AirRecon
Division of
RECON SYSTEMS, Inc.

Route 202 North, P.O. Box 460
Three Bridges, NJ 08887-0460
(201) 782-5900

Connecticut (203) 293-1212
Massachusetts (508) 752-4217
Pennsylvania (215) 433-5511
FAX (201) 782-0072

#6

AP-42 Section 9.13.2
Reference 10
Report Sect.
Reference

COMPLIANCE
STACK SAMPLING REPORT

For

General Foods Corporation
Maxwell House Division
1125 Hudson Street
Hoboken, New Jersey 07030

Source Tested:

Afterburner Inlet and Outlet

In Fulfillment of
Purchase Order No. 3362-88-MHD

RECON Project No. 0641

Test Date: January 31 and February 1, 1989

Report Date: March 13, 1989

0641 (ST-K)

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STACK SAMPLING REPORT FOR

General Foods Corporation
Maxwell House Division
Hoboken, New Jersey
on Afterburner Inlet and Outlet

INTRODUCTION

The above referenced locations were sampled for particulates. The outlet stack was also sampled for carbon monoxide and total hydrocarbon emissions on January 31 and February 1, 1989. This report contains the following information.

SUMMARY

The following results were obtained:

	INLET		
Run No.	1	2	3
Date	1/31/89	2/1/89	2/1/89
Time	1000-1145	0802-0921	1047-1247
Emissions Data			
Particulates			
pounds/hour	0.49	0.66	0.44
grains/dscf	0.035	0.046	0.032
grains/scf	0.032	0.042	0.030

	OUTLET		
Run No.	1	2	3
Date	1/31/89	2/1/89	2/1/89
Time	1000-1151	0750-0920	1045-1245
Emissions Data			
Particulates			
pounds/hour	0.19	0.28	0.12
grains/dscf	0.011	0.016	0.007
grains/scf	0.010	0.015	0.007
Total Hydrocarbons			
(as methane)			
pounds/hour	0.10	0.18	0.15
ppmv (wet)	18	33	28
ppmv (dry)	20	36	31
Carbon Monoxide			
pounds/hour	1.14	3.70	1.40
ppmv (wet)	121	384	150
ppmv (dry)	131	416	166
Carbon Monoxide Emissions			
Corrected to 7% Oxygen			
ppmv (dry)	236	741 737	334
Afterburner Efficiency			
Particulates, %	61.2	57.6	72.7

Samples from this project will be retained for sixty days from the date of this report unless otherwise directed.

PERSONNEL AND CERTIFICATIONS

Field sampling on this project was performed by:

P. F. Marshall S. J. Culmo C. D. Ruff

T. F. Mattei T. P. Brown

Laboratory work on this project was performed by:

R. N. Schaffer A. W. McNeel

Calculations and report preparation were by:

P. F. Marshall

The testing was observed by:

Rob Tenbrevilla NJDEP
Staffard Stewart NJDEP
Michael Ciosek NJDEP

This Report is submitted by:

Peter F. Marshall
Manager, Senior Environmental Specialist

Frank W. Swetits
Vice President

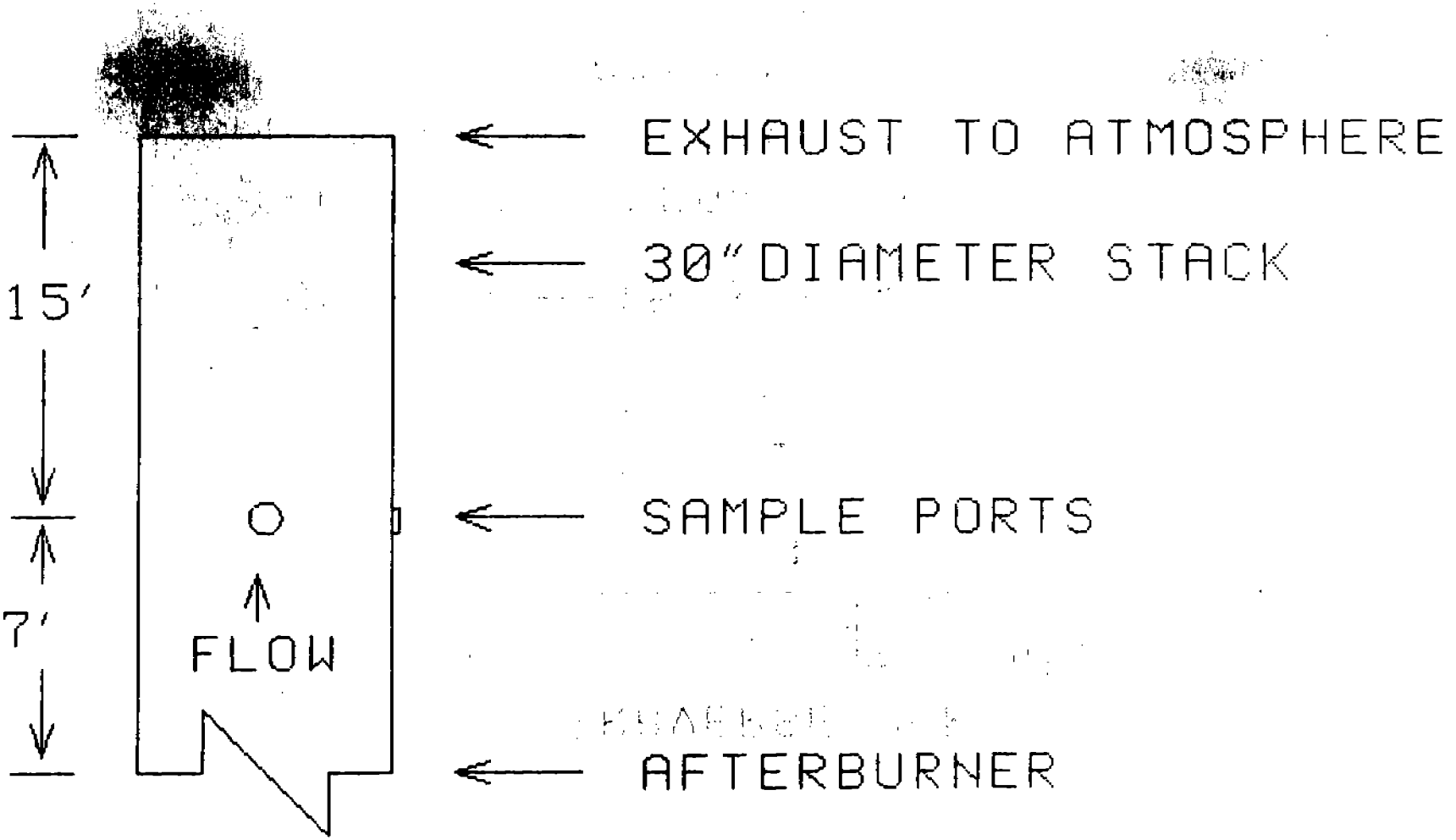
Professional Engineer Certification

I am in responsible charge of RECON's stack test work, and have discussed and reviewed the procedures and results of this set of tests with the relevant field and laboratory personnel.

Norman J. Weinstein, P.E.
New Jersey License 19536

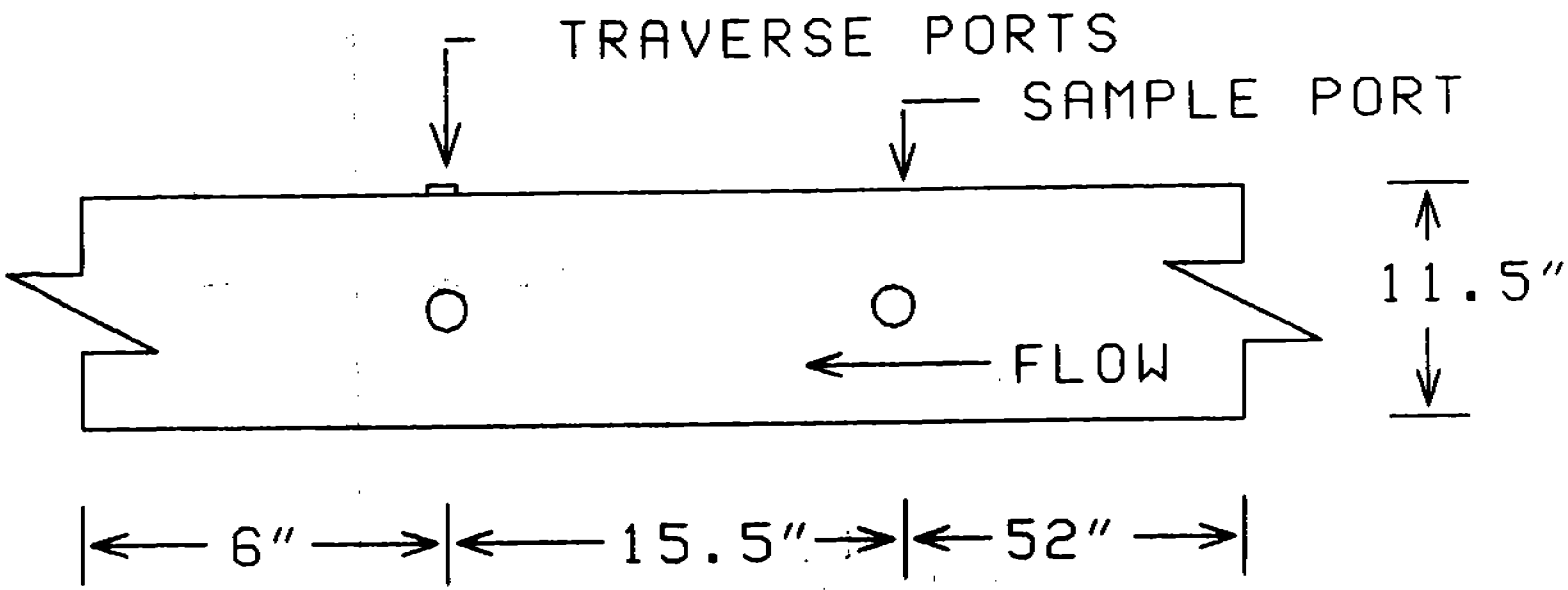
PFM/cp(ST-K)

GENERAL FOODS CORPORATION
MAXWELL HOUSE DIVISION
AFTERBURNER OUTLET



EPA DISTANCE"A":6.00
EPA DISTANCE"B":2.80
SAMPLE POINTS:24

GENERAL FOODS CORP.
MAXWELL HOUSE DIVISION
INCINERATOR OUTLET



UPSTREAM DISTURBANCE: AFTERBURNER
DOWNSTREAM DISTURBANCE: CYCLONE
EPA DISTANCE"A": 0.52
EPA DISTANCE"B": 4.52
STACK DIAMETER: 11.5"
TRAVERSE POINTS: 24
SAMPLE POINTS: 1

VELOCITY AND FLOW RATE DATA - Inlet

Sample No.	1	2	3
Date	1/31/89	2/1/89	2/1/89
Time	1000-1145	0802-0921	1047-1247
Stack Diameter (in)	11.5	----------	----------
Stack Cross Section (sq ft)	0.72	----------	----------
Barometric Pressure ("Hg)	29.91	29.78	29.80
Average Stack Temperature (°F)	163	194	201
Stack Pressure ("H_2O-gage)	-4.40	-4.30	-4.20
Moisture (% vol)	9.8	9.0	9.0
Average Velocity (ft/sec)	49.4	53.2	52.4
Actual Flow Rate (acfm)	2,140	2,300	2,270
Standard Flow Rate (scfm)	1,800	1,840	1,790
Dry Standard Flow Rate (dscfm)	1,620	1,670	1,630

Standard Conditions are 70°F, 29.92 "Hg.

VELOCITY AND FLOW RATE DATA - Outlet

Sample No.	1	2	3
Date	1/31/89	2/1/89	2/1/89
Time	1000-1151	0750-0920	1045-1245
Stack Diameter (in)	30.0		
Stack Cross Section (sq ft)	4.91		
Barometric Pressure ("Hg)	29.91	29.78	29.80
Average Stack Temperature (°F)	1506	1513	1526
Stack Pressure ("H_2O-gage)	-0.02	-0.02	-0.02
Moisture (% vol)	7.9	7.6	9.3
Average Velocity (ft/sec)	27.5	28.0	27.2
Actual Flow Rate (acfm)	8,110	8,240	8,020
Standard Flow Rate (scfm)	2,180	2,200	2,130
Dry Standard Flow Rate (dscfm)	2,010	2,030	1,930

Standard Conditions are 70°F, 29.92 "Hg.

CYCLONIC FLOW - Inlet

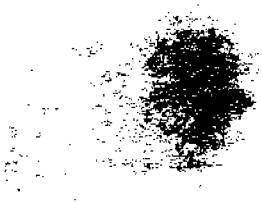
	Angle, Degrees	
Point	Port A	Port B*
1	0	-
2	2	-
3	4	-
4	4	-
5	2	-
6	2	-
7	4	-
8	4	-
9	5	-
10	7	-
11	5	-
12	2	-
	Avg. 3.4	

NOTE: **Since the average value of the cyclonic flow check is less than 20 degrees, the location is an appropriate location to determine flow rate (U.S. EPA Method 1).**

*Cyclonic flow could not be determined from this port because of the horizontal stack.

CYCLONIC FLOW - Outlet

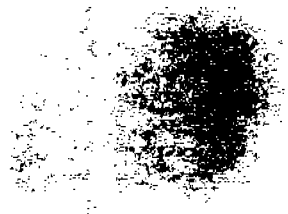
	Angle, Degrees	
Point	Port A	Port B
1	5	8
2	3	7
3	2	7
4	2	4
5	2	4
6	3	3
7	3	4
8	7	6
9	7	5
10	6	6
11	4	7
12	6	7
Avg.	4.2	6.2



NOTE: Since the average value of the cyclonic flow check is less than 20 degrees, the location is an appropriate location to determine flow rate (U.S. EPA Method 1).

CYCLONIC FLOW - Outlet

Point	Angle, Degrees Port A	Port B
1	5	8
2	3	7
3	2	7
4	2	4
5	2	4
6	3	3
7	3	4
8	7	6
9	7	5
10	6	6
11	4	7
12	6	7
Avg.	4.2	6.2



NOTE: Since the average value of the cyclonic flow check is less than 20 degrees, the location is an appropriate location to determine flow rate (U.S. EPA Method 1).

STACK GAS COMPOSITION - Inlet

Sample No.	1	2	3
Date	1/31/89	2/1/89	2/1/89
Time	1000-1151	0750-0920	1045-1245

	% By Volume (Dry Basis)		
ONSITE FYRITE			
CO_2	0.5	0.0	0.0
O_2	20.5	20.0	20.5
N_2 (By Difference)	79.0	80.0	79.5
LAB ORSAT			
CO_2	0.0	0.0	0.0
O_2	21.0	21.0	21.0
N_2 (By Difference)	79.0	79.0	79.0

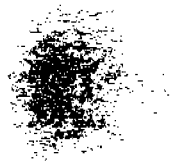
STACK GAS COMPOSITION - Outlet

Sample No.	1	2	3
Date	1/31/89	2/1/89	2/1/89
Time	1000-1145	0802-0921	1047-1247

	% By Volume (Dry Basis)		
ONSITE FYRITE			
CO_2	4.0	6.0	5.0
O_2	14.0	15.0	15.0
N_2 (By Difference)	82.0	79.0	80.0
LAB ORSAT			
CO_2	5.4	5.8	6.0
O_2	13.2	13.1	14.0
N_2 (By Difference)	81.4	81.1	80.0

PARTICULATE EMISSIONS - Inlet

Sample No.	1	2	3
Date	1/31/89	2/1/89	2/1/89
Time	1000-1145	0802-0921	1047-1247
Sampling Data			
Nominal Nozzle Size (in)	1/2		
No. of Sampling Points	1		
Sampling Time (min)	60		
Sample Volume (dscf)	~~43.7~~ 41.26	47.6	41.9 44.3
% Isokinetic	89	94	91
Emissions Data			
Particulates Grains/dscf	0.0355	0.0463	0.0318
Grains/scf	0.0319	0.0421	0.0300
Pounds/hour	0.49	0.66	0.44



PARTICULATE EMISSIONS - Outlet

Sample No.	1	2	3
Date	1/31/89	2/1/89	2/1/89
Time	1000-1151	0750-0920	1045-1245

Sampling Data

Nominal Nozzle Size (in)	1/2		
No. of Sampling Points	24		
Sampling Time (min)	72	60	60
Sample Volume (dscf)	38.4	33.7	32.1
% Isokinetic	95	99	100

Emissions Data

Particulates			
Grains/dscf	0.0113	0.0161	0.0073
Grains/scf	0.0104	0.0148	0.0066
Pounds/hour	0.19	0.28	0.12

HYDROCARBON AND CARBON MONOXIDE EMISSIONS - Outlet

Sample No.	1	2	3
Date	1/31/89	2/1/89	2/1/89
Time	1000-1151	0750-0920	1045-1245

Sampling Data

No. of Sampling Points	1		
Sampling Time (min)	60		
Sample Volume (dscf)	2.12		

Emissions Data

Total Hydrocarbons (as methane)

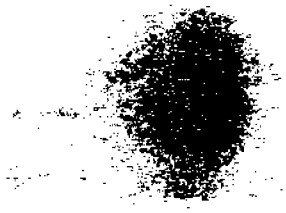
pounds/hour	0.10	0.18	0.15
ppmv (wet)	18.5	36	31
ppmv (dry)	20.1	33	28

Carbon Monoxide

pounds/hour	1.14	3.70	1.40
ppmv (wet)	131	416	166
ppmv (dry)	121	384	150

PROCESS INFORMATION

The following process information was supplied to RECON by General Foods/Maxwell House Division personnel.



EMISSION TEST PRODUCTION
REPORT FORM

I. Company Name MAXWELL HOUSE APC Plant ID# _____
Plant Location HOBOKEN
Certificate Number _____
Designation of Equipment PILOT PLANT AFTERBURNER

II. Emission Test Date(s) 31 JAN 89
Tests Conducted By:
Name of Firm RECON SYSTEMS
Business Address RT 202 N, PO BOX 460, Three Bridges, NJ 08887
Phone Number (201) 782-5960
Test Team Representatives Peter Marshall
Dave Ruff
Tom Brodon
Tom Matter

Fuel Usage was about 2000 ft³/hr

Length of Test 6 hrs

	Run #1	Run #2	Run #3
Test Time (Start/Finish)	/	/	/

III. Certificate Operating Conditions

A. List Conditions

List Conditions	Achieved (Yes or No)
350 kW ~~366~~ lbs/hr coffee	yes
1500 °F	

B. Log of Certificate Conditions During Stack Test
(Record at least every 15 minutes)

Condition	Run #	Readout	Time of Recording

IV. Equipment Operation/Process Parameters

Number of Sources Connected 2

Number of Sources Operating 2

Production Rate: Normal 200 + 150 = 350 lbs/hr

Maximum 350 lbs/hr

A. Raw Materials: Green whole beans

	Test Run #1	Test Run #2	Test Run #3
Usage Rate (lbs/hr)	350 lbs/hr	350 lbs/hr	350 lbs/hr
	~~200 lbs/hr~~	~~200 lbs/hr~~	~~200 lbs/hr~~
Breakdown (% by weight)			

B. Surface Coating:

Material Being Coated N/A

Type of Coating _____

Coating Rate (Gals/Hr) _____

Is Coating Altered (Yes or No) _____

With _____

Distance From Coating Head to Exhaust Duct N/A

C. Fuel Burning - Incineration:

Type of Fuel Natural Gas

Fuel Burning Rate _____ (lbs/hr), (gals/hr), (ft^3/hr)

Fuel Additives None, % _____

Meter Reading (if available)	Time

Emission Report Form
page 3 of 4

Type of Waste Constituents _____

Auxiliary Fuel None

Burning Rate N/A

D. Other:

Description of Operation and Process Rate

Exhausts from two small pilot plant roasters are discharged into a thermal incinerator for destruction.

V. Control Equipment Parameters

CEMs Required (Yes/No) 1500 °F. Conditions were met

Contaminant?

STACK TEST CEM READING

Parameter Cont/Read	Parameter Cont/Read	Parameter Cont/Read	Time	Test Run #

A. Control Equipment performance Parameter

Parameter	Reading	Time	Run #

B. Additional Observations

Fugitive Emissions (Yes/No) (No)

Equipment Location

Visible Emissions From Stack (Yes/No)

Odors Noticeable

Vicinity of Equipment (Yes/No)
Near Exhaust Stack (Yes/No)
Off Property (Yes/No)

VI. Samples

Type of Sample

Time of Sampling

Sampled By

Sample Taken From

To Be Analyzed For

Analyzed By

Form Information Supplied by: Name/Title (Please Print)

BRUNO G. PADOVANI, PROJECT ENGINEER

Signature(s)/Date Bruno G. Padovani

DEP Usage Only
Rec'd By Sample Rec'd Date/Time Rev'd By

ALLOWABLE EMISSIONS

The following allowable emissions are based on our understanding of the applicable regulatory rules and regulations. Since we are not always privy to the situation, these should not be accepted without confirmation from relevant sources.

Particulate	Reference	Allowable
Federal Regulations		
State Regulations		
State Permit	X	0.15 pounds/hr 99% Unit Efficiency
Sulfur Dioxide		
Federal Regulations		
State Regulations		
State Permit		
Sulfur Trioxide and Sulfuric Acid		
Federal Regulations		
State Regulations		
State Permit		
Nitrogen Oxides		
Federal Regulations		
State Regulations		
State Permit		
Hydrocarbon (VOS, VOC)		
Federal Regulations		
State Regulations		
State Permit		
Other: _____		
Federal Regulations		
State Regulations		
State Permit		

_____ We do not have sufficient information to determine allowable emissions.

PROTOCOL/PROCEDURES

Following is a copy of the original approved protocol.

0 035

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
CN 027, TRENTON, N.J. 08625

JORGE H. BERKOWITZ, Ph.D.
DIRECTOR

(609) 292-5383

July 14, 1988

Dear Mr. Sac[redacted]

Enclosed is a copy of DEP's response to RECON's stack sampling protocol for your project #0641. Please submit to me a revision to your protocol reflecting all DEP required changes. Your cooperation in this matter is greatly appreciated. Please provide a copy of this letter to Peter Marshall.

Sincerely yours
Bruno S. Padovani

Mr. Bruno S. Padovani
Project Engineer
General Foods Manufacturing Corporation
Maxwell House Division
1125 Hudson Street
Hoboken, New Jersey 07030

RE: Afterburner Stack
APC ID No. 10082
NJ Stack No. 068

Dear Mr. Padovani:

We have received the sampling and analytical protocol your company has submitted for the above referenced source. Emission tests are required to be conducted as a condition of approval of Permit No. P-82002.

Our review of the proposed procedures indicates several items which must be amended into the protocol prior to our approval. These items are as follows:

1) Emission tests for total hydrocarbons, as methane, must be conducted on the incinerator outlet. Sampling and analytical procedures to determine the total hydrocarbon emissions, must be submitted to our office for review and approval.

2) Carbon monoxide emission tests must follow the procedures outlined in EPA Reference Method 10.

3) Determination of oxygen concentrations must follow those outlined in EPA Reference Method Three.

4) Data on the determination of the absence of cyclonic flow must be presented to the on-site observer from this office prior to conducting the compliance tests.

You are required to respond to each item, in writing to our office. Until we have received and reviewed your comments, we can accept the submitted protocol.

If you have any questions please feel free to call me at (609) 530-4041.

Sincerely

Edward M. Choromanski
Chief
Bureau Technical Services

c Byron Sullivan (M.R.O.)

RECON SYSTEMS, INC.

Route 202 North, P.O. Box 460
Three Bridges, N.J. 08887
201-782-5900

New England 617-752-4217 Pennsylvania 215-433-5511

0 0 3

August 1, 1988

Mr. Edward M. Choromanski
NEW JERSEY DEPARTMENT OF
ENVIRONMENTAL PROTECTION
Technical Services Section
380 Scotch Road
W. Trenton, NJ 08628

Re: General Foods Corporation
Afterburner Stack
APC ID No. 10082
NJ Stack No. 068

RECON Project No. 0641

Dear Mr. Choromanski:

We have received your letter dated July 14, 1988 regarding protocol amendments for compliance testing at the above mentioned facility.

