Bethlehem, 12/96

BID 107

AP-42 73

NOx
NMOC--DE
(A)

Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

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FAX (908) 526-7886

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INTRODUCTION

AirRECON, a division of Levine•Fricke•Recon Inc., was contracted by **LFG Specialties Inc.** to perform a destruction efficiency evaluation on an enclosed landfill gas flare located at **Bethlehem Landfill**, Bethlehem PA.

The inlet and outlet were sampled concurrently for emissions of total hydrocarbons (as methane) and nitrogen oxides (NO_x as NO_2). Destruction efficiency of total hydrocarbons was calculated and compared to the permit application levels listed in *Section D*. The permit application is in Appendix I.

During the testing program, one process interruption occurred during Run 3. There was power outage for approximately 10 minutes. The testing was stopped immediately and resumed shortly after power was restored. Due to this interruption, one less GC-FID injection was performed for Run 3 than for Runs 1 and 2. There were no other process interruptions during the testing program.

Testing was performed in accordance with an approved protocol, which is presented in Appendix I. Sampling dates and times are detailed, along with emissions values, in the *SUMMARY* section of this report.

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San Francisco (415) 742-9900

COMPLIANCE STACK TEST REPORT

FOR THE LANDFILL GAS FLARE
INLET & OUTLET AT
BETHLEHEM LANDFILL
2335 APPLEBUTTER ROAD
BETHLEHEM PA

Prepared for
LFG SPECIALTIES INC.
705 South Friendship Drive
New Concord OH 43762
Attn: Tim Telepak

In Fulfillment of Purchase Order No. **1292**

AirRECON Project AR5-6922

Test Dates: October 8 & 9, 1996

Report Date: December 3, 1996

D.93

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Raritan, NJ 08869-0130

COMPLIANCE STACK TEST REPORT

ON THE

LANDFILL GAS FLARE INLET & OUTLET
AT BETHLEHEM LANDFILL, BETHLEHEM PA

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PERSONNEL AND CERTIFICATIONS 4

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II EMISSION CALCULATIONS
III CEM DATA SUMMARIES
IV FIELD DATA SHEETS
V CALIBRATION DATA & CYLINDER GAS CERTIFICATES
VI CEM STRIP CHARTS
VII LABORATORY DATA

INTRODUCTION

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Testing was performed in accordance with an approved protocol, which is presented in Appendix I. Sampling dates and times are detailed, along with emissions values, in the *SUMMARY* section of this report.

EMISSIONS SUMMARY

RUN	1	2	3
DATE	10/09/96	10/09/96	10/09/96
TIME	1006-1106	1220-1320	1405-1514
NITROGEN OXIDES (NO_x as NO_2) / OUTLET			
PPMV (wet)	6.4	7.7	7.7
PPMV (dry)	6.8	8.5	8.4
POUNDS/HOUR	0.37	0.45	0.39
PPMV (dry @ 7% O_2)	9.4	11.5	11.2
TOTAL NON-METHANE HYDROCARBONS (as METHANE) / INLET			
PPMV (wet)	890	750	750
PPMV (dry)	910	770	770
POUNDS/HOUR	2.5	2.1	2.1
TOTAL NON-METHANE HYDROCARBONS (as METHANE) / OUTLET			
PPMV (wet)	ND<1.0	ND<1.0	ND<1.0
PPMV (dry)	ND<1.1	ND<1.1	ND<1.1
POUNDS/HOUR	ND<0.02	ND<0.02	ND<0.02
TOTAL NON-METHANE HYDROCARBONS DESTRUCTION EFFICIENCY			
PERCENT	>99.2	>99.0	>99.2

Any remaining project sample will be kept for 60 days from report date unless directed otherwise.

ALLOWABLE EMISSIONS SUMMARY

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.

