Background Report Reference

AP-42 Section Number: 12.20

Background Chapter: 4

Reference Number: 60

Title: Chromium Removal Performance Test

CECO Filter

April 1992

GE BURLINGTON - CECO FILTER

The inlet location did not meet Method 1 criteria which is typical of most inlet locations on plating facilities. At both the outlet and inlet, only one sampling port was installed. At the inlet, only a single point was sampled. At the outlet, only one traverse was made when two traverses should have been performed (outlet point # 5 was improperly located). Experience in sampling electroplating facilities has shown that sampling a single point or a single traverse is not acceptable for providing accurate and representative emissions data, nor is a single traverse specified in any isokinetic sampling method. It is possible to perform two traverses through a single port, but this was not the case on this test.

Page 11 under the quality control section gives general quality control procedures used. This was a "cookbook" approach since the consultant did not even bother to remove the references to the filters that were not used. The section also refers to following the procedures in Method 5 but fails to mention that only one port was installed and only one traverse was performed at each location (inlet and outlet).

This fiber bed mist eliminator does not seem to be as efficient as others for which we have had test reports. Average milligrams per dry standard cubic meter at the outlet are 0.00333. My note to Gail Lacy set a standard for fiber bed mist eliminators at 0.00157 milligrams per dry standard cubic meter. This test report shows 2.1 times that amount at the outlet. Another way to look at it is compare the emissions at the outlet with a mesh pad mist eliminator or scrubber. The standard is 0.015 milligrams per dry standard cubic meter. Comparing 0.015 with 0.00333 means that the fiber bed mist eliminator is about 4.5 times more efficient than the mesh pad, or it will reduce the emissions below the 0.015 standard by 78%.

All this is somewhat academic since the test was not done properly and lacked the two required traverses. Sample quantities were, however, sufficient, but the test is unacceptable.

Martin Nurrieta
- can't use
- sampled one pt @ inlet
- did only 1 traverse @ outlet instead of 2
- sample ~~cake~~ was sufficient
- both traverses needed to get good #

PROJECT MILESTONES
FCLAY

26 APRIL 1993 1993

Title of Project FERROALLOYS	Planned	Revised	Actual
NO TESTING PLANNED			
Title of Next Project			
ERC INCINERATOR TEST			
Submit WA			
WA Signed by Contracts			
Receive Work Plan			
Conduct Presurvey at			
Receive Test Plan			
Perform Source Test			
Receive Preliminary Data			
Receive Rough Draft			
Receive Final Report			
Receive Test Plan			
Perform Source Test			
Receive Preliminary Data			
Receive Rough Draft			
Receive Final Report			

Note to: Gail Lacy, Robin Jones

From: Frank R. Clay

Subject: Standard for Fiber Bed Mist Eliminators

What follows is a possible method for setting the standard for fiber bed mist eliminators for which we have no suitable data for setting the standard and for which we do not wish to test. Therefore, with no data and no test possibility, I recommend the following compliance standard.

For Fiber Bed Mist Eliminators:

1. Sample volume of at least 90 dry standard cubic feet (DSCF).
2. Sample solution collected from the test is 600 to 800 milliliters
3. Determinme compliance in either of the two following ways:

    a. Use the equation:

        Total micrograms collected $\leq$ 0.0444 (DSCF sampled)

        If the equation is true, the source is in compliance.

    b. If the concentration is equal to or less than 0.00157 milligrams per dry standard cubic meter, the source is in compliance.

RATIONALE:

SAMPLE VOLUME OF AIR:

The sample volume must be 90 dry standard cubic feet or more. A volume of 90 DSCF will insure a sufficient volume of sample gas and pollutant to use the graphite furnace atomic absorption analytical method.

VOLUME OF LIQUID SAMPLE RECOVERED FROM TRAIN:

The sample volume recovered from the train should be between 600 and 800 milliliters of solution. The reason for choosing a minimum of 600 milliliters is that the graphite furnace atomic absorption analysis technique requires 300 milliliters of sample for the analysis. A sample of 600 milliliters will make it possible to perform a second analysis if necessary, and it will also insure a more thorough rinse of the probe, nozzle, and glassware if the source tester does not have to worry about keeping the volume of reagent to a minimum. Normal sample recovery does not exceed 800 milliliters nor is it less than 500 milliliters.

MICROGRAMS OF TOTAL CHROMIUM COLLECTED:

Frank - Update

ROBIN SEGALL, CHIEF Manufacturing & Combustion Testing Section's Calendar

August 29, 1994 3:32pm

Monday, August 29, 1994	Tuesday, August 30, 1994	Wednesday, August 31, 1994	Thursday, September 1, 1994	Friday, September 2, 1994
9:30am - 5:00pm Class (Lori) 12:30pm - 1:30pm Annual Leave (M. Toney) 3:00pm - 5:00pm Sick Leave (M. Toney)	7:30am - 6:00pm Working Hours (Lori) 8:30am - 5:30pm Travel - Washington, DC - To attend EMMC Mtg (Robin) 10:00am - 11:00am Pulp and Paper Mtg - Mu (Mike Toney) 11:30am - 12:30pm Branch Lunch (optional)	7:30am - 5:00pm Annual Leave (M. Toney) 8:00am - 1:30pm EMB Booth at Air Toxics Workshop (Robin) 9:30am - 5:00pm Class (Lori)	7:30am - 6:00pm Working Hours (Lori) 7:30am - 4:00pm RDO (M. Toney)(changed from 09/02/94) 8:00am - 12:00n Sick Leave (Robin) 3:00pm - 5:00pm Mtg w/ISB on Hydro Monitor Evaluation (Robin, Terry, Lori)	7:00am - 3:30pm RDO (Frank) 7:00am - 3:30pm RDO (Mike C.)(changed from 08/26/94) 7:30am - 4:00pm RDO (Terry)(changed from 08/26/94) 8:30am - 5:00pm RDO (Robin) 1:00pm - 5:00pm Class (Lori)

The detection limit of our method is one microgram of total chromium per liter of sample solution, or 0.001 micrograms per milliliter of solution. To insure ± 10% accuracy, we would like 5 times that amount for analysis, or 0.005 micrograms per milliliter. If the sample recovered contained 0.005 micrograms per milliliter and the volume were 800 milliliters, the quantity of chromium recovered would be 4 micrograms of chromium. There are 35.31 cubic feet in a cubic meter, thus, ninety cubic feet divided by 35.31 cubic feet/cubic meter = 2.5488 cubic meters. Four micrograms of chromium with a sample size of 2.5488 cubic meters would be equal to a concentration number of 1.569 micrograms per cubic meter. To convert this number to milligrams per cubic meter, it is necessary to divide by 1000. The concentration is 0.00157 milligrams per dry standard cubic meter.

The above concentration rate is nearly an order of magnitude less than our mesh pad mist eliminator standard (0.013 or 0.015) Even though the tests reports that we have reviewed for mesh pad mist eliminators have had insufficient sample to insure that the numbers are correct, the values have been in the range of 0.4 micrograms collected for an entire test, which is one tenth of what we are proposing. A fiber bed mist eliminator would never reach 4 micrograms of catch for a 90 cubic foot run. If the source were to reach 34 micrograms of catch for a 90 cubic foot test run, the concentration would still be 0.01334 milligrams per dry standard cubic meter which is our standard for mesh pad mist eliminators.

The concentration of 0.00157 milligrams per dry standard cubic meter is more than fair. The actual microgram catches from a 90 cubic foot sample should be far below the standard of 0.00157 milligrams / DSCM.

Frank Clay

ROBIN SEGALL, CHIEF Manufacturing & Combustion Testing Section's Calendar

August 19, 1994 3:33pm

Monday, August 22, 1994	Tuesday, August 23, 1994	Wednesday, August 24, 1994	Thursday, August 25, 1994	Friday, August 26, 1994
7:30am - 5:00pm Travel - Lincoln, NE - Scoping study - Greenwood Grain Elevators (Bob) 9:00am - 10:00am ESD Data Needs - Mutual (Robin) 1:00pm - 2:00pm Wood's Staff Meeting (Robin) 1:00pm - 5:00pm Class (Lori) 3:30pm - 4:30pm MCTS Mtg	7:30am - 5:00pm Travel - Lincoln, NE (Bob) 8:00am - 8:45am One-on-one w/Gil (Robin) 10:00am - 11:00am Pulp and Paper Mtg - Mu (Mike Toney) 11:30am - 12:30pm Branch Lunch (optional) 2:00pm - 4:00pm Lab Accreditation Ad Hoc Panel Conf. Call (202-260-4270) (Robin, Gil?) 4:00pm - 5:00pm BHO EMMC Briefing (Gil and Robin to brief Bill)	7:30am - 5:00pm Travel - Lincoln, NE (Bob) 10:00am - 11:00am Chlorinated Hydrocarbons Method Mtg - EML Conference Room 1:00pm - 5:00pm Class (Lori)	7:30am - 5:00pm Travel - Lincoln, NE (Bob) 1:00pm - 5:00pm Class (Lori)	7:30am - 4:00pm RDO (Polly, Terry) 7:30am - 4:00pm Travel - Lincoln, NE (Bob)

Enclosure 1

NOT SUBJECT TO THE REQUIREMENTS OF SECTION 3507, PAPERWORK REDUCTION ACT OF 1980.

RECEIVED SEP 7 1994

INFORMATION SURVEY OF THE APPLICATION OF FIBER-BED MIST ELIMINATORS

Please complete the information requested in the following survey and attach additional pages or drawings if necessary. If there are any questions regarding this request, please contact Mr. Lalit Banker of EPA at (919) 541-0252 or Ms. Robin Jones of Midwest Research Institute at (919) 677-0249, ext. 5351.

Please mail the completed response by September 2, 1994, to:

Mr. Lalit Banker
Emission Standards Division (MD-13)
U. S. Environmental Protection Agency
Research Triangle Park, N.C. 27711

I. GENERAL INFORMATION

A. Name of company: Martin MArietta Armament Systems

B. Name and title of respondent: ~~Robyn Frank - Manager~~ EHS

C. Address: Lakeside Ave
Burlington, VT 05401

D. Telephone No.: (802) 657-6982

E. Date of response: ~~9/1/94~~

F. Operating hours per year: potential - 6240 actual 94 - 1000

II. PROCESS AND CONTROL DEVICE INFORMATION

A. Is this facility a major or area sources as defined by Section 112 of the Clean Air Act (CAA)? Major sources are defined as "any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants." Table 1 provides a list of all compounds that are considered hazardous air pollutants under the CAA. Any source not meeting the definition of a major source is considered an area source.

Area Source

B. Is this facility a job or captive shop? Captive shops perform electroplating or anodizing services as one operation, within or for a manufacturing facility. Job shops provide custom plating or anodizing services for many different clients.

Captive

C. Does your facility operate a fiber-bed mist eliminator to control chromium emissions from chromium electroplating and/or chromium anodizing tanks? If so, please complete Table 2 for each fiber-bed mist eliminator system. If more than three fiber-bed units are in use at your facility, please copy Table 2 as needed for the additional units. In addition, please attach a detailed schematic of each control system.

Yes

D. Please provide any test data that support the performance of the fiber-bed mist eliminator system. In order to evaluate the test data, please send the full test report including: (1) the sampling site description; (2) a description of the sampling and analysis procedures and any modifications made to these procedures; (3) quality assurance procedures; (4) records of operating conditions during the test, preparation of standards, and calibration; (5) raw data sheets for field sampling and field laboratory analysis; and (6) documentation of calculations.

See attached final report

E. Why did your facility decide to install a fiber-bed mist eliminator control system? Was the facility attempting to meet a specific emission limitation required by State or local regulations? If so, please cite the applicable regulation(s).

State of Vermont required under VT 5-261 total chromium emissions of .0000071 lbs/8 hr. That standard has since been changed to chrome VI - .0000071 lbs/8hr and all other chrome - .01 lbs/8hr

F. Did the installation of the fiber-bed mist eliminator control system result in an increase in the cost of your electroplated or anodized product, or in the end product? If so, how much? Was the increased cost passed to the customer or absorbed by the company?

yes - increased overhead costs by $52K per year which added 1% to the overhead rate which is passed on to customer.

G. Please provide the total number of chromium electroplating and chromium anodizing tanks at your facility, the size of these tanks in gallons, the other types of control used to control chromium emissions from these tanks, if any, and the number of chromium tanks vented to each control system?

There is 1- 600 gal chromic acid anodizing tank which vents diretly to the CECO filter. There is 1-200 gal chrome repair tank which also vents directly to the CECO filter and 1-1200 gal chromium electroplating tank that vents to a mesh pad mist eliminator prior to venting to the one CECO filter.

TABLE 1. LIST OF HAZARDOUS AIR POLLUTANTS

CAS No.	Chemical name	CAS No.	Chemical name
75070	Acetaldehyde	105602	Caprolactam
60355	Acetamide	133062	Captan
75058	Acetonitrile	63252	Carbaryl
98862	Acetophenone	75150	Carbon disulfide
53963	2-Acetylaminofluorine	56235	Carbon tetrachloride
107028	Acrolein	43581	Carbonyl sulfide
79061	Acrylamide	120809	Catechol
79107	Acrylic acid	133904	Chloramben
107131	Acrylonitrile	57749	Chlordane
107051	Allyl chloride	7782505	Chlorine
92671	4-Aminobiphenyl	79118	Chloroacetic acid
62533	Aniline	532274	2-Chloroacetophenone
90040	o-Anisidine	108907	Chlorobenzene
1332214	Asbestos	510156	Chlorobenzilate
71432	Benzene (including benzene	67663	Chloroform
	from gasoline)	107302	Chloromethyl methyl ether
92875	Benzidine	126998	Chloroprene
98077	Benzotrichloride (isomers and mixture)	1319773	Cresols/Cresylic acid
100447	Benzyl chloride	95487	o-Cresol
92524	Biphenyl	108394	m-Cresol
117817	Bis(2-ethylhexyl)phthalate(DEHP)	106445	p-Cresol
542881	Bis(chloromethyl)ether	98828	Cumene
75252	Bromoform	94757	2,4-D, salts and esters
106990	1,3-Butadiene	3547044	DDE
156627	Calcium cyanamide	334883	Diazomethane
132649	Dibenzofurans	51285	2,4-Dinitrophenol
96128	1,2-Dibromo-3-chloropropane	121142	2,4-Dinitrotoluene
84742	Dibutylphthalate	123911	1,4-Dioxane (1,4-Diethyleneoxide)
106467	1,4-Dichlorobenzene(p)	122667	1,2-Diphenylhydrazine
91941	3,3-Dichlorobenzidene	106898	Epichlorohydrin (1-Chloro-2,3-epoxypropane)
111444	Dichloroethyl ether (Bis(2-chloroethyl ether)	106887	1,2-Epoxybutane
542756	1,3-Dichloropropene	140885	Ethyl acrylate
62737	Dichlorvos	100414	Ethyl benzene
111422	Diethanolamine	51796	Ethyl carbamate (Urethane)

TABLE 2. FIBER-BED MIST ELIMINATOR CONTROL SYSTEM DESIGN AND OPERATION

Operating Parameters	Fiber-bed Mist Eliminators		
	Unit #1	Unit #2	Unit #3
Year installed	1992		
Total ventilation rate, acfm	20,000 cfm		
Type of prefiltering device[a]	mesh pad mist elimin		
Type of monitoring device, if any	Pressure none		
Pressure drop across unit, in. of water	11"		
No. of fiber elements	5		
Type of fiber material (e.g., glass, polypropylene)	polypropylene		
Total number of tanks vented to system	3		
Total number of hard chromium plating tanks vented to system	2		
Total number of chromium anodizing tanks vented to system	1		
Capacity of each hard chromium plating tank vented to system, gals	1-1200 gal 1- 200 gal		
Capacity of each chromium anodizing tank vented to system, gals	1- 600 gal		
Are fume suppressant used in the plating or anodizing tanks (Y/N)?	N		
Are polypropylene ball balls used in the plating or anodizing tanks (Y/N)?	N		
Typical operating range of chromium plating tanks, amperes	1- 20 amps 1- 150-800		

TABLE 2. (continued)

Operating Parameters	Fiber-bed Mist Eliminators		
	Unit #1	Unit #2	Unit #3
Typical operating range of chromium anodizing tanks, volts/amperes	100 hp		
Type of parts plated (e.g., industrial rolls)	carbon steel gun barrels		
Type of parts anodized (e.g., aircraft landing gear)	Ammunition feed systems		
Type of end products from the facility	Ammunition feed & gun sys		
Typical plating or anodizing cycle, hrs	plating=8.5 hrs anodiz = 40 min		
Total installed capital cost of control system, $	$444,000		
Total operating costs of control system, $	$52,320		

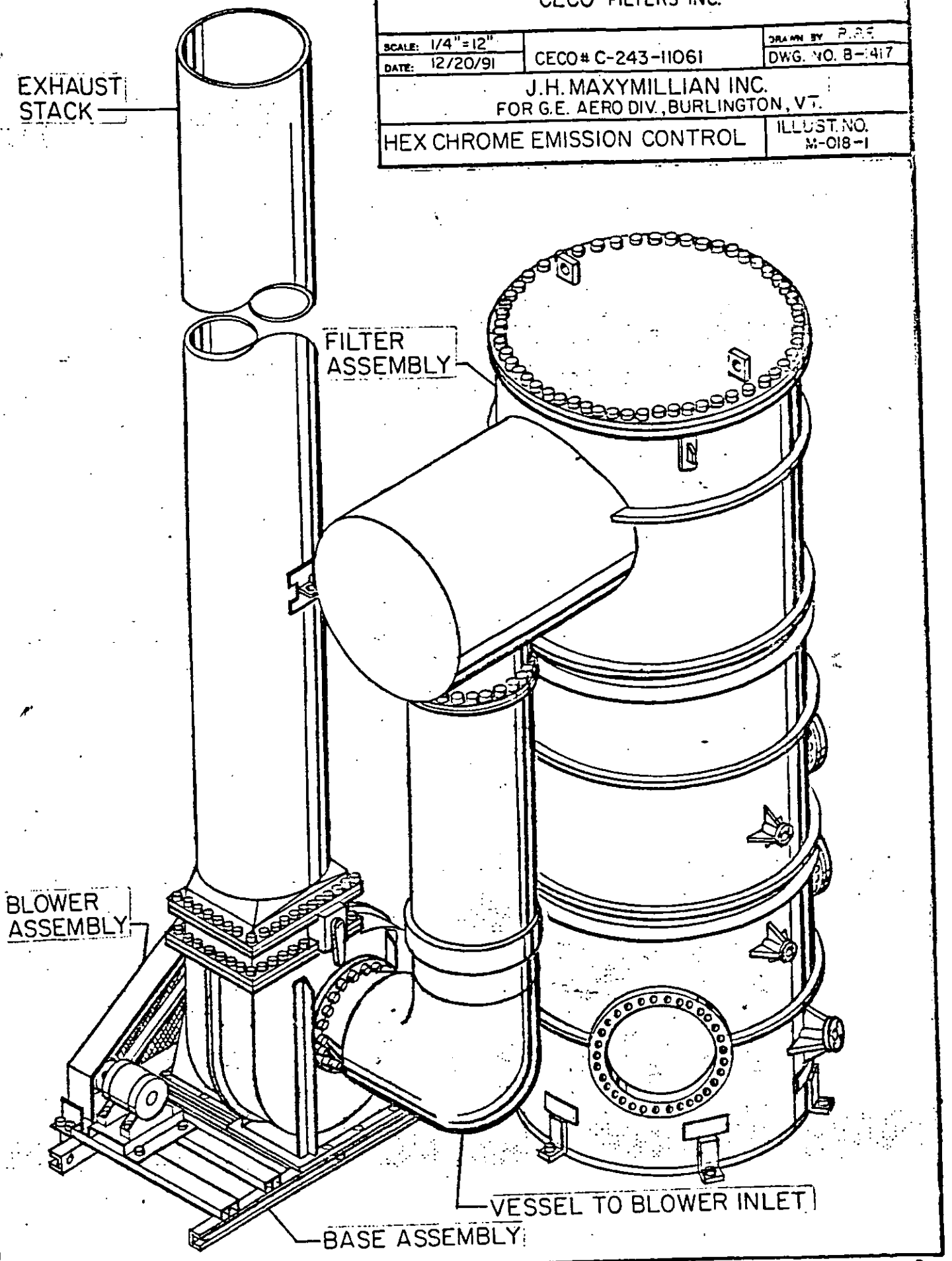
[a]Pre-filtering device refers to any control device located upstream of the fiber-bed unit to reduce the plugging potential of the unit. Typical pre-filtering devices consist of mesh-pad mist eliminators, chevron-blade mist eliminators, or packed-bed scrubbers.