Response to these items are as follows:

1. The afterburner outlet will be tested in triplicate for total hydrocarbons as methane.
   Proposed number of sampling points 1
   Proposed time per sampling point 60
   Proposed total stack gas sample size 2.12 dry standard ft^3

   Please see diagram of sampling train

   Condensible material recovered in the impinger catches will be determined by a gas chromatograph equipped with a flame ionization detector for determination of total hydrocarbons.

   Gas bag samples will be directly injected into the GC/FID via a calibrated sample loop. Total hydrocarbon concentrations will be determined as above. Concentrations of both phases will be totaled and used to calculate emissions. Copies of chromatograms will be included in our final report showing identified responses plus any other unidentified peaks.

2. We agree.

3. We agree.

4. We agree.

We anticipate a test date during the week of August 22, 1988. Please advise us of a test date that is convenient with your office.

Feel free to call if you have any questions or comments.

Very truly yours,

Richard F. Toro
Executive Vice President

Per Peter F. Marshall
Senior Environmental Specialist

PFM/cp

cc: Bruno Padovani
General Foods Corportion
Maxwell House Division
1125 Hudson Street
Hoboken, NJ 07030

Let's protect our earth

9 3912

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF ENVIRONMENTAL QUALITY

CN 027, TRENTON, N.J. 08625

JORGE H. BERKOWITZ, Ph.D.
DIRECTOR

August 9, 1988

(609) 292-5383

Mr. Richard F. Toro
Executive Vice President
Recon Systems. Inc.
P.O. Box 460
Three Bridges. New Jersey 08887

RE: General Foods Corporation
APC Plant ID No. 10082
NJ Stack No. 067 and 068

Dear Mr. Toro:

We have received your letter dated August 1, 1988 regarding the amendment to the emission test protocol for the above referenced facility. Our review of this additional information incorporating the previous submittal dated July 11, 1988 indicates the sampling and analytical procedures are acceptable.

In addition to the sampling and analytical protocol your company or a representative of General Foods, is required to complete the emission test production form which I have enclosed. The completed form must be sent to the Regional Office where the facility is located. A copy of the form must be included into the final test report.

You are required to contact this office to arrange a mutually acceptable test date, so that representatives of the Department may witness the tests.

If you have any questions, please feel free to call me at (609) -530-4041.

Sincerely,

Edward M. Choromanski
Chief
Bureau of Technical Services

c Byron Sullivan

RECON SYSTEMS, INC.

Route 202 North, P.O. Box 460
Three Bridges, N.J. 08887
201-782-5900

New England 617-752-4217 Pennsylvania 215-433-5511

0 027

STACK TEST PROTOCOL SUBMITTAL

NEW JERSEY DEPARTMENT OF
ENVIRONMENTAL PROTECTION
Technical Services Section
380 Scotch Road
W. Trenton, NJ 08628

Attn: Edward Choromanski

RE: General Foods/ Maxwell
House Division
1125 Hudson Street
Hoboken, [redacted]7030

Contact: [redacted] LaSalle
Phone No. [redacted]20-3731

RECON Project No. 0641

This protocol is submitted for stack testing planned by RECON SYSTEMS, INC. for the above referenced client.

Source to be tested: Afterburner Inlet and Outlet
ID No.: 068

Certificate Numbers: 082002

Approximate Date of Testing: August 1988

For Isokinetic Testing:

Inlet

Stack diameter:	12"
Nearest upstream disturbances:	6"
Nearest downstream disturbances:	5'
EPA Distance "A": 0.5 - EPA Distance "B":	5.0
Proposed number of sampling points:	24
Proposed time per sampling point:	3 minutes
Proposed total stack gas sample size:	~35.00 dry standard ft^3

Outlet

Stack diameter:	36"
Nearest upstream disturbances:	15'
Nearest downstream disturbances:	7'
EPA Distance "A": 5.00 - EPA Distance "B":	2.33
Proposed number of sampling points:	24
Proposed time per sampling point:	3 minutes
Proposed total stack gas sample size:	~35.00 dry standard ft^3

Sampling Program

Three (3) one-hour compliance tests will be conducted for particulates using New Jersey Air Test method 1. Temperatures of the stack, probe, filter inlet, filter box and filter outlet will be recorded. Flow rates, O_2, CO_2, N_2 (by difference) will also be recorded. Impinger Numbers 1 and 2 will have 100 mls each H_2O. Impinger Number 3 empty, Impinger Number 4 will contain 200 gms of silica gel. Non-cyclonic flow will be field verified. Calibration data will be made available to the onsite observer.

Carbon monoxide and oxygen concentrations will be determined by extracting a gas sample from the stack at one liter per minute for sixty minutes in triplicate. Samples will be analyzed within a 48-hour period.

Source Operation Record Keeping

Responsibility of __A__ Owner __B__ RECON

___ Production rate
___ Fuel usage
__A__ Incineration feed rate
___ Steam production
__A__ Operating parameters (temperatures, pressures, flows, etc.)
___ Other

The following are attached if available:

1. Test procedures proposed
2. Stack diagram
3. Permits or applications
4. Process description

This protocol submitted by:

Frank W. Goretta
Manager, Field Testing

Peter F. Marshall FWS
Senior Environmental Specialist

FWS/PFM:cac
(PRO-3)

STACK TESTING PROCEDURES CHECKL.

0 0.29

Particulate Emissions:
- ___ US EPA 5
- ___ US EPA 17
- X N.J. Method 1
- ___ N.J. Method 5 (draft)
- ___ Plus impinger catch
- ___ Plus aqueous and organic impinger catch
- ___ Other _____

Probe Material ___Glass___

Velocity:
- ___ Standard pitot tube and manometer
- X "S" pitot tube and manometer
- ___ Other: _____
- X Cyclonic Flow Check X Yes ___ No

Temperature:
- X Thermocouple
- ___ Temperature gage
- ___ Process indicator

Gas Composition:
- X Onsite fyrite
- X Grab sample and lab orsat
- ___ Integrated sample and lab orsat
- ___ Integrated and traversed sample and lab orsat
- ___ Oxygen by Infrared Industries 2200 Electrochemical Analyzer

Particle Sizing:
- ___ Instack cascade impactor
- ___ Heated out of stack cascade impactor
- ___ Plus impinger catch
- ___ Plus aqueous and organic impinger catch

Sulfur Oxide Emissions:
- ___ US EPA 6
- ___ US EPA 8
- ___ Sulfite Corrections Made
- ___ Controlled condensation for SO_3
- ___ US EPA 6 __ or 8 ___ combined with US EPA 5 __ or 17 __ or particle sizing ___

Nitrogen Oxide Emissions:
- ___ US EPA 7 ___ A, ___ B, ___ C, ___ D, ___ E
- ___ Chemiluminescent monitor
- ___ US EPA 20 (Chemiluminescent Monitor)

Hydrogen Chloride (HCl) Emissions:
- ___ API 767-54
- ___ Cl^- analysis of particulate test wet catch
- ___ Other _____

Hydrocarbon Emissions:
- ___ N.J. Method 3
- ___ RECON Method 2
- ___ Integrated gas bag direct and lab GC
- ___ Grab sample gas bag direct and lab GC
- ___ Onsite GC direct ___ detector
- ___ Onsite Continuous Monitor (FID)

Metal Emissions
- ___ AA determination on filter and probe wash
- ___ AA determination on impinger catch

Carbon Monoxide Emissions:
- X Thermal Conductivity analysis of "Gas Composition" sample(s)
- ___ Onsite Continuous Monitor

Opacity:
- ___ N.J. Method 2
- ___ U.S. EPA Method 9

Calibrations: Dry gas meters and orifice, pitot tubes, thermocouples and nozzle calibrations will be supplied with the test report unless test is unofficial.

Comments:

0 030

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
CN 027, TRENTON, N.J. 08625

JORGE H. BERKOWITZ, Ph.D.
DIRECTOR

(609) 292-5383

February 23, 1988

Mr. Walter Johnston
Maxwell House Div.
General Foods Corp.
1125 Hudson Street
Hoboken, NJ 07030

Dear Mr. Johnston:

This letter is to advise you that a Permit to Construct, Install or Alter Control Apparatus or Equipment and Certificate to Operate Control Apparatus or Equipment has been approved by the Bureau of New Source Review as follows:

Company Name: General Foods Corp.

Plant Location: Maxwell House Div., Hoboken, NJ

Company Designation of Stack: Afterburner Stack 068

Approval Date: 1-28-86

Log Number: 86-2168 ID 10082

Certificate Status: 90 Day Conditional - see attached

You will be sent form VEM-017 at a later date. Form VEM-017 will include your New Jersey Plant ID Number, New Jersey Stack Number, and Permit/Certificate Number.

If you have any questions regarding this approval, please contact this bureau at (609-292-6716) and refer to the Log Number above.

Sincerely,

Richard Craig

Richard Craig, Chief
Bureau of New Source Review

RC:lsk
cc: P. Zigrand
MRO
File

[illegible] Incinerator Corporation I.D. No. 186-2168

The permit and certificate will be conditioned with the following stipulations:

1. The afterburner shall have a minimum design destruction efficiency of 99 percent for particulate emissions. The particulate emissions may not exceed 0.10 lb-/m

2. The unit chamber shall be designed to operate at a minimum temperature of [illegible] with a minimum residence of 0.5 seconds.

3. A temperature sensor and monitor and recorder shall be [illegible] and operated on the afterburner. The thermocouple shall be installed in the exit from the combustion chamber.

4. A continuous carbon monoxide and oxygen monitors and recorders shall be installed and operated on the afterburner stack. The Department reserves its right but obligation to require the installation of a continuous total hydrocarbon monitor and recorder if necessary. The company may proposed to the Department for approval a surrogate method for determining oxygen levels in the afterburner exhaust gases for the purposes of establishing steady state combustion conditions. Such methods may include periodic testing by Orsat analysis or approved portable instrumentation.

5. Details on the continuous monitors, recording devices, sample collection, calibration, monitor operating procedures, and monitor performance specification test shall be submitted for approval to the Chief - Bureau of Technical Services, Engineering and Technology Element, 380 Scotch Road, Trenton, NJ 08619.

6. The equipment in this permit shall not be used in a manner which will cause [illegible] being detectable by sense of smell in any area, except for those areas over which the owner or operator has exclusive use or occupancy.

7. The company is required to:

a. Conduct stack tests for the afterburner within 90 days of start-up in accordance with N.J.A.C. 7:27-8.4(c), for the following substances: particulates, carbon monoxide and oxygen.

b. Thirty days prior to the conduct of the required tests, submit for approval a detailed description of the sampling port locations, sampling equipment, and sampling and analytical procedures for such tests to the Chief - Bureau of Technical Services.

c. Notify the Bureau of Technical Services at 609-530-4084 and the Metropolitan Regional Field Office at 201-669-3935 at least 72 hours prior to the actual testing in order that representatives of these offices may be scheduled to witness the conduct of the tests.

8. Subsequent to the receipt of the stack test results, the Department shall establish maximum hourly concentrations of carbon monoxide corrected to seven percent oxygen which relates to the maximum allowable emission rates.

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF ENVIRONMENTAL QUALITY
AIR POLLUTION CONTROL PROGRAM

All Correspondence must indicate your APC PLANT ID NUMBER

Certificate Number 082002 LBG NUMBER 862168A APC PLANT ID 10082

(Mailing Address)

MAXWELL HOUSE COFFEE DIV GENERAL FOODS
1125 HUDSON STREET
HOBOKEN NJ 07030

(Plant Location)

MAXWELL HOUSE HOBOKEN
1125 HUDSON STREET
HOBOKEN

Applicant's Designation of Equipment AFTERBURNER STACK-Bldg #12
N.J. Stack No. 068 No. of Stacks 003 No. [redacted] 02
Approval 02/29/88 Effective 02/29/88 [redacted] 05/27/88

PERMIT TO CONSTRUCT, INSTALL OR ALTER CONTROL APPARATUS OR EQUIPMENT
AND
TEMPORARY CERTIFICATE TO OPERATE CONTROL APPARATUS OR EQUIPMENT

*** CONDITIONAL ***

THIS PERMIT AND TEMPORARY CERTIFICATE IS BEING ISSUED UNDER THE AUTHORITY OF CHAPTER 106, P.L. 1967 (N.J.S.A.26:2C-9.2). THE TEMPORARY CERTIFICATE WILL ALLOW FOR INSPECTION AND EVALUATION TO ASSURE CONFORMANCE WITH ALL PROVISIONS OF THE NEW JERSEY ADMINISTRATIVE CODE, TITLE 7, CHAPTER 27. BASED ON THIS EVALUATION, STACK TESTS MAY BE REQUIRED IN ACCORDANCE WITH N.J.A.C. 7:27-8.4(C).

IF THE DEPARTMENT IS SOLELY RESPONSIBLE FOR BEING UNABLE TO INSPECT THIS EQUIPMENT IN OPERATION AS PERMITTED DURING THIS 90-DAY PERIOD, THIS TEMPORARY CERTIFICATE WILL BE EXTENDED AUTOMATICALLY. HOWEVER, IF YOU ARE RESPONSIBLE FOR THE DEPARTMENT'S BEING UNABLE TO INSPECT, E.G., NOT NOTIFYING THE DEPARTMENT WHEN THIS EQUIPMENT OR PROCESS IS IN OPERATION, THIS CERTIFICATE MAY NOT BE EXTENDED AND YOU WILL BE NOTIFIED BY THE DEPARTMENT THAT YOU MUST APPLY FOR AND OBTAIN AN EXTENSION AUTHORIZING YOU TO CONTINUE TO OPERATE THE EQUIPMENT. THE DEPARTMENT RESERVES THE RIGHT TO WITHHOLD ANY EXTENSION OF THIS TEMPORARY CERTIFICATE, IN WHICH EVENT YOU WILL BE NOTIFIED THAT YOU MUST APPLY FOR AND OBTAIN AN EXTENSION AUTHORIZING YOU TO CONTINUE TO OPERATE AFTER THE EXPIRATION DATE OF THIS CERTIFICATE.

IN ACCORDANCE WITH N.J.A.C. 7:27-8.3(D), THIS PERMIT AND CERTIFICATE MUST BE READILY AVAILABLE FOR INSPECTION ON THE OPERATING PREMISES.

THE FOLLOWING CONDITION(S) APPLY TO THIS PERMIT AND CERTIFICATE:

(SEE ATTACHED)

Richard Craig

Approved by: _____

N.J. Department of Environmental Protection
Division of Environmental Quality
CN-027, 401 East State Street
Trenton, New Jersey 08625

MRO - HUDSON REGIONAL HEALTH COMMISSION 04/18/88-51

CALIBRATION DATA

Test Equipment Calibration

Data Sheets Follow

CON SYSTEMS, INC.
Route 202 North P.O. Box 460
THREE BRIDGES, NEW JERSEY 08887
(201) 782-5900

Meter Orifice Calibration Form (L-32)

Meter Box No. 4 Barometric Pressure (Pb) - 30.23" Hg Calibrated by: CDRuff

Dry Gas Meter No. 175 176 Ambient Temperature (TAmb) 70°F Date: DEC. 15, 88

ΔH Orifice Setting	Meter Temperatures (Tm) Inlet (°F)	Outlet (°F)	Avg (°F)	Tm+460 (°F)	METER READING (Vm) (ft³) Final	Initial	Difference	Time Θ seconds	ΔH@	0.75 Fr Δ H
0.25	80	72	76	536	999.647	999.105	0.542	120	1.93	-0.
0.50	81	71	76	536	998.260	997.501	0.759	120	1.97	-0.
0.75	80	71	76	536	996.825	995.904	0.921	120	2.01	+0.
1.00	80	70	75	535	995.067	994.004	1.063	120	2.00	0.
1.50	78	69	74	534	992.603	991.305	1.298	120	2.01	+0.
2.00	78	68	73	533	990.596	989.104	1.492	120	2.02	+0.
2.50	77	67	72	532	988.176	986.505	1.671	120	2.01	+0.
3.00	75	66	70	530	985.224	983.403	[illegible]	120	2.01	+0.
								Avg.	2.00	

Calculation

$$\Delta H@ = \frac{0.0317(\Delta H)}{Pb \cdot (T_{Amb}+460)} \times \left[\frac{(T_m+460)(\ominus)}{(V_m)(Y\text{-factor})(60)}\right]^2$$

Y Factor - Dry Gas Meter Correction Factor

Note: Difference From ΔH@ not to exceed ± 0.15

STATE METER SHOP

0 036

PROOF AND DIFFERENTIAL TEST RECORD

3-175-S

Meter Size 1-175-S Date Received June 1, 1988 Inspector J. SaPRANO

Date Tested 6-14/15-88 New ___ Repaired ✓ Manufacturer Rockwell + Amer

Prover No. 1264 Temperatures: Room Air 83 F.

Total Meters this Page 3 Oil 83 F.

Prover Air 83 F.

Temp.Comp.Meters: $\frac{\text{Abs.Base Temp.}}{\text{Abs.Prover Temp.}}$ x Uncorr. %Proof = Corr. % Proof

Meter No.	Repair Class	Percent Proof Check	Percent Proof Open	Differential Maximum	Remarks
175176	INTEST	101.7	101.9	34	Uncorr. AS % Proof FOUND
					Corr. % Proof
591355	INTEST	106.0	105.0	50	Uncorr. AS % Proof FOUND
					Corr. % Proof
625432	INTEST	102.0	102.8	39	Uncorr. AS % Proof Found
					Corr. % Proof
					Uncorr. % Proof
					Corr. % Proof
175176	ADJUST	100.3	100.0	34	Uncorr. AS % Proof CALIBRATED
					Corr. % Proof
591355	ADJUST	100.2	100.2	50	Uncorr AS % Proof CALIBRATED
					Corr. % Proof
625432	ADJUST	100.0	99.8	39	Uncorr. AS % Proof CALIBRATED
					Corr. % Proof

METER BOX I.D.# 3 METER NO.# 38949 DATE INSTALLED: JAN. 18, 88 BY: CDR

BARO. PRESS. = 29.92

ΔH ORIFICE SETTING	METER TEMP. IN	METER TEMP. OUT	METER TEMP. AVG T	T + 460	METER READING	A	TIME θ SEC.	$\Delta H_@$	DIFFERENCE FROM AVG. ΔH.
					1: 472,852				
.5	84	70	77	537	1: 472,105	0.747	120	2.07	-0.07
					2: 474,483				
1.0	85	71	78	538	1: 473,404	1.079	120	1.96	-0.15
					2: 476,915				
1.5	88	72	80	540	1: 475,602	1.313	120	1.99	-0.12
					2: 479,826				
2.0	88	74	81	541	1: 478,305	1.521	120	1.98	-0.13
					2: 488,098				
2.5	84	76	80	540	1: 486,506	1.592	120	2.26	+0.15
					2: 485,168				
3.0	92	76	84	544	1: 483,408	1.760	120	2.23	+0.12
							AVG =	2.17	—

Box #3, METER # 38949
CALIBRATED: SEPT. 2, 87 by PS&G
INSTALLED: JAN. 18, 88 by CDR
LEAK CHECK: 0.000 CFM @ 28" WC
(REMOVED MAR. 1, 89 CDR)

$\Delta H @ = 2.11$

CALCULATION:

$$\Delta H_@ = \frac{.0317(\Delta H)}{29.84(T+460)}\left[\frac{T+460(20)}{A(60)}\right]^2$$

Avg. $\Delta H_@$ = NOT TO EXCEED ± 15% FROM AVG. $\Delta H_@$

LEAK CHECK = 0.000 CFM @ 28" WC

THREE ORIFICE METER CALIBRATION DATA

CHECKED BY _____ DATE _____

030

PROOF AND DIFFERENTIAL TEST RECORD

0 038

Meter Size S-130, S-190 S-175 Date Received 8-27-87 Inspector J. SOPRANO

Date Tested 9-2-87 New ___ Repaired ✓ Manufacturer Rockwell + Andec

Prover No. 1264 Temperatures: Room Air 79 F.

Total Meters this Page 3 Oil 79 F.

Prover Air 79 F.

Temp.Comp.Meters: $\frac{\text{Abs.Base Temp.}}{\text{Abs.Prover Temp.}}$ x Uncorr. %Proof = Corr. % Proof

Meter No.	Repair Class	Percent Proof Check	Percent Proof Open	Differential Maximum	Remarks
716691	INTEST	99.8	100.7	20	Uncorr. % Proof AS FOUND
					Corr. % Proof
38949	INTEST	106.2	103.8	36	Uncorr. % Proof AS FOUND
					Corr. % Proof
125176	INTEST	98.8	98.8	28	Uncorr. % Proof AS FOUND
					Corr. % Proof
					Uncorr. % Proof
					Corr. % Proof
716691	ADJUST	100.0	100.2	20	Uncorr. AS % Proof CALIBRATED
					Corr. % Proof
38949	VALVE	100.0	100.1	36	Uncorr. AS % Proof CALIBRATED
					Corr. % Proof
125176	ADJUST	100.2	100.2	28	Uncorr. AS % Proof CALIBRATED
					Corr. % Proof

Date 1-2-77 Calibrated by J. Arnold

Nozzle identification number	Nozzle Diameter[a] D_1, mm (in.)	D_2, mm (in.)	D_3, mm (in.)	ΔD[b] mm (in.)	D_{avg}[c]
#6	.500	.501	.500	.001	.500
#16	.499	.499	.499	.000	.499
#19	.502	.501	.502	.001	.502
#23	.177	.176	.177	.001	.177
#41	.500	.500	.498	.002	.499
#45	.495	.496	.495	.001	.495
#43	.430	.432	.431	.002	.431
#44	.425	.425	.425	.000	.425
#45	.425	.426	.425	.001	.425
#46	.432	.431	.432	.001	.432
#3	.252	.253	.252	.001	.252
#47	.146	.146	.147	.001	.146
#26	.187	.188	.188	.001	.188
#18	.237	.237	.237	.000	.237

where:

[a] $D_{1,2,3,}$ = three different nozzles diameters, mm (in.); each diameter must be within (0.025 mm) 0.001 in.

[b] ΔD = maximum difference between any two diameters, mm (in.), $\Delta D \leq$ (0.10 mm) 0.004 in.

[c] D_{avg} = average of D_1, D_2, and D_3.

N	D-1	D-2	D-3	ΔD	avg
#10	.243	.242	.243	.001	.243

Nozzle calibration data form. L-50

0 040

Date 12/24/87 Thermocouple number 40

Ambient temperature 24 °C Barometric pressure 30.46 in. Hg

Calibrator TPB Reference: mercury-in-glass ASTM ;

other _____

Reference point number	Source[a] (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference,[b] %
0°	ICE WATER	0.0	0.2	0.1
100°	boiling WATER	100	99.8	0.0
—	boiling cooking oil			

[a] Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

Figure 2.5 Stack temperature sensor calibration data form.

0 041

Date 12/24/87 Thermocouple number 43

Ambient temperature 24 °C Barometric pressure 30.46 in. Hg

Calibrator TPB Reference: mercury-in-glass ASTM

other

Reference point number	Source[a] (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	[illegible]ture, [illegible]ence,[b] %
0°	ICE WATER	0.0	0.3	0.2
100°	boiling WATER	100.0	100.3	0.0
—	boiling cooking oil			

[a] Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

Figure 2.5 Stack temperature sensor calibration data form.

Date 12/24/87 Thermocouple number 46

Ambient temperature 24 °C Barometric pressure 30.46 in. Hg

Calibrator TPB Reference: mercury-in-glass ASTM

other

Reference point number	Source[a] (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature[b] difference, %
0°	ICE WATER	0.0	-0.2	0.1
100°	boiling WATER	100.0	100.6	0.2
—	boiling cooking oil			

[a] Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

Figure 2.5 Stack temperature sensor calibration data form.

Date 12/24/87 Thermocouple number 41

Ambient temperature 24 °C Barometric pressure 30.46 in. Hg

Calibrator TPB Reference: mercury-in-glass ASTM

other

Reference point number	Source[a] (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference,[b] %
0°	ICE WATER	0.0	0.1	0.1
100°	boiling WATER	100	100.2	0.0
—	boiling cooking oil			

[a] Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

Figure 2.5 Stack temperature sensor calibration data form.

0011

Date 12/24/87 Thermocouple number 38

Ambient temperature 24 °C Barometric pressure 30.46 in. Hg

Calibrator TPB Reference: mercury-in-glass ASTM

other

Reference point number	Source[a] (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature[b] difference, %
0°	ICE WATER	0.0	0.3	0.1
100°	boiling WATER	99.5	99.2	0.0
—	boiling cooking oil			

[a]Type of calibration system used.