RUN 1	RUN 2	RUN 3	STATE PERMIT ALLOWABLE (Log No. 48-322-002A)	UNITS
TOTAL NON-METHANE HYDROCARBONS (as methane)				
<0.02	<0.02	<0.02	1.75	lb/hr
NITROGEN OXIDES				
0.37	0.45	0.39	1.30	lb/hr

PERSONNEL AND CERTIFICATIONS

FIELD SAMPLING ON THIS PROJECT WAS PERFORMED BY:

John R. Geissler

David P. Forbes

Barry Savar

CALCULATIONS AND REPORT PREPARATION WERE PERFORMED BY:

John R. Geissler

C. Daniel Miesse

THE TESTING WAS OBSERVED BY:

Tom Lechene PAVEX

THIS REPORT IS SUBMITTED BY:

John R. Geissler, CIH
Scientific Associate

APPROVED BY:

Thomas F. Mattei
Manager, Special Projects

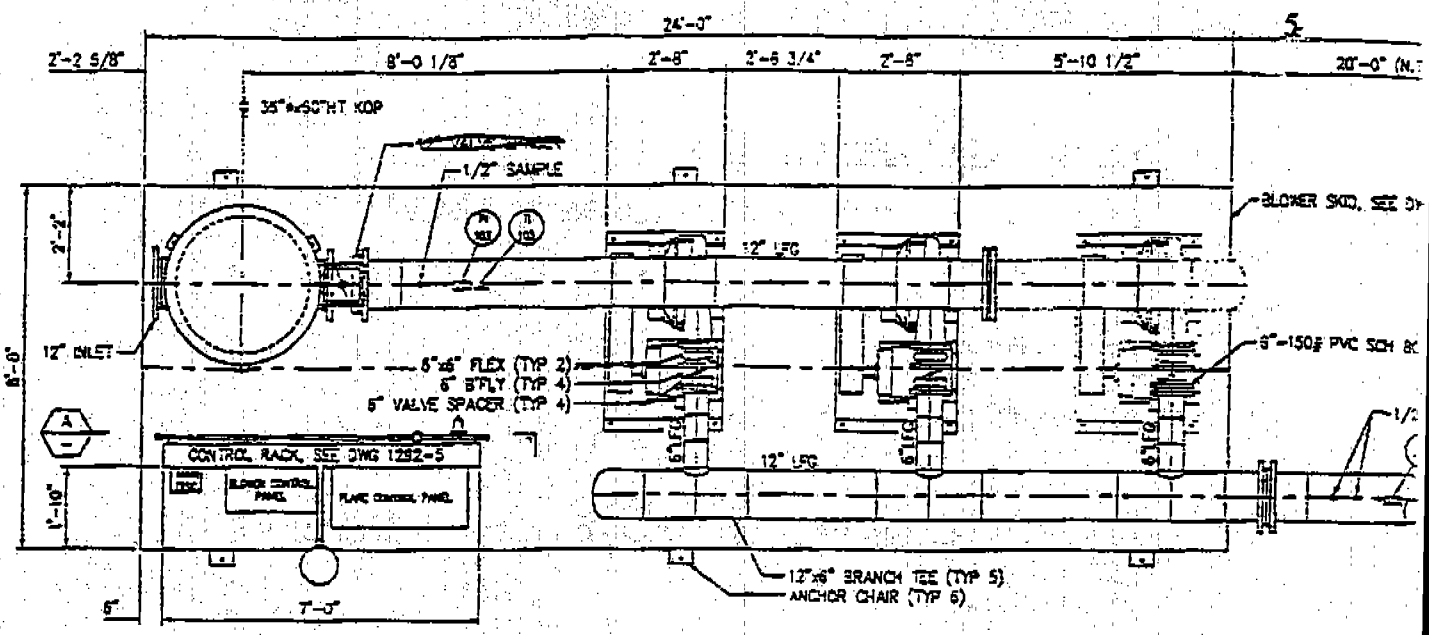
PROFESSIONAL ENGINEER OR CERTIFIED INDUSTRIAL HYGIENIST CERTIFICATION

I CERTIFY THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION DEVELOPED OR ACQUIRED BY RECON PERSONNEL IN THIS REPORT AND, TO THE BEST OF MY KNOWLEDGE, THIS INFORMATION IS TRUE, ACCURATE AND COMPLETE.

