0.3	-0.00	350	2.2	1.0
22:01:47	21.01	0.3	-0.05	296	2.2	0.9
22:02:17	21.01	0.3	-0.04	263	1.8	0.9
22:02:47	21.01	0.3	-0.01	233	1.6	0.9
22:03:17	21.01	0.3	0.00	206	1.4	0.9
22:03:47	21.01	0.3	-0.02	183	1.3	0.8
22:04:17	21.02	0.3	0.00	162	1.1	0.8
22:04:47	21.02	0.3	-0.02	147	1.2	0.8
22:05:18	21.02	0.3	-0.05	133	1.2	0.8
22:05:48	21.03	0.3	0.00	119	1.2	0.8
22:06:18	21.03	0.3	-0.02	109	1.2	0.8
22:06:48	20.94	3.8	0.03	456	1.7	9.1
22:07:18	20.90	23.7	-0.01	380	3.6	6.7
22:07:48	20.94	22.2	-0.03	434	2.9	5.9
22:08:18	20.95	17.3	-0.02	540	2.6	6.2
22:08:48	20.95	15.8	-0.00	551	2.5	5.4
22:09:18	20.99	9.7	-0.02	616	2.0	3.5
22:09:48	20.96	8.3	-0.02	675	2.3	5.2

[illegible] good background

22:10:18	20.96	12.8	-0.03	689	2.5	5.7
22:10:49	20.96	12.3	-0.02	736	2.6	5.3
22:11:19	20.96	10.3	0.02	776	2.6	5.6
22:11:49	20.96	10.8	-0.02	812	2.6	5.6
22:12:19	20.96	10.8	-0.01	844	2.6	5.6
22:12:49	20.96	10.3	0.02	826	2.6	5.8
22:13:19	20.96	9.7	-0.01	842	2.4	5.6
22:13:49	20.96	8.8	-0.03	869	2.3	5.6
22:14:19	20.96	8.8	-0.04	915	2.5	5.5
22:14:49	20.96	8.3	-0.04	933	2.6	5.4
22:15:19	20.95	7.2	0.01	944	2.6	5.3
22:15:50	20.96	6.3	-0.00	948	2.6	5.2
22:16:20	20.95	5.2	-0.03	950	2.6	5.1
22:16:50	20.94	6.3	-0.03	948	2.5	5.2
22:17:20	20.95	5.7	-0.01	942	2.2	4.9
22:17:50	20.95	3.8	-0.03	961	1.9	5.0
22:18:20	20.94	3.8	-0.01	954	1.6	5.0

[illegible] 2:00

22:18:50	20.95	3.8	0.02	969	1.6	5.0
22:19:20	20.94	3.8	-0.01	983	1.5	4.9
22:19:50	20.93	3.8	-0.04	989	1.5	5.0
22:20:20	20.94	3.8	-0.04	974	1.4	5.0
22:20:51	20.93	3.8	-0.01	986	1.6	5.0

22:20:59 SWITCHED FROM 1000 RANGE TO 2500 NO NOTICIBLE DIF. IN CONCENTRATI

22:21:21	20.93	3.8	0.01	977	1.8	5.1
22:21:51	20.94	3.8	0.02	980	1.9	5.1
22:22:21	20.92	3.8	0.01	968	2.0	5.0
22:22:51	20.91	3.8	-0.04	975	2.1	5.0
22:23:21	20.91	3.8	-0.04	965	2.2	5.0
22:23:51	20.91	3.8	-0.04	955	2.3	4.9
22:24:21	20.90	4.3	-0.03	951	2.3	5.1
22:24:51	20.88	5.2	-0.02	957	2.4	5.5
22:25:21	20.86	9.7	0.03	938	2.5	6.2
22:25:52	20.85	16.3	-0.03	937	2.5	6.8
22:26:22	20.85	16.3	-0.03	934	2.6	5.6
22:26:52	20.86	10.3	-0.01	955	2.7	5.2
22:27:22	20.86	7.3	0.03	955	2.8	5.0
22:27:52	20.88	5.2	0.03	966	2.8	5.0
22:28:22	20.88	4.3	-0.03	981	2.9	5.0
22:28:52	20.88	4.8	0.00	1001	3.0	5.0
22:29:22	20.88	4.8	0.02	998	3.1	5.0
22:29:52	20.88	5.2	0.02	1014	3.1	5.0
22:30:22	20.88	5.2	0.01	986	3.0	5.1
22:30:53	20.88	5.2	0.02	1005	3.0	5.1
22:31:23	20.88	4.8	-0.00	999	2.9	5.2
22:31:53	20.87	4.8	-0.02	1015	2.9	5.1
22:32:23	20.88	4.3	0.02	1023	2.8	5.1
22:32:53	20.88	4.3	0.02	1016	2.8	4.9

22:32:59 RUN POST DEMISTER

22:33:23	20.88	3.8	-0.00	977	2.8	5.0
22:33:53	20.70	13.3	0.03	1109	3.0	10.1
22:34:23	20.61	35.7	0.05	1167	4.0	12.2
22:34:53	20.55	51.7	0.06	1178	4.9	15.4
22:35:23	20.57	52.8	0.06	1278	4.8	14.8
22:35:54	20.52	60.8	0.04	1275	5.2	13.9
22:36:24	20.55	54.3	0.08	1334	4.8	11.9
22:36:54	20.55	48.7	0.06	1386	4.7	11.4
22:37:24	20.55	47.7	0.04	1469	5.0	13.7
22:37:54	20.53	52.3	0.03	1517	5.4	15.0
22:38:24	20.48	60.4	0.03	1592	5.8	18.7
22:38:54	20.37	85.2	0.11	1539	6.6	15.7
22:39:24	20.41	81.8	0.09	1563	6.7	15.2
22:39:54	19.49	251.1	0.54	2218	30.3	99.5
22:40:24	19.91	424.6	0.22	1426	21.5	30.6
22:40:54	20.21	210.5	0.10	1505	10.1	27.1
22:41:25	20.25	148.9	0.14	1612	9.5	27.2
22:41:55	20.25	147.4	0.09	1590	9.0	23.3
22:42:25	20.29	135.9	0.08	1664	8.2	22.7
22:42:55	20.29	134.9	0.07	1689	8.4	25.6
22:43:25	20.25	142.5	0.10	1690	8.0	25.0
22:43:55	20.27	146.5	0.08	1686	7.6	23.2
22:44:25	20.28	136.4	0.12	1725	7.2	20.6
22:44:55	20.31	125.0	0.11	1740	7.0	17.9
22:45:25	20.29	121.9	0.10	1804	6.7	20.0
22:45:56	20.28	119.9	0.09	1820	6.7	18.5
22:46:26	20.29	111.2	0.10	1842	6.7	17.1
22:46:56	20.28	106.7	0.11	1854	6.4	16.0

22:47:26	20.29	104.7	0.05	1886	6.1	15.4
22:47:56	20.42	96.3	0.09	2036	6.6	17.2
22:48:26	20.42	98.8	0.04	2003	7.5	19.3
22:48:56	20.43	101.2	0.07	2058	6.8	17.3

22:48:56 RUN #2 POST QUENCH

22:49:26	20.46	99.8	0.07	2079	6.7	18.1
22:49:56	20.46	92.8	0.07	2091	6.5	17.8
22:50:26	20.45	91.7	0.07	2095	6.4	20.8
22:50:56	20.52	85.2	0.08	2018	5.1	27.8
22:51:27	20.41	95.7	0.07	2148	6.0	25.4
22:51:57	20.47	93.7	0.05	2481	6.5	23.7
22:52:27	20.47	84.3	0.06	10240H	6.6	27.2
22:52:57	20.45	85.2	0.04	3197	6.7	23.2
22:53:27	20.44	83.3	0.04	3389	7.1	25.7

22:53:37 SWITCH TO 10000 RANGE

22:53:57	20.41	84.3	0.02	3530	7.5	23.6
22:54:27	20.39	87.7	0.03	3598	7.6	27.7
22:54:57	20.26	101.7	0.05	3248	7.4	27.7
22:55:27	20.20	122.5	0.10	2583	6.4	22.5
22:55:58	20.30	111.2	0.08	2341	5.9	25.8
22:56:28	20.37	81.8	0.02	2143	5.8	25.1
22:56:58	20.38	63.8	0.07	1942	5.5	25.2
22:57:28	20.38	55.3	0.01	1764	5.2	24.5
22:57:58	20.39	47.7	0.01	6617	4.9	24.7

22:58:24 VOID LAST NOX

22:58:28	20.39	41.2	0.06	1639	4.6	25.3

22:58:55 SWITCH RANGE TO 2500

22:58:58	20.38	38.2	0.02	1786	4.5	24.4
22:59:28	20.39	34.8	0.06	1575	4.5	23.8
22:59:58	20.40	32.3	0.04	1494	4.3	23.1
23:00:28	20.41	28.8	0.04	1478	4.2	23.0
23:00:59	20.39	28.3	0.01	1587	4.3	21.1
23:01:29	20.39	27.7	0.05	1465	4.5	21.8
23:01:59	20.40	23.7	0.01	1582	5.2	22.1
23:02:29	20.41	19.8	0.06	1515	5.8	22.9
23:02:59	20.41	18.3	0.05	1522	6.0	25.0
23:03:29	20.43	25.2	0.03	2036	8.1	25.2
23:03:59	20.49	20.7	-0.01	1247	6.2	25.9
23:04:29	20.42	19.3	0.02	1457	6.4	22.7
23:04:59	20.40	27.7	0.06	1760	7.3	16.4
23:05:29	20.40	34.3	0.01	2229	8.2	11.1
23:05:59	20.55	23.2	0.02	2174	6.5	20.2
23:06:30	20.56	5.7	-0.03	2081	5.6	20.0
23:07:00	20.40	15.3	0.04	2101	6.4	18.1
23:07:30	20.37	31.2	0.00	1927	7.3	20.1
23:08:00	20.38	33.7	0.00	2560	7.8	13.4
23:08:30	20.37	24.7	-0.00	2560	5.5	9.0
23:09:00	20.49	7.7	-0.05	2482	4.9	6.7
23:09:30	20.61	1.8	-0.03	2406	3.7	5.1
23:10:00	20.58	0.8	-0.01	1927	2.6	4.1
23:10:30	20.67	0.3	-0.05	941	1.6	3.4
23:11:01	20.66	0.3	-0.00	827	1.2	3.5
23:11:31	20.55	0.3	-0.02	855	1.1	30.0

23:11:35 FROM 2258 ON RELIVE FILTER WAS PLUGGED

23:12:01	20.66	0.8	-0.01	997	1.4	45.6
23:12:31	20.66	0.8	-0.05	844	1.6	44.8
23:13:01	7.11	0.8	-0.03	742	1.3	4.6
23:13:03	BEGINZERO BIAS O2 CO SO2 NOX					
23:13:31	5.55	0.3	-0.03	604	1.2	1.3
23:14:01	0.24	0.3	-0.01	257	1.0	0.9
23:14:31	0.08	0.3	-0.01	199	0.8	0.6
23:15:01	0.07	0.3	-0.03	169	0.7	0.4
23:15:16	0.07	-0.2	-0.04	159	0.8	0.4
23:15:31	0.06	0.3	-0.04	152	0.7	0.3
23:15:47	0.06	0.3	-0.05	145	0.7	0.3
23:16:02	0.06	0.3	-0.06	139	0.8	0.3
23:16:17	0.06	0.3	-0.06	133	0.8	0.2
23:16:23	BIAS THC 31.0					
23:16:32	0.06	0.3	-0.03	130	0.8	0.1
23:16:47	0.05	0.3	-0.02	130	0.8	0.1
23:17:02	0.05	0.3	-0.06	121	0.8	0.1
23:17:17	0.05	0.3	-0.01	120	0.8	37.0
23:17:32	0.05	0.3	-0.04	117	0.8	37.4
23:17:47	0.05	0.3	-0.05	115	0.8	37.5
23:18:02	0.05	0.3	-0.01	111	0.8	37.5
23:18:17	0.05	0.3	-0.02	110	0.9	[illegible]
23:18:23	CONTINUE BIAS ZERO NOX O2 11.54 CO 251					
23:18:32	0.05	0.3	-0.06	108	0.9	37.5
23:18:47	0.05	0.3	-0.06	107	1.0	37.5
23:19:02	0.05	0.3	-0.06	105	1.1	37.5
23:19:17	0.52	4.7	0.16	250	1.1	37.4
23:19:32	9.11	101.2	1.75H	202	0.8	37.4
23:19:47	11.16	156.9	2.12H	177	0.5	37.5
23:20:02	11.40	229.3	2.14H	163	0.4	37.5
23:20:17	11.43	246.0	12.10H	157	0.4	37.5
23:20:32	11.43	253.0	0.61	151	0.4	37.5
23:20:48	11.44	255.0	0.61	145	0.5	37.5
23:21:03	11.44	258.6	1.21	142	0.5	37.4
23:21:18	11.44	261.4	1.21	137	0.5	37.5
23:21:33	11.45	253.0	1.21	134	0.6	37.5
23:21:48	11.45	256.0	12.15H	130	0.6	37.5
23:22:03	11.45	258.5	12.15H	129	0.6	37.6
23:22:18	11.45	256.0	12.14H	127	0.7	37.6
23:22:33	11.46	259.0	12.15	126	0.6	37.6
23:22:48	11.45	261.9	12.15	123	0.7	37.6
23:23:03	11.45	252.5	12.15	122	0.7	37.6
23:23:18	11.45	256.5	9.57	119	0.7	37.6
23:23:33	11.45	253.5	10.48	119	0.7	37.6
23:23:48	11.45	254.5	12.14	117	0.8	37.7
23:24:03	11.46	255.5	1.22	116	0.8	37.6
23:24:18	11.45	257.0	1.21	115	0.8	37.7
23:24:33	11.46	254.5	1.21	114	0.8	37.7
23:24:48	11.46	256.0	12.14	112	0.8	37.0
23:25:03	11.46	255.5	5.99	111	0.8	37.7
23:25:19	11.46	253.5	12.15	109	0.8	2.1
23:25:34	11.46	259.5	10.26	108	0.8	0.4
23:25:49	11.47	250.0	8.28	107	0.8	0.2
23:26:04	11.46	258.0	10.01	105	0.9	0.1
23:26:19	11.46	254.5	9.90	105	0.9	0.1
23:26:34	11.46	254.0	3.84	104	0.9	0.1
23:26:49	11.46	258.0	7.76	[illegible]	0.9	0.1
23:27:04	11.47	261.4	7.78	101	0.9	0.0
23:27:19	11.47	254.0	8.41	101	0.9	0.1
23:27:24	END CALS					

23:27:49	11.47	256.5	3.49	99	0.9	0.1
23:28:19	11.48	256.0	2.08	110	1.0	0.1
23:28:49	18.09	204.9	0.13	140	1.8	0.3
23:29:19	20.57	49.2	-0.04	181	2.6	33.3
23:29:49	20.62	3.8	-0.03	239	2.9	1.8
23:30:19	20.68	1.3	-0.01	272	3.1	1.5
23:30:49	20.69	0.3	-0.01	294	3.0	1.4
23:31:20	20.70	0.8	-0.04	295	2.8	1.3
23:31:50	20.70	0.8	-0.02	288	2.6	1.2
23:32:20	20.70	0.8	-0.00	284	2.5	1.1
23:32:50	20.70	0.3	0.00	273	2.5	1.1
23:33:20	20.70	0.3	0.00	269	2.4	1.1
23:33:50	20.70	0.3	-0.04	261	2.4	1.1
23:34:20	20.70	0.8	0.00	253	2.4	1.0
23:34:50	20.70	0.3	-0.01	246	2.3	1.0
23:35:20	20.69	0.8	-0.05	240	2.3	1.0
23:35:50	20.70	0.3	-0.05	215	2.3	1.0
23:36:20	20.69	0.3	-0.01	160	2.2	1.0
23:36:51	20.70	0.8	-0.05	153	2.0	1.0
23:37:21	20.70	0.3	-0.05	141	2.2	0.9
23:37:51	20.70	0.8	-0.05	123	2.2	0.9
23:38:21	20.68	0.8	-0.05	92	2.2	0.9
23:38:51	20.66	0.8	-0.05	83	2.1	0.9
23:39:21	20.65	0.3	-0.04	78	2.1	0.9
23:39:51	20.68	0.3	-0.03	73	2.1	1.0
23:40:21	20.68	0.8	-0.02	69	2.2	1.0
23:40:51	20.65	0.3	-0.05	67	2.2	1.0
23:41:21	20.71	0.3	0.00	65	2.2	1.1
23:41:52	20.72	0.3	-0.01	63	2.2	1.0
23:42:22	20.73	0.8	-0.06	61	2.2	1.0
23:42:52	20.71	-0.2	0.00	63	2.2	1.0
23:43:22	20.71	0.3	-0.03	58	2.3	1.0
23:43:52	20.73	0.3	-0.05	56	2.2	1.1
23:44:22	20.74	0.3	0.00	55	2.2	1.0
23:44:52	20.74	0.3	-0.04	55	2.2	1.0
23:45:22	20.74	0.3	-0.00	55	2.2	1.0
23:45:52	20.75	0.8	-0.06	53	2.2	1.0
23:46:22	20.74	0.8	-0.00	53	2.3	0.9
23:46:53	20.75	0.3	-0.06	52	2.2	0.9
23:47:23	20.75	0.3	-0.05	51	2.2	1.0
23:47:53	20.76	0.8	0.00	50	2.3	0.9
23:48:23	20.76	0.3	-0.05	50	2.3	1.0
23:48:53	20.77	0.8	0.00	49	2.3	1.0
23:49:23	20.77	0.3	-0.05	49	2.3	0.9
23:49:53	20.77	0.3	-0.01	48	2.2	0.9
23:50:23	20.77	0.3	-0.05	47	2.1	0.9
23:50:53	20.78	0.3	-0.00	47	2.0	0.9
23:51:23	20.78	0.3	-0.04	47	2.0	0.9
23:51:54	20.78	0.3	-0.04	46	1.9	0.8
23:52:24	20.79	0.3	-0.01	46	1.9	0.9
23:52:54	20.79	0.8	-0.05	46	1.9	0.8
23:53:24	20.79	0.8	-0.01	45	1.9	0.8
23:53:54	20.79	0.3	-0.01	45	1.9	0.8
23:54:24	20.80	0.3	-0.00	45	1.8	0.8
23:54:54	20.81	-0.2	-0.03	44	2.0	0.8
23:55:24	20.81	0.3	-0.02	44	2.1	0.8
23:55:54	20.81	0.8	-0.03	44	2.2	0.8
23:56:24	20.81	0.3	-0.02	43	2.2	0.8

23:56:55	20.81	0.3	0.00	43	2.2	0.8
23:57:25	20.82	0.3	-0.04	44	2.2	0.8
23:57:55	20.82	0.3	0.00	43	2.2	0.8
23:58:25	20.82	0.3	0.00	42	2.3	0.8
23:58:55	20.83	0.3	0.00	42	2.3	0.8
23:59:25	20.84	-0.2	-0.04	42	2.3	0.8
23:59:55	20.84	0.3	-0.06	42	2.3	0.8
00:00:35	20.85	0.3	-0.03	42	2.3	0.8
00:01:05	20.85	0.3	-0.06	41	2.3	0.8
00:01:35	20.85	0.3	-0.02	41	2.3	0.8
00:02:05	20.85	0.3	-0.01	41	2.3	0.8
00:02:35	20.86	0.3	-0.03	41	2.4	0.8
00:03:05	20.86	0.3	-0.04	41	2.3	0.8
00:03:36	20.87	0.3	-0.03	41	2.3	0.8
00:04:06	20.86	1.3	-0.06	40	2.3	0.8
00:04:36	20.87	0.3	0.00	40	2.3	0.8
00:05:06	20.87	1.3	-0.06	41	2.3	0.8
00:05:36	20.87	0.3	-0.02	40	2.3	0.8
00:06:06	20.87	-0.2	-0.03	40	2.3	0.8
00:06:36	20.87	0.3	-0.02	40	2.3	0.8
00:07:06	20.87	0.3	-0.05	40	2.3	0.8
00:07:36	20.87	0.3	-0.03	40	2.2	0.8
00:08:06	20.87	0.3	-0.03	40	2.1	0.8
00:08:36	20.87	0.3	-0.01	40	2.0	0.7
00:09:07	20.88	0.8	-0.05	40	2.0	0.8
00:09:37	20.87	0.3	-0.03	39	1.9	0.8
00:10:07	20.87	0.8	0.00	40	1.9	0.8
00:10:37	20.87	0.8	-0.05	40	1.9	0.8
00:11:07	20.87	1.8	-0.02	40	1.9	0.8
00:11:37	20.87	-0.2	-0.03	39	1.9	0.8
00:12:07	20.87	0.8	-0.01	39	1.9	0.8
00:12:37	20.87	0.8	-0.04	39	2.1	0.8
00:13:07	20.87	0.3	0.00	39	2.2	0.8
00:13:38	20.87	0.8	-0.03	39	2.2	0.8
00:14:08	20.88	0.3	-0.05	39	2.3	0.8
00:14:38	20.88	0.3	-0.05	38	2.3	0.9
00:15:08	20.87	0.3	-0.00	38	2.3	0.8
00:15:38	20.87	0.8	-0.04	38	2.3	0.9
00:16:08	20.88	0.3	-0.06	38	2.3	0.9
00:16:38	20.88	0.8	-0.05	37	2.4	0.8
00:17:08	20.88	0.3	-0.04	38	2.4	0.8
00:17:38	20.87	0.8	-0.05	37	2.3	0.8
00:18:08	20.88	0.3	-0.06	38	2.4	0.8
00:18:38	20.88	0.3	-0.04	38	2.4	0.8
00:19:09	20.88	0.3	-0.01	37	2.3	0.8
00:19:39	20.88	0.3	-0.01	37	2.4	0.8
00:20:09	20.87	0.3	-0.00	36	2.4	0.8
00:20:39	20.88	0.3	-0.04	37	2.3	0.8
00:21:09	20.88	0.3	-0.06	36	2.4	0.8
00:21:39	20.88	-0.2	-0.05	36	2.3	0.8
00:22:09	20.88	0.3	-0.03	36	2.3	0.8
00:22:39	20.88	0.8	-0.03	36	2.4	0.8
00:23:09	20.88	0.3	-0.03	37	2.3	0.8
00:23:39	20.88	0.3	-0.04	37	2.4	0.8
00:24:10	20.88	0.3	0.00	36	2.4	0.8
00:24:40	20.87	0.3	-0.05	36	2.4	0.8
00:25:10	20.88	0.8	-0.04	36	2.4	0.8
00:25:40	20.88	0.3	-0.06	36	2.4	0.8
00:26:10	20.88	0.8	-0.03	35	2.3	0.8
00:26:40	20.87	0.3	0.00	384	2.5	7.6

00:27:10	20.68	[illegible]	[illegible]	479	5.5	9.0
00:27:40	20.69	[illegible]	-0.02	697	6.0	9.5
00:28:10	20.69	[illegible]	[illegible]	854	6.4	11.1
00:28:40	20.69	[illegible]	0.00	922	6.6	10.4
00:29:11	20.73	[illegible]	-0.03	946	5.7	7.0
00:29:41	20.71	[illegible]	-0.00	1024	5.3	11.2
00:30:11	20.69	[illegible]	[illegible]	1024	5.6	10.8
00:30:41	20.72	[illegible]	-0.03	1024	5.3	7.3
00:31:11	20.75	15.3	-0.03	1024	4.9	6.5
00:31:41	20.70	23.7	0.01	1024	5.3	10.5
00:32:11	20.67	35.2	0.03	1222	6.1	11.2
00:32:41	20.60	51.2	0.05	1379	8.4	18.8
00:32:58 ON LINE RUN #3 HEPA OUT						
00:33:11	20.56	65.3	0.01	1087	10.6	10.6
00:33:41	20.68	41.6	0.03	1266	7.3	11.9
00:34:12	20.62	46.7	-0.02	1269	9.4	12.7
00:34:42	20.60	49.2	0.04	1370	9.6	14.1
00:35:12	20.50	76.3	0.06	1327	11.2	17.2
00:35:42	20.53	84.7	0.04	1320	10.7	14.4
00:36:12	20.59	64.8	0.03	1340	9.6	12.6
00:36:42	20.61	55.8	0.02	1345	8.2	13.4
00:37:12	20.61	56.3	0.00	1384	7.7	13.5
00:37:42	20.59	57.3	-0.01	1370	7.6	11.6
00:38:12	20.62	50.7	0.00	1408	6.9	12.0
00:38:42	20.63	47.7	0.01	1404	6.7	11.3
00:39:13	20.63	46.2	-0.01	1279	5.5	10.4
00:39:43	20.62	45.2	-0.02	1298	3.8	11.5
00:40:13	20.61	47.7	0.01	1383	3.6	12.0
00:40:43	20.58	57.8	0.03	1390	4.7	12.7
00:41:13	20.58	58.3	0.01	1370	5.2	12.6
00:41:43	20.55	60.8	0.01	1341	5.0	12.4
00:42:13	20.57	60.8	0.00	1293	4.5	12.1
00:42:43	20.58	58.8	0.00	1301	4.0	11.6
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
00:43:33 ON LINE RUN #3 POST DEMISTER						
00:43:43	20.79	15.2	-0.04	1344	3.1	1.9
00:44:13	20.39	78.8	0.08	1546	52.5	20.1
00:44:44	20.39	125.4	0.05	1732	60.3	22.0
00:45:14	20.35	131.9	0.07	1927	57.4	19.1
00:45:44	20.37	125.0	0.05	2014	55.9	18.8
00:46:14	20.38	123.4	0.00	2238	55.7	20.2
00:46:44	20.38	115.2	0.00	2284	57.5	20.3
00:47:14	20.34	116.5	0.01	2399	59.7	20.2
00:47:44	20.40	102.7	0.04	2329	55.9	20.9
00:48:14	20.40	83.7	0.03	2470	53.8	18.0
00:48:44	20.39	80.8	0.04	2450	51.6	26.3
00:49:14	20.34	100.2	0.02	2370	47.2	21.5
00:49:45	20.35	95.2	0.05	2423	40.9	17.4
00:50:15	20.35	90.7	0.00	2457	34.9	19.4
00:50:45	20.36	89.2	0.05	2446	29.7	16.9
00:51:15	20.40	79.3	-0.00	2559	26.5	20.8
00:51:45	20.36	80.3	0.00	2560	25.7	19.1
00:52:15	20.10	123.4	0.08	2560	30.8	27.7
00:52:45	20.05	186.9	0.06	2560	35.6	26.2
00:53:15	20.11	185.4	0.10	2560	37.2	20.3
00:53:45	20.20	147.4	0.08	3022	37.3	21.7
00:54:15	20.22	131.0	0.02	2950	37.0	24.7

00:54:46	20.22	13[illegible].4	0.03	2904	33.7	23.8
00:55:16	20.21	134.9	0.03	2795	32.1	19.8
00:55:46	20.24	131.0	0.07	2837	31.1	21.3

00:56:09 ON LINE RUN #3 POST QUENCH

00:56:16	20.21	121.4	0.01	2600	31.6	9.3
00:56:46	20.29	95.7	0.04	3146	22.0	30.4
00:57:16	20.21	111.7	0.04	3380	22.1	31.9
00:57:46	20.18	119.9	0.03	3796	22.4	30.5
00:58:16	20.22	116.9	0.03	4107	22.9	30.1
00:58:46	20.20	108.7	0.07	4299	22.5	30.5
00:59:17	20.19	110.7	0.02	4431	21.5	33.9
00:59:47	20.17	115.7	0.04	4523	20.9	29.6
01:00:17	20.18	118.5	0.07	4484	20.7	32.1
01:00:47	20.16	117.9	0.04	4536	20.6	31.2
01:01:17	20.16	121.4	0.05	4457	20.2	31.8
01:01:47	20.13	119.9	0.00	4386	19.2	25.3
01:02:17	20.14	104.7	-0.01	4358	18.0	30.4
01:02:47	20.07	94.8	0.03	4507	18.3	26.4
01:03:17	19.95	115.7	-0.02	4397	20.5	24.0
01:03:47	19.97	89.7	0.00	4325	19.2	28.2
01:04:18	20.00	69.2	0.03	4321	18.5	28.2
01:04:48	19.98	73.7	0.02	4316	18.6	26.5
01:05:18	19.96	68.3	-0.03	4261	18.0	25.0
01:05:48	19.96	64.3	0.00	4276	17.4	17.6

01:06:10 MAIN SAMPLE PUMP OFF

01:06:18	19.96	44.7	-0.02	1548	12.1	9.9

01:06:39 NO EXCESS FLOW

01:06:48	19.98	18.8	0.02	2659	9.4	5.5
01:07:18	20.06	11.7	-0.01	2077	7.8	3.6

01:07:25 PUMP BACK ON

01:07:48	20.15	1.8	-0.05	923	7.0	2.6
01:08:18	20.23	12.8	0.00	1265	26.3	8.7
01:08:48	20.11	24.2	0.01	1904	40.3	14.6
01:09:18	20.08	44.7	-0.04	2442	49.8	27.6
01:09:49	19.98	74.8	0.00	2923	55.0	29.1
01:10:19	19.97	80.3	0.03	3202	62.1	30.1
01:10:49	19.95	90.7	-0.02	3435	65.0	29.2
01:11:19	19.94	88.3	0.00	3497	68.0	29.4
01:11:49	19.95	73.2	0.01	3644	55.9	31.0

01:12:10 ON LINE TO [illegible] MELTER EXHAUST Run #3

01:12:19	20.01	66.8	-0.03	3444	70.7	28.5
01:12:49	19.97	72.8	0.02	3324	72.9	27.0
01:13:19	19.96	75.3	0.03	3290	75.8	30.7
01:13:49	19.94	79.7	-0.03	3317	75.5	33.1
01:14:20	19.92	83.8	0.02	3122	75.0	29.0
01:14:50	19.91	88.7	0.00	3010	78.3	29.1
01:15:20	19.90	90.3	-0.03	2833	82.2	29.4
01:15:50	19.88	88.3	-0.03	2776	85.7	23.8
01:16:20	19.88	63.3	0.01	2775	88.4	20.3
01:16:50	19.91	61.8	-0.02	2605	106.1	23.7
01:17:20	19.95	80.3	0.02	2356	107.3	23.8
01:17:50	19.94	77.7	0.02	2283	102.7	29.5
01:18:20	19.92	81.8	-0.03	2246	93.7	29.7
01:18:50	19.91	82.3	0.02	2424	83.4	44.6
01:19:20	19.90	132.4	0.03	2156	85.0	34.9
01:19:51	19.86	120.5	0.03	2176	74.9	32.9
01:20:21	19.80	106.7	0.00	2242	65.5	33.3
01:20:51	19.81	104.2	-0.01	2261	60.4	34.8

01:21:21	19.84	106.7	-0.02	2259	58.2	38.4
01:21:51	19.85	114.2	-0.02	2207	54.2	35.4
01:22:21	19.84	117.9	0.03	2139	49.1	36.6
01:22:51	19.83	115.7	0.01	2243	43.6	35.8
01:23:21	19.84	122.5	-0.03	2462	41.3	36.9
01:23:51	19.84	122.5	0.03	2448	38.0	35.7
01:24:21	19.83	122.9	-0.01	2685	38.1	36.2
01:24:52	19.84	116.9	0.03	2745	38.1	36.5
01:25:22	19.85	120.5	-0.03	2717	40.1	36.8
01:25:52	19.86	124.5	-0.02	2651	42.2	34.2
01:26:22	19.84	118.5	0.01	2587	42.1	33.9
01:26:52	19.83	112.2	0.03	2558	41.6	34.6
01:27:22	19.85	111.2	0.03	2529	41.5	34.2
01:27:52	19.85	109.7	-0.02	2481	41.4	36.2
01:28:22	19.85	69.7	0.01	1741	18.8	47.3
01:28:52	19.85	14.8	0.02	1710	8.7	57.5
01:29:22	19.89	1.3	-0.04	1700	8.0	53.0
01:29:53	20.04	0.8	-0.02	1645	7.9	51.6
01:30:23	20.15	0.8	-0.05	1552	7.9	48.5
01:30:53	20.20	0.8	-0.03	1488	8.0	48.5
01:31:23	20.20	0.3	-0.03	1415	8.1	50.2
01:31:53	20.22	0.3	-0.04	1299	8.2	54.1
01:32:23	20.22	0.3	-0.05	1201	8.2	56.0
01:32:53	20.23	0.8	0.00	1116	8.2	50.9
01:33:23	20.23	0.8	0.00	1069	8.2	58.0
01:33:53	20.23	0.3	-0.02	1000	8.2	57.7
01:34:23	20.23	0.3	0.00	950	8.2	62.0
01:34:54	20.23	0.3	-0.02	896	8.2	61.7
01:35:24	20.23	0.3	-0.02	847	8.1	59.9
01:35:54	20.24	0.3	-0.04	819	8.0	58.1
01:36:24	20.24	0.3	-0.01	784	7.9	58.2
01:36:54	20.24	0.3	-0.06	765	7.7	56.8
01:37:24	20.24	0.8	-0.04	724	7.3	58.3
01:37:54	20.24	0.8	-0.01	709	6.9	53.9
01:38:24	20.24	0.3	-0.05	674	6.7	53.2
01:38:54	20.23	0.3	-0.05	647	6.5	52.7
01:39:24	20.24	0.3	-0.05	625	6.4	53.8
01:39:55	20.24	0.3	-0.05	605	6.2	53.6
01:40:17	ZERO	BIAS	O2	CO	SO2	NOX THC
01:40:25	20.25	1.8	-0.04	454	5.7	55.2
01:40:55	20.24	1.8	-0.06	166	4.7	61.5
01:41:25	14.89	0.8	-0.03	113	4.2	6.7
01:41:55	6.67	0.3	0.00	90	3.7	2.3
01:42:10	4.13	0.3	-0.02	962	3.8	2.1
01:42:25	2.72	0.3	-0.04	901	3.9	1.9
01:42:40	1.69	0.3	-0.06	86	3.8	1.7
01:42:55	1.14	0.3	-0.05	81	3.7	1.7
01:43:10	0.75	0.3	0.00	78	3.5	1.5
01:43:25	0.50	0.3	-0.06	75	3.2	1.4
01:43:40	0.38	0.3	-0.00	71	3.1	1.3
01:43:55	0.27	0.3	-0.06	69	3.1	1.2
01:44:10	0.22	0.3	-0.01	68	3.0	1.3
01:44:26	0.17	0.3	-0.04	67	2.8	1.2
01:44:41	0.15	0.3	-0.02	66	2.6	1.1
01:44:56	0.13	0.3	-0.04	65	2.5	1.1
01:45:09	BIAS	O2	11.54	CO	251	
01:45:11	0.12	0.3	-0.01	64	2.4	1.0
01:45:26	0.12	1.3	-0.01	261	2.5	1.0
01:45:41	0.09	69.2	0.00	218	2.0	1.0
01:45:56	0.08	119.9	0.01	187	1.6	1.0

END

01:46:11	0.19	200.4	0.07	173	1.3	1.0
01:46:26	1.67	223.4	0.14	166	1.2	0.9
01:46:41	4.09	238.8	0.23	158	1.1	0.9
01:46:56	6.63	254.0	0.35	154	1.0	0.9
01:47:11	8.25	255.5	0.33	150	0.8	0.9
01:47:26	9.45	256.6	0.47	145	0.8	0.9
01:47:41	10.16	257.0	0.46	144	0.9	0.8
01:47:56	10.54	256.6	0.46	142	1.0	0.8
01:48:04 BIAS THC 31.0						
01:48:11	10.81	256.0	0.53	139	1.1	0.9
01:48:26	10.95	257.0	0.54	135	1.2	0.9
01:48:41	11.05	257.5	0.53	136	1.2	0.8
01:48:56	11.11	257.5	0.54	133	1.3	40.3
01:49:12	11.14	256.0	0.51	132	1.3	40.2
01:49:27	11.15	258.0	0.56	128	1.3	40.3
01:49:42	11.18	257.5	0.50	130	1.3	40.4
01:49:57	11.18	257.5	0.54	128	1.4	40.4
01:50:12	11.19	256.6	0.51	128	1.4	40.4
01:50:27	11.19	256.6	0.50	129	1.5	40.5
01:50:32 BIAS NOX 849						
01:50:42	11.19	209.9	0.52	456	3.3	40.4
01:50:57	11.19	161.9	0.49	506	4.3	40.5
01:51:12	11.22	75.7	0.38	486	3.5	40.5
01:51:27	10.91	46.2	0.23	469	3.1	40.6
01:51:42	8.94	14.3	0.07	468	2.9	40.6
01:51:57	6.01	6.3	0.07	450	2.9	40.6
01:52:12	3.94	0.8	0.01	446	2.8	40.7
01:52:27	2.41	0.8	-0.01	439	2.8	40.7
01:52:42	1.48	0.3	0.01	427	2.8	40.8
01:52:57	0.98	0.3	-0.05	427	2.8	40.4
01:53:12	0.63	0.3	-0.04	426	2.8	40.9
01:53:27	0.44	0.3	-0.05	419	2.8	2.0
01:53:42	0.31	0.3	-0.03	420	2.8	1.4
01:53:57	0.23	0.3	-0.04	416	2.7	1.2
01:54:12	0.17	0.3	-0.04	412	2.7	-0.1
01:54:28	0.14	0.3	-0.03	416	2.8	0.0
01:54:43	0.11	0.3	-0.03	412	2.8	0.0
01:54:58	0.09	0.3	-0.04	409	2.8	0.0
01:55:13	0.09	0.3	-0.01	418	3.4	0.0
01:55:28	0.07	0.3	-0.07	389	3.3	0.0
01:55:43	0.07	0.3	-0.06	375	3.1	0.0
01:55:58	0.08	-0.2	-0.06	374	3.0	0.0
01:56:13	0.09	0.3	-0.03	378	2.7	0.0
01:56:28	0.07	0.3	-0.05	378	2.5	0.0
01:56:43	0.04	0.3	-0.04	374	2.3	0.0
01:56:58	0.03	0.3	-0.04	376	2.1	0.0
01:57:13	0.01	0.3	-0.00	375	2.0	0.0
01:57:28	0.00	0.3	-0.04	374	1.9	0.0
01:57:43	-0.00	0.3	-0.07	150	1.7	0.0
01:57:58	-0.01	0.3	-0.03	14	0.8	0.0
01:58:13	-0.00	0.3	-0.06	3	0.2	0.0
01:58:28	-0.01	0.3	-0.07	2	0.1	0.0
01:58:43	-0.02	0.3	-0.06	1	-0.1	0.0
01:58:58	-0.02	0.3	-0.05	15	-0.0	0.0
01:59:14	-0.03	0.3	-0.03	428	2.6	0.0
01:59:29	-0.03	0.3	-0.06	467	3.0	0.0
01:59:44	-0.00	0.8	-0.00	229	4.3	0.0
01:59:59	1.10	0.8	-0.05	181	3.5	0.0
02:00:04 BIAS SO2 86.8						
02:00:14	1.60	0.3	-0.03	172	2.5	0.0

NOx off

SO2

02:00:29	2.84	0.3	-0.02	164	2.1	0.0
02:00:44	6.75	0.3	-0.06	160	2.0	0.0
02:00:59	10.73	0.3	-0.01	152	1.9	0.0
02:01:14	14.30	0.3	0.00	144	1.9	0.0
02:01:29	16.38	0.3	-0.02	141	1.9	0.0
02:01:44	17.92	0.3	-0.02	134	1.8	0.0
02:01:59	18.82	0.3	-0.03	131	1.8	0.0
02:02:14	19.31	0.3	-0.03	124	1.8	0.0
02:02:29	19.66	-0.2	-0.03	123	1.9	0.0
02:02:44	19.84	0.3	-0.03	121	2.1	0.0
02:02:59	19.97	0.3	-0.04	116	2.2	0.0
02:03:14	20.05	0.3	-0.02	116	2.3	0.0
02:03:29	20.10	-0.2	-0.05	105	2.5	0.0
02:03:44	20.13	0.3	-0.06	101	2.6	0.0
02:03:59	20.16	0.8	-0.06	98	2.4	0.0
02:04:15	20.17	-0.2	-0.03	104	2.4	0.0
02:04:30	20.18	-0.2	-0.02	101	2.4	0.0
02:04:45	20.19	1.3	-0.01	93	2.3	0.0
02:05:00	20.19	-0.7	-0.03	92	2.2	0.0
02:05:15	20.19	0.8	-0.06	94	2.1	0.0
02:05:30	20.12	0.3	-0.00	102	2.0	0.0
02:05:45	19.04	-0.2	-0.03	103	2.1	0.0
02:06:00	14.82	0.3	-0.06	116	2.2	0.0
02:06:15	9.95	0.4	-0.05	110	2.4	0.0
02:06:30	6.67	0.3	-0.04	108	2.6	-0.0
02:06:45	4.70	-0.2	-0.01	103	2.6	0.0
02:07:00	6.35	-0.2	-0.01	90	2.6	0.0
02:07:15	10.35	-0.2	0.00	31	10.7	0.0
02:07:30	13.86	-0.2	-0.07	20	37.0	0.0
02:07:45	16.11	-0.2	-0.01	73	44.9	0.0
02:08:00	17.73	0.3	-0.03	88	17.8	0.0
02:08:15	18.64	0.4	-0.06	95	7.4	0.0
02:08:30	19.29	0.3	-0.00	94	4.1	0.0
02:08:45	19.67	0.3	-0.02	93	3.2	0.0
02:09:00	19.82	0.3	-0.06	90	2.9	0.0
02:09:16	19.92	0.4	-0.02	88	2.8	0.0
02:09:31	20.01	-0.2	-0.01	84	2.7	0.0
02:09:46	20.09	0.3	-0.01	84	2.7	0.0
02:10:01	20.14	0.4	-0.03	83	2.7	0.0
02:10:16	20.17	-0.2	-0.06	78	2.7	0.0
02:10:31	20.20	0.4	-0.01	77	2.7	0.0
02:10:46	20.20	0.4	-0.06	74	2.7	0.0
02:11:01	20.22	0.4	-0.01	72	2.7	0.0
02:11:16	20.22	0.3	-0.06	70	2.7	0.0
02:11:31	20.23	0.3	-0.03	67	2.7	0.0
02:11:46	20.24	0.3	-0.05	61	2.6	0.0
02:12:01	20.24	0.4	-0.05	61	2.5	0.0
02:12:16	20.24	0.3	-0.06	59	2.4	0.0
02:12:31	20.25	-0.2	-0.06	60	2.3	0.0
02:12:46	20.25	0.8	-0.03	59	2.2	0.0
02:13:01	20.25	0.3	-0.06	58	2.2	0.0
02:13:16	20.26	-0.2	-0.01	55	2.2	0.0
02:13:31	20.26	-0.7	-0.04	53	2.1	0.0
02:13:46	20.26	0.4	-0.06	51	2.0	0.0
02:14:01	20.26	-0.2	-0.01	51	2.0	0.0
02:14:17	20.26	0.4	-0.05	47	2.1	0.0
02:14:32	20.26	0.4	-0.04	46	2.6	0.0
02:14:47	20.26	-0.2	-0.06	44	2.6	0.0
02:15:02	20.26	0.3	-0.06	43	2.3	0.0
02:15:17	20.28	0.3	-0.05	41	2.2	0.0

02:15:32	20.30	0.3	-0.04	40	2.0	0.0
02:15:47	20.32	0.8	-0.01	38	1.9	0.0
02:16:02	20.26	0.3	-0.05	37	1.9	0.0
02:16:17	18.48	0.8	-0.04	36	1.9	0.0
02:16:32	15.01	-0.9	-0.02	35	1.9	0.0
02:16:47	14.71	0.8	-0.06	34	1.9	0.0
02:17:02	15.97	-0.9	-0.02	34	1.9	0.0
02:17:17	17.46	0.3	-0.05	32	2.0	0.0
02:17:32	18.40	-0.9	-0.05	32	2.2	0.0
02:17:47	19.12	0.8	-0.06	32	2.4	0.0
02:18:02	19.52	-0.7	-0.04	31	2.5	0.0
02:18:17	19.81	0.8	-0.06	15	5.7	0.0
02:18:32	19.99	-0.2	-0.06	5	71.2	0.0
02:18:47	20.11	0.3	-0.05	3	118.2	0.0
02:19:02	20.21	0.4	-0.07	2	140.2	0.0
02:19:18	20.28	0.8	-0.07	1	147.2	0.0
02:19:33	20.33	-0.2	0.00	1	150.8	0.0
02:19:38	86.8 PPM DIRECT					
02:19:48	20.37	0.4	-0.04	0	130.6	0.0
02:20:03	20.39	0.4	-0.04	0	99.6	0.0
02:20:18	20.41	-0.2	-0.07	-01.	86.3	0.0
02:20:33	20.41	0.4	-0.07	-01.	83.3	0.0
02:20:48	20.38	-0.2	-0.04	-01.	82.6	-0.0
02:21:03	20.34	-0.2	-0.00	-11.	82.5	0.0
02:21:18	20.32	0.4	-0.02	-11.	82.5	0.0
02:21:33	20.30	-0.2	-0.06	-11.	82.5	0.0
02:21:48	20.31	0.4	-0.06	11	73.9	0.0
02:22:03	20.29	0.4	-0.03	19	42.9	0.0
02:22:18	20.29	0.8	-0.06	20	23.9	0.0
02:22:33	20.29	0.8	-0.04	20	13.5	0.0
02:22:48	20.29	1.3	-0.01	20	9.1	0.0
02:23:03	20.29	0.8	-0.03	20	7.2	0.0
02:23:18	20.29	1.3	-0.06	20	6.0	0.0
02:23:33	20.29	1.3	-0.06	20	5.4	0.0
02:23:48	20.29	1.3	-0.01	21	4.9	0.0
02:24:03	20.29	1.3	-0.03	20	4.4	0.0
02:24:19	20.29	1.3	-0.03	21	4.2	0.0
02:24:34	20.29	0.8	-0.06	21	4.0	0.0
02:24:49	20.29	1.3	-0.05	21	3.8	0.0
02:25:04	20.29	0.8	-0.05	20	3.7	0.0
02:25:19	20.28	1.3	-0.03	20	3.5	0.0
02:25:34	20.28	0.8	-0.02	20	3.5	0.0
02:25:49	20.28	1.3	-0.06	20	3.4	0.0
02:26:04	20.29	1.3	-0.01	20	3.3	0.0
02:26:19	20.28	0.8	-0.06	20	3.3	0.0
02:26:34	20.28	0.8	-0.05	20	3.2	0.0
02:26:49	20.28	0.8	-0.06	20	3.2	0.0
02:27:04	20.28	1.3	-0.05	19	3.1	0.0
02:27:19	20.28	0.8	-0.02	19	3.1	0.0
02:27:34	20.28	0.8	-0.01	19	3.1	0.0
02:27:49	20.28	1.3	-0.06	20	3.0	0.0
02:28:04	20.28	0.8	-0.01	19	3.0	0.0
02:28:19	20.28	1.3	-0.06	19	3.0	0.0
02:28:34	20.30	1.3	-0.02	19	3.0	0.0
02:28:49	20.32	0.8	-0.04	18	2.9	0.0
02:29:04	20.35	1.3	-0.03	18	2.8	0.0
02:29:19	20.36	1.3	-0.01	18	2.7	0.0
02:29:35	20.36	1.3	-0.01	18	2.6	0.0
02:29:50	20.37	0.8	-0.01	18	2.5	0.0
02:30:05	20.36	0.8	-0.01	18	2.4	0.0

02:30:20	20.35	1.3	-0.06	18	2.4	0.0
02:30:35	20.34	0.8	-0.02	18	2.4	0.0
02:30:50	20.33	0.8	-0.05	19	2.3	0.0
02:31:05	20.32	1.3	-0.01	18	2.3	0.0
02:31:20	20.32	0.8	-0.06	19	2.2	0.0
02:31:35	20.32	1.3	-0.01	19	2.2	0.0
02:31:50	20.31	0.8	-0.06	19	2.2	0.0
02:32:05	20.31	1.3	-0.05	20	2.2	0.0
02:32:20	20.30	1.3	-0.06	20	2.2	0.0
02:32:35	20.31	0.8	-0.04	20	2.2	0.0
02:32:50	20.30	0.8	-0.05	20	2.2	0.0
02:33:05	20.30	1.3	-0.04	20	2.2	0.0
02:33:20	20.30	1.3	-0.02	20	2.1	0.0
02:33:35	20.30	0.8	-0.04	20	2.1	0.0
02:33:50	20.30	1.0	-0.03	20	2.1	0.0
02:34:05	20.30	0.8	-0.04	20	2.1	0.0
02:34:20	20.30	1.3	-0.03	21	2.1	0.0
02:34:36	20.30	1.3	-0.05	21	2.1	0.0
02:34:51	20.30	0.8	-0.05	21	2.1	0.0
02:35:06	20.30	1.8	-0.06	21	2.2	0.0
02:35:21	20.32	1.3	-0.06	21	2.5	0.0
02:35:36	20.30	1.3	-0.06	21	2.6	0.0
02:35:51	20.30	1.3	-0.03	21	2.7	0.0
02:36:06	20.30	0.8	-0.01	20	2.8	0.0
02:36:21	20.30	0.9	-0.06	19	2.8	0.0
02:36:36	20.31	0.9	-0.03	19	2.8	0.0
02:36:51	20.30	1.3	-0.00	18	2.8	0.0
02:37:06	20.31	0.8	-0.03	18	2.8	0.0
02:37:21	20.31	1.3	-0.05	17	2.8	0.0
02:37:36	20.31	1.3	-0.06	17	2.8	0.0
02:37:51	20.31	1.3	-0.05	17	2.8	0.0
02:38:06	20.31	1.3	-0.01	16	2.8	0.0
02:38:21	20.32	0.4	-0.06	16	2.8	0.0
02:38:36	20.31	0.8	-0.04	15	2.8	0.0
02:38:51	20.31	0.9	-0.01	15	2.8	0.0
02:39:06	20.31	1.3	-0.06	14	2.8	0.0
02:39:21	20.31	0.9	-0.01	14	2.8	0.0
02:39:37	20.32	0.9	-0.04	14	2.8	0.0
02:39:52	20.32	1.3	-0.04	13	2.8	0.0
02:40:07	20.31	0.9	-0.06	13	2.8	0.0
02:40:22	20.31	1.3	-0.06	12	2.8	0.0
02:40:37	20.31	1.3	-0.04	12	2.8	0.0
02:40:52	20.32	0.9	-0.04	11	2.8	0.0
02:41:07	20.32	0.8	-0.02	11	2.8	0.0
02:41:22	20.32	0.8	-0.06	11	2.7	0.0
02:41:37	20.32	0.8	-0.00	11	2.7	0.0
02:41:52	20.32	0.9	-0.05	11	2.7	0.0
02:42:07	20.32	1.3	-0.04	10	2.7	0.0
02:42:22	20.32	1.3	-0.01	10	2.7	0.0
02:42:37	20.32	0.9	-0.01	10	2.7	0.0
02:42:52	20.32	0.9	-0.02	9	2.7	0.0
02:43:07	20.32	1.3	-0.06	9	2.7	0.0
02:43:22	20.33	0.9	-0.05	9	2.7	0.0
02:43:37	20.33	0.9	-0.01	9	2.6	0.0
02:43:52	20.34	0.9	-0.05	9	2.4	0.0
02:44:07	20.33	0.9	-0.04	9	2.4	0.0
02:44:22	20.33	0.9	-0.01	10	2.3	0.0
02:44:38	20.33	1.3	-0.06	22	2.1	0.0
02:44:53	20.33	1.3	-0.06	22	2.1	0.0

Run Title: CATHOLIC UNIVERSITY
Date: 15/31/127

Time	O2	CO	CO2	NOX	SO2	THC
10:30:50	20.27	0.4	-0.05	54	7.2	5.4
10:31:20	20.27	0.9	-0.05	55	7.3	-0.1
10:31:50	20.27	0.9	-0.01	33	7.0	0.7
10:32:20	20.27	0.9	0.00	23	6.8	0.1
10:32:50	20.27	0.9	-0.02	18	6.9	-2.8
10:33:20	20.27	0.9	-0.02	14	6.2	-3.6
10:33:50	20.27	0.9	-0.06	11	4.5	-3.5
10:34:20	20.27	0.9	-0.00	10	3.6	-3.4
10:34:50	20.27	0.9	-0.04	9	3.3	-3.4
10:35:20	20.28	0.9	-0.01	8	3.2	-3.3
10:35:50	20.27	0.9	-0.06	7	3.1	-3.2
10:36:20	20.27	0.9	-0.05	6	3.1	-3.2
10:36:50	20.28	0.9	-0.02	9	3.0	-3.1
10:37:20	20.28	0.4	-0.03	-3I.	2.2	-3.1
10:37:50	17.02	0.4	-0.03	-5I.	1.3	-3.1
10:38:21	7.33	0.4	-0.05	-6I.	1.1	-3.1
10:38:51	2.43	0.4	-0.06	-7I.	0.9	-3.1

10:38:51 CATHOLIC UNIV. 9/27/94 PRE TEST CALS DIRECT

10:39:17 ZERO O2 CO SO2 NOX W/N2

10:39:21	1.25	0.4	-0.03	-7I.	0.9	-3.1
10:39:51	0.29	0.4	0.00	-7I.	0.8	-3.1
10:40:21	0.10	0.4	-0.07	-7I.	0.8	-3.1
10:40:51	0.13	0.4	0.00	-7I.	0.8	-3.0
10:41:21	0.15	0.4	-0.03	-8I.	0.7	-3.1
10:41:51	0.00	0.4	-0.04	-8I.	0.8	-3.0
10:42:21	0.02	-0.1	-0.00	-8I.	0.7	-3.0
10:42:51	0.03	-0.1	-0.05	-8I.	0.8	-3.0
10:43:21	0.04	0.4	-0.01	-8I.	0.8	-3.0
10:43:51	0.05	-0.1	0.00	-8I.	0.8	-2.9
10:44:21	0.05	0.4	-0.05	0	0.7	-3.0
10:44:51	0.06	0.4	-0.03	0	0.7	-2.9
10:45:21	0.06	0.4	-0.02	0	-0.1	-3.0
10:45:51	0.06	-0.1	-0.04	0	-0.1	-3.0
10:46:21	0.07	-0.1	-0.04	0	-0.1	-2.9
10:46:51	0.07	0.4	0.00	0	-0.0	-2.9
10:47:21	0.07	0.9	-0.07	0	-0.1	-2.9
10:47:51	0.07	0.4	0.00	0	-0.0	-2.9
10:48:21	0.07	0.4	-0.07	0	-0.1	-2.9

10:48:45 SPAN O2 17.72 461 CO

10:48:51	5.30	30.3	0.01	0	-0.3	-2.9
10:49:22	17.06	293.1	0.00	0	-1.4I.	-2.9

10:49:46 ZERO THC

10:49:52	17.51	413.3	0.05	0	-1.6I.	0.0
10:50:22	17.54	442.9	-0.00	0	-1.6I.	0.0
10:50:52	17.54	448.9	-0.02	0	-1.8I.	0.0
10:51:22	18.06	449.4	0.05	0	-2.2I.	0.0
10:51:52	18.08	453.3	-0.02	0	-2.3I.	0.0
10:52:22	17.80	447.8	-0.02	0	-2.4I.	0.1
10:52:52	17.81	465.8	0.04	0	-2.6I.	0.0
10:53:22	17.81	454.2	0.01	0	-2.7I.	0.0

10:53:33 SPAN THC 84.2 ALL THROUGH SYSTEM

10:53:52	17.83	455.7	-0.02	0	-2.9I.	0.0
10:54:22	17.86	458.2	0.02	0	-3.1I.	0.1

10:54:52	13.76	419.7	0.00	0	-2.6L	0.0
10:55:22	11.85	309.2	0.03	0	-2.2L	0.1
10:55:52	11.83	258.1	-0.04	0	-2.3L	-0.0
10:56:15 MID O2 11.54 CO 251						
10:56:22	11.83	251.6	0.03	0	-2.3L	0.1
10:56:52	11.81	254.1	-0.03	0	-2.2L	0.0
10:57:22	11.84	253.7	-0.03	0	-2.0L	-0.0
10:57:52	[illegible]	254.1	0.03	1	-2.0L	0.1
10:57:58 SPAN NOX 849 DIRECT						
10:58:22	2.20	179.9	-0.05	617	7.8	0.0
10:58:52	0.38	51.8	-0.03	627	1.9	0.1
10:59:22	0.31	5.8	-0.02	615	0.9	0.1
10:59:52	0.31	0.4	-0.06	819	0.8	-0.0
11:00:22	0.32	0.4	-0.07	612	0.8	0.0
11:00:53	0.32	-0.2	-0.05	629	0.9	0.0
11:01:23	-0.05	-0.2	-0.03	616	0.9	0.1
11:01:53	0.02	-0.2	0.00	620	0.9	0.1
11:02:23	0.03	-0.2	-0.04	631	0.9	0.0
11:02:53	0.03	0.4	-0.01	620	0.9	0.1
11:03:23	0.08	-0.2	-0.07	629	0.9	-0.0
11:03:53	0.11	-0.2	-0.03	629	1.0	0.1
11:04:23	0.13	0.4	-0.01	626	1.0	85.6
11:04:53	0.13	-0.2	-0.03	619	1.0	73.6
11:05:23	0.14	-0.2	0.00	624	1.0	84.1
11:05:53	0.13	-0.2	-0.06	843	1.0	84.6
11:06:23	0.14	-0.2	-0.06	846	1.0	84.3
11:06:53	0.13	-0.2	0.00	853	1.0	84.2
11:07:23	0.14	0.4	-0.03	841	1.0	[illegible]
11:07:53	0.14	-0.2	0.00	839	1.1	84.1
11:08:08	0.14	-0.2	-0.04	837	1.1	84.1
11:08:23	0.15	-0.2	-0.05	633	1.1	84.2
11:08:38	0.16	-0.2	0.01	108	1.3	84.1
11:08:53	0.33	0.4	-0.03	46	1.6	84.1
11:09:08	2.77	0.4	-0.07	825	2.0	84.1
11:09:23	0.76	0.4	-0.02	837	2.1	84.1
11:09:28 849 PPM NOX AGAIN						
11:09:38	0.25	0.4	-0.06	844	1.6	84.1
11:09:54	0.17	-0.2	-0.07	852	1.4	84.1
11:10:09	0.16	-0.2	-0.06	851	1.3	84.1
11:10:24	0.16	-0.2	-0.06	842	1.3	84.1
11:10:39	0.15	-0.2	-0.00	834	1.3	84.2
11:10:40 THC 31.0 THROUGH SYSTEM						
11:10:54	0.15	-0.2	-0.06	830	1.2	82.5
11:11:09	0.16	-0.2	-0.04	851	1.2	84.1
11:11:24	0.15	-0.2	0.00	852	1.2	33.3
11:11:39	0.16	-0.2	-0.04	[illegible]	1.2	32.8
11:11:54	0.16	-0.2	-0.07	835	1.2	32.5
11:12:09 163 PPM SO2 DIRECT						
11:12:09	5.52	-0.2	-0.01	109	22.3	32.5
11:12:24	17.29	-0.2	0.01	10	85.5	32.4
11:12:39	20.71	-0.2	-0.07	5	130.0	[illegible]
11:12:54	21.28	-0.2	-0.04	5	143.6	32.3
11:13:09	21.41	0.4	0.00	4	149.2	32.3
11:13:24	21.44	0.4	0.00	4	151.4	32.3
11:13:29 REINJECT AIR TO THC						
11:13:39	21.46	0.4	-0.03	4	152.5	32.2
11:13:54	21.48	0.4	-0.07	4	153.3	32.2
11:14:09	21.47	0.4	-0.07	4	154.0	6.7