[b]$\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

Figure 2.5 Stack temperature sensor calibration data form.

Date 12/28/87 Thermocouple number [redacted]

Ambient temperature 24 °C Barometric pressure 30.25 in. Hg

Calibrator TPB Reference: mercury-in-glass ASTM

other

Reference point number	Source[a] (specify)	Reference thermometer temperature, °C	Thermocouple potentiometer temperature, °C	Temperature difference,[b] %
0°	ICE WATER	0.0	- 0.2	0.1
100°	boiling WATER	100.0	100.0	0.0
—	boiling cutting oil			

[a]Type of calibration system used.

[b]$\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

Figure 2.5 Stack temperature sensor calibration data form.

PITOT TUBE CALIBRATION

Pitot tube calibration number 7 Date JAN. 20, 88

Calibrated by BROWN & RUFF @ RJU

EFFECTIVE LENGTH 3'

A Side Calibration

Run No.	Δp_{std} cm H_2O (in. H_2O)	Δp_s cm H_2O (in. H_2O)	$C_{p(s)}$	Deviation $C_{p(s)}-\bar{C}_{p(A)}$
1	0.47	0.65	0.842	+0.003
2	0.48	0.67	0.838	−0.001
3	0.48	0.67	0.838	−0.001
		$\bar{C}_{p(side\ A)}$	0.839	δ = ? *

B Side Calibration

Run No.	Δp_{std} cm H_2O (in. H_2O)	Δp_s cm H_2O (in. H_2O)	$C_{p(s)}$	Deviation $C_{p(s)}-\bar{C}_{p(B)}$
1	0.48	0.69	0.826	+0.005
2	0.47	0.69	0.817	-0.004
3	0.48	0.70	0.820	-0.001
		$\bar{C}_{p(side\ B)}$	0.821	δ = ? *

$C_p(A) - C_p(B) = 0.018$ *

Figure 4-10. Pitot tube calibration data.

* VALUE MUST BE ≤ ±0.01

RECON SYSTEMS, INC.
Route 202 North P.O. Box 460
THREE BRIDGES, NEW JERSEY 08887
(201) 782-5900

FORM: L-26 (REV. JUNE 10, 87)

PITOT TUBE CALIBRATION

Pitot tube calibration number 19 Date JAN. 20, 88

Calibrated by BROWN & RUFF @ RSU

EFFECTIVE LENGTH 4'

A Side Calibration

Run No.	Δp_{std} cm H_2O (in. H_2O)	Δp_s cm H_2O (in. H_2O)	$C_{p(s)}$	Deviation $C_{p(s)}-\bar{C}_{p(A)}$
1	0.48	0.68	0.832	+0.001
2	0.48	0.67	0.838	+0.007
3	0.47	0.68	0.823	-0.008
		$\bar{C}_{p(side\ A)}$	0.831	δ = ? *

B Side Calibration

Run No.	Δp_{std} cm H_2O (in. H_2O)	Δp_s cm H_2O (in. H_2O)	$C_{p(s)}$	Deviation $C_{p(s)}-\bar{C}_{p(B)}$
1	0.46	0.70	0.803	-0.009
2	0.47	0.69	0.817	+0.005
3	0.47	0.69	0.817	+0.005
		$\bar{C}_{p(side\ B)}$	0.812	δ = ? *

$C_p(A) - C_p(B) = +0.019$ *

Figure 4-10. Pitot tube calibration data.

* VALUE MUST BE $\leq \pm 0.01$

RECON SYSTEMS, INC.
Route 202 North P.O. Box 460
THREE BRIDGES, NEW JERSEY 08887
(201) 782-5900

FORM: L-26 (REV. JUNE 10, 87)

ORIGINAL DATA AND CALCULATION SHEETS

0 049

PARTICULATE FIELD DATA BOOK

DAILY STACK/AIR TESTING FIELD REPORT

F-19 (7.13.88)

cc: billing ____
chron ____
Original to Job file ____

Date 2/16/89 Client Bruno Padovani

RECON Job No. 0641
Project Manager
Field Supervisor PFM

Jobsite Company Maxwell House Street 1125 Hudson St.

City Hoboken State NJ Zip ____ Phone 201 [redacted] 500

Processes, Stacks, Vents, Air etc. Tested Today

1. Afterburner Inlet Condition* ____
2. Afterburner Outlet Condition* ____
3. ____ Condition* ____
4. ____ Condition* ____

* (e.g. stack opacity, raining?, odors, color, flowrate; process steady or upset; etc.)

Milestone Times (Military)

Departure from home or RECON 0700 Arrival at site 0730 Lunch — to ____

Lost Time — to ____ Arrival at home or RECON 1530

Reason For Lost Time ____

Client or Job Site Rep Aware of Lost Time ____ yes ____ no Person ____

Personnel Onsite

RECON	PFM	TFM	CDR	TPB
Client				
Jobsite Reps	Bruno Padovani			

Agency Observing (1) NJDEP (2) ____

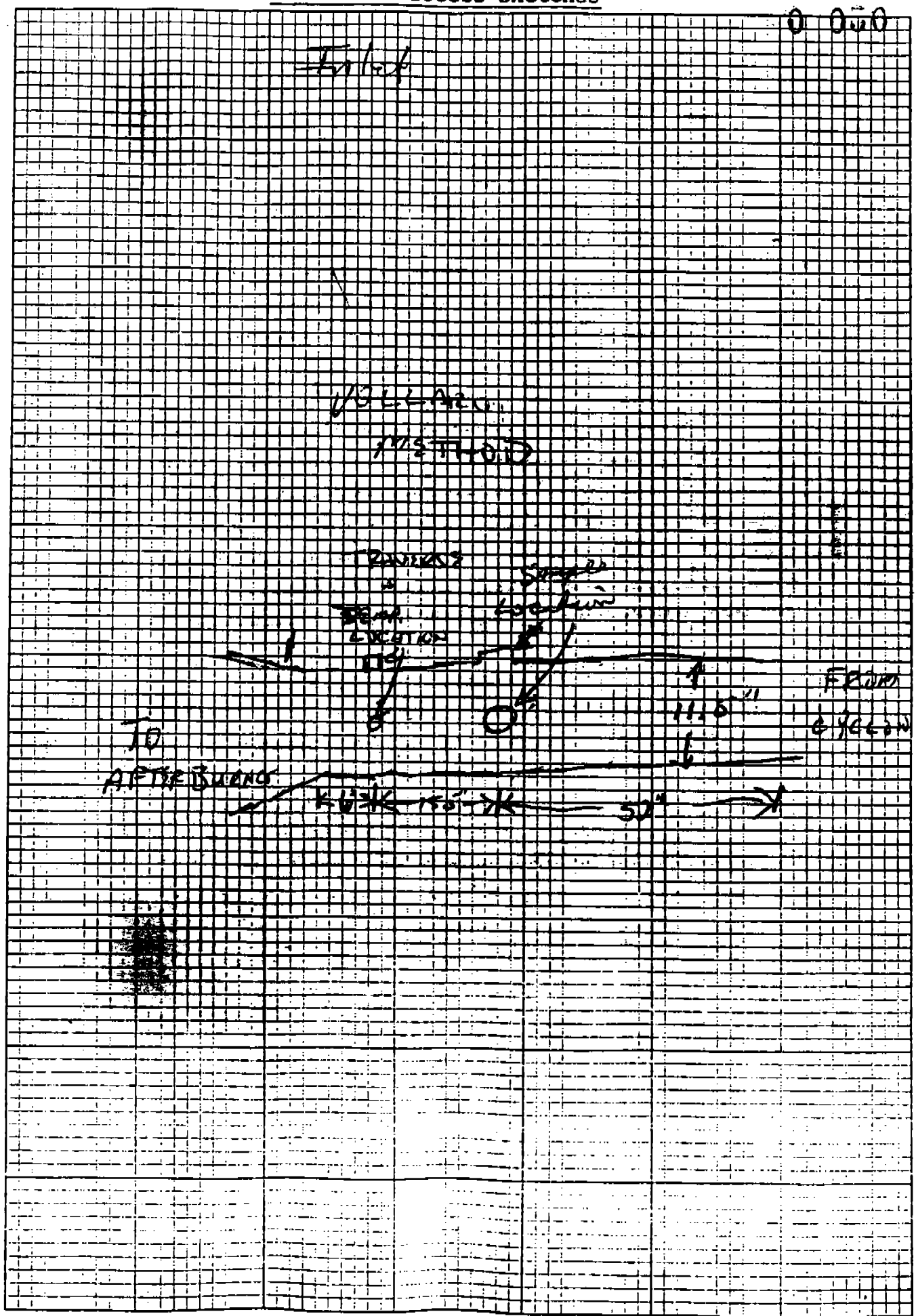
Agency Personnel (1) Stafford Stewart Rob Tenbrevilla Mike Gosek

(2) ____

Other ____

Out of Scope Work Requested and Performed

Stack and Process Sketches



PROBE MARKINGS - CIRCULAR STACK

STACK ID @ PORT 11.5 INCHES PORT EXTENSION 1 1/8 INCHES

RIGHT MOST COLUMN IS THE DISTANCE FROM PROBE TIP TO OUTSIDE OF PORT EXTENSION.

EPA DISTANCE "A"_____ DIAMETERS EPA DISTANCE "B" _____ DIAMETERS

TRAVERSE POINT NUMBER	LENGTH FACTOR FROM EPA METHOD 1 TABLE 1-2, K_L	PRODUCT OF LENGTH FACTOR TIMES STACK INSIDE DIAMETER (INCHES) K_L X (STACK ID)	SUM OF PREVIOUS COLUMN AND PORT EXTENSION (INCHES) K_L X (STACK ID)+ PORT EXTENSION	CONVERT PREVIOUS COLUMN TO INCHES AND COMMON FRACTIONS
1	2.1	0.24 → 0.5	1.625	1 5/8
2	6.7	0.77	1.896	1 15/16
3	11.8	1.36	2.48	2 1/2
4	17.7	2.04	3.16	3 3/16
5	25.0	2.875	4.0	4
6	35.6	4.094	5.22	5 1/4
7	64.4	7.41	8.5	8 1/2
8	75.0	8.625	9.75	9 3/4
9	82.3	9.46	10.6	10 5/8
10	88.2	10.14	11.3	11 5/16
11	93.3	10.73	11.85	11 7/8
12	97.9	11.25 → 10.0	12.38	12 1/8

CIRCULAR STACK CROSS SECTIONAL AREA = CSA = $\frac{\text{CSA}}{144} \times 0.785 \times (\text{ID}^2) = \frac{\text{ID}^2}{183} = 0.723$ FT^2

PROBE MARKINGS - RECTANGULAR STACK

STACK CROSS SECTION DIMENSIONS _____ (L) X _____ (W) INCHES PORT EXTENSIONS _____ INCHES

TO DETERMINE UPSTREAM/DOWNSTREAM DISTURBANCES, THE EQUIVALENT DIAMETER IS DETERMINED USING THE FOLLOWING EQUATION $d_e = \frac{2LW}{(L+W)}$

EPA DISTANCE "A"_____ DIAMETERS EPA DISTANCE "B" _____ DIAMETERS

TRAVERSE POINT NUMBER	CENTROID OF EACH EQUAL AREA (INCHES)	SUM OF PREVIOUS COLUMN AND PORT EXTENSION
1		
2		
3		
4		
5		
6		
7		

RECTANGULAR STACK CROSS SECTIONAL AREA = CSA = $\frac{L \times W}{144} = \frac{(\quad")\times(\quad")}{144} =$ _____ FT^2

PRELIMINARY DATA

Cp = _____

delta H_a = _____

Pb _____

P static -.4

% CO_2 = _____ x 0.44 = _____

% O_2 = _____ x 0.32 = _____

% N_2 = _____ x 0.28 = _____

Dry MW = _____

Cross Sectional Area _____ ft^2

% H_2O = _____

P_s = Pb + (±) P static = _____ Hg" (absolute)

T_s = _____ °F

T_m = _____ °F

delta P (average) = _____ "H_2O

MW = 0.18 (%H_2O) + $\frac{\text{Dry MW (100 - \%}H_2O)}{100}$

MW = _____

CALCULATIONS

VELOCITY (ACTUAL) IN STACK = $85.48(Cp)\sqrt{\frac{T_s + 460}{P_s(MW)}}\sqrt{\text{DELTA P}} = 85.48\ (.99)\sqrt{\frac{(1110)}{(29.58)(28.45)}}\sqrt{\text{DELTA P}}$

$V_s = (5460)\sqrt{1.30}\ \sqrt{\text{DELTA P}} = (5462)(1.14)\ \sqrt{\text{DELTA P}}$

$V_s = (96.48)\sqrt{\text{DELTA P}} = (96.48)(0.67) =$ 64.72 FT/SEC

ACFM = $(V_s)(60)(CSA) = (64.72)(60)(0.723) =$ 2808

VELOCITY @ Stp $V_{s\text{-std}} = V_S\ (17.65)\left(\frac{P_s}{T_s + 460}\right) = \frac{(64.72)(17.65)(29.58)}{(1110)} =$ 30.44 FT/SEC

SCFM = $(V_{s\text{-std}})(csa)(60) = (30.44)(0.723)(60) =$ 1320

DSCFM = $\left(\frac{100 - \%H_2O}{100}\right)$(SCFM) = (1320)(.95) = 1254

PRELIMINARY DATA

0 053

COMPANY: MAXWELL House SAMPLE LOCATION: Inlet

DATE: 1/31/89 TIME:

PITOT TUBE LINES LEAK CHECK ✓ LEVEL AND ZERO MANOMETER ✓

ESTIMATED MOISTURE -(%) 12 C_p .99

DRY BULB -(°F) WET BULB -(°F) DIRECTION OF FLOW to afterburner

TRAVERSE POINT NUMBER	CYCLONIC FLOW ANGLE THAT YIELDS A NULL DELTA P	VELOCITY HEAD DELTA P INCHES OF H_2O	STACK TEMPERATURE (DEGREES F)
A 1	0	0.45	161
2	2	0.47	162
3	4	0.49	163
4	4	0.51	164
5	2	0.52	165
6	2	0.51	166
7	4	0.45	166
8	4	0.44	165
9	5	0.42	155
10	7	0.41	154
11	5	0.41	151
12	2	0.59	149
B 1		0.40	161
2	CANNOT	0.42	164
3	BE	0.45	168
4	DETERMINED	0.46	170
5	IN	0.47	172
6	A	0.45	174
7	HORIZONTAL	0.45	174
8	DUCT	0.46	173
9		0.47	164
10		0.47	159
11		0.45	157
12		0.43	153
	AVERAGE	0.45	

AVERAGE ANGLE MUST BE <20 DEGREES

0 054

PARTICULATE FIELD DATA SHEET

PLANT Maxwell House | DATE 1/31/89 | RUN NO. one

SAMPLE LOCATION Inlet | RAC BOX NO. 3 | DRY GAS METER NO. 32949

NOZZLE NO. 27 | NOZZLE SIZE 0.249 INCHES | PITOT NO. 5 | C_p .99

TIME AT EACH POINT (Θ) 60 MINUTES | DELTA H @ 2.11 | THERMOCOUPLE NO.: T_s 46, PROBE OUTLET 40, BOX OUTLET 43

AMBIENT PRESSURE (P_{BAR}) 29.91 "HG

STATIC PRESSURE (P) -4.4 "H_2O/13.6 = _____ "Hg(P meter)

ΔH 4.5

STACK PRESSURE (P_s) = P_{bar} + P_{meter} = _____ "Hg | OPERATING CONDITION OR REMARKS _____

DRY BULB _____ °F | WET BULB _____ °F | _____ %H_2O

PORT/ POINT	MILITARY CLOCK TIME	METER READING	PITOT DELTA P "H_2O	ORIFICE DELTA H "H_2O	METER TEMP. °F IN	METER TEMP. °F OUT	LINE VAC "Hg	PROBE OUTLET °F	BOX OUTLET TEMP °F	BOX TEMP °F	STACK TEMP °F
A1	0900	242.975	0.45	2.0	96	94	6	154	195	235	161
2	1002:30		0.47	2.1	106	96	6	184	206	270	162
3	1005		0.49	2.2	109	96	6	208	221	270	163
4	1007:30		0.51	2.3	110	98	7	229	240	255	164
5	1010		0.52	2.3	112	98	7	201	243	235	165
6	1012:30		0.51	2.3	113	98	7	211	243	210	166
7	1015		0.49	2.0	114	98	6	224	240	200	166
8	1017:30		0.44	2.0	114	98	6	212	237	190	165
9	1020		0.42	1.9	114	98	6	227	235	180	155
10	1022:30		0.41	1.85	114	100	6	211	233	175	154
11	1025		0.41	1.85	114	100	6	208	229	165	151
12	1027:30		0.39	1.75	114	100	6	227	224	160	149
	1030	265.160	* STOP	TEST							
B1	1115	265.160	0.40	1.8	104	96	6	189	174	310	161
2	1117:30		0.42	1.9	108	96	6	209	206	330	168
3	1120		0.45	2.0	108	96	6	226	227	345	168
4	1122:30		0.46	2.0	111	96	6	204	250	300	170
5	1125		0.47	2.1	112	98	6	180	258	270	172
6	1127:30		0.45	2.0	112	98	6	198	250	250	174
7	1130		0.45	2.0	112	100	6	212	247	225	174
8	1132:30		0.46	2.1	114	100	6	231	245	210	173
9	1135		0.47	2.1	114	100	6	206	246	200	164
10	1137:30		0.47	2.1	114	100	6	205	240	190	159
11	1140		0.45	2.0	114	100	6	225	235	180	157
12	1142:30/1145	256.700	0.43	1.9	114	100	6	217	234	170	153
*	Θ 60	43.725 V=	....	delta H =	T_m =						T_s =

* Sum, average or Difference

Pre-Leak Check 0.005 @ 15" | Post Leak Check 0.001 @ 7" | FYRITE: % OXYGEN 20.5, % CARBON DIOXIDE 0.5

PARTICULATE.ATG (August 1988)

AirRecon
THREE BRIDGES, NJ

CLIENT: [illegible] HOUSE
SAMPLING DATE: 1/31/89
SAMPLING TIME: 1000-1145
UNIT SAMPLED: UNIT 1

Date: 02/[illegible]/89
Time: 10[illegible] AM
Run # 1

AVERAGE VELOCITY PRESSURE

Delta P (IN H2O)	Delta P Square Root
0.46	0.67
0.47	0.69
0.49	0.70
0.51	0.71
0.52	0.72
0.51	0.71
0.45	0.67
0.44	0.66
0.42	0.65
0.41	0.64
0.41	0.64
0.39	0.62
0.40	0.63
0.42	0.65
0.45	0.67
0.44	0.66
0.47	0.69
0.45	0.67
0.45	0.67
0.46	0.68
0.47	0.69
0.47	0.69
0.45	0.67
0.43	0.66

THE AVERAGE SQUARE ROOT OF DELTA P = .67[illegible]

CLIENT: MAXWELL HOUSE
SAMPLING DATE: 8/31/87
SAMPLING TIME: 1000-1145
UNIT SAMPLED: INLET

Date: 02/26/89
Time: 10:34 AM
Run # 1

Delta H (IN H2O)	Meter Temp(F) IN	Meter Temp(F) OUT	Stack Temp(F)
2.00	98.00	94.00	161.00
2.10	106.00	96.00	162.00
2.20	109.00	96.00	163.00
2.30	110.00	98.00	164.00
2.30	112.00	98.00	165.00
2.30	113.00	98.00	166.00
2.00	114.00	98.00	166.00
2.00	114.00	98.00	165.00
1.90	114.00	98.00	155.00
1.80	114.00	100.00	154.00
1.80	114.00	100.00	151.00
1.75	114.00	100.00	149.00
1.80	104.00	96.00	161.00
1.90	108.00	96.00	164.00
2.00	108.00	96.00	168.00
2.10	111.00	96.00	170.00
2.10	112.00	98.00	172.00
2.00	112.00	98.00	174.00
2.00	112.00	100.00	174.00
2.10	114.00	100.00	173.00
2.10	114.00	100.00	164.00
2.10	114.00	100.00	159.00
2.00	114.00	100.00	157.00
1.90	114.00	100.00	153.00

AVERAGES
DELTA H = 2.02/063 IN H2O
METER TEMP. = 104.6042 F
STACK TEMP. = 162.4167 F

MOISTURE DETERMINATION

SAMPLE LOCATION [illegible] INLET RUN NO. 1 DATE 1/31/89 0 05?

CHAIN-OF-CUSTODY SAMPLE NO. _____

		GRAMS	GRAMS
IMPINGER 1	FINAL WEIGHT	797.7	
	INITIAL WEIGHT	749.0	
	INCREASE		IMPINGER 1 48.7
IMPINGER 2	FINAL WEIGHT	735.5	
	INITIAL WEIGHT	705.0	
	INCREASE		IMPINGER 2 30.5
IMPINGER 3	FINAL WEIGHT	491.1	
	INITIAL WEIGHT	489.3	
	INCREASE		IMPINGER 3 2.8
SILICA GEL	FINAL WEIGHT	741.7	
	INITIAL WEIGHT	728.9	
	INCREASE		SILICA GEL _____
	TOTAL MASS OF WATER CAUGHT		94.8 GRAMS

CHAIN-OF-CUSTODY SAMPLE NO. _____

FILTER DIAMETER 4 INCHES FILTER TYPE Glass Fiber

FILTER: FINAL WEIGHT .6855 GMS
INITIAL WEIGHT .6268 GMS
INCREASE

.0587 GRAMS
TOTAL MASS OF PARTICULATE CAUGHT THIS FILTER

IS ICE PRESENT IN THE IMPINGER BATH AT THE END OF THIS SAMPLE? YES___ NO___

CALCULATIONS

$V_{m\text{-}std} = 17.65\ (V_m)\left(\frac{P_{bar} + \text{DELTA H}/13.6}{T_m + 460}\right) = 17.65\ (\quad)\left(\frac{\quad + \overline{\quad}/13.6}{\quad + 460}\right)$

$= 17.65\ (\quad)(\quad) = \_\_\_\_\_\ FT^3$

$V_{w\text{-}std}\ (H_2O) = \frac{\text{GRAMS COLLECTED}}{21.2\ \text{GRAMS/FT}^3} = \frac{(\quad)}{(21.2)} = \_\_\_\_\_\ FT^3$

$\%\ H_2O = \frac{(V_{w\text{-}std})\ 100}{(V_{m\text{-}std}) + (V_{w\text{-}std})} = \frac{100\ (\quad)}{(\quad)+(\quad)} = \frac{(\quad)}{(\quad)} = \_\_\_\_\_\ \%$

$\text{MOLECULAR WEIGHT (MW)} = \frac{18\ (\%H_2O)}{100} + \frac{\text{DRY MW}\ (100 - \%H_2O)}{100} = 0.18(\quad) + \frac{(\quad)(\quad)}{100}$

$\text{VELOCITY (ACTUAL) IN STACK} = 85.48(Cp)\sqrt{\frac{T_s + 460}{P_s(MW)}}\sqrt{\text{DELTA P}} = 85.48\ (\quad)\sqrt{\frac{(\quad)}{(\quad)(\quad)}}\sqrt{\text{DELTA P}}$

$V_s = (\quad)\sqrt{\quad}\sqrt{\text{DELTA P}} = (\quad)(\quad)\sqrt{\text{DELTA P}}$

$V_s = (\quad)\ \text{DELTA P} = (\quad)(\quad) = \_\_\_\_\_\ \text{FT/SEC}$

$ACFM = (V_s)(60)(CSA) = (\quad)(60)(\quad) = \_\_\_\_\_$

$\text{VELOCITY @ Stp}\quad V_{s\text{-}std} = V_S\ (17.65)\left(\frac{P_s}{Ts + 460}\right) = \frac{(\quad)(17.65)(\quad)}{(\quad)} = \_\_\_\_\_\ \text{FT/SEC}$

$SCFM = (V_{s\text{-}std})(csa)(60) = (\quad)(\quad)(60) = \_\_\_\_\_$

$DSCFM = \left(\frac{100 - \%H_2O}{100}\right)(SCFM) = (\quad)(\quad) = \_\_\_\_\_$

$\text{NOZZLE VELOCITY @ STD}\quad V_n = \frac{(V_{m\text{-}std} + V_{w\text{-}std})}{60\ (\Theta)\ A_n} = \frac{(\quad)}{60\ (\quad)(\quad)\ (10^{-4})} = \_\_\_\_\_\ \text{FT/SEC}$