NORMAN J. WEINSTEIN, P.E.
PENNSYLVANIA LICENSE 19270-E

CDM/vjm (D.93/6922.S)

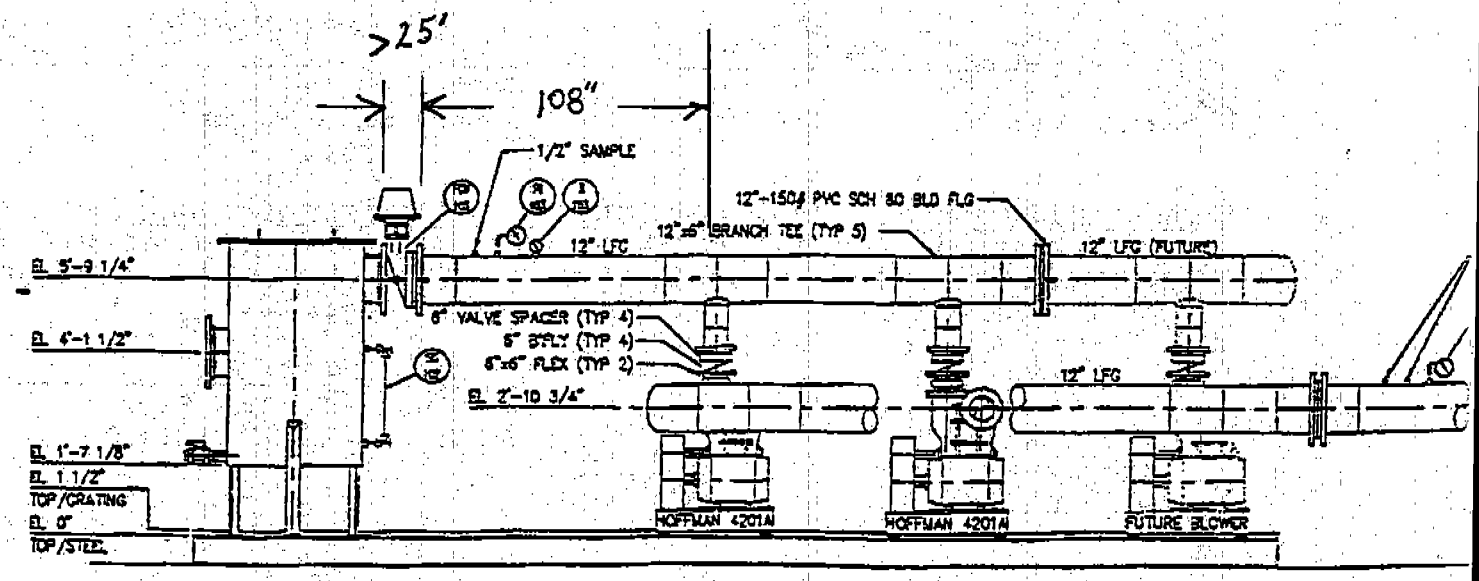
INLET



TOP VIEW

PLAN
SCALE: 1/2"=1'-0"

USEPA Distance A = >25
USEPA Distance B = 9
Duct ID = 12"