11:14:24	21.48	0.4	-0.01	4	154.8	2.4
11:14:39	21.49	0.4	-0.01	4	155.0	2.3
11:14:55	21.49	0.4	-0.06	4	155.4	1.2
11:15:10	21.49	0.4	-0.02	3	155.7	-0.0
11:15:25	21.50	0.4	-0.02	3	156.0	-0.0
11:15:40	21.51	0.4	0.01	3	158.0	-0.1
11:15:55	21.51	0.4	-0.00	3	163.0	-0.1
11:16:10	21.52	0.4	-0.07	3	163.2	-0.2
11:16:25	21.52	0.4	-0.02	3	163.3	-0.2
11:16:40	21.52	0.4	0.00	3	163.1	-0.2
11:16:55	21.52	0.4	-0.05	4	159.9	-0.2
11:17:10	20.92	0.4	-0.07	4	135.4	-0.2
11:17:11 SO2 MID 86.8						
11:17:25	20.43	-0.2	-0.02	3	95.7	-0.3
11:17:40	21.21	-0.2	-0.06	3	88.2	-0.2
11:17:55	21.35	-0.2	-0.03	3	87.6	-0.2
11:18:10	21.39	-0.2	0.01	3	87.4	-0.2
11:18:25	21.39	-0.2	-0.02	3	87.2	-0.3
11:18:40	21.39	-0.2	-0.07	3	87.1	-0.2
11:18:55	21.39	-0.2	-0.01	3	86.9	-0.3
11:19:10	21.40	-0.2	-0.02	3	86.4	-0.3
11:19:25	21.40	-0.2	-0.07	8	74.4	-0.3
11:19:40	21.41	0.4	-0.03	13	43.9	-0.3
11:19:56	21.39	0.9	0.00	14	18.9	-0.2
11:20:11	21.37	0.9	-0.01	15	8.5	-0.3
11:20:26	21.36	1.3	-0.03	15	5.1	-0.3
11:20:41	21.35	1.3	-0.07	15	3.4	-0.3
11:20:56	21.34	1.3	-0.04	15	2.9	-0.3
11:21:11	21.33	1.3	0.00	15	2.5	-0.3
11:21:26	21.32	1.3	-0.03	15	2.2	-0.3
11:21:41	21.30	1.3	-0.07	14	2.1	-0.3
11:21:56	21.29	1.8	-0.01	15	2.0	-0.3
11:22:11	21.27	1.3	-0.01	14	2.0	-0.3
11:22:26	21.26	1.3	-0.06	14	1.9	-0.3
11:22:41	21.24	1.8	-0.06	14	1.9	-0.4
11:22:56	21.23	1.8	-0.00	14	1.8	-0.3
11:23:11	21.22	1.8	-0.06	14	1.8	-0.3
11:23:26	21.21	1.8	-0.06	14	1.9	-0.3
11:23:41	21.21	1.8	-0.05	14	1.9	-0.3
11:23:56	21.22	1.8	-0.03	14	1.9	-0.3
11:24:11	21.22	1.8	0.00	14	1.9	-0.3
11:24:26	21.22	1.8	-0.06	14	2.0	-0.3
11:24:41	21.22	1.8	-0.02	14	2.0	-0.4
11:24:57	21.21	1.8	-0.02	14	2.0	-0.3
11:25:12	21.21	1.3	-0.06	14	2.0	-0.3
11:25:27	21.20	1.3	-0.01	14	1.9	-0.3
11:25:42	21.20	1.3	-0.04	14	1.9	-0.4
11:25:57	21.19	1.3	-0.06	15	1.9	-0.4
11:26:12	21.18	1.3	-0.04	14	1.9	-0.4
11:26:27	21.18	1.3	-0.03	15	1.9	-0.4
11:26:42	21.18	1.3	-0.00	14	1.9	-0.4
11:26:57	21.17	1.3	-0.02	14	1.9	-0.3
11:27:12	21.17	1.3	-0.06	15	1.9	-0.3
11:27:27	21.16	1.3	-0.05	15	1.9	-0.3
11:27:42	21.16	1.3	0.00	15	1.9	-0.4
11:27:57	21.16	1.3	-0.03	14	1.9	-0.4
11:28:12	21.15	1.3	0.00	15	1.9	-0.4
11:28:27	21.15	1.3	0.00	15	2.0	-0.4
11:28:42	21.14	1.3	-0.02	15	2.0	-0.4

11:28:57	21.14	1.3	-0.00	15	2.0	-0.4
11:29:12	21.13	1.3	-0.04	15	2.0	-0.4
11:29:27	21.12	1.3	-0.03	15	1.9	-0.4
11:29:42	21.13	1.3	-0.05	15	1.9	-0.4
11:29:58	21.13	1.3	-0.02	15	1.9	-0.4
11:30:13	21.12	1.3	-0.05	15	2.0	-0.4
11:30:28	21.12	1.3	-0.02	14	1.9	-0.4
11:30:43	21.11	1.3	-0.07	18	1.9	-0.4
11:30:58	20.30	1.8	-0.01	43	2.8	-0.4
11:31:13	4.82	1.8	-0.06	51	2.7	-0.4
11:31:28	1.27	1.3	-0.05	71	2.6	-0.4
11:31:43	7.27	1.3	0.00	59	2.3	-0.4
11:31:58	18.61	1.3	-0.01	57	1.9	-0.4
11:32:13	20.60	1.3	-0.07	55	1.6	-0.4
11:32:28	20.98	1.3	-0.02	55	1.5	-0.4
11:32:43	21.05	1.3	0.00	54	1.4	-0.4
11:32:58	21.07	1.3	-0.04	59	1.4	-0.4
11:33:00 ZERO BIAS O2 CO SO2 NOX						
11:33:13	19.44	1.3	-0.08	62	1.4	-0.4
11:33:28	5.82	0.8	-0.06	61	1.4	-0.4
11:33:43	1.10	0.8	-0.01	62	1.4	-0.4
11:33:58	0.41	0.4	0.00	61	1.3	-0.4
11:34:13	0.27	0.4	-0.07	60	1.3	-0.4
11:34:28	0.25	0.4	-0.04	58	1.3	-0.4
11:34:43	0.23	0.4	-0.02	57	1.3	-0.4
11:34:58	0.22	0.4	-0.01	57	1.3	-0.4
11:35:14	0.21	0.4	0.00	3	1.3	-0.4
11:35:29	0.20	0.4	-0.02	54	1.3	-0.4
11:35:44	0.21	0.4	-0.04	54	1.3	-0.4
11:35:59	0.20	0.4	-0.07	52	1.3	-0.4
11:36:14	0.20	0.4	0.00	51	1.3	-0.4
11:36:29	0.19	0.4	-0.03	52	1.3	-0.4
11:36:44	0.19	0.4	-0.04	50	1.3	-0.5
11:36:59	0.19	0.4	-0.01	50	1.3	-0.5
11:37:02 11.54 O2 BIAS 251 PPM CO BIAS						
11:37:14	0.19	0.4	-0.04	49	1.3	-0.5
11:37:29	2.48	14.3	-0.01	45	1.1	-0.4
11:37:44	9.12	110.8	0.02	42	0.7	-0.5
11:37:59	11.34	159.4	0.03	39	0.4	-0.4
11:38:14	11.66	221.4	0.02	37	0.4	-0.4
11:38:29	11.72	236.9	-0.01	35	0.3	-0.4
11:38:44	11.74	252.0	-0.04	34	0.3	-0.4
11:38:59	11.74	253.1	-0.01	32	0.3	-0.4
11:39:14	11.75	254.6	-0.02	30	0.3	-0.4
11:39:29	11.75	255.1	0.02	30	0.3	-0.4
11:39:44	11.76	253.6	0.00	29	0.3	-0.4
11:39:59	11.75	253.6	-0.03	28	0.3	-0.4
11:40:15	11.76	252.6	0.00	28	0.3	-0.4
11:40:30	11.76	252.6	-0.04	28	0.4	-0.5
11:40:45	11.76	255.1	-0.01	27	0.4	-0.5
11:41:00	11.77	252.6	0.02	27	0.4	-0.4
11:41:15	11.76	253.6	0.03	26	0.4	-0.5
11:41:30	11.76	254.1	0.02	26	0.4	-0.4
11:41:45	11.75	253.6	-0.04	25	0.4	-0.5
11:42:00	11.76	253.1	0.00	25	0.4	-0.5
11:42:15	11.75	254.1	-0.01	24	0.4	-0.5
11:42:30	11.76	254.1	-0.04	24	0.4	-0.5
11:42:45	11.76	254.1	0.03	24	0.4	-0.5
11:43:00	11.76	254.1	0.00	24	0.4	-0.4
11:43:15	11.76	253.6	-0.03	23	0.4	-0.4

11:43:30	11.76	252.8	-0.04	23	0.4	-0.4
11:43:45	11.76	253.6	-0.02	23	0.4	-0.5
11:44:00	11.75	254.1	0.02	22	0.3	-0.5
11:44:15	11.74	254.6	-0.03	22	0.4	-0.4
11:44:30	11.76	254.1	0.02	22	0.4	-0.4
11:44:45	11.75	255.1	9.84	22	0.4	-0.5
11:45:00	11.76	255.1	9.41	22	0.3	-0.4
11:45:15 BIAS 86.8 PPM SO2						
11:45:16	11.76	253.6	9.65	22	0.3	-0.5
11:45:31	11.77	254.1	9.29	22	0.4	-0.5
11:45:46	16.03	196.5	3.91	22	0.9	-0.5
11:46:01	20.18	145.4	0.85	22	1.4	-0.5
11:46:16	20.96	57.3	0.30	22	1.6	-0.5
11:46:31	21.12	30.8	0.18	23	1.6	-0.4
11:46:46	21.16	5.7	0.14	24	2.0	-0.5
11:47:01	21.17	1.8	0.13	25	3.3	-0.4
11:47:16	21.17	0.4	0.12	25	5.5	-0.4
11:47:31	21.18	0.3	0.11	26	7.7	-0.4
11:47:46	21.18	0.4	0.11	25	10.4	-0.4
11:48:01	21.18	0.4	0.11	25	12.8	-0.4
11:48:16	21.19	0.4	0.10	25	15.5	-0.4
11:48:31	21.19	0.4	0.10	24	17.8	-0.4
11:48:46	21.19	0.3	0.10	24	19.8	-0.4
11:49:01	21.19	0.3	0.09	24	21.9	-0.4
11:49:16	21.19	0.3	0.10	23	23.5	-0.4
11:49:31	21.20	0.4	0.09	23	25.3	-0.4
11:49:46	21.19	0.3	0.08	23	26.8	-0.4
11:50:01	21.20	0.3	0.08	23	28.2	-0.4
11:50:17	21.20	0.3	0.08	22	29.7	-0.4
11:50:32	21.20	0.3	0.08	22	30.8	-0.4
11:50:47	21.20	0.4	0.08	22	31.9	-0.4
11:51:02	21.20	0.3	0.08	22	33.2	-0.4
11:51:17	21.20	0.3	0.08	21	34.1	-0.4
11:51:32	21.21	0.3	0.08	22	35.1	-0.4
11:51:47	21.20	0.3	0.08	21	36.0	-0.4
11:52:02	21.20	0.3	0.07	20	37.0	-0.4
11:52:17	21.20	0.3	0.06	20	37.9	-0.4
11:52:32	21.20	0.3	0.08	20	38.8	-0.4
11:52:47	21.21	0.3	0.06	20	39.7	-0.2
11:53:02	21.21	0.3	0.07	20	40.3	-0.3
11:53:17	21.21	0.3	0.08	19	41.0	-0.4
11:53:32	21.21	0.3	0.07	19	41.6	-0.4
11:53:47	21.20	0.3	0.07	19	42.2	-0.3
11:54:02	21.21	0.3	0.07	19	43.0	-0.4
11:54:17	21.21	0.3	0.07	19	43.5	-0.3
11:54:32	21.21	0.3	0.06	18	44.1	-0.4
11:54:47	21.21	0.3	0.07	18	44.8	-0.3
11:55:02	21.21	0.3	0.07	18	45.7	-0.4
11:55:18	21.21	0.3	0.06	18	46.1	-0.3
11:55:33	21.21	0.3	0.07	18	46.5	-0.4
11:55:48	21.21	0.3	0.07	18	47.0	-0.2
11:56:03	21.22	0.3	0.07	17	47.6	-0.3
11:56:18	21.19	0.3	0.07	17	48.2	-0.4
11:56:33	21.21	0.3	0.07	17	48.7	-0.4
11:56:48	21.21	0.3	0.05	17	48.9	-0.3
11:57:03	21.21	0.3	0.06	17	49.2	-0.4
11:57:18	21.21	0.3	0.07	17	49.6	-0.4
11:57:33	21.21	0.3	0.07	16	50.2	-0.3
11:57:48	21.21	0.3	0.07	16	50.7	-0.3
11:58:03	21.21	0.3	0.07	16	51.0	-0.2

11:58:18	21.20	0.3	0.06	16	51.6	-0.3
11:58:33	21.22	0.3	0.07	16	51.9	-0.3
11:58:48	21.21	0.3	0.07	16	52.3	-0.4
11:59:03	21.21	0.3	0.07	15	52.5	-0.4
11:59:18	21.21	0.3	0.06	16	52.8	-0.4
11:59:33	21.21	0.3	0.05	16	53.1	-0.4
11:59:45 BIAS NOX 849						
11:59:48	21.21	0.3	0.08	15	53.3	-0.4
12:00:03	21.21	0.3	0.07	18	53.7	-0.4
12:00:19	19.49	0.3	0.07	766	52.9	-0.3
12:00:34	6.55	0.3	0.07	833	40.2	-0.3
12:00:49	1.26	0.3	0.07	833	23.7	-0.4
12:01:04	0.46	0.3	0.07	846	15.6	-0.2
12:01:19	0.30	0.3	0.07	828	11.0	-0.4
12:01:34	0.27	0.3	0.07	837	8.9	-0.3
12:01:49	0.25	0.3	0.07	845	7.4	-0.4
12:02:04	0.24	0.3	0.05	851	6.5	-0.3
12:02:19	0.24	0.3	0.07	840	5.8	-0.4
12:02:34	0.23	0.3	0.07	846	5.3	-0.3
12:02:49	0.22	0.3	0.06	842	4.9	-0.4
12:03:04	0.22	0.3	0.06	850	4.6	-0.3
12:03:19	0.22	0.3	0.07	856	4.4	-0.3
12:03:34	0.22	0.3	0.06	863	4.2	-0.3
12:03:49 END CALS						
12:03:49	0.22	0.3	0.06	847	4.0	-0.3
12:04:04	0.21	0.3	0.05	836	4.0	-0.3
12:04:19	2.61	0.3	0.08	126	5.0	-0.3
12:04:34	15.78	0.3	0.09	46	4.6	-0.5
12:04:49	17.40	0.3	0.08	20	3.8	-0.5
12:04:59 ZERO ALL CHECK THROUGH SYSTEM						
12:05:04	4.38	0.3	0.07	16	3.2	-0.4
12:05:19	0.98	0.3	0.06	15	2.9	-0.5
12:05:35	0.29	0.3	0.06	15	2.7	-0.5
12:05:50	0.20	0.3	0.06	15	2.6	-0.5
12:06:05	0.18	0.3	0.06	14	2.4	-0.5
12:06:20	0.17	0.3	0.06	14	2.4	-0.5
12:06:35	0.18	0.3	0.06	14	2.3	-0.5
12:06:50	0.17	0.3	0.07	14	2.2	-0.5
12:07:05	0.17	0.3	0.05	14	2.2	-0.5
12:07:20	0.16	0.3	0.06	15	2.2	-0.5
12:07:35	0.17	0.3	0.07	14	2.1	-0.5
12:07:50	0.17	0.3	0.06	14	2.1	-0.5
12:08:05	0.16	0.3	0.06	15	2.0	-0.5
12:08:20	0.16	0.3	0.06	15	2.0	-0.5
12:08:35	0.16	0.3	0.06	15	2.0	-0.5
12:08:50	0.16	0.3	0.06	15	1.9	-0.5
12:09:05	0.16	0.3	0.06	15	1.9	-0.5
12:09:20	0.16	0.3	0.06	15	1.9	-0.5
12:09:35	0.16	0.3	0.06	15	1.9	-0.4
12:09:50	0.16	0.3	0.06	15	1.8	-0.5
12:10:05	0.16	0.3	0.06	15	1.8	-0.5
12:10:20	0.15	0.3	0.07	16	1.8	-0.5
12:10:36	0.15	0.3	0.06	16	1.8	-0.5
12:10:51	0.15	0.3	0.06	16	1.8	-0.5
12:11:06	0.16	0.3	0.06	16	1.7	-0.5
12:11:21	0.15	0.3	0.06	16	1.7	-0.5
12:11:36	0.15	0.3	0.06	16	1.7	-0.5

12:11:51	0.15	0.3	0.06	17	1.7	-0.5
12:12:06	0.16	0.3	0.06	17	1.7	-0.1
12:12:21	0.15	0.3	0.06	19	1.7	0.7
12:12:36	9.42	0.8	0.09	17	1.8	0.6
12:12:51	18.38	0.8	0.10	212	1.9	5.6
12:13:06	20.63	8.2	0.43	429	2.7	6.1
12:13:21	20.85	17.2	0.61	487	3.9	6.9
12:13:36	20.87	36.7	0.66	672	4.5	6.8
12:13:51	20.89	43.1	0.67	780	4.6	6.7
12:14:06	20.89	47.6	0.65	875	4.6	6.6
12:14:21	20.91	46.2	0.62	978	4.6	6.9

12:14:25 ON LINE RUN #4 HEPA FILTER OUTLET

12:14:36 9/27/94

12:14:36	20.93	42.2	0.60	1024	4.7	7.2
12:14:51	20.94	40.7	0.59	462	4.9	7.5
12:15:06	20.93	39.6	0.59	1183	5.1	7.6
12:15:21	20.93	40.2	0.60	1263	5.2	7.5
12:15:37	20.93	40.7	0.60	1279	5.3	7.4
12:15:39	CHANGE TO 2500 PPM RANGE					
12:15:52	20.93	40.2	0.60	1289	5.4	8.2
12:16:07	20.91	42.2	0.65	1277	5.5	8.2
12:16:22	20.90	45.2	0.66	1289	5.3	8.0
12:16:52	20.90	47.6	0.68	1287	4.9	7.7
12:17:22	20.92	44.7	0.62	1299	4.6	7.5
12:17:52	20.93	41.1	0.61	1329	4.4	7.9
12:18:22	20.91	44.2	0.64	1361	4.4	7.9
12:18:52	20.89	47.6	0.68	1343	4.3	8.0
12:19:22	20.90	49.6	0.66	1331	4.2	7.6
12:19:52	20.91	45.6	0.61	1339	4.2	7.3
12:20:22	20.90	44.2	0.62	1367	4.2	7.9
12:20:52	20.88	47.2	0.68	1388	4.3	7.7
12:21:22	20.88	50.7	0.67	1405	4.3	7.3
12:21:52	20.90	47.2	0.61	1432	4.2	7.3
12:22:22	20.91	42.7	0.59	1441	4.3	7.1
12:22:53	20.91	42.2	0.61	1443	4.3	8.4
12:23:23	20.88	48.2	0.67	1391	4.3	8.5
12:23:53	20.85	54.8	0.74	1387	4.2	8.4
12:24:23	20.82	56.4	0.74	1337	4.0	8.2

12:24:34 ON LIN POST-DEMISTER

12:24:53	20.84	56.3	0.73	1315	3.7	8.6
12:25:23	20.84	62.8	0.85	1663	5.8	16.0
12:25:53	20.61	99.7	1.26	1795	11.8	14.9
12:26:23	20.61	115.2	1.18	2083	12.3	14.7
12:26:53	20.56	117.9	1.24	2087	12.3	14.8
12:27:23	20.49	145.9	1.87	746	15.4	19.5
12:27:54	20.32	217.8	2.13	3046	32.6	16.4
12:28:24	20.52	182.9	1.75	3117	38.3	14.8
12:28:33	CHANGE RANGE TO 10000					
12:28:54	20.57	135.8	1.66	3223	40.2	12.5
12:29:24	20.67	99.7	1.47	3220	41.3	11.0
12:29:54	20.79	63.8	1.01	2794	28.4	8.8
12:30:24	20.88	32.7	0.74	2987	17.7	9.0
12:30:54	20.91	20.7	0.66	3113	19.8	8.6
12:31:24	20.90	15.7	0.61	3100	17.8	8.3
12:31:54	20.91	14.2	0.58	3009	15.3	8.3

12:32:24	20.89	14.7	0.56	2869	11.1	8.3
12:32:55	20.89	15.2	0.55	3339	11.5	8.6
12:33:25	20.87	16.3	0.71	3192	19.5	8.9
12:33:55	20.78	28.2	0.86	2781	15.6	8.5
12:34:25	20.78	33.7	0.81	2672	10.8	8.1
12:34:55	20.81	31.2	0.71	2631	8.7	8.2
12:35:25	20.86	27.7	0.55	2647	6.6	8.2

12:35:40 ON LINE POST QUENCH

12:35:55	20.90	17.2	0.46	2660	5.6	4.8
12:36:25	20.91	10.2	0.40	2691	4.9	10.0
12:36:55	20.91	7.2	0.37	2966	4.8	9.9
12:37:25	20.92	7.7	0.34	3142	4.4	9.5
12:37:56	20.91	6.7	0.31	3336	4.3	9.2
12:38:26	20.91	4.2	0.28	3429	4.2	9.0
12:38:56	20.93	3.3	0.27	3491	4.1	8.8
12:39:26	20.91	2.8	0.26	3457	4.0	8.5
12:39:56	20.91	2.3	0.24	3441	3.9	8.3
12:40:26	20.92	2.3	0.24	3303	3.9	8.1
12:40:56	20.91	1.7	0.23	3319	3.9	7.9
12:41:26	20.91	1.7	0.22	3222	3.9	7.7
12:41:56	20.91	1.3	0.21	3189	3.9	7.5
12:42:26	20.91	1.3	0.21	3064	4.0	7.4
12:42:57	20.91	1.3	0.20	3026	4.0	7.2

[illegible] LINE [illegible] ST

12:43:27	20.91	1.3	0.21	3008	4.1	7.2
12:43:57	20.91	1.3	0.20	2932	4.1	7.2
12:44:27	20.88	2.3	0.25	3053	5.5	7.4
12:44:57	20.87	3.7	0.29	2948	5.6	8.4
12:45:27	20.82	9.2	0.39	3019	5.7	11.4
12:45:57	20.71	27.2	0.71	3073	7.5	12.0

12:46:04 ON LINE MELTER EXHAUST

12:46:27	20.68	45.6	0.77	2956	9.6	10.3
12:46:57	20.69	46.7	0.77	3091	10.9	7.4
12:47:27	20.73	33.2	0.65	3147	13.3	7.8
12:47:57	20.73	24.2	0.68	3097	14.2	11.2
12:48:28	20.65	35.7	0.82	2944	13.7	14.3
12:48:58	20.64	47.6	0.96	3093	14.4	26.2
12:49:28	20.24	130.4	1.77	2989	20.5	23.3
12:49:58	20.41	141.3	1.41	3167	23.8	22.7
12:50:28	20.43	108.2	1.28	3342	21.6	21.0
12:50:58	20.42	106.6	1.27	3549	20.1	20.2
12:51:28	20.43	108.7	1.18	3631	19.1	20.7
12:51:58	20.43	109.6	1.15	3761	17.7	21.0
12:52:28	20.42	111.1	1.13	3685	17.3	18.1
12:52:58	20.48	102.2	1.01	3948	17.0	20.5
12:53:29	20.44	95.7	1.16	3942	21.0	20.1
12:53:59	20.46	97.2	1.01	3800	20.4	18.3
12:54:29	20.52	75.7	0.91	3983	17.1	18.8
12:54:59	20.51	66.3	0.91	3875	16.7	17.3
12:55:29	20.50	66.3	0.89	3872	16.1	17.6
12:55:59	20.52	63.7	0.87	3798	14.7	17.6
12:56:29	20.50	64.3	0.87	3850	14.5	18.4
12:56:59	20.48	67.7	0.88	3776	14.6	15.9
12:57:29	20.53	60.3	0.83	2954	12.5	19.3

12:57:38 END TEST #4

12:57:59	3.65	34.2	0.22	2530	5.7	7.7
12:58:21 ZERO BIAS O2 CO SO2 NOX						
12:58:30	18.34	8.2	0.16	2274	4.5	13.4
12:59:00	2.96	1.2	0.13	601	3.7	13.7
12:59:26 ZERO THC						
12:59:30	0.13	0.3	0.11	301	3.4	14.7
13:00:00	0.05	0.3	0.12	2285	3.3	15.2
13:00:30	0.03	0.3	0.11	196	3.3	1.3
13:01:00	0.02	0.3	0.12	177	3.3	1.0
13:01:30	0.02	0.3	0.11	171	3.3	0.7
13:02:00	0.02	0.3	0.10	169	3.3	0.6
13:02:30	0.02	0.3	0.11	170	3.3	0.4
13:03:00	0.01	0.3	0.10	170	3.4	0.4
13:03:01 MID BIAS O2 11.54 251 PPM CO						
13:03:31	0.12	1.7	1.44	566	3.3	0.3
13:04:01	10.56	128.9	9.18	365	2.3	0.2
13:04:24 BIAS CHECK THC 31.0 PPM						
13:04:31	11.48	231.2	9.59	324	2.1	0.2
13:05:01	11.50	258.5	9.61	301	2.1	10.4
13:05:31	11.52	260.9	9.62	287	2.0	25.1
13:06:01	11.52	261.4	9.63	272	2.1	25.2
13:06:31	11.53	261.4	9.64	263	2.0	25.2
13:07:01	11.53	260.4	9.64	254	1.9	25.3
13:07:11 BIAS CHECK 849 PPM NOX						
13:07:31	11.53	260.4	9.64	246	1.9	25.3
13:08:01	18.13	149.8	2.09	392	2.7	25.4
13:08:32	20.90	60.3	0.27	453	3.1	25.6
13:09:02	21.01	6.7	0.17	448	3.1	25.7
13:09:32	21.02	0.8	0.15	422	3.0	25.9
13:10:02	21.03	0.3	0.13	390	2.9	26.0
13:10:32	21.05	0.3	0.13	358	2.8	26.1
13:10:56 NOW 849 BIAS NOX						
13:11:02	21.04	0.3	0.12	324	2.7	26.2
13:11:32	17.34	0.3	0.12	1014	3.5	26.3
13:12:02	0.86	0.3	0.10	1000	3.1	26.5
13:12:32	0.14	0.3	0.09	970	2.8	26.6
13:13:02 PURGE THC W/AIR						
13:13:02	0.10	0.3	0.09	951	2.7	26.7
13:13:33	0.08	0.3	0.09	934	2.7	26.8
13:14:03	0.08	0.3	0.09	926	2.2	0.3
13:14:33	0.07	0.3	0.09	928	1.6	0.1
13:15:03	0.07	0.3	0.09	918	1.6	0.0
13:15:33	0.06	0.3	0.08	903	1.5	-0.1
13:16:03	0.06	0.3	0.08	905	1.5	-0.1
13:16:33	0.07	0.3	0.08	904	1.4	-0.1
13:17:03	0.06	0.3	0.08	895	1.3	-0.1
13:17:22 ZERO BIAS NOX						
13:17:33	0.06	0.3	0.08	803	1.2	-0.1
13:18:03	0.10	0.3	0.08	139	0.7	-0.2
13:18:34	0.02	0.3	0.07	128	0.6	-0.3
13:19:04	0.02	0.3	0.08	123	0.3	-0.3
13:19:34	0.02	0.3	0.08	120	0.3	-0.4
13:20:04	0.02	0.3	0.08	118	0.4	-0.3
13:20:34	0.02	0.3	0.07	116	0.3	-0.3
13:21:02 86.8 PPM SO2 BIAS						
13:21:04	0.02	0.3	0.07	114	0.1	-0.2
13:21:34	0.06	0.3	0.08	149	0.3	-0.2
13:22:04	18.93	0.3	0.08	139	0.7	-0.2
13:22:34	20.76	0.3	0.07	129	0.8	-0.2
13:23:04	20.83	0.3	0.08	115	0.9	-0.2

13:23:35	20.85	0.3	0.08	101	1.0	-0.2
13:24:05	20.86	0.3	0.08	91	1.2	-0.2
13:24:35	20.87	0.3	0.07	84	1.5	-0.2
13:25:05	20.87	0.3	0.07	77	1.7	-0.3
13:25:35	20.87	0.3	0.07	73	2.1	-0.3
13:26:05	20.88	0.3	0.08	67	2.6	-0.3
13:26:35	20.88	0.3	0.00	63	3.0	-0.4
13:27:05	20.88	0.3	-0.00	61	3.5	-0.4
13:27:35	20.88	0.3	-0.02	57	3.8	-0.4
13:28:05	20.89	0.3	-0.06	56	4.2	-0.4
13:28:36	20.89	0.3	0.01	55	4.6	-0.5
13:29:06	20.88	0.3	0.01	73	4.8	-0.6
13:29:36	20.87	0.3	-0.05	62	3.9	-0.6
13:30:06	20.86	0.8	0.01	63	2.9	-0.6
13:30:36	20.85	0.8	-0.06	70	2.4	-0.7
13:31:06	20.84	0.8	0.01	79	2.2	-0.6
13:31:36	20.84	0.8	0.00	81	2.1	7.9
13:31:47	86.8 PPM SO2 BIAS					
13:32:06	20.85	0.3	-0.03	76	1.7	11.5
13:32:36	20.85	0.3	-0.02	73	1.6	14.8
13:33:06	20.86	0.3	-0.03	64	2.3	-0.0
13:33:37	20.87	0.3	-0.05	58	3.9	0.0
13:34:07	20.87	0.3	-0.07	53	5.6	0.0
13:34:37	20.82	0.8	0.01	56	3.7	0.0
13:35:07	END CALS					
13:35:07	20.78	1.3	-0.05	51	2.4	0.0

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Accession #: D295184054

Document #: SD-WM-VI-028

Title/Desc:
GTS DURATEK PHASE 1 HANFORD LLW MELTER TESTS 100KG MELTER OFFGAS REPORT [SEC 3 OF 3]

Pages: 125

This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

DOCUMENT NUMBER: SD-WM-VI-028 REV 0

SECTION 3 OF 3

TITLE: GTS DURATEK PHASE I HANFORD LLW MELTER TESTS 100 Kg MELTER OFFGAS REPORT

DATE: 11/30/95

ORIGINATOR: EATON WC

CO: WHC

RECIPIENT:

CO:

REFERENCES: EDT-611884

APPENDIX C

COMPUTER SUMMARIES AND CALCULATIONS

TEST SUMMARY
PARTICULATE EMISSIONS TEST RESULTS

PLANT : CATHOLIC UNIVERSITY
DATE : 9-27-94
SAMPLING LOCATION :INLET (OUTLET OF MELTER)
OPERATING COND. : 100 kg/day

	RUN NO. CU-MMT-I-01	RUN NO. CU-MMT-I-02	RUN NO. CU-MMT-I-03	TEST AVERAGE
GAS FLOW RATE (dscf/min)	82	77	77	79
(acf/min)	183	173	176	177
STACK TEMP. (DEG. R)	1069	1069	1069	1069
ISOKINETIC (%)	100.4	103.1	107.4	103.6
MOISTURE (% H2O)	5.98	6.03	8.11	6.70
SAMPLE VOLUME (dscf)	37.774	36.661	38.152	37.529
CONDENSATE VOL. (ml)	51	50	71.5	57.5
METER TEMP. (DEG. R)	550	552	554	552
PART. EMISSIONS (grains / dscf)	0.2050	0.3340	0.7509	0.4300
PART. EMISSIONS (lb /hour)	0.1436	0.2210	0.4964	0.2870

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. CU-MMT-I-01

PLANT : CATHOLIC UNIVERSITY
DATE : 9-27-94
SAMP. LOCATION : INLET (OUTLET OF MELTER)
OPERATING COND.: 100 kg/day

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.350	in.
BAR. PRESSURE =	29.69	in.Hg	NOZZLE AREA =	0.000668	Sq.Ft.
STK. PRESSURE =	28.81	in.Hg	METER ORIFICE =	1.450	in. H2O
EFF. STACK AREA =	0.09	Sq.Ft.	METER VOLUME =	37.989	Cu.Ft.
Cp =	0.99		METER TEMP. =	550	DEG. R
GAS ANALYSIS =	0.0	% CO2	STACK TEMP. =	1069	DEG. R
	20.9	% O2	SQ.RT. dP =	0.361	in. H2O
	0.0	% CO	COND.(Vlc) =	51.0	ml
	79.1	% N2	METER Y =	1.040	
LAB ANALYSIS =	0.5019	grams	HEAT INPUT =	***	MM Btu/hr
			F-FACTOR =	9780	dscf/MM Btu

********* ********* ********** ********** ********** **********

Vw(std) = 0.04707 x Vlc = 2.401 scf

Vm(std) = 17.64 x Vm x Y x (Pb + (dH / 13.6)) / (Tm) = 37.774 scf

Bws = Vw(std) / (Vm(std) + Vw(std)) = 0.060

%EA =(%O2 − 0.5%CO) / (0.264%N2 − (%O2 − 0.5%CO)) = −1187.500

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 28.84

Ms = (Md x (1−Bws)) + (18.0 x Bws) = 28.19

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts) / (Ms x Ps)] = 35.0 ft/sec

Qs = vs x As x 60 = 183 acf/min

Qs(std)=Qs x (1−Bws)x(528/(Ts)) x (Ps/29.92)= 82 dscf/min

I = (Ts) x [(0.00267 x Vlc) + (Vm(std) / 17.64)] x 100 / (Time x Ps x An x vs x 60) = 100.4 %

********* ********* ********** ********** ********** **********

cs = 15.432 x grams / Vm(std) = 0.2050 grains/dscf

grains/acf = cs x 17.64xPs x (1−Bws) / (Ts) = 0.0917 grains/acf

C = cs / 7000 = 2.93E−05 lbs/dscf

EM = C x Qs(std) x 60 = 0.144 lbs/hr

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. CU-MMT-I-02

PLANT : CATHOLIC UNIVERSITY
DATE : 9-27-94
SAMP. LOCATION : INLET (OUTLET OF MELTER)
OPERATING COND.: 100 kg/day

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.350	in.
BAR. PRESSURE =	29.71	in.Hg	NOZZLE AREA =	0.000668	Sq.Ft.
STK. PRESSURE =	28.82	in.Hg	METER ORIFICE =	1.250	in. H2O
EFF. STACK AREA =	0.09	Sq.Ft.	METER VOLUME =	37.045	Cu.Ft.
Cp =	0.99		METER TEMP. =	552	DEG. R
GAS ANALYSIS =	0.0	% CO2	STACK TEMP. =	1069	DEG. R
	20.9	% O2	SQ.RT. dP =	0.341	in. H2O
	0.0	% CO	COND.(Vic) =	50.0	ml
	79.1	% N2	METER Y =	1.040	
LAB ANALYSIS =	0.7935	grams	HEAT INPUT =	***	MM Btu/hr
			F-FACTOR =	9780	dscf/MM Btu

********* ********* ********** ********* ********* *********

Vw(std) = 0.04707 x Vic	=	2.354	scf
Vm(std) = 17.64 x Vm x Y x (Pb + (dH / 13.6)) / (Tm)	=	36.661	scf
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.060	
%EA =(%O2 - 0.5%CO) / (0.264%N2 - (%O2 - 0.5%CO)) =		-1187.500	
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] =		28.84	
Ms = (Md x (1-Bws)) + (18.0 x Bws)	=	28.18	
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts) / (Ms x Ps)]	=	33.1	ft/sec
Qs = vs x As x 60	=	173	acf/min
Qs(std)=Qs x (1-Bws)x(528/(Ts)) x (Ps/29.92)=		77	dscf/min
I = (Ts) x [(0.00267 x Vic) + (Vm(std) / 17.64)] x 100 / (Time x Ps x An x vs x 60)	=	103.1	%

********* ********* ********** ********* ********* *********

cs = 15.432 x grams / Vm(std)	=	0.3340	grains/dscf
grains/acf = cs x 17.64xPs x (1-Bws) / (Ts) =		0.1493	grains/acf
C = cs / 7000	=	4.77E-05	lbs/dscf
EM = C x Qs(std) x 60	=	0.221	lbs/hr

U.S EPA
PARTICULATE CALCULATIONS
RUN NO. CU-MMT-I-03

PLANT : CATHOLIC UNIVERSITY
DATE : 9-27-94
SAMP. LOCATION : INLET (OUTLET OF MELTER)
OPERATING COND.: 100 kg/day

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.350	in.
BAR. PRESSURE =	29.74	in.Hg	NOZZLE AREA =	0.000668	Sq.Ft.
STK. PRESSURE =	28.86	in.Hg	METER ORIFICE =	1.400	in. H2O
EFF. STACK AREA =	0.09	Sq.Ft.	METER VOLUME =	38.603	Cu.Ft.
Cp =	0.99		METER TEMP. =	554	DEG. R
GAS ANALYSIS =	0.0	% CO2	STACK TEMP. =	1069	DEG. R
	20.9	% O2	SQ.RT. dP =	0.346	in. H2O
	0.0	% CO	COND.(Vic) =	71.5	ml
	79.1	% N2	METER Y =	1.040	
LAB ANALYSIS =	1.8565	grams	HEAT INPUT =	***	MM Btu/hr
			F-FACTOR =	9780	dscf/MM Btu

********* ********* ********** ********* ********* *********

Vw(std) = 0.04707 x Vic	=	3.366	scf
Vm(std) = 17.64 x Vm x Y x (Pb + (dH / 13.6)) / (Tm)	=	38.152	scf
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.081	
%EA =(%O2 − 0.5%CO) / (0.264%N2 − (%O2 − 0.5%CO)) =		−1187.500	
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] =		28.84	
Ms = (Md x (1−Bws)) + (18.0 x Bws)	=	27.96	
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts) / (Ms x Ps)]	=	33.7	ft/sec
Qs = vs x As x 60	=	176	acf/min
Qs(std)=Qs x (1−Bws)x(528/(Ts)) x (Ps/29.92)=		77	dscf/min
I = (Ts) x [(0.00267 x Vic) + (Vm(std) / 17.64)] x 100 / (Time x Ps x An x vs x 60)	=	107.4	%

********* ********* ********** ********* ********* *********

cs = 15.432 x grams / Vm(std)	=	0.7509	grains/dscf
grains/acf = cs x 17.64xPs x (1−Bws) / (Ts) =		0.3286	grains/acf
C = cs / 7000	=	1.07E−04	lbs/dscf
EM = C x Qs(std) x 60	=	0.496	lbs/hr

FIELD DATA FORM

RUN # CU-MMT-I-01

| 1. {NumLock} to enter data. Turn off to move cursor.
| 2. {Ctrl}{Break} after data entry.
| 3.{Alt}M for next run.

I. INPUT DATA

NET METER VOLUME (CU.FT.):	37.989
CONDENSATE VOLUME (ml):	51
LAB ANALYSIS (g):	0.5019

II. FIELD DATA

POINT NO.	delta P	delta H	STACK TEMP. (F)	Tm Inlet (F)	Tm Outlet (F)	SQ.RT. dP
1	0.13	1.45	609	74	74	0.361
2	0.13	1.45	609	86	87	0.361
3	0.13	1.45	609	88	87	0.361
4	0.13	1.45	609	91	88	0.361
5	0.13	1.45	609	92	89	0.361
6	0.13	1.45	609	93	89	0.361
7	0.13	1.45	609	95	90	0.361
8	0.13	1.45	609	96	91	0.361
9	0.13	1.45	609	96	91	0.361
10	0.13	1.45	609	95	90	0.361
11	0.13	1.45	609	95	90	0.361
12	0.13	1.45	609	96	91	0.361
13						0.000
14						0.000
15						0.000
16						0.000
17						0.000
18						0.000
19						0.000
20						0.000
21						0.000
22						0.000
23						0.000
24						0.000
25						0.000
26						0.000
27						0.000
28						0.000
29						0.000
30						0.000
31						0.000
32						0.000
33						0.000
34						0.000
35						0.000

36					0.000
37					0.000
38					0.000
39					0.000
40					0.000
41					0.000
42					0.000
43					0.000
44					0.000
45					0.000
46					0.000
47					0.000
48					0.000
49					0.000
50					0.000
51					0.000
52					0.000
53					0.000
54					0.000
55					0.000
56					0.000
57					0.000
58					0.000
59					0.000
60					0.000
	d H	Ts (F)	Tm (F)	sq.rt. dP	
	1.450	609.0	89.8		0.361

FIELD DATA FORM

RUN # CU--MMT--1--02

| 1. {NumLock} to enter data. Turn off to move cursor.
| 2. {Ctrl}{Break} after data entry.
| 3.{Alt}M for next run.

I. INPUT DATA

NET METER VOLUME (CU.FT.):	37.045
CONDENSATE VOLUME (ml):	50
LAB ANALYSIS (g):	0.7935

II. FIELD DATA

POINT NO.	delta P	delta H	STACK TEMP. (F)	Tm Inlet (F)	Tm Outlet (F)	SQ.RT. dP
1	0.12	1.25	609	88	88	0.341
2	0.12	1.25	609	89	89	0.341
3	0.12	1.25	609	90	89	0.341
4	0.12	1.25	609	93	90	0.341
5	0.12	1.25	609	94	90	0.341
6	0.12	1.25	609	95	91	0.341
7	0.12	1.25	609	95	91	0.341
8	0.12	1.25	609	96	91	0.341
9	0.12	1.25	609	97	92	0.341
10	0.12	1.25	609	97	92	0.341
11	0.12	1.25	609	98	93	0.341
12	0.12	1.25	609	98	93	0.341
13						0.000
14						0.000
15						0.000
16						0.000
17						0.000
18						0.000
19						0.000
20						0.000
21						0.000
22						0.000
23						0.000
24						0.000
25						0.000
26						0.000
27						0.000
28						0.000
29						0.000
30						0.000
31						0.000
32						0.000
33						0.000
34						0.000
35						0.000
36						0.000
37						0.000

38					0.000
39					0.000
40					0.000
41					0.000
42					0.000
43					0.000
44					0.000
45					0.000
46					0.000
47					0.000
48					0.000
49					0.000
50					0.000
51					0.000
52					0.000
53					0.000
54					0.000
55					0.000
56					0.000
57					0.000
58					0.000
59					0.000
60					0.000
	d H	Ts (F)	Tm (F)	sq.rt. dP	
	1.250	609.0	92.5		0.341

FIELD DATA FORM

RUN # CU-MMT-I-03

| 1. {NumLock} to enter data. Turn off to move cursor. | 2. {Ctrl}{Break} after data entry. | 3.{Alt}M for next run. |

I. INPUT DATA

NET METER VOLUME (CU.FT.):	38.603
CONDENSATE VOLUME (ml):	71.5
LAB ANALYSIS (g):	1.8565

II. FIELD DATA

POINT NO.	delta P	delta H	STACK TEMP. (F)	Tm Inlet (F)	Tm Outlet (F)	SQ.RT. dP
1	0.12	1.40	609	91	91	0.346
2	0.12	1.40	609	91	90	0.346
3	0.12	1.40	609	93	91	0.346
4	0.12	1.40	609	94	91	0.346
5	0.12	1.40	609	95	92	0.346
6	0.12	1.40	609	96	93	0.346
7	0.12	1.40	609	96	92	0.346
8	0.12	1.40	609	97	93	0.346
9	0.12	1.40	609	98	94	0.346
10	0.12	1.40	609	98	94	0.346
11	0.12	1.40	609	98	94	0.346
12	0.12	1.40	609	98	95	0.346
13						0.000
14						0.000
15						0.000
16						0.000
17						0.000
18						0.000
19						0.000
20						0.000
21						0.000
22						0.000
23						0.000
24						0.000
25						0.000
26						0.000
27						0.000
28						0.000
29						0.000
30						0.000
31						0.000
32						0.000
33						0.000
34						0.000
35						0.000
36						0.000
37						0.000

38					0.000
39					0.000
40					0.000
41					0.000
42					0.000
43					0.000
44					0.000
45					0.000
46					0.000
47					0.000
48					0.000
49					0.000
50					0.000
51					0.000
52					0.000
53					0.000
54					0.000
55					0.000
56					0.000
57					0.000
58					0.000
59					0.000
60					0.000
	d H	Ts (F)	Tm (F)	sq.rt. dP	
	1.400	609.0	94.0		0.346

TEST SUMMARY
PARTICULATE EMISSIONS TEST RESULTS

PLANT : CATHOLIC UNIVERSITY
DATE : 9-26-94
SAMPLING LOCATION :BAGHOUSE OUTLET
OPERATING COND. :

	RUN NO. CU-MMT-O-01 (a)	RUN NO. CU-MMT-O-02	RUN NO. CU-MMT-O-03	RUN NO. CU-MMT-O-04	TEST AVERAGE
GAS FLOW RATE (dscf/min)	185	181	182	201	188
(acf/min)	217	201	206	227	211
STACK TEMP. (DEG. R)	578	550	563	562	558
ISOKINETIC (%)	86.7	103.5	98.4	94.7	98.9
MOISTURE (% H2O)	3.41	2.61	2.74	2.70	2.68
SAMPLE VOLUME (dscf)	36.034	42.111	40.127	41.573	41.270
CONDENSATE VOL. (ml)	27	24	24	24.5	24
METER TEMP. (DEG. R)	559	553	557	552	554
PART. EMISSIONS (grains / dscf)	0.0046	0.0018	0.0028	0.0027	0.0024
PART. EMISSIONS (lb/hour)	0.0073	0.0028	0.0044	0.0047	0.0040

a = aborted run (final results are not included in averages)

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. CU-MMT-O-01

PLANT : CATHOLIC UNIVERSITY
DATE : 9-26-94
SAMP. LOCATION : BAGHOUSE OUTLET
OPERATING COND.:

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.306	in.
BAR. PRESSURE =	29.75	in.Hg	NOZZLE AREA =	0.000511	Sq.Ft.
STK. PRESSURE =	28.87	in.Hg	METER ORIFICE =	1.700	in. H2O
EFF. STACK AREA =	0.14	Sq.Ft.	METER VOLUME =	38.390	Cu.Ft.
Cp =	0.99		METER TEMP. =	559	DEG. R
GAS ANALYSIS =	0.0	% CO2	STACK TEMP. =	578	DEG. R
	20.9	% O2	SQ.RT. dP =	0.374	in. H2O
		% CO	COND.(Vlc) =	27.0	ml
	79.1	% N2	METER Y =	0.996	
LAB ANALYSIS =	0.0107	grams	HEAT INPUT =	***	MM Btu/hr
			F-FACTOR =	9780	dscf/MM Btu

********* ********* ********** ********* ********* *********

Vw(std) = 0.04707 x Vlc	=	1.271	scf
Vm(std) = 17.64 x Vm x Y x (Pb + (dH / 13.6)) / (Tm)	=	36.034	scf
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.034	
%EA =(%O2 − 0.5%CO) / (0.264%N2 − (%O2 − 0.5%CO)) =		−1187.500	
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] =		28.84	
Ms = (Md x (1−Bws)) + (18.0 x Bws)	=	28.47	
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts) / (Ms x Ps)]	=	26.6	ft/sec
Qs = vs x As x 60	=	217	acf/min
Qs(std)=Qs x (1−Bws)x(528/(Ts)) x (Ps/29.92)=		185	dscf/min
I = (Ts) x [(0.00267 x Vlc) + (Vm(std) / 17.64)] x 100 / (Time x Ps x An x vs x 60)	=	86.7	%

********* ********* ********** ********* ********* *********

cs = 15.432 x grams / Vm(std)	=	0.0046	grains/dscf
grains/acf = cs x 17.64xPs x (1−Bws) / (Ts) =		0.0039	grains/acf
C = cs / 7000	=	6.55E−07	lbs/dscf
EM = C x Qs(std) x 60	=	0.007	lbs/hr

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. CU--MM--O--02

PLANT : CATHOLIC UNIVERSITY
DATE : 9-26-94
SAMP. LOCATION : BAGHOUSE OUTLET
OPERATING COND.:

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.306	in.
BAR. PRESSURE =	29.75	in.Hg	NOZZLE AREA =	0.000511	Sq.Ft.
STK. PRESSURE =	28.87	in.Hg	METER ORIFICE =	1.800	in. H2O
EFF. STACK AREA =	0.14	Sq.Ft.	METER VOLUME =	44.345	Cu.Ft.
Cp =	0.99		METER TEMP. =	553	DEG. R
GAS ANALYSIS =	0.0	% CO2	STACK TEMP. =	550	DEG. R
	20.9	% O2	SQ.RT. dP =	0.355	in. H2O
		% CO	COND.(Vic) =	24.0	ml
	79.1	% N2	METER Y =	0.996	
LAB ANALYSIS =	0.0050	grams	HEAT INPUT =	***	MM Btu/hr
			F-FACTOR =	9780	dscf/MM Btu

********* ********* ********** ********* ********* *********

Vw(std) = 0.04707 x Vic = 1.130 scf

Vm(std) = 17.64 x Vm x Y x (Pb + (dH / 13.6)) / (Tm) = 42.111 scf

Bws = Vw(std) / (Vm(std) + Vw(std)) = 0.026

%EA =(%O2 - 0.5%CO) / (0.264%N2 - (%O2 - 0.5%CO)) = -1187.500

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 28.84

Ms = (Md x (1-Bws)) + (18.0 x Bws) = 28.55

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts) / (Ms x Ps)] = 24.5 ft/sec

Qs = vs x As x 60 = 201 acf/min

Qs(std)=Qs x (1-Bws)x(528/(Ts)) x (Ps/29.92)= 181 dscf/min

I = (Ts) x [(0.00267 x Vic) + (Vm(std) / 17.64)] x 100 / (Time x Ps x An x vs x 60) = 103.5 %

********* ********* ********** ********* ********* *********

cs = 15.432 x grams / Vm(std) = 0.0018 grains/dscf

grains/acf = cs x 17.64xPs x (1-Bws) / (Ts) = 0.0017 grains/acf

C = cs / 7000 = 2.62E-07 lbs/dscf

EM = C x Qs(std) x 60 = 0.003 lbs/hr

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. CU-MMT-O-03

PLANT : CATHOLIC UNIVERSITY
DATE : 9-26-94
SAMP. LOCATION : BAGHOUSE OUTLET
OPERATING COND.:

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.306	in.
BAR. PRESSURE =	29.75	in.Hg	NOZZLE AREA =	0.000511	Sq.Ft.
STK. PRESSURE =	28.87	in.Hg	METER ORIFICE =	1.800	in. H2O
EFF. STACK AREA =	0.14	Sq.Ft.	METER VOLUME =	42.600	Cu.Ft.
Cp =	0.99		METER TEMP. =	557	DEG. R
GAS ANALYSIS =	0.0	% CO2	STACK TEMP. =	563	DEG. R
	20.9	% O2	SQ.RT. dP =	0.361	in. H2O
		% CO	COND.(Vic) =	24.0	ml
	79.1	% N2	METER Y =	0.996	
LAB ANALYSIS =	0.0073	grams	HEAT INPUT =	***	MM Btu/hr
			F-FACTOR =	9780	dscf/MM Btu

********* ********* ********** ********* ********* *********

Vw(std) = 0.04707 x Vic	=	1.130	scf
Vm(std) = 17.64 x Vm x Y x (Pb + (dH / 13.6)) / (Tm)	=	40.127	scf
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.027	
%EA =(%O2 - 0.5%CO) / (0.264%N2 - (%O2 - 0.5%CO)) =		-1187.500	
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] =		28.84	
Ms = (Md x (1-Bws)) + (18.0 x Bws)	=	28.54	
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts) / (Ms x Ps)]	=	25.2	ft/sec
Qs = vs x As x 60	=	206	acf/min
Qs(std)=Qs x (1-Bws)x(528/(Ts)) x (Ps/29.92)=		182	dscf/min
I = (Ts) x [(0.00267 x Vic) + (Vm(std) / 17.64)] x 100 / (Time x Ps x An x vs x 60)	=	98.4	%

********* ********* ********** ********* ********* *********

cs = 15.432 x grams / Vm(std)	=	0.0028	grains/dscf
grains/acf = cs x 17.64xPs x (1-Bws) / (Ts) =		0.0025	grains/acf
C = cs / 7000	=	4.01E-07	lbs/dscf
EM = C x Qs(std) x 60	=	0.004	lbs/hr

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. CU--MVT--O--04

PLANT : CATHOLIC UNIVERSITY
DATE : 9-26-94
SAMP. LOCATION : BAGHOUSE OUTLET
OPERATING COND.:

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.306	in.
BAR. PRESSURE =	29.75	in.Hg	NOZZLE AREA =	0.000511	Sq.Ft.
STK. PRESSURE =	28.87	in.Hg	METER ORIFICE =	1.992	in. H2O
EFF. STACK AREA =	0.14	Sq.Ft.	METER VOLUME =	43.689	Cu.Ft.
Cp =	0.99		METER TEMP. =	552	DEG. R
GAS ANALYSIS =	0.0	% CO2	STACK TEMP. =	562	DEG. R
	20.9	% O2	SQ.RT. dP =	0.387	in. H2O
	0.0	% CO	COND.(Vic) =	24.5	ml
	79.1	% N2	METER Y =	0.996	
LAB ANALYSIS =	0.0073	grams	HEAT INPUT =	0.000	MM Btu/hr
			F-FACTOR =	9780	dscf/MM Btu

********* ********* ********** ********* ********* *********

Vw(std) = 0.04707 x Vic = 1.153 scf

Vm(std) = 17.64 x Vm x Y x (Pb + (dH / 13.6)) / (Tm) = 41.573 scf

Bws = Vw(std) / (Vm(std) + Vw(std)) = 0.027

%EA =(%O2 - 0.5%CO) / (0.264%N2 - (%O2 - 0.5%CO)) = -1187.500

Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] = 28.84

Ms = (Md x (1-Bws)) + (18.0 x Bws) = 28.54

vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts) / (Ms x Ps)] = 27.1 ft/sec

Qs = vs x As x 60 = 227 acf/min

Qs(std)=Qs x (1-Bws)x(528/(Ts)) x (Ps/29.92)= 201 dscf/min

I = (Ts) x [(0.00267 x Vic) + (Vm(std) / 17.64)] x 100 / (Time x Ps x An x vs x 60) = 94.7 %

********* ********* ********** ********* ********* *********

cs = 15.432 x grams / Vm(std) = 0.0027 grains/dscf

grains/acf = cs x 17.64xPs x (1-Bws) / (Ts) = 0.0024 grains/acf

C = cs / 7000 = 3.87E-07 lbs/dscf

EM = C x Qs(std) x 60 = 0.005 lbs/hr

FIELD DATA FORM

RUN # CU-MMT-O-01

| 1. {NumLock} to enter data. Turn off to move cursor. |
| 2. {Ctrl}{Break} after data entry. |
| 3.{Alt}M for next run. |

I. INPUT DATA

NET METER VOLUME (CU.FT.): 38.39
CONDENSATE VOLUME (ml): 27
LAB ANALYSIS (g): 0.0107

II. FIELD DATA

POINT NO.	delta P	delta H	STACK TEMP. (F)	Tm Inlet (F)	Tm Outlet (F)	SQ.RT. dP
1	0.14	1.70	118	93	93	0.374
2	0.14	1.70	118	103	93	0.374
3	0.14	1.70	118	103	94	0.374
4	0.14	1.70	118	103	94	0.374
5	0.14	1.70	118	104	95	0.374
6	0.14	1.70	118	103	95	0.374
7	0.14	1.70	118	104	96	0.374
8	0.14	1.70	118	105	96	0.374
9	0.14	1.70	118	105	96	0.374
10	0.14	1.70	118	105	97	0.374
11	0.14	1.70	118	105	97	0.374
12	0.14	1.70	118	105	97	0.374
13						0.000
14						0.000
15						0.000
16						0.000
17						0.000
18						0.000
19						0.000
20						0.000
21						0.000
22						0.000
23						0.000
24						0.000
25						0.000
26						0.000
27						0.000
28						0.000
29						0.000
30						0.000
31						0.000
32						0.000
33						0.000
34						0.000
35						0.000

36					0.000
37					0.000
38					0.000
39					0.000
40					0.000
41					0.000
42					0.000
43					0.000
44					0.000
45					0.000
46					0.000
47					0.000
48					0.000
49					0.000
50					0.000
51					0.000
52					0.000
53					0.000
54					0.000
55					0.000
56					0.000
57					0.000
58					0.000
59					0.000
60					0.000
	d H	Ts (F)	Tm (F)	sq.rt. dP	
	1.700	118.0	99.2		0.374

36					0.000
37					0.000
38					0.000
39					0.000
40					0.000
41					0.000
42					0.000
43					0.000
44					0.000
45					0.000
46					0.000
47					0.000
48					0.000
49					0.000
50					0.000
51					0.000
52					0.000
53					0.000
54					0.000
55					0.000
56					0.000
57					0.000
58					0.000
59					0.000
60					0.000
	d H	Ts (F)	Tm (F)	sq.rt. dP	
	1.700	118.0	99.2		0.374

FIELD DATA FORM

RUN #
CU--MVT--O-02

1. {NumLock} to enter data. Turn off to move cursor.
2. {Ctrl}{Break} after data entry.
3. {Alt}M for next run.

I. INPUT DATA

NET METER VOLUME (CU.FT.): 44.345
CONDENSATE VOLUME (ml): 24
LAB ANALYSIS (g): 0.005

II. FIELD DATA

POINT NO.	delta P	delta H	STACK TEMP. (F)	Tm Inlet (F)	Tm Outlet (F)	SQ.RT. dP
1	0.13	1.80	90	89	89	0.355
2	0.13	1.80	90	90	89	0.355
3	0.13	1.80	90	92	89	0.355
4	0.13	1.80	90	93	89	0.355
5	0.13	1.80	90	94	90	0.355
6	0.13	1.80	90	95	91	0.355
7	0.13	1.80	90	96	91	0.355
8	0.13	1.80	90	96	92	0.355
9	0.13	1.80	90	97	93	0.355
10	0.13	1.80	90	97	93	0.355
11	0.13	1.80	90	98	94	0.355
12	0.13	1.80	90	98	94	0.355
13						0.000
14						0.000
15						0.000
16						0.000
17						0.000
18						0.000
19						0.000
20						0.000
21						0.000
22						0.000
23						0.000
24						0.000
25						0.000
26						0.000
27						0.000
28						0.000
29						0.000
30						0.000
31						0.000
32						0.000
33						0.000
34						0.000
35						0.000
36						0.000
37						0.000

FIELD DATA FORM

RUN #
CU-MMT--O--03

| 1. {NumLock} to enter data. Turn off to move cursor.
| 2. {Ctrl}{Break} after data entry.
| 3.{Alt}M for next run.