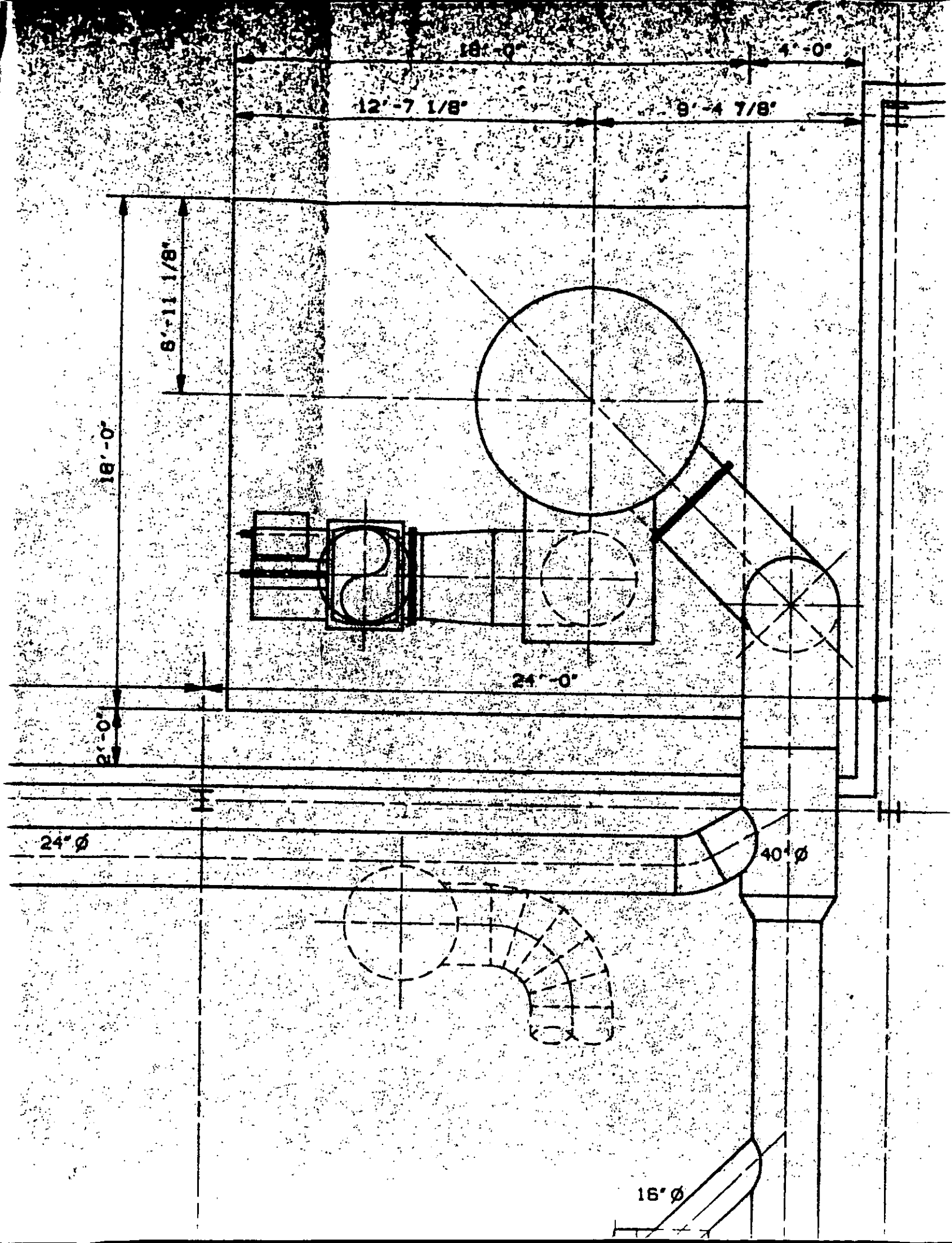
CECO FILTERS INC.

SCALE: 1/4"=12"	CECO # C-243-11061	DRAWN BY R.P.S.
DATE: 12/20/91		DWG. NO. 8-1417

J.H. MAXYMILLIAN INC.
FOR G.E. AERO DIV., BURLINGTON, VT.

HEX CHROME EMISSION CONTROL — ILLUST. NO. M-018-1

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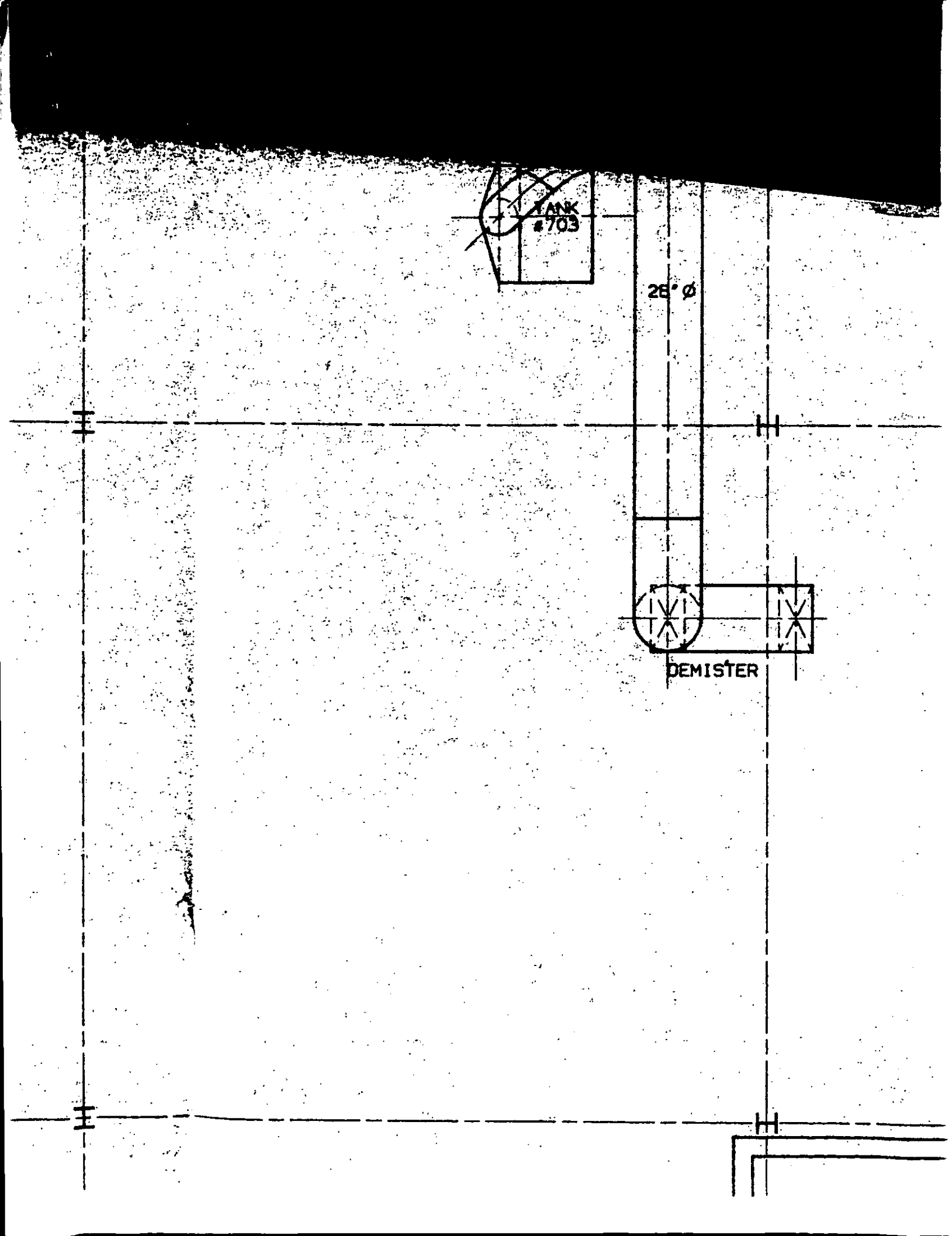
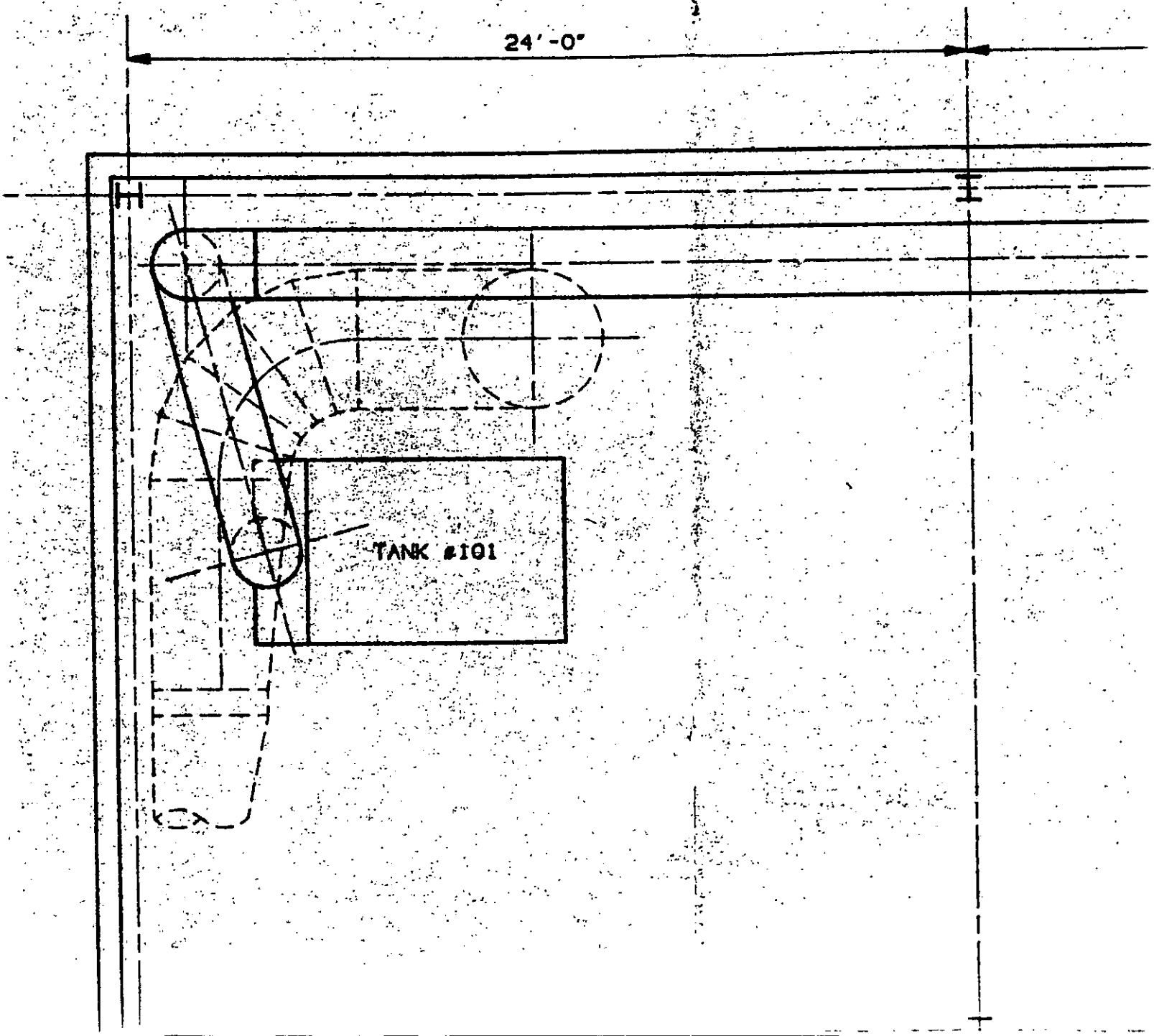
4'-0"
12'-7 1/8"
9'-4 7/8"
8'-11 1/8"
18'-0"
24'-0"
2'-0"
24"Ø
40"Ø
16"Ø


TANK
#703
28" ø
DEMISTER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TANK #101

Eastmount Engineering

Environmental Consultants — Air Quality Specialists

FINAL REPORT

CHROMIUM REMOVAL PERFORMANCE TEST

CECO FILTER

PREPARED FOR: General Electric Aerospace
Lakeside Avenue
Burlington, VT 05401

CONCERNING: Chromium Removal Performance Testing
CECO Filter - Plating Line No.5
GE Aerospace
Burlington, VT
March 19, 1992

PREPARED BY: Eastmount Engineering, Inc.
420 Main Street
Walpole, MA 02081
April 15, 1992

Anthony M. Stratton
Project Director

April 15, 1992
Date

CHAIN OF CUSTODY

All samples were in my custody during the chromium removal performance testing on the CECO filter at GE Burlington on March 19, 1992. This includes the time from pre-test laboratory preparation at Eastmount through shipment to Triangle Laboratories. Chain of Custody documentation was maintained throughout the program. These documents are held on file at Eastmount, and are available upon request.

Anthony M. Stratton
Project Director

TABLE OF CONTENTS

APPENDICES

1.0 ***COMPENDIUM***

Eastmount Engineering, Inc. conducted a chromium removal performance test on the recently installed CECO filter at General Electric Aerospace in Burlington, Vermont on March 19, 1992.

The purpose of this program was to determine the total chromium removal efficiency and emission rate of the CECO filter system which services Plating Line No. 5. Results were compared to the filter performance specifications of 99.98% removal efficiency and 7.10e-6 lb/8hrs outlet emissions

Testing was conducted at the inlet and outlet of the CECO filter in accordance with the EPA "Methodology for the Determination of Metals Emissions from Stationary Source Combustion Processes". A detailed explanation of the procedures which were used can be found in Sections 4 and 5 of this report.

Three 2-hour runs were conducted at the inlet and outlet sampling locations simultaneously. During testing, the Plating Line No. 5 was operating continuously. The filter was operating normally.

Anthony Stratton, Project Director, was responsible for all phases of the program. He also supervised all field laboratory activities. Kieran Nolan, Mark Wescott and Sean Griffin operated and maintained the sampling trains, and assisted in the field laboratory. Robyn Frank of GE Aerospace coordinated testing with plating operations. David Dimock of Hill Engineering observed all testing and recovery procedures.

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1.0 COMPENDIUM (cont.)

Table 1-1
Summary of Chromium Testing

Location	Units	Run 1	Run 2	Run 3	**Average**
Inlet	lb/8hrs	1.77e-2	8.70e-2	3.62e-2	**4.70e-2**
	lb/hr	2.22e-3	1.09e-2	4.53e-3	**5.88e-3**
	mg/dscm	3.43e-2	1.41e-1	7.41e-2	**8.31e-2**
Outlet	lb/8hrs	2.16e-3	1.89e-3	1.37e-3	**1.81e-3**
	lb/hr	2.70e-4	2.37e-4	1.71e-4	**2.26e-4**
	mg/dscm	4.17e-3	3.07e-3	2.79e-3	**3.33e-3**
Removal Efficiency	%	87.8	97.8	96.2	**93.9**

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1.0 COMPENDIUM (cont.)

Table 1-2
CECO Inlet Test Data

Parameter	Units	Run 1	Run 2	Run 3	**Average**
Start Time	—	11:25	14:35	17:20	—
End Time	—	13:25	16:35	19:20	—
Sampling Time	min.	120	120	120	**120**
Meter Volume	dscf	63.95	66.48	67.66	**66.03**
Isokinetics	%	111.0	109.7	111.0	**110.6**
Chromium Catch	mg	0.0621	0.2657	0.1419	**0.1566**
Stack Temp	°F	76.9	77.5	78.3	**77.6**
Stack Moisture	%	0.7	0.4	0.9	**0.7**
*Delta P	"H2O	—	—	—	—
*Stack Velocity	fps	—	—	—	—
*Stack Flow	acfm	—	—	—	—
*Stack Flow	dscfm	—	—	—	—
CO2	%	0	0	0	**0**
O2	%	20.9	20.9	20.9	**20.9**

* See outlet test data for these values

Table 1-3
CECO Outlet Test Data

Parameter	Units	Run 1	Run 2	Run 3	**Average**
Start Time	—	11:25	14:35	17:20	—
End Time	—	13:25	13:35	19:20	—
Sampling Time	min.	120	120	120	—
Meter Volume	dscf	82.21	103.55	77.13	**87.63**
Isokinetics	%	99.0	104.7	98.3	**100.7**
Chromium Catch	mg	0.0097	0.0090	0.0061	**0.0083**
Stack Temp	°F	84.1	85.1	85.5	**84.9**
Stack Moisture	%	0.5	0.6	0.6	**0.6**
Delta P	"H2O	0.38	0.55	0.37	**0.43**
Stack Velocity	fps	34.6	41.3	32.8	**36.2**
Stack Flow	acfm	18068	21597	17141	**18935**
Stack Flow	dscfm	17259	20573	16311	**18048**
CO2	%	0	0	0	**0**
O2	%	20.9	20.9	20.9	**20.9**

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2.0 REFERENCE METHOD SAMPLING LOCATIONS

The CECO filter was tested at the inlet and outlet for chromium removal efficiency determination. The following describes each location.

CECO Inlet Sampling Location

Inlet samples were taken in the short horizontal duct section which enters the CECO filter at its base. The internal diameter is 40 inches. One test port was located on a horizontal plane in the middle of the duct. The port is approximately five feet above ground level. This location does not meet the requirements of Method 1. Therefore, accurate flow rate values at the inlet could not be obtained. All inlet flow calculations were based on outlet flow data (it was assumed that the flow entering the CECO filter equaled the flow leaving).

CECO Outlet Sampling Location

Outlet samples were taken in the vertical exhaust stack which is located at the CECO filter outlet after the ID fan. The internal diameter is 40 inches. One test port was located on a horizontal plane approximately 22 feet above ground level. This location does meet the requirements of Method 1. Therefore, all flow calculations were based on outlet flow data.

Figure 2-1 on the following page illustrates the inlet and outlet sampling locations.

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2.0 REFERENCE METHOD SAMPLING LOCATION (cont.)