$I = \frac{100\ V_{n\text{-}std}}{V_{s\text{-}std}} = \frac{100\ (\quad)}{(\quad)} = \_\_\_\_\_\ \%\ \text{Isokinetic}$

LAB DATA - EVAPORATIONS

PLANT Maxwell House

SAMPLE LOCATION Inlet RUN NO. 1 FOR _____

SAMPLING DATE 1/31/89

OPERATING CONDITION _____

CHAIN-OF-CUSTODY SAMPLE NO. _____

ACETONE WASHINGS

TOTAL SAMPLE	GROSS	646.8	GMS
	TARE -	457.3	GMS
	(A) NET	189.5	GMS
AMOUNT EVAPORATED (B)		189.5	GMS

EVAP. BEAKER NO. _____

GROSS	103.1418	GMS
TARE -	103.1060	GMS
(C) NET	0.0358	GMS

ACETONE BLANK

EVAP. BEAKER NO. _____

GROSS	99.6314	GMS
TARE -	99.6316	GMS
NET	0	GMS

ACETONE BLANK = NET 100 GMS (D) / TOTAL AMOUNT EVAPORATED 100 GMS (F)

CORRECTED NET (E) = (C) - (B)[(D)/(F)]

= (.0358) - (189.5) [(100)/(100)]

= .0358 GMS (E) = (C) - B [(D)/(F)]

SCALED UP NET = (E)(A/B)

= 0 (189.5/189.5)

= 0.0358

WET CATCH

TOTAL SAMPLE	GROSS		GMS
	TARE -		GMS
	(A) NET		GMS
AMOUNT EXTRACTED (G)			GMS (MLS)
AMOUNT OF E/C			GMS (N)

WATER PHASE
EVAP. BEAKER NO. ____

GROSS		GMS
TARE -		GMS
(J) NET		GMS

WATER BLANK (L) = _____ GMS / 100 GMS

CORRECTED NET (N) = J - (G)(L)/100

= _____ GMS

SCALED UP NET = (N)(E/G)

= _____ GMS

EC PHASE
EVAP. BEAKER NO. ____

GROSS		GMS
TARE -		GMS
(K) NET		GMS

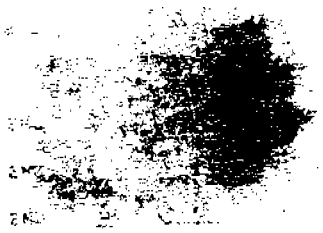
E/C BLANK (M) = _____ GMS / 100 MLS

CORRECTED NET (P) = K - (N)(M)/100

= _____ GMS

SCALED UP NET = (P)(E/G)

= _____ GMS



GRAINS/DSCF = 3.047244E-02
POUNDS/HOUR = .4932822

HIT RETURN TO CONTINUE

D# 4.9

0 000

PARTICULATE FIELD DATA SHEET

PLANT Maxwell House DATE 7/1/89 RUN NO. 2

SAMPLE LOCATION Inlet RAC BOX NO. 3 DRY GAS METER NO. 35949

NOZZLE NO. 27 NOZZLE SIZE 0249 INCHES PITOT NO. 5 C_p 0.99

TIME AT EACH POINT (θ) 60 MINUTES DELTA H @ 2.11 THERMOCOUPLE NO.: T_s 46
PROBE OUTLET 40
BOX OUTLET 43

AMBIENT PRESSURE (P_{BAR}) 29.78 "HG

STATIC PRESSURE (P) -4.3 "H_2O/13.6 = -0.316 "Hg(P meter)

STACK PRESSURE (P_s) = P_{bar} + P_{meter} = _____ "Hg OPERATING CONDITION OR REMARKS _____

DRY BULB ____ °F WET BULB ____ °F ____ %H_2O

PORT/ POINT	MILITARY CLOCK TIME	METER READING	PITOT DELTA P "H_2O	ORIFICE DELTA H "H_2O	METER TEMP. °F IN	METER TEMP. °F OUT	LINE VAC "Hg	PROBE OUTLET °F	BOX OUTLET TEMP °F	BOX TEMP °F	STACK TEMP °F
A1	0802	309.009	0.56	2.7	92	88	9	173	170	300	184
2	0804:30		0.56	2.7	96	88	10	202	198	250	189
3	0807		0.58	2.8	101	90	11	220	219	250	193
4	0809:30		0.60	2.9	106	90	11	236	233	250	194
5	0812		0.58	2.8	109	90	11	219	243	210	196
6	0814:30		0.56	2.7	112	92	11	216	241	200	196
7	0817		0.51	2.5	114	92	10	232	237	185	195
8	0819:30		0.48	2.4	114	94	10	219	239	175	184
9	0822		0.47	2.3	115	96	9	227	233	175	179
10	0824:30		0.47	2.3	115	96	9	217	231	165	177
11	0827		0.44	2.15	116	98	9	227	227	160	175
12	0828:30/0832	33.595	0.42	2.05	116	100	8	203	224	160	173
B1	0858	33.677	0.50	2.55	105	98	9	143	154	210	195
2	0852:30		0.52	2.5	108	100	9	173	173	230	200
3	0856		0.54	2.65	112	100	9	210	204	250	203
4	0858:30		0.54	2.65	112	100	9	228	232	250	206
5	0901		0.54	2.65	116	102	9	240	240	250	209
6	0903:30		0.53	2.6	118	102	10	217	240	250	210
7	0906		0.51	2.5	118	102	10	204	240	250	210
8	0908:30		0.49	2.45	116	102	10	182	230	250	203
9	0911		0.50	2.45	118	102	10	194	216	250	201
10	0913:30		0.46	2.25	119	100	9	211	213	250	198
11	0916		0.29	1.3	118	102	9	217	215	250	196
12	0918:30		0.34	1.75							192
	0921	356.84									
*	θ	V=49.759	....	delta H =	T_m =						T_s=

* Sum, average or Difference

Pre-Leak Check 0.005 @ 15" Post Leak Check 0.008 @ 12 FYRITE: % OXYGEN 20.0
% CARBON DIOXIDE 0.0

PARTICULATE.ATG (August 1988)

AirRecon
THREE BRIDGES, NJ

SAMPLING DATE: [illegible]
SAMPLING TIME: 0800 - 0925
UNIT SAMPLED: UNIT 1

Date: [illegible]
Time: 10:34 AM
Run # 2

AVERAGE VELOCITY PRESSURE

Delta P (IN H2O)	Delta P Square Root
0.56	0.75
0.56	0.75
0.58	0.76
0.60	0.77
0.58	0.76
0.56	0.75
0.50	0.71
0.48	0.69
0.47	0.69
0.47	0.69
0.44	0.66
0.42	0.65
0.50	0.71
0.52	0.72
0.54	0.73
0.54	0.73
0.54	0.73
0.53	0.73
0.51	0.71
0.49	0.70
0.50	0.71
0.46	0.68
0.29	0.54
0.36	0.60

THE AVERAGE SQUARE ROOT OF DELTA P = .7054586

CLIENT: [illegible] MOUSE
SAMPLING DATE: 2/17/89
SAMPLING TIME: 0802-0922
UNIT SAMPLED: [illegible]

Date: [illegible]
Time: 10:34 AM
Run # 2

Delta H (IN H2O)	Meter Temp (F) IN	Meter Temp (F) OUT	Stack Temp (F)
2.70	92.00	88.00	184.00
2.70	96.00	88.00	189.00
2.80	101.00	90.00	193.00
2.90	106.00	90.00	194.00
2.80	109.00	90.00	195.00
2.70	112.00	92.00	196.00
2.50	114.00	92.00	195.00
2.40	114.00	94.00	184.00
2.30	110.00	96.00	179.00
2.30	113.00	96.00	177.00
2.10	116.00	98.00	175.00
2.00	116.00	100.00	173.00
2.50	105.00	98.00	195.00
2.50	108.00	100.00	200.00
2.60	112.00	100.00	203.00
2.60	112.00	100.00	206.00
2.60	116.00	102.00	209.00
2.60	116.00	102.00	210.00
2.50	116.00	102.00	210.00
2.40	116.00	102.00	203.00
2.40	116.00	102.00	201.00
2.20	117.00	100.00	196.00
1.80	116.00	100.00	[illegible]
1.70	116.00	102.00	192.00

AVERAGES

DELTA H = [illegible] IN H2O

METER = 104.370 F

[illegible]

0 063

MOISTURE DETERMINATION

SAMPLE LOCATION INLET. RUN NO. 2 DATE 2/1/89

CHAIN-OF-CUSTODY SAMPLE NO. _____

		GRAMS	GRAMS
IMPINGER 1	FINAL WEIGHT	781.8	
	INITIAL WEIGHT	735.9	
	INCREASE		IMPINGER 1 45.9
IMPINGER 2	FINAL WEIGHT	739.6	
	INITIAL WEIGHT	715.9	
	INCREASE		IMPINGER 2 23.7
IMPINGER 3	FINAL WEIGHT	504.7	
	INITIAL WEIGHT	500.5	
	INCREASE		IMPINGER 3 4.2
SILICA GEL	FINAL WEIGHT	844.8	
	INITIAL WEIGHT	825.0	
	INCREASE		SILICA GEL _____
	TOTAL MASS OF WATER CAUGHT		93.6 GRAMS

CHAIN-OF-CUSTODY SAMPLE NO. _____

FILTER DIAMETER 4 INCHES FILTER TYPE Glass Fib

FILTER: FINAL WEIGHT .7033 GMS
INITIAL WEIGHT .6292 GMS
INCREASE

.0741 GRAMS
TOTAL MASS OF PARTICULATE CAUGHT THIS FILTER

IS ICE PRESENT IN THE IMPINGER BATH AT THE END OF THIS SAMPLE? YES___ NO___

CALCULATIONS

$V_{m\text{-std}} = 17.65\ (V_m)\left(\frac{P_{bar} + \text{DELTA H}/13.6}{T_m + 460}\right) = 17.65\ (\quad)\left(\frac{\quad + 13.6}{\quad}\right)$

$= 17.65\ (\quad)(\quad) = \_\_\_\_\_\ FT^3$

$V_{w\text{-std}}\ (H_2O) = \frac{\text{GRAMS COLLECTED}}{21.2\ \text{GRAMS/FT}^3} = \frac{(\quad)}{(21.2)} = \_\_\_\_\_\ FT^3$

$\%\ H_2O = \frac{(V_{w\text{-std}})\ 100}{((V_{m\text{-std}}) + (V_{w\text{-std}})} = \frac{100\ (\quad)}{(\quad)+(\quad)} = \frac{(\quad)}{(\quad)} = \_\_\_\_\_\ \%$

$\text{MOLECULAR WEIGHT (MW)} = \frac{18\ (\%H_2O)}{100} + \frac{\text{DRY MW}\ (100 - \%H_2O)}{100} = 0.18(\quad) + \frac{(\quad)(\quad)}{100}$

$\text{VELOCITY (ACTUAL) IN STACK} = 85.48(Cp)\sqrt{\frac{T_s + 460}{P_s(MW)}}\sqrt{\text{DELTA P}} = 85.48\ (\quad)\sqrt{\frac{(\quad)}{(\quad)(\quad)}}\sqrt{\text{DELTA P}}$

$V_s = (\quad)\sqrt{\quad}\sqrt{\text{DELTA P}} = (\quad)(\quad)\sqrt{\text{DELTA P}}$

$V_s = (\quad)\ \text{DELTA P} = (\quad)(\quad) = \_\_\_\_\_\ FT/SEC$

$ACFM = (V_s)(60)(CSA) = (\quad)(60)(\quad) = \_\_\_\_\_$

$\text{VELOCITY @ Stp}\quad V_{s\text{-std}} = V_s\ (17.65)\left(\frac{P_s}{Ts + 460}\right) = \frac{(\quad)(17.65)(\quad)}{(\quad)} = \_\_\_\_\_\ FT/SEC$

$SCFM = (V_{s\text{-std}})(csa)(60) = (\quad)(\quad)(60) = \_\_\_\_\_$

$DSCFM = \left(\frac{100 - \%H_2O}{100}\right)(SCFM) = (\quad)(\quad) = \_\_\_\_\_$

$\text{NOZZLE VELOCITY @ STD}\quad V_n = \frac{(V_{m\text{-std}} + V_{w\text{-std}})}{60\ (\theta)\ A_n} = \frac{(\quad)}{60\ (\quad)(\quad)\ (10^{-4})} = \_\_\_\_\_\ FT/SEC$

$I = \frac{100\ V_{n\text{-std}}}{V_{s\text{-std}}} = \frac{100\ (\quad)}{(\quad)} = \_\_\_\_\_\ \%\ \text{Isokinetic}$

LAB DATA - EVAPORATIONS

PLANT Maxwell House SAMPLE LOCATION Inlet RUN NO. 2 FOR _____

SAMPLING DATE 2-1-89 OPERATING CONDITION _____

CHAIN-OF-CUSTODY SAMPLE NO. _____

ACETONE WASHINGS

TOTAL SAMPLE	GROSS	661.4	GMS
	TARE -	456.8	GMS
	(A) NET	204.6	GMS
AMOUNT EVAPORATED (B)		204.6	GMS

EVAP. BEAKER NO. _____

GROSS	110.5458	GMS
TARE -	110.4860	GMS
(C) NET	0.0598	GMS

ACETONE BLANK

EVAP. BEAKER NO. _____

99.6314	GROSS	~~110.5458~~	GMS
99.6316	TARE -	~~110.4860~~	GMS
0	NET	~~0.0598~~	GMS

ACETONE BLANK = NET 100 GMS (D)
TOTAL AMOUNT EVAPORATED 100 GMS (F)

CORRECTED NET (E) = (C) - (B)[(D)/(F)]

= (0.0598) - (204.6) [(100)/(100)]

= 0.0598 GMS

SCALED UP NET = (E)(A/B)

= 0.0598 (204.6/204.6)

= .0598

WET CATCH

TOTAL SAMPLE	GROSS	GMS
	TARE -	GMS
	(A) NET	GMS
AMOUNT EXTRACTED (G)		GMS (MLS)
AMOUNT OF E/C		GMS (N)

WATER PHASE
EVAP. BEAKER NO. _____

GROSS		GMS
TARE -		GMS
(J) NET		GMS

WATER BLANK (L) = _____ GMS / 100 GMS

CORRECTED NET (M) = J - (G)(L)/100

= _____ - _____ (100)

= _____ GMS

SCALED UP NET = (M)(F/G)

= _____ (/)

= _____ GMS

EC PHASE
EVAP. BEAKER NO. _____

GROSS		GMS
TARE -		GMS
(K) NET		GMS

E/C BLANK (N) = _____ GMS / 100 MLS

CORRECTED NET (P) = K - (N)(M)/100

= _____ - _____ (100)

= _____ GMS

SCALED UP NET = (P)(F/G)

= _____ (/)

= _____ GMS

[illegible]

[illegible]

[illegible] Phase

[illegible] Phase [illegible] grms

[illegible] Phase [illegible] grms

Totals

GRAINS/HOUR = 4.633672E-02

POUNDS/HOUR = .0040006

HIT RETURN TO CONTINUE

ΔH = 4.9

0 066

PARTICULATE FIELD DATA SHEET

PLANT MAXWELL HOUSE DATE 2/1/89 RUN NO. 3

SAMPLE LOCATION Inlet RAC BOX NO. 3 DRY GAS METER NO. 38949

NOZZLE NO. 27 NOZZLE SIZE 0.249 INCHES PITOT NO. 5 C_p 0.99

TIME AT EACH POINT (θ) 60 MINUTES DELTA H @ 2.11 THERMOCOUPLE NO.: T_s 46
PROBE OUTLET 40
BOX OUTLET 43

AMBIENT PRESSURE (P_{BAR}) 29.80 "HG

STATIC PRESSURE (P) -42 "H_2O/13.6 = _____ "Hg(P meter)

STACK PRESSURE (P_s) = P_{bar} + P_{meter} = _____ "Hg OPERATING CONDITION OR REMARKS _____

DRY BULB ____ °F WET BULB ____ °F ____ %H_2O

PORT/ POINT	MILITARY CLOCK TIME	METER READING	PITOT DELTA P "H_2O	ORIFICE DELTA H "H_2O	METER TEMP °F IN	METER TEMP °F OUT	LINE VAC "Hg	PROBE OUTLET °F	BOX OUTLET TEMP °F	BOX TEMP °F	STACK TEMP °F
A-1	10:48	357.081	0.49	2.4	88	88	8	98	216	245	195
2	1049:30		0.47	2.3	90	88	8	139	242	240	197
3	1052		0.56	2.7	94	88	9	183	247	230	198
4	1054:30		0.59	2.9	99	90	8	202	251	220	199
5	1057		0.58	2.85	102	90	9	220	252	220	200
6	1059:30		0.58	2.85	104	92	9	227	248	210	201
7	1102		0.55	2.7	105	92	9	230	247	210	202
8	1104:30		0.49	2.4	106	92	8	220	210	210	201
9	1107		0.48	2.35	108	92	8	210	199	200	199
10	1109:30		0.36	1.75	111	94	7	204	221	190	194
11	1112		0.38	1.85	112	96	7	203	240	190	192
12	1114:30	1117	0.31	1.5	113	96	6	209	242	190	190
31	1137		0.48	2.35	98	94	8	152	167	170	200
2	1139:30	1142	0.49	2.4	99	92	8	162	208	185	204
3	1122		0.52	2.58	98	90	7	179	210	220	206
4	1224:30		0.51	2.49	99	92	7	190	240	200	210
5	1227		0.53	2.59	99	93	8	210	260	210	211
6	1229:30		0.52	2.58	100	95	8	230	280	215	212
7	1232		0.52	2.58	108	95	9	247	290	195	212
8	1234:30		0.53	2.59	110	96	9	247	290	195	209
9	1237		0.50	2.45	112	98	9	247	290	195	208
10	1239:30		0.43	2.10	115	96	8	245	290	195	199
11	1242		0.34	1.66	115	96	6	244	290	195	197
12	1244:30		0.29	1.42	115	96	6	242	288	195	192
	1247 END										
*	θ	401.368	....	delta H =	T_m =						T_s =

* Sum, average or Difference

Pre-Leak Check 0.009 @ 15 Post Leak Check ✓

FYRITE: % OXYGEN 20.5
% CARBON DIOXIDE 0.0

PARTICULATE.ATG (August 1988)

AirRecon
THREE BRIDGES, NJ

CLIENT: [illegible]
SAMPLING DATE: 2/1/89
SAMPLING TIME: 1044-1247
UNIT SAMPLED: INLET

Date: 2/16/89
Time: 10:34 AM
Run # 3

AVERAGE VELOCITY PRESSURE

Delta P (IN H2O)	Delta P Square Root
0.45	0.70
0.47	0.69
0.46	0.70
0.59	0.77
0.58	0.76
0.58	0.76
0.55	0.74
0.49	0.70
0.48	0.69
0.36	0.60
0.38	0.62
0.31	0.56
0.48	0.69
0.49	0.70
0.52	0.72
0.57	0.75
0.53	0.73
0.52	0.72
0.52	0.72
0.53	0.73
0.50	0.71
0.43	0.66
0.34	0.58
0.29	0.54

THE AVERAGE SQUARE ROOT OF DELTA P = .7010185

068

CLIENT: MAXWELL HOUSE
SAMPLING DATE: 2/1/89
SAMPLING TIME: 1047-1247
UNIT SAMPLED: INLET

Date: 02/16/89
Time: 10:34 AM
Run # 3

Delta H (IN H2O)	Meter Temp(F) IN	Meter Temp(F) OUT	Stack Temp(F)
2.40	98.00	88.00	195.00
2.30	90.00	88.00	197.00
2.70	94.00	88.00	198.00
2.90	99.00	90.00	199.00
2.80	102.00	90.00	200.00
2.60	104.00	92.00	201.00
2.70	103.00	92.00	202.00
2.40	106.00	92.00	201.00
2.30	108.00	92.00	197.00
1.72	111.00	94.00	194.00
1.60	112.00	96.00	192.00
1.50	113.00	96.00	190.00
2.30	96.00	94.00	200.00
2.40	99.00	92.00	204.00
2.08	98.00	90.00	206.00
2.77	99.00	92.00	210.00
2.07	97.00	93.00	211.00
2.08	100.00	95.00	212.00
2.06	106.00	95.00	212.00
2.09	110.00	96.00	209.00
2.40	112.00	98.00	205.00
2.10	115.00	96.00	199.00
1.60	115.00	96.00	197.00
1.42	115.00	96.00	192.00

AVERAGES

DELTA H = 2.36 IN H2O
METER TEMP. = 98.5625 F
STACK TEMP. = [illegible].041/ F

MOISTURE DETERMINATION

SAMPLE LOCATION INLET RUN NO. 3 DATE 2/1/89

CHAIN-OF-CUSTODY SAMPLE NO. _____

		GRAMS	GRAMS
IMPINGER 1	FINAL WEIGHT	763.1	
	INITIAL WEIGHT	720.7	
	INCREASE		IMPINGER 1 42.4
IMPINGER 2	FINAL WEIGHT	737.1	
	INITIAL WEIGHT	708.6	
	INCREASE		IMPINGER 2 28.5
IMPINGER 3	FINAL WEIGHT	482.0	
	INITIAL WEIGHT	479.7	
	INCREASE		IMPINGER 3 2.3
SILICA GEL	FINAL WEIGHT	776.0	
	INITIAL WEIGHT	761.2	
	INCREASE		SILICA GEL _____
	TOTAL MASS OF WATER CAUGHT		73.0 GRAMS

CHAIN-OF-CUSTODY SAMPLE NO. _____

FILTER DIAMETER 4 INCHES FILTER TYPE Glass Fiber

FILTER: FINAL WEIGHT .6716 GMS
INITIAL WEIGHT .2205 GMS
INCREASE

.0511 GRAMS
TOTAL MASS OF PARTICULATE CAUGHT THIS FILTER

IS ICE PRESENT IN THE IMPINGER BATH AT THE END OF THIS SAMPLE? YES___ NO___

CALCULATIONS

$V_{m\text{-}std} = 17.65\ (V_m)\left(\frac{P_{bar} + \text{DELTA H}/13.6}{T_m + 460}\right) = 17.65\ (\quad)\left(\frac{\quad + \overline{13.6}}{\quad}\right)$

$= 17.65\ (\quad)(\quad) = \_\_\_\_\_\ FT^3$

$V_{w\text{-}std}\ (H_2O) = \frac{\text{GRAMS COLLECTED}}{21.2\ \text{GRAMS/FT}^3} = \frac{(\quad)}{(21.2)} = \_\_\_\_\_\ FT^3$

$\%\ H_2O = \frac{(V_{w\text{-}std})\ 100}{((V_{m\text{-}std}) + (V_{w\text{-}std})} = \frac{100\ (\quad)}{(\quad)+(\quad)} = \frac{(\quad)}{(\quad)} = \_\_\_\_\_\ \%$

MOLECULAR WEIGHT (MW) $= \frac{18\ (\%H_2O)}{100} + \frac{\text{DRY MW}\ (100 - \%H_2O)}{100} = 0.18(\quad) + \frac{(\quad)(\quad)}{100}$

VELOCITY (ACTUAL) IN STACK $= 85.48(Cp)\sqrt{\frac{T_s + 460}{P_s(MW)}}\sqrt{\text{DELTA P}} = 85.48\ (\quad)\sqrt{\frac{(\quad)}{(\quad)(\quad)}}\sqrt{\text{DELTA P}}$

$V_s = (\quad)\sqrt{\quad}\sqrt{\text{DELTA P}} = (\quad)(\quad)\sqrt{\text{DELTA P}}$

$V_s = (\quad)\ \text{DELTA P} = (\quad)(\quad) = \_\_\_\_\_\ FT/SEC$

$ACFM = (V_s)(60)(CSA) = (\quad)(60)(\quad) = \_\_\_\_\_$

VELOCITY @ Stp $V_{s\text{-}std} = V_S\ (17.65)\left(\frac{P_s}{Ts + 460}\right) = \frac{(\quad)(17.65)(\quad)}{(\quad)} = \_\_\_\_\_\ FT/SEC$

$SCFM = (V_{s\text{-}std})(csa)(60) = (\quad)(\quad)(60) = \_\_\_\_\_$

$DSCFM = \left(\frac{100 - \%H_2O}{100}\right)(SCFM) = (\quad)(\quad) = \_\_\_\_\_$