I. INPUT DATA

NET METER VOLUME (CU.FT.):	42.6
CONDENSATE VOLUME (ml):	24
LAB ANALYSIS (g):	0.0073

II. FIELD DATA

POINT NO.	delta P	delta H	STACK TEMP. (F)	Tm Inlet (F)	Tm Outlet (F)	SQ.RT. dP
1	0.13	1.80	103	92	93	0.361
2	0.13	1.80	103	98	93	0.361
3	0.13	1.80	103	99	93	0.361
4	0.13	1.80	103	100	94	0.361
5	0.13	1.80	103	100	94	0.361
6	0.13	1.80	103	100	95	0.361
7	0.13	1.80	103	101	95	0.361
8	0.13	1.80	103	101	96	0.361
9	0.13	1.80	103	101	96	0.361
10	0.13	1.80	103	102	96	0.361
11	0.13	1.80	103	102	97	0.361
12	0.13	1.80	103	102	97	0.361
13						0.000
14						0.000
15						0.000
16						0.000
17						0.000
18						0.000
19						0.000
20						0.000
21						0.000
22						0.000
23						0.000
24						0.000
25						0.000
26						0.000
27						0.000
28						0.000
29						0.000
30						0.000
31						0.000
32						0.000
33						0.000
34						0.000
35						0.000
36						0.000
37						0.000

38					0.000
39					0.000
40					0.000
41					0.000
42					0.000
43					0.000
44					0.000
45					0.000
46					0.000
47					0.000
48					0.000
49					0.000
50					0.000
51					0.000
52					0.000
53					0.000
54					0.000
55					0.000
56					0.000
57					0.000
58					0.000
59					0.000
60					0.000
	d H	Ts (F)	Tm (F)	sq.rt. dP	
	1.800	103.0	97.4		0.361

FIELD DATA FORM

RUN # CU-MMT-O-04

| 1. {NumLock} to enter data. Turn off to move cursor. | 2. {Ctrl}{Break} after data entry. | 3.{Alt}M. |

I. INPUT DATA

NET METER VOLUME (CU.FT.): 43.689
CONDENSATE VOLUME (ml): 24.5
LAB ANALYSIS (g): 0.0073

II. FIELD DATA

POINT NO.	delta P	delta H	STACK TEMP. (F)	Tm Inlet (F)	Tm Outlet (F)	SQ.RT. dP
1	0.15	2.30	102	89	89	0.387
2	0.15	2.30	102	90	89	0.387
3	0.15	1.80	102	90	89	0.387
4	0.15	2.10	102	92	89	0.387
5	0.15	2.10	102	93	90	0.387
6	0.15	2.10	102	93	90	0.387
7	0.15	1.90	102	94	91	0.387
8	0.15	1.90	102	95	91	0.387
9	0.15	1.90	102	95	92	0.387
10	0.15	1.90	102	96	92	0.387
11	0.15	1.80	102	96	93	0.387
12	0.15	1.80	102	97	93	0.387
13						0.000
14						0.000
15						0.000
16						0.000
17						0.000
18						0.000
19						0.000
20						0.000
21						0.000
22						0.000
23						0.000
24						0.000
25						0.000
26						0.000
27						0.000
28						0.000
29						0.000
30						0.000
31						0.000
32						0.000
33						0.000
34						0.000
35						0.000
36						0.000
37						0.000

38					0.000
39					0.000
40					0.000
41					0.000
42					0.000
43					0.000
44					0.000
45					0.000
46					0.000
47					0.000
48					0.000
49					0.000
50					0.000
51					0.000
52					0.000
53					0.000
54					0.000
55					0.000
56					0.000
57					0.000
58					0.000
59					0.000
60					0.000
	d H	Ts (F)	Tm (F)	sq.rt. dP	
	1.992	102.0	92.0		0.387

CATHOLIC UNIVERSITY CEM RESULTS
(UNCORRECTED FOR DRIFT)

ON LINE BASELINE HEPA FILTER EXHAUST

TIME	O2	CO	NOx	SO2	THC
13:16:18	20.09	0.3	5	2.2	2.1
13:16:48	20.10	0.3	5	2.2	2.0
13:17:18	20.10	0.3	5	2.1	1.9
13:17:48	20.12	0.3	5	2.1	1.9
13:18:18	20.12	0.3	5	2.2	1.8
13:18:48	20.12	0.3	5	2.2	1.8
13:19:19	20.14	0.3	5	2.2	1.7
13:19:49	20.14	0.3	5	2.2	1.7
13:20:19	20.15	0.3	5	2.2	1.6
13:20:49	20.14	0.4	4	2.2	1.5
13:21:19	20.16	0.3	5	2.2	1.6
13:21:49	20.18	0.3	4	2.1	1.5
13:22:19	20.18	0.3	4	2.1	1.5
AVERAGE	20.13	0.3	4.8	2.2	1.7

ON LINE BASELINE POST DEMISTER

13:23:19	20.20	0.3	4	2.4	6.3
13:23:49	20.21	0.8	4	2.4	3.2
13:24:20	20.21	0.8	4	2.5	2.4
13:24:50	20.22	0.3	4	2.7	2.2
13:25:20	20.23	0.4	4	2.9	2.0
13:25:50	20.24	0.8	4	2.8	2.0
13:26:20	20.25	0.8	4	2.8	1.9
13:26:50	20.26	0.8	4	2.7	1.9
13:27:20	20.27	0.3	4	2.5	1.9
13:27:50	20.28	0.8	4	2.6	1.8
13:28:20	20.28	0.8	4	2.8	1.8
AVERAGE	20.24	1	4	2.6	2.5

ON LINE BASELINE POST QUENCH

13:28:50	20.29	0.8	4	3.1	1.8
13:29:21	20.29	0.8	4	4.5	1.9
13:29:51	20.30	0.8	4	4.1	1.8
13:30:21	20.31	0.8	4	3.5	1.8
13:30:51	20.31	0.8	4	3.1	1.7
13:31:21	20.32	0.8	4	3.1	1.6
13:31:51	20.32	0.8	4	3.0	1.6
13:32:21	20.33	0.8	4	2.9	1.5
13:32:51	20.33	0.8	4	2.7	1.4

13:33:21	20.33	0.8	4	2.6	1.4
13:33:51	20.34	0.8	4	2.5	1.4
13:34:21	20.33	0.8	4	2.3	1.3
AVERAGE	20.32	1	4	3.1	1.6

ON LINE BASELINE MELTER EXHAUST

13:34:52	20.35	0.8	4	2.3	1.6
13:35:22	20.35	0.4	4	3.8	11.9
13:35:52	20.35	0.8	4	3.1	3.1
13:36:22	20.35	0.8	4	2.3	2.5
13:36:52	20.35	0.8	4	2.1	2.4
13:37:22	20.36	0.8	4	2.0	2.5
13:37:52	20.36	0.8	4	2.0	2.5
13:38:22	20.36	0.8	4	2.1	2.4
13:38:52	20.37	0.8	4	2.1	2.1
13:39:22	20.37	0.8	4	2.2	1.8
13:39:53	20.37	0.8	4	2.1	1.7
13:40:23	20.37	0.8	4	2.1	1.8
13:40:53	20.38	0.8	4	2.1	1.6
13:41:23	20.38	0.8	4	2.1	1.5
13:41:53	20.39	0.8	4	2.1	1.5
13:42:23	20.39	0.8	4	2.1	1.4
13:42:53	20.39	0.3	4	2.1	1.4
13:43:23	20.40	0.8	4	2.1	1.4
13:43:53	20.40	0.8	4	2.1	1.4
13:44:23	20.40	0.3	4	2.2	1.4
13:44:54	20.40	0.8	4	2.3	1.4
13:45:24	20.38	0.8	4	2.3	1.4
13:45:54	20.38	0.8	4	2.4	1.3
13:46:24	20.38	0.8	4	2.4	1.2
13:46:54	20.37	0.8	4	2.4	1.2
13:47:24	20.37	0.8	4	2.5	1.1
13:47:54	20.36	0.8	4	2.5	1.1
13:48:24	20.37	0.8	4	2.5	1.1
13:48:54	20.37	0.8	4	2.6	1.0
13:49:25	20.36	0.8	4	2.6	1.0
13:49:55	20.36	0.8	4	2.6	1.0
13:50:25	20.36	0.8	4	2.6	0.9
13:50:55	20.36	0.8	4	2.6	0.9
13:51:25	20.37	0.8	4	2.6	0.9
13:51:55	20.36	0.8	4	2.6	0.8
13:52:25	20.36	0.8	4	2.6	0.8
13:52:55	20.37	0.8	4	2.6	0.8
13:53:25	20.37	0.8	4	2.6	0.8
13:53:55	20.37	0.8	4	2.6	0.7
13:54:25	20.38	0.8	4	2.6	0.8
13:54:56	20.37	0.8	4	2.6	0.7
13:55:26	20.37	0.8	4	2.6	0.7
13:55:56	20.37	0.8	4	2.5	0.7

13:56:26	20.37	0.8	4	2.6	0.6
13:56:56	20.37	0.8	4	2.6	0.6
13:57:26	20.38	0.8	4	2.6	0.6
13:57:56	20.38	0.8	4	2.6	0.6
13:58:26	20.38	0.8	4	2.6	0.6
13:58:56	20.38	0.8	4	2.5	0.6
13:59:26	20.37	0.8	4	2.6	0.6
13:59:56	20.38	0.8	4	2.6	0.6
14:00:27	20.38	0.8	5	2.6	0.6
14:00:57	20.38	0.8	5	2.6	0.6
14:01:27	20.38	0.8	4	2.6	0.5
AVERAGE	20.37	1	4	2.4	1.4

BEGIN PRELIMINARY MOISTURE RUN

14:20:00	20.27	42.7	329	4.9	4.6
14:20:31	20.25	43.6	345	5.0	4.5
14:21:01	20.26	45.2	338	5.1	4.4
14:21:31	20.28	43.6	331	5.0	4.2
14:22:01	20.27	41.6	344	5.1	4.2
14:22:31	20.28	41.1	342	5.2	4.5
14:23:01	20.28	41.1	359	5.3	4.7
14:23:31	20.27	41.6	357	5.5	4.6
14:24:01	20.28	40.7	401	5.6	4.9
14:24:31	20.29	42.2	367	5.9	4.6
14:25:01	20.29	38.2	349	5.6	4.2
14:25:32	20.31	35.2	351	5.4	4.3
14:26:02	20.31	33.7	356	5.5	4.3
14:26:32	20.30	33.7	370	5.6	4.0
14:27:02	20.31	33.7	359	5.7	4.5
14:27:32	20.31	33.2	320	5.5	3.4
14:28:02	20.31	29.7	344	5.2	4.1
14:28:32	20.30	30.7	352	5.4	4.2
14:29:02	20.31	32.2	348	5.4	4.1
14:29:32	20.32	29.7	325	5.4	3.9
14:30:03	20.32	27.7	300	5.1	3.1
14:30:33	20.34	25.2	281	4.8	3.4
14:31:03	20.33	24.2	291	4.7	3.4
14:31:33	20.33	24.2	320	4.9	3.8
14:32:03	20.33	26.2	314	5.0	4.1
14:32:33	20.32	27.2	332	4.9	4.9
14:33:03	20.31	29.7	283	5.2	2.8
14:33:33	20.35	23.2	280	4.5	4.0
14:34:03	20.33	24.2	292	4.6	3.2
14:34:33	20.34	23.7	280	4.6	3.5
14:35:03	20.34	23.2	307	4.6	3.5
14:35:34	20.34	22.2	269	4.7	3.6
14:36:04	20.33	22.7	311	4.6	4.4
14:36:34	20.32	27.7	315	4.9	4.2
14:37:04	20.33	26.7	287	4.7	3.6

14:37:34	20.35	23.2	278	4.5	3.7
14:38:04	20.34	22.2	291	4.5	4.2
14:38:34	20.33	25.7	297	4.7	3.3
14:39:04	20.34	25.2	302	4.6	3.5
14:39:34	20.34	23.6	262	4.5	3.1
14:40:04	20.35	22.2	261	4.2	4.1
14:40:35	20.33	24.7	275	4.2	3.7
14:41:05	20.34	25.2	254	4.2	3.1
14:41:35	20.35	22.2	246	4.1	3.2
14:42:05	20.34	22.2	287	4.1	4.4
14:42:35	20.32	27.2	335	4.6	3.9
14:43:05	20.32	29.2	352	4.8	11.4
14:43:35	20.13	61.8	806	9.5	9.7
14:44:05	20.17	79.7	632	12.4	6.1
14:44:35	20.24	52.8	574	10.2	6.3
14:45:05	20.27	43.6	534	9.0	6.0
14:45:36	20.28	39.6	492	8.3	6.0
14:46:06	20.29	37.6	449	7.3	5.9
14:46:36	20.30	36.6	464	6.9	6.1
14:47:06	20.29	37.6	450	7.0	6.5
14:47:36	20.29	38.6	438	6.7	6.1
14:48:06	20.30	36.6	402	6.4	5.2
14:48:36	20.30	33.2	389	5.8	6.1
14:49:06	20.30	34.7	395	5.8	6.4
14:49:36	20.30	37.1	395	5.8	5.6
14:50:06	20.31	35.2	357	5.8	3.9
14:50:37	20.35	26.7	312	5.2	3.6
AVERAGE	20.31	33	354	5.6	4.6

ON LINE RUN #1 CATHOLIC UNIVERSITY 9/26/94

ON LINE HEPA FILTER EXHAUST

17:22:37	20.51	18.8	547	3.3	3.7
17:23:07	20.54	11.3	534	3.3	3.6
17:23:37	20.56	7.7	540	3.2	3.5
17:24:07	20.56	6.8	566	3.3	3.6
17:24:37	20.55	7.7	562	3.2	5.3
17:25:07	20.48	17.8	594	3.0	6.5
17:25:37	20.50	29.3	568	2.6	4.1
17:26:07	20.56	16.8	574	2.4	3.8
17:26:37	20.58	8.8	578	2.0	3.9
17:27:08	20.56	8.8	574	2.0	4.4
17:27:38	20.55	12.8	578	1.8	4.5
17:28:08	20.55	15.3	593	1.7	4.9
17:28:38	20.53	16.8	594	1.5	5.1
17:29:08	20.52	19.3	614	1.5	5.8
17:29:38	20.51	23.7	624	0.9	6.5
17:30:08	20.49	27.7	624	1.1	7.4
17:30:38	20.48	30.8	618	1.3	7.1

17:31:08	20.49	31.7	608	1.4	7.4
17:31:38	20.50	31.3	605	1.5	7.4
17:32:08	20.50	31.7	590	1.6	6.9
17:32:39	20.52	29.7	594	1.6	5.6
17:33:09	20.54	23.7	603	1.8	5.2
17:33:39	20.54	19.8	603	2.1	5.0
17:34:09	20.54	18.3	623	2.2	5.2
17:34:39	20.54	19.3	635	2.4	5.2
17:35:09	20.53	20.3	633	2.5	5.3
17:35:39	20.53	22.7	633	2.5	5.9
17:36:09	20.52	25.2	633	2.6	5.5
17:36:39	20.53	23.2	632	2.7	4.8
17:37:09	20.53	19.8	632	2.8	5.1
17:37:40	20.53	20.3	622	2.8	5.2
17:38:10	20.44	21.2	623	2.8	5.2
17:38:40	20.54	20.7	639	2.9	5.2
17:39:10	20.54	20.3	634	3.0	5.2
AVERAGE	20.53	20	601	2.3	5.3

ON LINE POST DEMISTER RUN #1

17:39:40	20.56	17.3	743	2.8	10.8
17:40:10	20.33	38.7	864	4.5	10.8
17:40:40	20.35	61.3	789	4.9	11.3
17:41:10	20.36	52.3	798	4.7	14.4
17:41:40	20.34	58.8	809	4.7	11.0
17:42:10	20.35	60.8	803	4.8	10.5
17:42:41	20.33	57.8	800	4.7	11.0
17:43:11	20.35	57.8	811	4.6	12.8
17:43:41	20.34	57.3	805	4.7	10.1
17:44:11	20.34	55.8	812	4.5	10.2
17:44:41	20.35	55.3	820	4.2	9.2
17:45:11	20.39	44.2	820	4.0	7.7
17:45:41	20.41	38.2	840	3.8	8.2
17:46:11	20.41	35.3	847	3.6	8.6
17:46:41	20.41	36.7	898	3.4	8.4
17:47:11	20.41	38.2	911	3.3	7.8
17:47:42	20.42	36.2	881	3.1	7.8
17:48:12	20.42	35.7	897	2.8	11.4
17:48:42	20.40	40.7	915	2.8	9.0
17:49:12	20.42	43.2	919	2.8	9.0
17:49:42	20.43	38.7	945	2.9	10.2
17:50:12	20.42	36.2	961	3.1	10.2
17:50:42	20.41	37.7	957	3.2	9.6
17:51:12	20.43	36.2	942	3.1	9.5
17:51:42	20.43	34.3	950	3.1	9.8
17:52:12	20.43	32.8	973	3.1	9.8
17:52:43	20.43	31.3	970	3.2	9.3
17:53:13	20.43	29.7	979	3.2	8.8
17:53:43	20.43	29.3	1013	3.2	9.4

17:54:13	20.43	28.8	1007	3.4	9.3
17:54:43	20.44	25.7	1015	3.4	12.5
17:55:13	20.42	31.3	1024	3.5	14.6
17:55:43	20.39	41.7	1024	3.8	11.9
17:56:13	20.40	41.7	1024	3.8	13.2
17:56:43	20.41	40.7	1024	3.9	12.3
17:57:13	20.46	36.7	815	3.5	11.5
17:57:44	20.40	35.7	1045	3.1	19.9
17:58:14	20.35	53.8	901	3.7	21.1
17:58:44	20.37	55.8	957	4.0	23.0
AVERAGE	20.40	42	905	3.7	11.2

ON LINE POST QUENCH RUN #1

17:59:14	20.35	61.8	1228	4.2	25.2
17:59:44	20.34	74.8	1721	4.5	27.3
18:00:14	20.35	79.8	2176	4.9	27.3
18:00:44	20.31	84.3	2472	5.1	28.7
18:01:14	20.35	83.3	2560	5.1	27.3
18:01:44	20.34	77.8	2560	5.7	24.7
18:02:14	20.35	70.3	2560	5.6	20.7
18:02:44	20.45	45.7	2560	5.3	19.6
18:03:15	20.39	42.2	3136	5.5	29.8
18:03:45	20.29	76.3	3031	6.4	31.5
18:04:15	20.30	90.3	2979	6.6	28.6
18:04:45	20.31	84.8	3038	6.7	26.7
18:05:15	20.34	75.8	3129	6.7	19.5
18:05:45	20.40	50.7	3225	6.3	21.6
AVERAGE	20.35	71	2598	5.6	25.6

ON LINE MELTER EXHAUST RUN #1

18:06:15	20.36	57.3	3194	6.4	20.3
18:06:45	20.40	52.3	3264	6.1	19.1
18:07:15	20.41	42.7	3275	6.2	16.8
18:07:46	20.43	38.2	3333	6.4	18.2
18:08:16	20.43	37.2	3304	6.5	18.3
18:08:46	20.42	38.7	3229	6.6	17.5
18:09:16	20.41	41.2	3232	6.5	17.0
18:09:46	20.43	40.7	3246	6.5	17.5
18:10:16	20.42	38.7	3223	6.6	19.0
18:10:46	20.43	38.7	3248	6.7	16.9
18:11:16	20.44	34.3	3246	6.8	16.4
18:11:46	20.41	36.2	3247	6.9	16.3
18:12:16	20.40	39.7	3260	7.0	18.7
18:12:46	20.39	45.2	3194	7.1	16.8
18:13:17	20.40	45.7	3247	7.1	18.5
18:13:47	20.42	43.7	3236	7.1	23.4
18:14:17	20.39	48.7	3245	7.3	21.8

18:14:47	20.36	54.3	3173	7.5	17.0
18:15:17	20.64	32.8	3170	6.1	11.2
18:15:47	20.70	4.8	3304	4.4	7.3
18:16:17	20.70	0.8	3271	3.6	5.2
AVERAGE	20.45	39	3245	6.4	16.8

ON LINE RUN #2 CATHOLIC UNIVERSITY RUN #2

ON LINE HEPA FILTER EXHAUST

22:18:50	20.95	3.8	969	1.6	5.0
22:19:20	20.94	3.8	983	1.5	4.9
22:19:50	20.93	3.8	983	1.5	5.0
22:20:20	20.94	3.8	974	1.4	5.0
22:20:51	20.93	3.8	986	1.6	5.0
22:21:21	20.93	3.8	977	1.8	5.1
22:21:51	20.94	3.8	980	1.9	5.1
22:22:21	20.92	3.8	968	2.0	5.0
22:22:51	20.91	3.8	975	2.1	5.0
22:23:21	20.91	3.8	965	2.2	5.0
22:23:51	20.91	3.8	955	2.3	4.9
22:24:21	20.90	4.3	951	2.3	5.1
22:24:51	20.88	5.2	957	2.4	5.5
22:25:21	20.86	9.7	938	2.5	6.2
22:25:52	20.85	16.3	937	2.5	6.8
22:26:22	20.85	16.3	934	2.6	5.6
22:26:52	20.86	10.3	955	2.7	5.2
22:27:22	20.86	7.3	955	2.8	5.0
22:27:52	20.88	5.2	966	2.8	5.0
22:28:22	20.88	4.3	981	2.9	5.0
22:28:52	20.88	4.8	1001	3.0	5.0
22:29:22	20.88	4.8	998	3.1	5.0
22:29:52	20.88	5.2	1014	3.1	5.0
22:30:22	20.88	5.2	986	3.0	5.1
22:30:53	20.88	5.2	1005	3.0	5.1
22:31:23	20.88	4.8	999	2.9	5.2
22:31:53	20.87	4.8	1015	2.9	5.1
22:32:23	20.88	4.3	1023	2.8	5.1
22:32:53	20.88	4.3	1016	2.8	4.9
22:33:23	20.88	3.8	977	2.8	5.0
AVERAGE	20.89	6	977	2.4	5.2

ON LINE POST DEMISTER RUN #2

22:33:53	20.70	13.3	1109	3.0	10.1
22:34:23	20.61	35.7	1167	4.0	12.2
22:34:53	20.55	51.7	1178	4.9	15.4
22:35:23	20.57	52.8	1278	4.8	14.8
22:35:54	20.52	60.8	1275	5.2	13.9

22:36:24	20.55	54.3	1334	4.8	11.9
22:36:54	20.55	48.7	1386	4.7	11.4
22:37:24	20.55	47.7	1469	5.0	13.7
22:37:54	20.53	52.3	1517	5.4	15.0
22:38:24	20.48	60.4	1592	5.8	18.7
22:38:54	20.37	85.2	1539	6.6	15.7
22:39:24	20.41	81.8	1563	6.7	15.2
22:39:54	19.49	251.1	2218	30.3	99.5
22:40:24	19.91	424.6	1426	21.5	30.6
22:40:54	20.21	210.5	1505	10.1	27.1
22:41:25	20.25	148.9	1612	9.5	27.2
22:41:55	20.25	147.4	1590	9.0	23.3
22:42:25	20.29	135.9	1664	8.2	22.7
22:42:55	20.29	134.9	1689	8.4	25.6
22:43:25	20.25	142.5	1690	8.0	25.0
22:43:55	20.27	146.5	1686	7.6	23.2
22:44:25	20.28	136.4	1725	7.2	20.6
22:44:55	20.31	125.0	1740	7.0	17.9
22:45:25	20.29	121.9	1804	6.7	20.0
22:45:55	20.28	119.9	1820	6.7	18.5
22:46:26	20.29	111.2	1842	6.7	17.1
22:46:56	20.28	106.7	1854	6.4	16.0
22:47:26	20.29	104.7	1886	6.1	15.4
AVERAGE	20.34	115	1577	7.9	21.3

ON LINE POST QUENCH RUN #2

22:47:56	20.42	96.3	2036	6.6	17.2
22:48:26	20.42	98.8	2003	7.5	19.3
22:48:56	20.43	101.2	2058	6.8	17.3
22:49:26	20.46	99.8	2079	6.7	18.1
22:49:56	20.46	92.8	2091	6.5	17.8
22:50:26	20.45	91.7	2095	6.4	20.6
22:50:56	20.52	85.2	2018	5.1	27.6
22:51:27	20.41	95.7	2148	6.0	25.4
22:51:57	20.47	93.7	2481	6.5	23.7
22:52:57	20.45	85.2	3197	6.7	23.2
22:53:27	20.44	83.3	3389	7.1	25.7
22:53:57	20.41	84.3	3530	7.5	23.6
22:54:27	20.39	87.7	3598	7.6	27.7
22:54:57	20.26	101.7	3248	7.4	27.7
22:55:27	20.20	122.5	2583	6.4	22.5
AVERAGE	20.41	95	2570	6.7	22.5

NO MELTER EXHAUST FOR RUN #2 FILTER PLUGGED

CATHOLIC UNIVERSITY RUN #3

ON LINE HEPA FILTER EXHAUST

TIME	O2	CO	NOx	SO2	THC
00:33:11	20.56	65.3	1087	10.6	10.6
00:33:41	20.68	41.6	1266	7.3	11.9
00:34:11	20.62	46.7	1269	9.4	12.7
00:34:41	20.60	49.2	1370	9.6	14.1
00:35:11	20.50	76.3	1327	11.2	17.2
00:35:41	20.53	84.7	1320	10.7	14.4
00:36:11	20.59	64.8	1340	9.6	12.6
00:36:41	20.61	55.8	1345	8.2	13.4
00:37:11	20.61	56.3	1384	7.7	13.5
00:37:41	20.59	57.3	1370	7.6	11.6
00:38:11	20.62	50.7	1408	6.9	12.0
00:38:41	20.63	47.7	1404	6.7	11.3
00:39:11	20.63	46.2	1279	5.5	10.4
00:39:41	20.62	45.2	1298	3.8	11.5
00:40:11	20.61	47.7	1383	3.6	12.0
00:40:41	20.58	57.8	1390	4.7	12.7
00:41:11	20.58	58.3	1370	5.2	12.6
00:41:41	20.55	60.8	1341	5.0	12.4
00:42:11	20.57	60.8	1293	4.5	12.1
00:42:41	20.58	58.8	1301	4.0	11.6
AVERAGE	20.59	57	1327	7.1	12.5

ON LINE POST DEMISTER RUN #3

00:45:14	20.35	131.9	1927	57.4	19.1
00:45:44	20.37	125.0	2014	55.9	18.8
00:46:14	20.38	123.4	2238	55.7	20.2
00:46:44	20.38	115.2	2284	57.5	20.3
00:47:14	20.34	116.5	2399	59.7	20.2
00:47:44	20.40	102.7	2329	55.9	20.9
00:48:14	20.40	83.7	2470	53.8	18.0
00:48:44	20.39	80.8	2450	51.6	26.3
00:49:14	20.34	100.2	2370	47.2	21.5
00:49:44	20.35	95.2	2423	40.9	17.4
00:50:14	20.35	90.7	2457	34.9	19.4
00:50:44	20.36	89.2	2446	29.7	16.9
00:51:14	20.40	79.3	2559	26.5	20.8
00:51:44	20.36	80.3	2560	25.7	19.1
00:52:14	20.10	123.4	2560	30.8	27.7
00:52:44	20.05	186.9	2560	35.6	26.2
00:53:14	20.11	185.4	2560	37.2	20.3
00:53:44	20.20	147.4	3022	37.3	21.7
00:54:14	20.22	131.0	2950	37.0	24.7
00:54:44	20.22	132.4	2904	33.7	23.3
00:55:14	20.21	134.9	2795	32.1	19.8
00:55:44	20.24	131.0	2837	311.0	21.3
AVERAGE	20.30	118	2505	54.9	21.1

ON LINE POST QUENCH RUN #3

00:58:16	20.22	116.9	4107	22.9	30.1
00:58:46	20.20	108.7	4299	22.5	30.5
00:59:16	20.19	110.7	4431	21.5	33.9
00:59:46	20.17	115.7	4523	20.9	29.6
01:00:16	20.16	118.5	4464	20.7	32.1
01:00:46	20.16	117.9	4536	20.6	31.2
01:01:16	20.16	121.4	4457	20.2	31.8
01:01:46	20.13	119.9	4386	19.2	25.3
01:02:16	20.14	104.7	4358	18.0	30.4
01:02:46	20.07	94.8	4507	18.3	26.4
01:03:16	19.95	115.7	4397	20.5	24.0
01:03:46	19.97	89.7	4325	19.2	28.2
01:04:16	20.00	69.2	4321	18.5	28.2
01:04:46	19.98	73.7	4316	18.6	26.5
01:05:16	19.96	68.3	4261	18.0	25.0
01:05:46	19.96	64.3	4276	17.4	17.6
AVERAGE	20.09	101	4373	19.8	28.2

ON LINE MELTER EXHAUST RUN #3

01:12:19	20.01	66.8	3444	70.7	28.5
01:12:49	19.97	72.8	3324	72.9	27.0
01:13:19	19.96	75.3	3290	75.8	30.7
01:13:49	19.94	79.7	3317	75.5	33.1
01:14:19	19.92	83.8	3122	75.0	29.0
01:14:49	19.91	88.7	3010	78.3	29.1
01:15:19	19.90	90.3	2833	82.2	29.4
01:15:49	19.88	88.3	2776	85.7	23.8
01:16:19	19.88	63.3	2775	88.4	20.3
01:16:49	19.91	61.8	2605	106.1	23.7
01:17:19	19.95	80.3	2356	107.3	23.8
01:17:49	19.94	77.7	2283	102.7	29.5
01:18:19	19.92	81.8	2246	93.7	29.7
01:18:49	19.91	82.3	2424	83.4	44.6
01:19:19	19.90	132.4	2156	85.0	34.9
01:19:49	19.86	120.5	2176	74.9	32.9
01:20:19	19.80	106.7	2242	65.5	33.3
01:20:49	19.81	104.2	2261	60.4	34.8
01:21:19	19.84	106.7	2259	58.2	38.4
01:21:49	19.85	114.2	2207	54.2	35.4
01:22:19	19.84	117.9	2139	49.1	36.6
01:22:49	19.83	115.7	2243	43.6	35.8
01:23:19	19.84	122.5	2462	41.3	36.9
01:23:49	19.84	122.5	2448	38.0	35.7
01:24:19	19.83	122.9	2685	38.1	36.2
01:24:49	19.84	116.9	2745	38.1	36.5
01:25:19	19.85	120.5	2717	40.1	36.8

ON LINE POST QUENCH RUN #3

00:58:16	20.22	116.9	4107	22.9	30.1
00:58:46	20.20	108.7	4299	22.5	30.5
00:59:16	20.19	110.7	4431	21.5	33.9
00:59:46	20.17	115.7	4523	20.9	29.6
01:00:16	20.16	118.5	4464	20.7	32.1
01:00:46	20.16	117.9	4536	20.6	31.2
01:01:16	20.16	121.4	4457	20.2	31.8
01:01:46	20.13	119.9	4386	19.2	25.3
01:02:16	20.14	104.7	4358	18.0	30.4
01:02:46	20.07	94.8	4507	18.3	26.4
01:03:16	19.95	115.7	4397	20.5	24.0
01:03:46	19.97	89.7	4325	19.2	28.2
01:04:16	20.00	69.2	4321	18.5	28.2
01:04:46	19.98	73.7	4316	18.6	26.5
01:05:16	19.96	68.3	4261	18.0	25.0
01:05:46	19.96	64.3	4276	17.4	17.6
AVERAGE	20.09	101	4373	19.8	28.2

ON LINE MELTER EXHAUST RUN #3

01:12:19	20.01	66.8	3444	70.7	28.5
01:12:49	19.97	72.8	3324	72.9	27.0
01:13:19	19.96	75.3	3290	75.8	30.7
01:13:49	19.94	79.7	3317	75.5	33.1
01:14:19	19.92	83.8	3122	75.0	29.0
01:14:49	19.91	88.7	3010	78.3	29.1
01:15:19	19.90	90.3	2833	82.2	29.4
01:15:49	19.88	88.3	2776	85.7	23.8
01:16:19	19.88	63.3	2775	88.4	20.3
01:16:49	19.91	61.8	2605	106.1	23.7
01:17:19	19.95	80.3	2356	107.3	23.8
01:17:49	19.94	77.7	2283	102.7	29.5
01:18:19	19.92	81.8	2246	93.7	29.7
01:18:49	19.91	82.3	2424	83.4	44.6
01:19:19	19.90	132.4	2156	85.0	34.9
01:19:49	19.86	120.5	2176	74.9	32.9
01:20:19	19.80	106.7	2242	65.5	33.3
01:20:49	19.81	104.2	2261	60.4	34.8
01:21:19	19.84	106.7	2259	58.2	38.4
01:21:49	19.85	114.2	2207	54.2	35.4
01:22:19	19.84	117.9	2139	49.1	36.6
01:22:49	19.83	115.7	2243	43.6	35.8
01:23:19	19.84	122.5	2462	41.3	36.9
01:23:49	19.84	122.5	2448	38.0	35.7
01:24:19	19.83	122.9	2685	38.1	36.2
01:24:49	19.84	116.9	2745	38.1	36.5
01:25:19	19.85	120.5	2717	40.1	36.8

01:25:49	19.86	124.5	2651	42.2	34.2
01:26:19	19.84	118.5	2587	42.1	33.9
01:26:49	19.83	112.2	2558	41.6	34.6
01:27:19	19.85	111.2	2529	41.5	34.2
AVERAGE	19.88	99	2609	66.2	32.4

CATHOLIC UNIVERSITY RUN #4 SEPT. 27 1994

TIME	O2	CO	NOX	SO2	THC
ON LINE HEPA FILTER EXHAUST					
12:15:21	20.93	40.2	1263	5.2	7.5
12:15:36	20.93	40.7	1279	5.3	7.4
12:15:51	20.93	40.2	1289	5.4	8.2
12:16:06	20.91	42.2	1277	5.5	8.2
12:16:21	20.90	45.2	1289	5.3	8.0
12:16:51	20.90	47.6	1287	4.9	7.7
12:17:21	20.92	44.7	1299	4.6	7.5
12:17:52	20.93	41.1	1329	4.4	7.9
12:18:22	20.91	44.2	1361	4.4	7.9
12:18:52	20.89	47.6	1343	4.3	8.0
12:19:22	20.90	49.6	1331	4.2	7.6
12:19:52	20.91	45.6	1339	4.2	7.3
12:20:22	20.90	44.2	1367	4.2	7.9
12:20:52	20.88	47.2	1388	4.3	7.7
12:21:22	20.88	50.7	1405	4.3	7.3
12:21:52	20.90	47.2	1432	4.2	7.3
12:22:22	20.91	42.7	1441	4.3	7.1
12:22:52	20.91	42.2	1443	4.3	8.4
12:23:23	20.88	48.2	1391	4.3	8.5
12:23:53	20.85	54.8	1387	4.2	8.4
AVERAGE	20.90	45	1347	4.6	7.8
ON LINE POST DEMISTER					
12:27:53	20.32	217.8	3046	32.6	16.4
12:28:24	20.52	182.9	3117	38.3	14.8
12:28:54	20.57	135.8	3223	40.2	12.5
12:29:24	20.67	99.7	3220	41.3	11.0
12:29:54	20.79	63.8	2794	28.4	8.8
12:30:24	20.88	32.7	2987	17.7	9.0
12:30:54	20.91	20.7	3113	19.8	8.6
12:31:24	20.90	15.7	3100	17.8	8.3
12:31:54	20.91	14.2	3009	15.3	8.3
12:32:24	20.89	14.7	2869	11.1	8.3
12:32:55	20.89	15.2	3339	11.5	8.6
12:33:25	20.87	16.3	3192	19.5	8.9

12:56:59	20.48	67.7	3776	14.6	15.9
AVERAGE	20.51	81	3540	17.1	18.0

Catholic Univerity VSL - 100 Kg Melter Metals Sampling

	CU-MMT-I-01	CU-MMT-I-02	CU-MMT-I-03
Date	9/27/94	9/27/94	9/27/94
Time	17:20-18:20	22:13-23:13	00:39-01:49
Moisture (%)	5.98	6.03	8.11
Stack Temp (R)	1069	1069	1069
Isokinetic (%)	100.4	103.1	107.4

Metals Emission Rate(grams/hr)

	Na	K	Sr	B	Mo	Cr	Cs
Run 1	8.98	5.75	0.03	2.24	0.11	0.07	1.62
Run 2	16.91	8.49	0.06	4.45	0.24	0.14	2.82
Run 3	28.23	11.31	0.17	9.04	0.46	0.28	4.31
Avg	18.04	8.52	0.09	5.24	0.27	0.16	2.91

Metals Emission Rate (lbs/hr)

	Na	K	Sr	B	Mo	Cr	Cs
Run 1	1.98E-02	1.27E-02	6.45E-05	4.94E-03	2.36E-04	1.57E-04	3.57E-03
Run 2	3.73E-02	1.87E-02	1.41E-04	9.81E-03	5.19E-04	3.12E-04	6.21E-03
Run 3	6.23E-02	2.49E-02	3.78E-04	1.99E-02	1.01E-03	6.12E-04	9.50E-03
Avg	3.98E-02	1.88E-02	1.95E-04	1.16E-02	5.90E-04	3.60E-04	6.43E-03

Metals Concentration Dry(ug/dscf)

	Na	K	Sr	B	Mo	Cr	Cs
Run 1	1825.91	1168.29	5.95	455.32	21.80	14.47	329.33
Run 2	3660.92	1837.78	13.82	963.43	50.90	30.65	609.91
Run 3	6111.42	2447.74	37.14	1956.68	99.50	60.03	932.06
Avg	3866.09	1817.94	18.97	1125.14	57.40	35.05	623.77

CATHOLIC UNIVERSITY 100 kg MELTER

CU-MMT-I-01

Metal	Sample Volume Actual (CuFt)	Sample Volume Std (CuFt)	Front Half (ug)	Back Half (ug)	Front-Half Blank (ug)	Back-Half Blank (ug)	Total (ug/sample)	Conc'n (ug/acf)	Conc'n (ug/dscf)	Stack Gas Flow Rate (dscfm)	Emission Rate (g/hr)	Emission Rate (lb/hr)
Na	56.827	37.774	71720	701	3039	410	68972.0	1213.7	1825.9	82	9.0	1.98E-02
K	56.827	37.774	44800	366	858	177	44131.0	776.6	1168.3	82	5.7	1.27E-02
Sr	56.827	37.774	244	0.36	< 19.4	0.36	< 224.6	4.0	5.9	82	0.0	6.45E-05
B	56.827	37.774	18587	238	1617	8.84	17199.2	302.7	455.3	82	2.2	4.94E-03
Mo	56.827	37.774	848	8.57	25.8	7.35	< 823.4	14.5	21.8	82	0.1	2.36E-04
Cr	56.827	37.774	569	2.75	23.8	1.2	< 546.8	9.6	14.5	82	0.1	1.57E-04
Cs	56.827	37.774	12480	30	< 40	< 30	< 12440.0	218.9	329.3	82	1.6	3.57E-03

CU-MMT-I-02

Metal	Sample Volume Actual (CuFt)	Sample Volume Std (CuFt)	Front Half (ug)	Back Half (ug)	Front-Half Blank (ug)	Back-Half Blank (ug)	Total (ug/sample)	Conc'n (ug/acf)	Conc'n (ug/dscf)	Stack Gas Flow Rate (dscfm)	Emission Rate (g/hr)	Emission Rate (lb/hr)
Na	58.834	36.661	137140	522	3039	410	134213.0	2281.2	3660.9	77	16.9	3.73E-02
K	58.834	36.661	68200	210	858	177	67375.0	1145.2	1837.8	77	8.5	1.87E-02
Sr	58.834	36.661	526	0.573	19.4	0.36	< 506.8	8.6	13.8	77	0.1	1.41E-04
B	58.834	36.661	36707	239	1617	8.84	35320.2	600.3	963.4	77	4.5	9.81E-03
Mo	58.834	36.661	1892	7.35	< 25.8	7.35	< 1866.2	31.7	50.9	77	0.2	5.19E-04
Cr	58.834	36.661	1089	59.8	23.8	1.2	< 1123.8	19.1	30.7	77	0.1	3.12E-04
Cs	58.834	36.661	22400	30	< 40	< 30	< 22360.0	380.1	609.9	77	2.8	6.21E-03

CU-MMT-I-03

Metal	Sample Volume Actual (CuFt)	Sample Volume Std (CuFt)	Front Half (ug)	Back Half (ug)	Front-Half Blank (ug)	Back-Half Blank (ug)	Total (ug/sample)	Conc'n (ug/acf)	Conc'n (ug/dscf)	Stack Gas Flow Rate (dscfm)	Emission Rate (g/hr)	Emission Rate (lb/hr)
Na	55.060	38.152	235860	752	3039	410	233163.0	4234.7	6111.4	77	28.2	6.23E-02
K	55.060	38.152	94200	221	858	177	93386.0	1696.1	2447.7	77	11.3	2.49E-02
Sr	55.060	38.152	1436	0.678	19.4	0.36	< 1416.9	25.7	37.1	77	0.2	3.78E-04
B	55.060	38.152	76121	156	1617	8.84	74651.2	1355.8	1956.7	77	9.0	1.99E-02
Mo	55.060	38.152	3822	7.35	< 25.8	7.35	< 3796.2	68.9	99.5	77	0.5	1.01E-03
Cr	55.060	38.152	2314	1.2	< 23.8	1.2	< 2290.2	41.6	60.0	77	0.3	6.12E-04
Cs	55.060	38.152	35600	30	< 40	< 30	< 35560.0	645.8	932.1	77	4.3	9.50E-03

< Means that the entry to the left was listed in the laboratory data report as less than the given value. For conservatism, the number shown was used in calculations.

Catholic University HEPA Filter Metals Sampling

	CU-MMT-O-02	CU-MMT-O-03	CU-MMT-O-04
Date			
Time			
Moisture (%)	2.61	2.74	2.7
Stack Temp (R)	550	563	562
Isokinetic (%)	103.5	68.4	94.7

Metals Emission Rate(grams/hr)

	Na	K	Sr	B	Mo	Cr	Cs
Run 2	0.52	8.38E-02	1.11E-03	1.34E+00	2.53E-03	1.58E-03	1.03E-02
Run 3	0.55	4.00E-01	8.41E-04	1.34E+00	5.17E-03	1.18E-03	1.09E-02
Run 4	0.83	4.10E-01	8.91E-04	1.50E-01	4.99E-03	1.30E-03	1.16E-02
Avg	0.63	2.98E-01	9.49E-04	9.46E-01	4.23E-03	1.35E-03	1.09E-02

Metals Emission Rate (lbs/hr)

	Na	K	Sr	B	Mo	Cr	Cs
Run 2	1.15E-03	1.85E-04	2.46E-06	2.96E-03	5.57E-06	3.49E-06	2.27E-05
Run 3	1.22E-03	8.82E-04	1.85E-06	2.96E-03	1.14E-05	2.60E-06	2.40E-05
Run 4	1.83E-03	9.04E-04	1.96E-06	3.31E-04	1.10E-05	2.86E-06	2.56E-05
Avg	1.40E-03	6.57E-04	2.09E-06	2.09E-03	9.33E-06	2.98E-06	2.41E-05

Metals Concentration Dry(ug/dscf)

	Na	K	Sr	B	Mo	Cr	Cs
Run 2	48.16	7.72	0.10	123.77	0.23	0.15	0.95
Run 3	50.49	36.40	0.08	123.11	0.47	0.11	1.00
Run 4	68.70	34.30	0.07	12.10	0.41	0.11	0.96
Avg	55.78	26.14	0.08	86.33	0.37	0.12	0.97

CATHOLIC UNIVERSITY HEPA FILTER

CU-MMT-O-02

Metal	Sample Volume Actual (CuFt)	Sample Volume Std (CuFt)	Reported (ug/sample)		Blank (µg)		Blank-Adjusted µg/sample	Conc'n (ug/acf)	Conc'n (ug/dscf)	Stack Gas Flow Rate (dscfm)	Emission Rate (g/hr)	Emission Rate (lb/hr)
Na		42.111	5477.0		3449.0		2028.0	#DIV/0!	48.2	181	5.2E-01	1.2E-03
K		42.111	1360.0		1035.0		325.0	#DIV/0!	7.7	181	8.4E-02	1.8E-04
Sr		42.111	4.3		19.8		*	#DIV/0!	0.1	181	1.1E-03	2.5E-06
B		42.111	6838.0		1625.8		5212.2	#DIV/0!	123.8	181	1.3E+00	3.0E-03
Mo		42.111	9.8	<	33.2		*	#DIV/0!	0.2	181	2.5E-03	5.6E-06
Cr		42.111	6.1		25.0		*	#DIV/0!	0.1	181	1.6E-03	3.5E-06
Cs		42.111	40.00	<	40	<	*	#DIV/0!	0.9	181	1.0E-02	2.3E-05

CU-MMT-0-03

Metal	Sample Volume Actual (CuFt)	Sample Volume Std (CuFt)	Reported (ug/sample)		Blank (µg)		Blank-Adjusted µg/sample	Conc'n (ug/acf)	Conc'n (ug/dscf)	Stack Gas Flow Rate (dscfm)	Emission Rate (g/hr)	Emission Rate (lb/hr)
Na		40.127	5475.0		3449.0		2026.0	#DIV/0!	50.5	182	5.5E-01	1.2E-03
K		40.127	305.0		1035.0		-730.0	#DIV/0!	36.4	182	4.0E-01	8.8E-04
Sr		40.127	3.1		19.8		*	#DIV/0!	0.1	182	8.4E-04	1.9E-06
B		40.127	6566.0		1625.8		4940.2	#DIV/0!	123.1	182	1.3E+00	3.0E-03
Mo		40.127	19.0		33.2		*	#DIV/0!	0.5	182	5.2E-03	1.1E-05
Cr		40.127	4.3		25.0		*	#DIV/0!	0.1	182	1.2E-03	2.6E-06
Cs		40.127	40.00	<	40	<	*	#DIV/0!	1.0	182	1.1E-02	2.4E-05

CU-MMT-0-04

Metal	Sample Volume Actual (CuFt)	Sample Volume Std (CuFt)	Reported (ug/sample)		Blank (µg)		Blank-Adjusted µg/sample	Conc'n (ug/acf)	Conc'n (ug/dscf)	Stack Gas Flow Rate (dscfm)	Emission Rate (g/hr)	Emission Rate (lb/hr)
Na		41.573	2022.0		3449.0		-1427.0	#DIV/0!	68.7	201	8.3E-01	1.8E-03
K		41.573	322.0		1035.0		-713.0	#DIV/0!	34.3	201	4.1E-01	9.1E-04
Sr		41.573	3.1		19.8		*	#DIV/0!	0.1	201	8.9E-04	2.0E-06
B		41.573	1375.0		1625.8		-250.8	#DIV/0!	12.1	201	1.5E-01	3.2E-04
Mo		41.573	17.2		33.2		*	#DIV/0!	0.4	201	5.0E-03	1.1E-05
Cr		41.573	4.5		25.0		*	#DIV/0!	0.1	201	1.3E-03	2.9E-06
Cs		41.573	40.00	<	40	<	*	#DIV/0!	1.0	201	1.2E-02	2.6E-05

< Means that the entry to the left was listed in the laboratory data report as less than the given value. For conservatism, the number shown was used in calculations.
*Means that blank-adjusted value is not being used in emissions calculations for these metals.
Blank corrected values that are negative have been: multiplied by two and then the absolute value was used to calculate concentrations and emissions.
The resulting values are reported as "less than" values.

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.13 CGAS= 20.66

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	−0.04	1.6	0.06	1.0	−0.6
LOW RANGE GAS						
MID RANGE GAS	11.61	10.99	−2.5	11.51	−0.4	2.1
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.53 CGAS= 21.07

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	−0.04	1.6	0.06	1.0	−0.6
LOW RANGE GAS						
MID RANGE GAS	11.61	10.99	−2.5	11.51	−0.4	2.1
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.89 CGAS= 21.04

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.06	1.0	0.07	1.1	0.0
LOW RANGE GAS						
MID RANGE GAS	11.61	11.51	−0.4	11.46	−0.6	−0.2
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.59 CGAS= 21.11

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.07	1.1	0.14	1.4	0.3
LOW RANGE GAS						
MID RANGE GAS	11.61	11.46	−0.6	11.15	−1.8	−1.2
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 25 AVG % = 20.90 CGAS= 20.80

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.07	0.1	0.3
LOW RANGE GAS	0		0.0	0.0
MID RANGE GAS	11.54	11.84	0.3	1.2
HIGH RANGE GAS	17.72	17.83	0.1	0.4

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0.2	0.5	0.02	−0.2	−0.7
LOW RANGE GAS						
MID RANGE GAS	11.84	11.76	−0.3	11.53	−1.2	−0.9
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVGppm = 0.31 CGAS= −0.24

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.8	0.2	0.3	0.1	−0.1
MID RANGE GAS	253	254.5	0.3	254.6	0.3	0.0
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG ppm = 20.0 CGAS= 19.53

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.07	0.1	0.3	0.1	0.0
MID RANGE GAS	253	254.6	0.3	254.6	0.3	0.0
HIGH RANGE GAS						

CO ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG ppm = 6 CGAS= 5.87

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.3	0.1	−0.2	0.0	−0.1
MID RANGE GAS	253	254.6	0.3	254	0.2	−0.1
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVGppm = 57 CGAS= 55.85

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	−0.2		0.3	0.0	0.0
LOW RANGE GAS						
MID RANGE GAS	253	254	0.2	258	1.0	0.8
HIGH RANGE GAS						

CO ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 500 AVG PPM = 45 CGAS= 43.58

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.4	0.4	0.1
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253.7	2.7	0.5
HIGH RANGE GAS	451	455.7	4.7	0.9

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.4	0.4	0.0	0.3	−0.0	−0.0
LOW RANGE GAS						
MID RANGE GAS	253.7	253.6	−0.0	261.4	1.5	1.6
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG ppm = 4.77 CGAS= -5.82

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	461	14.0	1.4
HIGH RANGE GAS	849	850	1.0	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	21	2.1	0.3	0.0	-2.1
MID RANGE GAS	461	446	-1.5	478	1.7	3.2
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG ppm = 600.7 CGAS= 584.37

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	461	14.0	1.4
HIGH RANGE GAS	849	850	1.0	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	21	2.1	0.3	0.0	-2.1
MID RANGE GAS	461	446	-1.5	478	1.7	3.2
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG ppm = 977 CGAS= 973.82

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	449	2.0	0.2
HIGH RANGE GAS	849	845	−4.0	−0.4

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	1.0	1	0.0	104	10.3	10.3
MID RANGE GAS	845	857	1.2	860	1.5	0.3
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG ppm = 1327 CGAS= 860.23

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	449	2.0	0.2
HIGH RANGE GAS	849	846	−3.0	−0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	1.0	2	0.1	65	6.4	6.3
MID RANGE GAS	845	846	0.1	506	−33.9	−34.0
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 1000 AVG PPM = 1347 CGAS= 1336.24

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS			0.0	0.0
HIGH RANGE GAS	849	852	3.0	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0.07	0.0	116	11.6	11.6
LOW RANGE GAS						
MID RANGE GAS						
HIGH RANGE GAS	852	850	−0.2	904	5.2	5.4

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG ppm = 2.17 CGAS= 0.08

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	3.1	1.7	1.1	0.7	−1.0
MID RANGE GAS	86.4	77.2	−4.6	82.5	−2.0	2.7
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG ppm = 2.3 CGAS= 0.18

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	3.1	1.7	1.1	0.7	−1.0
MID RANGE GAS	86.4	77.2	−4.6	82.5	−2.0	2.7
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG ppm = 2.4 CGAS= 1.50

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	1.1	0.5	0.8	0.4	−0.2
MID RANGE GAS	86.4	82.5	−2.0	82.5	−2.0	0.0
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG ppm = 7.1 CGAS= 5.68

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0.8	0.4	2.5	1.2	0.9
LOW RANGE GAS	86.4	82.5	−2.0	82.5	−2.0	0.0
MID RANGE GAS						
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 200 AVG ppm = 4.6 CGAS= 3.56

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	84.2	86.9	2.7	1.4
MID RANGE GAS	163	163.3	0.3	0.2
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.3	1.7	0.7	1.9	0.8	0.1
LOW RANGE GAS	86.4	53.7	−16.4	82.5	−2.0	14.4
MID RANGE GAS						
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG % = 0.31

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.8	0.2	0.3	0.1	−0.1
MID RANGE GAS	253	254.5	0.3	254.6	0.3	0.0
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG % = 19.98

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.07	0.1	0.3	0.1	0.0
MID RANGE GAS	253	254.6	0.3	254.6	0.3	0.0
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG % = 6

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.3	0.1	−0.2	0.0	−0.1
MID RANGE GAS	253	254.6	0.3	254	0.2	−0.1
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG % = 57

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	−0.2		0.3	0.0	0.0
LOW RANGE GAS						
MID RANGE GAS	253	254	0.2	258	1.0	0.8
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY HEPA FILTER EXHAUST RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 500 AVG PPM = 45

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	0		0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.0
HIGH RANGE GAS	17.72	17.8	0.1	0.0

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.07	0.1	0.14	0.1	0.0
LOW RANGE GAS						
MID RANGE GAS	11.61	11.46	−0.0	11.15	−0.1	−0.1
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.37 CGAS= 20.90

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	−0.04	1.6	0.06	1.0	−0.6
LOW RANGE GAS						
MID RANGE GAS	11.61	10.99	−2.5	11.51	−0.4	2.1
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.45 CGAS= 20.99

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	−0.04	1.6	0.06	1.0	−0.6
LOW RANGE GAS						
MID RANGE GAS	11.61	10.99	−2.5	11.51	−0.4	2.1
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG PPM =NO DATA CGAS= ND

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.06	1.0	0.07	1.1	0.0
LOW RANGE GAS						
MID RANGE GAS	11.61	11.51	−0.4	11.46	−0.6	−0.2
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 19.88 CGAS= 20.38

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.07	1.1	0.14	1.4	0.3
LOW RANGE GAS						
MID RANGE GAS	11.61	11.46	−0.6	11.15	−1.8	−1.2
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 25 AVG % = 20.51 CGAS= 20.41

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.07	0.1	0.3
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.84	0.3	1.2
HIGH RANGE GAS	17.72	17.83	0.1	0.4

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0.2	0.5	0.02	−0.2	−0.7
LOW RANGE GAS						
MID RANGE GAS	11.84	11.76	−0.3	11.53	−1.2	−0.9
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG ppm = 0.77 CGAS= 0.22

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.8	0.2	0.3	0.1	−0.1
MID RANGE GAS	253	254.5	0.3	254.6	0.3	0.0
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG ppm = 39 CGAS= 38.29

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.07	0.1	0.3	0.1	0.0
MID RANGE GAS	253	254.6	0.3	254.6	0.3	0.0
HIGH RANGE GAS						

CO ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG ppm =no data CGAS= ND

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.3	0.1	−0.2	0.0	−0.1
MID RANGE GAS	253	254.6	0.3	254	0.2	−0.1
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG ppm = 99 CGAS= 97.04

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	−0.2		0.3	0.0	0.0
LOW RANGE GAS						
MID RANGE GAS	253	254	0.2	258	1.0	0.8
HIGH RANGE GAS						

CO ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 500 AVG PPM = 81 CGAS= 78.72

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.4	0.4	0.1
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253.7	2.7	0.5
HIGH RANGE GAS	451	455.7	4.7	0.9

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.4	0.4	0.0	0.3	−0.0	−0.0
LOW RANGE GAS						
MID RANGE GAS	253.7	253.6	−0.0	261.4	1.5	1.6
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG ppm = 4 CGAS= −8.96

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	461	14.0	1.4
HIGH RANGE GAS	849	850	1.0	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	5	0.5	21	2.1	1.6
MID RANGE GAS	461	446	−1.5	478	1.7	3.2
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG ppm = 3245 CGAS= 3217.60

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	461	14.0	1.4
HIGH RANGE GAS	849	850	1.0	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	5	0.5	21	2.1	1.6
MID RANGE GAS	461	446	−1.5	478	1.7	3.2
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG ppm =no data CGAS= ND

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	449	2.0	0.2
HIGH RANGE GAS	849	845	−4.0	−0.4

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	1.0	1	0.0	104	10.3	10.3
MID RANGE GAS	845	857	1.2	860	1.5	0.3
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG ppm = 2609 CGAS= 2552.28

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	449	2.0	0.2
HIGH RANGE GAS	849	845	−4.0	−0.4

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	1.0	2	0.1	64	6.3	6.2
MID RANGE GAS	845	846	0.1	506	−33.9	−34.0
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 1000 AVG PPM = 3540 CGAS= 3609.66

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS			0.0	0.0
HIGH RANGE GAS	849	852	3.0	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0.07	0.0	116	11.6	11.6
LOW RANGE GAS						
MID RANGE GAS						
HIGH RANGE GAS	852	850	−0.2	904	5.2	5.4

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG ppm = 2.4 C-GAS 0.3

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	3.1	1.7	1.1	0.7	−1.0
MID RANGE GAS	86.4	77.2	−4.6	82.5	−2.0	2.7
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG ppm = 6.4 C-GAS 4.7

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	3.1	1.7	1.1	0.7	−1.0
MID RANGE GAS	86.4	77.2	−4.6	82.5	−2.0	2.7
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG ppm =no data C-GAS ND

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	1.1	0.5	0.8	0.4	−0.2
MID RANGE GAS	86.4	82.5	−2.0	82.5	−2.0	0.0
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG ppm = 66.2 C-GAS 67.2

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0.8	0.4	2.5	1.2	0.9
LOW RANGE GAS	86.4	82.5	−2.0	82.5	−2.0	0.0
MID RANGE GAS						
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 200 AVG ppm = 17.1 CGAS= 19.67

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	84.2	86.9	2.7	1.4
MID RANGE GAS	163	163.3	0.3	0.2
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.3	−0.2		3.3	1.5	1.5
LOW RANGE GAS	86.4	53.7	−16.4	82.5	−2.0	14.4
MID RANGE GAS						
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG PPM = 1.4

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	55.7	54.4	−1.3	−1.3
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0	0.0	0.8	0.8	0.8
LOW RANGE GAS	29.4	29.4	0.0	35.9	6.5	6.5
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG PPM = 16.8