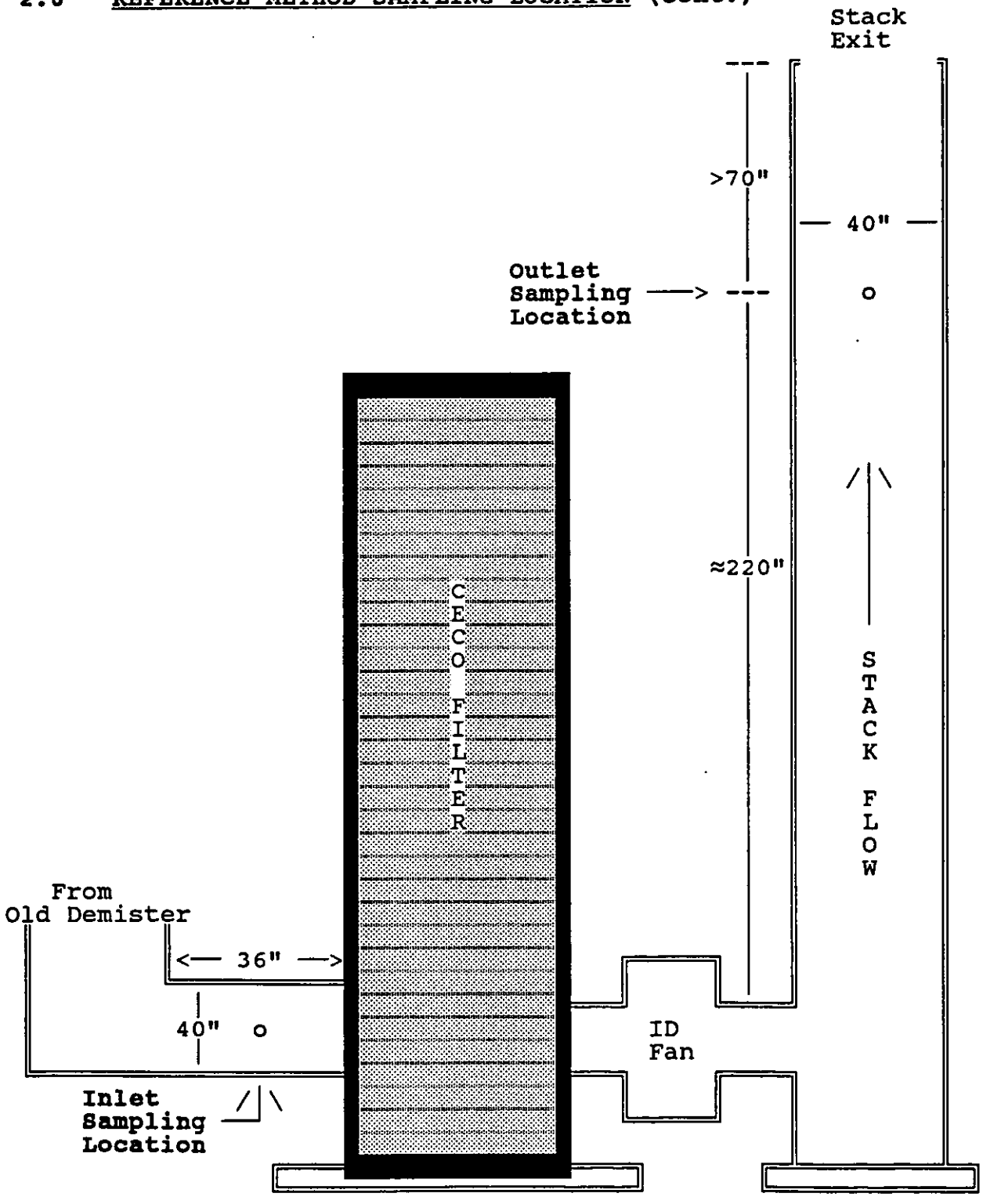

FIGURE 2-1

CECO FILTER SAMPLING LOCATIONS

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3.0 TRAVERSE POINT LOCATIONS

For each location, the internal diameter at the sampling location is 40 inches. The outlet test ports are approximately 220 inches or 5.5 diameters from the nearest upstream disturbance (breeching enetring stack), and greater than 70 inches or 1.75 diamters from the nearest downstream disturbance (stack outlet). Based on the requirements of EPA Method 1, the probe was marked for 10 points on a traverse. Table 3-1 below lists the probe markings. Each point was sampled for 12 minutes. Readings were taken every 6 minutes.

The inlet location did not meet the requiremnts of EPA Method 1. The overall distance from the upstream to the downstream disturbance was approximately 42 inches. EPA Method 1 requires atleast 2 diameters from the upstream disturbance to the port, and atleast 0.5 diameters from the port to the downstream disturbance. The port was located in the middle of the duct section, and the probe was placed at a single point in the center of the duct for the duration of each run.

TRAVERSE POINT	% OF DIAMETER	DISTANCE FROM OUTSIDE OF PORT (INCHES)
1	2.6	1.0
2	8.2	3.3
3	14.6	5.8
4	22.6	9.0
5	34.2	12.8
6	65.8	26.3
7	77.4	31.0
8	85.4	34.2
9	91.8	36.7
10	97.4	39.0

FIGURE 3-1
CECO FILTER OUTLET PROBE MARKINGS

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4.0 SAMPLING TRAIN AND ANALYTICAL PROCEDURES

Total chromium was tested in accordance with the EPA "Methodology for the Determination of Metals Emissions from Stationary Source Combustion Processes" in the manner of a compliance test at the locations described in Sections 1, 2 and 3. Three test runs constituted the test series. In this section, the test procedures that were used, including sampling and analysis, are discussed.

4.1 DESCRIPTION OF SAMPLING AND ANALYTICAL PROCEDURES

Total Chromium emissions from the facility were quantified using the EPA "Methodology for the Determination of Metals Emissions from Stationary Source Combustion Processes". Three 2-hour runs were conducted at the inlet and outlet simultaneously. During each run, at least 60 dry standard cubic feet were collected.

The sampling train consisted of a standard method 5 sampling train, modified by replacing the stainless steel probe liner and nozzle with glass components to avoid contamination of the sample. A filter was not used since a total chromium value (rather than a fractioned value) was adequate. Additionally, acidic KMnO4 solution for mercury absorption was excluded from the sampling train. A teflon line was used to connect the probe to the impingers.

The impinger train consisted of the following: impingers 1 and 2 - 100 ml of 0.1N HNO3/10% H2O2 absorbing solution in each; impinger 3 - empty; impinger 4 - loaded with a known amount (approx. 200g) of silica gel.

Before mobilization, all glassware was soaked in a 10% nitric acid bath for atleast 4 hours. Glassware was then thoroughly rinsed three times with DIUF water and then once with acetone. After air-drying, all glassware was sealed for transport.

Once onsite, all absorbing solutions were prepared fresh daily and kept refrigerated. The train was carefully assembed, making sure to protect glassware from contamination during handling. Once assembled, each train was subjected to 15" Hg vacuum to assure there were no leaks.

Emissions were measured isokinetically using the EPA Methods 1-5 procedures. This includes the determination of the proper number of sample points and their locations in the stack (RM 1), the determination of stack gas velocity and volumetric flow (RM 2), stack gas molecular weight (RM 3) and moisture content (RM 4).

4.0 SAMPLING TRAIN AND ANALYTICAL PROCEDURES (cont.)

At the end of each run, the contents of impingers 1, 2 and 3 were quantitatively recovered and stored in an acid-washed container. All components of the sampling train (nozzle, probe liner, teflon jumper, impingers 1 through 3, and connecting glassware) were thoroughly rinsed with 0.1N nitric acid into the container.

A reagent blank was taken during the program to insure that there was no contamination due to contamination of reagents.

Samples were analyzed at Triangle Laboratories in Durham, North Carolina. Total Chromium was determined via graphite furnace atomic absorption (GFAA). The results were reported in units of mg. These were used to calculate emission rate in units of mg/dscm and lb/8hrs.

4.2 DESCRIPTION OF ISOKINETIC SAMPLING

What follows is a general description of the sampling train and operational procedures for the isokinetic sampling methods.

4.2.1 Emission Sampling Equipment

The specific train used during these tests was manufactured by Research Appliance Company (RAC). The design specifications of this train meet all the requirements of

EPA's Reference Method 5 as found in the Federal Regulations under Section 40 CFR 60 Appendix A, as amended. The following is a description of the individual pieces of equipment that make up the train.

Nozzle - The nozzle is constructed of quartz glass of the buttonhook design. A range of sizes suitable for isokinetic sampling were available. All nozzles were calibrated before testing. A nozzle calibration sheet may be found in Appendix VI of this report.

Probe - A 6 foot heated stainless steel probe with a borosilicate glass liner was used.

Pitot Tube - A Type S pitot tube attached to the probe was used to monitor the stack gas velocity. Since the pitot tube meets all of the dimensional criteria set forth in Method 2 of 40CFR60, a coefficient of 0.84 was used.

Filter Holder - N/A

4.0 SAMPLING TRAIN AND ANALYTICAL PROCEDURES (cont.)

Condenser - Four impingers, connected in series with leak-free ground glass fittings, were used as the condenser. The first, third and fourth impingers were of the Greenburg-Smith design modified by replacing the tip with a 1/2" diameter glass tube extending to approximately 1/2" from the bottom of the flask. The second impinger was a standard Greenburg-Smith.

Metering System - A vacuum gauge, inclined manometer, leak-free pump, calibrated thermocouples, and a calibrated dry gas meter were the basic components used to meter the dried sample gas through the system. Sample meter box and thermocouple calibration sheets may be found in the appendices of this report.

Gas Density Determination - An Orsat analyzer was used to determine O2 and CO2 content. They were used to calculate the molecular weight of the flue gas.

4.2.2 Emission Sampling Procedures

All sampling procedures were conducted in strict accordance with the Methods prescribed in the Code of Federal

Regulations as found in 40CFR60 as amended, where available. The following is the sequence of events that occur prior to and during the actual test.

Traverse Points - The traverse points were calculated in accordance with Method 1 and the probe was marked accordingly.

Static Pressure - The static pressure of the ducts were checked and recorded.

Preliminary Traverse - A preliminary traverse was conducted. Readings included the pressure drops and gas temperatures.

Nomograph - Once the above information has been obtained, the nomograph for the actual test was set up to correlate the isokinetic relationships.

Barometric Pressure - Barometric pressure was obtained and recorded by use of an aneroid barometer at the test site.

Sampling Train Set-Up -

(a) The filter was placed in the filter holder and visually checked. Filter number and tare weight were recorded on the field data sheets,

(b) The impingers were loaded with the appropriate absorbing solution. Volumes were recorded on the field data sheets,

4.0 SAMPLING TRAIN AND ANALYTICAL PROCEDURES (cont.)

(c) Approximately 200 grams of silica gel were placed in the fourth impinger. Exact weights were logged on the field data sheets,
(d) Crushed ice was placed around the impingers,
(e) Once the entire train was assembled, the probe and hot box heaters were turned on.

Pre-Test Leak Check - Once the heater box was at the desired temperature for testing, the system was leak checked at fifteen inches of vacuum (15"Hg). A leak rate of less than 0.02 CFM was achieved prior to the start of sampling.

Final Check - Once everything was ready to go, plant operations were checked to confirm that the facility was operating at desired capacity.

Sampling - Isokinetic sampling, per Reference Method 5 then took place.

Post-Test Leak Check - Upon completion of each test run, the system was leak checked at the highest vacuum recorded during that run. All leak checks less than 0.02 CFM were considered acceptable.

Sample Recovery - All samples were recovered according to the respective Reference Method procedures.

Isokinetics - Once all sample recovery had been completed (including moisture determination), calculations were conducted to determine the percent isokinetics of the test run.

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5.0 QUALITY CONTROL PROCEDURES

5.1 GENERAL

Throughout all phases of the test program, including sampling, analysis and data reduction, strict quality control procedures were adhered to.

Sampling was conducted by trained personnel with extensive experience in both inorganic and organic compound sampling. Analysis for chromium was subcontracted to Triangle Laboratories of Durham, North Carolina.

All sampling and analysis was conducted in accordance with EPA test procedures. The quality control procedures found in the EPA Quality Assurance Handbook for Air Pollution Measurement Systems were adhered to as well.

All chemical reagents used in sampling, recovery and analysis were certified American Chemical Society grade (unless a higher purity is specified in the Method). Filters for particulate analysis were desiccated and weighed to a constant weight before and after testing as specified in the EPA Quality Assurance Handbook. All filters were identified numerically in labelled petri dishes which were sealed and transported to and from the field in a secure carrying case. Filters subject to chemical analysis after testing (trace metals, organics) were specially prepared from high purity glass fiber to reduce the possibility of blank contamination.

Eastmount Engineering's entire equipment inventory is on a schedule of routine maintenance and calibration. This includes meter boxes, thermocouples, barometers, pitot tubes and sampling nozzles.

Meter boxes are calibrated over a full range of flow rates against a wet test meter every six months. After each field use the meter box is given a calibration check against the wet test meter at the average flow rates and vacuums experienced in the field. Thermocouples are calibrated as specified in the EPA Handbook against a NBS traceable mercury in glass thermometer. Pitot tubes are visually inspected for conformance to the dimensional criteria specified in EPA Method 2.

All pitot tubes used by Eastmount meet this criteria and are assigned a pitot tube coefficient of 0.84. Pitot tubes which do not meet the criteria are either repaired or discarded. Nozzles are engraved with identification numbers and are calibrated in the field immediately before use with calipers using a minimum of three (3) diameters. If they do not meet the required maximum allowable range of .004 inches between points, then they are machined to fit this criteria.

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5.0 QUALITY CONTROL PROCEDURES (cont.)

Isokinetic sampling was conducted following the procedures specified in EPA Reference Methods 1-5 including the selection of the proper number and location of sampling points, collection of gaseous sample for ORSAT analysis, and maintenance of an isokinetic flow rate. Sampling was conducted for the period of time recommended by the individual method.

Sample train recovery procedures were conducted in accordance with the specific methods. In general, filters and impinger catches were recovered quantitatively , and a probe and sample train front half rinse was conducted using the appropriate solvent/reagent. Blanks were collected and submitted for analysis for all reagents and filters used in sampling. Samples were transferred to the appropriate (glass or Nalgene bottles or petri dishes) containers which were then labelled for identification, volumes noted and liquid levels marked.

Chain of custody documentation was initiated in the field and maintained on all samples from their recovery through inter-laboratory transfer until their final analysis. Upon Eastmount's return from the field, samples were assigned a sample bank number and logged into the master sample log book.

Analysis was conducted in accordance with the specific methods using good laboratory procedures. Subcontracted laboratory work was conducted by qualified analytical laboratories. Analytical results were used to calculate stack gas pollutant concentrations and emission rates. All calculations were conducted in strict accordance with the equations found in the individual methods. Isokinetic and emission rate calculations were conducted on a computer and the input data was checked by a person other than the original calculator to ensure that it was correct.

5.3 EPA MULTI-METALS

Eastmount strictly followed the quality control requirments of the EPA Multi-Metals Method for glassware preparation.

Prior to field testing, extensive preparation was necessary to properly complete the test method. All glassware including probe liners, filter holders, impingers, connecting pieces, and sample containers, were thoroughly cleaned with detergent and tap water, soaked in a 10% HNO_3 bath for a minimum of four hours, rinsed with DI H_2O, rinsed with high purity acetone and allowed to air dry before sealing with parafilm and labeling with the preparation date. All proper calibrations (ie. meter box and thermocouples) were conducted per normal EPA Method 5 procedures.

5.0 QUALITY CONTROL PROCEDURES (cont.)

The sampling train was loaded by a qualified chemist and carefully assembled by a qualified engineer. Sampling was conducted in accordance with EPA Method 5 procedures for 2 hours at a flow rate of less than 1.0 cfm.

Blanks were collected for all reagents in the field laboratory and were analyzed along with the test samples to determine the level of contamination introduced by the reagent.

Samples were recovered following procedures outlined in the method. The nozzle, probe, teflon jumper, first three impingers and all connecting glassware were quantitatively recovered and rinsed 3 times with 0.1N HNO3 into a clean labelled container #1. Silica gel in the fourth impinger was measured to complete the moisture determination. All volumes used in the recovery were recorded.

Once at Eastmount's laboratory, all samples were assigned a number and entered into the sample log. Chain of custody was maintained from the date of sampling through laboratory analysis at Triangle Laboratories in Durham, North Carolina. Results were reported in units of mg/dscm, lb/hr and lb/8hrs.

These specific procedures in addition to Eastmount's usual high standard of quality control will help validate the results obtained in this test program. Eastmount is staffed by a team of qualified, experienced environmental professionals. As the majority of our emissions testing work is done for compliance purposes, strict QC procedures are incorporated into our everyday work performance.

6.0 FACILITY DESCRIPTION

The CECO filter installed at GE Aerospace in Burlington, Vermont is a fiber bed filter consisting of a containing vessel, aerosol filter assemblies, a mesh pad mist eliminator, water wash spray manifolds, a blower, a damper, insulation with heat trace, interconnecting duct work, and an exhaust stack with a rain cap. It was installed downstream of the pre-existing impaction type mist eliminator on Plating Line #5.

The design flow rate through the unit is 20,000 ACFM at ambient conditions. The operating pressure drop across the system is 11 inches w.c.

Sampling took place between the old mist eliminator and the CECO filter (downstream from the point where all ducts from various tanks converge). Figure 6-1 on the following page shows the flow of air from the tanks through the system.

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6.0 FACILITY DESCRIPTION (cont.)

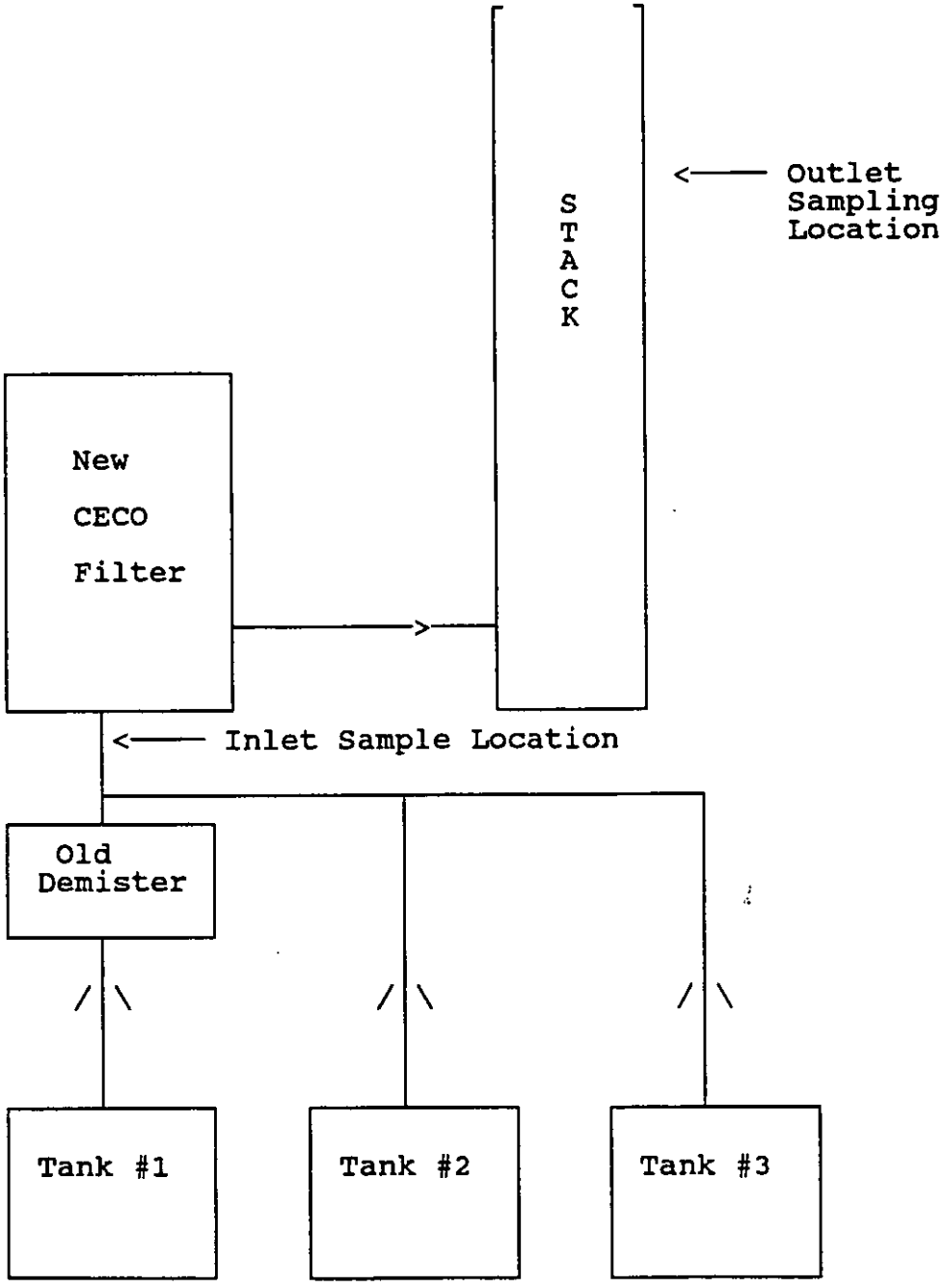

Figure 6-1
Flow Diagram

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APPENDIX I

NOMENCLATURE

NOMENCLATURE

ACFM	Actual cubic feet per minute.
Ar	Acetone residue - result of Blank evaporation.
AREA NOZZLE	Area of the nozzle in square feet.
AS	Area of the stack in square feet.
BWO	The amount of moisture in the flue gas.
% CO	Percent of carbon monoxide in the flue gas.
% CO2	Percent of carbon dioxide in the flue gas.
CM	Pollutant concentration in micrograms per dry standard cubic meter.
CM @ 7%	Pollutant concentration in micrograms per dry standard cubic meter corrected to 7% oxygen.
Cp	Pitot tube coefficient.
Cs	The concentration in the stack in pounds per dry standard cubic foot.
Cs'	The concentration in the stack in grains per dry standard cubic foot.
Cs' 7% O2	The concentration in the stack in grains per dry standard cubic foot corrected to 7% oxygen.
DELTA H	The meter orifice differential.
DELTA H (ABS)	The meter orifice differential, absolute conditions in inches of mercury.
Dn (IN)	Diameter of the nozzle in inches.
DRY GAS IN	Temperature of the dry gas meter inlet degrees Fahrenheit.
DRY GAS OUT	Temperature of the dry gas meter outlet degrees Fahrenheit.
Ds (FT)	Diameter of the stack in feet.
DSCFH	Dry standard cubic feet per hour.
DSCFM	Dry standard cubic feet per minute.
END METER	The dry gas meter reading at the end of the test.