NOZZLE VELOCITY @ STD $V_n = \frac{(V_{m\text{-}std} + V_{w\text{-}std})}{60\ (\theta)\ A_n} = \frac{(\quad)}{60\ (\quad)(\quad)\ (10^{-4})} = \_\_\_\_\_\ FT/SEC$

$I = \frac{100\ V_{n\text{-}std}}{V_{s\text{-}std}} = \frac{100\ (\quad)}{(\quad)} = \_\_\_\_\_\ \%$ Isokinetic

0 070

LAB DATA - EVAPORATIONS

PLANT Maxwell House SAMPLE LOCATION Inlet RUN NO. 3 FOR _____

SAMPLING DATE 2-1-89 OPERATING CONDITION _____

CHAIN-OF-CUSTODY SAMPLE NO. _____

ACETONE WASHINGS

TOTAL SAMPLE	GROSS	655.7	GMS
	TARE -	460.2	GMS
	(A) NET	195.5	GMS
AMOUNT EVAPORATED (B)		195.5	GMS

EVAP. BEAKER NO. _____

GROSS	96.7241	GMS
TARE -	96.6887	GMS
(C) NET	0.0354	GMS

ACETONE BLANK

EVAP. BEAKER NO. _____

99.6314	GROSS	~~96.7241~~	GMS
99.6316	TARE -	~~96.6887~~	GMS
0	NET	~~0.0359~~	GMS

ACETONE BLANK = NET .100 GMS (D) / TOTAL AMOUNT EVAPORATED 100 GMS (F)

CORRECTED NET (E) = (C) - (B)[(D)/(F)]

= (0.0354) - (195.5) [(.100)/(100)]

= 0.0354 GMS (E) = (C) - B [(D)/(F)]

SCALED UP NET = (E)(A/B)

= .0354 (195.5/195.5)

= .0354

WET CATCH

TOTAL SAMPLE	GROSS	_____	GMS
	TARE -	_____	GMS
	(A) NET	_____	GMS
AMOUNT EXTRACTED (K)		_____	GMS (MLS)
AMOUNT OF E/C		_____	GMS (H)

WATER PHASE
EVAP. BEAKER NO. _____

GROSS	_____	GMS
TARE -	_____	GMS
(J) NET	_____	GMS

WATER BLANK (L) = _____ GMS / 100 GMS

CORRECTED NET (N) = J - (G)(L)

= _____ - _____ (100)

= _____ GMS

SCALED UP NET = (N)(F/G)

= _____ (_____)

= _____ GMS

EC PHASE
EVAP. BEAKER NO. _____

GROSS	_____	GMS
TARE -	_____	GMS
(K) NET	_____	GMS

E/C BLANK (M) = _____ GMS / 100 MLS

CORRECTED NET (P) = K - (H)(M)

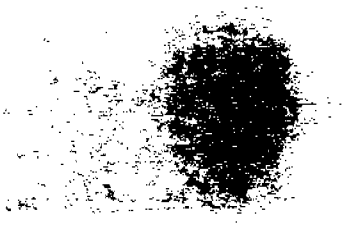
= _____ - _____ (100)

= _____ GMS

SCALED UP NET = (P)(F/G)

= _____ (_____)

= _____ GMS



INLET

0 072

CLIENT: [illegible] Huber

Date: [illegible]
Time: [illegible] AM

THE FOLLOWING WERE PROGRAMMER INPUTS FOR ISOKINETICS

SAMPLE NO.	1	2	3
DATE	[illegible]	2/11/97	2/11/97
TIME	[illegible]	0800-0923	1047-1240
UNIT IDENTIFIED	[illegible]	INLET	INLET
ACTUAL NOZZLE DIAMETER (ND), IN	0.250	0.250	0.250
PITOT FACTOR (CP)	0.99	0.99	0.99
TIME SPENT POINT (MIN)	2.50	2.50	2.50
AMBIENT PRESSURE (PBAR), IN-HG	29.91	29.78	29.80
STACK PRESSURE (PS), IN-HG	-4.10	-4.30	-4.20
METER VOLUME (VM), CUBIC	43.24	42.00	44.26
WATER COLLECTED IMPINGERS, GRAMS	74.60	73.00	68.00
CARBON DIOXIDE (CO2), %	0.00	0.00	0.00
OXYGEN (O2), %	20.90	21.00	21.00
STACK DIAMETER (DIA), IN	11.00	11.00	11.00
STACK GRAS[illegible] ADDITIONAL [illegible]	[illegible]	[illegible]	0.72

Date: [illegible]
Time: [illegible]

ISOKINETIC CALCULATIONS

[illegible]	1	2	3
[illegible]	1/31/87	2/1/87	2/1/87
[illegible]	1000-1140	0602-0921	[illegible]
[illegible]	INLET	INLET	[illegible]
METER VOLUME (VM-STD), DSCF	41.08	44.59	41.95
WATER COLLECTED (VW-STD), SCF	4.47	4.43	4.17
MOISTURE (VOL %)	7.85	9.04	9.03
ACTUAL MOLECULAR WEIGHT (MW), LBS/LB-MOLE	27.83	27.86	27.86
ACTUAL VELOCITY IN STACK (VS), FT/SEC	49.42	53.20	52.41
ACTUAL FLOW RATE IN STACK (ACFM)	2137.98	2303.50	2267.38
VELOCITY @ STP (VS-STD), FT/SEC	41.58	42.47	41.41
STACK FLOW RATE @ STP (SCFM)	1796.54	1837.91	1791.54
DRY FLOW RATE (DSCFM)	1621.45	1671.82	1629.72
NOZZLE VELOCITY @ STP (VN-STD), FT/SEC	37.13	39.95	37.58
ISOKINETIC %	89.32	94.03	90.75

PARTICULATE FIELD DATA BOOK

DAILY
STACK/AIR
TESTING
FIELD REPORT

F-19 (7.13.88)

cc: billing ____
chron ____
Original to Job file ____

Date 1-31-89 Client _____

RECON Job No. _____
Project Manager _____
Field Supervisor _____

Jobsite Company _____ Street _____

City _____ State _____ Zip _____ Phone _____

Processes, Stacks, Vents, Air etc. Tested Today

1. Afterburner Outlet Condition* _____
2. _____ Condition* _____
3. _____ Condition* _____
4. _____ Condition* _____

* (e.g. stack opacity, raining?, odors, color, flowrate; process steady or upset; etc.)

Milestone Times (Military)

Departure from home or RECON _____ Arrival at site _____ Lunch _____ to _____

Lost Time _____ to _____ Arrival at home or RECON _____

Reason For Lost Time _____

Client or Job Site Rep Aware of Lost Time _____ yes _____ no Person _____

Personnel Onsite

RECON _____ _____ _____ _____

_____ _____ _____ _____

Client _____ _____ _____ _____

Jobsite Reps _____ _____ _____ _____

Agency Observing (1) NJDEP (2) _____

Agency Personnel MIKE CIOSEK _____ _____

_____ _____ _____

Other _____

_____

Out of Scope Work Requested and Performed

_____

_____

_____

PRELIMINARY DATA

0 075

COMPANY: GENERAL FOODS SAMPLE LOCATION: OUTLET

DATE: 7/30/89 TIME:

PITOT TUBE LINES LEAK CHECK ✓ LEVEL AND ZERO MANOMETER ✓

ESTIMATED MOISTURE -(%) C_p

DRY BULB -(°F) WET BULB -(°F) DIRECTION OF FLOW

TRAVERSE POINT NUMBER	CYCLONIC FLOW ANGLE THAT YIELDS A NULL DELTA P	VELOCITY HEAD DELTA P INCHES OF H_2O	STACK TEMPERATURE (DEGREES F)
A-1	5		
2	3		
3	2		
4	2		
5	2		
6	3		
7	3		
8	7		
9	7		
10	6		
11	6		
12	6		
B-1	8		
2	7		
3	7		
4	4		
5	4		
6	3		
7	4		
8	6		
9	5		
10	6		
11	7		
12	7		
	AVERAGE		

AVERAGE ANGLE MUST BE <20 DEGREES

k = 17.0

0 070

PARTICULATE FIELD DATA SHEET

PLANT MAXWELL HOUSE DATE 1-31-89 RUN NO. 1

SAMPLE LOCATION AFTERBURNER OUTLET RAC BOX NO. 4 DRY GAS METER NO. 175176

NOZZLE NO. 6 NOZZLE SIZE 1/2 INCHES PITOT NO. 19 C_p .83

TIME AT EACH POINT (θ) 3 MINUTES DELTA H @ 2.00 THERMOCOUPLE NO.: T_s 41

PROBE OUTLET 38

BOX OUTLET 18

AMBIENT PRESSURE (P_{BAR}) 29.91 "HG

STATIC PRESSURE (P) -0.02 "H_2O/13.6 = _____ "Hg(P meter)

STACK PRESSURE (P_s) = P_{bar} + P_{meter} = _____ "Hg OPERATING CONDITION OR REMARKS _____

DRY BULB _____ °F WET BULB _____ °F _____ %H_2O

PORT/ POINT	MILITARY CLOCK TIME	METER READING	PITOT DELTA P "H_2O	ORIFICE DELTA H "H_2O	METER TEMP. °F IN	METER TEMP. °F OUT	LINE VAC "Hg	PROBE OUTLET °F	BOX OUTLET TEMP °F	BOX TEMP °F	STACK TEMP °F
A-1	1000	91.722	.05	.85	77	77	4+	188	195	220	1555
2	03	93.3	.05	.85	78	77	4+	188	196	221	1550
3	06	95.1	.06	1.02	79	77	4+	200	197	223	1520
4	09	96.3	.06	1.02	81	78	4+	201	198	221	1516
5	12	98.4	.07	1.18	83	78	4+	202	200	223	1485
6	15	100.0	.07	1.18	85	78	5+	201	201	220	1530
7	18	101.5	.06	1.02	86	78	5	200	205	228	1535
8	21	102.8	.06	1.02	87	79	5	200	202	227	1538
9	24	104.5	.055	.93	88	79	4+	201	203	228	1494
10	27	106.6	.07	1.18	89	80	5+	201	204	225	1485
11	30	108.0	.07	1.18	90	80	5+	202	203	226	1498
12	33	109.1	.07	1.18	91	81	5+	200	204	225	1498
END	36	110.7??									
B-1	1115	110.853	.06	1.02	82	82	5+	188	200	223	1501
2	18	112.5	.06	1.02	83	81	5+	189	201	225	1520
3	21	114.2	.07	1.18	84	80	5+	189	202	226	1502
4	24	116.0	.07	1.18	86	81	5+	198	203	225	1493
5	27	117.5	.07	1.18	89	81	5+	198	204	226	1495
6	30	[illegible]	.075	1.25	90	81	5+	203	208	228	1501
7	33	[illegible]	.075	1.25	92	82	5+	204	210	225	1493
8	36	122.4	.075	1.25	92	82	5+	206	211	227	1488
9	39	124.3	.07	1.18	93	83	5+	205	212	226	1497
10	42	126.1	.07	1.18	94	83	5+	208	213	226	1498
11	45	127.7	.07	1.18	94	83	5+	207	214	227	1488
12	48	129.8	.075	1.25	95	83	5+	207	213	225	1482
END	1151	131.242 V=	....	delta H =	T_m =						T_s =

* Sum, average or Difference

Pre-Leak Check 0.01 at 15" Post Leak Check 0.004 at 5+" FYRITE: % OXYGEN 14.0 % CARBON DIOXIDE 4.0

PARTICULATE.ATG (August 1988)

NOTE METER READING CHANGE BETWEEN PORTS

AirRecon THREE BRIDGES, NJ

CLIENT: [illegible]

Date: 02/20/87
Time: 10:30 AM

AVERAGE VELOCITY PRESSURE

Delta P (IN H2O)	Delta P Square Root
0.05	0.22
0.05	0.22
0.06	0.24
0.06	0.24
0.07	0.26
0.07	0.26
0.06	0.24
0.06	0.24
0.06	0.24
0.07	0.26
0.07	0.26
0.07	0.26
0.06	0.24
0.06	0.24
0.07	0.26
0.07	0.26
0.07	0.26
0.08	0.27
0.08	0.27
0.06	0.24
0.07	0.26
0.07	0.26
0.07	0.26
0.08	0.27

THE AVERAGE SQUARE ROOT OF DELTA P = .25655

CLIENT: [illegible]

Date: [illegible]
Time: [illegible]

Delta H (IN H2O)	Meter Temp (F) IN	OUT	Stack Temp (F)
[illegible]	[illegible]	[illegible]	1535.00
[illegible]	[illegible]	[illegible]	1550.00
[illegible]	[illegible]	[illegible]	1520.00
[illegible]	81.00	76.00	1516.00
1.10	[illegible]	78.00	1485.00
1.18	80.00	76.00	1530.00
1.04	86.00	78.00	1535.00
1.02	87.00	79.00	1538.00
0.95	88.00	79.00	1494.00
1.16	89.00	80.00	1485.00
1.15	90.00	80.00	1498.00
1.13	91.00	81.00	1498.00
1.02	82.00	82.00	1501.00
1.12	83.00	81.00	1520.00
1.16	84.00	80.00	1502.00
1.18	86.00	81.00	1493.00
1.18	89.00	81.00	1495.00
1.20	90.00	81.00	1501.00
1.20	92.00	82.00	1493.00
1.20	92.00	82.00	1488.00
1.14	93.00	83.00	1497.00
1.16	[illegible]	83.00	1498.00
1.14	94.00	83.00	1478.00
1.20	[illegible]	83.00	1482.00

AVERAGES

DELTA H = 1.1130 IN H2O

METER TEMP. = 83.08333 F

STACK TEMP. = 1506.333 F

HYDROCARBON SAMPLING DATA

SAMPLE LOCATION AF Return / Outlet RUN NO. 1 DATE 1-31-89

HYDROCARBON PUMP NO. _____

TIME	ROTOMETER SETTING	GAS METER TEMP.	VACUUM "HG	SAMPLE RATE L/M
1000	60	82	1+	1
05	60	82	1+	1
10	60	83	1+	1
15	60	83	1+	1
20	60	84	1+	1
25	60	84	1+	1
30	60	85	1+	1
1115	60	86	1+	1
20	60	86	1+	1
35	60	86	1+	1
40	60	87	1+	1
50	60	87	1+	1
		[illegible]		

PRE-LEAK CHECK ✓ POST-LEAK CHECK ✓

PUMP CALIBRATION FLOW RATE		CALIBRATION INSTRUMENT	FYRITE
FLOW RATE LITERS/MIN	ROTAMETER SETTING	✓ SOAP FILM BURET	% OXYGEN
[	60	_____ DRY GAS METER	% CARBON DIOXIDE
		_____ OTHER _____	

CORRECTING ROTOMETER VOLUME TO DRY STANDARD CONDITIONS

EQUATION: $V_{STD} = V_m \times \frac{P_m}{T_m} \times \frac{T_{STD}}{P_{STD}}$

WHERE:

V_M = SAMPLE RATE OF ROTOMETER (L/M)

T_{STD} = $70^0F + 460^0F = 530^0F$

P_{STD} = 29.92"HG

P_M = BAROMETRIC PRESSURE DURING SAMPLING ("HG)

T_m = TEMPERATURE OF GAS STREAM ($+460^0F$)

V_{STD} = $\times \frac{(\quad)}{(\quad)} \times \frac{(530)}{(29.92)} =$ _____

CF = (V_{STD} L/MIN) (3.53 X 10^{-2} CF/L) (60 MIN/1 HR) = ( )(3.53 x 10^{-2})(60)

= CFH

AirRecon
THREE BRIDGES, NJ

EPA Method #5 Gas Bag and Impinger Contents Data Sheet

Company Name:	PRIXWELL HOUSE	Total Net Catch(mls):	44.00
Unit:	AFTERBURNER OUTLET	Sample Volume(Std. Ft3):	2.12
Location:	RUBUKEN,NJ	Stack Flowrate(DSCFM):	2013.00
Run #:	1	Stack % Moisture:	7.90
Catch Log #:			
Bag Log #:			

Contaminant #	Name	MW	GC:Liquid Concentration (mg/l)	GC: Gas Concentration (ppmv)
(1)	THC as METHANE	16.05	1.000	19.000
(2)	CARBON MONOXIDE	28.01	0.000	131.000
(3)				
(4)				
(5)				
(6)				
(7)				
(8)				
(9)				
(10)				

Concentrations and Emissions

Contaminant #	Name	LB/HR	PPMV(WET)	PPMV(DRY)
(1)	THC as METHANE	0.101	18.315	20.103
(2)	CARBON MONOXIDE	1.149	120.651	131.000
(3)		0.000	ERR	ERR
(4)		0.000	ERR	ERR
(5)		0.000	ERR	ERR
(6)		0.000	ERR	ERR
(7)		0.000	ERR	ERR
(8)		0.000	ERR	ERR
(9)		0.000	ERR	ERR
(10)		0.000	ERR	ERR

This Program Uses the Following Equations for Each Contaminant Where:

A = Total Wet Catch(mls)
B = Sample Volume (Std. FT3)
C = Stack Moisture (%)
D = Stack Flowrate (DSCFM)

E = GC: Liquid Concentration (mg/l)
F = GC: Gas Concentration (dry ppmv)
G = Contaminant's Molecular Weight

For the Impinger Contents:
(W1) = dry ppmv = (0.805313 x (A) x (E)) / ((G) x (B))
(W2) = wet ppmv = (dry ppmv) x (100-(C)) / 100
(W3) = pounds/hour = (0.000000013226 x (A) x (E) x (D) / (B)

For the Bag Gas Contents:
(G1) = dry ppmv = (F)
(G2) = wet ppmv = (dry ppmv) x (100-(C)) / 100
(G3) = pounds/hour = (0.000000013226 x (dry ppmv) x (D) x (G)

Totals and Emissions:
Total dry ppmv = (W1) + (G1)
Total wet ppmv = (W2) + (G2)
Total pounds/hour = (W3) + (G3)

NUMBER

MOISTURE DETERMINATION

SAMPLE LOCATION Afterburner Outlet RUN NO. 1 DATE 1-31-89

CHAIN-OF-CUSTODY SAMPLE NO. _____

		GRAMS	GRAMS
IMPINGER 1	FINAL WEIGHT	757.3	
	INITIAL WEIGHT	724.6	
	INCREASE		IMPINGER 1 32.7
IMPINGER 2	FINAL WEIGHT	728.4	
	INITIAL WEIGHT	712.9	
	INCREASE		IMPINGER 2 15.5
IMPINGER 3	FINAL WEIGHT	480.5	
	INITIAL WEIGHT	475.2	
	INCREASE		IMPINGER 3 [illegible]
SILICA GEL	FINAL WEIGHT	855.1	
	INITIAL WEIGHT	838.9	
	INCREASE		SILICA GEL _____

TOTAL MASS OF WATER CAUGHT 69.3 GRAMS

CHAIN-OF-CUSTODY SAMPLE NO. _____

FILTER DIAMETER 4 INCHES FILTER TYPE Glass fiber

FILTER: FINAL WEIGHT .6475 GMS
INITIAL WEIGHT .6278 GMS
INCREASE

0.0197 GRAMS
TOTAL MASS OF PARTICULATE CAUGHT THIS FILTER

IS ICE PRESENT IN THE IMPINGER BATH AT THE END OF THIS SAMPLE? YES___ NO___

CALCULATIONS

$V_{m\text{-}std} = 17.65\ (V_m)\left(\frac{P_{bar} + \text{DELTA H}/13.6}{T_m + 460}\right) = 17.65\ (\quad)\left(\frac{\quad + \overline{\quad}/13.6}{\quad}\right)$

$= 17.65\ (\quad)(\quad) = \_\_\_\_\_\ FT^3$

$V_{w\text{-}std}\ (H_2O) = \frac{\text{GRAMS COLLECTED}}{21.2\ \text{GRAMS/FT}^3} = \frac{(\quad)}{(21.2)} = \_\_\_\_\_\ FT^3$

$\%\ H_2O = \frac{(V_{w\text{-}std})\ 100}{(V_{m\text{-}std}) + (V_{w\text{-}std})} = \frac{100\ (\quad)}{(\quad)(\quad)} = \frac{(\quad)}{(\quad)} = \_\_\_\_\_\ \%$

MOLECULAR WEIGHT (MW) $= \frac{18\ (\%H_2O)}{100} + \frac{\text{DRY MW}\ (100 - \%H_2O)}{100} = 0.18(\quad) + \frac{(\quad)(\quad)}{100}$

VELOCITY (ACTUAL) IN STACK $= 85.48(Cp)\sqrt{\frac{T_s + 460}{P_s(MW)}}\sqrt{\text{DELTA P}} = 85.48\ (\quad)\sqrt{\frac{(\quad)}{(\quad)(\quad)}}\sqrt{\text{DELTA P}}$

$V_s = (\quad)\sqrt{\quad}\sqrt{\text{DELTA P}} = (\quad)(\quad)\sqrt{\text{DELTA P}}$

$V_s = (\quad)\ \text{DELTA P} = (\quad)(\quad) = \_\_\_\_\_\ FT/SEC$

$ACFM = (V_s)(60)(CSA) = (\quad)(60)(\quad) = \_\_\_\_\_$

VELOCITY @ Stp $V_{s\text{-}std} = V_S\ (17.65)\left(\frac{P_s}{Ts + 460}\right) = \frac{(\quad)(17.65)(\quad)}{(\quad)} = \_\_\_\_\_\ FT/SEC$

$SCFM = (V_{s\text{-}std})(csa)(60) = (\quad)(\quad)(60) = \_\_\_\_\_$

$DSCFM = \left(\frac{100 - \%H_2O}{100}\right)(SCFM) = (\quad)(\quad) = \_\_\_\_\_$

NOZZLE VELOCITY @ STD $V_n = \frac{(V_{m\text{-}std} + V_{w\text{-}std})}{60\ (\theta)\ A_n} = \frac{(\quad)}{60\ (\quad)(\quad)\ (_{10}{}^{-4})} = \_\_\_\_\_\ FT/SEC$

$I = \frac{100\ V_{n\text{-}std}}{V_{s\text{-}std}} = \frac{100\ (\quad)}{(\quad)} = \_\_\_\_\_\ \%$ Isokinetic

LAB DATA - EVAPORATIONS

0 03

PLANT MAXWELL HOUSE SAMPLE LOCATION Outlet RUN NO. 1 FOR _____

SAMPLING DATE 1/31/89 OPERATING CONDITION _____

CHAIN-OF-CUSTODY SAMPLE NO. _____

ACETONE WASHINGS

TOTAL SAMPLE	GROSS	653.6	GMS
	TARE -	455.9	GMS
	(A) NET	197.7	GMS
AMOUNT EVAPORATED (B)		197.7	GMS

EVAP. BEAKER NO. _____

GROSS	99.8895	GMS
TARE -	99.8811	GMS
(C) NET	0.0084	GMS

ACETONE BLANK

EVAP. BEAKER NO. _____

99.6314	GROSS	~~99.8895~~	GMS
99.6316	TARE -	~~99.8811~~	GMS
0	NET	_____	GMS

ACETONE BLANK = NET 100 GMS (D) / TOTAL AMOUNT EVAPORATED 100 GMS (F)

CORRECTED NET (E) = (C) - (B)[(D)/(F)]

= (0.0084) - (197.7) [(100)/(100)]

= 0.0084 GMS (E) = (C) - B [(D)/(F)]

SCALED UP NET = (E)(A/B)

= 0.0084 (197.7/197.7)

= .0084 GMS

WET CATCH

TOTAL SAMPLE	GROSS	_____	GMS
	TARE -	_____	GMS
	(A) NET	_____	GMS
AMOUNT EXTRACTED (G)		_____	GMS (MLS)
AMOUNT OF E/C		_____	GMS (H)

WATER PHASE
EVAP. BEAKER NO. _____

GROSS	_____	GMS
TARE -	_____	GMS
(J) NET	_____	GMS

WATER BLANK (L) = _____ GMS / 100 GMS

CORRECTED NET (M) = J - (G)(L)

= _____ - _____ (100)

= _____ GMS

SCALED UP NET = (M)(F/G)

= _____ (_____)

= _____ GMS

EC PHASE
EVAP. BEAKER NO. _____

GROSS	_____	GMS
TARE -	_____	GMS
(K) NET	_____	GMS

E/C BLANK (N) = _____ GMS / 100 MLS

CORRECTED NET (M) = K - (N)(M)

= _____ - _____ (100)

= _____ GMS

SCALED UP NET = (P)(F/G)

= _____ (_____)