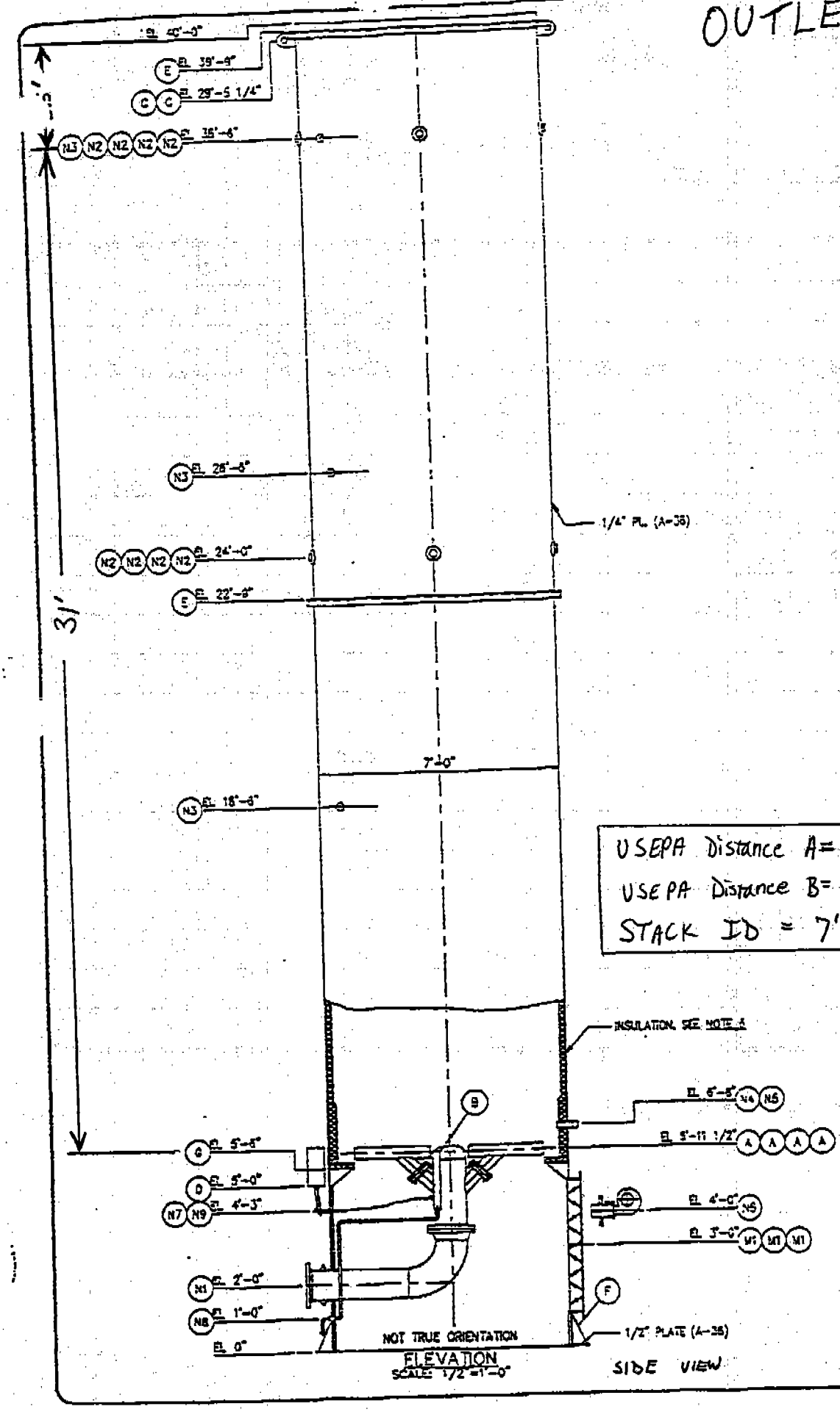
SIDE VIEW

SECTION A
SCALE: 1/8"=1'-0"

N.T.S.

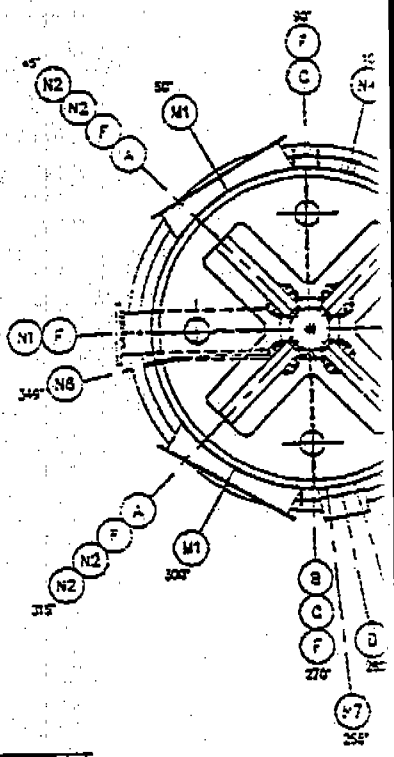
OUTLET

6



ELEVATION
SCALE: 1/2"=1'-0"