NOMENCLATURE (cont.)

F factor	The theoretical amount of air in dry standard cubic feet (DSCF) needed to combust a million Btu's worth of fuel.
Filter Catch	The amount of particulate captured on the filter during testing.
INT METER	The dry gas meter reading at the beginning of the test.
LB/SCF	Pounds per standard cubic foot.
Md (DRY)	The dry molecular weight of the flue gas in pounds per pound mole.
Mg/M3	Milligrams per cubic meter.
Mn	The amount of particulate collected by washing the nozzle, probe, and front half of the glassware, reported in milligrams.
Mn'	The milligrams of particulate collected minus the blank.
Ms (WET)	Wet or actual molecular weight of the flue gas in pounds per pound mole.
Mw WET	Molecular weight of stack gas, wet basis.
% N_2	The percent of nitrogen in the flue gas.
NO PTS	Number of traverse points.
% O_2	Percent of oxygen in the flue gas.
P BAR	Barometric pressure at test location.
P STK	Static pressure of the stack in inches of water.
PMR	The emission rate in pounds per hour.
PS (ABS)	Absolute pressure conditions in the stack in inches of mercury.
Qs	The volumetric flow rate of the flue gas in dry standard cubic feet per hour.
SQ ROOT	The square root of each velocity head measurement.
SQRT DELTA P	The average of the square roots of the measured pressure drops.

NOMENCLATURE (cont.)

Stack Temp or TS (°F)	The temperature of the stack in degrees Fahrenheit.
TS (°R)	The temperature of the stack in degrees Rankine.
T (Hot Box)	Temperature around the filter box, degrees Fahrenheit.
TM (°F)	Average temperature of the dry gas meter in degrees Fahrenheit.
TM (°R)	Average temperature of the dry gas meter in degrees Rankine.
VEL HEAD	The pressure drop measured across the pitot tubes.
VI (TOT)	The amount of water collected in the impingers in milliliters.
VM (CF)	The volume sampled through the dry gas meter in cubic feet.
VM STD	Volume sampled through the dry gas meter corrected to standard conditions.
VS	Velocity of the stack gas in feet per second.
VW STD	The amount of moisture collected, converted to standard cubic feet.
Y	Meter box calibration factor.
θ	Sampling time in minutes.

APPENDIX II

INPUT DATA SHEETS

INPUT DATA SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER INLET

RUN #: CR-1-IN
DATE : 19MAR92

Ds (FT)	3.33							
Dn (IN)	.203							
FILTER #	N/A	TRAV PT	VEL HEAD	SQ ROOT	DELTA H	DRYGAS IN	DRYGAS OUT	STACK TEMP
PIT COEFF	.84							
		A1	.42	.65	.88			
IMP-1 (INT)	100	2	.43	.66	.90	95	85	76
		3	.42	.65	.88	92	84	77
IMP-2 (INT)	100	4	.42	.65	.88	87	79	77
		5	.41	.64	.86	83	75	77
IMP-3 (INT)	0	6	.41	.64	.86	81	73	77
		7	.42	.65	.88	78	69	77
IMP-4 (INT)	500.0	8	.42	.65	.88	77	68	77
		9	.42	.65	.88	76	66	77
IMP-1 (FIN)	100	10	.41	.64	.86	76	65	77
IMP-2 (FIN)	100							
IMP-3 (FIN)	0							
IMP-4 (FIN)	509.3							
% CO2	.0							
% O2	20.9							
% CO	0							
P BAR	29.67							
P STK	-.80							
NO. PTS	1							
TEST LNGTH	120							
END METER	191.781							
LEAK CHECK	0							
INT METER	125.299							
BEGIN TIME:	11:25							
END TIME:	13:25							
AVERAGE			.42	.65	.88	82.8	73.8	76.9

INPUT DATA SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER INLET

RUN #: CR-2-IN
DATE : 19MAR92

Ds (FT)	3.33
Dn (IN)	.203
FILTER #	N/A
PIT COEFF	.84
IMP-1 (INT)	100
IMP-2 (INT)	100
IMP-3 (INT)	0
IMP-4 (INT)	500.0
IMP-1 (FIN)	98
IMP-2 (FIN)	99
IMP-3 (FIN)	0
IMP-4 (FIN)	509.0
% CO2	.0
% O2	20.9
% CO	0
P BAR	29.67
P STK	-.80
NO. PTS	1
TEST LNGTH	120
END METER	261.852
LEAK CHECK	0
INT METER	192.100
BEGIN TIME:	14:35
END TIME:	16:35

TRAV PT	VEL HEAD	SQ ROOT	DELTA H	DRYGAS IN	DRYGAS OUT	STACK TEMP
A1	.45	.67	.95	73	64	78
1	.46	.68	.97	76	64	77
2	.47	.69	.99	79	64	77
2	.46	.68	.97	83	66	77
3	.46	.68	.97	86	69	78
3	.46	.68	.97	89	72	77
4	.47	.69	.99	92	75	77
4	.46	.68	.97	94	78	78
5	.46	.68	.97	93	80	78
5	.46	.68	.97	91	80	77
6	.47	.69	.99	91	80	77
6	.47	.69	.99	90	80	78
7	.46	.68	.97	89	79	77
7	.46	.68	.97	88	77	77
8	.47	.69	.99	91	78	78
8	.46	.68	.97	94	79	78
9	.46	.68	.97	98	82	78
9	.45	.67	.95	101	85	77
10	.45	.67	.95	103	88	77
10	.45	.67	.95	105	90	79
AVERAGE	.46	.68	.97	90.3	76.5	77.5

INPUT DATA SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER INLET

RUN #: CR-3-IN
DATE : 19MAR92

Ds (FT)	3.33							
Dn (IN)	.203							
FILTER #	N/A	TRAV PT	VEL HEAD	SQ ROOT	DELTA H	DRYGAS IN	DRYGAS OUT	STACK TEMP
PIT COEFF	.84							
		A1	.47	.69	.99	76	73	78
IMP-1 (INT)	100	1	.47	.69	.99	81	72	79
		2	.46	.68	.97	81	71	78
IMP-2 (INT)	100	2	.48	.69	1.01	82	71	79
		3	.47	.69	.99	81	71	78
IMP-3 (INT)	0	3	.47	.69	.99	80	69	78
		4	.47	.69	.99	81	69	79
IMP-4 (INT)	500.0	4	.48	.69	1.01	79	68	78
		5	.47	.69	.99	80	69	77
IMP-1 (FIN)	102	5	.46	.68	.97	82	68	77
		6	.47	.69	.99	87	70	78
IMP-2 (FIN)	102	6	.47	.69	.99	90	73	78
		7	.47	.69	.99	95	76	78
IMP-3 (FIN)	0	7	.46	.68	.97	98	81	78
		8	.46	.68	.97	101	84	79
IMP-4 (FIN)	509.6	8	.47	.69	.99	101	88	78
		9	.48	.69	1.01	99	89	78
% CO2	.0	9	.47	.69	.99	97	88	79
		10	.48	.69	1.01	95	87	80
% O2	20.9	10	.48	.69	1.01	94	85	78
% CO	0							
P BAR	29.67							
P STK	-.80							
NO. PTS	1							
TEST LNGTH	120							
END METER	332.887							
LEAK CHECK	0							
INT METER	262.073							
BEGIN TIME:	17:20							
END TIME:	19:20							
AVERAGE			.47	.69	.99	88.0	76.1	78.3

INPUT DATA SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER OUTLET

RUN #: CR-1-OUT
DATE : 19MAR92

Ds (FT)	3.33
Dn (IN)	.253
FILTER #	N/A
PIT COEFF	.84
IMP-1 (INT)	100
IMP-2 (INT)	100
IMP-3 (INT)	0
IMP-4 (INT)	500.0
IMP-1 (FIN)	98
IMP-2 (FIN)	99
IMP-3 (FIN)	0
IMP-4 (FIN)	511.8
% CO2	.0
% O2	20.9
% CO	0
P BAR	29.67
P STK	-.80
NO. PTS	10
TEST LNGTH	120
END METER	398.714
LEAK CHECK	0
INT METER	312.592
BEGIN TIME:	11:25
END TIME:	13:25

TRAV PT	VEL HEAD	SQ ROOT	DELTA H	DRYGAS IN	DRYGAS OUT	STACK TEMP
A1	.18	.42	.72	90	70	83
1	.18	.42	.72	93	75	83
2	.15	.39	.60	95	77	83
2	.22	.47	.88	92	78	83
3	.32	.57	1.28	92	77	84
3	.32	.57	1.28	92	77	84
4	.40	.63	1.60	90	76	84
4	.40	.63	1.60	88	79	84
5	.48	.69	1.90	88	74	84
5	.55	.74	2.20	87	73	85
6	.70	.84	2.75	88	72	85
6	.64	.80	2.55	89	71	84
7	.40	.63	1.60	89	71	84
7	.40	.63	1.60	89	72	84
8	.37	.61	1.48	85	84	83
8	.34	.58	1.35	83	69	85
9	.33	.57	1.30	82	68	85
9	.38	.62	1.50	82	68	85
10	.38	.62	1.50	81	67	85
10	.38	.62	1.50	81	66	85
AVERAGE	.38	.60	1.496	87.8	73.2	84.1

INPUT DATA SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER OUTLET

RUN #: CR-2-OUT
DATE : 19MAR92

Ds (FT)	3.33
Dn (IN)	.253
FILTER #	N/A
PIT COEFF	.84
IMP-1 (INT)	100
IMP-2 (INT)	100
IMP-3 (INT)	0
IMP-4 (INT)	500.0
IMP-1 (FIN)	100
IMP-2 (FIN)	99
IMP-3 (FIN)	0
IMP-4 (FIN)	514.3
% CO2	.0
% O2	20.9
% CO	0
P BAR	29.67
P STK	-.80
NO. PTS	10
TEST LNGTH	120
END METER	498.616
LEAK CHECK	0
INT METER	388.909
BEGIN TIME:	14:35
END TIME:	16:35

TRAV PT	VEL HEAD	SQ ROOT	DELTA H	DRYGAS IN	DRYGAS OUT	STACK TEMP
A1	.18	.42	.72	71	72	85
1	.18	.42	.72	85	78	85
2	.26	.51	1.05	83	65	85
2	.31	.56	1.24	87	66	85
3	.30	.55	1.20	92	70	86
3	.32	.57	1.27	94	73	85
4	.46	.68	1.82	95	74	85
4	.44	.66	1.73	98	76	85
5	.37	.61	1.47	98	77	85
5	.58	.76	2.30	96	78	85
6	.63	.79	2.52	97	78	85
6	.60	.77	2.38	97	79	85
7	.83	.91	3.30	96	79	85
7	.91	.95	3.60	99	79	85
8	.80	.89	3.18	103	81	85
8	.88	.94	3.50	106	83	85
9	.68	.82	2.70	109	85	85
9	.68	.82	2.70	111	88	85
10	.68	.82	2.70	111	89	85
10	.83	.91	3.30	113	91	85
AVERAGE	.55	.72	2.170	97.1	78.1	85.1

INPUT DATA SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER OUTLET

RUN #: CR-3-OUT
DATE : 19MAR92

Ds (FT)	3.33							
Dn (IN)	.253							
FILTER #	N/A	TRAV PT	VEL HEAD	SQ ROOT	DELTA H	DRYGAS IN	DRYGAS OUT	STACK TEMP
PIT COEFF	.84							
		A1	.15	.39	.60	80	75	86
IMP-1 (INT)	100	1.18	.22	.00	.72	81	72	85
		2	.21	.46	.88	84	71	85
IMP-2 (INT)	100	2	.25	.50	.84	84	71	86
		3	.23	.48	.99	86	69	85
IMP-3 (INT)	0	3	.35	.59	.92	85	69	85
		4	.30	.55	1.39	85	69	86
IMP-4 (INT)	500.0	4	.35	.59	1.20	86	69	86
		5	.55	.74	2.19	87	69	86
IMP-1 (FIN)	100	5	.55	.74	2.19	92	71	85
		6	.80	.89	2.30	97	74	86
IMP-2 (FIN)	100	6	.45	.67	1.77	100	76	85
		7	.35	.59	1.39	101	78	85
IMP-3 (FIN)	0	7	.38	.62	1.51	103	78	85
		8	.33	.57	1.31	105	83	86
IMP-4 (FIN)	510.5	8	.33	.57	1.31	104	85	86
		9	.33	.57	1.31	102	85	85
% CO2	.0	9	.42	.65	1.68	101	85	86
		10	.38	.62	1.50	100	84	85
% O2	20.9	10	.38	.62	1.50	99	84	85
% CO	0							
P BAR	29.67							
P STK	-.80							
NO. PTS	10							
TEST LNGTH	120							
END METER	580.130							
LEAK CHECK	0							
INT METER	498.716							
BEGIN TIME:	17:20							
END TIME:	19:20							
AVERAGE			.37	.57	1.375	93.1	75.9	85.5

APPENDIX III

ISOKINETIC CALCULATIONS

ISOKINETIC CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER INLET

RUN #: CR-1-IN
DATE : 19MAR92

TS (`F)=	76.9	% CO2=	.0	VM (CF) =	66.482
TS (`R)=	536.9	% O2=	20.9	DELTA H (ABS)=	29.73
TM (`F)=	78.3	% CO=	0	PS (ABS) =	29.61
TM (`R)=	538.3	% N2=	79.1	SQRT DELTA P =	.64651
VI(TOT)=	9.3	CP=	.84	AREA NOZZLE =	.00022
				Y =	.9872

VM STD	=	$17.64 \frac{(VM)(Y)(DELTA\ H\ ABS)}{(TM)}$	=	63.95 DSCF
VW STD	=	.04707 (VI TOT)	=	.44 CF
BWO	=	$\frac{VW\ STD}{VW\ STD + VM\ STD}$	=	.007
1-BWO	=	1 - BWO	=	.993
Md (DRY)	=	.44 (% CO2) +.32 (% O2) +.28 (% CO) +.28 (% N2)	=	28.84 LBS/LB MOLE
Ms (WET)	=	MD (1-BWO) + 18 (BWO)	=	28.76 LBS/LB MOLE
G	=	SQRT (TS / PS / MS)	=	.79
VS	=	85.49(CP)(G)(SQRT DELTA P)	=	36.9 FPS
H	=	0.002669 (VI TOT)	=	.02
J	=	(DELTA H ABS)(VM)(Y)/(TM)	=	3.63
K	=	(H) + (J)	=	3.65
% ISO	=	$\frac{(TS)\ (K)\ (1.667)}{(TIME)\ (VS)\ (PS)\ (AN)}$	=	111.0

ISOKINETIC CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER INLET

RUN #: CR-2-IN
DATE : 19MAR92

TS (`F)=	77.5	% CO2=	.0	VM (CF) =	69.752
TS (`R)=	537.5	% O2=	20.9	DELTA H (ABS)=	29.74
TM (`F)=	83.4	% CO=	0	PS (ABS) =	29.61
TM (`R)=	543.4	% N2=	79.1	SQRT DELTA P =	.67858
VI(TOT)=	6.0	CP=	.84	AREA NOZZLE =	.00022
				Y =	.9872

VM STD	=	$17.64 \frac{(VM)(Y)(DELTA\ H\ ABS)}{(TM)}$	= 66.48	DSCF
VW STD	=	.04707 (VI TOT)	= .28	CF
BWO	=	$\frac{VW\ STD}{VW\ STD + VM\ STD}$	= .004	
1-BWO	=	1 - BWO	= .996	
Md (DRY)	=	.44 (% CO2) +.32 (% O2) +.28 (% CO) +.28 (% N2)	= 28.84	LBS/LB MOLE
Ms (WET)	=	MD (1-BWO) + 18 (BWO)	= 28.79	LBS/LB MOLE
G	=	SQRT (TS / PS / MS)	= .79	
VS	=	85.49(CP)(G)(SQRT DELTA P)	= 38.7	FPS
H	=	0.002669 (VI TOT)	= .02	
J	=	(DELTA H ABS)(VM)(Y)/(TM)	= 3.77	
K	=	(H) + (J)	= 3.78	
% ISO	=	$\frac{(TS)\ (K)\ (1.667)}{(TIME)\ (VS)\ (PS)\ (AN)}$	= 109.7	

ISOKINETIC CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER INLET

RUN #: CR-3-IN
DATE : 19MAR92

TS (`F) =	78.3	% CO2 =	.0	VM (CF) =	70.814
TS (`R) =	538.3	% O2 =	20.9	DELTA H (ABS) =	29.74
TM (`F) =	82.1	% CO =	0	PS (ABS) =	29.61
TM (`R) =	542.1	% N2 =	79.1	SQRT DELTA P =	.68591
VI(TOT) =	13.6	CP =	.84	AREA NOZZLE =	.00022
				Y =	.9872

VM STD	=	$17.64 \frac{(VM)(Y)(DELTA\ H\ ABS)}{(TM)}$	= 67.66	DSCF
VW STD	=	.04707 (VI TOT)	= .64	CF
BWO	=	$\frac{VW\ STD}{VW\ STD + VM\ STD}$	= .009	
1-BWO	=	1 - BWO	= .991	
Md (DRY)	=	.44 (% CO2) +.32 (% O2) +.28 (% CO) +.28 (% N2)	= 28.84	LBS/LB MOLE
Ms (WET)	=	MD (1-BWO) + 18 (BWO)	= 28.73	LBS/LB MOLE
G	=	SQRT (TS / PS / MS)	= .80	
VS	=	85.49(CP)(G)(SQRT DELTA P)	= 39.2	FPS
H	=	0.002669 (VI TOT)	= .04	
J	=	(DELTA H ABS)(VM)(Y)/(TM)	= 3.84	
K	=	(H) + (J)	= 3.87	
% ISO	=	$\frac{(TS)\ (K)\ (1.667)}{(TIME)\ (VS)\ (PS)\ (AN)}$	= 111.0	