= _____ GMS

Particulates

[illegible] and Acetone Washing .0084 grms

[illegible] grms

[illegible] Organic or Aqueous Phase

Aqueous Phase 0 grms

Organic Phase 0 grms

Totals

GRAINS/DSCF = 1.128415E-02
POUNDS/HOUR = .1746987

HIT RETURN TO CONTINUE

PARTICULATE FIELD DATA SHEET

PLANT Maxwell House | DATE 2-1-89 | RUN NO. 2

SAMPLE LOCATION AF burner outlet | RAC BOX NO. 4 | DRY GAS METER NO. 175176

NOZZLE NO. ____ NOZZLE SIZE 1/2 INCHES | PITOT NO. 19 | C_p .83

TIME AT EACH POINT (0) 2½ MINUTES | DELTA H @ 2.00 | THERMOCOUPLE NO.: T_s 41, PROBE OUTLET 38, BOX OUTLET 18

AMBIENT PRESSURE (P_{BAR}) 29.78 "HG

STATIC PRESSURE (P) −0.02 "H_2O/13.6 = ____ "Hg(P meter)

STACK PRESSURE (P_s) = P_{bar} + P_{meter} = ____ "Hg | OPERATING CONDITION OR REMARKS ____

DRY BULB ____ °F | WET BULB ____ °F | ____ %H_2O

PORT/ POINT	MILITARY CLOCK TIME	METER READING	PITOT DELTA P "H_2O	ORIFICE DELTA H "H_2O	METER TEMP. °F IN	METER TEMP. °F OUT	LINE VAC "Hg	PROBE OUTLET °F	BOX OUTLET TEMP °F	BOX TEMP °F	STACK TEMP °F
A-1	0750	151.759	.08	1.48	91	91	2	188	200	223	1523
2	52½	153.2	.08	1.48	92	90	2	189	201	220	1540
3	55	154.9	.085	1.70	92	90	2	191	205	226	1545
4	57½	156.4	.07	1.30	94	91	2	194	204	228	1544
5	0800	157.4	.07	1.30	94	91	2	197	206	227	1528
6	02½	159.5	.07	1.30	96	91	2	198	207	228	1499
7	5	161.4	.07	1.30	99	92	2	200	204	225	1530
8	07½	163.1	.065	1.20	99	92	H	201	208	222	1524
9	10	164.3	.065	1.20	100	92	H	201	208	226	1535
10	12½	165.3	.065	1.20	100	92	H	202	209	228	1534
11	15	167.0	.06	1.10	100	92	H	203	210	227	1503
12	17½	168.2	.055	1.02	100	92	H	204	212	224	1488
END	0820	169.762									
B-1	0850	169.783	.05	.93	89	89	H	195	198	219	1484
2	02½	171.5	.08	1.50	88	89	2	198	199	220	1520
3	55	172.3	.08	1.50	88	87	2	198	200	223	1530
4	57½	174.5	.07	1.30	90	87	2	199	201	228	1530
5	0900	[illegible]	.07	1.30	91	87	2	200	203	229	T500
6	02½	[illegible]	.075	1.40	94	87	2	201	204	227	1495
7	05	[illegible]	.075	1.40	95	88	2	201	203	225	1493
8	07½	180.6	.07	1.30	96	88	2	202	203	226	1496
9	10	181.9	.06	1.10	97	88	2	203	203	225	1493
10	12½	183.0	.06	1.10	97	88	2	204	203	226	1495
11	15	184.0	.05	.93	98	88	2	204	204	224	1490
12	17½	184.9	.05	.93	99	88	2	204	204	225	1498
END	0920	185.946	....	delta H =	T_m =						T_s =

* Sum, average or Difference

Pre-Leak Check 0.00 at 15" | Post Leak Check 0.00 at 3" | FYRITE: % OXYGEN 15.0, % CARBON DIOXIDE 6.0

PARTICULATE.ATG (August 1988)

NOTE METER READING CHANGE BETWEEN PORTS.

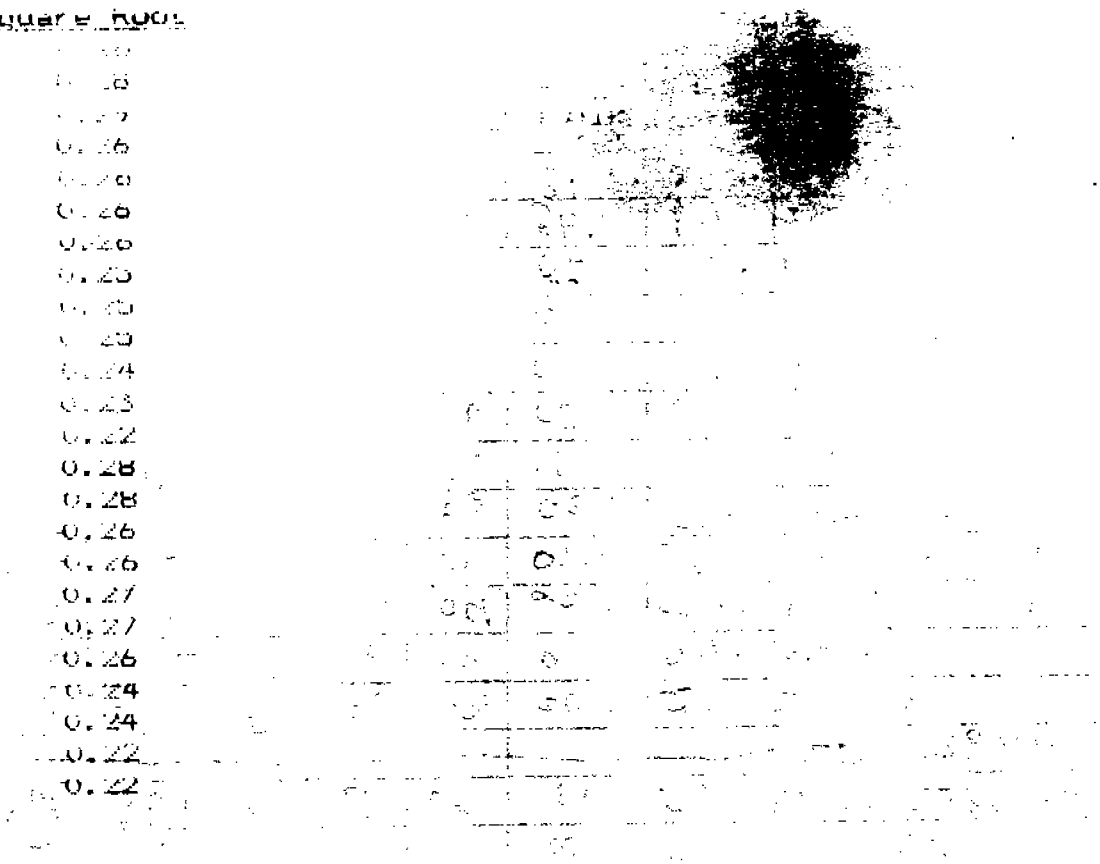
AirRecon
THREE BRIDGES, NJ

CLIENT: [illegible]

Date: [illegible]
Time: 10:30 AM

AVERAGE VELOCITY PRESSURE

Delta P (in H2O)	Delta P square root
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
0.07	0.26
0.07	[illegible]
0.07	0.26
0.07	[illegible]
0.07	0.25
0.07	[illegible]
0.07	[illegible]
0.06	[illegible]
0.06	0.23
0.06	0.22
0.08	0.28
0.08	0.28
0.07	0.26
0.07	0.26
0.08	0.27
0.08	0.27
0.07	0.26
0.06	0.24
0.06	0.24
0.05	0.22
0.05	0.22



THE AVERAGE SQUARE ROOT OF DELTA P = .25948/8

CLIENT: RHANELL HOUSE

Date: 02/26/89
Time: 10:38 AM

Delta H (IN H2O)	Meter Temp (F) IN	OUT	Stack Temp (F)
1.40	91.00	91.00	1525.00
1.40	92.00	90.00	1540.00
1.40	92.00	90.00	1545.00
1.30	94.00	91.00	1544.00
1.30	94.00	91.00	1528.00
1.30	96.00	91.00	1499.00
1.30	97.00	92.00	1530.00
1.20	97.00	92.00	1524.00
1.20	100.00	92.00	1535.00
1.20	100.00	92.00	1534.00
1.10	100.00	92.00	1503.00
1.02	100.00	92.00	1488.00
0.93	87.00	87.00	1484.00
1.50	88.00	87.00	1520.00
1.50	88.00	87.00	1530.00
1.30	90.00	87.00	1530.00
1.30	91.00	87.00	1500.00
1.40	94.00	87.00	1490.00
1.40	95.00	88.00	1493.00
1.30	96.00	88.00	1496.00
1.10	97.00	88.00	1493.00
1.10	97.00	88.00	1490.00
0.93	98.00	88.00	1490.00
0.93	99.00	88.00	1498.00

AVERAGES

DELTA H = 1.26120 IN H2O
METER TEMP. = 92.27084 F
STACK TEMP. = 1513.208 F

HYDROCARBON SAMPLING DATA

SAMPLE LOCATION Outlet RUN NO. 2 DATE 2-1-89

HYDROCARBON PUMP NO. _____

TIME	ROTOMETER SETTING	GAS METER TEMP.	VACUUM "HG	SAMPLE RATE L/M
0750	60	74	11+	1
55	60	74	11+	1
0800	60	74	11+	1
05	60	75	11+	1
10	60	75	11+	1
15	60	76	11+	1
20	60	76	11+	1
25	60	76	11+	1
30	60	76	11+	1
35	60	76	11+	1
40	60	76	11+	1
45	60	77	11+	1
0850	60	78	11+	1

PRE-LEAK CHECK ✓ POST-LEAK CHECK ✓

PUMP CALIBRATION FLOW RATE		CALIBRATION INSTRUMENT	FYRITE
FLOW RATE LITERS/MIN	ROTAMETER SETTING	_____ SOAP FILM BURET _____ DRY GAS METER _____ OTHER_____	% OXYGEN % CARBON DIOXIDE
1	60		

CORRECTING ROTOMETER VOLUME TO DRY STANDARD CONDITIONS

EQUATION: $V_{STD} = V_m \times \frac{P_m}{T_m} \times \frac{T_{STD}}{P_{STD}}$

WHERE:

V_M = SAMPLE RATE OF ROTOMETER (L/M)

T_{STD} = $70^0F + 460^0F = 530^0F$

P_{STD} = 29.92"HG

P_M = BAROMETRIC PRESSURE DURING SAMPLING ("HG)

T_m = TEMPERATURE OF GAS STREAM ($+460^0F$)

V_{STD} = $\times \frac{(\quad\quad)}{(\quad\quad)} \times \frac{(530)}{(29.92)} =$ _____

CF = (V_{STD} L/MIN) (3.53 X 10^{-2} CF/L) (60 MIN/1 HR) = ( )(3.53 x 10^{-2})(60)

= CFH

AirRecon
THREE BRIDGES, NJ

N.J. Method #3 bag bag and Impinger Contents Data Sheet

Company Name:	MAXWELL HOUSE	Total Wet Catch(mls):	44.00
Unit:	AFTERBURNER OUTLET	Sample Volume(std. Ft3):	2.12
Location:	HOBOKEN,NJ	Stack Flowrate(DSCFM):	2035.00
Run #:	4	Stack % Moisture:	7.60
Batch I.D.#:			
Bag I.D.#:			

Contaminants	Name	MW	GC:Liquid Concentration -(mg/l)	GC: Gas Concentration (ppmv)
(1)	THC as METHANE	16.00	0.500	35.000
(2)	CARBON MONOXIDE	28.01	0.000	416.000
(3)				
(4)				
(5)				
(6)				
(7)				
(8)				
(9)				
(10)				

Concentrations and Emissions

Contaminants	Name	LB/HR	PPMV(WET)	PPMV(DRY)
(1)	THC as METHANE	0.181	32.952	35.662
(2)	CARBON MONOXIDE	3.677	384.384	416.000
(3)		0.000	ERR	ERR
(4)		0.000	ERR	ERR
(5)		0.000	ERR	ERR
(6)		0.000	ERR	ERR
(7)		0.000	ERR	ERR
(8)		0.000	ERR	ERR
(9)		0.000	ERR	ERR
(10)		0.000	ERR	ERR

This Program Uses the Following Equations for Each Contaminant Where:

A = Total Wet Catch (mls)
B = Sample Volume (std. Ft3)
C = Stack Moisture (%)
D = Stack Flowrate (DSCFM)
E = GC: Liquid Concentration (mg/l)
F = GC: Gas Concentration (dry ppmv)
G = Contaminant's Molecular Weight

For the Impinger Contents:
(ppmv) = dry ppmv = (0.02313 x (A) x (E)) / ((B) x (G))
(ppmv) = wet ppmv = (dry ppmv) x (100-(C)) / 100
(lb/hr) = pounds/hour = 0.000000132 x (B) x (E) x (D) / (G)

For the bag Gas Contents:
(ppmv) = dry ppmv = (F)
(ppmv) = wet ppmv = (dry ppmv) x (100-(C)) / 100
(lb/hr) = pounds/hour = 0.000000132 x (dry ppmv) x (D) x (G)

Concentrations and Emissions:
total dry ppmv = (h1) + (h2)
total wet ppmv = (i1) + (i2)

0 089

MOISTURE DETERMINATION

SAMPLE LOCATION Outlet RUN NO. 2 DATE 2/1/89

CHAIN-OF-CUSTODY SAMPLE NO. _____

		GRAMS	GRAMS
IMPINGER 1	FINAL WEIGHT	720.9	
	INITIAL WEIGHT	696.4	
	INCREASE		IMPINGER 1 24.5
IMPINGER 2	FINAL WEIGHT	693.0	
	INITIAL WEIGHT	678.2	
	INCREASE		IMPINGER 2 14.8
IMPINGER 3	FINAL WEIGHT	499.4	
	INITIAL WEIGHT	495.5	
	INCREASE		IMPINGER 3 3.9
SILICA GEL	FINAL WEIGHT	720.0	
	INITIAL WEIGHT	709.5	
	INCREASE		SILICA GEL [illegible]

TOTAL MASS OF WATER CAUGHT: 58.7 GRAMS

CHAIN-OF-CUSTODY SAMPLE NO. _____

FILTER DIAMETER 4 INCHES FILTER TYPE Glass fiber

FILTER: FINAL WEIGHT 6514 GMS
INITIAL WEIGHT 6280 GMS
INCREASE

0.0234 GRAMS
TOTAL MASS OF PARTICULATE CAUGHT THIS FILTER

IS ICE PRESENT IN THE IMPINGER BATH AT THE END OF THIS SAMPLE? YES____ NO____

CALCULATIONS

$V_{m\text{-}std} = 17.65\ (V_m)\left(\frac{P_{bar} + \text{DELTA H}/13.6}{T_m + 460}\right) = 17.65\ (\quad)\left(\frac{\quad + \quad/13.6}{\quad + 460}\right)$

$= 17.65\ (\quad)(\quad) = \_\_\_\_\_\ FT^3$

$V_{w\text{-}std}\ (H_2O) = \frac{\text{GRAMS COLLECTED}}{21.2\ \text{GRAMS/FT}^3} = \frac{(\quad)}{(21.2)} = \_\_\_\_\_\ FT^3$

$\%\ H_2O = \frac{(V_{w\text{-}std})\ 100}{((V_{w\text{-}std}) + (V_{w\text{-}std})} = \frac{100\ (\quad)}{(\quad)(\quad)} = \frac{(\quad)}{(\quad)} = \_\_\_\_\_\ \%$

MOLECULAR WEIGHT (MW) $= \frac{18\ (\%H_2O)}{100} + \frac{\text{DRY MW}\ (100 - \%H_2O)}{100} = 0.18(\quad) + \frac{(\quad)(\quad)}{100}$

VELOCITY (ACTUAL) IN STACK $= 85.48(Cp)\sqrt{\frac{T_s + 460}{P_s(MW)}}\sqrt{\text{DELTA P}} = 85.48\ (\quad)\sqrt{\frac{(\quad)}{(\quad)(\quad)}}\sqrt{\text{DELTA P}}$

$V_s = (\quad)\sqrt{\quad}\sqrt{\text{DELTA P}} = (\quad)(\quad)\sqrt{\text{DELTA P}}$

$V_s = (\quad)\ \text{DELTA P} = (\quad)(\quad) = \_\_\_\_\_\ FT/SEC$

$ACFM = (V_s)(60)(CSA) = (\quad)(60)(\quad) = \_\_\_\_\_$

VELOCITY @ Stp $V_{s\text{-}std} = V_s\ (17.65)\left(\frac{P_s}{Ts + 460}\right) = \frac{(\quad)(17.65)(\quad)}{(\quad)} = \_\_\_\_\_\ FT/SEC$

$SCFM = (V_{s\text{-}std})(csa)(60) = (\quad)(\quad)(60) = \_\_\_\_\_$

$DSCFM = \left(\frac{100 - \%H_2O}{100}\right)(SCFM) = (\quad)(\quad) = \_\_\_\_\_$

NOZZLE VELOCITY @ STD $V_n = \frac{(V_{m\text{-}std} + V_{w\text{-}std})}{60\ (\theta)\ A_n} = \frac{(\quad)}{60\ (\quad)(\quad)\ (10^{-4})} = \_\_\_\_\_\ FT/SEC$

$I = \frac{100\ V_{n\text{-}std}}{V_{s\text{-}std}} = \frac{100\ (\quad)}{(\quad)} = \_\_\_\_\_\ \%$ Isokinetic

LAB DATA - EVAPORATIONS

0 030

PLANT MAXWELL HOUSE SAMPLE LOCATION Outlet RUN NO. 2 FOR _____

SAMPLING DATE 2/1/89 OPERATING CONDITION _____

CHAIN-OF-CUSTODY SAMPLE NO. _____

ACETONE WASHINGS

TOTAL SAMPLE	GROSS	659.4	GMS
	TARE -	457.1	GMS
	(A) NET	202.3	GMS
AMOUNT EVAPORATED (B)		202.3	GMS
EVAP. BEAKER NO.		_____	
	GROSS	106.9286	GMS
	TARE -	106.9169	GMS
	(C) NET	0.0117	GMS

ACETONE BLANK

EVAP. BEAKER NO. _____

99.6314	GROSS	~~106.9286~~	GMS
99.6316	TARE -	~~106.9169~~	GMS
	NET	0	GMS

ACETONE BLANK = NET 0 GMS (D) / TOTAL AMOUNT EVAPORATED 100 GMS (F)

CORRECTED NET (E) = (C) - (B)[(D)/(F)]

= (0.0117) - (202.3) [(0)/(100)]

= 0.0117 GMS (E) = (C) - B [(D)/(F)]

SCALED UP NET = (E)(A/B)

= 0.0117 (202.3/202.3)

= 0.0117

WET CATCH

TOTAL SAMPLE	GROSS	_____	GMS
	TARE -	_____	GMS
	(A) NET	_____	GMS
AMOUNT EXTRACTED (G)		_____	GMS (MLS)
AMOUNT OF E/C		_____	GMS (H)

WATER PHASE EVAP. BEAKER NO. ____		EC PHASE EVAP. BEAKER NO. ____	
GROSS	_____ GMS	GROSS	_____ GMS
TARE -	_____ GMS	TARE -	_____ GMS
(J) NET	_____ GMS	(K) NET	_____ GMS
WATER BLANK (L) =	_____ GMS / 100 GMS	E/C BLANK (P) =	_____ GMS / 100 MLS

CORRECTED NET (N) = J - (G)(L/100)

= _____ - _____ (100)

= _____ GMS

CORRECTED NET (M) = K - (H)(M/100)

= _____ - _____ (100)

= _____ GMS

SCALED UP NET = (N)(F/G)

= _____ (_____)

= _____ GMS

SCALED UP NET = (P)(F/G)

= _____ (_____)

= _____ GMS

Particulates

0 021

Totals

GRAINS/DSCF = 1.608752E-02.
POUNDS/HOUR = .2805597

HIT RETURN TO CONTINUE

0 092

PARTICULATE FIELD DATA SHEET

PLANT MAXWELL HOUSE | DATE 1 | RUN NO. 3

SAMPLE LOCATION OUTLET | RAC BOX NO. 4 | DRY GAS METER NO. 175176

NOZZLE NO. ____ NOZZLE SIZE 1/2 INCHES | PITOT NO. 7 | C_p .83

TIME AT EACH POINT (θ) 2½ MINUTES | DELTA H @ 2.00 | THERMOCOUPLE NO.: T_s 41, PROBE OUTLET 38, BOX OUTLET 18

AMBIENT PRESSURE (P_{BAR}) 29.80 "HG

STATIC PRESSURE (P) -0.02 "H_2O/13.6 = ____ "Hg(P meter)

STACK PRESSURE (P_s) = P_{bar} + P_{meter} = ____ "Hg | OPERATING CONDITION OR REMARKS ____

DRY BULB ____ °F | WET BULB ____ °F | ____ %H_2O

PORT/ POINT	MILITARY CLOCK TIME	METER READING	PITOT DELTA P "H_2O	ORIFICE DELTA H "H_2O	METER TEMP. °F IN	METER TEMP. °F OUT	LINE VAC "Hg	PROBE OUTLET °F	BOX OUTLET TEMP °F	BOX TEMP °F	STACK TEMP °F
A-1	1045	189.263	.07	1.3	86	86	6+	189	192	209	1548
2	47½	90.6	.065	1.2	86	85	6+	191	198	221	1543
3	50	92.1	.065	1.2	87	85	6+	193	200	225	1520
4	52½	93.7	.07	1.3	89	85	6+	195	201	226	1530
5	55	95.7	.07	1.3	90	85	6+	198	203	225	1548
6	57½	96.8	.07	1.3	90	85	6+	199	205	225	1548
7	11 00	97.7	.065	1.2	91	85	6+	200	210	225	1546
8	02½	99.5	.07	1.3	91	85	6+	201	211	224	1520
9	05	00.6	.065	1.2	92	86	6+	202	210	223	1492
10	07½	3.2	.065	1.2	94	86	6+	202	210	225	1522
11	10	4.3	.07	1.3	95	86	6+	203	212	228	1520
12	12½	5.4	.04	.75	95	87	6+	204	213	228	1500
LUNCH	11 15	206.790									
B-1	1135	207.6	.05	.94	90	87	5+	200	201	225	1580
2	37½	208.5	.05	.94	91	87	5+	203	200	224	1571
3	220	209.7	.065	1.2	88	88	6+	200	200	226	1530
4	22½	211.2	.065	1.2	88	87	6+	201	201	225	1565
5	25	[illegible]	.05	.94	90	87	5+	200	202	228	1533
6	27½	[illegible]	.06	1.12	91	87	5+	201	203	227	1530
7	30	[illegible]	.06	1.12	92	87	5+	202	204	227	1500
8	32½	216.8	.06	1.12	93	87	5+	203	204	225	1501
9	35	218.0	.07	1.3	94	88	6+	203	205	226	1498
10	37½	219.2	.07	1.3	94	88	6+	203	205	225	1498
11	40	220.0	.065	1.2	95	88	6+	203	205	228	1494
12	42½	221.9	.065	1.2	95	88	6+	203	205	227	1495
END	1245	223.470 V=	----	delta H =	T_m =						T_s =

Test stopped at 1:14 Resumed 1:22 Finis 1:24

* Sum, average or Difference

Pre-Leak Check 0.01 at 15" | Post Leak Check ✓

FYRITE: % OXYGEN 15.0 | % CARBON DIOXIDE 5.0

PARTICULATE.ATG (August 1988)

AirRecon
THREE BRIDGES, NJ

Date:
Time:

AVERAGE VELOCITY PRESSURE

Delta P (in H2O)	Delta P square root
0.07	0.26
0.07	0.25
0.07	0.27
0.07	0.26
0.07	0.26
0.07	0.26
0.07	0.25
0.07	0.26
0.07	0.25
0.07	0.25
0.07	0.26
0.04	0.20
0.05	0.22
0.05	0.22
0.07	0.25
0.07	0.25
0.05	0.22
0.06	0.24
0.06	0.24
0.06	0.24
0.07	0.26
0.07	0.26
0.07	0.25
0.07	0.25

THE AVERAGE SQUARE ROOT OF DELTA P = .250701

CLIENT: HAWELL [redacted]