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	55.7	54.4	−1.3	−1.3
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0	0.0	0.8	0.8	0.8
LOW RANGE GAS	29.4	29.4	0.0	35.9	6.5	6.5
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG PPM =NO DATA

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	55.7	54.4	−1.3	−1.3
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0.8	0.8	0.3	0.3	−0.5
LOW RANGE GAS	29.4	35.9	6.5	37.5	8.1	1.6
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG PPM = 32.4

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	55.7	54.4	−1.3	−1.3
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0.3	0.2	1.3	1.2	1.0
LOW RANGE GAS	29.4	37.5	8.1	40.3	10.9	2.8
MID RANGE GAS						
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY MELTER EXHAUST RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 100 AVG PPM = 18

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	32.4	1.4	1.4
MID RANGE GAS				
HIGH RANGE GAS	84.2	84.2	0.0	0.0

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0		0.7	0.7	0.7
LOW RANGE GAS	32.4	32.4	0.0	26.6	−5.8	−5.8
MID RANGE GAS						
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.24 CGAS= 20.77

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	−0.04	1.6	0.06	1.0	−0.6
LOW RANGE GAS						
MID RANGE GAS	11.61	10.99	−2.5	11.51	−0.4	2.1
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.4 CGAS= 20.93

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	−0.04	1.6	0.06	1.0	−0.6
LOW RANGE GAS						
MID RANGE GAS	11.61	10.99	−2.5	11.51	−0.4	2.1
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.34 CGAS= 20.49

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.06	1.0	0.07	1.1	0.0
LOW RANGE GAS						
MID RANGE GAS	11.61	11.51	−0.4	11.46	−0.6	−0.2
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.3 CGAS= 20.81

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.07	1.1	0.14	1.4	0.3
LOW RANGE GAS						
MID RANGE GAS	11.61	11.46	−0.6	11.15	−1.8	−1.2
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 25 AVG % = 20.76 CGAS= 20.66

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.07	0.1	0.3
LOW RANGE GAS				
MID RANGE GAS	11.54	11.84	0.3	1.2
HIGH RANGE GAS	17.72	17.83	0.1	0.4

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0.2	0.5	0.02	−0.2	−0.7
LOW RANGE GAS						
MID RANGE GAS	11.84	11.76	−0.3	11.53	−1.2	−0.9
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG PPM = 0.63 CGAS= 0.08

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.8	0.2	0.3	0.1	−0.1
MID RANGE GAS	253	254.5	0.3	254.6	0.3	0.0
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG PPM = 41.5 CGAS= 40.47

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.8	0.2	0.3	0.1	−0.1
MID RANGE GAS	253	254.5	0.3	254.6	0.3	0.0
HIGH RANGE GAS						

CO ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG PPM = 115 CGAS= 113.48

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.3	0.1	−0.2	0.0	−0.1
MID RANGE GAS	253	254.6	0.3	254	0.2	−0.1
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG PPM = 118 CGAS= 115.67

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	−0.2	0.0	0.3	0.0	0.0
LOW RANGE GAS						
MID RANGE GAS	253	254	0.2	258	1.0	0.8
HIGH RANGE GAS						

CO ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 500 AVG PPM = 69 CGAS= 67.01

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.4	0.4	0.1
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253.7	2.7	0.5
HIGH RANGE GAS	451	455.7	4.7	0.9

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.4	0.4	0.0	0.3	−0.0	−0.0
LOW RANGE GAS						
MID RANGE GAS	253.7	253.6	−0.0	261.4	1.5	1.6
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG PPM = 4 CGAS= −9

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	461	14.0	1.4
HIGH RANGE GAS	849	850	1.0	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	5	0.5	21	2.1	1.6
MID RANGE GAS	461	446	−1.5	478	1.7	3.2
HIGH RANGE GAS						

p Cgasmid = −9 Cgashigh=

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG PPM = 905 CGAS= 886

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	461	14.0	1.4
HIGH RANGE GAS	849	850	1.0	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	21	2.1	0.3	0.0	−2.1
MID RANGE GAS	461	446	−1.5	478	1.7	3.2
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG PPM = 1577 CGAS= 2051

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	449	2.0	0.2
HIGH RANGE GAS	849	845	−4.0	−0.4

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	1.0	30	2.9	65	6.4	3.5
MID RANGE GAS	845	855	1.0	506	−33.9	−34.9
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG PPM = 2505 CGAS= 2417

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	449	2.0	0.2
HIGH RANGE GAS	849	845	−4.0	−0.4

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	1.0	2	0.1	65	6.4	6.3
MID RANGE GAS	845	846	0.1	506	−33.9	−34.0
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 1000 AVG PPM = 3084 CGAS= 3055

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS			0.0	0.0
HIGH RANGE GAS	849	852	3.0	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0.07	0.0	55	5.5	5.5
LOW RANGE GAS						
MID RANGE GAS						
HIGH RANGE GAS	852	850	−0.2	904	5.2	5.4

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG PPM = 2.6 CGAS= 1

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	3.1	1.7	1.1	0.7	−1.0
MID RANGE GAS	86.4	77.2	−4.6	82.5	−2.0	2.7
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG PPM = 3.66 CGAS= 2

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	3.1	1.7	1.1	0.7	−1.0
MID RANGE GAS	86.4	77.2	−4.6	82.5	−2.0	2.7
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG PPM = 7.9 CGAS= 7.2

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	1.1	0.5	0.8	0.4	−0.2
MID RANGE GAS	86.4	82.5	−2.0	82.5	−2.0	0.0
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG PPM = 54.9 CGAS= 55.5

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0.8	0.4	2.5	1.2	0.9
LOW RANGE GAS	86.4	82.5	−2.0	82.5	−2.0	0.0
MID RANGE GAS						
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 200 AVG PPM = 24.5 CGAS= 28.8

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	84.2	86.9	2.7	1.4
MID RANGE GAS	163	163.3	0.3	0.2
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.3	1.7	0.7	1.9	0.8	0.1
LOW RANGE GAS	86.4	53.7	−16.4	82.5	−2.0	14.4
MID RANGE GAS						
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG PPM = 2.49

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.2
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	54.4	54.4	0.0	0.0
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	−0.2	0.0	0.8	1.0	1.0
MID RANGE GAS	29.4	29.4	0.0	35.9	6.5	6.5
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG PPM = 11.2

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.2
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	54.4	54.4	0.0	0.0
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	−0.2	0.0	0.8	1.0	1.0
MID RANGE GAS	29.4	29.4	0.0	35.9	6.5	6.5
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG.PPM= 21.3

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.2
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	54.4	54.4	0.0	0.0
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.8	1.0	0.3	0.5	−0.5
MID RANGE GAS	29.4	35.9	6.5	37.5	8.1	1.6
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG PPM = 21.1

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	31	29.4	−1.6	−0.3
MID RANGE GAS	54.4	54.4	0.0	0.0
HIGH RANGE GAS	84.2	84.3	0.1	0.0

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0	−0.0	0.3	0.0	0.1
LOW RANGE GAS	29.4	37.5	1.6	40.3	2.2	0.6
MID RANGE GAS					0.0	
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST DEMISTER RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 100 AVG PPM = 10.3

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	32.4	1.4	1.4
MID RANGE GAS			0.0	0.0
HIGH RANGE GAS	84.2	84.2	0.0	0.0

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0		0.7	0.7	0.7
LOW RANGE GAS	32.4	32.4	0.0	26.6	−5.8	−5.8
MID RANGE GAS					0.0	
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.32 CGAS= 20.85

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	−0.04	1.6	0.06	1.0	−0.6
LOW RANGE GAS						
MID RANGE GAS	11.61	10.99	−2.5	11.51	−0.4	2.1
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.4 CGAS= 20.93

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	−0.04	1.6	0.06	1.0	−0.6
LOW RANGE GAS						
MID RANGE GAS	11.61	10.99	−2.5	11.51	−0.4	2.1
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.41 CGAS= 20.56

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.06	1.0	0.07	1.1	0.0
LOW RANGE GAS						
MID RANGE GAS	11.61	11.51	−0.4	11.46	−0.6	−0.2
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 25 AVG % = 20.09 CGAS= 20.59

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.8
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	11.54	11.61	0.1	0.3
HIGH RANGE GAS	17.72	17.8	0.1	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.07	1.1	0.14	1.4	0.3
LOW RANGE GAS						
MID RANGE GAS	11.61	11.46	−0.6	11.15	−1.8	−1.2
HIGH RANGE GAS						

O2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 25 AVG % = 20.89 CGAS= 20.79

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.07	0.1	0.3
LOW RANGE GAS	0		0.0	0.0
MID RANGE GAS	11.54	11.84	0.3	1.2
HIGH RANGE GAS	17.72	17.83	0.1	0.4

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0.2	0.5	0.02	−0.2	−0.7
LOW RANGE GAS						
MID RANGE GAS	11.84	11.76	−0.3	11.53	−1.2	−0.9
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG PPM = 0.8 CGAS= 0.25

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.8	0.2	0.3	0.1	−0.1
MID RANGE GAS	253	254.5	0.3	254.6	0.3	0.0
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG PPM = 71.3 CGAS= 69.91

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.8	0.2	0.3	0.1	−0.1
MID RANGE GAS	253	254.5	0.3	254.6	0.3	0.0
HIGH RANGE GAS						

CO ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG % = 95 CGAS= 93.74

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0.3	0.1	−0.2	0.0	−0.1
MID RANGE GAS	253	254.6	0.3	254	0.2	−0.1
HIGH RANGE GAS						

C0 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 500 AVG PPM = 101 CGAS= 99.00

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	−0.2	−0.2	−0.0
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253	2.0	0.4
HIGH RANGE GAS	451	455	4.0	0.8

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	−0.2		0.3	0.0	0.0
LOW RANGE GAS						
MID RANGE GAS	253	254	0.2	258	1.0	0.8
HIGH RANGE GAS						

CO ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 500 AVG PPM = 5 CGAS= 4.54

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.4	0.4	0.1
LOW RANGE GAS	90.7	90.7	0.0	0.0
MID RANGE GAS	251	253.7	2.7	0.5
HIGH RANGE GAS	451	455.7	4.7	0.9

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.4	0.4	0.0	0.3	−0.0	−0.0
LOW RANGE GAS						
MID RANGE GAS	253.7	253.6	−0.0	261.4	1.5	1.6
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG PPM = 4 CGAS= −6.59

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	461	14.0	1.4
HIGH RANGE GAS	849	850	1.0	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	21	2.1	0.3	0.0	−2.1
MID RANGE GAS	461	446	−1.5	478	1.7	3.2
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG PPM = 2598 CGAS= 2573

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	461	14.0	1.4
HIGH RANGE GAS	849	850	1.0	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	5	0.5	21	2.1	1.6
MID RANGE GAS	461	446	−1.5	478	1.7	3.2
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG PPM = 2570 CGAS= 3430

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	1	1.0	0.1
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	449	2.0	0.2
HIGH RANGE GAS	849	846	−3.0	−0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	1.0	2	0.1	104	10.3	10.2
MID RANGE GAS					0.0	
HIGH RANGE GAS	846	846	0.0	506	−34.0	−34.0

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 1000 AVG PPM = 4373 CGAS= 5234

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS	447	449	2.0	0.2
HIGH RANGE GAS	849	845	−4.0	−0.4

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	1.0	104	10.3	65	6.4	−3.9
MID RANGE GAS	845	860	1.5	506	−33.9	−35.4
HIGH RANGE GAS						

NOX ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 1000 AVG PPM = 3180 CGAS= 3171

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS			0.0	0.0
MID RANGE GAS			0.0	0.0
HIGH RANGE GAS	849	852	3.0	0.3

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	15	1.5	55	5.5	4.0
LOW RANGE GAS						
MID RANGE GAS						
HIGH RANGE GAS	852	850	−0.2	904	5.2	5.4

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG PPM = 3.12 CGAS= 1.10

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	3.1	1.7	1.1	0.7	−1.0
MID RANGE GAS	86.4	77.2	−4.6	82.5	−2.0	2.7
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG % = 5.6 CGAS= 3.79

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	3.1	1.7	1.1	0.7	−1.0
MID RANGE GAS	86.4	77.2	−4.6	82.5	−2.0	2.7
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG PPM = 6.7 CGAS= 5.94

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	1.1	0.5	0.8	0.4	−0.2
MID RANGE GAS	86.4	82.5	−2.0	82.5	−2.0	0.0
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 200 AVG PPM = 19.8 CGAS= 18.90

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0.1	0.1	0.1
LOW RANGE GAS	84.2	86.4	2.2	1.1
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0.8	0.4	2.5	1.2	0.9
LOW RANGE GAS	86.4	82.5	−2.0	82.5	−2.0	0.0
MID RANGE GAS						
HIGH RANGE GAS						

SO2 ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 200 AVG PPM = 4.5 CGAS= 6.39

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	86.8	86.4	−0.4	−0.2
MID RANGE GAS	163	163.1	0.1	0.1
HIGH RANGE GAS				

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.3	1.7	0.7	3.3	1.5	0.8
LOW RANGE GAS	86.4	53.7	−16.4	5.6	−40.4	−24.1
MID RANGE GAS						
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH BASELINE
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG PPM = 1.6

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	55.7	54.4	−1.3	−1.3
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	−0.2	0	0.2	0.3	0.5	0.3
LOW RANGE GAS	29.4	29.4	0.0	35.9	6.5	6.5
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #1
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG % = 25.6

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	55.7	54.4	−1.3	−1.3
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0	0.0	0.8	0.8	0.8
LOW RANGE GAS	29.4	29.4	0.0	35.9	6.5	6.5
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #2
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG % = 21.3

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	55.7	54.4	−1.3	−1.3
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0.8	0.8	0.3	0.3	−0.5
LOW RANGE GAS	29.4	35.9	6.5	37.5	8.1	1.6
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #3
TEST DATE: SEPTEMBER 26, 1994
ANALYZER SPAN: 100 AVG % = 28.2

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	29.4	−1.6	−1.6
MID RANGE GAS	55.7	54.4	−1.3	−1.3
HIGH RANGE GAS	84.2	84.3	0.1	0.1

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.1	0.3	0.2	1.3	1.2	1.0
LOW RANGE GAS	29.4	37.5	8.1	40.3	10.9	2.8
MID RANGE GAS					0.0	
HIGH RANGE GAS						

THC ANALYZER DRIFT CORRECTION CALCULATION
SAMPLING RUN:CATHOLIC UNIVERSITY POST QUENCH RUN #4
TEST DATE: SEPTEMBER 27, 1994
ANALYZER SPAN: 100 AVG PPM = 8.6

	CYLINDER VALUE (PPM)	ANALYZER CAL RESPONSE	ABSOLUTE DIFF (PPM)	DIFF (% OF SPAN)
ZERO GAS	0	0	0.0	0.0
LOW RANGE GAS	31	32.4	1.4	1.4
MID RANGE GAS			0.0	0.0
HIGH RANGE GAS	84.2	84.2	0.0	0.0

	ANALYZER CAL RESPONSE	INITIAL SYSTEM RESPONSE	INITIAL SYSTEM BIAS (%)	FINAL SYSTEM RESPONSE	FINAL SYSTEM BIAS (%)	DRIFT (% OF SPAN)
ZERO GAS	0.0	0		0.7	0.7	0.7
LOW RANGE GAS	32.4	32.4	0.0	26.6	−5.8	−5.8
MID RANGE GAS						
HIGH RANGE GAS						

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APPENDIX D

SAMPLING METHODS

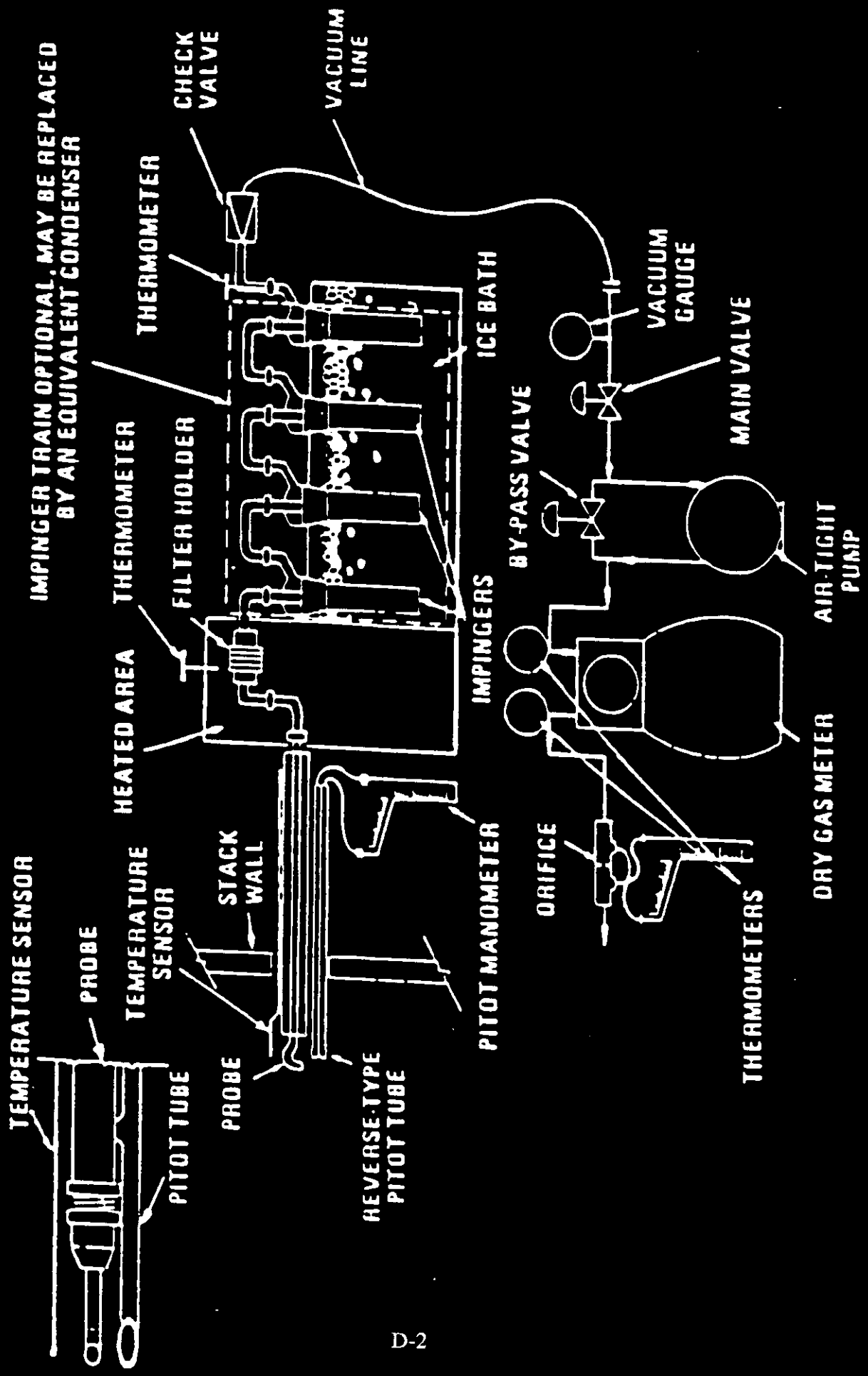

FIGURE 1

METHOD 5 SAMPLING TRAIN

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FIGURE 2

CONTINUOUS ANALYZER DAILY DATA

Plant: ______________________ Run: ______________________

Date: ______________________ Pollutant: ______________________

Operator: ______________________ Sample Size: ______________________

Strip Chart Analyzer Serial No.: ______________________

Recorder Type: ______________________ Analyze Model: ______________________

Inst. Span Range: ______________________ Output Signal Format: ______________________

_____ Span Gas Conc.: ________ ________ ________ ________ ________

Meter/Recorder Reading: ________ ________ ________ ________ ________

CALIBRATION (SCALE FACTOR/LINEAR REGRESSION, ETC.)

Time HR:MIN	Chart Reading	Scale Factor	ppm	Time HR:MIN	Chart Reading	Scale Factor	ppm

VOLUMETRIC FLOW RATE BY METHOD 2

Summary of Method

Method 2 is a procedure for measurement of the average velocity head and temperature of a gas stream at discrete locations within the duct that are representative of the total gas flow. The density of the gas must be known before the data collected can be used to calculate the volumetric flow rate of the gas. The density of the exhaust gases of combustion sources may be determined by measuring the oxygen and carbon dioxide (by Method 3 or 3A) and moisture (by Method 4) concentrations of the gas.

The velocity head, the difference between the impact pressure and the static pressure of the gas, can be measured with either a standard Pitot tube or an S-type Pitot tube. Either of these devices may be used without calibration if their construction conforms to certain geometric criteria. A properly constructed standard Pitot tube will overestimate the total velocity head by 1 percent, and a properly constructed S-type Pitot tube will overestimate the total velocity head by 19 percent. When the velocity of the stack gas is calculated, a correction appropriate to the type of Pitot tube used is made. In both cases, the error is due to static pressure decrease in the turbulent wake behind the impact pressure tap.

Description of Sampling Equipment

The velocity head is measured by the Pitot tube and an oil-filled manometer. The stack gas temperature is measured by a type-K thermocouple. The temperature is displayed by a digital temperature readout that is electronically compensated for ambient temperature. Figure 1, which shows an entire Method 5 sampling train, also shows the Pitot tube and manometer system.

Description of Operation

Prior to recording velocity and temperature data, the gas in the duct must be checked to ensure straight (non-cyclonic) flow with respect to the duct centerline. The Pitot tube is inserted into the duct with the faces perpendicular to the duct cross-section. A reading of zero pressure differential at each of the sampling points indicates non-cyclonic flow.

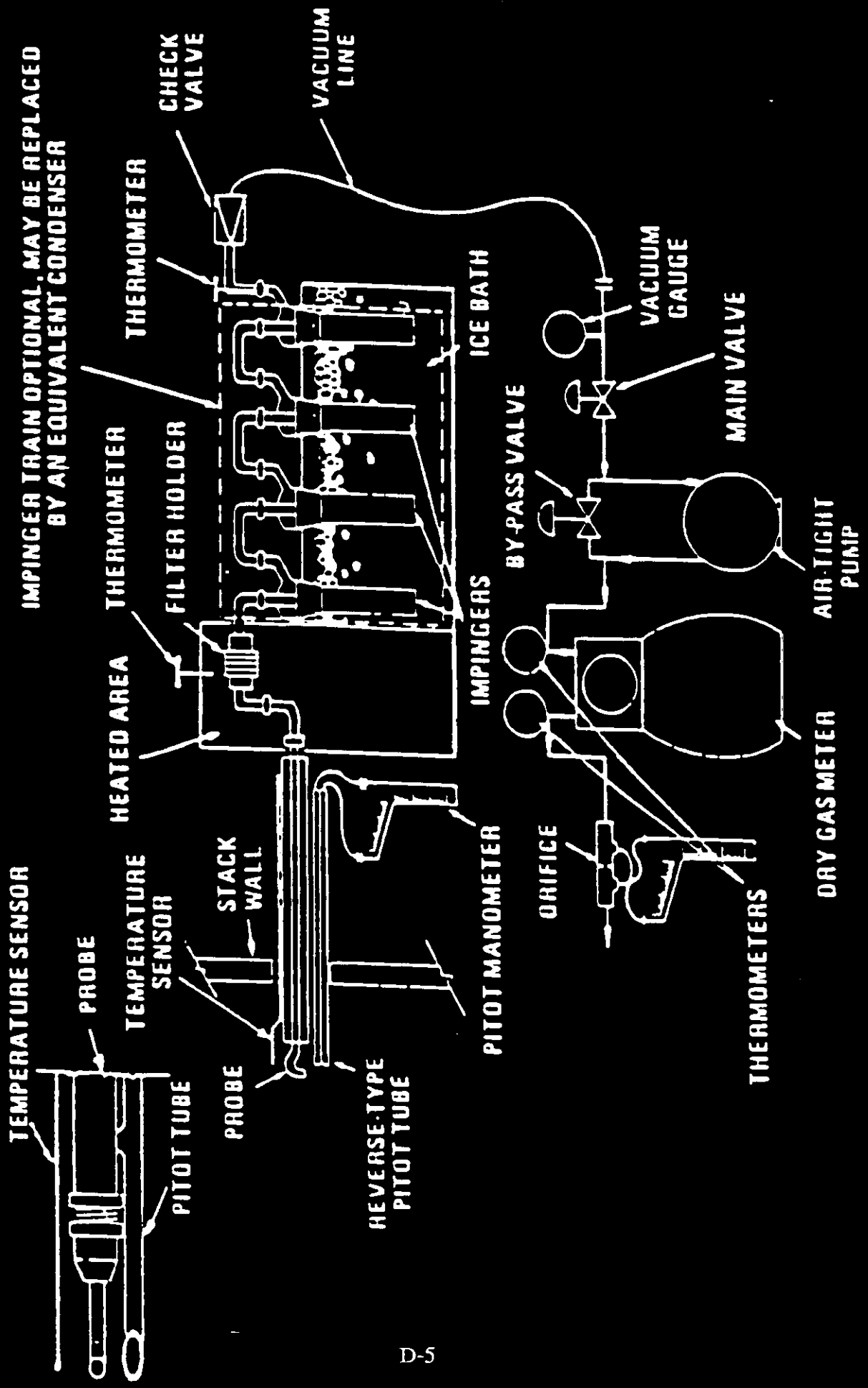

FIGURE 1

METHOD 5 SAMPLING TRAIN

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During testing, the velocity head and temperature at each sample point, the static pressure of the duct, and the absolute barometric pressure are recorded.

Description of Leak Check Procedures

Before reading of the gas velocity pressure one made, the pitot-manometer system is leak checked. A short length of flexible tubing is attached to the impact side of the pitot tube, and a pressure of five to seven inches of water is put on the system by month. The tubing is crimped and the manometer is observed. The leak check is considered successful if the pressure holds steady for fifteen seconds. The process is then repeated on the static side of the system, however in this instance five to seven inches of water vacuum is placed on the system.

Description of Detection Limits

The minimum differential pressure that can be accurately measured with the standard 0" to 10" inclined manometer is 0.01" water. If more than 10 percent of the velocity head values are, or if the average value is, less than 0.10" then a more precise manometer must be used. The minimum velocity that can be measured with a Pitot tube is approximately 10 ft/sec. Below this value the assumptions about turbulent flow upon which the Bernoulli equation is based fail and the calculation becomes inaccurate.

Temperature is measured with a type-K thermocouple. These devices are accurate to ±3°F over a range from 0°F to 1500°F.

Calibration Procedures

Pretest calibration of the S-type Pitot tube consists of measuring the angles and dimensions of the measuring tip and making adjustments as required to ensure that it conforms to standards specified in Method 2.

The thermocouple is calibrated at the ice point and boiling point of water and at an upscale, hot oil, temperature against a mercury-in-glass thermometer.

CO_2 AND O_2 CONCENTRATION BY METHOD 3A

Summary of Method

This method uses an electronic continuous emission monitor (CEM) to measure both CO_2 and O_2 concentrations. Analysis of carbon dioxide is based upon the absorption of infrared radiation by the carbon dioxide molecule. The intensity of the absorption depends on the concentration of CO_2 compound present. The infrared light beam is split after the light source, with one part passing through the sample cell, and the other part passing through the reference cell, which is filled with a non-absorbing gas. Each beam then passes through a narrow band pass filter which passes the wavelength of light corresponding to the most intensely absorbing vibration into a photomultiplier tube which amplifies the signal. The amount of absorbed light (found by difference in signal intensity) is proportional to the amount of absorbing species present.

The method of analysis for O_2 is based upon the electrochemical reaction of oxygen in a fuel cell which occurs at a rate proportional to the concentration of oxygen. Oxygen in the sample gas diffuses through an oxygen specific membrane and is reduced at the cathode. A corresponding oxidation occurs at the anode and an electrical current is produced which is amplified and transmitted to an LCD readout.

Description of Sampling Equipment

The analyzer and sampling system used for this analysis meets the following specifications.

- Analyzer calibration error - Less than ± 2 percent of the span for zero and calibration gases.
- Sampling system bias - Less than ± 5 percent of the span for the zero and calibration gases.
- Zero drift - Less than ± 3 percent of span over the period of each run.
- Calibration drift - Less than ± 3 percent of span over the period of each run.

The CO_2 and O_2 analyzer used by Parsons Engineering Science is an Anarad Model AR-205 Combustion Efficiency Monitor, which measures CO_2 concentration by the IR absorbtion

technique and O_2 concentration using an electrolytic fuel cell. The AR-205 has full-scale range 0-20% CO_2. The CO_2 calibration standards are typically 10-12% and 16-18% CO_2 in N_2

The O_2 analyzer has a range of 0-20.9% and calibration gases of 10-12% and 16-18% O_2 in$N_2$are typically used. Pure nitrogen, or another cylinder gas which contains no CO_2 or O_2 is used to zero the instrument.

The sample is extracted from the duct, conditioned and transported from the sample location into a vented manifold. The sample is then extracted from the manifold by a pump contained inside the analyzer cabinet.

Description of Operation

After the analyzer is calibrated and system bias and leak checks are performed, sample gas is introduced into the instrument. Sampling runs may last from 15 minutes for turbine tests to 60 minutes or longer when done in conjunction with Method 5.

Analyzer responses are determined from a digital data acquisition system which uses an analog to digital signal converter, a personal computer and a hard copy printer. Spread sheet files of all measurements and calibration results are also saved onto a hard disk.

Description of Detection Limits

The flow rate of the AR-205 is 0.5 liters per minute. The analyzer has detection limits of 0.1 percent for both CO_2 and O_2.

Calibration Procedures

After the measurement system is prepared for use, calibration gases are introduced directly into the instrument. The analyzer is calibrated to ± 2 percent of the instrument span for each standard introduced. A gas standard is then introduced into the sample system at the probe to conduct a system bias check. The system bias must not be greater than five percent of the instrument range.

After the sampling run a zero and calibration drift check is performed by introducing a zero and a mid-range calibration gas into the analyzer. If either the zero or upscale value has drifted by more than 3 percent of the span, the run is considered invalid.

In the event that the analyzer fails any of the above tests, the system is diagnosed to determine the source of the problem, corrective maintenance is performed, and the procedure is repeated. All measurements are corrected for bias and drift using equation 3A-1 found in USEPA Method 3A.

SO_2 CONCENTRATION BY USEPA METHOD 6C

Summary of Method

The method of analysis of sulfur dioxide is based upon the absorption of infra-red (IR) radiation by the sulfur dioxide molecule. The intensity of the absorption depends on the concentration of SO_2 present. The IR light beam is split after the light source, with one part passing through the sample cell, and the other part passing through the reference cell, which is filled with a non-absorbing gas. Each beam then passes through a narrow band pass filter (which passes the wavelength of light corresponding to the most intensely absorbing vibration) into photomultiplier tubes for creation and amplification of the signals. The amount of absorbed light (found by difference in signal intensity) is proportional to the amount of SO_2 present.

Description of Sampling Equipment

The analyzer used for this analysis meets the following specifications.

- Analyzer calibration error - Less than ± 2 percent of the span for zero, mid-range, and high-range calibration gases.
- Sampling system bias - Less than ± 5 percent of the span for the zero, and mid- or high-range calibration gases.
- Zero drift - Less than 3 percent of span over the period of each run.

The SO_2 analyzer used by Engineering-Science is a Horiba Model AIA 24 Sulfur Dioxide Analyzer, which operates on the principle of IR absorbtion. The analyzer has full-scale ranges of 0-500, 1,000, 1,500 and 2,000 ppm. SO_2 standards are selected to correspond to approximately 55 and 85 percent of the instrument span range. Gas standards are certified as Protocol-1 by the gas manufacturer. The detection limit of the analyzer is 5 percent of the operating range or 1 ppm when operated on the 0-500 ppm range.

Description of Operation

The full scale range of the analyzer is chosen such that the sample gas concentration corresponding to the applicable emission standard is on-scale, but not less than 30 percent of the analyzer response.

After the analyzer is calibrated and system bias and leak checks are performed, sample gas is introduced into the instrument. Sampling runs may last from 15 minutes for turbine tests to 60 minutes or longer when done in conjunction with Method 5.

Analyzer responses are recorded by a data acquisition system (DAS) which consists of an analog to digital signal converter, a personal computer and a hard copy printer. Analyzer responses are also recorded in a hard disk for subsequent importation into Lotus 1-2-3 for data reduction.

Calibration Procedures

All calibration gases are chosen to conform to USEPA Protocol-1 and are chosen as follows. A cylinder of zero grade air or pure nitrogen is be used as the zero standard. The high- and mid-range gases are SO_2 in air, with concentrations of corresponding to approximately 80-90 percent and 50-60 percent of the full-scale range of the analyzer.

After the measurement system has been prepared for use, the zero and calibration standards are introduced one at a time. The analyzer calibration error check is considered invalid if the response from a single gas differs by more than two percent of the analyzer span.

Immediately before and after each sampling run, a zero and calibration system bias check is performed by introducing zero and mid-range gas into the sampling system at the probe. If either the zero or upscale value exceeds the system bias specification, the run is considered invalid.

In the event that the analyzer fails any of the above tests, the system is diagnosed to locate the source of the problem, corrective maintenance is performed, and the mesurement system is recalibrated according to the procedures outlined previously.

If all checks are satisfactory, the results of the calibration and system bias checks are used to correct the average observed SO_2 concentrations for system drift. The drift correction is performed using equation 6C-1 from Method 6C.

NO_X CONCENTRATION BY USEPA METHOD 7E

Summary of Method

The method of analysis of total oxides of nitrogen (NO_x) is based upon the chemiluminescent reaction between nitric oxide (NO) and ozone (O_3). When these two compounds react, a characteristic wavelength of light is emitted. The light is passed through a photomultiplier tube which amplifies the light beam. The intensity of the amplified light beam is measured by a detector, which converts the light energy into an electronic signal. The magnitude of the signal is proportional to the amount of NO present in the gas sample. The instrument contains an internal source of ozone and a catalytic reduction chamber wherein NO_2 in the sample is reduced to NO prior to its introduction into the reaction chamber. The reduction catalyst may be by-passed, thus allowing for sequential analysis of total NO_x and then NO. The concentration of NO_2 may then be determined by difference.

Description of Sampling Equipment

The analyzer and sampling system used for this analysis meets the following specifications:

- Analyzer calibration error - Less than ± 2 percent of the span for zero, mid-range, and high-range calibration gases.
- Sampling system bias - Less than ± 5 percent of the span for the zero, and mid- or high-range calibration gases.
- Zero drift - Less than 3 percent of span over the period of each run.

The NO_X analyzer used by Engineering-Science is a Thermo Electron Model 10 Oxides of Nitrogen Analyzer, with ranges of 0-2.5, 10, 25, 100, 250, 1,000, 2,500, and 10,000 ppm. Calibration standards are chosen to conform to approximately fifty to sixty percent of span for the mid-range gas, and eighty to ninety percent for the high-range gas. Pre-purified air or nitrogen is used as a zero gas.

Description of Operation

The analyzer is prepared for use according to the manufacturers written instructions and calibrated using the appropriate gas standards. Sample gas is conditioned to remove moisture and allowed to flow into the instrument for the duration of the pre-determined sampling period.

Analyzer responses are recorded by a digital data acquisition System (DAS) which consists of an analog to digital signal converter, a personal computer and a hard copy printer. Responses are also recorded on the computer's hard disk drive for subsequent importation into Lotus 1-2-3 for data reduction.

Description of Detection Limits

The detection limit of the measurement system is typically two percent of the instrument span range. For an operating range of 250 ppm, the instrument detection limit is approximately 5 ppm.

Calibration Procedures

All calibration gases certified by the supplier to conform to USEPA Protocol 1. After the measurement system is prepared for use, the calibration gases are directly introduced into the instrument one at a time beginning with the zero gas. The high- and mid-range calibration gas

are then introduced into the instrument. If the analyzer response to any of the gases differs by more than two percent of the instrument from the predicted response, the calibration error check is considered invalid, the instrument is repaired and the calibration repeated.

Immediately before the sampling run, a zero and calibration system bias check is performed by introducing the zero and mid-range calibration gases into the measurement system. If either the zero or upscale value exceeds the system bias specification, the run is considered invalid.

In the event that the analyzer fails any of the above tests, the system is diagnosed to determine the source of the problem, corrective maintenance is performed, and the entire procedure is repeated.

If all checks are satisfactory, the averages of the zero and span responses to the calibration error and bias checks at the beginning and end of the test are used to calculate the sample concentration for the run the calculation is done using equation 6C-1 of EPA Method 6C.

CARBON MONOXIDE CONCENTRATION BY METHOD 10

Summary of Method

The method of analysis of carbon monoxide is based upon the absorption of infrared radiation by the carbon monoxide molecule, which causes the C-O bond to vibrate in such a manner as to change the dipole moment of the molecule. The wavelength of the absorbed light is dependent upon the difficulty of causing the vibration in question and the intensity of the absorption depends on the concentration of carbon monoxide present. The infrared light beam is split after the light source, with one part passing through a sample cell, and the other part passing through a reference cell, which is filled with a non-absorbing gas. Each beam then passes through a narrow band pass filter which passes the wavelength of light corresponding to the most intensely absorbing vibration into a photomultiplier tube which amplifies the signal. The amount of absorbed light (found by difference in signal intensity) is proportional to the amount of absorbing species present.

Description of Sampling Equipment

The analyzer used for this analysis meets the following specifications:

- Analyzer calibration error - Less than ± 2 percent of the span for zero, mid-range, and high-range calibration gases.
- Sampling system bias - Less than ± 5 percent of the span for the zero, and mid- or high-range calibration gases.
- Zero drift - Less than ± 3 percent of span over the period of each run.
- Calibration drift - Less than ± 3 percent of span over the period of each run.

The CO analyzer used by Engineering-Science is the Bendix Model 8501-SCA Carbon Monoxide Analyzer, which has full-scale ranges 0-50, 0-250, 0-500, and 0-1,000 ppm CO. It is typically operated in the 0-1000 ppm range with standard gases that are 300 ppm, 600 ppm and 900 ppm CO in N_2.

The sample is extracted from the stack, conditioned to remove moisture, and transported to the sample manifold by in inert sample line. The sample conditioning system removes moisture to a dew point of 30°F. Method 10 specifies the use of ascarite to remove CO_2 from the sample, however ES does not typically use ascarite. During calibration, the introduction of twelve to eighteen percent CO_2 into the analyzer demonstrates the absence of CO_2 interference.

Description of Operation

The full-scale range of the analyzer is chosen such that the high range span gas concentration does not exceed 1.5 times the applicable source performance standard at stack conditions.

Analyzer response is measured by a digital acquisition system (DAS), which converts the analog output of the analyzer to digital data which is displayed on the screen of a personal computer. Data is also written to a hard disk file and to a printer.

Description of Detection Limits

The flow rate of the sample gas to the analyzer is self regulated at one liter per minute by a on board pump. The detection limit of the analyzer is two percent of the instrument span, or 20 ppm when operated at the 1000 ppm range.

Calibration Procedures

Zero grade air or pure nitrogen used is used for zero gas. Calibration gases are chosen to be approximately 30, 60, and 90 percent of the instrument's operating range. After the measurement system is prepared for use, calibration gases are directly introduced into the instrument. The analyzer is calibrated and checked to insure that the output differs by no more than two percent of span for each cylinder introduced.

Immediately before each sampling run a bias check is performed on the measurement system by introducing a zero and mid-range calibration gas into the probe. If the system bias check exceeds five percent of the instrument span the system is not used until the problem is repaired. Immediately after each sampling run a bias and calibration drift check is performed to insure that the analyzer drift has not exceeded three percent.

TOTAL HYDROCARBON CONCENTRATION BY USEPA METHOD 25A

Summary of Method

The method of analysis of hydrocarbons is based on the principle that the electrical conductivity of a gas is directly proportional to the number of charged particles present. When hydrocarbons are burned in a hydrogen flame, ionized carbon atoms are produced which decrease the resistance (voltage) across an electrode gap. The resulting voltage decrease is then measured by an amplifier electrometer and recorded on a potentiometric chart recorder.

Description of Sampling Equipment

The sample extraction and analysis for hydrocarbons differs from that of SO_2, CO and NO_X in that no condenser is used to remove moisture from the gas stream. The sample is introduced through a probe, glass fiber filter, a 3-way calibration gas valve, and Teflon® line into a pump within the analyzer. All surfaces that contact the sample gas stream are of stainless steel, glass, or Teflon®, and are heated to prevent condensation of water or organic vapors.

The analyzer to be used for this analysis must meet the following specifications:

- Zero drift - Less than ± 3 percent of the span over the period of each run.
- Calibration drift - Less than ± 3 percent of the span over the period of each run.
- Calibration error - Less than ± 5 percent of the span over the period of each run.

The hydrocarbon analyzer used by Engineering-Science is the J.U.M. Total Hydrocarbon Gas Analyzer which uses a heated Flame Ionization Detector (FID). The J.U.M. has ranges that vary from 0-50 ppm to 10,000 ppm total hydrocarbons, measured as propane ppm total hydrocarbons.

Description of Operation

The span gas concentration is chosen such that it is 1.5 to 2.5 times the expected concentration of the sample or emission limit. The mid-range standard is 45-55 percent of the concentration of the span gas, and the low-range standard is 25-35 percent of the span value. The zeros gas is high purity air with less than 0.1 parts per million by volume of organic material.

After the system is calibrated and all performance checks are completed (see below) the sample gas is introduced into the instrument.

Description of Leak-Check Procedure

Prior to initiation of sampling a three-point calibration is performed on each instrument with the calibration gases injected directly into the instrument. These calibrations are compared

*Teflon is a trademark of E. I. du Pont de Nemours & Company.

to the five-point calibrations that were done in the laboratory to ensure proper instrument calibration. Following these three point calibrations a system bias check is performed for each instrument. This consists of injecting a zero and span gas into the sample conditioning system at the 3-way valve that is mounted at the end of the probe. The response to the span gas injected ahead of the conditioning system must agree within two percent to the response to the same gas injected directly into the analyzer. If this test is passed, the system is proven to be free of leaks and interferences. If the test is failed, then a diagnosis of the system if performed. This diagnosis includes looking for leaks, pools of condensate, accumulations of dirt in the lines or on the filter and checking for instrument malfunctions.

Description of Sample Volumes and Detection Limits

Sample volume does not apply to a continuous monitoring system. The analyzer flow rate is specific to the instrument and may be found in the operator's manual. Where the concentration of organic vapors in the sample gas stream exceeds the capacity of the detector, a heated capillary or critical orifice may be used downstream of the pump to restrict the flow to the analyzer.

Since the span value is chosen to be 1.5 to 2.5 times the expected sample concentration, the detection limit of the method does not apply.

Calibration Procedures

All calibration gases are chosen to conform to USEPA Protocol 1, so verification of the calibration gases is not required. Gas concentrations are chosen as follows. The span gas is 80-90% of the full-scale range, and the midrange standard is 45-55% of the concentration of the span gas.

After the measurement system is prepared for use, the calibration gases are directly introduced into the instrument. The analyzer calibration error check shall be considered invalid if the result for any of the gases is more than ± 2 percent different from the results obtained when compared with the five-point calibration performed at the laboratory.

Immediately after the sampling run, a zero and calibration drift check is performed in the same manner as the system bias check described above. If either the zero or upscale value exceeds the system bias specification, the run is considered invalid.

In the event that the analyzer fails any of the above tests, the system is diagnosed to determine the source of the problem, corrective maintenance is performed, and the entire procedure is repeated.

If all checks are satisfactory, the averages of the zero and span responses from the recorder at the beginning and end of the test are used to calculate the sample concentration for the run.

After a run is successfully completed, the data is transcribed from the strip chart onto the Continuous Analyzer Daily Data form (Figure 2) and the information at the top is completed. The data is then reduced.

A Data Acquisition System may be incorporated in order to obtain the detector output response which provides a hard copy of the results and, the data is also stored on computer.

FIGURE 2

CONTINUOUS ANALYZER DAILY DATA

Plant: ____________________ Run: ____________________
Date: ____________________ Pollutant: ____________________
Operator: ____________________ Sample Size: ____________________
Strip Chart Analyzer Serial No.: ____________________
Recorder Type: ____________________ Analyze Model: ____________________
Inst. Span Range: ____________________ Output Signal Format: ____________________
_____Span Gas Conc.: ______ ______ ______ ______ ______
Meter/Recorder Reading: ______ ______ ______ ______ ______

CALIBRATION (SCALE FACTOR/LINEAR REGRESSION, ETC.)

Time HR:MIN	Chart Reading	Scale Factor	ppm	Time HR:MIN	Chart Reading	Scale Factor	ppm

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DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	Waste Product Technology	Date
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Document #: SD-WM-VI-028

Title/Desc:
GTS DURATEK PHASE 1 HANFORD LLW MELTER TESTS 100 KG MELTER OFFGAS REPORT [SEC 2 OF 3]

Pages: 126

This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

DOCUMENT NUMBER: SD-WM-VI-028 REV 0

SECTION 2 OF 3

TITLE: GTS DURATEK PHASE I HANFORD LLW MELTER TESTS 100 Kg MELTER OFFGAS REPORT

DATE: 11/30/95

ORIGINATOR: EATON WC

CO: WHC

RECIPIENT:

CO:

REFERENCES: EDT-611884

APPENDIX B

LABORATORY DATA

BEST AVAILABLE COPY

CATHOLIC UNIVERSITY
WASHINGTON D.C.
LAB DATA

PLANT	SAMPLE NUMBER	SAMPLE WEIGHT (GRAMS)	SAMPLE VOLUME CORR (ML)	RINSE VOLUME (ML)	TOTAL VOLUME (ML)	BEAKER #	BEAKER TARE (GRAMS)	BEAKER FINAL (GRAMS)	DIFF. (GRAMS)	FILTER#	FILTER TARE (GRAMS)	FILTER FINAL (GRAMS)	DIFF. (GRAMS)	BLANK ACETONE (GRAMS)	TOTAL GAIN (GRAMS)
CATHOLIC	ACETONE BLANK	203.7	259.3	75	334.3	94/06	102.6459	102.6462	0.0003	------	------	------	------	------	------
CATHOLIC	CU-MMT-I-01	82.7	105.3	75	180.3	94/07	103.4214	103.6268	0.2054	M003/91	45.0250	45.2845	0.2595	0.2052	0.5019
CATHOLIC	CU-MMT-I-02	75.4	96.0	75	171.0	94/08	99.9365	100.1562	0.2197	M004/91	36.4174	36.8993	0.4819	0.2195	0.7935
CATHOLIC	CU-MMT-I-03	147.3	187.5	75	262.5	94/13	105.6774	106.4690	0.7916	M002/91	43.9510	44.7929	0.8419	0.7914	1.8565
CATHOLIC	CU-MMT-O-01	20.9	26.6	75	101.6	94/15	104.1137	104.1245	0.0108	M005/91	43.1479	43.1479	0.0000	0.0107	0.0107
CATHOLIC	CU-MMT-O-02	16.6	21.1	75	96.1	94/16	103.6209	103.6260	0.0051	M008/91	37.9172	37.9155	0.0000	0.0050	0.0050
CATHOLIC	CU-MMT-O-03	39.7	50.5	75	125.5	94/17	102.5638	102.5712	0.0074	M006/91	43.3798	43.3793	0.0000	0.0073	0.0073
CATHOLIC	CU-MMT-O-04	54.1	68.9	75	143.9	94/18	107.2171	107.2237	0.0066	M010/92	57.9217	57.9227	0.0010	0.0065	0.0075

1N HNO3 FRONT-HALF RINSE FILTERED

CATHOLIC	CU-MMT-I-01-.1HNO3-FILTER	M018/91	46.6802	46.7174	0.0372	0.0000	0.0372
CATHOLIC	CU-MMT-I-02-.1HNO3-FILTER	M019/91	42.4506	42.5427	0.0921	0.0000	0.0921
CATHOLIC	CU-MMT-I-03-.1HNO3-FILTER	M020/91	36.2936	36.5168	0.2232	0.0000	0.2232
CATHOLIC	CU-MMT-I-FB-.1HNO3-FILTER	M017/91	44.6568	44.6590	0.0022	0.0000	0.0022

WASH BOTTLES

ANALYSIS _____ SOLVENT _____ DATE STARTED _____ DATE FINISHED _____

PROJECT NUMBER _____ PROJECT NAME _____ PROJECT MANAGER _____ ANALYST _____

BEAKER NUMBER	SAMPLE NUMBER/SOLVENT	INITIAL BOTTLE WT. (g)	FINAL BOTTLE WT. (g)	DIFFERENCE (g)	1/DENSITY OF SOLVENT	FIELD SAMPLE VOL. (ml)	LAB WASH VOL. (ml)	TOTAL WASH VOL. (L)
94/01	PSD-GD-Blank Ga. Duct	290.7	218.3	72.4	1.2728	92.2	—	0.0922
94/02	Ga. Duct PSD-GD-01 Acetone	271.0	217.2	53.8	1.2728	68.5	75mL	0.1435
94/03	Ga Duct PSD-GD-02 Acetone	259.3	216.1	43.2	1.2728	55.0	75mL	0.1300
94/04	Ga. Duct PSD-GD-03 Acetone	251.0	218.8	32.2	1.2728	41.0	75mL	0.1160
94/05	Ga Duct PSD-GD-04 Acetone	253.7	218.1	35.6	1.2728	45.3	75mL	[illegible]
94/06	Catholic U. 9/26 FHA Blank	472.6	268.9	203.7	1.2728	259.27	75mL	[illegible]
94/07	Catholic U 9/26 CU-MMT-01-I	300.0	217.3	82.7	1.2728	105.3	75mL	[illegible]
94/08	Catholic U 9/26 CU-MMT-02-I	293.5	218.1	75.4	1.2728	95.97	75mL	[illegible]

(Cath U Cont'd on p. 171)

SAMPLE RESIDUE WEIGHT, CALCULATIONS

RUN NUMBER	01	02	03	04	05			

	BEAKER NUMBER	94/01	94/02	94/03	94/04	94/05	94/06	94/07	[illegible]
A	BLANK WASH VOLUME, L	0.0922	0.0922	0.0922	0.0922	0.0922	0.3343	0.3343	[illegible]
B	BLANK RESIDUE, g	0.0008	0.0008	0.0008	0.0008	0.0008	0.0003	[illegible]	
C	BLANK CONC., g/l (B÷A)	0.0087	0.0087	0.0087	0.0087	0.0087	0.00090	[illegible]	
D	SAMPLE WASH VOLUME, L		0.1435	0.1300	0.1160	0.1203		0.1803	[illegible]
E	SAMPLE RESIDUE WEIGHT, g		0.0048	0.0101	0.0142	0.0066		[illegible]	[illegible]
F	BLANK CORRECTION, g (C•D)		0.0012	0.0011	0.0010	0.0010		[illegible]	
G	NET RESIDUE WEIGHT, g (E−F)		0.0036	0.0090	0.0132	0.0056		[illegible]	

METHOD 5 BEAKER WEIGHTS

TARE WEIGHTS

BEAKER NUMBER	DATE	7/7/94	7/7/94									TARE WEIGHT (g)
	STANDARD WT.	100.0000	100.0000									
	R.H. (%)	44	44									
	TEMP. (°F)	74	74									
	ANALYST	DAH	DAH									
94/01		102.0075	102.0070									102.0073
94/02		104.0261	104.0256									104.0259
94/03		103.7963	103.7958									103.7961
94/04		105.7474	105.7470									105.7472
94/05		102.6943	102.6941									102.6942
94/06		102.6459	102.6458									102.6459
94/07		103.4215	103.4212									103.4214
94/08		99.9367	99.9362									99.9365

FINAL WEIGHTS

BEAKER NUMBER / FIELD SAMPLE NUMBER		PROJECT NO.			726517	726517					FINAL WEIGHT (g)	TARE WEIGHT (g)	RESIDUE WEIGHT (g)
		PROJECT NAME	Ga. Duck	Ga. Duck	Cath U	Cath U.							
		DATE	7/12/94	7/12/94	10/10/94	10/10/94							
		STANDARD WT.	100.0000	100.0000	100.0000	100.0000							
		R.H. (%)	38	38	38	38							
		TEMP. (°F)	74	74	73	74							
		ANALYST	DAH	DAH	GDH	GDH							
94/01	Blank	Ga Duck	102.0079	102.0083							102.0081	102.0073	0.0008
94/02	01		104.0305	104.0309							104.0307	104.0259	0.0048
94/03	02		103.8061	103.8062							103.8062	103.7961	0.0101
94/04	03		105.7613	105.7615							105.7614	105.7472	0.0142
94/05	04		102.7005	102.7010							102.7008	102.6942	0.0066
94/06		Catholic U. Blank			102.6462	102.6462					102.6462	102.6459	0.0003
94/07		Comm-01-5			103.6269	103.6266					103.6268	103.4214	0.2054
94/08		Comm-02-1			100.1564	100.1560					100.1562	99.9365	0.2197

171

WASH BOTTLES

ANALYSIS _____ SOLVENT _____ DATE STARTED _____ DATE FINISHED _____

PROJECT NUMBER _____ PROJECT NAME _____ PROJECT MANAGER _____ ANALYST _____

BEAKER NUMBER	SAMPLE NUMBER/SOLVENT (Cont'd From p. 165)	INITIAL BOTTLE WT. (g)	FINAL BOTTLE WT. (g)	DIFFERENCE (g)	1/DENSITY OF SOLVENT	FIELD SAMPLE VOL. (ml)	LAB WASH VOL. (ml)	TOTAL WASH VOL. (L)
94/013	Catholic U 9/26 CU-MMT-03-I	366.0	218.7	147.3	1.2728	187.5	100mL	0.2875
94/014	~~Catholic U 9/26 CU-MMT-01-0~~ CU-MMT-I FB-[illegible]	~~[illegible]~~ 295	264.5	30.5	1.2728	38.82	75 μL	0.1138
94/015	Catholic U 9/26 CU-MMT-01-0	239.2	218.3	20.9	1.2728	26.6	75mL	0.1016
94/016	Catholic U 9/26 CU-MMT-02-0	236.0	219.4	16.6	1.2728	21.12	75mL	0.0961
94/017	Catholic U 9/26 CUMMT-03-0	259.4	219.7	39.7	1.2728	50.53	75mL	[illegible]
94/018	Catholic U 9/26 CU-MMT-04-0	573.6	519.5	54.1	1.2728	68.86	75mL	[illegible]
94/019							75 mL	
94/020								

SAMPLE RESIDUE WEIGHT, CALCULATIONS

RUN NUMBER								

	BEAKER NUMBER	94/013	94/014	94/015	94/016	94/017	94/018	94/019	94[illegible]
A	BLANK WASH VOLUME, L	0.3343	0.3343	0.3343	0.3343	0.3343	0.3343		
B	BLANK RESIDUE, g	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003		
C	BLANK CONC., g/l (B÷A)	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090		
D	SAMPLE WASH VOLUME, L	0.2875	0.1138	0.1016	0.0961	0.1255	0.1439		
E	SAMPLE RESIDUE WEIGHT, g	0.7916	0.0227	0.0108	0.0051	0.0074	0.0066		
F	BLANK CORRECTION, g (C•D)	0.000259	0.000102	0.000091	0.000086	0.000113	0.000130		
G	NET RESIDUE WEIGHT, g (E-F)	0.7913	0.0226	0.0107	0.0050	0.0073	0.00647		

METHOD 5 BEAKER WEIGHTS

TARE WEIGHTS

BEAKER NUMBER	DATE	9/29/94	9/30/94	9/30/94	10-2-94	10-3-94	10-10-94					TARE WEIGHT (g)
	STANDARD WT.	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000					
	R.H. (%)	38	40	40	42	32	38					
	TEMP. (°F)	72	75	74	75	74	73					
	ANALYST	DAH	GDB	GDB	GDB	DAH	GDB					
94/013		105.6775	105.6772	~~105.6776~~								105.6774
94/014		100.9712	100.9700	100.9718	100.9738	100.9724	100.9724					100.9724
94/015		104.1145	104.1135	104.1139								104.1137
94/016		103.6223	103.6208	103.6210								103.6209
94/017		102.5646	102.5636	102.5639								102.5638
94/018		107.2180	107.2169	107.2172								107.2171
94/019		103.2041	103.2029	103.2029								103.2029
94/020		107.3843	107.3833	107.3832								107.3833

FINAL WEIGHTS

BEAKER NUMBER / FIELD SAMPLE NUMBER	PROJECT NO.	726517	726517	726517	726517					FINAL WEIGHT (g)	TARE WEIGHT (g)	RESIDUE WEIGHT (g)
	PROJECT NAME	Cath U.	Cath U.	Cath U	Cath U							
	DATE	10/10/94	10/10/94	10/14/94	10/14/94							
	STANDARD WT.	100.0000	100.0000	100.000	100.0000							
	R.H. (%)	38	35	34	33							
	TEMP. (°F)	73	74	75	74							
	ANALYST	GDB	GDB	GDB	GDB							
94/013	CUMMT-03-I	106.4687	106.4692							106.4690	105.6774	0.7916
94/014	FIELD BLANK			100.9952	100.9950					100.9951	100.9724	0.0227
94/015	CUMMT-01-O	104.1245	104.1244							104.1245	104.1137	0.0108
94/016	CUMMT-02-O	103.6259	103.6260							103.6260	103.6209	0.0051
94/017	CU-MMT-03-O	102.5711	102.5713							102.5712	102.5638	0.0074
94/018	CU-MMT-04-O	107.2237	107.2236							107.2237	107.2171	0.0066
94/019												
94/020												

DATE 10/20/94
ANALYST GDH
CHECKED BY DAH
DATE CHECKED 10/20/94

SAMPLE WEIGHT, FILTER

PROJECT NUMBER	~~326517~~	726517	726517	726517	726517	726517	726517	726517
RUN NUMBER		CU-I-03	CU-I-01	CU-I-02	CU-O-01	CU-O-03	CU-FieldBl	CU-O-02
FILTER #1 NUMBER		M002/91	M003/91	M004/91	M005/91	M006/91	M007/91	M008/91
FILTER, FINAL WT.,g		44.7929	45.2845	36.8993	43.1479	43.3793	40.5360	37.9155
FILTER, TARE WT.,g		43.9510	45.0250	36.4174	43.1479	43.3798	40.5404	37.9172
CATCH WEIGHT , g		0.8419	0.2595	0.4819	0	-0.0005 (0)	-0.0044 (0)	-0.0017 (0)
FILTER #2 NUMBER		M020/91	M018/91	M014/91				
FILTER, FINAL WT.,g		36.5168	46.7174	42.5489				
FILTER, TARE WT.,g		36.2936	46.6802	42.4506				
CATCH WEIGHT , g		0.2232	0.0372	0.0921				
TOTAL CATCH WT. g		1.0651	0.2967	0.5740	0	0	0	0

RESIDUE WEIGHT, FRONT HALF ACETONE

BEAKER NUMBER		94/13	94/07	94/08	94/15	94/17	94/14	94/16
NET RESIDUE WT., g		0.7914	0.2052	0.2195	0.0107	0.0073	0.0226	0.0050

TOTAL WEIGHT, grams

TOTAL WEIGHT ,g		1.8565	0.5019	0.7935	0.0107	0.0073	0.0226	0.0050

CALCULATION SHEET

DATE 10/20/94
ANALYST GDH
CHECKED BY DAH
DATE CHECKED 10/20/94

SAMPLE WEIGHT, FILTER

PROJECT NUMBER					726517				
RUN NUMBER					20.0-04				
FILTER NUMBER					M010/42				
FILTER, FINAL WT., g					57.9227				
FILTER TARE WT., g					57.9217				
FILTER WEIGHT, g					0.0010				

RESIDUE WEIGHT, FRONT HALF ACETONE WASH

BEAKER NUMBER					94/18				
NET RESIDUE WT., g					0.0065				

TOTAL WEIGHT, grams

TOTAL WEIGHT, g					0.0075				

METHOD 5 FILTER WEIGHTS

PALLFLEX METALS FILTERS

TARE WEIGHTS

FILTER NUMBER	DATE	3-15-91	3-15-91	10								TARE WEIGHT (g)
	STANDARD WT.	30.0000	30.0000									
	R.H. (%)	36	36									
	TEMP. (°F)	70	70									
	ANALYST	DAH	DAH									
M001/91		38.5444	38.5440									38.5442
M002/91	CU-I-03	43.9510	43.9509									43.9510
M003/91	CU-I-01	45.0251	45.0249									45.0250
M004/91	CU-I-02	36.4175	36.4172									36.4174
M005/91	CU-O-01	43.1481	43.1476									43.1479
M006/91	CU-O-03	43.3798	43.3797									43.3798
M007/91	CU-FieldBlank	40.5406	40.5401									40.5404
M008/91	CU-O-02	37.9174	37.9170									37.9172

FINAL WEIGHTS

FILTER NUMBER / FIELD SAMPLE NUMBER	PROJECT NO.	726517	726517	726517	726517							FINAL WEIGHT (g)
	PROJECT NAME	CathLic	Cath. U.	Cath U	Cath U							
	DATE	9/20/94	10/2/94	10/10/94	10/10/94							
	STANDARD WT.	60.0000	30.0000	50.0000	50.0000							
	R.H. (%)	40	42	38	38							
	TEMP. (°F)	74	75	73	74							
	ANALYST	GDK	GDK	GDK	GDK							
M001		~~Cath U~~										
M002	Cath U Inlet 03	44.7930	44.7940	44.7927	44.7931							44.79[illegible]
M003	Cath U Inlet 01	45.2867	45.2856	45.2846	45.2844							45.2845
M004	Cath U. Inlet 02	36.8993	36.8993									36.8993
M005	Cath U Outlet 01	43.1467	43.1481	43.1476								[illegible]
M006	Cath U Outlet 03	43.3791	43.3794									43.3[illegible]
M007	Cath U Field Blank	40.5361	40.5358									[illegible]
M008	Cath U Outlet 02	37.9157	37.9153									[illegible]

METHOD 5 FILTER WEIGHTS

TARE WEIGHTS

FILTER NUMBER	DATE	5/12 92	5/13 92	5/22 92	6/1 92	6/2 92	6/8 92	6/16 92	6/17 92	6/18 92	6/19 92	TARE WEIGHT (g)
	STANDARD WT.	60.0002	60.0005	60.0003	60.0005	60.0002	60.0003	60.0005	60.0001	60.0003	60.0005	
	R.H. (%)	34.0°	32.0°	30.0°	38.0°	35.0°	46.0°	35.0°	32.0°	49.0°	38.0°	
	TEMP. (°F)	74 F	74 F	74 F	72 F	74 F	77 F	72 F	74 F	74 F	74 F	
	ANALYST	LHC	LHC	LHC	LHC	LHC	LHC	LHC	LHC	LHC	LHC	
M004/92		61.8864										61.8864
M006/92		63.9394	63.9351	63.9390	63.9291	63.9293						63.9293
M008/92		62.9129										62.9129
M009/92		67.8979	67.8778	67.8669	67.8639	67.8602	67.8616	67.8787	67.8943	67.8877	67.9900	Rejected
M010/92	Cath U-0-04	57.9200	57.9226	57.9215	57.9229	57.9215	57.9208	[redacted]				[redacted]
M013/92		57.0000	57.0001									57.0000
M014/92		78.2996	78.3039	78.2989	78.2976	78.2989	78.2988					78.2989
M016/92		71.5400	71.5377	71.5516	71.5373	71.5349	71.5358	71.5358				71.5358

FINAL WEIGHTS

FILTER NUMBER	FIELD SAMPLE NUMBER	PROJECT NO.		726517	726517									FINAL WEIGHT (g)
		PROJECT NAME	Erie	Cath U	Cath U									
		DATE	4-9-93	9-30-94	10-10-94									
		STANDARD WT.	60.0000	60.0000	50.0000									
		R.H. (%)	28	40	33									
		TEMP. (°F)	74	74	73									
		ANALYST	DAH	GDB	GDB									
M004			61.9188											
~~M005~~	M006													
~~M006~~	M008													
~~M007~~	M009													
~~M008~~	M010	Cath U-0-04		57.9227	57.9226									57.9227
~~M009~~	M012													
~~M010~~	M014													
	M016													

DATE 10/20/94
ANALYST GDH
CHECKED BY
DATE CHECKED

SAMPLE WEIGHT, FILTER

PROJECT NUMBER	~~726517~~	726517	726517	726517	726517	726517	726517	726517
RUN NUMBER		CU-I-03	CU-I-01	CU-I-02	CU-O-01	CU-O-03	CU-FieldBL	CU-O-02
FILTER #1 NUMBER		M002/91	M003/91	M004/91	M005/91	M006/91	M007/91	M008/91
FILTER, FINAL WT.,g		44.7929	45.2845	36.8993	43.1479	43.3793	40.5360	37.9155
FILTER, TARE WT.,g		43.9510	45.0250	36.4174	43.1479	43.3798	40.5404	37.9172
CATCH WEIGHT , g		0.8419	0.2595	0.4819	0	-0.0005 (0)	-0.0044 (0)	-0.0017 (0)
FILTER #2 NUMBER		M020/91	M018/91	M019/91				
FILTER, FINAL WT.,g		36.5168	46.7174	42.5429				
FILTER, TARE WT.,g		36.2936	46.6802	42.4506				
CATCH WEIGHT , g		0.2232	0.0372	0.0921				
TOTAL CATCH WT. g		1.0651	0.2967	0.5740	0	0	0	0

RESIDUE WEIGHT, FRONT HALF ACETONE

BEAKER NUMBER		94/13	94/07	94/08	94/15	94/17	94/14	94/16
NET RESIDUE WT., g		0.7914	0.2052	0.2195	0.0107	0.0073	0.0226	0.0050

TOTAL WEIGHT, grams

TOTAL WEIGHT ,g		1.8565	0.5019	0.7935	0.0107	0.0073	0.0226	0.0050

GALBRAITH LABORATORIES, INC. *Accuracy with speed - since 1950*

NOV 28 1994

LABORATORY REPORT

Tracy J Gee
Triangle Labs of RTP Inc
801 Capitola Drive
Durham NC 27713

Sample Received: 11/08/94
Report Date: 11/22/94
Purchase Order #: 12347

SAMPLE ID	LAB ID	ANALYSIS	RESULTS	
30047-002	I-7615	Cesium	62.4	mg/Liter
30047-005	I-7616	Cesium	<0.20	mg/Liter
30047-007	I-7617	Cesium	112.0	mg/Liter
30047-010	I-7618	Cesium	<0.20	mg/Liter
30047-012	I-7619	Cesium	178.0	mg/Liter
30047-015	I-7620	Cesium	<0.20	mg/Liter
30047-021	I-7621	Cesium	<0.20	mg/Liter
30047-025	I-7622	Cesium	<0.20	mg/Liter
30047-029	I-7623	Cesium	<0.20	mg/Liter

2323 Sycamore Drive
Knoxville, TN 37921-1750
Tel: (615) 546-1335

Analytical services, worldwide

P.O. Box 51610
Knoxville, TN 37950-1610
Fax: (615) 546-7209

GALBRAITH LABORATORIES, INC. *Accuracy with speed - since 1950*

LABORATORY REPORT

Tracy J. Gee

SAMPLE ID	LAB ID	ANALYSIS	RESULTS	
30047-037	I-7624	Cesium	<0.20	%
30047-038	I-7625	Cesium	<0.20	%
30047-039	I-7626	Cesium	<0.20	%
30047-Method Blank	I-7627	Cesium	<0.20	%

Notes:

1. Project #30047
2. All samples were analyzed by Flame Atomic Absorption.
3. The instrument detection limit for the matrix was 0.2 mg/Liter.
4. All samples were analyzed 11/21/94.