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ISOKINETIC CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER OUTLET

RUN #: CR-1-OUT
DATE : 19MAR92

TS (`F)=	84.1	% CO2=	.0	VM (CF) =	86.122
TS (`R)=	544.1	% O2=	20.9	DELTA H (ABS)=	29.78
TM (`F)=	80.5	% CO=	0	PS (ABS) =	29.61
TM (`R)=	540.5	% N2=	79.1	SQRT DELTA P =	.60262
VI(TOT)=	8.8	CP=	.84	AREA NOZZLE =	.00035
				Y =	.9822

VM STD	=	$17.64 \frac{(VM)(Y)(DELTA\ H\ ABS)}{(TM)}$	= 82.21	DSCF
VW STD	=	.04707 (VI TOT)	= .41	CF
BWO	=	$\frac{VW\ STD}{VW\ STD + VM\ STD}$	= .005	
1-BWO	=	1 - BWO	= .995	
Md (DRY)	=	.44 (% CO2) +.32 (% O2) +.28 (% CO) +.28 (% N2)	= 28.84	LBS/LB MOLE
Ms (WET)	=	MD (1-BWO) + 18 (BWO)	= 28.78	LBS/LB MOLE
G	=	SQRT (TS / PS / MS)	= .80	
VS	=	85.49(CP)(G)(SQRT DELTA P)	= 34.6	FPS
H	=	0.002669 (VI TOT)	= .02	
J	=	(DELTA H ABS)(VM)(Y)/(TM)	= 4.66	
K	=	(H) + (J)	= 4.68	
% ISO	=	$\frac{(TS)\ (K)\ (1.667)}{(TIME)\ (VS)\ (PS)\ (AN)}$	= 99.0	

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ISOKINETIC CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER OUTLET

RUN #: CR-2-OUT
DATE : 19MAR92

TS (`F)=	85.1	% CO2=	.0	VM (CF) =	109.707
TS (`R)=	545.1	% O2=	20.9	DELTA H (ABS)=	29.83
TM (`F)=	87.6	% CO=	0	PS (ABS) =	29.61
TM (`R)=	547.6	% N2=	79.1	SQRT DELTA P =	.71954
VI(TOT)=	13.3	CP=	.84	AREA NOZZLE =	.00035
				Y =	.9822

VM STD	=	$17.64 \frac{(VM)(Y)(DELTA\ H\ ABS)}{(TM)}$	=	103.55 DSCF
VW STD	=	.04707 (VI TOT)	=	.63 CF
BWO	=	$\frac{VW\ STD}{VW\ STD + VM\ STD}$	=	.006
1-BWO	=	1 - BWO	=	.994
Md (DRY)	=	.44 (% CO2) +.32 (% O2) +.28 (% CO) +.28 (% N2)	=	28.84 LBS/LB MOLE
Ms (WET)	=	MD (1-BWO) + 18 (BWO)	=	28.77 LBS/LB MOLE
G	=	SQRT (TS / PS / MS)	=	.80
VS	=	85.49(CP)(G)(SQRT DELTA P)	=	41.3 FPS
H	=	0.002669 (VI TOT)	=	.04
J	=	(DELTA H ABS)(VM)(Y)/(TM)	=	5.87
K	=	(H) + (J)	=	5.91
% ISO	=	$\frac{(TS)\ (K)\ (1.667)}{(TIME)\ (VS)\ (PS)\ (AN)}$	=	104.7

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ISOKINETIC CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER OUTLET

RUN #: CR-3-OUT
DATE : 19MAR92

TS (`F) =	85.5	% CO2 =	.0	VM (CF) =	81.414
TS (`R) =	545.5	% O2 =	20.9	DELTA H (ABS) =	29.77
TM (`F) =	84.5	% CO =	0	PS (ABS) =	29.61
TM (`R) =	544.5	% N2 =	79.1	SQRT DELTA P =	.57085
VI(TOT) =	10.5	CP =	.84	AREA NOZZLE =	.00035
				Y =	.9822

VM STD	=	$\frac{(VM)(Y)(DELTA\ H\ ABS)}{(TM)}$ = 17.64	77.13	DSCF
VW STD	=	.04707 (VI TOT)	.49	CF
BWO	=	$\frac{VW\ STD}{VW\ STD + VM\ STD}$	.006	
1-BWO	=	1 - BWO	.994	
Md (DRY)	=	.44 (% CO2) +.32 (% O2) +.28 (% CO) +.28 (% N2)	28.84	LBS/LB MOLE
Ms (WET)	=	MD (1-BWO) + 18 (BWO)	28.77	LBS/LB MOLE
G	=	SQRT (TS / PS / MS)	.80	
VS	=	85.49(CP)(G)(SQRT DELTA P)	32.8	FPS
H	=	0.002669 (VI TOT)	.03	
J	=	(DELTA H ABS)(VM)(Y)/(TM)	4.37	
K	=	(H) + (J)	4.40	
% ISO	=	$\frac{(TS)\ (K)\ (1.667)}{(TIME)\ (VS)\ (PS)\ (AN)}$	98.3	

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APPENDIX IV

TOTAL CHROMIUM EMISSION CALCULATIONS

TOTAL CHROMIUM
EMISSION CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER INLET

RUN #: CR-1-IN
DATE : 19MAR92

Mn = AMOUNT FOUND	=	.0621	mg
REPORTING LIMIT	=	N/A	mg
REAGENT BLANK	=	.0017	mg
FIELD BLANK	=	N/D	mg
COMBINED FRONT AND BACK HALF (Mn)	=	.0621	mg

AS = AREA OF THE STACK	=	8.71	SQ FT
Qs = 3600(1-BWO)(VS)(AS)(17.64)(PS)/(TS)	=	1116765 1155725 31604	DSCFH ACFH DSCMH
Cs = (2.205 X 10-6) (Mn) / (VM STD)	=	2.141e-9	LBS/SCF
CM =		3.429e-2	mg/DSCM
Cs' = 0.0154 (Mn) / (VM STD)	=	1.495e-5	GRAINS /DSCF
PMR = (QS) (CS)	=	2.391e-3	LBS/HR
PMR8 = PMR x 8 hrs	=	1.913e-2	LBS/8 HRS
	=	1084.6	mg/HR

EMISSIONS BASED ON OUTLET FLOW MEASUREMENTS:

OUTLET FLOW = 1035529 DSCFH

PMR = (QS) (CS)	=	2.217e-3	LBS/HR
PMR8 = PMR x 8 hrs	=	1.774e-2	LBS/8 HRS

TOTAL CHROMIUM
EMISSION CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER INLET

RUN #: CR-2-IN
DATE : 19MAR92

Mn = AMOUNT FOUND	=	.2657	mg
REPORTING LIMIT	=	N/A	mg
REAGENT BLANK	=	.0017	mg
FIELD BLANK	=	N/D	mg
COMBINED FRONT AND BACK HALF (Mn)	=	.2657	mg
AS = AREA OF THE STACK	=	8.71	SQ FT
Qs = 3600(1-BWO)(VS)(AS)(17.64)(PS)/(TS)	=	1173959 1213160 33223	DSCFH ACFH DSCMH
Cs = (2.205 X 10-6) (Mn) / (VM STD)	=	8.813e-9	LBS/SCF
CM =		1.411e-1	mg/DSCM
Cs' = 0.0154 (Mn) / (VM STD)	=	6.155e-5	GRAINS /DSCF
PMR = (QS) (CS)	=	1.035e-2	LBS/HR
PMR8 = PMR x 8 hrs	=	8.276e-2	LBS/8 HRS
	=	4692.8	mg/HR

EMISSIONS BASED ON OUTLET FLOW MEASUREMENTS:

OUTLET FLOW = 1234362 DSCFH

PMR = (QS) (CS)	=	1.088e-2	LBS/HR
PMR8 = PMR x 8 hrs	=	8.702e-2	LBS/8 HRS

TOTAL CHROMIUM
EMISSION CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER INLET

RUN #: CR-3-IN
DATE : 19MAR92

Mn = AMOUNT FOUND	=	.1419	mg
REPORTING LIMIT	=	N/A	mg
REAGENT BLANK	=	.0017	mg
FIELD BLANK	=	N/D	mg
COMBINED FRONT AND BACK HALF (Mn)	=	.1419	mg
AS = AREA OF THE STACK	=	8.71	SQ FT
Qs = 3600(1-BWO)(VS)(AS)(17.64)(PS)/(TS)	=	1180831 1228307 33418	DSCFH ACFH DSCMH
Cs = (2.205 X 10-6) (Mn) / (VM STD)	=	4.624e-9	LBS/SCF
CM =		7.405e-2	mg/DSCM
Cs' = 0.0154 (Mn) / (VM STD)	=	3.230e-5	GRAINS /DSCF
PMR = (QS) (CS)	=	5.460e-3	LBS/HR
PMR8 = PMR x 8 hrs	=	4.368e-2	LBS/8 HRS
	=	2476.8	mg/HR

EMISSIONS BASED ON OUTLET FLOW MEASUREMENTS:

OUTLET FLOW = 978639 DSCFH

PMR = (QS) (CS)	=	4.525e-3	LBS/HR
PMR8 = PMR x 8 hrs	=	3.620e-2	LBS/8 HRS

TOTAL CHROMIUM
EMISSION CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER OUTLET

RUN #: CR-1-OUT
DATE : 19MAR92

Mn = AMOUNT FOUND	=	.0097	mg
REPORTING LIMIT	=	N/A	mg
REAGENT BLANK	=	.0017	mg
FIELD BLANK	=	N/D	mg
COMBINED FRONT AND BACK HALF (Mn)	=	.0097	mg

AS = AREA OF THE STACK	=	8.71	SQ FT
Qs = 3600(1-BWO)(VS)(AS)(17.64)(PS)/(TS)	=	1035529 1084100 29305	DSCFH ACFH DSCMH
Cs = (2.205 X 10-6) (Mn) / (VM STD)	=	2.60e-10	LBS/SCF
CM =		4.166e-3	mg/DSCM
Cs' = 0.0154 (Mn) / (VM STD)	=	1.817e-6	GRAINS /DSCF
PMR = (QS) (CS)	=	2.694e-4	LBS/HR
PMR8 = PMR X 8 HRS	=	2.155e-3	LBS/ 8 HRS
	=	122.2	mg/HR

TOTAL CHROMIUM
EMISSION CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER OUTLET

RUN #: CR-2-OUT
DATE : 19MAR92

Mn = AMOUNT FOUND	=	.0090	mg
REPORTING LIMIT	=	N/A	mg
REAGENT BLANK	=	.0017	mg
FIELD BLANK	=	N/D	mg
COMBINED FRONT AND BACK HALF (Mn)	=	.0090	mg
AS = AREA OF THE STACK	=	8.71	SQ FT
Qs = 3600(1-BWO)(VS)(AS)(17.64)(PS)/(TS)	=	1234362 1295813 34932	DSCFH ACFH DSCMH
Cs = (2.205 X 10-6) (Mn) / (VM STD)	=	1.92e-10	LBS/SCF
CM =		3.069e-3	mg/DSCM
Cs' = 0.0154 (Mn) / (VM STD)	=	1.338e-6	GRAINS /DSCF
PMR = (QS) (CS)	=	2.366e-4	LBS/HR
PMR8 = PMR X 8 HRS	=	1.892e-3	LBS/ 8 HRS
	=	107.3	mg/HR

TOTAL CHROMIUM
EMISSION CALCULATION SHEET

PLANT: GE BURLINGTON
LOCATION: CECO FILTER OUTLET

RUN #: CR-3-OUT
DATE : 19MAR92

Mn = AMOUNT FOUND	=	.0061	mg
REPORTING LIMIT	=	N/A	mg
REAGENT BLANK	=	.0017	mg
FIELD BLANK	=	N/D	mg
COMBINED FRONT AND BACK HALF (Mn)	=	.0061	mg

AS = AREA OF THE STACK	=	8.71	SQ FT
Qs = 3600(1-BWO)(VS)(AS)(17.64)(PS)/(TS)	=	978639 1028484 27695	DSCFH ACFH DSCMH
Cs = (2.205 X 10-6) (Mn) / (VM STD)	=	1.74e-10	LBS/SCF
CM =		2.793e-3	mg/DSCM
Cs' = 0.0154 (Mn) / (VM STD)	=	1.218e-6	GRAINS /DSCF
PMR = (QS) (CS)	=	1.707e-4	LBS/HR
PMR8 = PMR X 8 HRS	=	1.365e-3	LBS/ 8 HRS
	=	77.4	mg/HR

APPENDIX V

LABORATORY ANALYSIS REPORT

TRIANGLE LABORATORIES
801 CAPITOLA DRIVE
DURHAM, NC 27713

ANALYSIS REPORT

Prepared for:

Eastmount Engineering
Attn: Mark Spiro

Patricia Chagaris
Patricia Chagaris
Inorganic Report Generation

W.H. Wadlin
Dr. William H. Wadlin
Inorganic Laboratory Manager

Quality Assurance

March 8, 1992

TRIANGLE LABORATORIES

801 CAPITOLA DR.
DURHAM, NC 27713

Project: 20479
Eastmount Engineering
Client PO #: 3001

Date Recieved: 03/26/92
Date Reported: 04/08/92

CASE NARRATIVE

Overview

The purpose of this project was to determine total metals in multi-metals trains. The analyte of interest is Total Chromium. The Client agreed to have these samples determined by Graphite Furnace AA.

The governing protocol for this work was the *"Heavy Metals Test Method"* promulgated by the Pennsylvania Department of Environmental Resources. A copy of this document is included in the report. This method calls for analysis of a single combined solution obtained by digesting all of the impinger solutions together. Thus there is only one analytical result per run, rather than the usual "front- and back-half".

Preparation

Samples were prepared for GFAA by the hotplate digestion procedure described on page 11 of the method. For GFAA, 250ml of the combined impinger solutions was digested and brought to a final volume of 100ml. Only 100ml of the Blank sample was digested and brought back to a 100ml final volume.

This method required no duplicates or spikes. A Preparation Blk was run with the samples.

Analysis

Total Chromium determined by GFAA. Samples 1-3 required a X10 dilution factor.

Report

At the Client's request, results are reported in total milligrams of analyte, rather than the format described in the Pennsylvania Method.

Notes

There was a detectable level in the Client supplied Blank, but it does not seem signifigant compared to the large amounts found in the Samples. A <5ug/L value was determined in the laboratory Preparation Blk.

TRIANGLE LABORATORIES, INC
801 CAPITOLA DRIVE
DURHAM, NC 27713

INORGANICS ANALYSIS REPORT

TLI PROJECT #: 20479
CLIENT: EASTMOUNT ENGINEERING
CLIENT PO#: 3001

DATE RECIEVED: 03/26/92
DATE REPORTED: 04/08/92

CLIENT SAMPLE IDENTIFICATION

1. a. 9330 CR-1-IN
   b. 9331 CR-1-IN
   c. 9332 CR-1-IN

2. a. 9336 CR-2-IN
   b. 9337 CR-2-IN
   c. 9338 CR-2-IN

3. a. 9342 CR-3-IN
   b. 9344 CR-3-IN
   c. 9345 CR-3-IN

4. a. 9333 CR-1-OUT
   b. 9334 CR-1-OUT
   c. 9335 CR-1-OUT

5. a. 9339 CR-2-OUT
   b. 9340 CR-2-OUT
   c. 9341 CR-2-OUT

6. a. 9345 CR-3-OUT
   b. 9346 CR-3-OUT
   c. 9347 CR-3-OUT

7. 9348 BLANK

CLIENT #	TLI #	TOTAL mg Cr
CR-1-IN	55.019.1	.0621
CR-2-IN	55.019.2	.2657
CR-3-IN	55.019.3	.1491
CR-1-OUT	55.019.4	.0097
CR-2-OUT	55.019.5	.0090
CR-3-OUT	55.019.6	.0061
BLANK	55.019.7 BLK	.0017

BLANK SUMMARY

SAMPLE ID	ug/L Cr
PBW	<5.0

AA ANALYTE SUMMARY REPORT

CLIENT: EASTMOUNT ENGINEERING
PURCHASE ORDER # 3001

ANALYTE(S): Cr
ug/L IDL(S): 5

DATE RECEIVED: 03/26/92
DATE REPORTED: 04/08/92
TLI PROJECT #: 20479

CLIENT #	SAMPID	EL	MEANABS	ug/L CONCENTRATION	ml TOTAL VOL	ml DIGESTED	ml FV	DIL FACTOR	TOTAL mg ANSWER
CR-1-IN	55.019.1	Cr	.418500	26.6000	584	250	100	10	.0621
CR-2-IN	55.019.2	Cr	1.523000	103.8000	640	250	100	10	.2657
CR-3-IN	55.019.3	Cr	1.066000	70.6000	528	250	100	10	.1491
CR-1-OUT	55.019.4	Cr	.726000	47.1000	516	250	100	1	.0097
CR-2-OUT	55.019.5	Cr	.556500	35.7000	628	250	100	1	.0090
CR-3-OUT	55.019.6	Cr	.553000	35.5000	430	250	100	1	.0061
BLANK	55.019.7	Cr	.135000	8.4000	200	100	100	1	.0017
	PBW	Cr	.0265	1.3					
	STD BLK	Cr	.02400	0.0000					
	STD 1=10ug/L	Cr	.15850	10.0000					
	STD 2=20ug/L	Cr	.32250	20.3000					
	STD 3=50ug/L	Cr	.74950	44.8000					
	STD 4=100ug/L	Cr	1.48500	107.9000					
	POS 0=0ug/L	Cr	.02450	1.5000					
	POS 0=0ug/L	Cr	.05000	3.1000					
	POS 0=0ug/L	Cr	.05100	3.2000					
	POS 40=50ug/L	Cr	.81150	52.9000					
	POS 40=50ug/L	Cr	.83550	54.6000					
	POS 40=50ug/L	Cr	.85500	55.9000					

A.A. SAMPLE PREPARATION FORM

TLI-RTP PROJECT NUMBER: 20479
CLIENT: Gauntpount Engineering
SAMPLE MATRIX:
DATE OF PREPARATION: April 3, 19

ANALYTES REQUESTED: Pb

SAMPLE TLI #	SAMPLE CLIENT ID	BEGIN'G WT/VOL (GF)	FINAL VOL	TYPE DIGEST	ACID MATRIX	COMMENTS
55.019.1 ABC	9330/MW-1-IN 9331, 9332	250 ml	100 ml	HNO_3	—	run binned A, B and C
55.019.2 ABC	9336/MW-2-IN 9337, 9338	250 ml		" "		" "
55.019.3 ABC	9342/MW-3-IN 9344, 9345	250 ml		" "		" "
55.019.4 ABC	9333/MW-1-OUT 9334, 9335	250 ml		" "		" "
55.019.5 ABC	9339/MW-2-OUT 9340, 9341	250 ml		" "		" "
55.019.6 ABC	9345/MW-3-OUT 9346, 9347	250 ml		" "		" "
55.019.7	9348/~~BLANK~~	100 ml		" "		ONLY (1) BOTTLE
55.019.BLNK						
						* Pennsylvania Heavy Metals Test Method

aasmpprp rev 1 03/18/92

Element File: CREMT.GEL Element: Cr Wavelength: 357.9
Date: 04/05/92 Time: 09:14 Slit: 0.70
Data File: ID/Wt File: 040392.IDW Lamp Current: 25
Technique: HGA Calib. Type: Nonlinear Energy: 72

Cr ID: Blank Seq. No.: 00005 A/S Pos.: 0 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 0
Replicate 1 Time: 09:17
Peak Area (A-s): 0.038 Peak Height (A): 0.031
Background Pk Area (A-s): -0.004 Background Pk Height (A): 0.018
Blank Corrected Pk Area (A-s): 0.038

uL dispensed: 10 from 0, 5 from 35, 10 from 0
Replicate 2 Time: 09:20
Peak Area (A-s): 0.010 Peak Height (A): 0.005
Background Pk Area (A-s): -0.017 Background Pk Height (A): 0.010
Blank Corrected Pk Area (A-s): 0.010

Mean Pk Area (A-s): 0.024 SD: 0.0195 RSD(%): 81.88

Auto-zero performed.