Date: 02/28/89
Time: 10:30 AM

Delta-P (IN H2O)	Meter Temp (F) IN	Meter Temp (F) OUT	Stack Temp (F)
1.30	86.00	86.00	1548.00
1.20	86.00	87.00	1543.00
1.20	87.00	85.00	1520.00
1.30	87.00	85.00	1530.00
1.30	90.00	85.00	1548.00
1.30	90.00	85.00	1548.00
1.20	91.00	85.00	1546.00
1.30	91.00	85.00	1520.00
1.20	92.00	86.00	1492.00
1.20	94.00	86.00	1522.00
1.30	95.00	86.00	1520.00
0.75	95.00	87.00	1500.00
0.94	90.00	87.00	1580.00
0.94	91.00	87.00	1571.00
1.20	88.00	88.00	1530.00
1.20	88.00	87.00	1565.00
0.94	90.00	87.00	1533.00
1.12	91.00	87.00	1530.00
1.12	92.00	87.00	1500.00
1.12	93.00	87.00	1501.00
1.30	94.00	86.00	1478.00
1.30	94.00	86.00	1478.00
1.20	95.00	88.00	1494.00
1.20	96.00	88.00	1495.00

AVERAGES

DELTA-P = 1.17/20=4 IN H2O

METER TEMP. = 88.79/96= F

STACK TEMP. = 1526.3[illegible] F

HYDROCARBON SAMPLING DATA

SAMPLE LOCATION Outlet RUN NO. 1 DATE 2/1/89 0 095

HYDROCARBON PUMP NO. _____

TIME	ROTOMETER SETTING	GAS METER TEMP.	VACUUM "HG	SAMPLE RATE L/M
1045	60	80	17	1
50	60	81	17	1
55	60	82	17	1
1100	60	84	17	1
05	60	84	17	1
10	60	84	17	1
15	60	84	17	1
20	60	85	17	1
25	60	85	17	1
30	60	86	17	1
35	60	87	17	1
40	60	88	17	1
1145	60	88	17	1

PRE-LEAK CHECK ✓ POST-LEAK CHECK ✓

PUMP CALIBRATION FLOW RATE		CALIBRATION INSTRUMENT	FYRITE
FLOW RATE LITERS/MIN	ROTAMETER SETTING	_____ SOAP FILM BURET _____ DRY GAS METER _____ OTHER_____	% OXYGEN % CARBON DIOXIDE

CORRECTING ROTOMETER VOLUME TO DRY STANDARD CONDITIONS

EQUATION: $V_{STD} = V_m \times \frac{P_m}{T_m} \times \frac{T_{STD}}{P_{STD}}$

WHERE:

V_M = SAMPLE RATE OF ROTOMETER (L/M)

T_{STD} = $70^0F + 460^0F = 530^0F$

P_{STD} = 29.92"HG

P_M = BAROMETRIC PRESSURE DURING SAMPLING ("HG)

Tm = TEMPERATURE OF GAS STREAM ($+460^0F$)

V_{STD} = $\times \frac{(\quad\quad)}{(\quad\quad)} \times \frac{(530)}{(29.92)} =$ _____

CF = (V_{STD} L/MIN) (3.53 X 10^{-2} CF/L) (60 MIN/1 HR) = ( )(3.53 x 10^{-2})(60)

= CFH

AirRecon
THREE BRIDGES, NJ

n.y. method #3 Gas Bag and Impinger Contents Data Sheet

Company Name:	MAXWELL HOUSE	Total Wet Catch(mls):	44.00
Unit:	AFTERBURNER OUTLET	Sample Volume(std. Ft3):	2.12
Location:	HOBOKEN,NJ	Stack Flowrate(DSCFM):	1930.00
Run #:	3	Stack % Moisture:	9.30
Datum 1.D.#:			
Bag 1.D.#:			

Contaminants	Name	MW	GC:Liquid Concentration (mg/l)	GC: Gas Concentration (ppmv)
(1)	THC as METHANE	16.04	0.600	30.000
(2)	CARBON MONOXIDE	28.01	0.000	166.000
(3)				
(4)				
(5)				
(6)				
(7)				
(8)				
(9)				
(10)				

Concentrations and Emissions

Contaminants	Name	LB/HR	PPMV(WET)	PPMV(DRY)
(1)	THC as METHANE	0.147	27.810	30.662
(2)	CARBON MONOXIDE	1.391	150.562	166.000
(3)		0.000	ERR	ERR
(4)		0.000	ERR	ERR
(5)		0.000	ERR	ERR
(6)		0.000	ERR	ERR
(7)		0.000	ERR	ERR
(8)		0.000	ERR	ERR
(9)		0.000	ERR	ERR
(10)		0.000	ERR	ERR

This Program Uses the Following Equations for Each Contaminant Where:

A = Total Wet Catch (ml)
B = Sample Volume (std. Ft3)
C = Stack Moisture %
D = Stack Flowrate (DSCFM)
E = GC: Liquid Concentration (mg/l)
F = GC: Gas Concentration (dry ppmv)
G = Contaminant's Molecular Weight

For the Impinger Contents:
(M1) = dry ppmv = (.00022 x A x (E)) / ((B) x (G))
(J1) = wet ppmv = (dry ppmv) x (100-(C)) / 100
(K1) = pounds/hour = 0.000006 x (dry ppmv) x (D) x (G) / (B)

For the Gas Bag Contents:
(M2) = dry ppmv = (F)
(J2) = wet ppmv = (dry ppmv) x (100-(C)) / 100
(K2) = pounds/hour = 0.000006 x (dry ppmv) x (D) x (G)

Concentrations and Emissions:
Total dry ppmv = (M1) + (M2)
Total wet ppmv = (J1) + (J2)
Total pounds/hour = (K1) + (K2)

MOISTURE DETERMINATION

SAMPLE LOCATION Outlet RUN NO. 3 DATE 2-1-89

CHAIN-OF-CUSTODY SAMPLE NO. _____

		GRAMS	GRAMS
IMPINGER 1	FINAL WEIGHT	757.6	
	INITIAL WEIGHT	721.3	
	INCREASE		IMPINGER 1 36.3
IMPINGER 2	FINAL WEIGHT	694.9	
	INITIAL WEIGHT	676.9	
	INCREASE		IMPINGER 2 18.0
IMPINGER 3	FINAL WEIGHT	492.5	
	INITIAL WEIGHT	489.0	
	INCREASE		IMPINGER 3 3.5
SILICA GEL	FINAL WEIGHT	749.7	
	INITIAL WEIGHT	732.6	
	INCREASE		SILICA GEL [redacted]

TOTAL MASS OF WATER CAUGHT: 69.9 GRAMS

CHAIN-OF-CUSTODY SAMPLE NO. _____

FILTER DIAMETER 4 INCHES FILTER TYPE Glass Fiber

FILTER: FINAL WEIGHT .6271 GMS
INITIAL WEIGHT .6177 GMS
INCREASE

0.0094 GRAMS
TOTAL MASS OF PARTICULATE CAUGHT THIS FILTER

IS ICE PRESENT IN THE IMPINGER BATH AT THE END OF THIS SAMPLE? YES____ NO____

CALCULATIONS

$V_{m\text{-}std} = 17.65\ (V_m)\left(\frac{P_{bar} + \text{DELTA H}/13.6}{T_m + 460}\right) = 17.65\ (\quad)\left(\frac{\quad + \overline{13.6}}{\quad}\right)$

$= 17.65\ (\quad)(\quad) = \_\_\_\_\_\ FT^3$

$V_{w\text{-}std}\ (H_2O) = \frac{\text{GRAMS COLLECTED}}{21.2\ \text{GRAMS/FT}^3} = \frac{(\quad)}{(21.2)} = \_\_\_\_\_\ FT^3$

$\%\ H_2O = \frac{(V_{w\text{-}std})\ 100}{((V_{w\text{-}std}) + (V_{m\text{-}std})} = \frac{100\ (\quad)}{(\quad)(\quad)} = \frac{(\quad)}{(\quad)} = \_\_\_\_\_\ \%$

MOLECULAR WEIGHT (MW) $= \frac{18\ (\%H_2O)}{100} + \frac{\text{DRY MW}\ (100 - \%H_2O)}{100} = 0.18(\quad) + \frac{(\quad)(\quad)}{100}$

VELOCITY (ACTUAL) IN STACK $= 85.48(Cp)\sqrt{\frac{T_s + 460}{P_s(MW)}}\sqrt{\text{DELTA P}} = 85.48\ (\quad)\sqrt{\frac{(\quad)}{(\quad)(\quad)}}\sqrt{\text{DELTA P}}$

$V_s = (\quad)\sqrt{\quad}\sqrt{\text{DELTA P}} = (\quad)(\quad)\sqrt{\text{DELTA P}}$

$V_s = (\quad)\ \text{DELTA P} = (\quad)(\quad) = \_\_\_\_\_\ FT/SEC$

$ACFM = (V_s)(60)(CSA) = (\quad)(60)(\quad) = \_\_\_\_\_$

VELOCITY @ Stp $V_{s\text{-}std} = V_s\ (17.65)\left(\frac{P_s}{Ts + 460}\right) = \frac{(\quad)(17.65)(\quad)}{(\quad)} = \_\_\_\_\_\ FT/SEC$

$SCFM = (V_{s\text{-}std})(csa)(60) = (\quad)(\quad)(60) = \_\_\_\_\_$

$DSCFM = \left(\frac{100 - \%H_2O}{100}\right)(SCFM) = (\quad)(\quad) = \_\_\_\_\_$

NOZZLE VELOCITY @ STD $V_n = \frac{(V_{m\text{-}std} + V_{w\text{-}std})}{60\ (\Theta)\ A_n} = \frac{(\quad)}{60\ (\quad)(\quad)\ (10^{-4})} = \_\_\_\_\_\ FT/SEC$

$I = \frac{100\ V_{n\text{-}std}}{V_{s\text{-}std}} = \frac{100\ (\quad)}{(\quad)} = \_\_\_\_\_\ \%$ Isokinetic

LAB DATA - EVAPORATIONS

PLANT MAXWELL HOUSE SAMPLE LOCATION Inlet RUN NO. 3 FOR _____

SAMPLING DATE 2/1/89 OPERATING CONDITION _____

CHAIN-OF-CUSTODY SAMPLE NO. _____

ACETONE WASHINGS

TOTAL SAMPLE	GROSS	646.1	GMS
	TARE -	455.6	GMS
	(A) NET	190.5	GMS
AMOUNT EVAPORATED (B)		190.5	GMS

EVAP. BEAKER NO. _____

GROSS	96.8724	GMS
TARE -	96.8665	GMS
(C) NET	0.0059	GMS

ACETONE BLANK

EVAP. BEAKER NO. _____

99.6314	GROSS	~~96.8724~~	GMS
99.6316	TARE -	~~96.8665~~	GMS
0	NET	~~0.0059~~	GMS

ACETONE BLANK = NET 0 GMS (D) / TOTAL AMOUNT EVAPORATED 100 GMS (F)

CORRECTED NET (E) = (C) - (B)[(D)/(F)]

= (0.0059) - (190.5) [(0)/(100)]

= 0.0059 GMS (E) = (C) - B [(D)/(F)]

SCALED UP NET = (E)(A/B)

= 0.0059 (190.5/190.5)

= 0.0059

WET CATCH

TOTAL SAMPLE	GROSS	_____	GMS
	TARE -	_____	GMS
	(A) NET	_____	GMS
AMOUNT EXTRACTED (G)		_____	GMS (MLS)
AMOUNT OF E/G		_____	GMS (H)

WATER PHASE
EVAP. BEAKER NO. _____

GROSS	_____	GMS
TARE -	_____	GMS
(J) NET	_____	GMS

WATER BLANK (L) = _____ GMS / 100 GMS

CORRECTED NET (N) = J - (G)(L)

= _____ - _____ (100)

= _____ GMS

SCALED UP NET = (N)(F/G)

= _____ (_____)

= _____ GMS

EC PHASE
EVAP. BEAKER NO. _____

GROSS	_____	GMS
TARE -	_____	GMS
(K) NET	_____	GMS

EC BLANK (M) = _____ GMS / 100 MLS

CORRECTED NET (P) = K - (H)(M)

= _____ - _____ (100)

= _____ GMS

SCALED UP NET = (P)(F/G)

= _____ (_____)

= _____ GMS

0 000

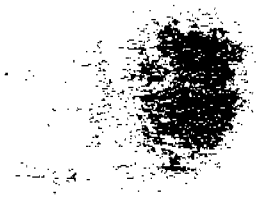
[illegible] and Acetone Mass [illegible] grams

[illegible] grams

[illegible] Organic or Aqueous Phase

Aqueous Phase 0 grams

Organic Phase 0 grams



Totals

GRAINS/DSCF = .3549688E-03
POUNDS/HOUR = .1216771

HIT RETURN TO CONTINUE

CLIENT: PHARMACIA HOUSE

Date: 02/28/89
Time: 10:[illegible] AM

THE FOLLOWING WERE PROGRAMMER INPUTS FOR ISOKINETICS

SAMPLE NO.	1	2	3
DATE	1/31/89	2/1/89	2/20/89
TIME	1000-1101	0750-0920	1045-1245
UNIT SAMPLED	OUTLET	OUTLET	OUTLET
ACTUAL NOZZLE DIAMETER (AND), IN	0.50	0.50 **	0.50
PITOT FACTOR (Cp)	0.83	0.83	0.83
TIME @ EACH POINT (MIN)	2.50	2.50	2.50
AMBIENT PRESSURE (PBAR), IN-HG	29.71	29.75	29.80
STATIC PRESSURE (PS), IN-HG	-0.02	-0.02	-0.02
METER VOLUME (VM), CU-FT	39.46	36.26	33.39
WATER COLLECTED/ IMPINGERS, GRMS	67.30	56.70	69.90
CARBON DIOXIDE (CO_2), %	6.70	6.30	6.00
OXYGEN (O_2), %	13.20	13.10	14.00
STACK DIAMETER (DIA), IN	30.00	30.00	30.00
STACK GRAV SPEC (GMW), AIR=	4.71	4.71	4.91

CLIENT: [illegible]

Date: 02/[illegible]/87
Time: 10:[illegible] AM

ISOKINETIC CALCULATIONS

SAMPLE NO.	1	2	3
DATE	1/31/87	2/1/87	2/20/87
TIME	0900-1101	0700-0920	[illegible]
UNIT SAMPLED	OUTLET	OUTLET	OUTL[illegible]
METER VOLUME (VM-STD), DSCF	30.43	33.07	32.10
WATER COLLECTED (VW-STD), SCF	3.25	2.70	3.33
MOISTURE (VOL %)	7.00	7.52	9.34
ACTUAL MOLECULAR WEIGHT (MW), LBS/LB-MOLE	28.69	28.60	28.45
ACTUAL VELOCITY IN STACK (VS), FT/SEC	27.54	27.98	27.21
ACTUAL FLOW RATE IN STACK (ACFM)	8112.98	8243.16	8017.09
VELOCITY @ STP (VS-STD), FT/SEC	7.42	7.48	7.23
STACK FLOW RATE @ STP (SCFM)	2184.81	2202.52	2129.58
DRY FLOW RATE (DSCFM)	2013.00	2034.63	1930.43
NOZZLE VELOCITY @ STP (VN-STD), FT/SEC	7.06	7.43	7.21
ISOKINETIC %	90.48	97.32	99.80

RECON SYSTEMS, INC.

Route 202 North, P.O., Box 460
Three Bridges, N.J. 08887
201-782-5900

0 102

LABORATORY ORSAT OR GC GAS ANALYSIS

PLANT General Foods - Maxwell House Division STACK AFterburner Inlet/Outlet

SAMPLE NO. _____ OPERATING CONDITIONS _____

JOB NO. 0641

--Dry Basis--

Sample ID	Date	% CO_2	% O_2	% CO	% N_2 (By Diff.)
Run #1 Inlet	1/31/89	0.0	21.0	—	81.4
Sample ID	Date	% CO_2	% O_2	% CO	% N_2 (By Diff.)
Run #2 Inlet	2/1/89	0.0	21.0	—	81.1
Sample ID	Date	% CO_2	% O_2	% CO	% N_2 (By Diff.)
Run #3 Inlet	2/1/89	0.0	21.0	—	80.0
Sample ID	Date	% CO_2	% O_2	% CO	% N_2 (By Diff.)
Run #1 Outlet	1/31/89	5.4	13.2	—	81.4
Sample ID	Date	% CO_2	% O_2	% CO	% N_2 (By Diff.)
Run #2 Outlet	2/1/89	5.8	13.1	—	81.1
Sample ID	Date	% CO_2	% O_2	% CO	% N_2 (By Diff.)
Run #3 Outlet	2/1/89	6.0	14.0	—	80.0
Sample ID	[redacted]	% CO_2	% O_2	% CO	% N_2 (By Diff.)

CHEMIST: Robert F. Mandell

Date: 2/2/89

Linear Regression Calculations
for Gas Chromatographic Analysis - Impingers

RECON SYSTEMS INC
THREE BRIDGES, NJ

STANDARDS Conc. (mg/L)	STANDARDS Area Counts
0	10792
11.69	43194
23.38	76859

UNKNOWNS Sample ID	Sample Number	Sample Area Counts	Dil. Factor	Dil. Samp. Conc. (mg/L)	Actual Conc. (mg/L)
Outlet-1	14568	13447	1.00	1.0	1.0
Outlet-2	14569	12368	1.00	0.6	0.6
Outlet-3	14570	9836	1.00	-0.3	ND

Method Detection Limit - 0.5 mg/L

COEFF. OF DETERMIN.
0.9998781

COEFF. OF CORRELATION
0.9999390

STD ERROR OF ESTIMATE
5.157E+02

Client: General Foods/Maxwell House
Job Number: 0641

Compound:Total HxCx (as Methane)
Sample Location: Afterburner Outlet
Sample Date: 1-/31,2/1,1989

Report Date: 08-Feb-89

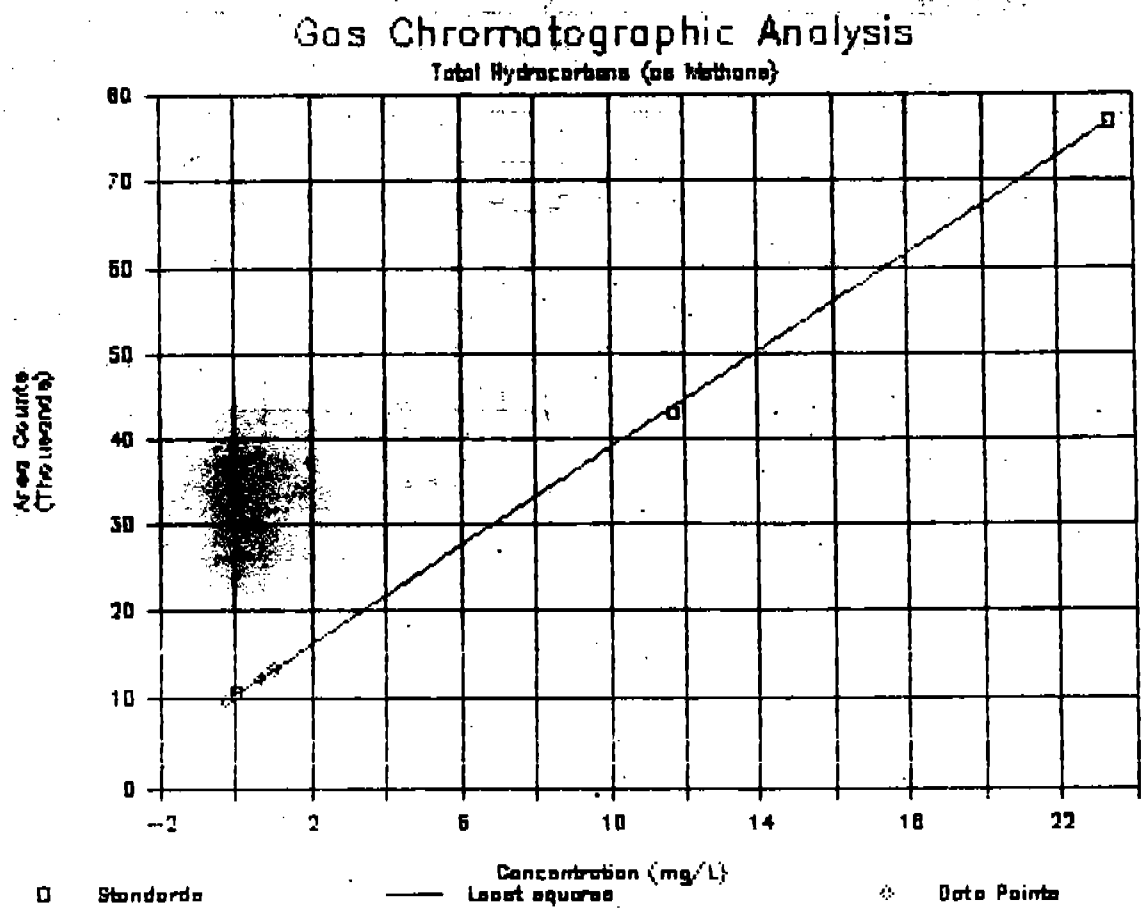
Samples Run: 3

Analyst: RNS

Reference: RNS83, p.32

2mL inj. of samples and standards.

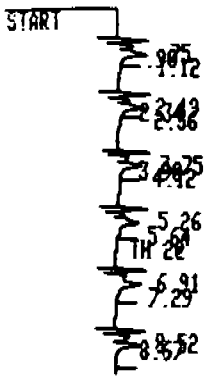
Total volume of 44 ml.