LB:le

2323 Sycamore Drive
Knoxville, TN 37921-1750
Tel: (615) 546-1335

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Knoxville, TN 37950-1610
Fax: (615) 546-7209

I7615-27

CHAIN OF CUSTODY

SAMPLER'S SIGNATURE _____

CO.Name: Triangle Labs. Contact Name: Tracy [illegible]

Address: 801 Capitola Dr. Project Name: 30047

Durham, NC 27703 PO#: 12347

Phone #: 919/544/8354

Total No. of Containers

Analysis Wanted: Cs

SIA No.	Date	Time	Comp	Grab	Sample I.D.#	#of Cont.	Cs							Remarks

All same as sample information on form!

Relinquished By/Sign.	Date/Time	Received By/Sign.	Relinquished By/Sign.	Date/Time	Received By/Sign.
[illegible]	11/7/94 2:00 pm	[illegible]			
Relinquished By/Sign.	Date/Time	Received By/Sign.	Relinquished By/Sign.	Date/Time	Received By/Sign.

Received for Laboratory By/Signature	Date/Time	Send Samples To: Triangle Laboratories of RTP, Inc. 801 Capitola Drive Durham, North Carolina 27713

NOV - 8 1994

COC/DLH

REVISION 5/23/94

Custody Seal	: Present/Intact	TLI Project Number	30047
Chain of Custody	: Absent		
Sample Tags	: Present	Client: ESI02	ENGINEERING-SCIENCE, INC.
Sample Tag Numbers	: Not Listed on Chain of Custody		
SMO Forms	: Absent	Date Received	10/15/94 By B Dale
Box	NO COOLANT	Carrier and Number	FedEx/5927242366

Book: 89

Page: 243

TLI Number mR/H	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
89-243-11	CU-12 / 03-0-.1N HNO3	FH HNO3 METALS LAB								
89-243-12	CU-16 / 03-0-IR	IMP. METALS LAB								
89-243-13	CU-33 / 04-0-FH-.1N HNO3	FH HNO3 METALS LAB								
89-243-14	CU-40 / BLANK-.1N HNO3-FI	BL. FILTRATE METALS LAB								
89-243-15	CU-31 / I-FH(NITRIC)-FB	FB:FHHNO3 METALS LAB								
89-243-16	CU-29 / I-IR-FB	FB: IMP. METALS LAB								
89-243-17	CU-20 / BLANK-.1N HNO3	HNO3 BLANK METALS LAB								
89-243-18	CU-21 / BLANK REAGENT	HNO3/H2O2 METALS LAB								

Receiving Remarks: No paperwork arrived with samples; CLIENT needs to provide a Chain of Custody with sample IDs matching the sample labels. Used Sample No./Run No. as client's Sample ID. Deleted 'CU-MMT-' from the beginning of each Run # in order to fit in available space.

Archive Remarks:

PAGE 1 OF 2

Custody Seal	: Present/Intact	TLI Project Number	30047	Book
Chain of Custody	: Absent			
Sample Tags	: Present	Client: ESI02	ENGINEERING-SCIENCE, INC.	89
Sample Tag Numbers	: Not Listed on Chain of Custody			
SMO Forms	: Absent	Date Received	10/15/94 By B Dale	Page
Box	NO COOLANT	Carrier and Number	FedEx/5927242366	243

TLI Number mR/H	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
89-243-1A	CU-2 / 01-I-.1NHNO3	FH HNO3								
		METALS LAB								
89-243-2	CU-13 / 01-I-IR	IMP.								
		METALS LAB								
89-243-3	CU-8 / 01-O-.1N HNO3	FH HNO3								
		METALS LAB								
89-243-4	CU-18 / 01-O-IR-1	IMP.								
		METALS LAB								
89-243-5	CU-4 / 02-I-.1N HNO3	FH HNO3								
		METALS LAB								
89-243-6	CU-14 / 02-I-IR	IMP.								
		METALS LAB								
89-243-7	CU-10 / 02-O-.1N HNO3	FH HNO3								
		METALS LAB								
89-243-8	CU-17 / 02-O-IR	IMP.								
		METALS LAB								
89-243-9	CU-6 / 03-I-.1N HNO3	FH HNO3								
		METALS LAB								
89-243-10	CU-15 / 03-I-IR	IMP.								
		METALS LAB								

Receiving Remarks: No paperwork arrived with samples; CLIENT needs to provide a Chain of Custody with sample IDs matching the sample labels. Used Sample No./Run No. as client's Sample ID. Deleted 'CU-MMT-' from the beginning of each Run # in order to fit in available space.

Archive Remarks:

TRIANGLE LABORATORIES OF RTP, INC --CHAIN OF CUSTODY--REVISED 06/20/94

I 7615-27

TRIANGLE LABORATORIES
SAMPLE SUBMISSION FORM

Subcontractor: Galbraith Labs
Address: 2323 Sycamore Dr.
Knoxville, TN 37921-1750

Submission Date: 11/8/94
Due Date: 11/22/94
TLI Project No. 30047
TLI P.O. No. 12347

I. Sample Description:

Client Sample ID	Tests Required	Amount of Sample Submitted	Quoted Price	Matrix
30047-002	C_5	>10g	$15	digestate
30047-005				
30047-007				
30047-010 30047-012				
30047-015 30047-021				
30047-025 30047-029				
30047-037 30047-038				
30047-039 30047 method Blank				

II. Standard Requirements for results reported to Triangle Labs:

1. Please indicate for all data:

   a. Method used. Make note of any exceptions and include an explanation.
   b. Detection limit.
   c. Reference TLI project number.
   d. Date tested.

2. Please include with results any chromatograms, spectra or other graphic supporting data generated (all raw data).

III. Send Report to: Triangle Labs of RTP, Inc.
Attention: [illegible]
801 Capitola Drive
Durham, NC 27713
919-544-5729

IV. Special Instructions: NOV - 8 1994

I 7615-27

TRIANGLE LABORATORIES
SAMPLE SUBMISSION FORM

Subcontractor: Galbraith Labs
Address: 2323 Sycamore Dr.
Knoxville, TN 37921-1750

Submission Date: 11/8/94
Due Date: 11/22/94
TLI Project No. 30047
TLI P.O. No. 12347

I. Sample Description:

Client Sample ID	Tests Required	Amount of Sample Submitted	Quoted Price	Matrix
30047-002	C_5	>10g	$15	digestate
30047-005				
30047-007				
30047-010 30047-012				
30047-015 30047-021				
30047-025 30047-029				
30047-037 30047-038				
30047-039 30047 method blank				

II. Standard Requirements for results reported to Triangle Labs:

1. Please indicate for all data:

   a. Method used. Make note of any exceptions and include an explanation.
   b. Detection limit.
   c. Reference TLI project number.
   d. Date tested.

2. Please include with results any chromatograms, spectra or other graphic supporting data generated (all raw data).

III. Send Report to: Triangle Labs of RTP, Inc.
Attention: [illegible]
801 Capitola Drive
Durham, NC 27713
919-544-5729

NOV - 8 1994

IV. Special Instructions:

Post-it® Fax Note 7671
Date 11/01 # of pages ▶ 1
To Debbie Hage
From Linda [illegible]
Co./Dept.
Co. Galbraith Labs
Phone #
Phone # (615) 546-1335
Fax # 919 544 5791
Fax # (615) 546-1209

TRIANGLE LABORATORIES of RTP, INC.
PO BOX 13485
RTP, NC 27709

ANALYSIS REPORT

for

TLI project: 30047

ANALYSIS of MULTI-METAL TRAIN SAMPLES

PREPARED FOR:

Engineering-Science, Inc.
Attn: Gary Henry

Show-Jon Hsieh
Report Preparation Chemist

Reviewed by: BHR

November 22, 1994

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TRIANGLE LABORATORIES of RTP,INC.
PO BOX 13485
RTP, NC 27709

TLI Project #: 30047 Dates Received: October 15 & 17, 1994
Client: Engineering-Science, Inc. Date Reported: November 22, 1994
Project Manager: Hani Karam (919) 544-8351

CASE NARRATIVE

Overview

This project involved the analysis of twelve (12) multi-metal fractions for B, Cr, Mo, Sr, K, and Na. The analysis was conducted according to the protocol described in Method 29: *"Determination of Metals Emissions from Stationary Sources"*. Results reported relate only to the items tested.

Receipt

The multi-metal fractions for this project were received on October 15 and 17, 1994 in good condition in boxes without ice.

Preparation

The samples were prepared by microwave digestion, as required by the contract. Detailed flow charts of the sample preparation are included in the data package.

Analysis

B (boron), Cr (chromium), Mo (molybdenum), and Sr (strontium) concentrations were determined by Inductively Coupled Plasma Emission Spectroscopy (ICP).

K (potassium) and Na (sodium) concentrations were determined by Flame Atomic Absorption (FLAA).

Results

The sample results are reported in μg.

MB

The concentrations of each analyte for this sample are reported in μg/L.

The method blanks for all analytes, with the exception of Na, were less than the respective IDLs. The method blank for Na was greater than the IDL and should be taken into consideration when reviewing the appropriate sample results.

LCS/LCSD

All LCS and LCSD samples demonstrated recoveries within the control criteria of 75-125%.

Duplicate Analysis (D)

Run #1 CU-MMT-01-I FH D:

The duplicate analyses for B, Cr, Mo, Sr, K, and Na demonstrated RPDs within the control criteria of 20.0%.

Run #1 CU-MMT-01-I BH D:

The duplicate analyses for B, K, and Na demonstrated RPDs within the control criteria of 20.0%.

The original and/or duplicate μg/L concentrations of the duplicate analyses for Cr, Mo, and Sr were less than ten (10) times the respective IDLs and cannot be considered valid quality control (QC) qualifiers.

Run #2 CU-MMT-02-O D:

The duplicate analyses for B and Na demonstrated RPDs within the control criteria of 20.0%.

The original and/or duplicate μg/L concentrations of the duplicate analyses for Cr, Mo, and Sr were less than ten (10) times the respective IDLs and cannot be considered valid quality control (QC) qualifiers.

The original and/or duplicate μg/L concentrations of the duplicate analysis for K were less than five (5) times the respective IDL and cannot be considered a valid quality control (QC) qualifier.

Serial Dilutions (L)

Run #2 CU-MMT-02-I FH L:

The serial dilution analyses for B and Mo are valid qualifiers and demonstrated RPDs within the 10.0 % control criteria.

The serial dilution analyses for Cr and Sr are valid qualifiers but demonstrated RPDs outside the 10.0 % control criteria. The high RPDs for these analytes may indicate a significant amount of interferents specific to these analytes in the sample.

Serial dilution analyses for K and Na on the sample Run #2 CU-MMT-03-I FH were not performed since dilutions on the sample were required to determine the concentrations of K and Na in the smaple.

Run #2 CU-MMT-02-I BH L:

The serial dilution analyses for B, Mo, and Sr cannot be considered valid qualifiers since the concentrations of these analytes in the serial dilution samples were less than ten times the respective IDLs. The RPDs for these analytes are reported as "<IDL" in the Analysis Report.

The serial dilution analyses for Cr and K are valid qualifiers but demonstrated RPDs outside the 10.0 % control criteria. The high RPDs for these analytes may indicate a significant amount of interferents specific to these analytes in the sample.

A serial dilution for Na on the sample Run #2 CU-MMT-03-I BH was not performed since dilutions on the sample were required to determine the concentration of Na in the sample.

Run #3 CU-MMT-04-O L:

The serial dilution analyses for Cr, Mo, and Sr cannot be considered valid qualifiers since the concentrations of these analytes in the serial dilution samples were less than ten times the respective IDLs. The RPDs for these analytes are reported as "<IDL" in the Analysis Report.

The serial dilution analysis for K is a valid qualifier and demonstrated a RPD within the 10.0 % control criteria.

The serial dilution analysis for B is a valid qualifier but demonstrated a RPD outside the 10.0 % control criteria. The high RPD for this analyte may indicate a significant amount of interferents specific to this analyte in the sample.

A serial dilution for Na on the sample Run #3 CU-MMT-04-O was not performed since dilutions on the sample were required to determine the concentration of Na in the sample.

Post-digestion Spike Samples (P)

Run #3 CU-MMT-03-I FH P:

The spike recoveries for B, Cr, Mo, and Sr for this sample cannot be considered valid since the spike concentrations added were insignificant in comparison to the concentrations of the analytes in the native sample.

Run #3 CU-MMT-03-I BH P:

All spike samples, with the exception of Cr and Sr, demonstrated recoveries within the control criteria of 75-125%. The spikes for Cr and Sr demonstrated recoveries of 73.7% and 69.7%, respectively, which are slightly outside the control criteria but do not indicate any significant matrix effects specific to these analytes in the sample.

Run #4 CU-MMT-04-O P:

The spike recovery for B cannot be considered valid since the spike concentration added was insignificant in comparison to the concentration of the analyte in the native sample. All other spike samples demonstrated recoveries within the control criteria of 75-125%.

General Comments

Per consultation with Engineering-Science, Inc., the analysis for Cs will be submitted by Galbraith Laboratories in Knoxsville, TN.

The number of pages in this data package is 109

Description of Abbreviations

BH = Back-half
CCB = Continuing Calibration Blank
CCV = Continuing Calibration Verification
CHECK HS = Check High Standard
FH = Front-half
ICB = Initial Calibration Blank
ICV = Initial Calibration Verification
ICSA = Interference Check Solution (Solution A)
    I = Initial
    F = Final
    Solution A contains common interferents
ICSAB = Intereference Check Solution (Solution B)
    I = Initial
    F = Final
    Solution B contains common interferents in addition to the analyte of interest.
IDL = Instrument Detection Limit
L = Serial Dilution Sample
LCS = Laboratory Control Spike Sample
LCSD = Laboratory Control Spike Sample Duplicate
MB = Method Blank
P = Post-digestion Matrix Spike
%REC = Percent Recovery
RPD = Relative Percent Difference

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Sample Calculations

$$\text{RESULT in } \mu g \text{ (FH)} = \frac{\mu g/L * \text{ml FV} * DF}{1000}$$

ml FV = final volume in ml,
DF = Dilution Factor.

$$\text{RESULT in } \mu g \text{ (BH \& combined trains)} = \frac{\mu g/L * (\text{ml TV/ml used}) * \text{ml FV} * DF}{1000}$$

ml FV = final volume in ml,
ml TV = total volume in ml,
DF = Dilution Factor.

%REC (Percent Recovery) for spike samples :

$$\%REC = \frac{\text{Spike sample } \mu g/L \text{ conc. - original sample } \mu g/L \text{ conc.}}{\text{spike conc. } (\mu g/L)} * 100$$

RPDs:

$$RPD = \frac{|\text{Result 2 - Result 1}|}{(\text{Result 2 + Result 1})/2} * 100$$

ICP MMTL ANALYTE SUMMARY REPORT

:lient: ENGINEERING - SCIENCE, INC.
Dates Received: 10/15/94 & 10/17/94
Date(s) analyzed: 11/10/94
'ate Reported: 11/22/94
LI Project #: 30047
Data File: BB589

ANALYTE: B
ug/L IDL: 50.7
Analysis Method: 6010
Instrument: P E Plasma 1000
Post-digestion
Spike Conc.: 1000 ug/L
LCS
Spike Conc.: 1000 ug/L

Client Sample ID	TLI Sample ID	Peak Int.	ug/L CONC	ml TV	ml USED	ml FV	DIL FACTOR	TOTAL ug RESULT	RPD	%REC
un #1 CU-MMT-01-I FH	89-243-1A	1699.0579	9293.401	N/A	N/A	200	10	18587	–	–
un #1 CU-MMT-01-I BH	89-243-2	291.0977	1583.901	785	785	150	1	238	–	–
Run #2 CU-MMT-02-I FH	89-243-5	1677.7693	9178.832	N/A	N/A	200	20	36707	–	–
un #2 CU-MMT-02-I BH	89-243-6	292.8822	1593.672	388	388	150	1	239	–	–
un #3 CU-MMT-03-I FH	89-243-9	1392.0016	7612.068	N/A	N/A	200	50	76121	–	–
Run #3 CU-MMT-03-I BH	89-243-10	191.5984	1039.078	445	445	150	1	156	–	–
un #2 CU-MMT-02-O	89-243-7	1250.7172	6838.443	361	361	200	5	6838	–	–
un #3 CU-MMT-03-O	89-243-11	1200.8873	6565.593	384	384	200	5	6566	–	–
Run #4 CU-MMT-04-O	89-243-13	1257.3364	6874.658	355	355	200	1	1375	–	–
ield Blank FH	89-243-15	1478.6387	8086.462	N/A	N/A	200	1	1617	–	–
ield Blank BH	89-243-16	12.5981	56.934	305	305	150	1	8.54	–	–
HNO3 Filtered Blank	89-243-14	637.6671	3481.594	N/A	N/A	200	1	696	–	–
un #1 CU-MMT-01-I FH D	89-243-1A D	1664.0596	9101.763	N/A	N/A	200	10	18204	2.08%	–
un #1 CU-MMT-01-I BH D	89-243-2 D	287.5571	1564.514	785	785	150	1	235	1.23%	–
Run #2 CU-MMT-02-I FH L	89-243-5 L	321.3036	1749.298	N/A	N/A	200	100	34986	4.80%	–
un #2 CU-MMT-02-I BH L	89-243-6 L	73.7229	393.632	388	388	150	5	295	<IDL	–
un #3 CU-MMT-03-I FH P	89-243-9 P	1385.1893	7574.766	N/A	N/A	200	50	75748	–	-3.73%
Run #3 CU-MMT-03-I BH P	89-243-10 P	329.9271	1796.517	445	445	150	1	269	–	75.7%
un #2 CU-MMT-02-O D	89-243-7 D	1236.1671	6758.772	361	361	200	5	6759	1.17%	–
un #3 CU-MMT-03-O L	89-243-11 L	290.8938	1582.785	384	384	200	25	7914	18.6%	–
Run #4 CU-MMT-04-O P	89-243-13 P	1312.1819	7175.003	355	355	200	1	1435	–	30.0%
lethod Blank	30047-MB	2.9526	6.119	—	—	—	—	—	–	–
CS	30047-LCS	177.6981	962.964	—	—	—	—	—	–	96.3%
LCSD	30047-LCSD	177.1107	959.748	—	—	—	—	—	–	96.0%

blank	3.8465	0.0	
#1 standard	37.9757	200.0	
#2 standard	90.1950	500.0	
#3 standard	185.5620	1000.0	
#4 standard	367.3152	2000.0	
CHECK HS	373.9784	2037.727	CORR. COEFF. = 0.99992
ICV	94.6080	507.992	(500ug/L)
ICB	3.3190	8.125	
ICSAI	82.5237	441.822	
ICSABI	103.4122	558.201	(500ug/L)
CCV1	908.3051	4963.514	(5000ug/L)
CCB1	8.8698	38.519	
CCV2	935.1876	5110.713	(5000ug/L)
CCB2	5.9189	22.361	
CCV3	874.9480	4780.862	(5000ug/L)
CCB3	4.9576	17.098	
CCV4	857.6174	4685.986	(5000ug/L)
CCB4	3.9266	11.452	
CCV5	891.5359	4871.692	(5000ug/L)
CCB5	6.0315	22.978	
ICSAF	85.3668	457.390	
ICSABF	107.7731	580.079	(500ug/L)

ICP MMTL ANALYTE SUMMARY REPORT

Client: ENGINEERING - SCIENCE, INC.
Dates Received: 10/15/94 & 10/17/94
Date(s) analyzed: 11/10/94
Date Reported: 11/22/94
TLI Project #: 30047
Data File: BB590

ANALYTE: Cr
ug/L IDL: 8.0
Analysis Method: 6010
Instrument: P E Plasma 1000
Post-digestion
Spike Conc.: 160 ug/L
LCS
Spike Conc.: 160 ug/L

Client Sample ID	TLI Sample ID	Peak Int.	ug/L CONC	ml TV	ml USED	ml FV	DIL FACTOR	TOTAL ug RESULT	RPD	%REC
Run #1 CU-MMT-01-I FH	89-243-1A	13253.3311	2843.060	N/A	N/A	200	1	569	--	--
Run #1 CU-MMT-01-I BH	89-243-2	140.0278	18.362	785	785	150	1	2.75	--	--
Run #2 CU-MMT-02-I FH	89-243-5	25343.1270	5447.287	N/A	N/A	200	1	1089	--	--
Run #2 CU-MMT-02-I BH	89-243-6	1905.8031	398.722	388	388	150	1	59.8	--	--
Run #3 CU-MMT-03-I FH	89-243-9	53760.4609	11568.580	N/A	N/A	200	1	2314	--	--
Run #3 CU-MMT-03-I BH	89-243-10	85.1931	6.550	445	445	150	1	< 1.20	--	--
Run #2 CU-MMT-02-O	89-243-7	197.0729	30.650	361	361	200	1	6.13	--	--
Run #3 CU-MMT-03-O	89-243-11	155.3522	21.663	384	384	200	1	4.33	--	--
Run #4 CU-MMT-04-O	89-243-13	158.4715	22.335	355	355	200	1	4.47	--	--
Field Blank FH	89-243-15	607.8852	119.142	N/A	N/A	200	1	23.8	--	--
Field Blank BH	89-243-16	87.8859	7.130	305	305	150	1	< 1.20	--	--
HNO3 Filtered Blank	89-243-14	85.9071	6.704	N/A	N/A	200	1	< 1.60	--	--
Run #1 CU-MMT-01-I FH D	89-243-1A D	12497.8027	2680.313	N/A	N/A	200	1	536	5.89%	--
Run #1 CU-MMT-01-I BH D	89-243-2 D	163.0121	23.313	785	785	150	1	3.50	<IDL	--
Run #2 CU-MMT-02-I FH L	89-243-5 L	5947.6958	1269.374	N/A	N/A	200	5	1269	15.3%	--
Run #2 CU-MMT-02-I BH L	89-243-6 L	475.8904	90.709	388	388	150	5	68.0	12.9%	--
Run #3 CU-MMT-03-I FH P	89-243-9 P	50866.5820	10945.218	N/A	N/A	200	1	2189	--	-390%
Run #3 CU-MMT-03-I BH P	89-243-10 P	602.0505	117.885	445	445	150	1	17.7	--	73.7%
Run #2 CU-MMT-02-O D	89-243-7 D	203.4213	32.017	361	361	200	1	6.40	<IDL	--
Run #3 CU-MMT-03-O L	89-243-11 L	102.4008	10.257	384	384	200	5	10.3	<IDL	--
Run #4 CU-MMT-04-O P	89-243-13 P	801.8021	160.913	355	355	200	1	32.2	--	86.6%
Method Blank	30047-MB	73.4836	4.028	--	--	--	--	--	--	--
LCS	30047-LCS	797.0250	159.884	--	--	--	--	--	--	100%
LCSD	30047-LCSD	777.1487	155.602	--	--	--	--	--	--	97.3%

blank	72.4691	0.0	
#1 standard	148.2720	20.0	
#2 standard	263.4408	50.0	
#3 standard	517.6973	100.0	
#4 standard	989.7241	200.0	
CHECK HS	1000.6370	203.743	CORR. COEFF. = 0.99918
ICV	1994.0997	417.742	(400ug/L)
ICB	58.5168	0.804	
ICSAI	90.8692	7.773	
ICSABI	2159.4973	453.370	(500ug/L)
CCV1	9993.2314	2140.811	(2000ug/L)
CCB1	76.3212	4.639	
CCV2	8534.3848	1826.565	(2000ug/L)
CCB2	87.8652	7.126	
CCV3	8867.3643	1898.292	(2000ug/L)
CCB3	79.4301	5.309	
ICSAF	76.6956	4.720	
ICSABF	2154.4299	452.278	(500ug/L)

ICP MMTL ANALYTE SUMMARY REPORT

lient: ENGINEERING - SCIENCE, INC.
Dates Received: 10/15/94 & 10/17/94
Date(s) analyzed: 11/10/94
ate Reported: 11/22/94
U Project #: 30047
Data File: BB588

ANALYTE: Mo
ug/L IDL: 49
Analysis Method: 6010
Instrument: P E Plasma 1000
Post-digestion
Spike Conc.: 1000 ug/L
LCS
Spike Conc.: 1000 ug/L

Client Sample ID	TLI Sample ID	Peak Int.	ug/L CONC	ml TV	ml USED	ml FV	DIL FACTOR	TOTAL ug RESULT	RPD	%REC
un #1 CU-MMT-01-I FH	89-243-1A	1938.0583	4240.006	N/A	N/A	200	1	848	–	–
..un #1 CU-MMT-01-I BH	89-243-2	52.0529	57.133	785	785	150	1	8.57	–	–
Run #2 CU-MMT-02-I FH	89-243-5	4291.6265	9459.862	N/A	N/A	200	1	1892	–	–
un #2 CU-MMT-02-I BH	89-243-6	41.4662	33.653	388	388	150	1	< 7.35	–	–
..un #3 CU-MMT-03-I FH	89-243-9	8643.2393	19111.078	N/A	N/A	200	1	3822	–	–
Run #3 CU-MMT-03-I BH	89-243-10	44.4459	40.262	445	445	150	1	< 7.35	–	–
un #2 CU-MMT-02-O	89-243-7	42.1953	35.270	361	361	200	1	< 9.80	–	–
..un #3 CU-MMT-03-O	89-243-11	69.1281	95.003	384	384	200	1	19.0	–	–
Run #4 CU-MMT-04-O	89-243-13	65.1290	86.134	355	355	200	1	17.2	–	–
ield Blank FH	89-243-15	84.5131	129.125	N/A	N/A	200	1	25.8	–	–
. ield Blank BH	89-243-16	42.7323	36.461	305	305	150	1	< 7.35	–	–
HNO3 Filtered Blank	89-243-14	103.4308	171.081	N/A	N/A	200	1	34.2	–	–
un #1 CU-MMT-01-I FH D	89-243-1A D	1866.8804	4082.145	N/A	N/A	200	1	816	3.79%	–
..un #1 CU-MMT-01-I BH D	89-243-2 D	44.2231	39.768	785	785	150	1	< 7.35	<IDL	–
Run #2 CU-MMT-02-I FH L	89-243-5 L	827.0105	1775.871	N/A	N/A	200	5	1776	6.33%	–
un #2 CU-MMT-02-I BH L	89-243-6 L	32.3592	13.455	388	388	150	5	< 36.8	<IDL	–
..un #3 CU-MMT-03-I FH P	89-243-9 P	8076.9141	17855.055	N/A	N/A	200	1	3571	–	-126%
Run #3 CU-MMT-03-I BH P	89-243-10 P	425.3539	885.058	445	445	150	1	133	–	88.5%
un #2 CU-MMT-02-O D	89-243-7 D	73.2848	104.222	361	361	200	1	20.8	<IDL	–
..un #3 CU-MMT-03-O L	89-243-11 L	56.2016	66.334	384	384	200	5	66.3	<IDL	–
Run #4 CU-MMT-04-O P	89-243-13 P	474.3482	993.720	355	355	200	1	199	–	90.6%
lethod Blank	30047-MB	34.4852	18.171	—	—	—	—	—	–	–
_CS	30047-LCS	475.6160	996.532	—	—	—	—	—	–	100%
LCSD	30047-LCSD	466.1514	975.541	—	—	—	—	—	–	97.6%

	blank	23.2677	0.0
	#1 standard	75.9154	100.0
	#2 standard	146.5713	250.0
	#3 standard	238.2878	500.0
	#4 standard	481.5612	1000.0
	CHECK HS	501.7275	1054.443
	ICV	208.0008	403.002
	ICB	32.7435	14.308
	ICSAI	15.0392	-24.958
	ICSABI	398.3933	825.263
	CCV1	884.9980	1904.479
	CCB1	36.4502	22.529
	CCV2	970.1868	2093.415
	CCB2	31.5649	11.694
	CCV3	963.5803	2078.762
	CCB3	12.5243	-30.535
	ICSAF	43.3623	37.859
	ICSABF	434.4040	905.130

CORR. COEFF. = 0.99890

(400ug/L)
(1000ug/L)
(2000ug/L)
(2000ug/L)
(2000ug/L)
(1000ug/L)

ICP MMTL ANALYTE SUMMARY REPORT

Client: ENGINEERING - SCIENCE, INC.
Dates Received: 10/15/94 & 10/17/94
Date(s) analyzed: 11/11/94
Date Reported: 11/22/94
TLI Project #: 30047
Data File: BB591

ANALYTE: Sr
ug/L IDL: 2.4
Analysis Method: 6010
Instrument: P E Plasma 1000
Post-digestion
Spike Conc.: 500 ug/L
LCS
Spike Conc.: 500 ug/L

Client Sample ID	TLI Sample ID	Peak Int.	ug/L CONC	ml TV	ml USED	ml FV	DIL FACTOR	TOTAL ug RESULT	RPD	%REC
Run #1 CU-MMT-01-I FH	89-243-1A	160744.0000	1218.404	N/A	N/A	200	1	244	–	–
Run #1 CU-MMT-01-I BH	89-243-2	223.3243	-0.124	785	785	150	1	< 0.360	–	–
Run #2 CU-MMT-02-I FH	89-243-5	346767.5938	2630.527	N/A	N/A	200	1	526	–	–
Run #2 CU-MMT-02-I BH	89-243-6	743.0385	3.821	388	388	150	1	0.573	–	–
Run #3 CU-MMT-03-I FH	89-243-9	946064.3750	7179.847	N/A	N/A	200	1	1436	–	–
Run #3 CU-MMT-03-I BH	89-243-10	835.0250	4.519	445	445	150	1	0.678	–	–
Run #2 CU-MMT-02-O	89-243-7	3084.5066	21.595	361	361	200	1	4.32	–	–
Run #3 CU-MMT-03-O	89-243-11	2277.1431	15.467	384	384	200	1	3.09	–	–
Run #4 CU-MMT-04-O	89-243-13	2263.9314	15.366	355	355	200	1	3.07	–	–
Field Blank FH	89-243-15	12992.0654	96.805	N/A	N/A	200	1	19.4	–	–
Field Blank BH	89-243-16	198.1347	-0.315	305	305	150	1	< 0.360	–	–
HNO3 Filtered Blank	89-243-14	1749.6364	11.462	N/A	N/A	200	1	2.29	–	–
Run #1 CU-MMT-01-I FH D	89-243-1A D	173105.3594	1312.240	N/A	N/A	200	1	262	7.42%	–
Run #1 CU-MMT-01-I BH D	89-243-2 D	196.3326	-0.329	785	785	150	1	< 0.360	<IDL	–
Run #2 CU-MMT-02-I FH L	89-243-5 L	62255.9492	470.772	N/A	N/A	200	5	471	11.1%	–
Run #2 CU-MMT-02-I BH L	89-243-6 L	235.3372	-0.033	388	388	150	5	< 1.80	<IDL	–
Run #3 CU-MMT-03-I FH P	89-243-9 P	953250.1875	7234.396	N/A	N/A	200	1	1447	–	10.9%
Run #3 CU-MMT-03-I BH P	89-243-10 P	46732.5234	352.932	445	445	150	1	52.9	–	69.7%
Run #2 CU-MMT-02-O D	89-243-7 D	3191.3130	22.406	361	361	200	1	4.48	<IDL	–
Run #3 CU-MMT-03-O L	89-243-11 L	623.9849	2.917	384	384	200	5	2.92	<IDL	–
Run #4 CU-MMT-04-O P	89-243-13 P	52216.2969	394.560	355	355	200	1	78.9	–	75.8%
Method Blank	30047-MB	142.7364	-0.736	—	—	—	—	—	–	–
LCS	30047-LCS	60010.3906	453.725	—	—	—	—	—	–	90.7%
LCSD	30047-LCSD	60468.7344	457.205	—	—	—	—	—	–	91.4%

blank	174.8324	0.0	
#1 standard	6457.1489	50.0	
#2 standard	13433.0869	100.0	
#3 standard	67034.0078	500.0	
#4 standard	131525.5156	1000.0	
blank	108.4398	0.0	CORR. COEFF. = 0.99995
CHECK HS	125972.8047	954.453	
ICV	33541.4883	252.797	(250ug/L)
ICB	148.4741	-0.692	
ICSAI	471.3468	1.759	
ICSABI	121308.8203	919.033	(1000ug/L)
CCV1	257230.2188	1950.840	(2000ug/L)
CCB1	159.2690	-0.610	
CCV2	267398.5938	2028.029	(2000ug/L)
CCB2	185.5721	-0.411	
CCV3	279238.5938	2117.908	(2000ug/L)
CCB3	137.2066	-0.778	
ICSAF	462.7401	1.693	
ICSABF	112612.4453	853.033	(1000ug/L)

11

FLAA MMTL ANALYTE SUMMARY REPORT

Client: ENGINEERING - SCIENCE, INC.
Dates Received: 10/15/94 & 10/17/94
Date(s) analyzed: 11/11/94
Date Reported: 11/22/94
TLI Project #: 30047
Data File: AA903

ANALYTE: K
ug/L IDL: 38
Analysis Method: 7610
Instrument: P E Zeeman 5100

LCS
Spike Conc.: 1000 ug/L

Client Sample ID	TLI Sample ID	Mean ABSORB	ug/L CONC	ml TV	ml USED	ml FV	DIL FACTOR	TOTAL ug RESULT	RPD	%REC
Run #1 CU-MMT-01-I FH	89-243-1A X1000	0.07698	224.0	N/A	N/A	200	1000	44800	–	–
Run #1 CU-MMT-01-I BH	89-243-2 X10	0.08383	244.0	785	785	150	10	366	–	–
Run #2 CU-MMT-02-I FH	89-243-5 X1000	0.11782	341.0	N/A	N/A	200	1000	68200	–	–
Run #2 CU-MMT-02-I BH	89-243-6	0.51578	1398.0	388	388	150	1	210	–	–
Run #3 CU-MMT-03-I FH	89-243-9 X1000	0.16391	471.0	N/A	N/A	200	1000	94200	–	–
Run #3 CU-MMT-03-I BH	89-243-10	0.54583	1473.0	445	445	150	1	221	–	–
Run #2 CU-MMT-02-O	89-243-7 X50	0.04656	136.0	361	361	200	50	1360	–	–
Run #3 CU-MMT-03-O	89-243-11	0.56825	1527.0	384	384	200	1	305	–	–
Run #4 CU-MMT-04-O	89-243-13	0.60139	1608.0	355	355	200	1	322	–	–
Field Blank FH	89-243-15 X10	0.14921	429.0	N/A	N/A	200	10	858	–	–
Field Blank BH	89-243-16	0.42907	1180.0	305	305	150	1	177	–	–
HNO3 Filtered Blank	89-243-14	0.26282	743.0	N/A	N/A	200	1	149	–	–
Run #1 CU-MMT-01-I FH D	89-243-1AD	0.07616	222.0	N/A	N/A	200	1000	44400	0.897%	–
Run #1 CU-MMT-01-I BH D	89-243-2 D X10	0.08383	244.0	785	785	150	10	366	0.000%	–
Run #2 CU-MMT-02-I BH L	89-243-6 L	0.10290	298.0	388	388	150	5	224	6.37%	–
Run #2 CU-MMT-02-O D	89-243-7D X50	0.04662	136.0	361	361	200	50	1360	<IDL	–
Run #3 CU-MMT-03-O L	89-243-11 L	0.10046	291.0	384	384	200	5	291	4.83%	–
Method Blank	30047-MB	0.00309	9.0	—	—	—	—	—	–	–
LCS	30047-LCS	0.36623	1018.0	—	—	—	—	—	–	102%
LCSD	30047-LCSD	0.36212	1007.0	—	—	—	—	—	–	101%
	STD BLK	0.00072	0.0							
	STD 1	0.03399	100.0							
	STD 2	0.17448	500.0							
	STD 3	0.35866	1000.0							
	STD 4	0.56658	1500.0							
	STD 5	0.76012	2000.0		CORR. COEFF. =		0.99979			
	ICV=380 ug/L	0.13018	378.0							
	ICB	0.00055	2.0							
	CCV=1200 ug/L	0.44935	1232.0							
	CCB	0.00176	5.0							
	CCV=1200 ug/L	0.43584	1197.0							
	CCB	0.00053	2.0							
	CCV=1200 ug/L	0.45084	1235.0							
	CCB	-0.00023	-1.0							

12

FLAA MMTL ANALYTE SUMMARY REPORT

Client: ENGINEERING - SCIENCE, INC.
Dates Received: 10/15/94 & 10/17/94
Date(s) analyzed: 11/11/94
Date Reported: 11/22/94
TLI Project #: 30047
Data File: AA902

ANALYTE: Na
ug/L IDL: 11
Analysis Method: 7770
Instrument: P E Zeeman 5100

LCS
Spike Conc.: 1000 ug/L

Client Sample ID	TLI Sample ID	Mean ABSORB	ug/L CONC	ml TV	ml USED	ml FV	DIL FACTOR	TOTAL ug RESULT	RPD	%REC
Run #1 CU-MMT-01-I FH	89-243-1A-X1000	0.09028	358.6	N/A	N/A	200	1000	71720	–	–
Run #1 CU-MMT-01-I BH	89-243-2-X50	0.02352	93.4	785	785	150	50	701	–	–
Run #2 CU-MMT-02-I FH	89-243-5-X1000	0.17265	685.7	N/A	N/A	200	1000	137140	–	–
Run #2 CU-MMT-02-I BH	89-243-6-X50	0.01752	69.6	388	388	150	50	522	–	–
Run #3 CU-MMT-03-I FH	89-243-9-1000	0.29690	1179.3	N/A	N/A	200	1000	235860	–	–
Run #3 CU-MMT-03-I BH	89-243-10-X50	0.02522	100.2	445	445	150	50	752	–	–
Run #2 CU-MMT-02-O	89-243-7-X50	0.13788	547.7	361	361	200	50	5477	–	–
Run #3 CU-MMT-03-O	89-243-11-X50	0.13784	547.5	384	384	200	50	5475	–	–
Run #4 CU-MMT-04-O	89-243-13-X50	0.05090	202.2	355	355	200	50	2022	–	–
Field Blank FH	89-243-15-X50	0.07651	303.9	N/A	N/A	200	50	3039	–	–
Field Blank BH	89-243-16-X50	0.01376	54.7	305	305	150	50	410	–	–
HNO3 Filtered Blank	89-243-14-X2	0.36602	1453.8	N/A	N/A	200	2	582	–	–
Run #1 CU-MMT-01-I FH D	89-243-1ADX1000	0.09100	361.4	N/A	N/A	200	1000	72280	0.778%	–
Run #1 CU-MMT-01-I BH D	89-243-2 D-X50	0.02369	94.1	785	785	150	50	706	0.747%	–
Run #2 CU-MMT-02-O D	89-243-7DX50	0.13939	553.6	361	361	200	50	5536	1.07%	–
Method Blank	30047-MB	0.01048	41.6	—	—	—	—	—	–	–
LCS	30047-LCS	0.24762	983.5	—	—	—	—	—	–	98.4%
LCSD	30047-LCSD	0.24702	981.2	—	—	—	—	—	–	98.1%
	BLANK	0.00056	0.0							
	STD1	0.01741	50.0							
	STD2	0.05528	200.0							
	STD3	0.13305	500.0							
	STD4	0.25404	1000.0							
	STD5	0.49976	2000.0		CORR. COEFF. =		0.99962			
	ICV=110 ug/L	0.02763	109.7							
	ICB	0.00046	1.8							
	CCV=1500 ug/L	0.36990	1469.2							
	CCB	0.00020	0.8							
	CCV=1500 ug/L	0.36250	1439.8							
	CCB	0.00049	2.0							
	CCV=1500 ug/L	0.36502	1449.8							
	CCB	-0.00005	-0.2							

MULTIPLE METALS ANALYSIS

RUN #2 CU-MMT-02-O	ONE ANALYSIS	$180.00
COMBINE FIELD SAMPLE NUMBERS		
CU-9 CU-10 CU-17 CU-27		

RUN #3 CU-MMT-03-O	ONE ANALYSIS	$180.00
COMBINE FIELD SAMPLE NUMBERS		
CU-11 CU-12 CU-16 CU-28		

RUN #4 CU-MMT-04-O	ONE ANALYSIS	$180.00
COMBINE FIELD SAMPLE NUMBERS		
CU-32 CU-33 CU-34 CU-35		

FIELD BLANK	TWO ANALYSIS	$260.00
SAMPLE #1 COMBINE FRONT HALF	SAMPLE #2 BACK HALF	
CU-22 CU-30 CU-31	CU-29	

RUN #1 CU-MMT-01-I	TWO ANALYSIS	$260.00
SAMPLE #1 COMBINE FRONT HALF	SAMPLE #2 BACK HALF	
CU-1 CU-2 CU-23 CU-36	CU-13	

RUN #2 CU-MMT-02-I	TWO ANALYSIS	$260.00
SAMPLE #1 COMBINE FRONT HALF	SAMPLE #2 BACK HALF	
CU-3 CU-4 CU-24 CU-37	CU-14	

RUN #3 CU-MMT-03-I	TWO ANALYSIS	$260.00
SAMPLE #1 COMBINE FRONT HALF	SAMPLE #2 BACK HALF	
CU-5 CU-6 CU-25 CU-38	CU-15	

.1N NITRIC ACID FILTERED BLANK		
COMBINE FIELD SAMPLE NUMBERS	ONE ANALYSIS	$180.00
CU-39 CU-40		

SAMPLES TO BE HELD FOR FUTURE ANALYSIS
CU-7 CU-8 CU-26 CU-18 CU-19 CU-20 CU-21

TOTAL SAMPLES	40
TOTAL SAMPLES ANALYZED	33
TOTAL ANALYSIS	12
TOTAL SAMPLES HELD	7
TOTAL ANALYTICAL COST	$1,760.00

ENGINEERING-SCIENCE

ANALYTICAL REQUEST FORM
CHAIN OF CUSTODY RECORD

723

PROJECT NO.: 726517

PROJECT NAME/LOCATION: Catholic University / Washington DC

SAMPLERS: (Name/Signature): [illegible]

METHOD OF ANALYSES: METALS

FIELD NUMBER	COLLECTION DATE	COLLECTION TIME	SAMPLE NAME	MATRIX	NO. OF BOTTLES	METALS	SPECIAL INSTRUCTIONS (*) (TYPE OF CONTAINER, PRESERVATION, HANDLING, ETC.)
CU-1	9/26/94	1500	CU-MMT-01-I-FH Acetone	Dry	1	✓	Beaker # 94/07
CU-2	9/26/94	1500	CU-MMT-01-I-FH-HNO3	Liquid	1	✓	Filtered Front Half
CU-3	9/26/94	1700	CU-MMT-02-I-FH Acetone	Dry	1	✓	Beaker # 94/08
CU-4	9/26/94	1700	CU-MMT-02-I-FH-HNO3	Liquid	1	✓	Filtered Front Half
CU-5	9/26/94	2000	CU-MMT-03-I-FH Acetone	Dry	1	✓	Beaker # 94/09
CU-6	9/26/94	2000	CU-MMT-03-I-FH-HNO3	Liquid	1	✓	Filtered Front Half
CU-7	9/26/94	1500	CU-MMT-01-O-FH Acetone	Dry	1	✓	Beaker # 94/15
CU-8	9/26/94	1500	CU-MMT-01-O-FH-HNO3	Liquid	1	✓	Front Half Rinse
CU-9	9/26/94	1700	CU-MMT-02-O-FH Acetone ~~HNO3~~	Dry	1	✓	Beaker # 94/16
CU-10	9/26/94	1700	CU-MMT-02-O-FH-HNO3	Liquid	1	✓	Front Half Rinse
CU-11	9/26/94	2000	CU-MMT-03-O-FH Acetone	Dry	1	✓	Beaker # 94/17
CU-12	9/26/94	2000	CU-MMT-03-O-FH-HNO3	Liquid	1	✓	Front Half Rinse
CU-13	9/26/94	1500	CU-MMT-01-I-IR	Liquid	1	✓	Impinger contents + Rinse
CU-14	9/26/94	1700	CU-MMT-02-I-IR	Liquid	1	✓	Impinger contents + Rinse
CU-15	9/26/94	2000	CU-MMT-03-I-IR	Liquid	1	✓	Impinger contents + Rinse
CU-16	9/26/94	2000	CU-MMT-03-O-IR	Liquid	1	✓	Impinger contents + Rinse

Relinquished by: (Name/Signature)	Date/Time	Received by: (Name/Signature)	Date/Time
[signature]	9/29/94 1315	[signature]	[illegible]
Relinquished by: (Name/Signature)	Date/Time	Received by: (Name/Signature)	Date/Time

Courier:

Airbill No.:

Custody Seal No.:

Cooler No.:

General Comments: [illegible] 10/17/94

1013 [illegible] 10/17/94

Matrix Origin Sample Turnaround Analytical low C Laboratory Files, F Copy: [illegible]

ENGINEERING-SCIENCE

ANALYTICAL REQUEST FORM
CHAIN OF CUSTODY RECORD

726

PROJECT NO.: 726517

PROJECT NAME/LOCATION: Catholic University / Washington DC

SAMPLERS: (Name/Signature) [illegible]

METHOD OF ANALYSES

FIELD NUMBER	COLLECTION DATE	COLLECTION TIME	SAMPLE NAME	MATRIX	NO. OF BOTTLES	METALS									SPECIAL INSTRUCTIONS (*) (TYPE OF CONTAINER, PRESERVATION, HANDLING, ETC.)
CU-17	9/26/94	1700	CU-MMT-02-O-IR	Liquid	1	✓									Impinger contents + Rinse
CU-18	9/26/94	1500	CU-MMT-01-O-IR	Liquid	1	✓									Impinger contents + Rinse
CU-19	9/26/94	2100	CU-MMT-BLANK-ACETONE	Dry	1	✓									Blank Acetone Beaker # [illegible]
CU-20	9/26/94	2100	CU-MMT-BLANK-IN HNO3	Liquid	1	✓									BLANK IN HNO3
CU-21	9/26/94	2100	CU-MMT-BLANK-REAGENT	Liquid	1	✓									BLANK REAGENT
CU-22	9/26/94	2100	CU-MMT-BLANK-Filter	Filter	1	✓									FILTER # M007/91
CU-23	9/26/94	1500	CU-MMT-01-I-Filter	Filter	1	✓									FILTER # M003/91
CU-24	9/26/94	1700	CU-MMT-02-I-Filter	Filter	1	✓									FILTER # M004/91
CU-25	9/26/94	2000	CU-MMT-03-I-Filter	Filter	1	✓									FILTER # M002/91
CU-26	9/26/94	1500	CU-MMT-01-O-Filter	Filter	1	✓									FILTER # M005/91
CU-27	9/26/94	1700	CU-MMT-02-O-Filter	Filter	1	✓									FILTER # M008/91
CU-28	9/26/94	2000	CU-MMT-03-O-Filter	Filter	1	✓									FILTER # M006/91
CU-29	9/26/94	2100	CU-MMT-I-IR-FB	Liquid	1	✓									FIELD BLANK
CU-30	9/26/94	2100	CU-MMT-I-FH-FB ACETONE	Dry	1	✓									BEAKER # 94/14
CU-31	9/26/94	2100	CU-MMT-I-FH-FB-[illegible]	Liquid	1	✓									FIELD BLANK
CU-32	9/27/94	1200	CU-MMT-04-O-FH-Acetone	Dry	1	✓									BEAKER # 94/018

Relinquished by: (Name/Signature)	Date/Time	Received by: (Name/Signature)	Date/Time	Courier:
[illegible]	10/14/94/1315	[illegible]	[illegible]	
Relinquished by: (Name/Signature)	Date/Time	Received by: (Name/Signature)	Date/Time	Airbill No.:
				Custody Seal No.:
				Cooler No.:

General Comments: 2 of 3

1 cooler [illegible] 10/15/94
1 cooler [illegible] 10/17/94

Distrib Origin Compr Sampl Return Originator Flow C Laborc Files, F Copy:

ENGINEERING-SCIENCE

ANALYTICAL REQUEST FORM
CHAIN OF CUSTODY RECORD

727

PROJECT NO.: 726517

PROJECT NAME/LOCATION: Catholic University / Washington D.C.

SAMPLERS: (Name/Signature) Gary D. Henry / [signature]

METHOD OF ANALYSES

FIELD NUMBER	COLLECTION DATE	COLLECTION TIME	SAMPLE NAME	MATRIX	NO. OF BOTTLES	METALS										SPECIAL INSTRUCTIONS (*) (TYPE OF CONTAINER, PRESERVATION, HANDLING, ETC.)
CU-33	9/27/94	1200	CU-MMT-04-0-FH-.1N HNO3	Liquid	1	✓										Front Half Rinse
CU-34	9/27/94	1200	CU-MMT-04-0-IR	Liquid	1	✓										Impinger contents & Rinse
CU-35	9/27/94	1200	CU-MMT-04-0-Filter	Filter	1	✓										Filter # M010/92
CU-36	10/12/94	0900	CU-MMT-I-01-FH-.1N HNO3-F	Filter	1	✓										Filter # M018/91
CU-37	10/12/94	0900	CU-MMT-I-02-FH-.1N HNO3-F	Filter	1	✓										Filter # M014/91
CU-38	10/12/94	0900	CU-MMT-I-03 FH .1N HNO3-F	Filter	1	✓										Filter # M020/91
CU-39	10/12/94	0900	CU-MMT BLANK-.1N-HNO3-F	Filter	1	✓										Filter # M017/91
CU-40	10/12/94	0900	CU-MMT-BLANK-.1N HNO3 F/Hd	Liquid	1	✓										Filtrate

Relinquished by: (Name/Signature)	Date/Time	Received by: (Name/Signature)	Date/Time	Courier:
[signature]	10/14/94/1315	[signature]	10/14/94	
Relinquished by: (Name/Signature)	Date/Time	Received by: (Name/Signature)	Date/Time	Airbill No.:
				Custody Seal No.:
				Cooler No.:

General Comments: 3 of 3

[illegible] SAT 10/15/94

[illegible]

Distribution: Original Accompanies Samples (Return to Originator) Yellow Copy: Laboratory Files, Pink Copy: Crew

PAGE 1 OF 1

Custody Seal : Present/Intact	TLI Project Number	30064	Book
Chain of Custody : Present			
Sample Tags : Present	Client: ESIOZ	ENGINEERING-SCIENCE, INC.	96
Sample Tag Numbers : Listed			
SMO Forms : Absent	Date Received	10/17/94 By	Page
Ice Chest NO COOLANT	Carrier and Number	FEDX.	14

TLI Number mR/H	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
90-14-1	CU-22 M007/91	FILTER METALS LAB								
90-14-2	CU-23 M003/91	FILTER METALS LAB								
90-14-3	CU-24 M004/91	FILTER METALS LAB								
90-14-4	CU-25 M002/91	FILTER METALS LAB								
90-14-5	CU-26 M005/91	FILTER METALS LAB								
90-14-6	CU-27 M008/91	FILTER METALS LAB								
90-14-7	CU-28 M006/91	FILTER METALS LAB								
90-14-8	CU-35 M010/92	FILTER METALS LAB								
90-14-9	CU-36 M018/91	FILTER METALS LAB								
90-14-10	CU-37 M019/91	FILTER METALS LAB								

Receiving Remarks: SEE TLI#30047 WHICH ARRIVED ON 10/15/94.THESE ARRIVED 10/17/94 WITH THE PAPERWORK.
Client's Chain of Custody differs from what the Sample IDs read; used the IDs on sample to log in.