Cr ID: Standard 1 Seq. No.: 00006 A/S Pos.: 6 Date: 04/05/92

uL dispensed: 15 from 0, 5 from 35, 5 from 6
Replicate 1 Time: 09:24
Peak Area (A-s): 0.182 Peak Height (A): 0.099
Background Pk Area (A-s): 0.082 Background Pk Height (A): 0.021
Blank Corrected Pk Area (A-s): 0.158

uL dispensed: 15 from 0, 5 from 35, 5 from 6
Replicate 2 Time: 09:27
Peak Area (A-s): 0.183 Peak Height (A): 0.100
Background Pk Area (A-s): 0.091 Background Pk Height (A): 0.020
Blank Corrected Pk Area (A-s): 0.159

Mean Pk Area (A-s): 0.159 SD: 0.0008 RSD(%): 0.48

Standard number 1 applied. [10.0]
Correlation coefficient: 1.00000 Slope: 0.0159

Cr ID: Standard 2 Seq. No.: 00007 A/S Pos.: 6 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 6
Replicate 1 Time: 09:30
Peak Area (A-s): 0.345 Peak Height (A): 0.188
Background Pk Area (A-s): 0.103 Background Pk Height (A): 0.023
Blank Corrected Pk Area (A-s): 0.321
Concentration (ug/L): 20.2

uL dispensed: 10 from 0, 5 from 35, 10 from 6
Replicate 2 Time: 09:33
Peak Area (A-s): 0.347 Peak Height (A): 0.193
Background Pk Area (A-s): 0.107 Background Pk Height (A): 0.023

Blank Corrected Pk Area (A-s): 0.324
Concentration (ug/L): 20.4

an Conc (ug/L): 20.3 SD: 0.11 RSD(%): 0.56

Standard number 2 applied. [20.0]
Correlation coefficient: 1.00000 Slope: 0.0157

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Cr ID: Standard 3 Seq. No.: 00008 A/S Pos.: 14 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 14
Replicate 1 Time: 09:37
Peak Area (A-s): 0.762 Peak Height (A): 0.407
Background Pk Area (A-s): 0.129 Background Pk Height (A): 0.031
Blank Corrected Pk Area (A-s): 0.738
Concentration (ug/L): 44.2

uL dispensed: 10 from 0, 5 from 35, 10 from 14
Replicate 2 Time: 09:40
Peak Area (A-s): 0.784 Peak Height (A): 0.408
Background Pk Area (A-s): 0.135 Background Pk Height (A): 0.030
Blank Corrected Pk Area (A-s): 0.761
Concentration (ug/L): 45.5

Mean Conc (ug/L): 44.8 SD: 0.88 RSD(%): 1.97

S-shaped calibration curve detected. 2-coef. equation used.
andard number 3 applied. [50.0]
orrelation coefficient: 0.99987 Slope: 0.0164

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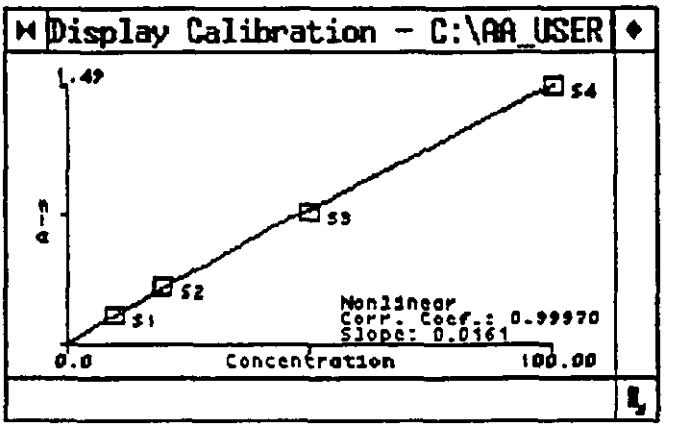
Cr ID: Standard 4 Seq. No.: 00009 A/S Pos.: 13 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 13
Replicate 1 Time: 09:43
Peak Area (A-s): 1.501 Peak Height (A): 0.754
Background Pk Area (A-s): 0.161 Background Pk Height (A): 0.045
Blank Corrected Pk Area (A-s): 1.477
Concentration (ug/L): 107.2

uL dispensed: 10 from 0, 5 from 35, 10 from 13
Replicate 2 Time: 09:46
Peak Area (A-s): 1.517 Peak Height (A): 0.761
Background Pk Area (A-s): 0.164 Background Pk Height (A): 0.045
Blank Corrected Pk Area (A-s): 1.493
Concentration (ug/L): 108.6

Mean Conc (ug/L): 107.9 SD: 1.00 RSD(%): 0.93

S-shaped calibration curve detected. 2-coef. equation used.
Standard number 4 applied. [100.0]
Correlation coefficient: 0.99970 Slope: 0.0161



Cr ID: CR = 50 Seq. No.: 00011 A/S Pos.: 14 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 14
Replicate 1 Time: 09:51
Peak Area (A-s): 0.845 Peak Height (A): 0.428
Background Pk Area (A-s): 0.150 Background Pk Height (A): 0.030
Blank Corrected Pk Area (A-s): 0.821
Concentration (ug/L): 53.5

dispensed: 10 from 0, 5 from 35, 10 from 14
plicate 2 Time: 09:54
Peak Area (A-s): 0.826 Peak Height (A): 0.421
Background Pk Area (A-s): 0.139 Background Pk Height (A): 0.030
Blank Corrected Pk Area (A-s): 0.802
Concentration (ug/L): 52.3

Mean Conc (ug/L): 52.9 SD: 0.88 RSD(%): 1.67

Check sample is within range 40 - 60

Cr ID: AS Position 0 Seq. No.: 00012 A/S Pos.: 0 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 0
Replicate 1 Time: 09:57
Peak Area (A-s): 0.065 Peak Height (A): 0.027
Background Pk Area (A-s): 0.110 Background Pk Height (A): 0.023
Blank Corrected Pk Area (A-s): 0.041
Concentration (ug/L): 2.5

uL dispensed: 10 from 0, 5 from 35, 10 from 0
Replicate 2 Time: 10:00
Peak Area (A-s): 0.032 Peak Height (A): 0.014
Background Pk Area (A-s): 0.115 Background Pk Height (A): 0.024
Blank Corrected Pk Area (A-s): 0.008
ncentration (ug/L): 0.5

Mean Conc (ug/L): 1.5 SD: 1.43 RSD(%): 93.76

Check sample is within range -10 - 10

Cr ID: 55.019.PBW Seq. No.: 00013 A/S Pos.: 5 Date: 04/05/92

dispensed: 10 from 0, 5 from 35, 10 from 5
Replicate 1 Time: 10:04
Peak Area (A-s): 0.049 Peak Height (A): 0.022
Background Pk Area (A-s): 0.118 Background Pk Height (A): 0.025
Blank Corrected Pk Area (A-s): 0.025
Concentration (ug/L): 1.6

uL dispensed: 10 from 0, 5 from 35, 10 from 5
Replicate 2 Time: 10:07
Peak Area (A-s): 0.042 Peak Height (A): 0.019
Background Pk Area (A-s): 0.123 Background Pk Height (A): 0.025
Blank Corrected Pk Area (A-s): 0.018
Concentration (ug/L): 1.1

Mean Conc (ug/L): 1.3 SD: 0.32 RSD(%): 23.77

Cr ID: 55.019.2 Seq. No.: 00014 A/S Pos.: 7 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 7
Sample abs. is greater than that of the largest standard.
Replicate 1 Time: 10:10
Peak Area (A-s): 6.909 Peak Height (A): 1.364
Background Pk Area (A-s): 0.594 Background Pk Height (A): 0.246
Blank Corrected Pk Area (A-s): 6.886
Concentration (ug/L): 717.9

Cr ID: 55.019.2 Seq. No.: 00015 A/S Pos.: 7 Date: 04/05/92

RERAN at 1:10 dil

uL dispensed: 15 from 0, 5 from 35, 5 from 7
Sample abs. is greater than that of the largest standard.
Replicate 1 Time: 10:13
Peak Area (A-s): 5.238 Peak Height (A): 1.345
Background Pk Area (A-s): 0.388 Background Pk Height (A): 0.144
Blank Corrected Pk Area (A-s): 5.214
Concentration (ug/L): 466.7 Corrected Conc (ug/L): 933.4

uL dispensed: 15 from 0, 5 from 35, 5 from 7
Sample abs. is greater than that of the largest standard.
Replicate 2 Time: 10:17
Peak Area (A-s): 5.202 Peak Height (A): 1.330
Background Pk Area (A-s): 0.389 Background Pk Height (A): 0.144
Blank Corrected Pk Area (A-s): 5.178
Concentration (ug/L): 462.1 Corrected Conc (ug/L): 924.1

Sample abs. is greater than that of the largest standard.
Mean Conc (ug/L): 464.4 SD: 3.27 RSD(%): 0.70
Corrected Conc (ug/L): 928.7

ID: 55.019.3 Seq. No.: 00016 A/S Pos.: 8 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 8
Sample abs. is greater than that of the largest standard.
Replicate 1 Time: 10:20

Peak Area (A-s): 5.897 Peak Height (A): 1.340
Background Pk Area (A-s): 0.460 Background Pk Height (A): 0.171
Blank Corrected Pk Area (A-s): 5.873
Concentration (ug/L): 556.7

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Cr ID: 55.019.3 Seq. No.: 00017 A/S Pos.: 8 Date: 04/05/92

uL dispensed: 15 from 0, 5 from 35, 5 from 8
Sample abs. is greater than that of the largest standard.
Replicate 1 Time: 10:23
Peak Area (A-s): 4.198 Peak Height (A): 1.315
Background Pk Area (A-s): 0.319 Background Pk Height (A): 0.104
Blank Corrected Pk Area (A-s): 4.174
Concentration (ug/L): 343.3 Corrected Conc (ug/L): 686.6

uL dispensed: 15 from 0, 5 from 35, 5 from 8
Sample abs. is greater than that of the largest standard.
Replicate 2 Time: 10:26
Peak Area (A-s): 4.090 Peak Height (A): 1.311
Background Pk Area (A-s): 0.313 Background Pk Height (A): 0.105
Blank Corrected Pk Area (A-s): 4.067
Concentration (ug/L): 331.7 Corrected Conc (ug/L): 663.4

Sample abs. is greater than that of the largest standard.
Mean Conc (ug/L): 337.5 SD: 8.22 RSD(%): 2.44
Corrected Conc (ug/L): 674.9

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ID: 55.019.4 Seq. No.: 00018 A/S Pos.: 9 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 9
Replicate 1 Time: 10:30
Peak Area (A-s): 0.828 Peak Height (A): 0.289
Background Pk Area (A-s): 0.169 Background Pk Height (A): 0.027
Blank Corrected Pk Area (A-s): 0.805
Concentration (ug/L): 52.4

uL dispensed: 10 from 0, 5 from 35, 10 from 9
Replicate 2 Time: 10:33
Peak Area (A-s): 0.671 Peak Height (A): 0.260
Background Pk Area (A-s): 0.164 Background Pk Height (A): 0.027
Blank Corrected Pk Area (A-s): 0.647
Concentration (ug/L): 41.8

Mean Conc (ug/L): 47.1 SD: 7.54 RSD(%): 16.02

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Cr ID: 55.019.5 Seq. No.: 00001 A/S Pos.: 10 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 10
Replicate 1 Time: 10:36
Peak Area (A-s): 0.601 Peak Height (A): 0.258
Background Pk Area (A-s): 0.155 Background Pk Height (A): 0.027
Blank Corrected Pk Area (A-s): 0.578
Concentration (ug/L): 37.1

uL dispensed: 10 from 0, 5 from 35, 10 from 10
Replicate 2 Time: 10:40
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Peak Area (A-s): 0.559 Peak Height (A): 0.241
Background Pk Area (A-s): 0.154 Background Pk Height (A): 0.027
Blank Corrected Pk Area (A-s): 0.535
Concentration (ug/L): 34.3

Mean Conc (ug/L): 35.7 SD: 2.01 RSD(%): 5.63

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Cr ID: 55.019.6 Seq. No.: 00002 A/S Pos.: 11 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 11
Replicate 1 Time: 10:43
Peak Area (A-s): 0.584 Peak Height (A): 0.257
Background Pk Area (A-s): 0.160 Background Pk Height (A): 0.027
Blank Corrected Pk Area (A-s): 0.560
Concentration (ug/L): 35.9

uL dispensed: 10 from 0, 5 from 35, 10 from 11
Replicate 2 Time: 10:46
Peak Area (A-s): 0.569 Peak Height (A): 0.256
Background Pk Area (A-s): 0.154 Background Pk Height (A): 0.026
Blank Corrected Pk Area (A-s): 0.546
Concentration (ug/L): 35.0

Mean Conc (ug/L): 35.5 SD: 0.68 RSD(%): 1.91

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Cr ID: 55.019.7 Seq. No.: 00003 A/S Pos.: 12 Date: 04/05/92

dispensed: 10 from 0, 5 from 35, 10 from 12
licate 1 Time: 10:50
Peak Area (A-s): 0.171 Peak Height (A): 0.060
Background Pk Area (A-s): 0.142 Background Pk Height (A): 0.026
Blank Corrected Pk Area (A-s): 0.147
Concentration (ug/L): 9.2

uL dispensed: 10 from 0, 5 from 35, 10 from 12
Replicate 2 Time: 10:53
Peak Area (A-s): 0.147 Peak Height (A): 0.057
Background Pk Area (A-s): 0.142 Background Pk Height (A): 0.026
Blank Corrected Pk Area (A-s): 0.123
Concentration (ug/L): 7.7

Mean Conc (ug/L): 8.4 SD: 1.04 RSD(%): 12.32

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Cr ID: 55.019.1 Seq. No.: 00004 A/S Pos.: 15 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 15
Replicate 1 Time: 10:56
Peak Area (A-s): 0.071 Peak Height (A): 0.028
Background Pk Area (A-s): 0.137 Background Pk Height (A): 0.026
Blank Corrected Pk Area (A-s): 0.047
Concentration (ug/L): 2.9

dispensed: 10 from 0, 5 from 35, 10 from 15
Replicate 2 Time: 10:59
Peak Area (A-s): 0.065 Peak Height (A): 0.028
Background Pk Area (A-s): 0.134 Background Pk Height (A): 0.026
~~~~~~

Blank Corrected Pk Area (A-s): 0.042
Concentration (ug/L): 2.6

an Conc (ug/L): 2.7 SD: 0.23 RSD(%): 8.28

Cr ID: CR = 50 Seq. No.: 00005 A/S Pos.: 14 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 14

Cr ID: CR = 50 Seq. No.: 00007 A/S Pos.: 14 Date: 04/05/92

Replicate 1 Time: 11:07
Peak Area (A-s): 0.854 Peak Height (A): 0.434
Background Pk Area (A-s): 0.166 Background Pk Height (A): 0.035
Blank Corrected Pk Area (A-s): 0.830
Concentration (ug/L): 54.2

uL dispensed: 10 from 0, 5 from 35, 10 from 14
Replicate 2 Time: 11:10
Peak Area (A-s): 0.865 Peak Height (A): 0.455
Background Pk Area (A-s): 0.161 Background Pk Height (A): 0.036
Blank Corrected Pk Area (A-s): 0.841
Concentration (ug/L): 54.9

Mean Conc (ug/L): 54.6 SD: 0.54 RSD(%): 1.00

Check sample is within range 40 - 60

Cr ID: AS Position 0 Seq. No.: 00008 A/S Pos.: 0 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 0
Replicate 1 Time: 11:14
Peak Area (A-s): 0.088 Peak Height (A): 0.032
Background Pk Area (A-s): 0.141 Background Pk Height (A): 0.027
Blank Corrected Pk Area (A-s): 0.065
Concentration (ug/L): 4.0

uL dispensed: 10 from 0, 5 from 35, 10 from 0
Replicate 2 Time: 11:17
Peak Area (A-s): 0.058 Peak Height (A): 0.024
Background Pk Area (A-s): 0.135 Background Pk Height (A): 0.025
Blank Corrected Pk Area (A-s): 0.035
Concentration (ug/L): 2.2

Mean Conc (ug/L): 3.1 SD: 1.33 RSD(%): 42.85

Check sample is within range -10 - 10

Cr ID: 55.019.1 1:10 Seq. No.: 00009 A/S Pos.: 16 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 16
olicate 1 Time: 11:20
eak Area (A-s): 0.439 Peak Height (A): 0.232
Background Pk Area (A-s): 0.152 Background Pk Height (A): 0.027
Blank Corrected Pk Area (A-s): 0.415
Concentration (ug/L): 26.4

uL dispensed: 10 from 0, 5 from 35, 10 from 16
Replicate 2 Time: 11:23
Peak Area (A-s): 0.445 Peak Height (A): 0.229
:kground Pk Area (A-s): 0.152 Background Pk Height (A): 0.028
..ank Corrected Pk Area (A-s): 0.422
Concentration (ug/L): 26.8

Mean Conc (ug/L): 26.6 x10 SD: 0.29 RSD(%): 1.10

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Cr ID: 55.019.2 1:10 Seq. No.: 00010 A/S Pos.: 17 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 17
Replicate 1 Time: 11:26
Peak Area (A-s): 1.533 Peak Height (A): 0.715
Background Pk Area (A-s): 0.195 Background Pk Height (A): 0.046
Blank Corrected Pk Area (A-s): 1.509
Concentration (ug/L): 102.8

uL dispensed: 10 from 0, 5 from 35, 10 from 17
Replicate 2 Time: 11:29
Peak Area (A-s): 1.561 Peak Height (A): 0.723
Background Pk Area (A-s): 0.190 Background Pk Height (A): 0.045
Blank Corrected Pk Area (A-s): 1.537
Concentration (ug/L): 104.9

Mean Conc (ug/L): 103.8 x10 SD: 1.50 RSD(%): 1.45

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ID: 55.019.3 1:10 Seq. No.: 00011 A/S Pos.: 18 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 18
Replicate 1 Time: 11:33
Peak Area (A-s): 1.097 Peak Height (A): 0.522
Background Pk Area (A-s): 0.173 Background Pk Height (A): 0.037
Blank Corrected Pk Area (A-s): 1.074
Concentration (ug/L): 71.1

uL dispensed: 10 from 0, 5 from 35, 10 from 18
Replicate 2 Time: 11:36
Peak Area (A-s): 1.082 Peak Height (A): 0.501
Background Pk Area (A-s): 0.173 Background Pk Height (A): 0.037
Blank Corrected Pk Area (A-s): 1.058
Concentration (ug/L): 70.0

Mean Conc (ug/L): 70.6 x10 SD: 0.79 RSD(%): 1.11

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Cr ID: CR = 50 Seq. No.: 00012 A/S Pos.: 14 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 14
Replicate 1 Time: 11:39
Peak Area (A-s): 0.887 Peak Height (A): 0.451
Background Pk Area (A-s): 0.169 Background Pk Height (A): 0.037
ank Corrected Pk Area (A-s): 0.863
..oncentration (ug/L): 56.4

uL dispensed: 10 from 0, 5 from 35, 10 from 14
Replicate 2 Time: 11:43
~~~~~~