Blank H_2O

ID 0.0 @

START



STOP

RUN # 18 FEB/07/89 12:14:08
ID 0.0

AREA%

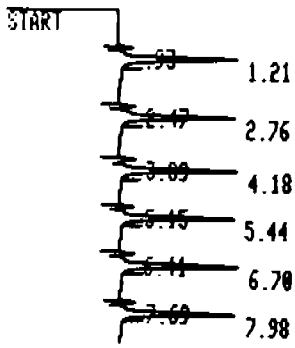
RT		AREA	TYPE	AR/HT	AREA%
0.75		3698	D BP	0.067	4.890
0.98	X10932	2375	PV	0.083	3.141
1.12		8517	D VB	0.178	11.263
2.19		4360	D BP	0.072	5.766
2.34	9791	1796	PV	0.089	2.375
2.56		6935	VB	0.164	9.171
3.75		3955	D BP	0.069	5.230
3.90	X9755	2033	PV	0.097	2.689
4.12		7722	VB	0.185	10.212
5.26	X11399	4139	D BP	0.077	5.474
5.64		7260	VB	0.186	9.601
6.91		4165	D BP	0.073	5.508
7.29	X11120	11120	PB	0.228	14.706
8.52	7543	3593	D BP	0.066	4.752
8.67		3950	PV	0.129	5.224

TOTAL AREA= 75618
MUL FACTOR= 1.0000E+00

LIST: ID 1 11.69 mg/L as Methane

0 100

START



STOP

RUN # 20 FEB/07/89 12:37:06
ID 1

AREA%

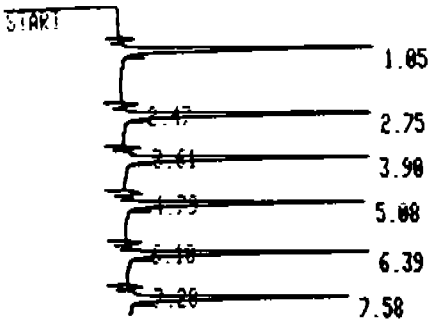
RT	AREA	TYPE	AR/HT	AREA%
0.93	3569	D BP	0.065	1.269
1.21	[illegible]	D PB	0.106	[illegible]
2.47	3918	D BP	0.071	1.393
2.76	[illegible]	D PB	0.110	[illegible]
3.89	3928	D PP	0.070	1.379
4.18	[illegible]	D PB	0.101	15.428
5.15	4063	D BP	0.074	1.445
5.44	40274	D PB	0.098	14.322
6.41	4321	D BP	0.071	1.354
6.70	[illegible]	D PB	0.101	15.293
7.69	3673	D BP	0.066	1.306
7.98	40178	D PB	0.098	14.288

TOTAL AREA= 281200
MUL FACTOR= 1.0000E+00

23.38 mg/l as CH_4

0 107

ID 2 @



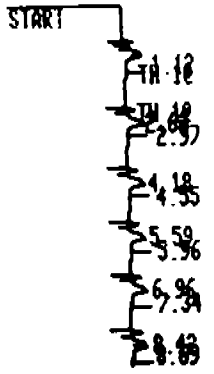
RUN # 24 FEB/07/89 13:19:07
ID 2

AREA%

RT	AREA	TYPE	AR/HT	AREA%
1.05	X79734	D PB	0.089	16.610
2.47	4468	D BP	0.069	0.931
2.75	84914	D PB	0.096	17.689
3.61	4225	D BP	0.068	0.880
3.90	X78063	D PB	0.089	16.262
4.79	3963	D PP	0.067	0.826
5.08	X73968	D VB	0.087	15.409
6.10	4013	D BP	0.068	0.836
6.39	X75670	D VB	0.088	15.763
7.28	3441	D BP	0.067	0.717
7.58	67585	D PB	0.086	14.079

TOTAL AREA= 480040
MUL FACTOR= 1.0000E+00

ID 14568-0641 @



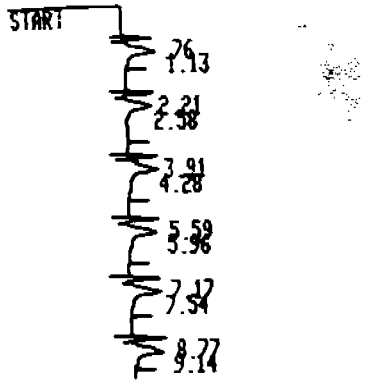
RUN # 4 FEB/07/89 10:49:50
ID 14568-0641

AREA%

RT	AREA	TYPE	AR/HT	AREA%
1.12	5124	VV	0.095	6.501
2.60	2747	D BP	0.071	3.485
2.97	X13567	PB	0.201	17.212
4.18	3111	D BP	0.073	3.947
4.55	X13179	PB	0.223	16.719
5.59	3118	D BP	0.073	3.956
5.96	X13272	PB	0.224	16.837
6.96	2898	D BP	0.072	3.677
7.34	X13771	PB	0.240	17.470
8.42	2754	D BP	0.070	3.494
8.69	5294	PV	0.110	6.704

TOTAL AREA= 78825
MUL FACTOR= 1.0000E+00

ID 14569-0641 @



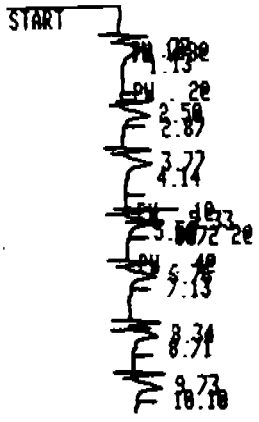
RUN # 19 FEB/07/89 12:26:00
ID 14569-0641

AREA%

RT	AREA	TYPE	AR/HT	AREA%
0.76	3283	D BP	0.066	3.418
1.13	12289	PB	0.223	12.793
2.21	3734	D BP	0.071	3.887
2.58	10680	PB	0.220	11.118
3.91	3545	D BP	0.067	3.690
4.28	13274	PB	0.237	13.818
5.59	4145	D BP	0.076	4.315
5.96	11070	PB	0.221	11.524
7.17	3931	D BP	0.067	4.092
7.54	13025	PB	0.224	13.559
8.77	4639	D BP	0.074	4.829
9.14	12446	PB	0.237	12.956

TOTAL AREA= 96061
MUL FACTOR= 1.0000E+00

LIST: ID 14570-0641 0 106



RUN # 17 FEB/07/89 12:01:00
ID 14570-0641

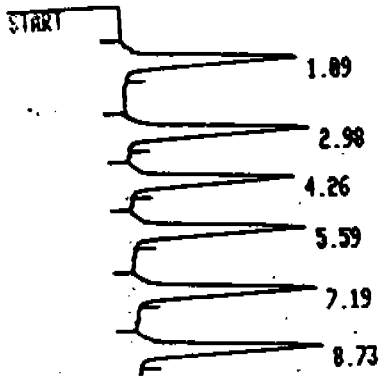
AREA%

RT	AREA	TYPE	AR/HT	AREA%
0.77	3727	D BP	0.070	3.946
1.13	14958	D PB	0.414	15.836
2.58	2139	D BP	0.055	2.265
2.87	9460	PB	0.191	10.015
3.77	3897	D BP	0.072	4.126
4.14	13143	PB	0.236	13.914
5.33	3495	BB	0.039	3.700
5.59	0	PB	0.000	0.000
5.72	1366	D BB	0.034	1.446
6.76	4314	D BP	0.075	4.567
7.13	9855	PB	0.199	10.433
8.34	3535	D BB	0.066	3.742
8.71	9422	BB	0.207	9.975
9.73	4541	D BP	0.075	4.808
10.10	10605	PB	0.210	11.227

TOTAL AREA= 94457
MUL FACTOR= 1.0000E+00

Post-cal check ~3.38 mg/L as Methane
~~24.21 mg/L as Hexane~~

ID 2 e



RUN # 37 FEB/07/89 15:10:14
ID 2

AREA% RT	AREA	TYPE	AR/HT	AREA%
1.09	86348	D PB	0.269	16.581
2.98	[illegible]	D PB	0.274	17.456
4.26	78936	D PB	0.264	15.158
5.59	83675	D PB	0.266	16.068
7.19	[illegible]	D PB	0.269	16.943
8.73	[illegible]	D PB	0.290	17.795

Average Area Cnt = 82986

TOTAL AREA= 520770
MUL FACTOR= 1.0000E+00

0 1.0

RECON SYSTEMS, INC.
ROUTE 202N, BOX 460, THREE BRIDGES, NJ 08887
201-782-5900

CHAIN-OF-CUSTODY/REQUEST FOR ANALYSIS/DOT SHIPPING PAPER

(Use one form each sample) PROJECT MANAGER PFM

SAMPLE NO. D 14568 ANALYTICAL RESULTS TO BE REPORTED TO: PFM

SAMPLE LOCATION afterburner outlet Run 1 RECON JOB NO. 0641

SAMPLE DESCRIP. voc vial 40mls. SAMPLING DATE/TIME 1-31-89 BY: CBE/PFM

Relinquished By Person/Organ. (Signature)	Received By Person/Organ./ Date/Time (Signature)	Container Description and Preservative	Analysis Requested	Analysis Performed By Person/Lab	Date/Time Analysis Performed	Results
SJC	Rec'd/Rec 2-2-89 11:03	40ml VOA vial	Total Hydrocarbons	BNS /R	2-7-89	

MAKE ADDITIONAL COMMENTS/NOTES

RUSH YES ☐ NO ☒

EMERGENCY YES ☐ NO ☒

COMPLIANCE OR TIER II YES ☒

IF SAMPLES HAVE BEEN DETERMINED HAZARDOUS, PLEASE INCLUDE SHIPPING NAME, HAZARD CLASS, AND IDENTIFICATION NUMBER.

COPIES OF THIS FORM MUST BE ATTACHED TO EACH LABORATORY REPORT.

L-37A (CPB)(July 11, 1988)

RECON SYSTEMS, INC.
ROUTE 202N, BOX 460, THREE BRIDGES, NJ 08887
201-782-5900

CHAIN-OF-CUSTODY/REQUEST FOR ANALYSIS/DOT SHIPPING PAPER

(Use one for sample) PROJECT MANAGER PFM

SAMPLE NO. D 14569 ANALYTICAL RESULTS TO BE REPORTED TO: PJM

SAMPLE LOCATION afterburner outlet Run 2 RECON JOB NO. 0641

SAMPLE DESCRIP. 40ml VOC vial SAMPLING DATE/TIME 2-1-89 BY: DDR/PFM

Relinquished By Person/Organ. (Signature)	Received By Person/Organ./ Date/Time (Signature)	Container Description and Preservative	Analysis Requested	Analysis Performed By Person/Lab	Date/Time Analysis Performed	Results
STC	RRS/Rec 2-2-89 11:06	40ml VOC vial	Total Hydrocarbons	RNS/R	2-7-89	

MAKE ADDITIONAL COMMENTS/NOTES

RUSH YES ☐ NO ☒

EMERGENCY YES ☐ NO ☒

COMPLIANCE OR TIER II YES ☒

IF SAMPLES HAVE BEEN DETERMINED HAZARDOUS, PLEASE INCLUDE SHIPPING NAME, HAZARD CLASS, AND IDENTIFICATION NUMBER.

COPIES OF THIS FORM MUST BE ATTACHED TO EACH LABORATORY REPORT.

L-37A (CP8)(July 11, 1988)

RECON SYSTEMS, INC.
ROUTE 202N, BOX 460, THREE BRIDGES, NJ 08887
201-782-5900

CHAIN-OF-CUSTODY/REQUEST FOR ANALYSIS/DOT SHIPPING PAPER

(Use one form sample) PROJECT MANAGER PFM

SAMPLE NO. D 14570 ANALYTICAL RESULTS TO BE REPORTED TO: PJM

SAMPLE LOCATION afterburner outlet Run 3 RECON JOB NO. 0641

SAMPLE DESCRIP. 40ml VOC vial SAMPLING DATE/TIME 2-1-89/1145 BY: CAR/PFM

Relinquished By Person/Organ. (Signature)	Received By Person/Organ./ Date/Time (Signature)	Container Description and Preservative	Analysis Requested	Analysis Performed By Person/Lab	Date/Time Analysis Performed	Results
SJC	Odd/Rec 2-2-89 11:09	40ml VOC vial	total hydrocarbons	RNS/RI	2-7-89	

MAKE ADDITIONAL COMMENTS/NOTES

RUSH YES ☐ NO ☒

EMERGENCY YES ☐ NO ☒

COMPLIANCE OR TIER II YES ☒

IF SAMPLES HAVE BEEN DETERMINED HAZARDOUS, PLEASE INCLUDE SHIPPING NAME, HAZARD CLASS, AND IDENTIFICATION NUMBER.

COPIES OF THIS FORM MUST BE ATTACHED TO EACH LABORATORY REPORT.

L-37A (CPB)(July 11, 1988)

0 113

RECON SYSTEMS, INC.
ROUTE 202N, BOX 460, THREE BRIDGES, NJ 08887
201-782-5900

CHAIN-OF-CUSTODY/REQUEST FOR ANALYSIS/DOT SHIPPING PAPER

(Use one form per sample) PROJECT MANAGER PFM

SAMPLE NO. B 14574 ANALYTICAL RESULTS TO BE REPORTED TO: PFM

SAMPLE LOCATION Blank (Trip) RECON JOB NO. 0641

SAMPLE DESCRIP. water SAMPLING DATE/TIME — BY: SJC

Relinquished By Person/Organ. (Signature)	Received By Person/Organ./ Date/Time (Signature)	Container Description and Preservative	Analysis Requested	Analysis Performed By Person/Lab	Date/Time Analysis Performed	Results
SJC	ORS/Rec 2-2-89 11:24	Distilled water Blank	Total Hydrocarbon	K		

VOID

MAKE ADDITIONAL COMMENTS/NOTES

RUSH YES ☐ NO ☒

EMERGENCY YES ☐ NO ☒

COMPLIANCE JOB TIER II YES ☐

IF SAMPLES HAVE BEEN DETERMINED HAZARDOUS, PLEASE INCLUDE SHIPPING NAME, HAZARD CLASS, AND IDENTIFICATION NUMBER.

COPIES OF THIS FORM MUST BE ATTACHED TO EACH LABORATORY REPORT.

L-37A (CP8)(July 11, 1988)

RECON SYSTEMS INC.

ROUTE 202N, P.O. BOX 460, THREE BRIDGES, N.J. 08887-0460
201-782-[illegible] FAX 201-782-0072
NEW ENGLAND 508-752-[illegible] PENNSYLVANIA 215-433-5511 CONNECTICUT 203-293-1212

0 114

ANALYSIS REPORT

February 14, 1989

TO: Maxwell House/General Foods Project Attn: P. F. Marshall
RECON Project No. 0641

Sample: 80 Liter Tedlar Gas Bag; sampled 1/31/89

RECON Sample No.	RUN NO.	SAMPLE DESCRIPTION	OXYGEN (%)	CO PPMV DRY	THC AS METHANE PPMV DRY
14571	1	OUTLET	13.2	131	19.
14572	2	OUTLET	13.1	416	35.
14573	3	OUTLET	14.0	166	30.
Detection Limit			0.1	0.1	1

Samples from this project will be retained for sixty days from the date of this report unless directed otherwise.

Submitted by

Patrick J. Mulrooney, B.S.
Acting Laboratory Director

per Andrew W. McNeel, B.S.
Test Engineer

AWM/lej (AR16)
0641

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS, INC.
ROUTE 202N, BOX 460, THREE BRIDGES, NJ 08887
201-782-5900

CHAIN-OF-CUSTODY/REQUEST FOR ANALYSIS/DOT SHIPPING PAPER

(Use one form for each sample) PROJECT MANAGER PFM

SAMPLE NO. D 14571 ANALYTICAL RESULTS TO BE REPORTED TO: PJM

SAMPLE LOCATION afterburner outlet Run 1 RECON JOB NO. 0641

SAMPLE DESCRIP. 80L Tedlar Bag SAMPLING DATE/TIME 1-31-89 BY: CORPEN

Relinquished By Person/Organ. (Signature)	Received By Person/Organ./ Date/Time (Signature)	Container Description and Preservative	Analysis Requested	Analysis Performed By Person/Lab	Date/Time Analysis Performed	Results
SJC	RTA/Rec 2-2-89 11:12	80L Tedlar Bag	Total Hydrocarbons as Methane Carbon Monoxide Oxygen	ALM/R /R /R	2-2-89 1300	

MAKE ADDITIONAL COMMENTS/NOTES

RUSH YES ☐ NO ☒

EMERGENCY YES ☐ NO ☒

COMPLIANCE/TIER II YES ☒

IF SAMPLES HAVE BEEN DETERMINED HAZARDOUS, PLEASE INCLUDE SHIPPING NAME, HAZARD CLASS, AND IDENTIFICATION NUMBER.

COPIES OF THIS FORM MUST BE ATTACHED TO EACH LABORATORY REPORT.

L-37A (CPB)(July 11, 1988)

RECON SYSTEMS, INC.
ROUTE 202N, BOX 460, THREE BRIDGES, NJ 08887
201-782-5900

CHAIN-OF-CUSTODY/REQUEST FOR ANALYSIS/DOT SHIPPING PAPER

(Use one form per sample) PROJECT MANAGER PFM

SAMPLE NO. G 14572 ANALYTICAL RESULTS TO BE REPORTED TO: PJM

SAMPLE LOCATION afterburner outlet Run 2 RECON JOB NO. 0641

SAMPLE DESCRIP. 80 L Tedlar Bag SAMPLING DATE/TIME 2-2-89 @ 1100 BY: CDR/PFM

Relinquished By Person/Organ. (Signature)	Received By Person/Organ./ Date/Time (Signature)	Container Description and Preservative	Analysis Requested	Analysis Performed By Person/Lab	Date/Time Analysis Performed	Results
SJC	RTS/Rec 2-2-89 11:15	80 L Tedlar Bag	Total Hydrocarbons as Methane Carbon Monoxide Oxygen	AWMC/R IR IR	2-8-89 1200	

MAKE ADDITIONAL COMMENTS/NOTES

RUSH YES ☐ NO ☒

EMERGENCY YES ☐ NO ☒

COMPLIANCE OR TIER II YES ☒

IF SAMPLES HAVE BEEN DETERMINED HAZARDOUS, PLEASE INCLUDE SHIPPING NAME, HAZARD CLASS, AND IDENTIFICATION NUMBER.

COPIES OF THIS FORM MUST BE ATTACHED TO EACH LABORATORY REPORT.

L-37A (CPS)(July 11, 1988)

RECON SYSTEMS, INC.
ROUTE 202N, BOX 460, THREE BRIDGES, NJ 08887
201-782-5900

CHAIN-OF-CUSTODY/REQUEST FOR ANALYSIS/DOT SHIPPING PAPER

(Use one form for each sample) PROJECT MANAGER PFM

SAMPLE NO. B 14573 ANALYTICAL RESULTS TO BE REPORTED TO: PJM

SAMPLE LOCATION afterburner outlet Run 3 RECON JOB NO. 0641

SAMPLE DESCRIP. 80l Tedlar Bag SAMPLING DATE/TIME 2-1-89 1445 BY: CORAM

Relinquished By Person/Organ. (Signature)	Received By Person/Organ./ Date/Time (Signature)	Container Description and Preservative	Analysis Requested	Analysis Performed By Person/Lab	Date/Time Analysis Performed	Results
SJC	DDL/Rec 2-2-89 11:18	80l Tedlar Bag	Total hydrocarbons as Methane Carbon monoxide Oxygen	PLM/R/R/R	2-2-89 1300	

MAKE ADDITIONAL COMMENTS/NOTES

RUSH YES ☐ NO ☒

EMERGENCY YES ☐ NO ☒

COMPLIANCE OR TIER II YES ☒

IF SAMPLES HAVE BEEN DETERMINED HAZARDOUS, PLEASE INCLUDE SHIPPING NAME, HAZARD CLASS, AND IDENTIFICATION NUMBER.

COPIES OF THIS FORM MUST BE ATTACHED TO EACH LABORATORY REPORT.

L-37A (CP8)(July 11, 1988)

RATFISHE MODEL RS 55 FID OPERATING CONDITIONS

Sample pressure	<4 PSIG, Instrument 200 mbar
Fuel pressure	Regulator 15 PSIG, Instrument 0.3 bar
Zero gas pressure	Regulator 3PSIG
Span gas pressure	Regulator 3PSIG
Oven temperature	150°C
Combustion air	Regulator 15 PSIG, Instrument 0.8 bar

THERMO ELECTRON MODEL 48 NON-DISPERSIVE INFRARED, GAS FILTER CORRELATION CO ANALYZER

Sample gas flow rate	1 LPM
Zero gas flow rate	1 LPM
Span gas flow rate	1 LPM
Sample conditioning	Filtraton and Drying

FEB 11 48 EOL

2 = 39.6 % 3 = 1.5 PPM 4 = 16.[illegible] PPM

2/FEB/89 11 50 34 LEDER

100 PPM 9-[illegible]

2/FEB/89 11 49 56 LEDER

2 = 39.6 % 3 = [illegible] PPM 4 = 16.[illegible] PPM

2/FEB/89 11 48 56 LEDER

2 = 26.6 % 3 = [illegible] PPM 4 = 15.[illegible] PPM

2/FEB/89 11 48 35 LEDER

AMBIENT AIR

2 = 14.6 % 3 = 1.6 PPM 4 = 15.[illegible] PPM

2/FEB/89 11 47 56 LEDER

2 = 14.8 % 3 = 1.6 PPM 4 = 11.[illegible] PPM

2/FEB/89 11 47 [illegible] LEDER

14.0% OXYGEN

2/FEB/89 11 41 56 LEDER

2 = 0.6 % 3 = 0.2 PPM 4 = 5.1 PPM

2/FEB/89 11 41 5 LEDER

2 = 0.6 % 3 = 0.2 PPM 4 = 5.5 PPM 17 = 5.9 PPM 1E = 6.0 PPM

2/FEB/89 11 40 1E LEDER

ZERO CH 2.4

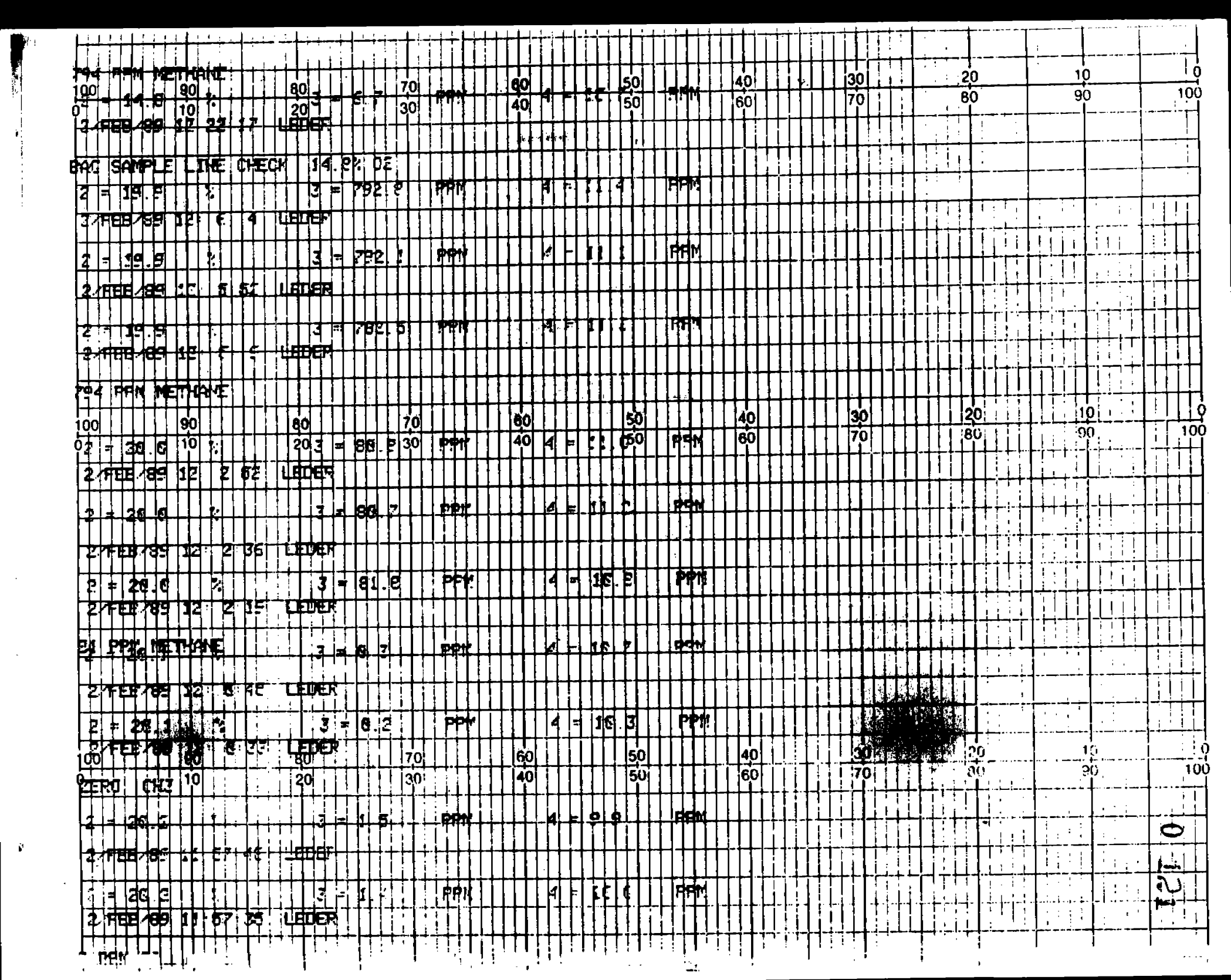
CALIBRATE

CH. 4 CARBON MONOXIDE

CH. 3 THC AS METHANE

CHANNEL 2 OXYGEN

GENERAL FOODS/MAXWELL HOUSE JOB #6641


794 PPM METHANE
2 = 14.8 %
2/FEB/89 12 22 17 LEDER
BAG SAMPLE LINE CHECK 14.8% O2
2 = 19.5 % 3 = 792.5 PPM 4 = 11.4 PPM
3/FEB/89 12 6 4 LEDER
2 = 19.5 % 3 = 792.5 PPM 4 = 11.4 PPM
2/FEB/89 12 5 57 LEDER
2 = 19.5 % 3 = 792.5 PPM 4 = 11.4 PPM
2/FEB/89 12 5 5 LEDER
794 PPM METHANE
02 = 20.6 % 3 = 88.2 PPM 4 = 11.0 PPM
2/FEB/89 12 2 52 LEDER
2 = 20.6 % 3 = 88.2 PPM 4 = 11.0 PPM
2/FEB/89 12 2 36 LEDER
2 = 20.6 % 3 = 91.8 PPM 4 = 16.8 PPM
2/FEB/89 12 2 15 LEDER
94 PPM METHANE 3 = 8.2 PPM 4 = 16.3 PPM
2/FEB/89 12 1 46 LEDER
2 = 20.1 % 3 = 8.2 PPM 4 = 16.3 PPM
2/FEB/89 12 0 20 LEDER
ZERO CH2
2 = 20.5 % 3 = 1.5 PPM 4 = 0.0 PPM
2/FEB/89 11 57 46 LEDER
2 = 20.5 % 3 = 1.5 PPM 4 = 12.0 PPM
2 FEB/89 11 57 35 LEDER
PPM