20

Archive Remarks:

Custody Seal	: Present/Intact	TLI Project Number	30064 — Book
Chain of Custody	: Present		
Sample Tags	: Present	Client: ESI02	ENGINEERING-SCIENCE, INC. — 90
Sample Tag Numbers	: Listed		
SMO Forms	: Absent	Date Received	10/17/94 By — Page
Ice Chest	NO COOLANT	Carrier and Number	FEDX. — 14

	TLI Number mR/H	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
	90-14-11	CU-38 M020/91	FILTER METALS LAB								
3	90-14-12	CU-39 M017/91	FILTER METALS LAB								
	90-14-13	CU-19 94/06	BEAKER METALS LAB								
	90-14-14	CU-1 94/07	BEAKER METALS LAB								
1	90-14-15	CU-3 94/08	BEAKER METALS LAB								
2	90-14-16	CU-5 94/13	BEAKER METALS LAB								
3	90-14-17	CU-30 94/14	BEAKER METALS LAB								
	90-14-18	CU-7 94/15	BEAKER METALS LAB								
	90-14-19	CU-9 94/16	BEAKER METALS LAB								
2-1	90-14-20	CU-11 94/17	BEAKER METALS LAB								
3-1											

Receiving Remarks: SEE TLI#30047 WHICH ARRIVED ON 10/15/94.THESE ARRIVED 10/17/94 WITH THE PAPERWORK.
Client's Chain of Custody differs from what the Sample IDs read; used the IDs on sample to log in.

21

Archive Remarks:

Custody Seal	: Present/Intact	TLI Project Number	30064	Book
Chain of Custody	: Present			
Sample Tags	: Present	Client: ESI02	ENGINEERING-SCIENCE, INC.	90
Sample Tag Numbers	: Listed			
SMO Forms	: Absent	Date Received	10/17/94 By	Page
Ice Chest	NO COOLANT	Carrier and Number	FEDX.	14

TLI Number mR/H	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
90-14-2I	CU-32 94/18	BEAKER METALS LAB								

Receiving Remarks: SEE TLI#30047 WHICH ARRIVED ON 10/15/94.THESE ARRIVED 10/17/94 WITH THE PAPERWORK.
Client's Chain of Custody differs from what the Sample IDs read; used the IDs on sample to log in.

22

Archive Remarks:

Custody Seal	: Present/Intact	TLI Project Number	30047	Book
Chain of Custody	: Absent			
Sample Tags	: Present	Client: ESI02	ENGINEERING-SCIENCE, INC.	89
Sample Tag Numbers	: Not Listed on Chain of Custody			
SMO Forms	: Absent	Date Received	10/15/94 By B Dale	Page
Box	NO COOLANT	Carrier and Number	FedEx/5927242366	243

TLI Number / mR/H	Client ID	Matrix / Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
89-243-1A	CU-2 / 01-I-.1NHNO3	FH HNO3								
		METALS LAB								
89-243-2	CU-13 / 01-I-IR	IMP.								
		METALS LAB								
89-243-3	CU-8 / 01-O-.1N HNO3	FH HNO3								
		METALS LAB								
89-243-4	CU-18 / 01-O-IR-1	IMP.								
		METALS LAB								
89-243-5	CU-4 / 02-I-.1N HNO3	FH HNO3								
		METALS LAB								
89-243-6	CU-14 / 02-I-IR	IMP.								
		METALS LAB								
89-243-7	CU-10 / 02-O-.1N HNO3	FH HNO3								
		METALS LAB								
89-243-8	CU-17 / 02-O-IR	IMP.								
		METALS LAB								
89-243-9	CU-6 / 03-I-.1N HNO3	FH HNO3								
		METALS LAB								
89-243-10	CU-15 / 03-I-IR	IMP.								
		METALS LAB								

Receiving Remarks: No paperwork arrived with samples; CLIENT needs to provide a Chain of Custody with sample IDs matching the sample labels. Used Sample No./Run No. as client's Sample ID. Deleted 'CU-MMT-' from the beginning of each Run # in order to fit in available space.

23

Archive Remarks:

TRIANGLE LABORATORIES OF RTP, INC.--CHAIN OF CUSTODY--REVISED 06/20/94

Custody Seal	: Present/Intact	TLI Project Number	30047 — Book
Chain of Custody	: Absent		
Sample Tags	: Present	Client: ESI02	ENGINEERING-SCIENCE, INC. — 89
Sample Tag Numbers	: Not Listed on Chain of Custody		
SMO Forms	: Absent	Date Received	10/15/94 — By B Dale — Page
Box	NO COOLANT	Carrier and Number	FedEx/5927242366 — 243

TLI Number mR/H	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
89-243-11	CU-12 / 03-0-.1N	FH HNO3 HNO3 METALS LAB								
89-243-12	CU-16 / 03-0-IR	IMP. METALS LAB								
89-243-13	CU-33 / 04-0-FH-.1N	FH HNO3 HNO3 METALS LAB								
89-243-14	CU-40 / BLANK-.1N	BL. FILTRATE HNO3-FI METALS LAB								
89-243-15	CU-31 / I-FH(NITRIC)-FB	FB:FHHNO3 METALS LAB								
89-243-16	CU-29 / I-IR-FB	FB: IMP. METALS LAB								
89-243-17	CU-20 / BLANK-.1N	HNO3 BLANK HNO3 METALS LAB								
89-243-18	CU-21 / BLANK REAGENT	HNO3/H2O2 METALS LAB								

Receiving Remarks: No paperwork arrived with samples; CLIENT needs to provide a Chain of Custody with sample IDs matching the sample labels. Used Sample No./Run No. as client's Sample ID. Deleted 'CU-MMT-' from the beginning of each Run # in order to fit in available space.

Archive Remarks:

Project # 36-7

Client: ENGINEERING-SCIENCE, INC.

Date/Int.: OCTOBER 31, 1994 SRB, RYR

Client Run# CU-UMT-01-I

Triangle Laboratories of RTP

(919) 544-5729

Analytes

ICP	GFAA	FFAA	CVAA
Cr, B Mo, Sr	—	Na, K	—

CONT # 1

Filter Type: G or Q

label 90-14-29

Microwave dig with conc. HF and conc. HNO3 — Int RYR — Date 11/2/94

CONT # 2

Acetone Rinse

label 90-14-14

Volume — arrived dry

~~Dessicate to dryness and~~ redissolve in 10ml con HNO3 — Int RYR — Date 11/3/94

Reduce volume to 20 ml on hotplate — Int SRB — Date 11/1/94

Microwave dig with conc. HF and conc. HNO3 — Int RYR — Date 11/3/94

label 89-243-1A

Combine digestates

Front Half Digestate

~~Add 500 uL Sc~~

Dilute to ~~100~~ 200 mls — Int RYR — Date 11/3/94

label 89-243-1A

Volume 200 ML

For Metal

label 89-243-1A Int RYR

Volume 200 mL Date 11/3/94

(post digest spike on FH for GFAA))

~~For Hg~~

label ____ Int ____

Volume ____ ml Date ____

FH & BH Post dig. spk.

____ ppb (Instrument spiked)

Aliquot A: ____ mL

(No spike required)

Aliquot B: ____ mL

CONT # 3

HNO3 Rinse

label 89-243-1A

Volume 148 mL

Reduce Volume to 20 mL on Hotplate — Int. SRB — Date 11/1/94

Hotplate dig with HNO3 and H202 — Int. RYR — Date 11/2/94

~~Add 500 uL Sc — Int. ____ — Date ____~~

Dilute to ~~100~~ 150 mls — Int. SRB — Date 11/3/94

label 89-243-2 Int SRB

Volume 150 Date 11/3/94

(One post digestion spk on BH for GFAA)

CONT # 4

Back Half Impinger

label 89-243-2

Volume 785 mL

For Metals

label 89-243-2

Volume 785

~~For Hg~~

label ____

Volume ____

Sample

label ____ Int ____

Volume ____ Date ____

Aliquot A: ____

Aliquot B: ____

Spike (1 BH Hg Spike required)

label ____ Int ____

Volume ____ Date ____

Aliquot A: ____

Aliquot B: ____

spk ____ ml of ____ ppb — Int ____

final spk conc. added ____ ppb — Date ____

FH & BH Serial dilution performed

____ ml to ____ ml FV + ____ uL Sc

Initials: ____

Date:

Hg Impingers

CONT # ~~5A~~ HNO3

label ____

Volume ____ ml

Aliquot A ____

Aliquot B ____

Int ____

Date ____

CONT # ~~5B~~ KMNO4

label ____

Volume ____ ml

Aliquot A ____

Aliquot B ____

Int ____

Date ____

CONT # ~~5C~~ HCl

label ____

Volume ____ ml

Aliquot A ____

Aliquot B ____

Int ____

Date ____

(Duplicate Analysis of Each)

WHC-SD-WM-VI-028, Revision 0

(L)

Project #_____

Client:_____

Date/Int.:_____

Client Run# CU-MMT-02-I

Triangle Laboratories of RTP
(919) 544-5729

Analytes: ICP | GFAA | FLAA | CVAA

CONT # 1 — Filter Type: G or Q — label 90-14-3,10

CONT # 2 — Acetone Rinse — label 90-14-15 — Volume —

CONT # 3 — HNO3 Rinse — label 89-243-5 — Volume 168 mL

CONT # 4 — Back Half Impinger — label 89-243-6 — Volume 388 mL

Hg Impingers

CONT # ~~5A~~ HNO3 — label____ Volume____ml Aliquot A____ Aliquot B____ Int____ Date____

CONT # ~~5B~~ KMNO4 — label____ Volume____ml Aliquot A____ Aliquot B____ Int____ Date____

CONT # ~~5C~~ HCl — label____ Volume____ml Aliquot A____ Aliquot B____ Int____ Date____

(Duplicate Analysis of Each)

~~Dessicate to dryness and~~ redissolve in 10ml con HNO3 — Int RYR — Date 11/3/94

Reduce volume to 20 ml on hotplate — Int SRB — Date 11/1/94

Microwave dig with conc. HF and conc. HNO3 — Int RYR — Date 11/2/94

Microwave dig with conc. HF and conc. HNO3 — Int RYR — Date 11/3/94 — label 89-243-5

Combine digestates

Front Half Digestate

~~Add 500 uL Sc~~

Dilute to ~~100~~ 200 mls — Int RYR — Date 11/3/94 — label 89-243-5 — Volume 200 ML

For Metal — label 89-243-5 Int RYR — Volume 200 mL Date 11/3/94 (post digest spike on FH for GFAA))

~~For Hg~~ — label____ Int____ Volume____ml Date____

FH & BH Post dig. spk. ~~____~~ ppb (instrument spiked)

Aliquot A: ____mL (No spike required)

Aliquot B: ____mL

For Metals — label 89-243-6 Volume 388

~~For Hg~~ — label____ Volume____

Reduce Volume to 20 mL on Hotplate — Int. SRB — Date 11/1/94

Hotplate dig with HNO3 and H202 — Int. RYR — Date 11/2/94

~~Add 500 uL Sc — Int.____ Date____~~

Dilute to ~~100~~ 150 mls — Int. SRB — Date 11/3/94

label 89-243-6 Int SRB — Volume 150 Date 11/3/94

(One post digestion spk on BH for GFAA)

Sample — label____ Int____ Volume____ Date____ Aliquot A:____ Aliquot B:____

Spike (1 BH Hg Spike required) — label____ Int____ Volume____ Date____ Aliquot A:____ Aliquot B:____

spk____ml of____ppb — Int____ — final spk conc. added____ppb — Date____

FH & BH Serial dilution performed 10 ml to 50 ml FV + N/A mL Sc

Initials: PC

Date: 11/9/94

see element files & spiked on 11/9/94 (Samples 8, 9, & 13)

WHC-SD-WM-VI-028, Revision 0

DD [illegible]

Project #_____

Client:_____

Date/Int.:_____

Client Run# CU-MMT-03-I

Triangle Laboratories of RTP

(919) 544-5729

ICP	GFAA	FLAA	CVAA

CONT # 1 — Filter Type: G or Q — label 90-14-4, 11

CONT # 2 — Acetone Rinse — label 90-14-16 — Volume —

CONT # 3 — HNO3 Rinse — label 89-243-9 — Volume 228 mL

CONT # 4 — Back Half Impinger — label 89-243-10 — Volume 445 mL

Hg Impingers

CONT # ~~5A~~ HNO3 — label____ Volume____ml Aliquot A____ Aliquot B____ Int____ Date____

CONT # ~~5B~~ KMNO4 — label____ Volume____ml Aliquot A____ Aliquot B____ Int____ Date____

CONT # ~~5C~~ HCl — label____ Volume____ml Aliquot A____ Aliquot B____ Int____ Date____

~~Dessicate to dryness and~~ redissolve in 10ml con HNO3 — Int RYR — Date 11/3/94

Reduce volume to 20 ml on hotplate — Int SRB — Date 11/1/94

Microwave dig with conc. HF and conc. HNO3 — Int RYR — Date 11/2/94

Microwave dig with conc. HF and conc. HNO3 — Int RYR — Date 11/3/94 — label 89-243-9

Combine digestates

Front Half Digestate

~~Add 500 uL Sc~~

Dilute to ~~100~~ 200 mls — Int RYR — Date 11/3/94 — label 89-243-9 — Volume 200 ML

For Metal — label 89-243-9 Int RYR — Volume 200 mL Date 11/3/94 (post digest spike on FH for GFAA))

~~For Hg~~ — label____ Int____ Volume____ml Date____

FH & BH Post dig. spk. ____ ppb (Instrument spiked)

Aliquot A: ____mL (No spike required) Aliquot B: ____mL

For Metals — label 89-243-10 Volume 445

~~For Hg~~ — label____ Volume____

Reduce Volume to 20 mL on Hotplate — Int. SRB — Date 11/1/94

Hotplate dig with HNO3 and H202 — Int. RYR — Date 11/2/94

~~Add 500 uL Sc — Int.____ Date____~~

Dilute to ~~100~~ 150 mls — Int. SRB — Date 11/3/94

label 89-243-10 Int SRB — Volume 150 Date 11/3/94 (One post digestion spk on BH for GFAA)

Sample — label____ Int____ Volume____ Date____ Aliquot A:____ Aliquot B:____

Spike (1 BH Hg Spike required) — label____ Int____ Volume____ Date____ Aliquot A:____ Aliquot B:____

spk____ml of____ppb — Int____ final spk conc. added____ppb — Date____

(Duplicate Analysis of Each)

FH & BH Serial dilution performed ____ml to ____ml FV + ____uL Sc

Initials: _____

Date:

Project #_____

Client:_____

Date:_____

Triangle Laboratories of RTP, INC.

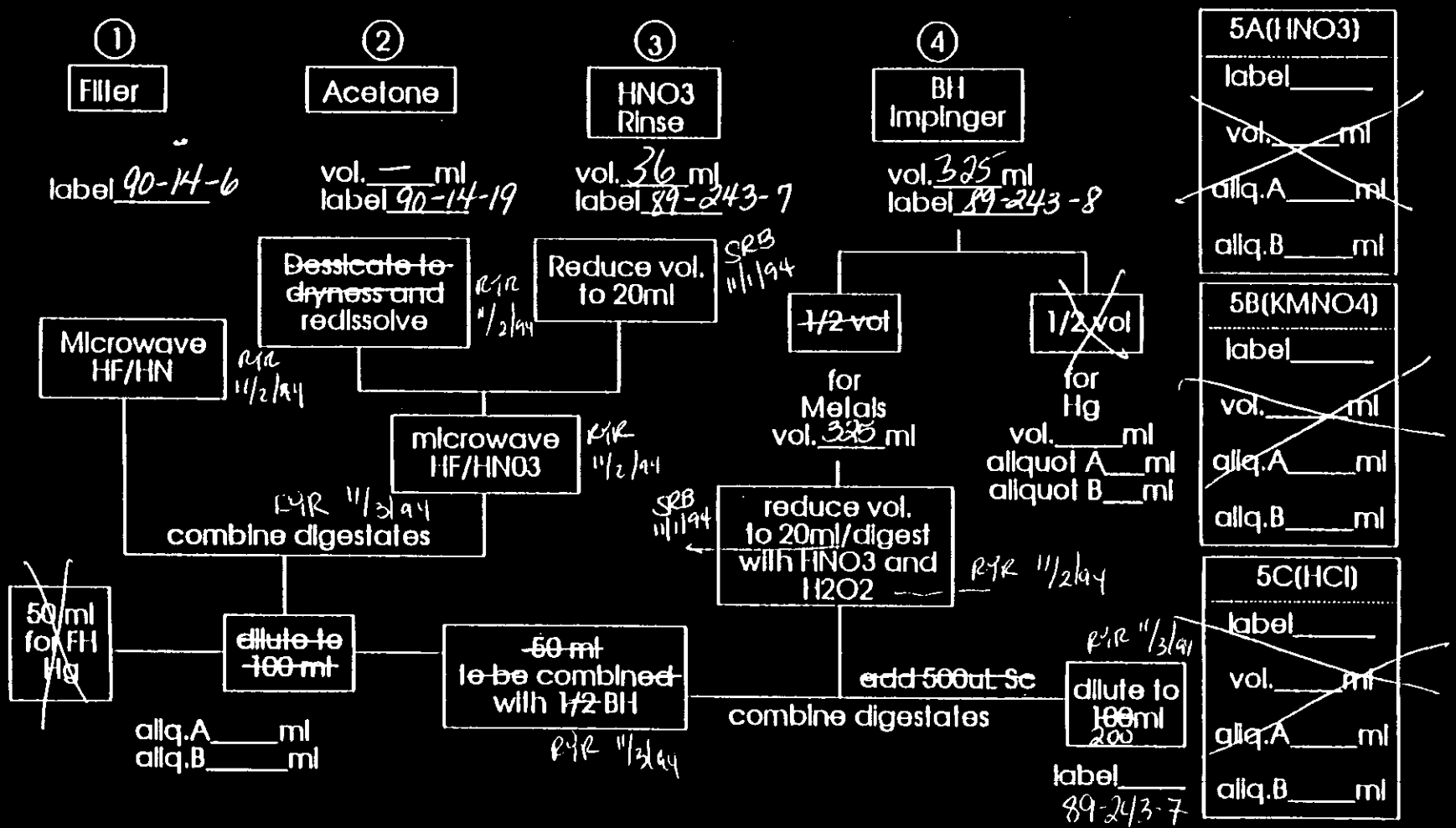
Run# CU-HMT-02-0

FH/BH combined worksheet

Analytes

ICP	GFAA	FLAA	CVAA

Hg Impingers



(L)

Project #_____

Client:_____

Date:_____

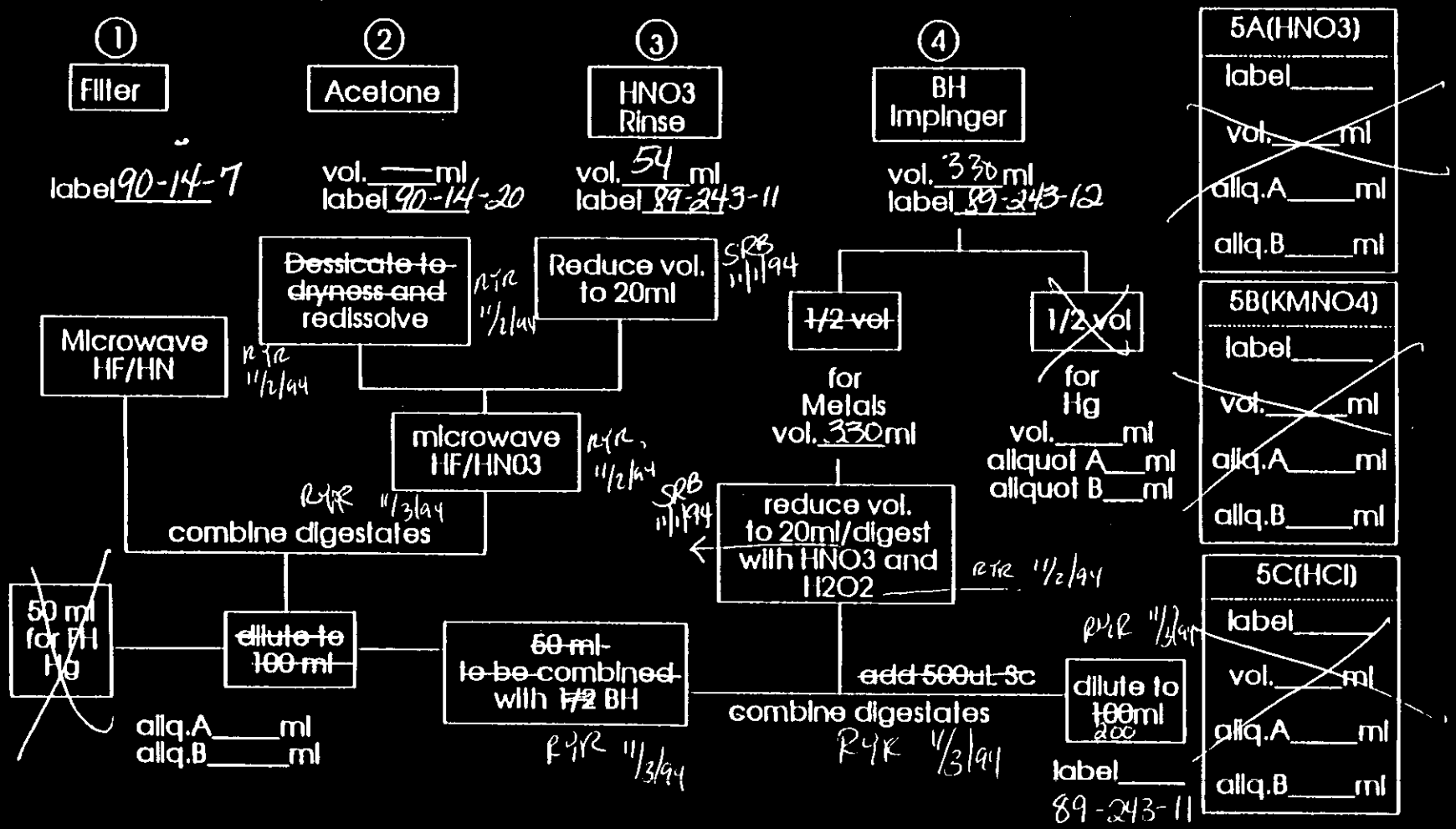
Triangle Laboratories of RTP, INC.

Run# CU-MMT-03-0

FH/BH combined worksheet

Analytes

ICP	GFAA	FLAA	CVAA



29

Project #_____

Client:_____

Date:_____

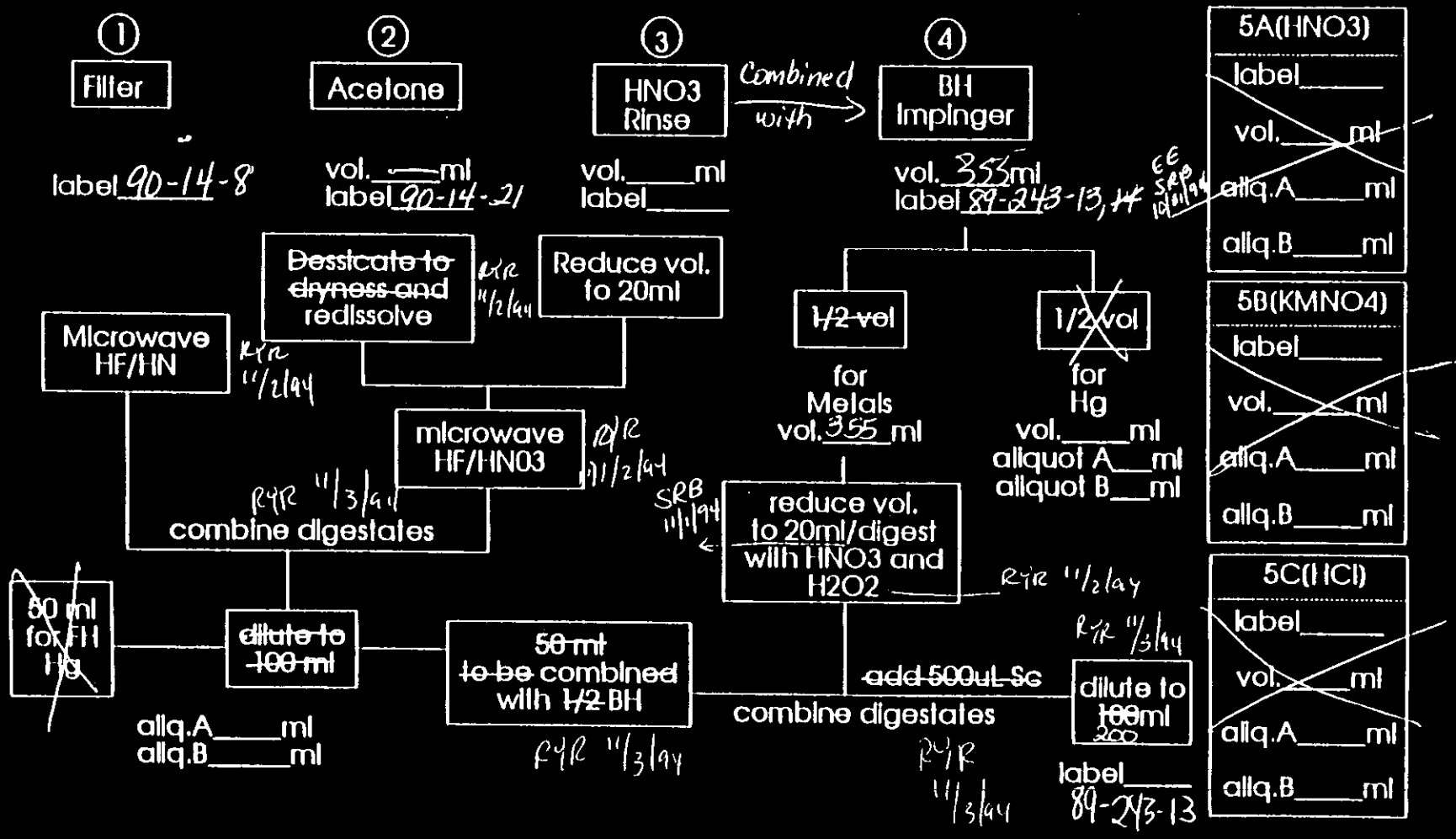
Triangle Laboratories of RTP, INC.

Run# CU-MMT-04-0

FH/BH combined worksheet

Analytes

ICP	GFAA	FLAA	CVAA



oject #: _____

lent: _____

ate/Int: _____

ilent Run# CU-MMT-BLANK (FIELD)

Triangle Laboratories of RTP

(919) 544-5729

Analytes

ICP	GFAA	FLAA	CVAA

CONT # 1 — Filter
pe: G or Q
label 90-14-1

CONT # 2 — Acetone Rinse
label 90-14-17
Volume —

CONT # 3 — HNO3 Rinse
label 89-243-15
Volume 30mL

CONT # 4 — Back Half Impinger
label 89-243-16
Volume 305 mL

Hg Impingers

CONT # ~~5A~~ HNO3
label _____
Volume ____ ml
Aliquot A ____
Aliquot B ____
Int _____
Date _____

CONT # ~~5B~~ KMNO4
label _____
Volume ____ ml
Aliquot A ____
Aliquot B ____
Int _____
Date _____

CONT # ~~5C~~ HCl
label _____
Volume ____ ml
Aliquot A ____
Aliquot B ____
Int _____
Date _____

(Duplicate Analysis of Each)

~~Dessicate to dryness and~~ redissolve in 10ml con HNO3 — Int RYR — Date 11/2/94

Reduce volume to 20 ml on hotplate — Int SRB — Date 11/1/94

For Metals — ~~For Hg~~
label 89-243-16 — label _____
Volume 305 — Volume _____

wave dig conc. HF onc. HNO3 — Int RYR — Date 11/2/94

Microwave dig with conc. HF and conc. HNO3 — Int RYR — Date 11/2/94
label 89-243-15

Combine digestates

Front Half Digestate

~~Add 500 uL Sc~~

Dilute to ~~100~~ 200 mls — Int RYR — Date 11/3/94
label 89-243-15
Volume 200 ML

Metal
89-243-15 Int RYR
me 200mL Date 11/3/94
digest spike on FH for GFAA))

~~For Hg~~
label _____ Int _____
Volume ____ ml Date _____

BH Post dig. spk.
____ ppb (instrument spiked)

Aliquot A: _____ mL
(No spike required)
Aliquot B: _____ mL

Reduce Volume to 20 mL on Hotplate — Int. SRB — Date 11/1/94

Hotplate dig with HNO3 and H202 — Int. RYR — Date 11/2/94

~~Add 500 uL Sc — Int. _____ Date _____~~

Dilute to ~~100~~ 150 mls — Int. SRB — Date 11/3/94

label 89-243-16 Int SRB
Volume 150 Date 11/3/94
(One post digestion spk on BH for GFAA)

Sample
label _____ Int _____
Volume ____ Date _____
Aliquot A: _____
Aliquot B: _____

Spike
(1 BH Hg Spike required)
label _____ Int _____
Volume ____ Date _____
Aliquot A: _____
Aliquot B: _____

spk ____ ml of ____ ppb — Int _____
final spk conc. added ____ ppb — Date _____

FH & BH Serial dilution performed
____ ml to ____ ml FV + ____ uL Sc
Initials: _____
Date:

Triangle Laboratories of RTP
(919) 544-5729

Project #: _____
Client: _____
Date/Int.: _____
Client Run# CU-NHT- BLANK(FILTERED)

Anal	ICP	GFAA	FLAA	CVAA

CONT # 1 — Filter type: G or Q
label 90-1412

CONT # 2 — Acetone Rinse
label _____
Volume _____

CONT # 3 — HNO3 Rinse
label 89-243-14
Volume 89 mL

CONT # 4 — Back Half Impinger
label _____
Volume _____
For Metals: label _____ Volume _____
For Hg: label _____ Volume _____

Hg Impingers

CONT # 5A — HNO3
label _____
Volume _____ ml
Aliquot A _____
Aliquot B _____
Int _____
Date _____

CONT # 5B — KMNO4
label _____
Volume _____ ml
Aliquot A _____
Aliquot B _____
Int _____
Date _____

CONT # 5C — HCl
label _____
Volume _____ ml
Aliquot A _____
Aliquot B _____
Int _____
Date _____

(Duplicate Analysis of Each)

Dessicate to dryness and redissolve in 10ml con HNO3 — Int _____ Date _____

Reduce volume to 20 ml on hotplate — Int SRB Date 11/1/94

Microwave dig with conc. HF and conc. HNO3 — Int RJR Date 11/3/94
label 89-243-14

Microwave dig conc. HF conc. HNO3 — Int RJR Date 11/3/94

Combine digestates

Front Half Digestate

~~Add 500 uL Sc~~

Dilute to ~~100~~ 200 mls — Int RJR Date 11/3/94
label 89-243-14
Volume 200 ML

Metal
label 89-243-14 Int RJR
Volume 200 ml Date 11/3/94
(digest spike on FH for GFAA))

~~Form~~
label _____ Int _____
Volume _____ ml Date _____

BH Post dig. spk.
____ ppb (instrument spiked)

Aliquot A: _____ mL
(No spike required)
Aliquot B: _____ mL

Reduce Volume to 20 mL on Hotplate — Int. _____ Date _____

Hotplate dig with HNO3 and H202 — Int. _____ Date _____

Add 500 uL Sc — Int. _____ Date _____

Dilute to 100 mls — Int. _____ Date _____

label _____ Int _____
Volume _____ Date _____
(One post digestion spk on BH for GFAA)

Sample
label _____ Int _____
Volume _____ Date _____
Aliquot A: _____
Aliquot B: _____

Spike
(1 BH Hg Spike required)
label _____ Int _____
Volume _____ Date _____
Aliquot A: _____
Aliquot B: _____

spk ____ ml of ____ ppb — Int _____
final spk conc. added ____ ppb — Date _____

FH & BH Serial dilution performed
____ ml to ____ ml FV + ____ uL Sc
Initials: _____
Date:

Initials	Witness	Date	Project & Sample #	Analyte	Original Std #	Original Std Conc (ppm)	Spike Vol. / Sample Vol.	Sample Spike (ppb)	Initials	Witness
21	VP	10/8/94	29868A	Ba	2-47-3	100	40/100	40	SRB	VP
			89-64-2(S)	Cu	2-39-3	1000	20/100	200		
		spd. 10 p. 46	-2(SD)	Fe	2-46-1	1000	60/100	600		
			-12(S)	V	2-51-1	100	160/100	160		
			-12(SD)	Zn	2-50-7	100	160/100	160		
			-LCS	Be	2-50-4	100	5/100	5		
			-LCS(D)	Cd	2-46-5	100	5/100	5		
			-13(S)	Cr	2-42-5	100	25/100	25		
			-13(SD)	Pb	2-48-1	100	50/100	50		
				Ni	2-48-2	100	50/100	50		
				As	2-47-1	100	50/100	50		
				Tl	2-47-6	100	50/100	50		
B	SVL		* ⇒ Spiked separately	Ag *	2-50-6	100	5/100	5	SRB	VP
		10/18/94	29746	Fe	2-46-1	10000	3mL/5mL	6000	PC	DKH
	XH		Post-digestion 88-182-3CP	↓	↓	↓	↓	↓	↓	↓
			Respike							
		10/19/94	29746							
			Post-digestion 88-182-3CP	B	2-31-7	1000	5mL/5mL	1000	PC	DKH
			Respike — 3DP	↓	↓	↓	↓	↓	↓	↓
			Spiked into plastic Nalgene bottle							
		11/2/94	30047	Cr	2-36-6	1000	32/200	160	SRB	VP
			90-14-LCS	B	2-31-7	1000	200/200	1000		
			-LCS(D)	Mo	1-109-7	1000	200/200	1000		
				Sr	2-20-3	1000	100/200	500		
				Na	2-39-7	1000	200/200	1000		
				K	2-25-4	1000	200/200	1000		

ANALYS	WITNESS	Date	Project # Sample #	ANALYTE	Original Std #	Original Std CONC (ppm)	SPIKE VOL / SAMPLE VOL	SPIKE SAMPLE (ppb)	INITIALS	WITNESS INITIAL
3	V.P.	11-7-94 PC	298168B							
		Post-digestion	89-164-23P	Ba	2-52-3	100	4uL/10mL	40	PC	gm
		Spikes	↓ 22P	Cu	2-39-3	1000	2uL/10mL	200	↓	↓
				Fe	2-46-1	↓	6uL/10mL	600		
				V	2-43-6		1.6uL/10mL	160		
				Zn	2-36-5		1.6uL/10mL	160		
		11/8/94 Std to p.63	30198	As	2-52-1	100	50/100	50	SRB	V.P.
			90-148-LCS	Be	2-50-4	100	5/100	5	↓	↓
			-LCS(D)	Cd	2-51-7	100	5/100	5		
PC	gm			Cr	2-42-5	100	25/100	25		
				Ni	2-48-2	100	50/100	50		
				Pb	2-53-1	100	50/100	50		
				Tl	2-53-2	100	50/100	50		
				Ba	2-52-3	100	40/100	40		
				Cu	2-39-3	1000	20/100	200		
PC	gm			Fe	2-46-1	1000	60/100	600		
				V	2-43-6	1000	20/100	200		
				Zn	2-36-5	1000	150/100	1500	↓	↓
		11/9/94	* - spiked separately	Ag	2-53-3	100	5/100	5	SRB	V.P.
		11/9/94 PC	30047						WITNESS	INITIAL
		Post-Digest	89-243-9P	Cr	2-36-6	1000	1.6uL/10mL	160	gm	PC
		SPIKES	10P	B	2-31-7	1000	10uL/10mL	1000	↓	↓
			↓ 13P	Mo	2-36-2	1000	10uL/10mL	1000		
	gm			Sr	2-20-3	1000	5uL/10mL	500		

5-5-94

DATE / ANALYST	INSTRUMENT	METHOD ICP, CVAA GFAA, FLAA	TRI PROJECT #	TRI SAMPLE ID	VOL of SAMPLE USED	FINAL VOLUME	DILUTION FACTOR	ELEMENT	DATA FILE	COMMENTS
11/10/94 PC	(B) ICP	ICP	30047	89-243-1A	1ml	10ml	X10	B	BB589	
				5	0.5ml	10ml	X20			
				5L	0.5ml	10ml	X20			
				7	2ml	10ml	X5			
				9	2ml	10ml	X50			
				9P	2ml	10ml	X50			
				11	2ml	10ml	X5			
				11L	2ml	10ml	X5			
				9	0.2ml	10ml	X50			
				9P	0.2ml	10ml	X50			
11/11/94 DKH 11/11/94	A	FLAA	30047	89-243-1A	100ml	100ml	X1000	Na/K	AA903	
				2	2ml	100ml	X50			
				5	100ml		X1000			
				6	2ml		X50			
				7	100ml		X1000			
				9	100ml		X1000			
				10	2ml		X50			
				11	100ml		X1000			
				13	2ml		X50			
				14	2ml					
				15	100ml		X1000			
				16	2ml		X50			
11/11/94 DKH				7	2ml		X50			
				11	2ml		X50	Na/K		
				14	25ml	50ml	X2			
				15	1ml	50ml	X50			
				15	5ml	50ml	X10			

Rewritten for clarity 11/22/94

COMMENTS	Date Analyst	Instrument	Method ICP CVAA GFAA FLAA	Project #	Sample ID	Vol of Sample Used	Final Volume	Dilution Factor	Element	DATA File	Comments
	11/17/94 DKH	B	ICP	30416	90-116-1	1 ml	50 ml	x50	Cu	BB603	
						1 ml	100 ml	x100			
						500 uL	100 ml	x200			
	11/11/94 JAM	A	FLAA	30047	89-243 1A9 1AD	100 ul	100 ml	x1000	Na	AA902	
					2/2D	2 ml	100 ml	x50			
					5	100 ul	100 ml	x1000			
					6	2 ml	100 ml	x50			
					7/7D	2 ml	100 ml	x50			
					9	100 ul	100 ml	x1000			
					10	2 ml	100 ml	x50			
					11	2 ml	100 ml	x50			
					13	2 ml	100 ml	x50			
					14	25 ml	50 ml	x2			
					15	2 ml	100 ml	x50			
					16	2 ml	100 ml	x50			
	11/11/94 JAM	A	FLAA	30047	89-243-1A1 1AD	100 ul	100 ml	x1000	K	AA903	
					2/2D	10 ml	100 ml	x10			
					5	100 ul	100 ml	x1000			
					7/7D	2 ml	100 ml	x50			
					9	100 ul	100 ml	x1000			
					15	10 ml	100 ml	x10			
					6L	10 ml	50 ml	x5			EE
					11L	10 ml	50 ml	x5			DKH 11-22-94

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30047
B

Method Name: BB589

Comment:Analyst: RC

Read Delay : 30 sec Replicates : 3 Format name : Database

Analysis Number	AS Posn	Sample ID	Sequence Name	Dilution	Weight / Volume
1	4	wcal standard	B		
2	5	blank	B		
3	1	#1 standard	B		
4	2	#2 standard	B		
5	3	#3 standard	B		
6	4	#4 standard	B		
7	5	blank	B		
8	4	CHECK HS	B		
9	6	ICV	B		
10	5	ICB	B		
11	53	ICSAI	B		
12	54	ICSABI	B		
13	9	30047-MB	B		
14	10	30047-LCS	B		
15	11	30047-LCSD	B		
16	12	89-243-1A	B	diluted X10	
17	12	89-243-1A D	B		
18	13	89-243-2	B		
19	13	89-243-2 D	B		
20	14	89-243-5	B	diluted X20	
21	15	89-243-5 L	B		
22	16	89-243-6	B		
23	7	CCV1	B		
24	8	CCB1	B		
25	17	89-243-6 L	B	diluted X5	
26	18	89-243-7	B		
27	18	89-243-7 D	B	~~X3~~ X50 Required a greater dilution 11/10/92	
28	19	89-243-9	B	diluted	
29	20	89-243-9 P	B		
30	21	89-243-10	B		
31	22	89-243-10 P	B		
32	23	89-243-11	B	diluted X5	
33	24	89-243-11 L	B		
34	25	89-243-13	B		
35	7	CCV2	B		
36	8	CCB2	B		
37	26	89-243-13 P	B		
38	27	89-243-14	B		
39	28	89-243-15	B		
40	29	89-243-16	B		
41	7	CCV3	B		
42	8	CCB3	B		
43	53	ICSAF	B		
44	54	ICSABF	B		

ICV=500
CCV=5000
ICB = 500 11/10/92

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lement Name: B!

Wavelength	Height	Std Conc		
49.773*	15	#1:	200.00	
249.678	6	#2:	500.00	
208.959	8	#3:	1000.00	
08.893	10	#4:	2000.00	
82.589	12	#5:		
182.640	14	#6:		
	16	#7:		
	18	#8:		
		#9:		
		#10:		

Source Name :	S1
Mono Select :	A
Signal Comp :	No
PMT Voltage :	450 Volts
Survey Window :	0.100 nm
Peak Window :	0.030 nm
Sampling Time :	100 msec
Bkgd Correction :	Auto
Lower Interval:	0.000 nm
Upper Interval:	0.000 nm
Units :	ug/L

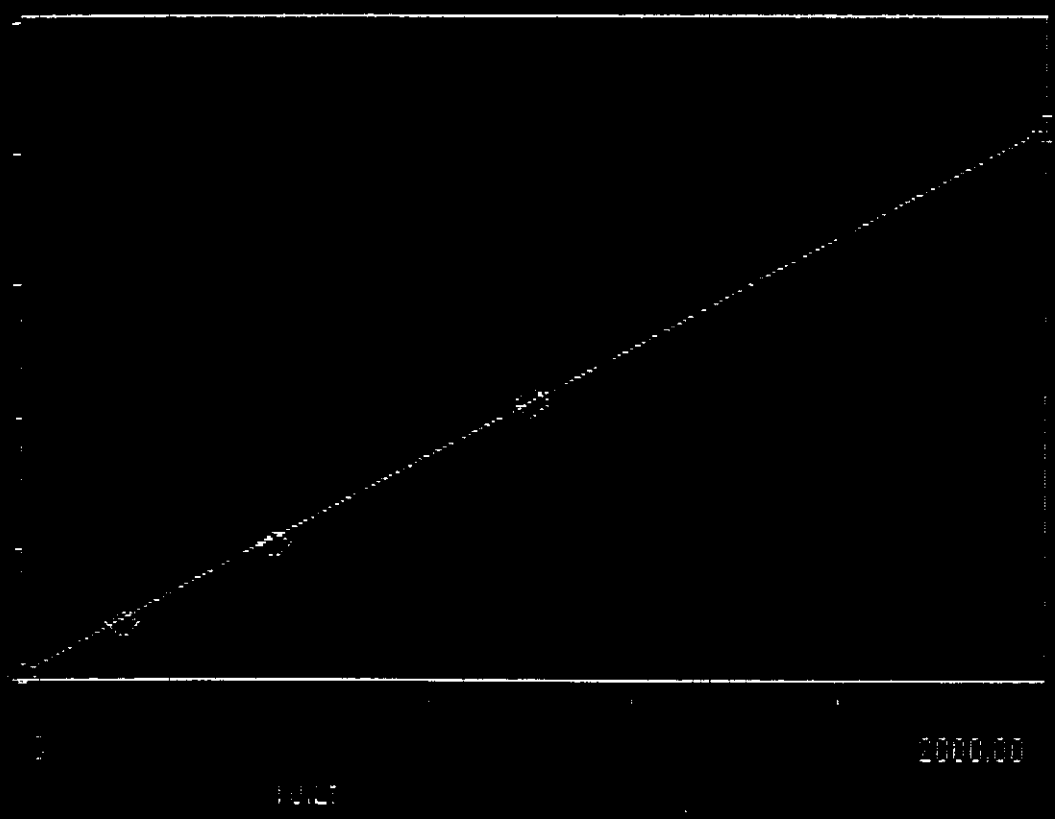
```
 1/10/94 10:37
.cal standard  rep   1  B!          em        372.3 conc 200.00
               rep   2  B!          em        383.9 conc 200.00
               rep   3  B!          em        371.3 conc 200.00
 cal standard
11/10/94 10:37
    B!         av    375.83               sd      7.020 %cv   1.87 conc  200.00

11/10/94 10:39
blank          rep   1  B!          em          4.5
               rep   2  B!          em          3.6
               rep   3  B!          em          3.4
blank
 1/10/94 10:39
    B!         av      3.85               sd      0.597 %cv  15.52

 1/10/94 10:40
 1 standard    rep   1  B!          em         38.2 conc 200.00
               rep   2  B!          em         37.7 conc 200.00
               rep   3  B!          em         38.1 conc 200.00
 1 standard
 1/10/94 10:41
    B!         av     37.98               sd      0.279 %cv   0.74 conc  200.00

 1/10/94 10:42
#2 standard    rep   1  B!          em         90.9 conc 500.00
               rep   2  B!          em         91.8 conc 500.00
               rep   3  B!          em         87.9 conc 500.00
#2 standard
11/10/94 10:42
    B!         av     90.19               sd      2.075 %cv   2.30 conc  500.00

11/10/94 10:44
 3 standard    rep   1  B!          em        187.3 conc 1000.00
               rep   2  B!          em        181.4 conc 1000.00
               rep   3  B!          em        188.0 conc 1000.00
#3 standard
 1/10/94 10:44
    B!         av    185.56               sd      3.582 %cv   1.93 conc  1000.0

 1/10/94 10:45
 4 standard    rep   1  B!          em        372.0 conc 2000.00
               rep   2  B!          em        361.7 conc 2000.00
               rep   3  B!          em        368.3 conc 2000.00
 4 standard
11/10/94 10:46
    B!         av    367.32               sd      5.206 %cv   1.42 conc  2000.0
```

DISPLAY > CALIB ELEM LIST > CALIB CURVE

11/10/94
10:48:23

Method Name: BB589 Element Name: Bi

Algorithm	RMSD
	1.7
Wtd Linear	4.2



Command?

F5	F6	F7	F8	F9	F10	F11	F12
	Standard List			Log Display		Algorthm	

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```
 1/10/94 10:51
CHECK HS        rep   1  B!          conc   2030.92 ug/L
                rep   2  B!          conc   2024.49 ug/L
                rep   3  B!          conc   2057.77 ug/L
 HECK HS
11/10/94 10:51
    B!          av   2037.73 ug/L 2000   sd    17.652 %cv   0.87
                                 11/10/94pc
11/10/94 10:53
ICV             rep   1  B!          conc    508.11 ug/L
                rep   2  B!          conc    499.67 ug/L
                rep   3  B!          conc    516.20 ug/L
ICV
 1/10/94 10:53
    B!          av    507.99 ug/L 500    sd     8.268 %cv   1.63
                                 11/10/94pc
 1/10/94 10:55
 CB             rep   1  B!          conc      4.87 ug/L
                rep   2  B!          conc     -1.12 ug/L
                rep   3  B!          conc     20.63 ug/L
 CB
 1/10/94 10:55                       IPC
    B!          av      8.13 ug/L 50.7   sd    11.234 %cv  138.2

 1/10/94 10:56
ICSAI           rep   1  B!          conc    411.33 ug/L
                rep   2  B!          conc    457.69 ug/L
                rep   3  B!          conc    456.45 ug/L
 ICSAI
11/10/94 10:57
    B!          av    441.82 ug/L        sd    26.417 %cv   5.98

11/10/94 10:58
 CSABI          rep   1  B!          conc    556.45 ug/L
                rep   2  B!          conc    556.27 ug/L
                rep   3  B!          conc    555.88 ug/L
 CSABI
 1/10/94 10:58
    B!          av    556.20 ug/L 500    sd     0.295 %cv   0.05
                                 11/10/94pc
```


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```
 1/10/94 11:00
30047-MB        rep   1  B!        conc      8.85 ug/L
                rep   2  B!        conc     -5.42 ug/L          window edge
                rep   3  B!        conc     14.93 ug/L
.0047-MB
11/10/94 11:00
    B!          av      6.12 ug/L        sd    10.446 %cv  170.7

11/10/94 11:01
30047-LCS       rep   1  B!        conc    930.51 ug/L
                rep   2  B!        conc    994.09 ug/L
                rep   3  B!        conc    964.30 ug/L
30047-LCS
 1/10/94 11:02
    B!          av    962.96 ug/L        sd    31.809 %cv   3.30

11/10/94 11:03
0047-LCSD       rep   1  B!        conc    960.81 ug/L
                rep   2  B!        conc    953.06 ug/L
                rep   3  B!        conc    965.37 ug/L
 0047-LCSD
11/10/94 11:03
    B!          av    959.75 ug/L        sd     6.226 %cv   0.65

11/10/94 11:05
89-243-1A       rep   1  B!        conc  73584.17 ug/L
                rep   2  B!        conc  76115.77 ug/L
                rep   3  B!        conc  75718.13 ug/L
89-243-1A
11/10/94 11:05
    B!          av  75139.36 ug/L        sd  1361.422 %cv   1.81

11/10/94 11:07
9-243-1A D      rep   1  B!        conc  75528.33 ug/L
                rep   2  B!        conc  78273.15 ug/L
                rep   3  B!        conc  78389.83 ug/L
9-243-1A D
 1/10/94 11:07
    B!          av  77397.10 ug/L        sd  1619.156 %cv   2.09

 1/10/94 11:08
 9-243-2        rep   1  B!        conc   1567.80 ug/L
                rep   2  B!        conc   1585.38 ug/L
                rep   3  B!        conc   1598.52 ug/L
 9-243-2
11/10/94 11:09
    B!          av   1583.90 ug/L        sd    15.414 %cv   0.97

 1/10/94 11:10
89-243-2 D      rep   1  B!        conc   1579.72 ug/L
                rep   2  B!        conc   1562.23 ug/L
                rep   3  B!        conc   1551.60 ug/L
89-243-2 D
11/10/94 11:11
    B!          av   1564.51 ug/L        sd    14.199 %cv   0.91
```

[Sample] > linear range 8 20,000

Reanalyzed w/X10 dilution after 89-243-1A 11/10/94 gc

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```
 1/10/94 11:12
89-243-5          rep   1  B!          conc 145583.66 ug/L
                  rep   2  B!          conc 145537.41 ug/L
                  rep   3  B!          conc 148684.09 ug/L
9-243-5
11/10/94 11:12
    B!            av  146601.7 ug/L          sd   1803.524 %cv    1.23

11/10/94 11:14
89-243-5 L        rep   1  B!          conc  35752.35 ug/L
                  rep   2  B!          conc  35563.46 ug/L
                  rep   3  B!          conc  35051.99 ug/L
89-243-5 L
 1/10/94 11:14
    B!            av  35455.93 ug/L          sd    362.348 %cv    1.02

11/10/94 11:16
 9-243-6          rep   1  B!          conc   1558.08 ug/L
                  rep   2  B!          conc   1627.76 ug/L
                  rep   3  B!          conc   1595.17 ug/L
 9-243-6
11/10/94 11:16
    B!            av   1593.67 ug/L          sd     34.864 %cv    2.19

 1/10/94 11:18
CCV1              rep   1  B!          conc   4988.48 ug/L
                  rep   2  B!          conc   4962.60 ug/L
                  rep   3  B!          conc   4939.46 ug/L
CCV1
11/10/94 11:18
    B!            av   4963.51 ug/L 5000 sd     24.526 %cv    0.49
                                   11/10/94 PC
11/10/94 11:19
 CB1              rep   1  B!          conc     28.78 ug/L
                  rep   2  B!          conc     48.86 ug/L
                  rep   3  B!          conc     37.92 ug/L
CCB1
 1/10/94 11:20                   DL
    B!            av     38.52 ug/L 50.7  sd     10.052 %cv   26.10
                                   11/10/94 PC
 1/10/94 11:21
 9-243-6 L        rep   1  B!          conc    413.41 ug/L
                  rep   2  B!          conc    391.75 ug/L
                  rep   3  B!          conc    375.73 ug/L
 9-243-6 L
11/10/94 11:21
    B!            av    393.63 ug/L          sd     18.912 %cv    4.80

 1/10/94 11:23
89-243-7          rep   1  B!          conc  29791.55 ug/L
                  rep   2  B!          conc  30791.39 ug/L
                  rep   3  B!          conc  29430.27 ug/L
89-243-7
11/10/94 11:23
    B!            av  30004.40 ug/L          sd    705.085 %cv    2.35

11/10/94 11:25
 9-243-7 D        rep   1  B!          conc  30452.99 ug/L
                  rep   2  B!          conc  29781.92 ug/L
```

[Sample] > linear range

Reanalyzed w/ X20 dilutions @ end of run 11/10/94 PC

[Sample] > linear range

Reanalyzed @ end of run w/ X5 dilution 11/10/94 PC

```
8 -243-7 D
11/10/94 11:25
    B!          av  29996.95 ug/L          sd    395.153 %cv    1.32

11/10/94 11:27
89-243-9        rep   1  B!          conc 303671.81 ug/L
                rep   2  B!          conc 294809.13 ug/L
                rep   3  B!          conc 307792.00 ug/L
89-243-9
11/10/94 11:27
    B!          av  302090.9 ug/L          sd   6634.224 %cv    2.20

11/10/94 11:29
8 -243-9 P      rep   1  B!          conc 260433.42 ug/L
                rep   2  B!          conc 253201.39 ug/L
                rep   3  B!          conc 271356.91 ug/L
8 -243-9 P
  /10/94 11:29
    B!          av  261663.9 ug/L          sd   9140.098 %cv    3.49

  /10/94 11:31
89-243-10       rep   1  B!          conc   1015.48 ug/L
                rep   2  B!          conc   1037.58 ug/L
                rep   3  B!          conc   1064.17 ug/L
8 -243-10
11/10/94 11:31
    B!          av   1039.08 ug/L          sd     24.381 %cv    2.35

11/10/94 11:33
89-243-10 P     rep   1  B!          conc   1745.08 ug/L
                rep   2  B!          conc   1882.54 ug/L
                rep   3  B!          conc   1761.93 ug/L
89-243-10 P
  /10/94 11:33
    B!          av   1796.52 ug/L          sd     74.971 %cv    4.17

11/10/94 11:35
8 -243-11       rep   1  B!          conc  31209.22 ug/L
                rep   2  B!          conc  30514.16 ug/L
                rep   3  B!          conc  31095.11 ug/L
8 -243-11
  /10/94 11:35
    B!          av  30939.49 ug/L          sd    372.748 %cv    1.20

  /10/94 11:37
89-243-11 L     rep   1  B!          conc   7713.13 ug/L
                rep   2  B!          conc   7488.93 ug/L
                rep   3  B!          conc   7558.71 ug/L
89-243-11 L
11/10/94 11:37
    B!          av   7586.92 ug/L          sd    114.730 %cv    1.51

11/10/94 11:39
89-243-13       rep   1  B!          conc   6876.78 ug/L
                rep   2  B!          conc   6782.90 ug/L
                rep   3  B!          conc   6964.39 ug/L
89-243-13
  /10/94 11:39
    B!          av   6874.69 ug/L          sd     90.763 %cv    1.32
```

NA 11/10/94

[Sample] > linear range

Reanalyzed @ end of run w/ X5 dilution 11/10/94

[Sample] > linear range

Reanalyzed @ end of run w/ X5 dilution 11/10/94

```
 1/10/94 11:40
CCV2            rep   1  B!          conc   5188.76 ug/L
                rep   2  B!          conc   5083.46 ug/L
                rep   3  B!          conc   5059.93 ug/L
CCV2
11/10/94 11:41
    B!          av   5110.71 ug/L 5000  sd     68.604 %cv    1.34
                                 11/10/94 RC
                                 EE
11/10/94 11:42
CCB2            rep   1  B!          conc     18.68 ug/L
                rep   2  B!          conc     21.92 ug/L
                rep   3  B!          conc     26.48 ug/L
CCB2
 1/10/94 11:43                   IDL
    B!          av     22.36 ug/L  50.7  sd      3.919 %cv   17.53
                                 11/10/94 RC
 1/10/94 11:44
 9-243-13 P     rep   1  B!          conc   7160.89 ug/L
                rep   2  B!          conc   7142.92 ug/L
                rep   3  B!          conc   7221.20 ug/L
 9-243-13 P
11/10/94 11:44
    B!          av   7175.00 ug/L        sd     41.005 %cv    0.57

 1/10/94 11:46
89-243-14       rep   1  B!          conc   3494.97 ug/L
                rep   2  B!          conc   3456.80 ug/L
                rep   3  B!          conc   3493.02 ug/L
89-243-14
11/10/94 11:46
    B!          av   3481.59 ug/L        sd     21.494 %cv    0.62

11/10/94 11:48
 9-243-15       rep   1  B!          conc   7918.08 ug/L
                rep   2  B!          conc   8196.24 ug/L
                rep   3  B!          conc   8145.06 ug/L
89-243-15
 1/10/94 11:49
    B!          av   8086.46 ug/L        sd    148.048 %cv    1.83

 1/10/94 11:50
89-243-16       rep   1  B!          conc     61.56 ug/L
                rep   2  B!          conc     56.57 ug/L
                rep   3  B!          conc     58.68 ug/L
 9-243-16
11/10/94 11:51
    B!          av     58.93 ug/L        sd      2.505 %cv    4.25

11/10/94 11:52
CCV3            rep   1  B!          conc   4762.71 ug/L
                rep   2  B!          conc   4839.11 ug/L
                rep   3  B!          conc   4740.76 ug/L
CCV3
11/10/94 11:52
    B!          av   4780.86 ug/L 5000  sd     51.629 %cv    1.08
                                 11/10/94 RC
11/10/94 11:54
 CB3            rep   1  B!          conc     16.45 ug/L
                rep   2  B!          conc     13.47 ug/L
```

```
 CB3
11/10/94 11:54
    B!          av      17.10 ug/L   sd      3.992 %cv   23.35

11/10/94 11:58
89-243-1A       rep   1  B!          conc    9446.08 ug/L
                rep   2  B!          conc    9347.63 ug/L
                rep   3  B!          conc    9086.50 ug/L
89-243-1A
11/10/94 11:58
    B!          av    9293.40 ug/L        sd    185.821 %cv    2.00

11/10/94 11:59
 9-243-1A D     rep   1  B!          conc    9273.34 ug/L
                rep   2  B!          conc    9055.79 ug/L
                rep   3  B!          conc    8976.16 ug/L
9-243-1A D
 1/10/94 12:00
    B!          av    9101.76 ug/L        sd    153.828 %cv    1.69

 1/10/94 12:02
9-243-5         rep   1  B!          conc    9149.30 ug/L
                rep   2  B!          conc    9111.94 ug/L
                rep   3  B!          conc    9269.25 ug/L
 9-243-5
11/10/94 12:03
    B!          av    9176.83 ug/L        sd     82.189 %cv    0.90

11/10/94 12:04
89-243-5 L      rep   1  B!          conc    1770.27 ug/L
                rep   2  B!          conc    1752.62 ug/L
                rep   3  B!          conc    1725.00 ug/L
89-243-5 L
 1/10/94 12:05
    B!          av    1749.30 ug/L        sd     22.814 %cv    1.30

11/10/94 12:07
 9-243-7        rep   1  B!          conc    6808.51 ug/L
                rep   2  B!          conc    6843.73 ug/L
                rep   3  B!          conc    6863.09 ug/L
 9-243-7
 1/10/94 12:07
    B!          av    6838.44 ug/L        sd     27.675 %cv    0.40

 1/10/94 12:09
89-243-7 D      rep   1  B!          conc    6774.65 ug/L
                rep   2  B!          conc    6699.83 ug/L
                rep   3  B!          conc    6801.84 ug/L
9-243-7 D
11/10/94 12:09
    B!          av    6758.77 ug/L        sd     52.825 %cv    0.78

11/10/94 12:11
9-243-9         rep   1  B!          conc   66600.20 ug/L
                rep   2  B!          conc   66874.91 ug/L
                rep   3  B!          conc   67485.25 ug/L
89-243-9
 1/10/94 12:11
    B!          av   66986.78 ug/L        sd    453.011 %cv    0.68
```

DX 50.7 11/10/94 R

X10 11/10/94 R

X10 11/10/94 R

X20 11/10/94 R

X20 11/10/94 R

X5 11/10/94 R

X5 11/10/94 R

[Sample] > linear range.

Redeluted @ X50 11/10/94 R

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```
 1/10/94 12:13
89-243-9 P        rep   1  B!          conc  66972.11 ug/L
X5 11/10/94 PC    rep   2  B!          conc  67436.52 ug/L
                  rep   3  B!          conc  66812.37 ug/L
89-243-9 P
11/10/94 12:13
    B!            av  67073.66 ug/L        sd   324.236 %cv   0.48

11/10/94 12:16
89-243-9          rep   1  B!          conc   7816.61 ug/L
X50 11/10/94      rep   2  B!          conc   7579.93 ug/L
                  rep   3  B!          conc   7439.66 ug/L
89-243-9 PC
 1/10/94 12:16
    B!            av   7612.07 ug/L        sd   190.515 %cv   2.50

11/10/94 12:18
 9-243-9 P        rep   1  B!          conc   7629.30 ug/L
X50 11/10/94      rep   2  B!          conc   7614.03 ug/L
                  rep   3  B!          conc   7480.97 ug/L
89-243-9 P PC
11/10/94 12:18
    B!            av   7574.77 ug/L        sd    81.591 %cv   1.08

 1/10/94 12:24
CCV3              rep   1  B!          conc   4614.46 ug/L
CCV4 11/10/94 PC  rep   2  B!          conc   4692.41 ug/L
                  rep   3  B!          conc   4751.03 ug/L
CCV3
11/10/94 12:24
    B!            av   4685.97 ug/L        sd    68.515 %cv   1.46

11/10/94 12:25
CCB3              rep   1  B!          conc     16.99 ug/L
CCB4 11/10/94 PC  rep   2  B!          conc      1.66 ug/L
                  rep   3  B!          conc     15.70 ug/L
CCB3
 1/10/94 12:26
    B!            av     11.45 ug/L        sd     8.501 %cv  74.23

 1/10/94 12:28
89-243-11         rep   1  B!          conc   6560.17 ug/L
X5 11/10/94 PC    rep   2  B!          conc   6582.08 ug/L
                  rep   3  B!          conc   6554.53 ug/L
89-243-11
11/10/94 12:28
    B!            av   6565.59 ug/L        sd    14.555 %cv   0.22

11/10/94 12:30
89-243-11 L       rep   1  B!          conc   1600.66 ug/L
X5 11/10/94 PC    rep   2  B!          conc   1565.54 ug/L
                  rep   3  B!          conc   1582.16 ug/L
89-243-11 L
11/10/94 12:30
    B!            av   1582.78 ug/L        sd    17.568 %cv   1.11
```

reanalyzed SJH 11-22-94

```
 1/10/94 12:32
~~CCV3~~                rep   1  B!          conc    4878.81 ug/L
                        rep   2  B!          conc    4786.99 ug/L
CCV5 11/10/94 PC        rep   3  B!          conc    4949.28 ug/L
~~CCV3~~
11/10/94 12:33
    B!                  av   4871.69 ug/L 5000  sd     81.382 %cv    1.67
                                          11/10/94 PC

11/10/94 12:34
~~CCB3~~                rep   1  B!          conc      29.56 ug/L
                        rep   2  B!          conc      15.62 ug/L
CCB5 11/10/94 PC        rep   3  B!          conc      23.75 ug/L
~~CCB3~~
 1/10/94 12:34                                IPC
    B!                  av     22.98 ug/L  50.7  sd      6.998 %cv   30.45
                                          11/10/94 PC

 1/10/94 12:36
 CSAF                   rep   1  B!          conc     452.35 ug/L
                        rep   2  B!          conc     463.67 ug/L
                        rep   3  B!          conc     456.15 ug/L
 CSAF
 1/10/94 12:36
    B!                  av    457.39 ug/L         sd      5.764 %cv    1.26

 1/10/94 12:37
~~ICSABF~~              ~~rep   1  B!          conc     613.88 ug/L~~
                        ~~rep   2  B!          conc     609.67 ug/L~~
                        ~~rep   3  B!          conc     645.87 ug/L~~
ICSABF
~~11/10/94 12:38~~                Reanalyzed 11/10/94 PC
    ~~B!~~              ~~av    623.14 ug/L         sd     19.798 %cv~~    3.18

11/10/94 12:40
 CSABF                  rep   1  B!          conc     575.83 ug/L
                        rep   2  B!          conc     583.07 ug/L
                        rep   3  B!          conc     581.33 ug/L
ICSABF
 1/10/94 12:40
    B!                  av    580.08 ug/L 500  sd      3.782 %cv    0.65
                                          11/10/94 PC
```

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30047
Cr

ethod Name: BB590

Comment:Analyst: RC

ead Delay : 30 sec Replicates : 3 Format name : Database

alysis mber	AS Posn	Sample ID	Sequence Name	Dilution	Weight / Volume
1	4	wcal standard	Cr		
2	5	blank	Cr		
3	1	#1 standard	Cr		
4	2	#2 standard	Cr		
5	3	#3 standard	Cr		
6	4	#4 standard	Cr		
7	5	blank	Cr		
8	4	CHECK HS	Cr		
9	6	ICV	Cr		
10	5	ICB	Cr		
11	53	ICSAI	Cr		
12	54	ICSABI	Cr		
13	9	30047-MB	Cr		
14	10	30047-LCS	Cr		
15	11	30047-LCSD	Cr		
16	12	89-243-1A	Cr		
17	12	89-243-1A D	Cr		
18	13	89-243-2	Cr		
19	13	89-243-2 D	Cr		
20	14	89-243-5	Cr		
21	15	89-243-5 L	Cr		
22	16	89-243-6	Cr		
23	7	CCV1	Cr		
24	8	CCB1	Cr		
25	17	89-243-6 L	Cr		
26	18	89-243-7	Cr		
27	18	89-243-7 D	Cr		
28	19	89-243-9	Cr		
29	20	89-243-9 P	Cr		
30	21	89-243-10	Cr		
31	22	89-243-10 P	Cr		
32	23	89-243-11	Cr		
33	24	89-243-11 L	Cr		
34	25	89-243-13	Cr		
35	7	CCV2	Cr		
36	8	CCB2	Cr		
37	26	89-243-13 P	Cr		
38	27	89-243-14	Cr		
39	28	89-243-15	Cr		
40	29	89-243-16	Cr		
41	7	CCV3	Cr		
42	8	CCB3	Cr		
43	53	ICSAF	Cr		
44	54	ICSABF	Cr		

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Element Name: Cr!