Peak Area (A-s): 0.871 Peak Height (A): 0.437
Background Pk Area (A-s): 0.167 Background Pk Height (A): 0.035
Blank Corrected Pk Area (A-s): 0.847
ncentration (ug/L): 55.3

Mean Conc (ug/L): 55.9 SD: 0.78 RSD(%): 1.40

Check sample is within range 40 - 60

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Cr ID: AS Position 0 Seq. No.: 00013 A/S Pos.: 0 Date: 04/05/92

uL dispensed: 10 from 0, 5 from 35, 10 from 0
Replicate 1 Time: 11:46
Peak Area (A-s): 0.090 Peak Height (A): 0.032
Background Pk Area (A-s): 0.140 Background Pk Height (A): 0.026
Blank Corrected Pk Area (A-s): 0.067
Concentration (ug/L): 4.1

uL dispensed: 10 from 0, 5 from 35, 10 from 0
Replicate 2 Time: 11:49
Peak Area (A-s): 0.059 Peak Height (A): 0.021
Background Pk Area (A-s): 0.140 Background Pk Height (A): 0.027
Blank Corrected Pk Area (A-s): 0.035
Concentration (ug/L): 2.2

Mean Conc (ug/L): 3.2 SD: 1.38 RSD(%): 43.46

eck sample is within range -10 - 10
~~~~~~

METER BOX CALIBRATION SHEET

BOX NUMBER: 4
PRESS BAR : 30.18

DATE: 7 NOV 91
DUE: 7 MAY 92

RUN #	VOLUME WET	VOLUME DRY	DELTA H	DELTA H /13.6	PRES BAR (ABS)	TIME (MINS)
1	5	5.119	.50	.0368	30.22	12.62
2	5	5.266	1.00	.0735	30.25	8.95
3	10	10.284	1.50	.1103	30.29	14.39
4	10	10.433	2.00	.1471	30.33	12.92
5	10	10.591	3.00	.2206	30.40	10.96
6	10	10.404	4.00	.2941	30.47	9.20

RUN #	TEMP WET (`F)	TEMP DRY INLET	TEMP DRY OUT	TEMP DRY (AVG)	Y	DELTA H @
1	64.33	76.33	67.33	71.8	.9895	1.73
2	64.33	83.67	70.00	76.8	.9698	1.72
3	64.00	89.00	73.33	81.2	1.001	1.66
4	64.00	91.00	76.00	83.5	.9893	1.77
5	64.00	95.00	77.67	86.3	.9773	1.90
6	64.00	98.00	79.00	88.5	.9964	1.78
				AVERAGE	.9872	1.76
				MAX % DEVIATION	1.76	
				ALLOWABLE % DEV	2.00	

FORMULAS:

$$Y = \frac{(V_w)(P_b)(T_d)}{(V_d)(P_b\ ABS)(T_w)}$$

$$\text{DELTA H @} = \frac{0.0317\ (\text{DELTA H})}{(P_b)(T_d)} * \left[\frac{(T_w)(\text{TIME})}{(V_w)}\right.$$

CALIBRATION BY: JAMES JARMIN

POST
METER BOX CALIBRATION SHEET

BOX #: 4.00 DATE: 16 April 92
PRES BAR: 30.47 VACUUM: 1.00

RUN #	VOLUME WET	VOLUME DRY	DELTA H	DELTA H /13.6	PRES BAR (ABS)	TIME (MINS)
1	10.00	10.101	1.00	.074	30.54	17.98
2	10.00	9.998	1.00	.074	30.54	17.93
3	10.00	10.007	1.00	.074	30.54	18.48

RUN #	TEMP WET (`F)	TEMP DRY INLET	TEMP DRY OUT	TEMP DRY (AVG)	Y	DELTA H @
1	63.0	85.7	75.0	80.3	1.020	1.70
2	64.0	88.0	77.3	82.7	1.033	1.69
3	64.0	89.0	77.3	83.2	1.033	1.80
				AVERAGE	1.029	1.73
				MAX % DEV	.85	
				ALLOWABLE % DEV	2.00	

PRE CAL Y = .9872 % DIFFERENCE = 4.06 %

ALLOWABLE = 5.00 %

FORMULAS:

$$Y = \frac{(V_w)(P_b)(T_d)}{(V_d)(P_b\ ABS)(T_w)} \qquad \text{DELTA H @} = \frac{0.0317\ (\text{DELTA H})}{(P_b)(T_d)} * \left[\frac{(T_w)(\text{TIME})}{(V_w)}\right]^2$$

CALIBRATION BY: Mark on Wescott

MARK WESCOTT

Eastmount Engineering Inc. • 420 Main Street • Walpole, MA 02081 • (508) 668-9005 • FAX (508) 668-4989

POST
METER BOX CALIBRATION SHEET

BOX #: 7
PRES BAR: 30.37

DATE: 16 Apr 1992
VACUUM: 5 In Hg

RUN #	VOLUME WET	VOLUME DRY	DELTA H	DELTA H /13.6	PRES BAR (ABS)	TIME (MINS)
1	10.00	10.250	1.50	.110	30.48	14.92
2	10.00	10.390	1.50	.110	30.48	14.97
3	10.00	10.551	1.50	.110	30.48	15.28

RUN #	TEMP WET (`F)	TEMP DRY INLET	TEMP DRY OUT	TEMP DRY (AVG)	Y	DELTA H @
1	65.0	91.3	72.3	81.8	1.003	1.77
2	64.3	101.3	79.0	90.2	1.006	1.75
3	64.0	105.3	84.0	94.7	.9996	1.81
				AVERAGE	1.003	1.78
				MAX % DEV	.34	
				ALLOWABLE % DEV	2.00	

PRE CAL Y = .9822 % DIFFERENCE = 2.08 %

ALLOWABLE = 5.00 %

FORMULAS:

$$Y = \frac{(V_w)(P_b)(T_d)}{(V_d)(P_{b\,ABS})(T_w)}$$

$$\text{DELTA H @} = \frac{0.0317\,(\text{DELTA H})}{(P_b)(T_d)} * \left[\frac{(T_w)(\text{TIME})}{(V_w)}\right]^2$$

CALIBRATION BY: Mark M Wescott
MARK WESCOTT"

Eastmount Engineering Inc. • 420 Main Street • Walpole, MA 02081 • (508) 668-9005 • FAX (508) 668-4989

THERMOCOUPLE CALIBRATION SHEET

SET #: METER BOX #4 - IN DATE: 9/11/85

STANDARD ('F)	THERMOCOUPLE ('F)	% DIFFERENCE
32	27	1.02
63	57	1.15
204	201	.45
	MAXIMUM	1.15
	ALLOWABLE	1.50

SET #: METER BOX #4 - OUT DATE: 9/11/85

STANDARD ('F)	THERMOCOUPLE ('F)	% DIFFERENCE
32	27	1.02
63	57	1.15
204	202	.30
	MAXIMUM	1.15
	ALLOWABLE	1.50

CALIBRATION BY: C. LODI

THERMOCOUPLE CALIBRATION SHEET

SET #: METER BOX EN-1-IN (ωο.η) DATE: 11/22/88

STANDARD ('F)	THERMOCOUPLE ('F)	% DEVIATION OF ABSOLUTE
32	30	.41
66	65	.19
212	214	.30
	MAXIMUM	.41
	ALLOWABLE	1.50

SET #: METER BOX EN-1-OUT DATE: 11/22/88

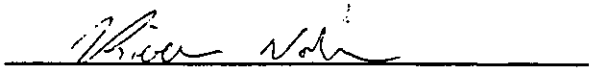
STANDARD ('F)	THERMOCOUPLE ('F)	% DEVIATION OF ABSOLUTE
32	33	.20
66	65	.19
212	215	.45
	MAXIMUM	.45
	ALLOWABLE	1.50

...LIBRATION BY: A. STRATTON

THERMOCOUPLE CALIBRATION SHEET

SET #: 5.5' - 193 DATE 3/6/91

STANDARD ('F)	THERMOCOUPLE ('F)	% DIFFERENCE (ABSOLUTE)
32	34	.41
212	213	.15
482	491	.96
	MAXIMUM	.96
	ALLOWABLE	1.50

CALIBRATION BY: 

KIERAN NOLAN

THERMOCOUPLE CALIBRATION SHEET

SET #: 5.5' - 115 DATE 3/6/91

STANDARD ('F)	THERMOCOUPLE ('F)	% DIFFERENCE (ABSOLUTE)
32	32	.00
212	212	.00
475	488	1.41
	MAXIMUM	1.41
	ALLOWABLE	1.50

CALIBRATION BY: Kieran Nolan

KIERAN NOLAN

M11-3

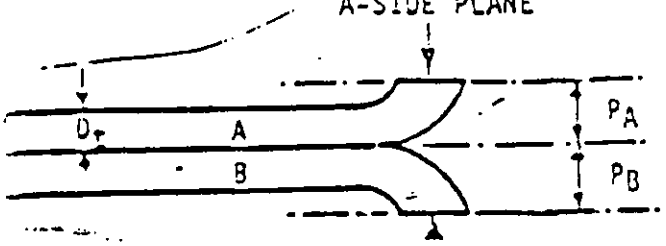
TYPE S PITOT TUBE INSPECTION DATA FORM

Tubing diameter, D_t .373 in.

Pitot Tube Assembly Level? (Yes) / No

Pitot Tube Openings Damaged? Yes / (No)

A = 1.07



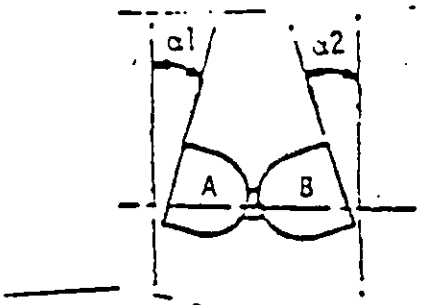
NOTE:

$\{1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

P_A = .487 in.

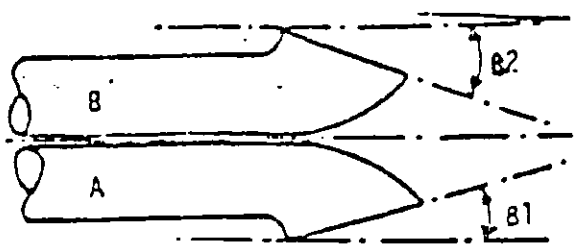
P_B = .527 in.



α_1 = 6 °

α_2 = 1 °

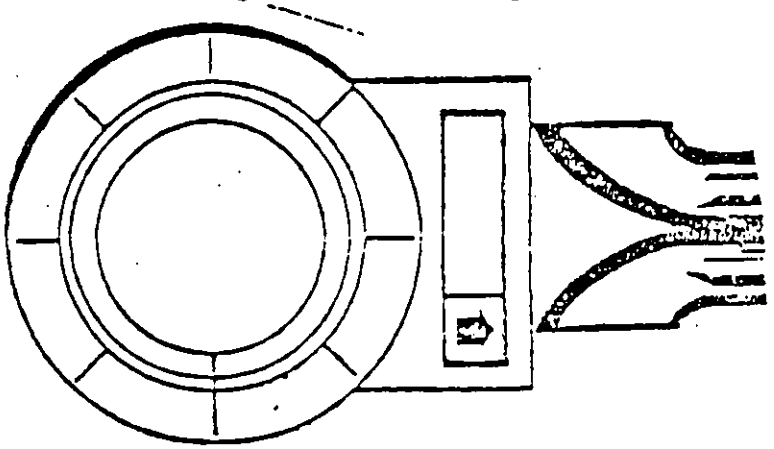
(<10°)

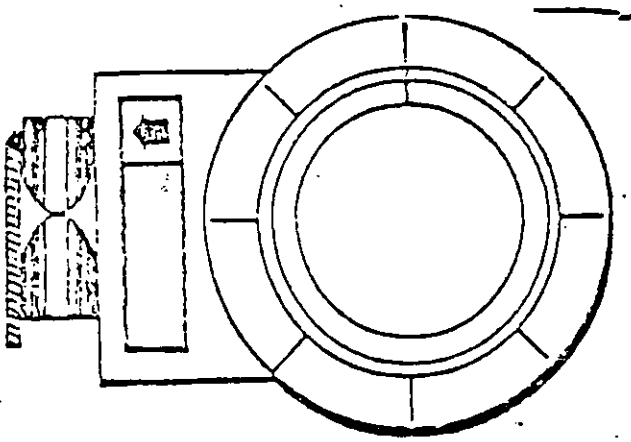


B_1 2 °

B_2 1 0 °

(< 5°)





Level Position to Find γ γ = 1 °

Z = A sin γ .0187 in. (< 1/8 in.)

allowable = .125

Level Position to find θ θ = 0

W = A sin θ 0 in. (< 1/32 in.)

Comments _____

Checked by: M. Wescott Date: 16 May 91

Calibration Required? _____

71"-2

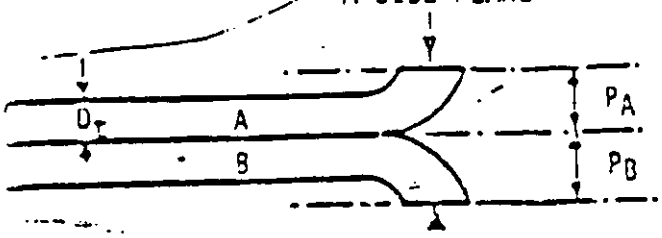
TYPE S PITOT TUBE INSPECTION DATA FORM

Tubing diameter, D_t .375 in.

Pitot Tube Assembly Level? (Yes) / No

Pitot Tube Openings Damaged? Yes / (No)

A = .998



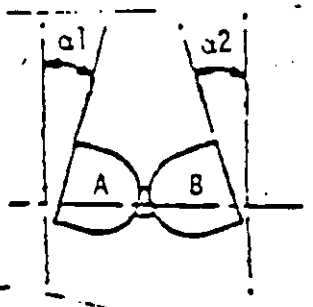
NOTE:

$\{1.05\ D_t < P < 1.50\ D_t$

$P_A = P_B$

P_A = .508 in.

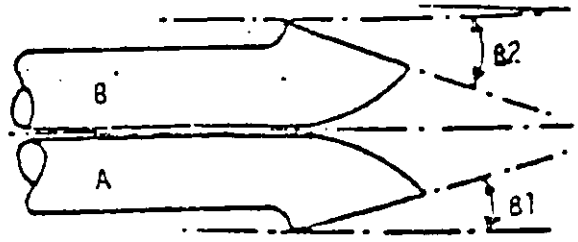
P_B = .497 in.



α_1 = 0 °

α_2 = 1 °

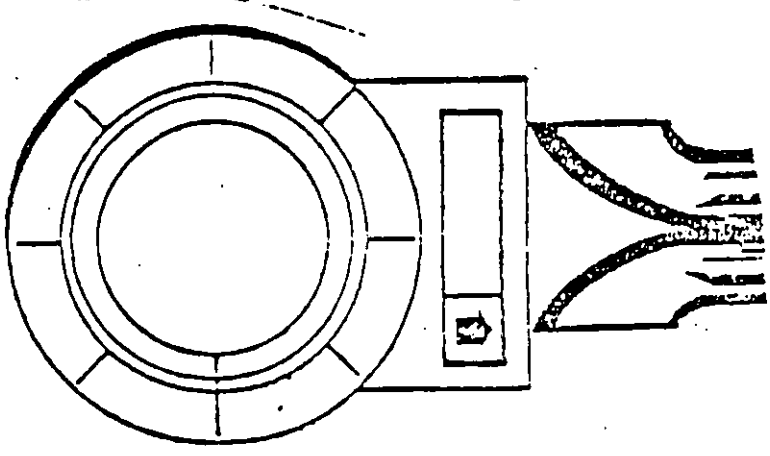
(<10°)

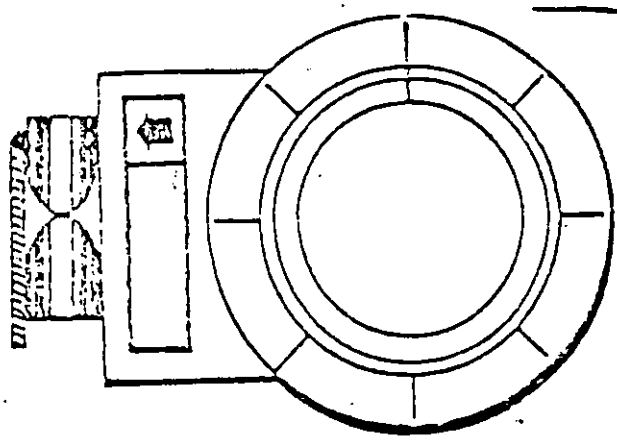


B_1 2 °

B_2 0 °

(< 5°)





Level Position to Find γ $\gamma = 2°$

Z = A sin γ .0345 in. (< 1/8 in.)
allowable = .125

Level Position to find θ $\theta = 1°$

W = A sin θ .0174 in. (< 1/32 in.)
allowable = .0312

Comments _____

Checked by: M Wescott Date: 16 May 91

Calibration Required? _____

NOZZLE CALIBRATION SHEET

PROJECT NAME: GE Burlington PROJECT NUMBER: 92-029

POINT#	Outlet NOZZLE# 1/4-#QTZ	Inlet NOZZLE # 3/16-QTZ	NOZZLE#____	NOZZLE #____
1	.252	.203	____	____
2	.253	.204	____	____
3	.255	.202	____	____
AVG.	.253	.203	____	____

CALIBRATED BY: _____ DATE: _____

APPENDIX VII

STACK TESTING FIELD DATA SHEETS

FIELD DATA SHEET

GENERAL INFORMATION

Plant:	GE Burlington	Run #:	Cr-1-In
Location:	CECO Filter Inlet	Date:	19 Mar 92
Ds (ft):	3.33 ~~3.33~~ (40")	No. Points:	1
Dn (in):	.203	Test Length:	120 min
Filter #:	N/A	End Meter Reading:	191.781
Cp:	.84	Int Meter Reading:	125.299
P bar:	29.67	Begin Time:	11:25
P stack:	-0.8	End Time:	13:25
IMP-1 (INT)	100	IMP-1 (FINAL)	100 ml
IMP-2 (INT)	100	IMP-2 (FINAL)	100 ml
IMP-3 (INT)	0	IMP-3 (FINAL)	0
IMP-4 (INT)	500.0 g	IMP-4 (FINAL)	509.3 g

	TEST 1	TEST 2	TEST 3
% CO2	—		
% O2	20.9		
% CO	—		

Project Director:	D Stratton	Field Laboratory:	D Stratton
Meter Box Operator:	S. Griffith	Chain of Custody:	D Stratton
Probe Operator:	S. Griffith	Plant Coordinator:	R Frank
Orsat Analyst:	N/A	Agency Rep:	N/A

Comments: 175
184
25
200 ± Imp 1&2

584 ml

TRAVERSE DATA SHEET

Page 1 of 1 (Burlington VT)
Plant: GE Plating Facility
Location: Inlet

Sampling time per point: 12 min
Run #: CR - 1 - IN
Date: 3-19-92

Trav. No.	Delta P	Delta H	Meter Reading 125.299	DGM In (2)	DGM Out (1)	Hot Box	Tmcs Temp (4)	Stack Temp (3)	Vac
A 1	.42	0.882				N/A			
2	.43	.903	136.31	95	85		33	76	1
3	.42	.882	139.33	92	84		34	77	1
4	.42	.882	146.04	87	79		35	77	1
5	.41	.861	152.66	83	75		35	77	1
6	.41	.861	159.20	81	73		36	77	1
7	.42	.882	165.69	78	69		35	77	1
8	.42	.882	172.27	77	68		36	77	1
9	.42	.882	178.81	76	66		37	77	1
10	.41	.861	185.32	76	65		37	77	1
9			191.781						

Relationship: 8.1
Box #: 4 Y: .9792 Delta H@: 1.076
Start Time: 11:25 End Time: _____
Pre Leak Ck: 0.005 CFM @ 5 "Hg
Mid Leak Ck: _____ CFM @ _____ "Hg (Vol: _____)
Post Leak CK: 0.001 CFM @ 3 "Hg
Pitot Leak CK: _____ @ _____ "H2O
Box Oper: _____ Probe Oper: _____

FIELD DATA SHEET

GENERAL INFORMATION

Plant:	GE Burlington	Run #:	Cr-2-Inlet
Location:	CECO Filter Inlet	Date:	19 Mar 92
Ds (ft):	3.33	No. Points:	1
Dn (in):	.203	Test Length:	120
Filter #:	N/A	End Meter Reading:	~~332.887~~261.852
Cp:	.84	Int Meter Reading:	192.100
P bar:	29.67	Begin Time:	14:35
P stack:	-0.8	End Time:	16:35
IMP-1 (INT)	100	IMP-1 (FINAL)	98
IMP-2 (INT)	100	IMP-2 (FINAL)	99
IMP-3 (INT)	0	IMP-3 (FINAL)	0
IMP-4 (INT)	500	IMP-4 (FINAL)	509.0

	TEST 1	TEST 2	TEST 3
% CO2	—		
% O2	20.9		
% CO	—		

Project Director:	A Stoffa	Field Laboratory:	A Stoffa
Meter Box Operator:	S. Griffis	Chain of Custody:	A Stoffa
Probe Operator:	S. Griffis	Plant Coordinator:	R. Frank
Orsat Analyst:	N/A	Agency Rep:	N/A

Comments: 640 ml dry

FIELD DATA SHEET

TRAVERSE POINT INFORMATION

Page 1 of 2

Sampling time per point: 12 min

Plant: GE Burlington

Run #: Cr-2-In

Location: Inlet

Date: 3-19-92

192.100

Trav. No.	Delta P	Delta H	Meter Reading	2 DGM In	1 DGM Out	Hot Box	4 Impg Temp	3 Stack Temp	Vac
1	.45	.945	195.50	73	64	N/A	32	~~37~~ 78	1
	.46	.966	198.45	76	64		33	77	1
2	.47	.987	202.42	79	64		35	77	1
	.46	.966	205.87	83	66		37	77	1
3	.46	.966	209.30	86	69		38	78	1
	.46	.966	212.77	89	72		38	77	1
4	.47	.987	216.33	92	75		38	77	1
	.46	.966	219.82	94	78		39	78	1
5	.46	.966	223.44	93	80		39	78	1
	.46	.966	226.82	91	80		39	77	1
6	.47	.987	230.12	91	80		39	77	1
	.47	.987	233.91	90	80		39	78	1
7	.46	.966	237.48	89	79		39	79	1
	.46	.966	240.86	88	77		39	77	1
8	.47	.987	244.40	91	78		39	78	1
	.46	.966	247.91	94	79		39	78	1

Comments: DELTA P * 2.1 = DELTA H

BOX # 4 ; Y = .9872 , DELTA H @ = 1.76

START TIME : ~~12~~ 14:35

STOP TIME : _____

INITIAL LEAK CHECK _____ AT _____ INCHES HG

FINAL LEAK CHECK _____ AT _____ INCHES HG

FIELD DATA SHEET

TRAVERSE POINT INFORMATION

Page 2 of 2

Sampling time per point: 12 MIN

Plant: GE Burlington

Run #: CR-2-IN

Location: Inlet

Data: 3-19-92

Trav. No.	Delta P	Delta H	Meter Reading	DGM In (2)	DGM Out (1)	Hot Box	Impg Temp (4)	Stack Temp (3)	Vac
9	.46	.966	251.42	98	82		39	78	1
	.45	.945	254.84	101	85		39	77	1
10	.45	.945	258.36	103	88		39	77	1
	.45	.945	261.852	105	90		39	79	1

Comments: DELTA P = 2.1 = DELTA H

BOX # 4 ; Y = .9872, DELTA H @ = 1.96

START TIME : 16:35

STOP TIME : _____

INITIAL LEAK CHECK _____ AT _____ INCHES HG

FINAL LEAK CHECK _____ AT _____ INCHES HG

FIELD DATA SHEET

GENERAL INFORMATION

Plant:	GE Burlington	Run #:	Cr-3-Inlet
Location:	CECO Filter Inlet	Date:	19 Mar 92
Ds (ft):	3.33	No. Points:	1
Dn (in):	.203	Test Length:	120
Filter #:	N/A	End Meter Reading:	332.887
Cp:	.84	Int Meter Reading:	262.073
P bar:	29.67	Begin Time:	17:20
P stack:	-0.8	End Time:	19:20
IMP-1 (INT)	100	IMP-1 (FINAL)	102
IMP-2 (INT)	100	IMP-2 (FINAL)	102
IMP-3 (INT)	0	IMP-3 (FINAL)	0
IMP-4 (INT)	500	IMP-4 (FINAL)	509.6

	TEST 1	TEST 2	TEST 3
% CO2	-		
% O2	20.9		
% CO	-		

Project Director:	A Stoffa	Field Laboratory:	A Stoffa
Meter Box Operator:	S. Griffin	Chain of Custody:	A Stoffa
Probe Operator:	S. Griffin	Plant Coordinator:	R. Frank
Orsat Analyst:	N/A	Agency Rep:	N/A

Comments:

528ml

159
369
528

FIELD DATA SHEET

TRAVERSE POINT INFORMATION

Page 1 of 2 — Sampling time per point: 12 min

Plant: Ge Burlington — Run #: CR-3-IN

Location: INLET — Data: 3-19-92

262.073

Trav. No.	Delta P	Delta H	Meter Reading	DGM In (2)	DGM Out (1)	Hot Box	Impg Temp (4)	Stack Temp (3)	Vac
1	.47	.987	265.63	76	73	N/D	34	78	1
12	.47	.987	269.15	81	72		34	79	1
2	.46	.966	272.63	81	71		35	78	1
24	.48	1.008	276.48	82	71		36	79	1
3	.47	.987	280.89	81	71		37	78	1
36	.47	.987	283.23	80	69		38	78	1
4	.47	.987	286.73	81	69		37	79	1
	.48	1.008	290.30	79	68		36	78	1
5	.47	.987	293.82	80	69		37	77	1
	.46	.966	297.33	82	68		36	77	1
6	.47	.987	300.82	87	70		36	78	1
	.47	.987	304.37	96	73		36	78	1
7	.47	.987	307.90	95	76		36	78	1
	.46	.966	311.55	98	81		35	78	1
8	.46	.966	315.10	101	84		36	79	1
	.47	.987	318.98	101	88		37	78	1

Comments: DELTA P * 2.1 = DELTA H

BOX # 4 ; Y = .9872, DELTA H @ = 1.76

START TIME : 1720

STOP TIME : _____

INITIAL LEAK CHECK _____ AT _____ INCHES HG

FINAL LEAK CHECK _____ AT _____ INCHES HG

FIELD DATA SHEET

TRAVERSE POINT INFORMATION

Page 2 of 2

Sampling time per point: 12 min

Plant: GE Burlington

Run #: CR-3-IN

Location: Inlet

Date: 3-19-92

Trav. No.	Delta P	Delta H	Meter Reading	DGM In	DGM Out	Hot Box	Impg Temp	Stack Temp	Vac
9	.48	1.008	322.14	99	89		36	78	1
	.47	.987	325.68	97	88		36	79	1
10	.48	1.008	329.27	95	87		36	80	1
	.48	1.008	332.887	94	85		36	78	1

Comments: DELTA P * 2.1 = DELTA H
BOX # 4 ; Y = .9872 , DELTA H @ = 1.76
START TIME :
STOP TIME : 1920
INITIAL LEAK CHECK _____ AT _____ INCHES HG
FINAL LEAK CHECK _____ AT _____ INCHES HG

FIELD DATA SHEET

GENERAL INFORMATION

Plant:	GE Burlington	Run #:	Cr-1-Out
Location:	CECO Filter Outlet	Date:	19 Mar 92
Ds (ft):	3.33	No. Points:	10
Dn (in):	.253	Test Length:	120 min
Filter #:	N/A	End Meter Reading:	~~398.714~~ 398.714
Cp:	.84	Int Meter Reading:	312.592
P bar:	29.67	Begin Time:	11:25
P stack:	+ 0.42	End Time:	13:25
IMP-1 (INT)	100	IMP-1 (FINAL)	98 ml
IMP-2 (INT)	100	IMP-2 (FINAL)	99 ml
IMP-3 (INT)	0	IMP-3 (FINAL)	0
IMP-4 (INT)	500.0g	IMP-4 (FINAL)	511.8g

	TEST 1	TEST 2	TEST 3
% CO2	—		
% O2	20.9		
% CO	—		

Project Director:	D. Straffon	Field Laboratory:	D. Straffon
Meter Box Operator:	K. Nolan	Chain of Custody:	D. Straffon
Probe Operator:	M. Wescott	Plant Coordinator:	R. Frank
Orsat Analyst:	N/A	Agency Rep:	N/A

Comments: 184
135
98
99

516 ml

TRAVERSE DATA SHEET

Page 1 of 2 — Sampling time per point: 6 min

Plant: G.E. Burlington — Run #: Cr 1 Out

Location: Outlet — Date: 3-19-92

Trav. No.	Delta P	Delta H	Meter Reading 312.592	DGM In	DGM Out	Hot Box	Impg Temp	Stack Temp	Vac
A.1 a	.18	.72	315.8	90	70	N/A	28	83	1
b	.18	.72	319.2	93	75		28	83	1
2 a	.15	0.60	321.9	95	77		26	83	1
b	.22	0.88	325.3	92	78		29	83	1
3 a	.32	1.28	329.3	92	77		32	84	2
b	.32	1.28	333.3	92	77		32	84	2
4 a	.40	1.60	339.0	90	76		33	84	2
b	.40	1.60	342.2	88	79		33	84	3
5 a	.48	1.90	347.0	88	74		34	84	3
b	.55	2.20	352.2	87	73		34	85	3
6 a	.70	2.75	358.9	88	72		35	85	4
b	.64	2.55	363.7	89	71		36	84	4
7 a	.40	1.60	368.6	89	71		36	84	4
b	.40	1.60	373.1	89	72		36	84	3
8 a	.37	1.48	377.4	85	84		37	83	3
b	.34	1.35	381.6	83	69		36	85	3
9 a	.33	1.30	386.1	82	68			85	3

Relationship: 4
Box #: 7 Y: .9822 Delta H@: 1.67
Start Time: 11:25 End Time:
Pre Leak Ck: .005 CFM @ 10 "Hg
Mid Leak Ck: CFM @ "Hg (Vol:)
Post Leak CK: CFM @ "Hg
Pitot Leak CK: @ "H2O
Box Oper: KN Probe Oper: MW

TRAVERSE DATA SHEET

Page 2 of 2 — Sampling time per point: 6 min

Plant: G.E. Burlington / V.T. — Run #: Cr 1 Out

Location: OUTLET — Date: 3-19-92

Trav. No.	Delta P	Delta H	Meter Reading	DGM In	DGM Out	Hot Box	Impg Temp	Stack Temp	Vac
9 s	.38	1.50	390.1	82	68	N/A	36	85	3
10 a	.38	1.50	394.4	81	67	"	36	85	3
5	.38	1.50	398.714	81	66	"	36	85	3

Relationship:_____
Box #:_____ Y:_____ Delta H@:_____
Start Time:_____ End Time:_____
Pre Leak Ck:_____ CFM @_____"Hg
Mid Leak Ck:_____ CFM @_____"Hg (Vol:_____)
Post Leak CK:_____CFM @_____"Hg
Pitot Leak CK:_____ @ _____"H2O
Box Oper:_____ Probe Oper:_____

FIELD DATA SHEET

GENERAL INFORMATION

Plant:	GE Burlington	Run #:	Cr-2-Outlet
Location:	CECO Filter Outlet	Date:	19 Mar 92
Ds (ft):	3.33	No. Points:	10
Dn (in):	.253	Test Length:	120 min
Filter #:	N/D	End Meter Reading:	498.616
Cp:	.84	Int Meter Reading:	388.909
P bar:	29.67	Begin Time:	14:35
P stack:	+0.4	End Time:	16:35
IMP-1 (INT)	100 ml	IMP-1 (FINAL)	100
IMP-2 (INT)	100 ml	IMP-2 (FINAL)	99
IMP-3 (INT)	0 ml	IMP-3 (FINAL)	0
IMP-4 (INT)	500 g	IMP-4 (FINAL)	514.3

	TEST 1	TEST 2	TEST 3
% CO2	—		
% O2	20.9		
% CO	—		
Project Director:	D. Stratton	Field Laboratory:	D. Stratton
Meter Box Operator:	K. Wolan	Chain of Custody:	D. Stratton
Probe Operator:	M. Wescott	Plant Coordinator:	R. Frank
Orsat Analyst:	N/D	Agency Rep:	N/D

Comments: 234 195 199 628 ml

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FIELD DATA SHEET

TRAVERSE POINT INFORMATION

Page 1 of 2 — Sampling time per point: 6 min

Plant: G.G. BURLINGTON — Run #: CA-2-Out

Location: OUTLET — Data: 3-19-92

Trav. No.	Delta P	Delta H	Meter Reading	DGM In	DGM Out	Hot Box	Impg Temp	Stack Temp	Vac
			398.909						
1a	.18	.72	401.9	71	62	N/A	33	35	1
b	.18	.72	404.9	55	78		32	85	1
2a	.26	1.05	408.6	53	65		34	85	1
b	.31	1.24	412.0	87	64		36	85	1
3a	.30	1.20	416.0	92	70		38	86	1
b	.32	1.27	419.8	94	73		38	85	1
4a	.46	1.82	424.4	95	74		39	85	2
b	.44	1.73	429.1	98	76		39	85	2
5a	.37	1.47	434.0	98	77		39	85	2
b	.58	2.30	439.5	96	78		39	85	3

Comments: DELTA P * 4 = DELTA H
BOX # 7 ; Y = .9822 , DELTA H @ = 1.67
START TIME : 14:35
STOP TIME : _____
INITIAL LEAK CHECK .005 AT 10 INCHES HG
FINAL LEAK CHECK _____ AT _____ INCHES HG

FIELD DATA SHEET

TRAVERSE POINT INFORMATION

Page 2 of 2 — Sampling time per point: 6 min

Plant: G.E. BURLINGTON — Run #: Gr-2-Out

Location: OUTLET — Data: 3-19-92

Trav. No.	Delta P	Delta H	Meter Reading	DGM In	DGM Out	Hot Box	Impg Temp	Stack Temp	Vac
6a	.63	2.52	444.0	97	78	N/A	34	85	3
b	.60	2.38	449.6	97	79		39	85	3
7a	.53	3.30	455.6	96	79		39	85	3
b	.91	3.60	463.0	99	79		39	85	4
8a	.80	3.18	469.0	103	81		39	85	4
6	.86	3.50	474.8	106	83		39	85	4
9a	.68	2.70	481.5	109	85		38	85	4
b	.68	2.70	486.5	111	88		38	85	3
10a	.68	2.70	492.3	111	89		37	85	3
b	.83	3.30	498.616	113	91		37	85	3

Comments: DELTA P * 4 = DELTA H
BOX # 7 ; Y = .9822 , DELTA H @ = 2.67
START TIME : 14:35
STOP TIME : 15:35
INITIAL LEAK CHECK .005 AT 10 INCHES HG
FINAL LEAK CHECK _____ AT _____ INCHES HG

FIELD DATA SHEET

GENERAL INFORMATION

Plant:	GE Burlington	Run #:	Cr-3-Outlet
Location:	CECO Filter Outlet	Date:	19 Jan 92
Ds (ft):	3.33	No. Points:	10
Dn (in):	.253	Test Length:	120 min
Filter #:	N/A	End Meter Reading:	580.130
Cp:	.84	Int Meter Reading:	498.716
P bar:	27.67	Begin Time:	17:20
P stack:	+ 0.42	End Time:	19:20
IMP-1 (INT)	100	IMP-1 (FINAL)	100
IMP-2 (INT)	100	IMP-2 (FINAL)	100
IMP-3 (INT)		IMP-3 (FINAL)	0
IMP-4 (INT)	500	IMP-4 (FINAL)	510.5

	TEST 1	TEST 2	TEST 3
% CO2	—		
% O2	20.9		
% CO	—		

Project Director:	A. Stratton	Field Laboratory:	A Stratton
Meter Box Operator:	K. Nolan	Chain of Custody:	A Stratton
Probe Operator:	M. Wescott	Plant Coordinator:	R. Frank
Orsat Analyst:	N/A	Agency Rep:	N/A

Comments: 430 ml

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430

2/6
104
110

FIELD DATA SHEET

TRAVERSE POINT INFORMATION

Page 2 of 2 — Sampling time per point: 6 min

Plant: G.E. BURLINGTON — Run #: Cr-3-Out

Location: OUTLET — Data: 3-19-92

Trav. No.	Delta P	Delta H	Meter Reading	DGM In	DGM Out	Hot Box	Impg Temp	Stack Temp	Vac
6 a	.58	2.30	541.0	97	74	N/A	29	86	5
b	.45	1.77	545.8	100	76		32	85	4
7 a	.35	1.39	550.0	101	78		32	85	4
b	.38	1.51	554.4	103	78		32	85	3
8 a	.33	1.31	558.4	105	83		32	86	3
b	.33	1.31	562.0	104	85		32	86	3
9 a	.33	1.31	566.9	102	85		33	85	3
b	.42	1.68	571.4	101	85		31	86	3
10 a	.38	1.50	575.7	101	84		31	85	3
b	.38	1.50	580.150	99	84		30	85	3

Comments: DELTA P * 4 = DELTA H
BOX # 7 ; Y = .9822, DELTA H @ = 1.67
START TIME : 17:20
STOP TIME : 19:20
INITIAL LEAK CHECK _____ AT _____ INCHES HG
FINAL LEAK CHECK _____ AT _____ INCHES HG

FIELD DATA SHEET

TRAVERSE POINT INFORMATION

Page 1 of 2 — Sampling time per point: 6 min

Plant: G.E. BURLINGTON — Run #: CR-3-Out

Location: OUTLET — Date: 3-14-92

Trav. No.	Delta P	Delta H	Meter Reading	DGM In	DGM Out	Hot Box	Impg Temp	Stack Temp	Vac
			495.716						
1a	.15	.60	501.6	80	75	N/A	32	86	1
b	.18	.72	504.8	81	72	"	32	85	1
2a	.22	.88	507.8	84	71		32	85	1
b	.21	.84	510.9	84	71		33	86	2
3a	.25	.99	515.1	86	70		33	85	2
b	.23	.92	517.4	85	69		33	85	2
4a	.35	1.39	521.8	85	69		33	86	2
b	.30	1.20	525.7	86	69		30	86	3
5a	.55	2.19	531.0	87	69		30	86	3
b	.55	2.19	536.1	92	71	↓	32	85	4

Comments: DELTA P = 4 = DELTA H
BOX # 7 ; Y = 0.9822, DELTA H @ = 1.67
START TIME : 17:20
STOP TIME : _____
INITIAL LEAK CHECK .005 AT 10 INCHES HG
FINAL LEAK CHECK _____ AT _____ INCHES HG