Wavelength		Height	Std Conc		
205.552	286.257	15	#1:	20.00	Source Name : S1
206.149	266.602	6	#2:	50.00	Mono Select : A
267.716*	286.511	8	#3:	100.00	Signal Comp : No
83.563	286.674	10	#4:	200.00	PMT Voltage : 650 Volts
84.325	357.869	12	#5:		Survey Window : 0.100 nm
206.542		14	#6:		Peak Window : 0.030 nm
276.654		16	#7:		Sampling Time : 200 msec
84.984		18	#8:		Bkgd Correction : Auto
285.568			#9:		Lower Interval: 0.000 nm
276.259			#10:		Upper Interval: 0.000 nm
					Units : ug/L

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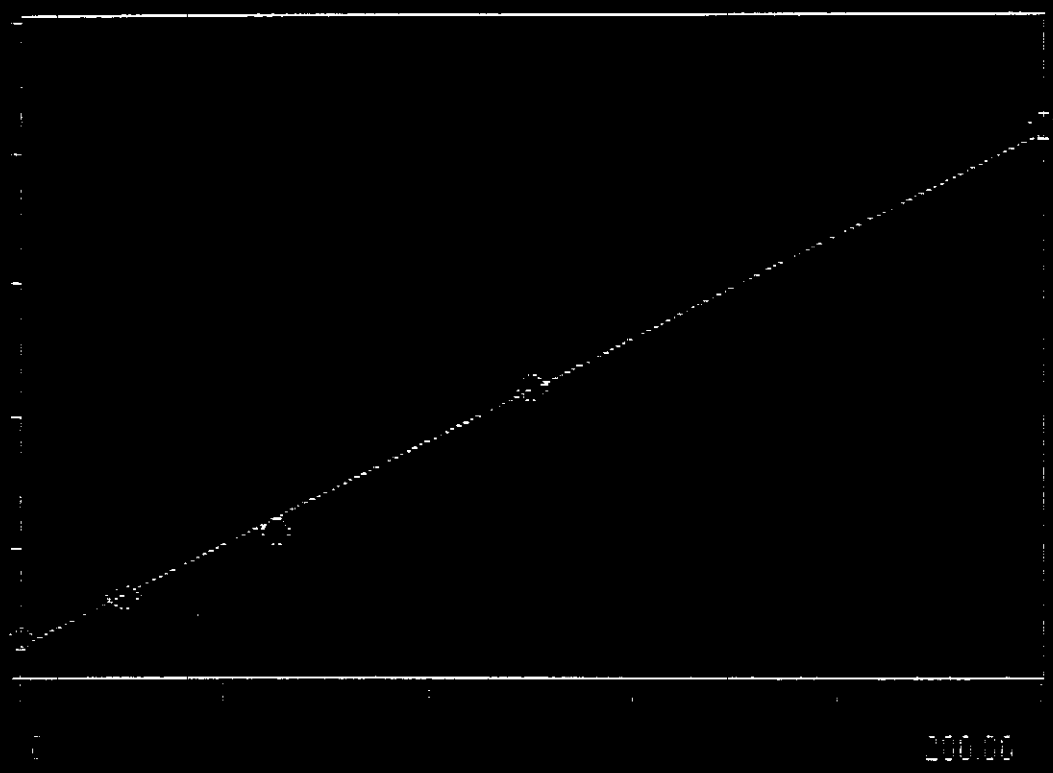
```
 1/10/94 12:44
wcal standard   rep   1  Cr!        em      1010.8 conc 20.00
                rep   2  Cr!        em      1030.4 conc 20.00
                rep   3  Cr!        em      1051.0 conc 20.00
 cal standard
11/10/94 12:44
    Cr!         av   1030.72            sd    20.098 %cv   1.95 conc   20.00

11/10/94 12:46
blank           rep   1  Cr!        em        89.6
                rep   2  Cr!        em        29.2
                rep   3  Cr!        em        98.6
blank
 1/10/94 12:46
    Cr!         av     72.47            sd    37.772 %cv  52.12

11/10/94 12:47
 1 standard     rep   1  Cr!        em       131.5 conc 20.00
                rep   2  Cr!        em       145.9 conc 20.00
                rep   3  Cr!        em       167.4 conc 20.00
 1 standard
11/10/94 12:48
    Cr!         av    148.27            sd    18.094 %cv  12.20 conc   20.00

 1/10/94 12:49
#2 standard     rep   1  Cr!        em       262.6 conc 50.00
                rep   2  Cr!        em       286.5 conc 50.00
                rep   3  Cr!        em       241.2 conc 50.00
#2 standard
11/10/94 12:50
    Cr!         av    263.44            sd    22.704 %cv   8.62 conc   50.00

11/10/94 12:51
 3 standard     rep   1  Cr!        em       559.1 conc 100.00
                rep   2  Cr!        em       455.3 conc 100.00
                rep   3  Cr!        em       538.7 conc 100.00
#3 standard
 1/10/94 12:52
    Cr!         av    517.70            sd    54.966 %cv  10.62 conc  100.00

 1/10/94 12:53
 4 standard     rep   1  Cr!        em      1021.0 conc 200.00
                rep   2  Cr!        em       893.1 conc 200.00
                rep   3  Cr!        em      1055.1 conc 200.00
 4 standard
11/10/94 12:53
    Cr!         av    989.72            sd    85.433 %cv   8.63 conc  200.00
```

DISPLAY > CALIB ELEM LIST > CALIB CURVE

11/10/94
12:55:40

Method Name: BB590 Element Name: Cr!

Algorithm	RMSD
BB590	13.5
Wtd Linear	19.9



Command?

F5	F6	F7	F8	F9	F10	F11	F12
	Standard List			Log Display		Algorthm	

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```
  /10/94 12:59
CHECK HS        rep   1  Cr!        conc    189.06 ug/L
                rep   2  Cr!        conc    217.74 ug/L
                rep   3  Cr!        conc    204.43 ug/L
CHECK HS
11/10/94 12:59
    Cr!         av    203.74 ug/L 200      sd     14.352 %cv    7.04
                                  11/10/94 RC

11/10/94 13:00
ICV             rep   1  Cr!        conc    421.27 ug/L
                rep   2  Cr!        conc    413.71 ug/L
                rep   3  Cr!        conc    418.25 ug/L
ICV
  /10/94 13:01
    Cr!         av    417.74 ug/L 400      sd      3.805 %cv    0.91
                                  11/10/94 RC

  /10/94 13:02
  B             rep   1  Cr!        conc      7.73 ug/L
                rep   2  Cr!        conc     -9.68 ug/L          window edge
                rep   3  Cr!        conc      4.36 ug/L
  B
11/10/94 13:03
    Cr!         av      0.80 ug/L IPC 8.0    sd      9.233 %cv  1148.
                                  11/10/94 RC

  /10/94 13:04
ICSAI           rep   1  Cr!        conc     10.36 ug/L
                rep   2  Cr!        conc      7.17 ug/L
                rep   3  Cr!        conc      5.79 ug/L
ICSAI
11/10/94 13:05
    Cr!         av      7.77 ug/L         sd      2.343 %cv   30.14

11/10/94 13:06
  SABI          rep   1  Cr!        conc    468.17 ug/L
                rep   2  Cr!        conc    448.37 ug/L
                rep   3  Cr!        conc    443.57 ug/L
ICSABI
  /10/94 13:06
    Cr!         av    453.37 ug/L 500      sd     13.041 %cv    2.88
                                  11/10/94 RC
```


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```
11/10/94 13:08
30047-MB        rep   1  Cr!        conc     -1.55 ug/L          window edge
                rep   2  Cr!        conc      4.51 ug/L
                rep   3  Cr!        conc      9.13 ug/L
30047-MB
11/10/94 13:08
    Cr!         av      4.03 ug/L        sd     5.356 %cv  132.9

11/10/94 13:10
30047-LCS       rep   1  Cr!        conc    166.20 ug/L
                rep   2  Cr!        conc    156.49 ug/L
                rep   3  Cr!        conc    156.95 ug/L
30047-LCS
11/10/94 13:10
    Cr!         av    159.88 ug/L        sd     5.477 %cv   3.43

11/10/94 13:11
30047-LCSD      rep   1  Cr!        conc    152.65 ug/L
                rep   2  Cr!        conc    158.03 ug/L
                rep   3  Cr!        conc    156.12 ug/L
30047-LCSD
11/10/94 13:12
    Cr!         av    155.60 ug/L        sd     2.725 %cv   1.75

11/10/94 13:13
89-243-1A       rep   1  Cr!        conc   2814.88 ug/L
                rep   2  Cr!        conc   2807.02 ug/L
                rep   3  Cr!        conc   2907.27 ug/L
89-243-1A
11/10/94 13:14
    Cr!         av   2843.06 ug/L        sd    55.751 %cv   1.96

11/10/94 13:15
89-243-1A D     rep   1  Cr!        conc   2719.92 ug/L
                rep   2  Cr!        conc   2687.47 ug/L
                rep   3  Cr!        conc   2633.55 ug/L
89-243-1A D
11/10/94 13:16
    Cr!         av   2680.31 ug/L        sd    43.625 %cv   1.63

11/10/94 13:17
89-243-2        rep   1  Cr!        conc     13.09 ug/L
                rep   2  Cr!        conc     19.84 ug/L
                rep   3  Cr!        conc     22.15 ug/L
89-243-2
11/10/94 13:18
    Cr!         av     18.36 ug/L        sd     4.710 %cv  25.65

11/10/94 13:19
89-243-2 D      rep   1  Cr!        conc     28.87 ug/L
                rep   2  Cr!        conc     25.64 ug/L
                rep   3  Cr!        conc     15.43 ug/L
89-243-2 D
11/10/94 13:20
    Cr!         av     23.31 ug/L        sd     7.018 %cv  30.10

11/10/94 13:21
89-243-5        rep   1  Cr!        conc   5814.08 ug/L
                rep   2  Cr!        conc   5386.65 ug/L
```

```
 9-243-5
11/10/94 13:22
    Cr!          av   5447.29 ug/L        sd   340.546 %cv   6.25

11/10/94 13:23
89-243-5 L       rep   1  Cr!        conc   1333.55 ug/L
                 rep   2  Cr!        conc   1244.46 ug/L
                 rep   3  Cr!        conc   1230.12 ug/L
89-243-5 L
11/10/94 13:24
    Cr!          av   1269.37 ug/L        sd    56.034 %cv   4.41

11/10/94 13:25
 9-243-6         rep   1  Cr!        conc    430.47 ug/L
                 rep   2  Cr!        conc    390.14 ug/L
                 rep   3  Cr!        conc    375.55 ug/L
 9-243-6
 /10/94 13:26
    Cr!          av    398.72 ug/L        sd    28.448 %cv   7.13

 /10/94 13:27
CCV1             rep   1  Cr!        conc   1759.98 ug/L
                 rep   2  Cr!        conc   1752.34 ug/L
                 rep   3  Cr!        conc   1697.28 ug/L
CCV1
11/10/94 13:28
    Cr!          av   1736.54 ug/L        sd    34.200 %cv   1.97

11/10/94 13:29
CCB1             rep   1  Cr!        conc      4.45 ug/L
                 rep   2  Cr!        conc     -4.16 ug/L          window edge
                 rep   3  Cr!        conc     -0.54 ug/L          window edge
CCB1
 /10/94 13:29
    Cr!          av     -0.08 ug/L        sd     4.319 %cv  5135.

11/10/94 13:32
CCV1             rep   1  Cr!        conc      3.96 ug/L
                 rep   2  Cr!        conc      4.83 ug/L
11/10/94 13:33
CCV1             rep   3  Cr!        conc     15.39 ug/L
11/10/94 13:34
CCV1             rep   1  Cr!        conc     12.97 ug/L
 /10/94 13:34
CCV1             rep   2  Cr!        conc      5.06 ug/L
```

Autosampler error - corrected and restarted @ CCV1 11/10/94 PC

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```
 1/10/94 13:36
CCV1            rep   1  Cr!        conc   2143.58 ug/L
                rep   2  Cr!        conc   2163.66 ug/L
                rep   3  Cr!        conc   2115.19 ug/L
 CV1
11/10/94 13:36
    Cr!         av   2140.81 ug/L 2000 sd    24.354 %cv   1.14
                                  11/10/94
11/10/94 13:38
CCB1            rep   1  Cr!        conc     12.24 ug/L
                rep   2  Cr!        conc      6.48 ug/L
                rep   3  Cr!        conc     -4.80 ug/L          window edge
CCB1
 1/10/94 13:38
    Cr!         av      4.64 ug/L IDL 8.0 sd     8.667 %cv  186.8
                                  11/10/94
11/10/94 13:40
 9-243-6 L      rep   1  Cr!        conc     91.46 ug/L
                rep   2  Cr!        conc     97.90 ug/L
                rep   3  Cr!        conc     82.76 ug/L
 9-243-6 L
11/10/94 13:40
    Cr!         av     90.71 ug/L        sd     7.600 %cv   8.38

 1/10/94 13:42
89-243-7        rep   1  Cr!        conc     30.35 ug/L
                rep   2  Cr!        conc     26.89 ug/L
                rep   3  Cr!        conc     34.71 ug/L
89-243-7
11/10/94 13:42
    Cr!         av     30.65 ug/L        sd     3.915 %cv  12.77

11/10/94 13:44
89-243-7 D      rep   1  Cr!        conc     31.44 ug/L
                rep   2  Cr!        conc     24.54 ug/L
                rep   3  Cr!        conc     40.07 ug/L
89-243-7 D
 1/10/94 13:44
    Cr!         av     32.02 ug/L        sd     7.783 %cv  24.31

 1/10/94 13:46
 9-243-9        rep   1  Cr!        conc  11735.49 ug/L
                rep   2  Cr!        conc  11356.65 ug/L
                rep   3  Cr!        conc  11613.60 ug/L
 9-243-9
11/10/94 13:46
    Cr!         av  11568.58 ug/L        sd   193.389 %cv   1.67

11/10/94 13:48
89-243-9 P      rep   1  Cr!        conc  10550.52 ug/L
                rep   2  Cr!        conc  11424.10 ug/L
                rep   3  Cr!        conc  10861.04 ug/L
89-243-9 P
11/10/94 13:48
    Cr!         av  10945.22 ug/L        sd   442.835 %cv   4.05

11/10/94 13:50
 9-243-10       rep   1  Cr!        conc      8.70 ug/L
                rep   2  Cr!        conc     10.23 ug/L
                rep   3  Cr!        conc      0.72 ug/L   B-52
```

```
 9-243-10
 1/10/94 13:50
    Cr!          av      6.55 ug/L          sd      5.105 %cv   77.94

 1/10/94 13:52
89-243-10 P      rep   1  Cr!          conc     126.07 ug/L
                 rep   2  Cr!          conc     122.07 ug/L
                 rep   3  Cr!          conc     105.52 ug/L
89-243-10 P
11/10/94 13:52
    Cr!          av    117.88 ug/L          sd     10.894 %cv    9.24

11/10/94 13:54
89-243-11        rep   1  Cr!          conc      27.02 ug/L
                 rep   2  Cr!          conc      14.86 ug/L
                 rep   3  Cr!          conc      23.11 ug/L
89-243-11
 1/10/94 13:55
    Cr!          av     21.66 ug/L          sd      6.209 %cv   28.66

 1/10/94 13:56
 9-243-11 L      rep   1  Cr!          conc       8.05 ug/L
                 rep   2  Cr!          conc      10.01 ug/L
                 rep   3  Cr!          conc      12.71 ug/L
 9-243-11 L
11/10/94 13:57
    Cr!          av     10.26 ug/L          sd      2.344 %cv   22.85

 1/10/94 13:58
89-243-13        rep   1  Cr!          conc      28.50 ug/L
                 rep   2  Cr!          conc      19.70 ug/L
                 rep   3  Cr!          conc      18.81 ug/L
89-243-13
11/10/94 13:59
    Cr!          av     22.33 ug/L          sd      5.360 %cv   24.00

11/10/94 14:00
 CV2             rep   1  Cr!          conc    1834.96 ug/L
                 rep   2  Cr!          conc    1799.95 ug/L
                 rep   3  Cr!          conc    1844.78 ug/L
CV2
 1/10/94 14:01
    Cr!          av   1826.57 ug/L 2000          sd     23.564 %cv    1.29
                                  11/10/94 LPC

 1/10/94 14:02
CB2              rep   1  Cr!          conc      12.79 ug/L
                 rep   2  Cr!          conc       3.86 ug/L
                 rep   3  Cr!          conc       4.72 ug/L
 CB2
11/10/94 14:03
    Cr!          av      7.13 ug/L IDL/P.O          sd      4.927 %cv   69.14
                                  11/10/94 LPC
```


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```
 1/10/94 14:05
89-243-13 P     rep   1  Cr!        conc     159.72 ug/L
                rep   2  Cr!        conc     150.69 ug/L
                rep   3  Cr!        conc     172.32 ug/L
 9-243-13 P
11/10/94 14:05
    Cr!         av    160.91 ug/L        sd     10.865 %cv    6.75

11/10/94 14:07
89-243-14       rep   1  Cr!        conc       5.85 ug/L
                rep   2  Cr!        conc       2.66 ug/L          window edge
                rep   3  Cr!        conc      11.61 ug/L
89-243-14
 1/10/94 14:08
    Cr!         av      6.70 ug/L        sd      4.535 %cv   67.65

11/10/94 14:09
 9-243-15       rep   1  Cr!        conc     112.37 ug/L
                rep   2  Cr!        conc     123.38 ug/L
                rep   3  Cr!        conc     121.68 ug/L
 9-243-15
11/10/94 14:10
    Cr!         av    119.14 ug/L        sd      5.924 %cv    4.97

 1/10/94 14:11
89-243-16       rep   1  Cr!        conc       7.00 ug/L
                rep   2  Cr!        conc       2.62 ug/L
                rep   3  Cr!        conc      11.77 ug/L
89-243-16
11/10/94 14:12
    Cr!         av      7.13 ug/L        sd      4.578 %cv   64.21

11/10/94 14:13
CCV3            rep   1  Cr!        conc    1894.87 ug/L
                rep   2  Cr!        conc    1888.11 ug/L
                rep   3  Cr!        conc    1911.90 ug/L
CCV3
 1/10/94 14:14
    Cr!         av   1898.29 ug/L 2000 sd     12.256 %cv    0.65
                                  11/10/94PC

 1/10/94 14:15
CB3             rep   1  Cr!        conc       8.06 ug/L
                rep   2  Cr!        conc      11.66 ug/L
                rep   3  Cr!        conc      13.38 ug/L
CB3
11/10/94 14:16
    Cr!         av     11.04 ug/L        sd      2.713 %cv   24.58

11/10/94 14:17
CCB3            rep   1  Cr!        conc      -5.11 ug/L          window edge
                rep   2  Cr!        conc      22.45 ug/L
                rep   3  Cr!        conc      -1.42 ug/L
CCB3
11/10/94 14:18
    Cr!         av      5.31 ug/L IDL 8.0 sd     14.959 %cv   281.7
                                  11/10/94PC

11/10/94 14:19
 CSAF           rep   1  Cr!        conc      14.58 ug/L
                rep   2  Cr!        conc      -4.56 ug/L
                rep   3  Cr!        conc       4.14 ug/L
```

Repoured CCB soln and reanalyzed 11/10/94PC

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```
 CSAF
11/10/94 14:20
    Cr!          av       4.72 ug/L          sd      9.582 %cv   203.0

11/10/94 14:21
ICSABF           rep   1  Cr!          conc     444.31 ug/L
                 rep   2  Cr!          conc     463.23 ug/L
                 rep   3  Cr!          conc     449.30 ug/L
ICSABF
11/10/94 14:21
    Cr!          av     452.28 ug/L 500          sd      9.807 %cv     2.17
```

11/10/94

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30047
MO

ethod Name: BB588

Comment:Analyst: PC

Read Delay : 30 sec Replicates : 3 Format name : Database

nalysis umber	AS Posn	Sample ID	Sequence Name	Dilution	Weight / Volume
1	4	wcal standard	Mo		
2	5	blank	Mo		
3	1	#1 standard	Mo		
4	2	#2 standard	Mo		
5	3	#3 standard	Mo		
6	4	#4 standard	Mo		
7	5	blank	Mo		
8	4	CHECK HS	Mo		
9	6	ICV	Mo		
10	5	ICB	Mo		
11	53	ICSAI	Mo		
12	54	ICSABI	Mo		
13	9	30047-MB	Mo		
14	10	30047-LCS	Mo		
15	11	30047-LCSD	Mo		
6	12	89-243-1A	Mo		
17	12	89-243-1A D	Mo		
18	13	89-243-2	Mo		
19	13	89-243-2 D	Mo		
20	14	89-243-5	Mo		
21	15	89-243-5 L	Mo		
22	16	89-243-6	Mo		
23	7	CCV1	Mo		
24	8	CCB1	Mo		
25	17	89-243-6 L	Mo		
26	18	89-243-7	Mo		
27	18	89-243-7 D	Mo		
28	19	89-243-9	Mo		
29	20	89-243-9 P	Mo		
30	21	89-243-10	Mo		
31	22	89-243-10 P	Mo		
32	23	89-243-11	Mo		
33	24	89-243-11 L	Mo		
34	25	89-243-13	Mo		
35	7	CCV2	Mo		
36	8	CCB2	Mo		
37	26	89-243-13 P	Mo		
38	27	89-243-14	Mo		
39	28	89-243-15	Mo		
40	29	89-243-16	Mo		
41	7	CCV3	Mo		
42	8	CCB3	Mo		
43	53	ICSAF	Mo		
44	54	ICSABF	Mo		

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:lement Name: Mo!

Wavelength	Height	Std Conc		
.02.030* 292.339	15	#1: 100.00	Source Name :	S1
203.844	6	#2: 250.00	Mono Select :	A
204.598	8	#3: 500.00	Signal Comp :	No
81.615	10	#4: 1000.00	PMT Voltage :	650 Volts
_01.511	12	#5:	Survey Window :	0.100 nm
284.823	14	#6:	Peak Window :	0.030 nm
77.540	16	#7:	Sampling Time :	200 msec
87.151	18	#8:	Bkgd Correction :	Auto
268.414		#9:	Lower Interval:	0.000 nm
263.876		#10:	Upper Interval:	0.000 nm
			Units :	ug/L

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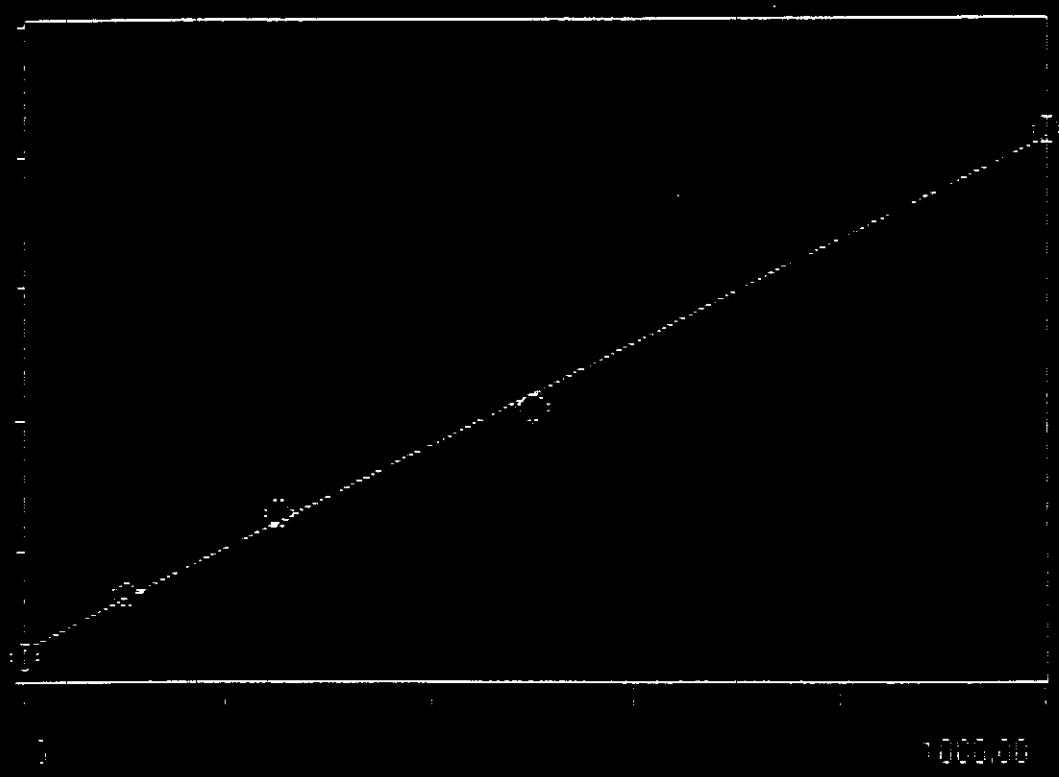
```
 1/10/94 08:31
wcal standard   rep   1  Mo!        em        476.2 conc 100.00
                rep   2  Mo!        em        463.3 conc 100.00
                rep   3  Mo!        em        515.0 conc 100.00
wcal standard
11/10/94 08:32
    Mo!         av    484.84              sd    26.909 %cv   5.55 conc  100.00

11/10/94 08:33
blank           rep   1  Mo!        em         33.8
                rep   2  Mo!        em          0.8                window edge
                rep   3  Mo!        em         35.2
blank
 1/10/94 08:33
    Mo!         av     23.27              sd    19.460 %cv  83.63

 1/10/94 08:35
 1 standard     rep   1  Mo!        em         91.3 conc 100.00
                rep   2  Mo!        em         57.8 conc 100.00
                rep   3  Mo!        em         78.6 conc 100.00
 1 standard
11/10/94 08:35
    Mo!         av     75.92              sd    16.891 %cv  22.25 conc  100.00

 1/10/94 08:36
#2 standard     rep   1  Mo!        em        152.9 conc 250.00
                rep   2  Mo!        em        162.7 conc 250.00
                rep   3  Mo!        em        124.1 conc 250.00
#2 standard
11/10/94 08:37
    Mo!         av    146.57              sd    20.093 %cv  13.71 conc  250.00

11/10/94 08:38
#3 standard     rep   1  Mo!        em        261.3 conc 500.00
                rep   2  Mo!        em        236.7 conc 500.00
                rep   3  Mo!        em        216.9 conc 500.00
#3 standard
 1/10/94 08:39
    Mo!         av    238.29              sd    22.283 %cv   9.35 conc  500.00

 1/10/94 08:40
#4 standard     rep   1  Mo!        em        477.8 conc 1000.00
                rep   2  Mo!        em        487.8 conc 1000.00
                rep   3  Mo!        em        479.1 conc 1000.00
#4 standard
11/10/94 08:40
    Mo!         av    481.56              sd     5.405 %cv   1.12 conc  1000.0
```

DISPLAY > CALIB ELEM LIST > CALIB CURVE

11/10/94
08:41:35

Method Name: BB588 Element Name: Mo!

Algorithm	RMSD
	7.6
Wtd Linear	7.9



Command?

F5	F6	F7	F8	F9	F10	F11	F12
	Standard List			Log Display		Algorthm	

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```
 1/10/94 08:44
CHECK HS        rep   1  Mo!        conc   1043.77 ug/L
                rep   2  Mo!        conc   1080.90 ug/L
                rep   3  Mo!        conc   1038.66 ug/L
CHECK HS
11/10/94 08:45
    Mo!         av   1054.44 ug/L 1000  sd    23.053 %cv   2.19
                                 11/10/94 pc

11/10/94 08:46
ICV             rep   1  Mo!        conc    407.42 ug/L
                rep   2  Mo!        conc    427.00 ug/L
                rep   3  Mo!        conc    374.58 ug/L
ICV
 1/10/94 08:47
    Mo!         av    403.00 ug/L 400   sd    26.489 %cv   6.57
                                 11/10/94 pc

 1/10/94 08:48
 CB             rep   1  Mo!        conc     65.67 ug/L
                rep   2  Mo!        conc     66.42 ug/L
                rep   3  Mo!        conc     68.15 ug/L
 CB
11/10/94 08:48                 Reported ICB soln & Reanalyzed 11/10/94 pc
    Mo!         av     66.75 ug/L        sd     1.270 %cv   1.90

 1/10/94 08:50
ICB             rep   1  Mo!        conc     43.04 ug/L
                rep   2  Mo!        conc     28.41 ug/L
                rep   3  Mo!        conc    -28.53 ug/L
ICB
11/10/94 08:51                 IPL
    Mo!         av     14.31 ug/L 49   sd    37.810 %cv  264.2
                                 11/10/94 pc

11/10/94 08:52
 CSAI           rep   1  Mo!        conc   -109.59 ug/L          window edge
                rep   2  Mo!        conc     32.06 ug/L
                rep   3  Mo!        conc      2.65 ug/L
ICSAI
 1/10/94 08:52
    Mo!         av    -24.96 ug/L        sd    74.752 %cv  299.5

 1/10/94 08:54
 CSABI          rep   1  Mo!        conc     79.19 ug/L
                rep   2  Mo!        conc     35.38 ug/L
                rep   3  Mo!        conc    -53.42 ug/L          window edge
 CSABI
11/10/94 08:54
    Mo!         av     20.38 ug/L        sd    67.569 %cv  331.5

11/10/94 08:55
30047-MB        rep   1  Mo!        conc    104.73 ug/L
                rep   2  Mo!        conc      7.89 ug/L
 1/10/94 08:56
30047-MB        rep   3  Mo!        conc     88.91 ug/L
```

auto sampler probe
error - restarted @ ICSABI
11/10/94 pc

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```
 1/10/94 08:57
ICSABI          rep   1  Mo!        conc    828.88 ug/L
                rep   2  Mo!        conc    745.01 ug/L
                rep   3  Mo!        conc    901.89 ug/L
ICSABI
11/10/94 08:58
    Mo!         av    825.26 ug/L        sd    78.501 %cv   9.51

11/10/94 08:59
^0047-MB        rep   1  Mo!        conc     -6.52 ug/L
                rep   2  Mo!        conc    -13.78 ug/L          window edge
                rep   3  Mo!        conc     74.82 ug/L
30047-MB
 1/10/94 09:00
    Mo!         av     18.17 ug/L        sd    49.192 %cv  270.7

 1/10/94 09:01
 0047-LCS       rep   1  Mo!        conc     67.73 ug/L
                rep   2  Mo!        conc      3.22 ug/L
11/10/94 09:02
 0047-LCS       rep   3  Mo!        conc    -43.75 ug/L          window edge
11/10/94 09:03
30047-LCS       rep   1  Mo!        conc   1063.12 ug/L
                rep   2  Mo!        conc    972.37 ug/L
                rep   3  Mo!        conc    954.10 ug/L
30047-LCS
 1/10/94 09:04
    Mo!         av    996.53 ug/L        sd    58.384 %cv   5.86

11/10/94 09:05
 0047-LCSD      rep   1  Mo!        conc     52.58 ug/L
11/10/94 09:05
30047-LCSD      rep   2  Mo!        conc    -38.58 ug/L          window edge
 1/10/94 09:05
 0047-LCSD      rep   3  Mo!        conc     18.76 ug/L
```

autosampler error 11/10/94 [illegible]

autosampler error 11/10/94 [illegible]

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```
 1/10/94 09:07
30047-LCSD      rep   1  Mo!        conc     934.23 ug/L
                rep   2  Mo!        conc     949.41 ug/L
                rep   3  Mo!        conc    1042.98 ug/L
30047-LCSD
11/10/94 09:07
    Mo!         av    975.54 ug/L        sd     58.896 %cv    6.04

11/10/94 09:09
 9-243-1A       rep   1  Mo!        conc    4184.20 ug/L
                rep   2  Mo!        conc    4045.63 ug/L
                rep   3  Mo!        conc    4490.19 ug/L
89-243-1A
 1/10/94 09:09
    Mo!         av   4240.01 ug/L        sd    227.475 %cv    5.36

 1/10/94 09:11
 9-243-1A D     rep   1  Mo!        conc    4169.70 ug/L
                rep   2  Mo!        conc    4016.80 ug/L
                rep   3  Mo!        conc    4059.93 ug/L
 9-243-1A D
11/10/94 09:11
    Mo!         av   4082.14 ug/L        sd     78.833 %cv    1.93

11/10/94 09:13
89-243-2        rep   1  Mo!        conc      10.23 ug/L
                rep   2  Mo!        conc      55.14 ug/L
                rep   3  Mo!        conc     106.02 ug/L
89-243-2
11/10/94 09:13
    Mo!         av     57.13 ug/L        sd     47.926 %cv   83.88

11/10/94 09:15
 9-243-2        rep   1  Mo!        conc     134.09 ug/L
                rep   2  Mo!        conc      79.07 ug/L
                rep   3  Mo!        conc      10.56 ug/L
 9-243-2
 1/10/94 09:15
    Mo!         av     74.58 ug/L        sd     61.886 %cv   82.98

 1/10/94 09:17
 9-243-2 D      rep   1  Mo!        conc     -75.01 ug/L          window edge
                rep   2  Mo!        conc      66.39 ug/L
                rep   3  Mo!        conc     -10.15 ug/L          window edge
 9-243-2 D
11/10/94 09:17
    Mo!         av     -6.26 ug/L        sd     70.782 %cv 1130.

11/10/94 09:20
89-243-2 D      rep   1  Mo!        conc      50.47 ug/L
                rep   2  Mo!        conc      -2.22 ug/L
                rep   3  Mo!        conc      71.06 ug/L
89-243-2 D
 1/10/94 09:20
    Mo!         av     39.77 ug/L        sd     37.794 %cv   95.04

11/10/94 09:22
 9-243-5        rep   1  Mo!        conc    9964.78 ug/L
                rep   2  Mo!        conc    9611.79 ug/L
```

NA 11/10/94

NA 11/10/94

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```
:9-243-5
11/10/94 09:22
    Mo!          av   9459.86 ug/L          sd   595.592 %cv   6.30

11/10/94 09:24
89-243-5 L       rep   1  Mo!          conc   1739.91 ug/L
                 rep   2  Mo!          conc   1853.78 ug/L
                 rep   3  Mo!          conc   1733.92 ug/L
89-243-5 L
11/10/94 09:24
    Mo!          av   1775.87 ug/L          sd    67.540 %cv   3.80

11/10/94 09:25
 9-243-6         rep   1  Mo!          conc     17.34 ug/L
                 rep   2  Mo!          conc     55.29 ug/L
                 rep   3  Mo!          conc     28.33 ug/L
9-243-6
 1/10/94 09:26
    Mo!          av     33.65 ug/L          sd    19.529 %cv  58.03

 1/10/94 09:27
CCV1             rep   1  Mo!          conc   1712.47 ug/L
                 rep   2  Mo!          conc   1653.48 ug/L
                 rep   3  Mo!          conc   1817.69 ug/L
CCV1
11/10/94 09:28
    Mo!          av   1727.88 ug/L          sd    83.180 %cv   4.81

11/10/94 09:29
CCB1             rep   1  Mo!          conc     -3.00 ug/L          window edge
                 rep   2  Mo!          conc      1.33 ug/L          window edge
                 rep   3  Mo!          conc     84.29 ug/L
CCB1
 1/10/94 09:30
    Mo!          av     27.54 ug/L          sd    49.196 %cv  178.6

11/10/94 09:31
89-243-6 L       rep   1  Mo!          conc     31.56 ug/L
                 rep   2  Mo!          conc     41.09 ug/L
                 rep   3  Mo!          conc     17.19 ug/L
89-243-6 L
 1/10/94 09:32
    Mo!          av     29.94 ug/L          sd    12.030 %cv  40.17
```

purged nebulizer and reanalyzed CCV/CCB 11/10/94

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```
 1/10/94 09:48
CCV1            rep   1  Mo!        conc   1892.35 ug/L
                rep   2  Mo!        conc   2013.89 ug/L
                rep   3  Mo!        conc   1807.20 ug/L
CCV1
11/10/94 09:48
   Mo!          av   1904.48 ug/L 2000   sd   103.881 %cv   5.45
                                 11/10/94QC

11/10/94 09:50
CCB1            rep   1  Mo!        conc     51.41 ug/L
                rep   2  Mo!        conc     40.56 ug/L
                rep   3  Mo!        conc    -24.38 ug/L          window edge
CCB1
 1/10/94 09:50                      DX
   Mo!          av     22.53 ug/L  49    sd    40.982 %cv  181.9
                                   11/10/94QC

11/10/94 09:51
 9-243-6 L      rep   1  Mo!        conc     47.22 ug/L
                rep   2  Mo!        conc     76.20 ug/L
                rep   3  Mo!        conc    -83.06 ug/L          window edge
 9-243-6 L
11/10/94 09:52
   Mo!          av     13.46 ug/L        sd    84.830 %cv  630.4

 1/10/94 09:53
89-243-7        rep   1  Mo!        conc    -31.08 ug/L          window edge
                rep   2  Mo!        conc     17.58 ug/L          window edge
                rep   3  Mo!        conc    119.31 ug/L
89-243-7
11/10/94 09:54
   Mo!          av     35.27 ug/L        sd    76.742 %cv  217.5

11/10/94 09:55
89-243-7 D      rep   1  Mo!        conc    130.78 ug/L
                rep   2  Mo!        conc     61.49 ug/L
                rep   3  Mo!        conc    120.40 ug/L
89-243-7 D
 1/10/94 09:56
   Mo!          av    104.22 ug/L        sd    37.368 %cv  35.85

 1/10/94 09:58
 9-243-9        rep   1  Mo!        conc  19290.56 ug/L
                rep   2  Mo!        conc  19419.07 ug/L
                rep   3  Mo!        conc  18623.60 ug/L
 9-243-9
11/10/94 09:58
   Mo!          av  19111.08 ug/L        sd   427.026 %cv   2.23

11/10/94 10:00
89-243-9 P      rep   1  Mo!        conc  18911.00 ug/L
                rep   2  Mo!        conc  17250.16 ug/L
                rep   3  Mo!        conc  17404.01 ug/L
89-243-9 P
11/10/94 10:00
   Mo!          av  17855.05 ug/L        sd   917.701 %cv   5.14

11/10/94 10:02                                                      68
 9-243-10       rep   1  Mo!        conc      5.54 ug/L
                rep   2  Mo!        conc     84.49 ug/L
                rep   3  Mo!        conc     20.76 ug/L
```

```
89-243-10
11/10/94 10:02
    Mo!         av      40.26 ug/L          sd     40.324 %cv   100.1

11/10/94 10:04
89-243-10 P     rep   1  Mo!         conc     861.49 ug/L
                rep   2  Mo!         conc     946.89 ug/L
                rep   3  Mo!         conc     846.79 ug/L
89-243-10 P
11/10/94 10:04
    Mo!         av     885.06 ug/L          sd     54.051 %cv    6.11

11/10/94 10:06
89-243-11       rep   1  Mo!         conc     111.98 ug/L
                rep   2  Mo!         conc      92.35 ug/L
                rep   3  Mo!         conc      80.68 ug/L
89-243-11
11/10/94 10:06
    Mo!         av      95.00 ug/L          sd     15.815 %cv   16.65

11/10/94 10:08
89-243-11 L     rep   1  Mo!         conc      71.23 ug/L
                rep   2  Mo!         conc      93.54 ug/L
                rep   3  Mo!         conc      34.24 ug/L
89-243-11 L
11/10/94 10:08
    Mo!         av      66.33 ug/L          sd     29.952 %cv   45.15

11/10/94 10:10
89-243-13       rep   1  Mo!         conc     125.25 ug/L
                rep   2  Mo!         conc      89.74 ug/L
                rep   3  Mo!         conc      43.41 ug/L
89-243-13
11/10/94 10:11
    Mo!         av      86.13 ug/L          sd     41.038 %cv   47.64

11/10/94 10:12
CCV2            rep   1  Mo!         conc    2023.33 ug/L
                rep   2  Mo!         conc    2168.23 ug/L
                rep   3  Mo!         conc    2088.68 ug/L
CCV2
11/10/94 10:13
    Mo!         av    2093.41 ug/L 2000     sd     72.568 %cv    3.47
                                   11/10/94
```

```
 1/10/94 10:14
CCB2            rep   1  Mo!        conc     -2.86 ug/L
                rep   2  Mo!        conc     40.91 ug/L
                rep   3  Mo!        conc     -2.96 ug/L          window edge
 CB2
11/10/94 10:14
    Mo!         av     11.69 ug/L  DOL 49   sd    25.299 %cv  216.3
                                   11/10/94PC
11/10/94 10:16
89-243-13 P     rep   1  Mo!        conc   1008.03 ug/L
                rep   2  Mo!        conc    976.61 ug/L
                rep   3  Mo!        conc    996.51 ug/L
89-243-13 P
 1/10/94 10:16
    Mo!         av    993.72 ug/L        sd    15.895 %cv   1.60

 1/10/94 10:18
 9-243-14       rep   1  Mo!        conc    198.00 ug/L
                rep   2  Mo!        conc    216.11 ug/L
                rep   3  Mo!        conc     99.13 ug/L
 9-243-14
 1/10/94 10:19
    Mo!         av    171.08 ug/L        sd    62.965 %cv  36.80

 1/10/94 10:20
89-243-15       rep   1  Mo!        conc    153.68 ug/L
                rep   2  Mo!        conc    145.75 ug/L
                rep   3  Mo!        conc     87.94 ug/L
89-243-15
11/10/94 10:21
    Mo!         av    129.12 ug/L        sd    35.883 %cv  27.79

11/10/94 10:22
 9-243-16       rep   1  Mo!        conc     95.64 ug/L
                rep   2  Mo!        conc      8.89 ug/L
                rep   3  Mo!        conc      4.86 ug/L
89-243-16
 1/10/94 10:23
    Mo!         av     36.46 ug/L        sd    51.286 %cv  140.6

 1/10/94 10:24
 CV3            rep   1  Mo!        conc   2102.02 ug/L
                rep   2  Mo!        conc   2135.33 ug/L
                rep   3  Mo!        conc   1998.94 ug/L
 CV3
11/10/94 10:25
    Mo!         av   2078.76 ug/L 2000  sd    71.109 %cv   3.42
                                   11/10/94PC
 1/10/94 10:26
CCB3            rep   1  Mo!        conc    -36.08 ug/L
                rep   2  Mo!        conc   -115.70 ug/L          window edge
                rep   3  Mo!        conc     60.16 ug/L
CCB3
11/10/94 10:27
    Mo!         av    -30.54 ug/L  DOL 49   sd    88.061 %cv  288.3
                                   11/10/94PC
11/10/94 10:28
 CSAF           rep   1  Mo!        conc     49.46 ug/L
                rep   2  Mo!        conc     65.55 ug/L
                rep   3  Mo!        conc     -1.43 ug/L
```

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```
 CSAF
11/10/94 10:28
    Mo!          av      37.86 ug/L          sd     34.965 %cv   92.36

 1/10/94 10:30
ICSABF           rep   1  Mo!          conc     902.37 ug/L
                 rep   2  Mo!          conc     960.82 ug/L
                 rep   3  Mo!          conc     852.20 ug/L
ICSABF
11/10/94 10:30
    Mo!          av     905.13 ug/L 1000  sd     54.366 %cv    6.01
                                   11/10/94
```


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30047
Sr

ethod Name: BB591

Comment:Analyst: RC

..ead Delay : 30 sec Replicates : 3 Format name : Database

nalysis umber	AS Posn	Sample ID	Sequence Name	Dilution	Weight / Volume
1	4	wcal standard	Sr		
2	5	blank	Sr		
3	1	#1 standard	Sr		
4	2	#2 standard	Sr		
5	3	#3 standard	Sr		
6	4	#4 standard	Sr		
7	5	blank	Sr		
8	4	CHECK HS	Sr	IDL = 2.4	
9	6	ICV	Sr		
10	5	ICB	Sr	ICV = 250	
11	53	ICSAI	Sr		
12	54	ICSABI	Sr	CCV = 2000	
13	9	30047-MB	Sr		
14	10	30047-LCS	Sr	AB = 1000	
15	11	30047-LCSD	Sr		
16	12	89-243-1A	Sr		
17	12	89-243-1A D	Sr		
18	13	89-243-2	Sr		
19	13	89-243-2 D	Sr		
20	14	89-243-5	Sr		
21	15	89-243-5 L	Sr		
22	16	89-243-6	Sr		
23	7	CCV1	Sr		
24	8	CCB1	Sr		
25	17	89-243-6 L	Sr		
26	18	89-243-7	Sr		
27	18	89-243-7 D	Sr		
28	19	89-243-9	Sr		
29	20	89-243-9 P	Sr		
30	21	89-243-10	Sr		
31	22	89-243-10 P	Sr		
32	23	89-243-11	Sr		
33	24	89-243-11 L	Sr		
34	25	89-243-13	Sr		
35	7	CCV2	Sr		
36	8	CCB2	Sr		
37	26	89-243-13 P	Sr		
38	27	89-243-14	Sr		
39	28	89-243-15	Sr		
40	29	89-243-16	Sr		
41	7	CCV3	Sr		
42	8	CCB3	Sr		
43	53	ICSAF	Sr		
44	54	ICSABF	Sr		

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lement Name: Sr!

Wavelength	Height	Std Conc		
07.771	15	#1:	50.00	
21.552*	6	#2:	100.00	
216.596	8	#3:	500.00	
15.284	10	#4:	1000.00	
	12	#5:		
	14	#6:		
	16	#7:		
	18	#8:		
		#9:		
		#10:		

Source Name :	S1
Mono Select :	Auto
Signal Comp :	No
PMT Voltage :	600 Volts
Survey Window :	0.100 nm
Peak Window :	0.100 nm
Sampling Time :	100 msec
Bkgd Correction :	Auto
Lower Interval:	0.000 nm
Upper Interval:	0.000 nm
Units :	

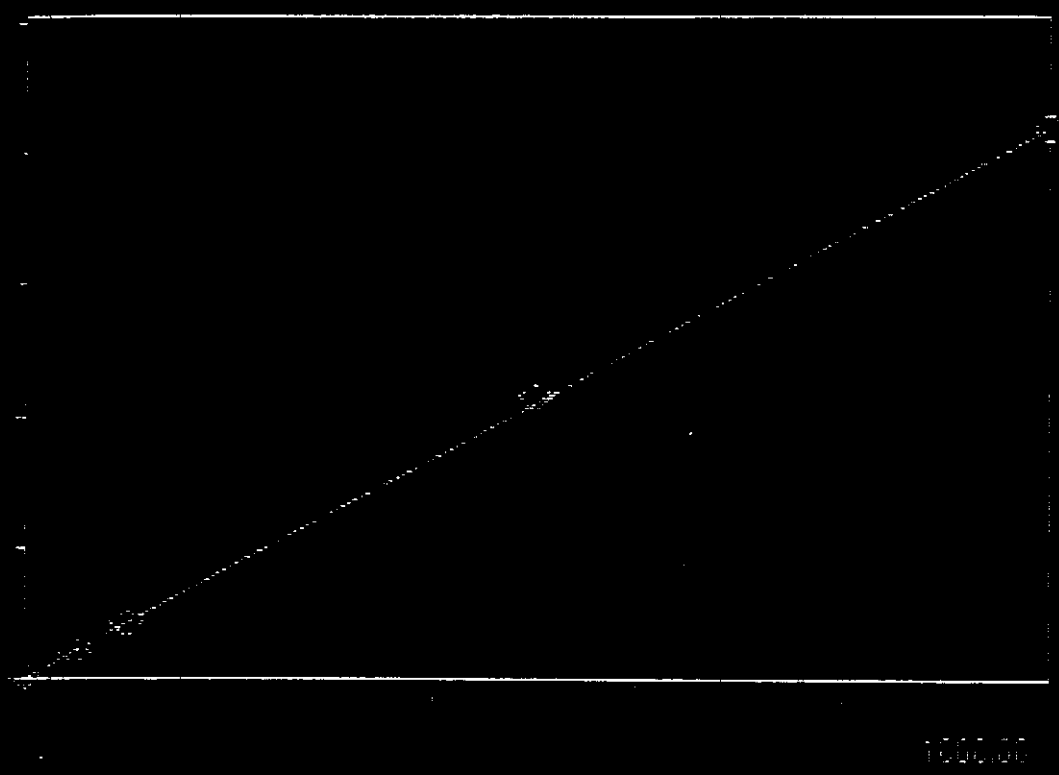
```
11/11/94 07:35
 cal standard   rep   1  Sr!        em    138607.8 conc 50.00
                rep   2  Sr!        em    143791.0 conc 50.00
                rep   3  Sr!        em    140904.4 conc 50.00
wcal standard
 1/11/94 07:36
    Sr!         av  141101.0             sd  2597.215 %cv   1.84 conc   50.00

 1/11/94 07:37
 lank           rep   1  Sr!        em       244.8
                rep   2  Sr!        em        94.3                 window edge
                rep   3  Sr!        em       185.4
 lank
11/11/94 07:37
    Sr!         av    174.83             sd    75.799 %cv  43.36

 1/11/94 07:38
#1 standard     rep   1  Sr!        em      6518.1 conc 50.00
                rep   2  Sr!        em      6266.7 conc 50.00
                rep   3  Sr!        em      6586.6 conc 50.00
#1 standard
11/11/94 07:39
    Sr!         av   6457.15             sd   168.426 %cv   2.61 conc   50.00

11/11/94 07:40
 2 standard     rep   1  Sr!        em     13624.6 conc 100.00
                rep   2  Sr!        em     13232.4 conc 100.00
                rep   3  Sr!        em     13442.2 conc 100.00
 2 standard
 1/11/94 07:40
    Sr!         av  13433.09             sd   196.254 %cv   1.46 conc  100.00

 1/11/94 07:41
 3 standard     rep   1  Sr!        em     66862.6 conc 500.00
                rep   2  Sr!        em     67488.7 conc 500.00
                rep   3  Sr!        em     66750.7 conc 500.00
 3 standard
11/11/94 07:42
    Sr!         av  67034.01             sd   397.739 %cv   0.59 conc  500.00

11/11/94 07:43
#4 standard     rep   1  Sr!        em    131545.6 conc 1000.00
                rep   2  Sr!        em    128648.0 conc 1000.00
                rep   3  Sr!        em    134383.0 conc 1000.00
#4 standard
 1/11/94 07:43
    Sr!         av  131525.5             sd  2867.568 %cv   2.18 conc  1000.0

11/11/94 07:44
 lank           rep   1  Sr!        em        40.4                 window edge
                rep   2  Sr!        em       196.6
                rep   3  Sr!        em        88.3                 window edge
 lank
 1/11/94 07:44
    Sr!         av    108.44             sd    80.057 %cv  73.83
```

ISPLAY > CALIB ELEM LIST > CALIB CURVE

11/11/94
07:45:24

ethod Name: BB591 Element Name: Sr!

Algorithm	RMSD
	492.9
Wtd Linear	933.7



Command?

F5	F6	F7	F8	F9	F10	F11	F12
	Standard List			Log Display		Algorthm	

```
11/11/94 07:48
CHECK HS        rep   1  Sr!        conc    951.80
                rep   2  Sr!        conc    957.73
                rep   3  Sr!        conc    953.83
CHECK HS
 1/11/94 07:48
    Sr!         av    954.45  1000  sd      3.012 %cv   0.32
                              11/11/94 pc

 1/11/94 07:49
 CV             rep   1  Sr!        conc    249.12
                rep   2  Sr!        conc    256.23
                rep   3  Sr!        conc    253.04
 CV
11/11/94 07:50
    Sr!         av    252.80  250   sd      3.561 %cv   1.41
                              11/11/94 pc

11/11/94 07:51
ICB             rep   1  Sr!        conc      1.16
                rep   2  Sr!        conc     -0.81
                rep   3  Sr!        conc     -2.43                window edge
ICB
11/11/94 07:51
    Sr!         av     -0.69  DDL  sd      1.798 %cv  259.7
                              2.4 11/11/94 pc

11/11/94 07:52
 CSAI           rep   1  Sr!        conc      1.69
                rep   2  Sr!        conc      1.76
                rep   3  Sr!        conc      1.83
 CSAI
 1/11/94 07:53
    Sr!         av      1.76            sd      0.071 %cv   4.05

 1/11/94 07:54
ICSABI          rep   1  Sr!        conc    932.20
                rep   2  Sr!        conc    871.43
                rep   3  Sr!        conc    953.46
 CSABI
11/11/94 07:54
    Sr!         av    919.03  1000  sd     42.573 %cv   4.63
                              11/11/94 pc
```

```
11/11/94 07:55
30047-MB        rep   1  Sr!        conc     -1.18                window edge
                rep   2  Sr!        conc     -0.52                window edge
                rep   3  Sr!        conc     -0.50
30047-MB
 1/11/94 07:56
    Sr!         av     -0.74             sd      0.387 %cv   52.63

 1/11/94 07:57
 0047-LCS       rep   1  Sr!        conc    453.82
                rep   2  Sr!        conc    445.33
                rep   3  Sr!        conc    462.03
 0047-LCS
 1/11/94 07:57
    Sr!         av    453.73             sd      8.353 %cv    1.84

 1/11/94 07:58
30047-LCSD      rep   1  Sr!        conc    455.59
                rep   2  Sr!        conc    450.00
                rep   3  Sr!        conc    466.03
30047-LCSD
11/11/94 07:59
    Sr!         av    457.20             sd      8.134 %cv    1.78

11/11/94 08:00
9-243-1A        rep   1  Sr!        conc   1261.88
                rep   2  Sr!        conc   1193.32
                rep   3  Sr!        conc   1200.02
89-243-1A
 1/11/94 08:00
    Sr!         av   1218.40             sd     37.797 %cv    3.10

 1/11/94 08:02
 9-243-1A D     rep   1  Sr!        conc   1320.19
                rep   2  Sr!        conc   1266.76
                rep   3  Sr!        conc   1349.77
 9-243-1A D
11/11/94 08:02
    Sr!         av   1312.24             sd     42.069 %cv    3.21

11/11/94 08:03
89-243-2        rep   1  Sr!        conc     -0.19
                rep   2  Sr!        conc      0.64
                rep   3  Sr!        conc     -0.82                window edge
89-243-2
 1/11/94 08:04
    Sr!         av     -0.12             sd      0.731 %cv   589.6

11/11/94 08:05
 9-243-2 D      rep   1  Sr!        conc      0.09
                rep   2  Sr!        conc     -0.90
                rep   3  Sr!        conc     -0.17
9-243-2 D
 1/11/94 08:05
    Sr!         av     -0.33             sd      0.513 %cv   155.9
```

```
11/11/94 08:06
89-243-5        rep   1  Sr!        conc   2616.49
                rep   2  Sr!        conc   2688.81
                rep   3  Sr!        conc   2586.28
89-243-5
 1/11/94 08:07
    Sr!         av   2630.53             sd     52.688 %cv   2.00

 1/11/94 08:08
 9-243-5 L      rep   1  Sr!        conc    481.58
                rep   2  Sr!        conc    492.61
                rep   3  Sr!        conc    438.13
 9-243-5 L
 1/11/94 08:08
    Sr!         av    470.77             sd     28.805 %cv   6.12

 1/11/94 08:10
89-243-6        rep   1  Sr!        conc      2.52
                rep   2  Sr!        conc      4.84
                rep   3  Sr!        conc      4.10
89-243-6
11/11/94 08:10
    Sr!         av      3.82             sd      1.183 %cv  30.96

11/11/94 08:11
CCV1            rep   1  Sr!        conc   1982.74
                rep   2  Sr!        conc   1916.20
                rep   3  Sr!        conc   1953.58
CCV1
 1/11/94 08:12
    Sr!         av   1950.84 2000        sd     33.356 %cv   1.71
                             11/11/94pc
 1/11/94 08:13
CB1             rep   1  Sr!        conc     -0.71
                rep   2  Sr!        conc     -0.66
                rep   3  Sr!        conc     -0.46                window edge
CB1
11/11/94 08:13
    Sr!         av     -0.61 DOL/2.4      sd      0.132 %cv  21.69
                             11/11/94pc
 1/11/94 08:14
89-243-6 L      rep   1  Sr!        conc      0.09                window edge
                rep   2  Sr!        conc      0.03
                rep   3  Sr!        conc     -0.22
89-243-6 L
11/11/94 08:15
    Sr!         av     -0.03             sd      0.168 %cv  510.6

11/11/94 08:16
 9-243-7        rep   1  Sr!        conc     22.21
                rep   2  Sr!        conc     21.82
                rep   3  Sr!        conc     20.75
 9-243-7
 1/11/94 08:16
    Sr!         av     21.60             sd      0.754 %cv   3.49

 1/11/94 08:18
 9-243-7 D      rep   1  Sr!        conc     21.51
                rep   2  Sr!        conc     22.55
                rep   3  Sr!        conc     23.16
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89-243-7 D
11/11/94 08:18
    Sr!          av      22.41              sd      0.837 %cv    3.74

11/11/94 08:19
 9-243-9         rep   1  Sr!         conc   7265.67
                 rep   2  Sr!         conc   7120.28
                 rep   3  Sr!         conc   7153.59
89-243-9
 1/11/94 08:20
    Sr!          av    7179.85              sd     76.165 %cv    1.06

 1/11/94 08:21
 9-243-9 P       rep   1  Sr!         conc   7293.83
                 rep   2  Sr!         conc   7299.45
                 rep   3  Sr!         conc   7109.91
 9-243-9 P
11/11/94 08:22
    Sr!          av    7234.40              sd    107.847 %cv    1.49

11/11/94 08:23
89-243-10        rep   1  Sr!         conc      4.60
                 rep   2  Sr!         conc      5.13
                 rep   3  Sr!         conc      3.83
89-243-10
11/11/94 08:23
    Sr!          av       4.52              sd      0.654 %cv   14.47

11/11/94 08:25
 9-243-10 P      rep   1  Sr!         conc    346.80
                 rep   2  Sr!         conc    352.06
                 rep   3  Sr!         conc    359.94
 9-243-10 P
 1/11/94 08:25
    Sr!          av     352.93              sd      6.615 %cv    1.87

 1/11/94 08:26
89-243-11        rep   1  Sr!         conc     14.76
                 rep   2  Sr!         conc     16.77
                 rep   3  Sr!         conc     14.87
 9-243-11
11/11/94 08:27
    Sr!          av      15.47              sd      1.130 %cv    7.30

11/11/94 08:28
89-243-11 L      rep   1  Sr!         conc      2.97
                 rep   2  Sr!         conc      2.96
                 rep   3  Sr!         conc      2.82
89-243-11 L
 1/11/94 08:29
    Sr!          av       2.92              sd      0.085 %cv    2.90

11/11/94 08:30
 9-243-13        rep   1  Sr!         conc     15.57
                 rep   2  Sr!         conc     15.81
                 rep   3  Sr!         conc     14.72
 9-243-13
 1/11/94 08:30
    Sr!          av      15.37              sd      0.573 %cv    3.73
```


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```
11/11/94 08:32
CCV2            rep   1  Sr!        conc   2031.51
                rep   2  Sr!        conc   2031.55
                rep   3  Sr!        conc   2021.03
CCV2
 1/11/94 08:32
    Sr!         av   2028.03 2000 11/11/94 PC   sd     6.061 %cv   0.30

11/11/94 08:33
 CB2            rep   1  Sr!        conc      0.15
                rep   2  Sr!        conc     -1.19
                rep   3  Sr!        conc     -0.19
 CB2
 1/11/94 08:34
    Sr!         av     -0.41 IDL 2.4 11/11/94 PC   sd     0.695 %cv  169.2

 1/11/94 08:35
89-243-13 P     rep   1  Sr!        conc    386.39
                rep   2  Sr!        conc    402.27
                rep   3  Sr!        conc    395.02
89-243-13 P
11/11/94 08:35
    Sr!         av    394.56              sd     7.948 %cv   2.01

11/11/94 08:37
 9-243-14       rep   1  Sr!        conc     10.98
                rep   2  Sr!        conc     11.87
                rep   3  Sr!        conc     11.53
89-243-14
 1/11/94 08:37
    Sr!         av     11.46              sd     0.452 %cv   3.94

 1/11/94 08:38
 9-243-15       rep   1  Sr!        conc     97.49
                rep   2  Sr!        conc     98.77
                rep   3  Sr!        conc     94.16
 9-243-15
11/11/94 08:39
    Sr!         av     96.80              sd     2.380 %cv   2.46

 1/11/94 08:40
89-243-16       rep   1  Sr!        conc      0.01
                rep   2  Sr!        conc     -0.49
                rep   3  Sr!        conc     -0.47                window edge
89-243-16
11/11/94 08:41
    Sr!         av     -0.32              sd     0.282 %cv  89.55

11/11/94 08:42
 CV3            rep   1  Sr!        conc   2094.04
                rep   2  Sr!        conc   2088.95
                rep   3  Sr!        conc   2170.74
CCV3
 1/11/94 08:42
    Sr!         av   2117.91 2000 11/11/94 PC   sd    45.825 %cv   2.16

 1/11/94 08:44
 CB3            rep   1  Sr!        conc      0.51
                rep   2  Sr!        conc     -1.14                window edge
                rep   3  Sr!        conc     -1.70                window edge
```

```
CB3
11/11/94 08:44
    Sr!          av      -0.78  IPL 2.4 11/11/94 pc      sd      1.151 %cv   147.9

11/11/94 08:45
 CSAF            rep   1  Sr!          conc       1.46
                 rep   2  Sr!          conc       1.81
                 rep   3  Sr!          conc       1.81
 CSAF
 1/11/94 08:45
    Sr!          av       1.69                  sd      0.205 %cv   12.10

 1/11/94 08:46
 CSABF           rep   1  Sr!          conc     831.55
                 rep   2  Sr!          conc     868.75
                 rep   3  Sr!          conc     858.80
 CSABF
11/11/94 08:47
    Sr!          av     853.03  1060 11/11/94 pc      sd     19.258 %cv    2.26
```

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30047
Na 11/4/94

ID/Weight File: AA902.IDW
Sample Volume: 100 mL

Analyst: D HOLSTE
Nominal Weight: 1.0 g

Loc.	Sample ID	Weight	Dilution
1	ICV=110		
2	ICB		
3	30047-MB		
4	30047-LCS		
5	30047-LCSD		
6	89-243-1A-X1000		
7	89-243-1ADX1000		
8	89-243-2-X50		
9	89-243-2 D-X50		
10	89-243-5-X1000		
11	89-243-6-X50		
12	CCV=1500		
13	CCB		
14	89-243-7-X1000		
15	89-243-7DX1000		
16	89-243-9-1000		
17	89-243-10-X50		
18	89-243-11-X1000		
19	89-243-13-X50		
20	89-243-14-X50		
21	89-243-15-X1000		
22	89-243-16-X50		
23	CCV=1500		
24	CCB		

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```
-----------------------------------------------------------------------------
Element File: NA_.FEL        Element: Na                  Wavelength: 589.0
Date: 11/11/94               Time: 11:27                  Slit: 0.40 H
Data File: AA902.DAT         ID/Wt File: AA902.IDW        Lamp Current: 8
Technique: Flame             Calib. Type: Linear          Energy: 75
Remark 1: CALIBRATION STD ID#2-31-1
Remark 2: ICV\CCV STD ID#2-25-2
Remark 3: STD PREPARATION LOGBOOK #5 PAGE #8
-----------------------------------------------------------------------------
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: BLANK              Seq. No.: 00001    A/S Pos.: --    Date: 11/11/94

Absorbance: 0.001                        Time: 11:27
Concentration (ug/L  ): 2.5

Absorbance: 0.000                        Time: 11:27
Concentration (ug/L  ): 1.9

Mean Conc  (ug/L  ):        2.2          SD: 0.42                RSD(%): 18.77

Auto-zero performed.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: STD1               Seq. No.: 00002    A/S Pos.: --    Date: 11/11/94

Absorbance: 0.018                        Time: 11:28
Concentration (ug/L  ): 69.2

Absorbance: 0.017                        Time: 11:28
Concentration (ug/L  ): 68.1

Mean Conc  (ug/L  ):       68.6          SD: 0.81                RSD(%): 1.18

Standard number 1 applied.  [50.0]
Correlation coefficient: 1.00000         Slope: 0.0003
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: STD2               Seq. No.: 00003    A/S Pos.: --    Date: 11/11/94

Absorbance: 0.056                        Time: 11:28
Concentration (ug/L  ): 161.4

Absorbance: 0.054                        Time: 11:28
Concentration (ug/L  ): 156.1

Mean Conc  (ug/L  ):      158.8          SD: 3.70                RSD(%): 2.33

Standard number 2 applied.  [200.0]
Correlation coefficient: 0.99316         Slope: 0.0003
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: STD3               Seq. No.: 00004    A/S Pos.: --    Date: 11/11/94

Absorbance: 0.133                        Time: 11:29
Concentration (ug/L  ): 473.1

Absorbance: 0.133                        Time: 11:29
Concentration (ug/L  ): 471.7
```

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Mean Conc (ug/L): 472.4 SD: 0.95 RSD(%): 0.20

Standard number 3 applied. [500.0]
Correlation coefficient: 0.99869 Slope: 0.0003

Na ID: STD4 Seq. No.: 00005 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.253 Time: 11:30
Concentration (ug/L): 943.7

Absorbance: 0.255 Time: 11:30
Concentration (ug/L): 948.8

Mean Conc (ug/L): 946.2 SD: 3.65 RSD(%): 0.39

Standard number 4 applied. [1000.0]
Correlation coefficient: 0.99906 Slope: 0.0003

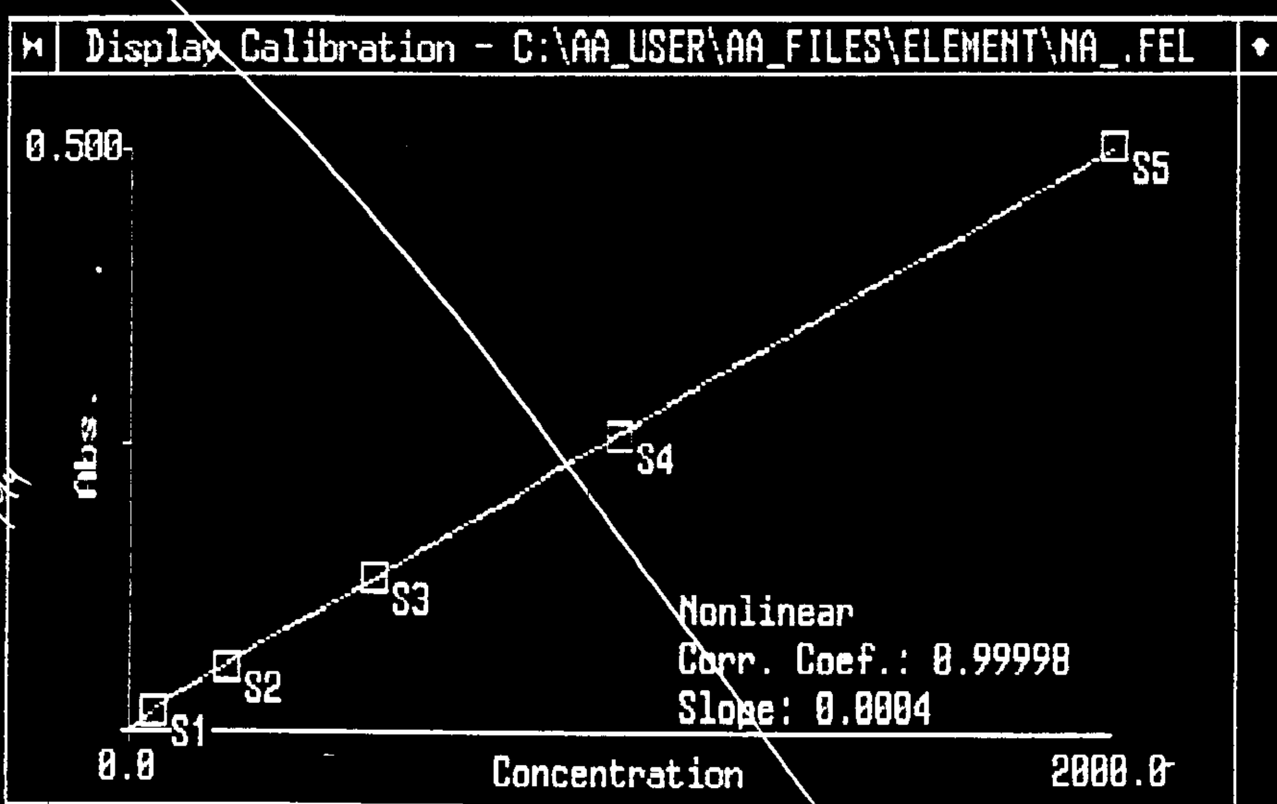
Na ID: STD5 Seq. No.: 00006 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.501 Time: 11:30
Concentration (ug/L): 1944.8

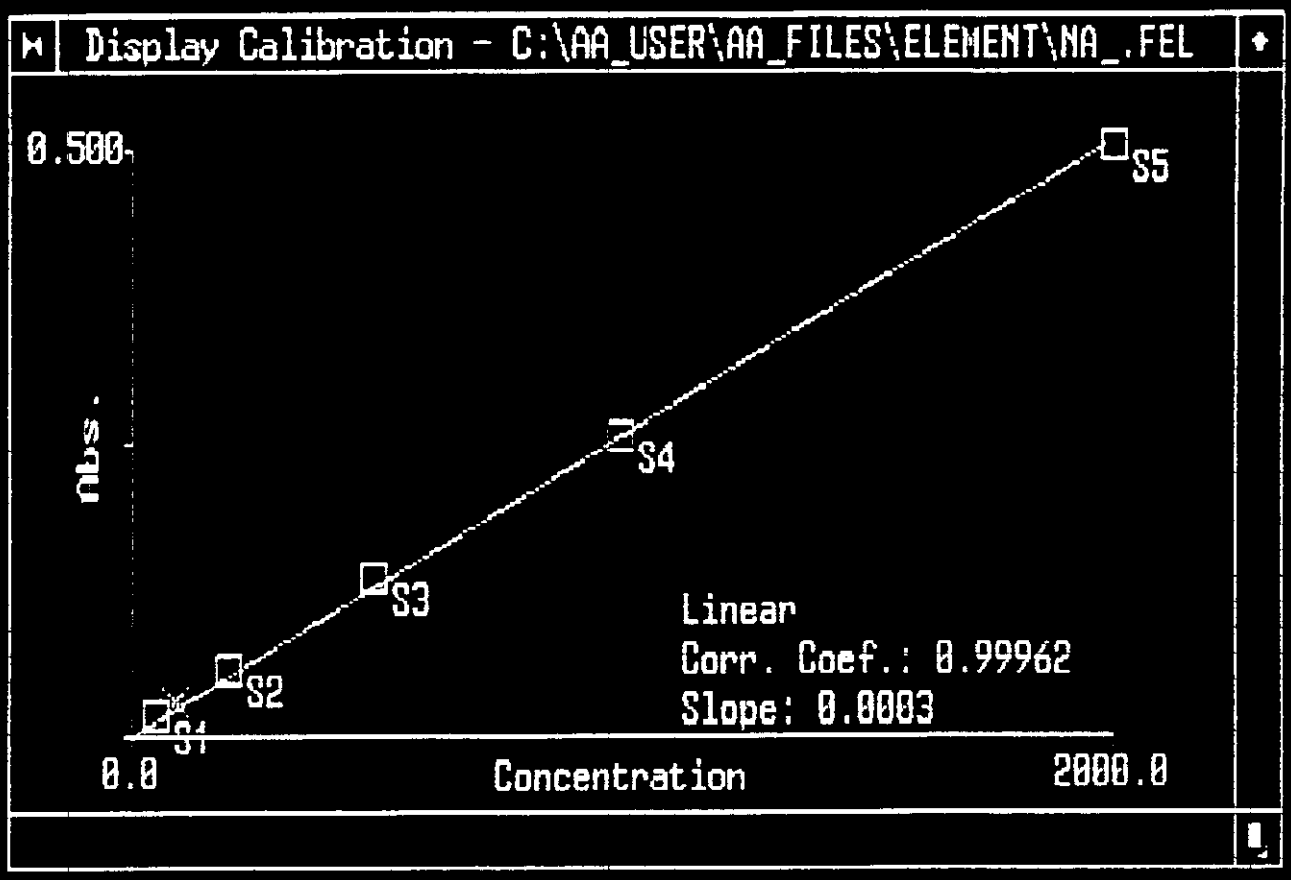
Absorbance: 0.499 Time: 11:31
Concentration (ug/L): 1937.6

Mean Conc (ug/L): 1941.2 SD: 5.08 RSD(%): 0.26

Standard number 5 applied. [2000.0]
Correlation coefficient: 0.99962 Slope: 0.0003



Nonlinear not used DKH 11/11/94


Display Calibration - C:\AA_USER\AA_FILES\ELEMENT\NA_.FEL
0.500
abs.
S5
S4
S3
S2
S1
Linear
Corr. Coef.: 0.99962
Slope: 0.0003
0.0
Concentration
2000.0

Na ID: ICV=110 Seq. No.: 00010 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.033 Time: 11:37
Concentration (ug/L): 130.1

Absorbance: 0.029 Time: 11:37
Concentration (ug/L): 116.5

Mean Conc (ug/L): 123.3 SD: 9.60 RSD(%): 7.78

N/A. Reanalyzed. DKH 11/11/94

Na ~~ID: ICV=110~~ Seq. No.: 00011 A/S Pos.: -- ~~Date: 11/11~~/94

Absorbance: 0.030 Time: 11:38
Concentration (ug/L): 117.3

Absorbance: 0.028 Time: 11:38
Concentration (ug/L): 112.4

Mean Conc (ug/L): 114.8 SD: 3.45 RSD(%): 3.00

Na ID: ICB Seq. No.: 00012 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.002 Time: 11:38
Concentration (ug/L): 8.2

Absorbance: 0.003 Time: 11:38
Concentration (ug/L): 13.5

Mean Conc (ug/L): 10.8 SD: 3.71 RSD(%): 34.19

Auto-zeroed. ICV/ICB Reanalyzed. DKH 11/11/94

Na ID: BLANK Seq. No.: 00013 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.002 Time: 11:39
Concentration (ug/L): 6.7

Absorbance: 0.001 Time: 11:39
Concentration (ug/L): 4.2

Mean Conc (ug/L): 5.4 SD: 1.75 RSD(%): 32.30

Auto-zero performed.

Na ID: BLANK Seq. No.: 00014 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.000 Time: 11:39
Concentration (ug/L): 1.6

Absorbance: 0.001 Time: 11:39
Concentration (ug/L): 2.6

Mean Conc (ug/L): 2.1 SD: 0.69 RSD(%): 33.32

Auto-zero performed.

~~~~~~

Na ID: ICV=110 Seq. No.: 00015 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.028 Time: 11:40
Concentration (ug/L): 109.3

Absorbance: 0.028 Time: 11:40
Concentration (ug/L): 110.2

Mean Conc (ug/L): 109.7 SD: 0.68 RSD(%): 0.62

~~~~~~

Na ID: ICB Seq. No.: 00016 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.000 Time: 11:40
Concentration (ug/L): 0.6

Absorbance: 0.001 Time: 11:41
Concentration (ug/L): 3.1

Mean Conc (ug/L): 1.8 SD: 1.74 RSD(%): 94.48

~~~~~~

Na ID: 30047-MB Seq. No.: 00017 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.010 Time: 11:41
Concentration (ug/L): 40.6

Absorbance: 0.011 Time: 11:41
Concentration (ug/L): 42.7

Mean Conc (ug/L): 41.6 SD: 1.44 RSD(%): 3.45

~~~~~~

Na ID: 30047-LCS Seq. No.: 00018 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.248 Time: 11:42
Concentration (ug/L): 983.2

Absorbance: 0.248 Time: 11:42
Concentration (ug/L): 983.8

Mean Conc (ug/L): 983.5 SD: 0.42 RSD(%): 0.04

~~~~~~

Na ID: 30047-LCSD Seq. No.: 00019 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.247 Time: 11:42
Concentration (ug/L): 979.5

Absorbance: 0.247 Time: 11:43
Concentration (ug/L): 982.8

Mean Conc (ug/L): 981.2 SD: 2.31 RSD(%): 0.24

~~~~~~

Na ID: 89-243-1A-X1000 Seq. No.: 00020 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.090 Time: 11:43

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Concentration (ug/L  ): 358.5

Absorbance: 0.090                     Time: 11:43
Concentration (ug/L  ): 358.7

Mean Conc  (ug/L  ):     358.6        SD: 0.09              RSD(%): 0.03

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Na    ID: 89-243-1ADX1000    Seq. No.: 00021    A/S Pos.: --    Date: 11/11/94

Absorbance: 0.091                     Time: 11:43
Concentration (ug/L  ): 360.1

Absorbance: 0.091                     Time: 11:43
Concentration (ug/L  ): 362.7

Mean Conc  (ug/L  ):     361.4        SD: 1.86              RSD(%): 0.52

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Na    ID: 89-243-2-X50       Seq. No.: 00022    A/S Pos.: --    Date: 11/11/94

Absorbance: 0.024                     Time: 11:44
Concentration (ug/L  ): 94.5

Absorbance: 0.023                     Time: 11:44
Concentration (ug/L  ): 92.4

Mean Conc  (ug/L  ):      93.4        SD: 1.50              RSD(%): 1.60

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: 89-243-2 D-X50     Seq. No.: 00023    A/S Pos.: --    Date: 11/11/94

Absorbance: 0.023                     Time: 11:45
Concentration (ug/L  ): 92.2

Absorbance: 0.024                     Time: 11:45
Concentration (ug/L  ): 95.9

Mean Conc  (ug/L  ):      94.1        SD: 2.62              RSD(%): 2.79

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: 89-243-5-X1000     Seq. No.: 00024    A/S Pos.: --    Date: 11/11/94

Absorbance: 0.172                     Time: 11:46
Concentration (ug/L  ): 683.9

Absorbance: 0.173                     Time: 11:46
Concentration (ug/L  ): 687.6

Mean Conc  (ug/L  ):     685.7        SD: 2.64              RSD(%): 0.39

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: 89-243-6-X50       Seq. No.: 00025    A/S Pos.: --    Date: 11/11/94

Absorbance: 0.018                     Time: 11:46
Concentration (ug/L  ): 71.1

Absorbance: 0.017                     Time: 11:47
Concentration (ug/L  ): 68.1
```

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Mean Conc  (ug/L  ):        69.6        SD: 2.13                RSD(%): 3.06
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: CCV=1500          Seq. No.: 00026   A/S Pos.: --    Date: 11/11/94

Absorbance: 0.371                       Time: 11:47
Concentration (ug/L  ): 1472.4

Absorbance: 0.369                       Time: 11:47
Concentration (ug/L  ): 1466.0

Mean Conc  (ug/L  ):      1469.2        SD: 4.53                RSD(%): 0.31
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: CCB               Seq. No.: 00027   A/S Pos.: --    Date: 11/11/94

Absorbance: 0.000                       Time: 11:47
Concentration (ug/L  ): 1.9

Absorbance: -0.000                      Time: 11:48
Concentration (ug/L  ): -0.2

Mean Conc  (ug/L  ):         0.8        SD: 1.49                RSD(%): 184.08
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: 89-243-7-X1000    Seq. No.: 00028   A/S Pos.: --    Date: 11/11/94

Absorbance: 0.005                       Time: 11:48
Concentration (ug/L  ): 20.9

Absorbance: 0.005                       Time: 11:48
Concentration (ug/L  ): 19.9

Mean Conc  (ug/L  ):        20.4        SD: 0.76                RSD(%): 3.70
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: 89-243-7-X50      Seq. No.: 00029   A/S Pos.: --    Date: 11/11/94

Absorbance: 0.138                       Time: 11:51
Concentration (ug/L  ): 549.7

Absorbance: 0.137                       Time: 11:51
Concentration (ug/L  ): 545.6

Mean Conc  (ug/L  ):       547.7        SD: 2.93                RSD(%): 0.54
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Na    ID: 89-243-7DX50      Seq. No.: 00030   A/S Pos.: --    Date: 11/11/94

Absorbance: 0.139                       Time: 11:52
Concentration (ug/L  ): 551.8

Absorbance: 0.140                       Time: 11:52
Concentration (ug/L  ): 555.5

Mean Conc  (ug/L  ):       553.6        SD: 2.60                RSD(%): 0.47
```

Reanalyzed @ X50 Dilution DKH 11/11/94

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Na ID: 89-243-9-1000 Seq. No.: 00031 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.296 Time: 11:52
Concentration (ug/L): 1177.5

Absorbance: 0.297 Time: 11:52
Concentration (ug/L): 1181.0

Mean Conc (ug/L): 1179.3 SD: 2.52 RSD(%): 0.21

~~~~~~

Na ID: 89-243-10-X50 Seq. No.: 00032 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.025 Time: 11:53
Concentration (ug/L): 100.9

Absorbance: 0.025 Time: 11:53
Concentration (ug/L): 99.5

Mean Conc (ug/L): 100.2 SD: 0.97 RSD(%): 0.97

~~~~~~

Na ID: 89-243-11-X1000 Seq. No.: 00033 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.012 Time: 11:54
Concentration (ug/L): 45.8

Absorbance: 0.011 Time: 11:54
Concentration (ug/L): 45.5

Mean Conc (ug/L): 45.7 SD: 0.21 RSD(%): 0.45

Reanalyzed @ X50 Dilution DKH 11/11/94

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Na ID: 89-243-11-X50 Seq. No.: 00034 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.137 Time: 11:59
Concentration (ug/L): 545.6

Absorbance: 0.138 Time: 11:59
Concentration (ug/L): 549.4

Mean Conc (ug/L): 547.5 SD: 2.72 RSD(%): 0.50

~~~~~~

Na ID: 89-243-13-X50 Seq. No.: 00035 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.051 Time: 11:59
Concentration (ug/L): 202.2

Absorbance: 0.051 Time: 12:00
Concentration (ug/L): 202.1

Mean Conc (ug/L): 202.2 SD: 0.09 RSD(%): 0.05

This is OK DKH 11/11/94

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Na ID: 89-243-14-X50 Seq. No.: 00036 A/S Pos.: -- Date: 11/11/94

Absorbance: 0.017 Time: 12:01

N/A DKH 11/11/94

91

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Na    ID: CCV=1500             Seq. No.: 00047    A/S Pos.: --     Date: 11/11/94

Absorbance: 0.365                         Time: 12:17
Concentration (ug/L   ): 1448.7

Absorbance: 0.365                         Time: 12:17
Concentration (ug/L   ): 1450.9

Mean Conc  (ug/L  ):     1449.8          SD: 1.51                 RSD(%): 0.10
```

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```
Na    ID: CCB                  Seq. No.: 00048    A/S Pos.: --     Date: 11/11/94

Absorbance: 0.000                         Time: 12:17
Concentration (ug/L   ): 1.0

Absorbance: -0.000                        Time: 12:17
Concentration (ug/L   ): -1.3

Mean Conc  (ug/L  ):       -0.2          SD: 1.63                 RSD(%): 842.72
```

94

30047 K

ID/Weight File: AA903.IDW
Sample Volume: 100 mL

Analyst: D HOLSTE
Nominal Weight: 1.0 g

Loc.	Sample ID	Weight	Dilution
1	ICV=110		
2	ICB		
3	30047-MB		
4	30047-LCS		
5	30047-LCSD		
6	89-243-1A		
7	89-243-1AD		
8	89-243-2		
9	89-243-2 D		
10	89-243-5		
11	89-243-6		
12	CCV=1500		
13	CCB		
14	89-243-7		
15	89-243-7		
16	89-243-9		
17	89-243-10		
18	89-243-11		
19	89-243-13		
20	89-243-14		
21	89-243-15		
22	89-243-16		
23	CCV=1500		
24	CCB		

95

Element File: K_.FEL
Element: K
Print Data: Main+Suppl.
Print: Calib. Curve+Elem. Params.
Remarks:
CALIBRATION STD ID:2-39-4
ICV/CCV STD ID:2-25-4
STD PREP LOGBOOK #5 PAGE #8

Analyst: D HOLSTE
Peak Storage: None

INSTRUMENT: 5100
Wavelength: 766.5 Peak
Signal Type: Emission
Read Time: 10.0
Sample Replicates: 2
Standard Replicates: 2

Technique: Flame
Slit: 1.4 High
Signal Measurement: Time Average
Read Delay: 0.0

Version: 7.01
BOC Time: 2

FLAME:
Flame Type: AIR
Oxidant Flow: 10.0 L/min

Flame Sensor: On
Fuel Flow: 2.0 L/min

CALIBRATION:

Solutions	ID	Conc
Calib. Blank	STD BLK	
Standard 1	STD 1	100.
Standard 2	STD 2	500.
Standard 3	STD 3	1000.
Standard 4	STD 4	1500.
Standard 5	STD 5	2000.

Calibration Units: ug/L
Calibration Type: Nonlinear

Sample Units: ug/L

QC:
Matrix Check Calculations:
% Difference for Dupls: No Locations:
% Recovery for Spike: No Locations: Conc:

96

Element File: K_.FEL
Element: K
Analyst: D HOLSTE
Print Data: Main+Suppl.
Peak Storage: None
Print: Calib. Curve+Elem. Params.
Remarks:
CALIBRATION STD ID:2-39-4
ICV/CCV STD ID:2-25-4
STD PREP LOGBOOK #5 PAGE #8

INSTRUMENT: 5100
Technique: Flame
Version: 7.01
Wavelength: 766.5 Peak
Slit: 1.4 High
Signal Type: Emission
Signal Measurement: Time Average
Read Time: 10.0
Read Delay: 0.0
BOC Time: 2
Sample Replicates: 2
Standard Replicates: 2

FLAME:
Flame Type: AIR
Flame Sensor: On
Oxidant Flow: 10.0 L/min
Fuel Flow: 2.0 L/min

CALIBRATION:

Solutions	ID	Conc
Calib. Blank	STD BLK	
Standard 1	STD 1	100.
Standard 2	STD 2	500.
Standard 3	STD 3	1000.
Standard 4	STD 4	1500.
Standard 5	STD 5	2000.

Calibration Units: ug/L
Sample Units: ug/L
Calibration Type: Nonlinear

QC:
Matrix Check Calculations:
% Difference for Dupls: No Locations:
% Recovery for Spike: No Locations: Conc:

```
-----------------------------------------------------------------------------
Element File: K_.FEL          Element: K                    Wavelength: 766.5
Date: 11/11/94                Time: 14:01                   Slit: 1.4 H
Data File: AA903.DAT          ID/Wt File: AA903.IDW         Lamp Current: 0
Technique: Flame              Calib. Type: Nonlinear        Energy: 80
Remark 1: CALIBRATION STD ID:2-39-4
Remark 2: ICV/CCV STD ID:2-25-4
Remark 3: STD PREP LOGBOOK #5 PAGE #8
-----------------------------------------------------------------------------
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: STD BLK             Seq. No.: 00001    A/S Pos.: --    Date: 11/11/94

Emission: 0.157                          Time: 14:01

Emission: 0.157                          Time: 14:01

Mean Emission:       0.157               SD: 0.0000              RSD(%): 0.00

Auto-zero performed.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: STD 1               Seq. No.: 00002    A/S Pos.: --    Date: 11/11/94

Emission: 0.034                          Time: 14:03

Emission: 0.030                          Time: 14:03

Mean Emission:       0.032               SD: 0.0029              RSD(%): 9.23

Standard number 1 applied.  [100.]
Correlation coefficient: 1.00000         Slope: 0.0003

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: STD BLK             Seq. No.: 00003    A/S Pos.: --    Date: 11/11/94

Emission: -0.002                         Time: 14:15
Concentration (ug/L  ): -7.

Emission: -0.002                         Time: 14:15
Concentration (ug/L  ): -7.

Mean Conc  (ug/L  ):         -7.         SD: 0.1                 RSD(%): 0.96

Auto-zero performed.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: STD BLK             Seq. No.: 00004    A/S Pos.: --    Date: 11/11/94

Emission: 0.001                          Time: 14:19
Concentration (ug/L  ): 2.

Emission: 0.001                          Time: 14:19
Concentration (ug/L  ): 3.

Mean Conc  (ug/L  ):          2.         SD: 0.5                 RSD(%): 23.65

Auto-zero performed.
```

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K ID: STD 1 Seq. No.: 00005 A/S Pos.: -- Date: 11/11/94

Emission: 0.034 Time: 14:20
Concentration (ug/L): 107.

Emission: 0.034 Time: 14:20
Concentration (ug/L): 106.

Mean Conc (ug/L): 106. SD: 1.2 RSD(%): 1.10

Standard number 1 applied. [100.]
Correlation coefficient: 1.00000 Slope: 0.0003

~~~~~~

K ID: STD 2 Seq. No.: 00006 A/S Pos.: -- Date: 11/11/94

Emission: 0.175 Time: 14:21
Concentration (ug/L): 516.

Emission: 0.174 Time: 14:21
Concentration (ug/L): 511.

Mean Conc (ug/L): 513. SD: 3.2 RSD(%): 0.63

Standard number 2 applied. [500.]
Correlation coefficient: 1.00000 Slope: 0.0003

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K ID: STD 3 Seq. No.: 00007 A/S Pos.: -- Date: 11/11/94

Emission: 0.300 Time: 14:21
Concentration (ug/L): 840.

Emission: 0.207 Time: 14:21
Concentration (ug/L): 589.

Mean Conc (ug/L): 716. SD: 177.4 RSD(%): 24.81

S-shaped calibration curve detected. 2-coef. equation used.
Standard number 3 applied. [1000.]
Correlation coefficient: 0.98493 Slope: 0.0004

~~~~~~

K ID: STD 3 Seq. No.: 00008 A/S Pos.: -- Date: 11/11/94

Emission: 0.360 Time: 14:22
Concentration (ug/L): 1516.

Emission: 0.358 Time: 14:22
Concentration (ug/L): 1503.

Mean Conc (ug/L): 1510. SD: 8.9 RSD(%): 0.59

Standard number 3 applied. [1000.]
Correlation coefficient: 1.00000 Slope: 0.0003

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K ID: STD 4 Seq. No.: 00009 A/S Pos.: -- Date: 11/11/94

Emission: 0.566 Time: 14:23
Concentration (ug/L): 1542.

Emission: 0.567 Time: 14:23
Concentration (ug/L): 1542.

Mean Conc (ug/L): 1542. SD: 0.5 RSD(%): 0.03

Standard number 4 applied. [1500.]
Correlation coefficient: 1.00000 Slope: 0.0003

~~~~~~

K ID: STD 5 Seq. No.: 00010 A/S Pos.: -- Date: 11/11/94

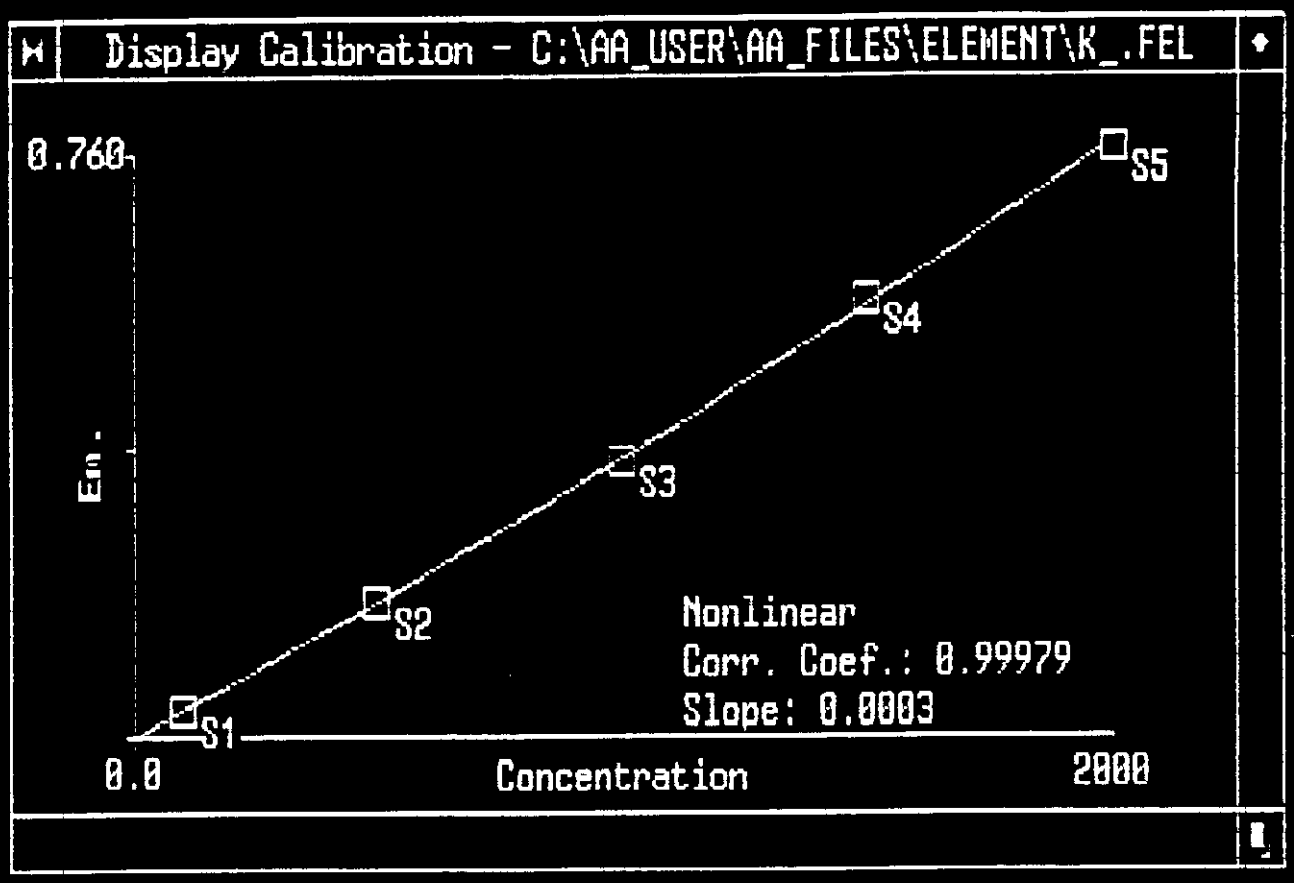
Emission: 0.758 Time: 14:23
Concentration (ug/L): 1890.

Emission: 0.762 Time: 14:23
Concentration (ug/L): 1899.

Mean Conc (ug/L): 1894. SD: 5.9 RSD(%): 0.31

Standard number 5 applied. [2000.]
Correlation coefficient: 0.99979 Slope: 0.0003

100


Display Calibration - C:\AA_USER\AA_FILES\ELEMENT\K_.FEL
0.760
Em.
S1
S2
S3
S4
S5
Nonlinear
Corr. Coef.: 0.99979
Slope: 0.0003
0.0
Concentration
2000

```
-----------------------------------------------------------------------------
Element File: K_.FEL          Element: K                    Wavelength: 766.5
Date: 11/11/94                Time: 14:25                   Slit: 1.4 H
Data File: AA903.DAT          ID/Wt File: AA903.IDW         Lamp Current: 0
Technique: Flame              Calib. Type: Nonlinear        Energy: 80
Remark 1: CALIBRATION STD ID:2-39-4
Remark 2: ICV/CCV STD ID:2-25-4
Remark 3: STD PREP LOGBOOK #5 PAGE #8
-----------------------------------------------------------------------------
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: ICV=110             Seq. No.: 00011    A/S Pos.: --    Date: 11/11/94

Emission: 0.133                          Time: 14:28
Concentration (ug/L  ): 384.

Emission: 0.098                          Time: 14:28
Concentration (ug/L  ): 285.

Mean Conc  (ug/L  ):        334.         SD: 70.2                RSD(%): 21.00
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: ICV=380             Seq. No.: 00012    A/S Pos.: --    Date: 11/11/94

Emission: 0.130                          Time: 14:28
Concentration (ug/L  ): 375.

Emission: 0.130                          Time: 14:29
Concentration (ug/L  ): 376.

Mean Conc  (ug/L  ):        376.         SD: 0.7                 RSD(%): 0.18
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: ICB                 Seq. No.: 00013    A/S Pos.: --    Date: 11/11/94

Emission: 0.001                          Time: 14:29
Concentration (ug/L  ): 2.

Emission: 0.000                          Time: 14:29
Concentration (ug/L  ): 1.

Mean Conc  (ug/L  ):          2.         SD: 0.3                 RSD(%): 17.91
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: 30047-MB            Seq. No.: 00014    A/S Pos.: --    Date: 11/11/94

Emission: 0.003                          Time: 14:29
Concentration (ug/L  ): 9.

Emission: 0.003                          Time: 14:30
Concentration (ug/L  ): 9.

Mean Conc  (ug/L  ):          9.         SD: 0.2                 RSD(%): 2.40
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: 30047-LCS           Seq. No.: 00015    A/S Pos.: --    Date: 11/11/94

Emission: 0.371                          Time: 14:30
Concentration (ug/L  ): 1030.
```

Reanalyzed, aspirator pulled out of ICV.

DKH 11/11/94

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Emission: 0.361                            Time: 14:31
Concentration (ug/L  ): 1005.

Mean Conc  (ug/L  ):      1018.        SD: 17.5               RSD(%): 1.72

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: 30047-LCSD         Seq. No.: 00016    A/S Pos.: --    Date: 11/11/94

Emission: 0.363                            Time: 14:31
Concentration (ug/L  ): 1009.

Emission: 0.361                            Time: 14:31
Concentration (ug/L  ): 1005.

Mean Conc  (ug/L  ):      1007.        SD: 3.0                RSD(%): 0.30

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: 89-243-1A          Seq. No.: 00017    A/S Pos.: --    Date: 11/11/94

The signal is too large for the range of the electronics.
Sample abs. is greater than that of the largest standard.
Emission: 1.313                            Time: 14:35
Concentration (ug/L  ): --------

Sample abs. is greater than that of the largest standard.
Emission: 0.900                            Time: 14:35
Concentration (ug/L  ): 2288.

Sample abs. is greater than that of the largest standard.
Mean Conc  (ug/L  ): ----              SD: ----               RSD(%): ----
                                                 Reanalyzed
                                                 @ above D.I.
                                                 DKH 11/11/94
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: 89-243-1A X1000    Seq. No.: 00018    A/S Pos.: --    Date: 11/11/94

Emission: 0.077                            Time: 14:36
Concentration (ug/L  ): 224.

Emission: 0.035                            Time: 14:36
Concentration (ug/L  ): 103.

Mean Conc  (ug/L  ):      164.         SD: 85.5               RSD(%): 52.15
                                         Reanalyzed. DKH 11/11/94
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: 89-243-1A X1000    Seq. No.: 00019    A/S Pos.: --    Date: 11/11/94

Emission: 0.077                            Time: 14:36
Concentration (ug/L  ): 224.

Emission: 0.077                            Time: 14:37
Concentration (ug/L  ): 224.

Mean Conc  (ug/L  ):      224.         SD: 0.1                RSD(%): 0.02

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: 89-243-1AD x 1000  Seq. No.: 00020    A/S Pos.: --    Date: 11/11/94
                          SJH
Emission: 0.077           11/22/94         Time: 14:37
Concentration (ug/L  ): 224.
```


103

Emission: 0.075 Time: 14:37
Concentration (ug/L): 220.

Mean Conc (ug/L): 222. SD: 2.9 RSD(%): 1.30

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K ID: 89-243-2 Seq. No.: 00021 A/S Pos.: -- Date: 11/11/94

Sample abs. is greater than that of the largest standard.
Emission: 0.870 Time: 14:38
Concentration (ug/L): 2224.

Emission: 0.197 Time: 14:38
Concentration (ug/L): 562.

Mean Conc (ug/L): 1442. SD: 1175.3 RSD(%): 84.36

reanalyzed SJH 11-22-94

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K ID: 89-243-2 X50 Seq. No.: 00022 A/S Pos.: -- Date: 11/11/94

Emission: 0.012 Time: 14:38
Concentration (ug/L): 37.

Emission: 0.016 Time: 14:39
Concentration (ug/L): 48.

Mean Conc (ug/L): 42. SD: 7.7 RSD(%): 18.27

Reanalyzed @ X10 Dil DKH 11/11/94

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K ID: 89-243-2 X10 Seq. No.: 00023 A/S Pos.: -- Date: 11/11/94

Emission: 0.084 Time: 14:43
Concentration (ug/L): 243.

Emission: 0.084 Time: 14:43
Concentration (ug/L): 244.

Mean Conc (ug/L): 244. SD: 0.6 RSD(%): 0.24

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K ID: CCV=1200 Seq. No.: 00024 A/S Pos.: -- Date: 11/11/94

Emission: 0.451 Time: 14:44
Concentration (ug/L): 1235.

Emission: 0.448 Time: 14:44
Concentration (ug/L): 1228.

Mean Conc (ug/L): 1232. SD: 4.9 RSD(%): 0.40

~~~~~~

K ID: CCB Seq. No.: 00025 A/S Pos.: -- Date: 11/11/94

Emission: 0.002 Time: 14:45
Concentration (ug/L): 6.

Emission: 0.001 Time: 14:45
Concentration (ug/L): 4.
~~~~~~

Mean Conc (ug/L): 5. SD: 1.3 RSD(%): 25.27

~~~~~~

K ID: 89-243-2 D X10 Seq. No.: 00026 A/S Pos.: -- Date: 11/11/94

Emission: 0.084 Time: 14:45
Concentration (ug/L): 245.

Emission: 0.052 Time: 14:46
Concentration (ug/L): 152.

Mean Conc (ug/L): 199. SD: 65.5 Reanalyzed. DKH 11/11/94 RSD(%): 32.95

~~~~~~

K ID: 89-243-2 D X10 Seq. No.: 00027 A/S Pos.: -- Date: 11/11/94

Emission: 0.085 Time: 14:46
Concentration (ug/L): 247.

Emission: 0.083 Time: 14:47
Concentration (ug/L): 241.

Mean Conc (ug/L): 244. SD: 4.0 RSD(%): 1.65

~~~~~~

K ID: 89-243-5 X1000 Seq. No.: 00028 A/S Pos.: -- Date: 11/11/94

Emission: 0.117 Time: 14:48
Concentration (ug/L): 340.

Emission: 0.118 Time: 14:48
Concentration (ug/L): 342.

Mean Conc (ug/L): 341. SD: 1.6 RSD(%): 0.48

~~~~~~

K ID: 89-243-6 Seq. No.: 00029 A/S Pos.: -- Date: 11/11/94

Emission: 0.511 Time: 14:51
Concentration (ug/L): 1387.

Emission: 0.520 Time: 14:52
Concentration (ug/L): 1410.

Mean Conc (ug/L): 1398. SD: 16.2 RSD(%): 1.16

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K ID: 89-243-6 L Seq. No.: 00030 A/S Pos.: -- Date: 11/11/94

Emission: 0.103 Time: 14:52
Concentration (ug/L): 298.

Emission: 0.103 Time: 14:53
Concentration (ug/L): 299.

Mean Conc (ug/L): 298. SD: 0.7 RSD(%): 0.24

105
~~~~~~

K ID: 89-243-7 X50 Seq. No.: 00031 A/S Pos.: -- Date: 11/11/94

Emission: 0.046 Time: 14:54
Concentration (ug/L): 136.

Emission: 0.047 Time: 14:54
Concentration (ug/L): 137.

Mean Conc (ug/L): 136. SD: 1.0 RSD(%): 0.75

K ID: 89-243-7 Seq. No.: 00032 A/S Pos.: -- Date: 11/11/94

The signal is too large for the range of the electronics.
Sample abs. is greater than that of the largest standard.
Emission: 1.314 Time: 14:55
Concentration (ug/L): --------

Emission: 0.245 Time: 14:55
Concentration (ug/L): 696.

Mean Conc (ug/L): ---- SD: ---- RSD(%): ----

N/A. Use dilution value above. DKH 11/11/94

K ID: 89-243-7D X50 Seq. No.: 00033 A/S Pos.: -- Date: 11/11/94

Emission: 0.046 Time: 14:55
Concentration (ug/L): 135.

Emission: 0.047 Time: 14:55
Concentration (ug/L): 138.

Mean Conc (ug/L): 136. SD: 1.6 RSD(%): 1.20

K ID: 89-243-9 X1000 Seq. No.: 00034 A/S Pos.: -- Date: 11/11/94

Emission: 0.163 Time: 14:57
Concentration (ug/L): 468.

Emission: 0.165 Time: 14:57
Concentration (ug/L): 473.

Mean Conc (ug/L): 471. SD: 4.0 RSD(%): 0.86

K ID: CCV=1200 Seq. No.: 00035 A/S Pos.: -- Date: 11/11/94

Emission: 0.435 Time: 14:58
Concentration (ug/L): 1194.

Emission: 0.437 Time: 14:58
Concentration (ug/L): 1200.

Mean Conc (ug/L): 1197. SD: 4.1 RSD(%): 0.34

^06

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K     ID: CCB               Seq. No.: 00036    A/S Pos.: --    Date: 11/11/94

Emission: 0.001                       Time: 14:59
Concentration (ug/L  ): 2.

Emission: 0.001                       Time: 14:59
Concentration (ug/L  ): 2.

Mean Conc  (ug/L  ):        2.        SD: 0.0                 RSD(%): 2.79

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
K     ID: 89-243-10         Seq. No.: 00037    A/S Pos.: --    Date: 11/11/94

Emission: 0.552                       Time: 15:00
Concentration (ug/L  ): 1488.

Emission: 0.540                       Time: 15:00
Concentration (ug/L  ): 1458.

Mean Conc  (ug/L  ):     1473.        SD: 21.2                RSD(%): 1.44

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K     ID: 89-243-11 X50     Seq. No.: 00038    A/S Pos.: --    Date: 11/11/94

Emission: 0.008                       Time: 15:01
Concentration (ug/L  ): 25.

Emission: 0.009                       Time: 15:02
Concentration (ug/L  ): 25.

Mean Conc  (ug/L  ):       25.        SD: 0.4                 RSD(%): 1.42
```

Sample Reanalyzed w/o Dilution. DKH 11/11/94

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K     ID: 89-243-11         Seq. No.: 00039    A/S Pos.: --    Date: 11/11/94

Emission: 0.568                       Time: 15:02
Concentration (ug/L  ): 1526.

Emission: 0.569                       Time: 15:02
Concentration (ug/L  ): 1529.

Mean Conc  (ug/L  ):     1527.        SD: 2.6                 RSD(%): 0.17

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K     ID: 89-243-11 L       Seq. No.: 00040    A/S Pos.: --    Date: 11/11/94

Emission: 0.100                       Time: 15:03
Concentration (ug/L  ): 290.

Emission: 0.101                       Time: 15:03
Concentration (ug/L  ): 293.

Mean Conc  (ug/L  ):      291.        SD: 2.5                 RSD(%): 0.86

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K     ID: 89-243-13         Seq. No.: 00041    A/S Pos.: --    Date: 11/11/94

Emission: 0.601                       Time: 15:04
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Concentration (ug/L): 1608.

Emission: 0.601 Time: 15:04
Concentration (ug/L): 1608.

Mean Conc (ug/L): 1608. SD: 0.1 RSD(%): 0.01

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K ID: 89-243-14 Seq. No.: 00042 A/S Pos.: -- Date: 11/11/94

Emission: 0.263 Time: 15:05
Concentration (ug/L): 743.

Emission: 0.263 Time: 15:05
Concentration (ug/L): 742.

Mean Conc (ug/L): 743. SD: 0.5 RSD(%): 0.06

~~~~~~

K ID: 89-243-15 Seq. No.: 00043 A/S Pos.: -- Date: 11/11/94

The signal is too large for the range of the electronics.
Sample abs. is greater than that of the largest standard.
Emission: 1.313 Time: 15:06
Concentration (ug/L): --------

Emission: 0.469 Time: 15:06
Concentration (ug/L): 1281.

Sample abs. is greater than that of the largest standard.
Mean Conc (ug/L): ---- SD: ---- RSD(%): ----

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K ID: 89-243-15 X50 Seq. No.: 00044 A/S Pos.: -- Date: 11/11/94

Emission: 0.027 Time: 15:06
Concentration (ug/L): 79.

Emission: 0.027 Time: 15:06
Concentration (ug/L): 79.

Reanalyzed @ x10 D.I.
DKH 11/11/94

Mean Conc (ug/L): 79. SD: 0.4 RSD(%): 0.56

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K ID: 89-243-15 X10 Seq. No.: 00045 A/S Pos.: -- Date: 11/11/94

Emission: 0.149 Time: 15:11
Concentration (ug/L): 429.

Emission: 0.149 Time: 15:11
Concentration (ug/L): 430.

Mean Conc (ug/L): 429. SD: 0.3 RSD(%): 0.07

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K ID: 89-243-16 Seq. No.: 00046 A/S Pos.: -- Date: 11/11/94

Emission: 0.428 Time: 15:12
Concentration (ug/L): 1179.
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Emission: 0.430                               Time: 15:12
Concentration (ug/L   ): 1181.

Mean Conc  (ug/L   ):       1180.             SD: 2.1                  RSD(%): 0.18

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K      ID: CCV=1200             Seq. No.: 00047     A/S Pos.: --     Date: 11/11/94

Emission: 0.453                               Time: 15:13
Concentration (ug/L   ): 1241.

Emission: 0.449                               Time: 15:13
Concentration (ug/L   ): 1230.

Mean Conc  (ug/L   ):       1235.             SD: 8.3                  RSD(%): 0.67

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K      ID: CCB                  Seq. No.: 00048     A/S Pos.: --     Date: 11/11/94

Emission: -0.000                              Time: 15:13
Concentration (ug/L   ): -1.

Emission: -0.000                              Time: 15:14
Concentration (ug/L   ): -0.

Mean Conc  (ug/L   ):         -1.             SD: 0.3                  RSD(%): 40.24
```

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