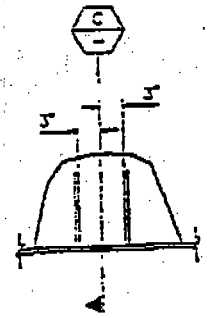
SIDE VIEW



NOZZLE ORIENTA
SCALE: 1/2"=1'-0"

TOP VIEW

USEPA Distance A= 0.5
USEPA Distance B= 4.4
STACK ID = 7'



DETAIL
SCALE: 1"=1'-0"

STACK CONDITIONS: **INLET**

RUN	1	2	3
DATE	10/09/96	10/09/96	10/09/96
TIME	1006-1106	1220-1320	1405-1514
STACK DIAMETER (in)	12.0	12.0	12.0
STACK CROSS SECTION (sq ft)	0.79	0.79	0.79
BAROMETRIC PRESSURE ("Hg)	29.73	29.72	29.72
AVG. STACK TEMP (°F)	91	93	92
STACK PRESSURE ("H_2O-gage)	1.8	1.8	1.8
MOISTURE (% vol)	2.2	1.8	1.9
O_2 (% vol)	1.8	1.4	1.2
CO_2 (% vol)	25.4	25.8	26.2
CH_4 (% vol)	24.2	24.3	24.7
N_2 (% vol by difference)	48.6	48.5	47.9
AVG. VELOCITY (ft/sec)	25.2	25.2	25.0
ACTUAL FLOW RATE (acfm)	1,190	1,190	1,180
STD FLOW RATE (scfm)	1,140	1,140	1,130
DRY STD FLOW RATE (dscfm)	1,110	1,120	1,110

Standard Conditions are 70°F, 29.92 "Hg.

STACK CONDITIONS: **OUTLET**

RUN	1	2	3
DATE	10/09/96	10/09/96	10/09/96
TIME	1006-1106	1220-1320	1405-1514
STACK DIAMETER (in)	84	84	84
STACK CROSS SECTION (sq ft)	38.5	38.5	38.5
BAROMETRIC PRESSURE ("Hg)	29.73	29.72	29.72
AVG. STACK TEMP (°F)	1,470	1,480	1,500
STACK PRESSURE ("H_2O-gage)	-0.06	-0.06	-0.06
MOISTURE (% vol)	5.7	9.0	8.3
O_2 (% vol)	10.8	10.7	10.5
CO_2 (% vol)	9.1	9.3	9.4
N_2 (% vol by difference)	80.1	80.0	80.1
AVG. VELOCITY (ft/sec)	13.0	13.2	11.4
ACTUAL FLOW RATE (acfm)	29,900	30,400	26,300
STD FLOW RATE (scfm)	8,160	8,250	7,080
DRY STD FLOW RATE (dscfm)	7,700	7,510	6,490

Standard Conditions are 70°F, 29.92 "Hg.

CYCLONIC FLOW

POINT	ANGLE, DEGREES	
	OUTLET	
	PORT A	PORT B
1	2	0
2	4	3
3	8	5
4	5	2
5	2	6
6	0	8
7	4	6
8	2	8
AVERAGE	3.4	4.8
OVERALL AVG.	4.1	

The absence of cyclonic flow is verified if the average value of the rotation angle is less than 20 degrees.

SAMPLING DATA

RUN	1	2	3
DATE	10/09/96	10/09/96	10/09/96
TIME	1006-1106	1220-1320	1405-1514
INLET & OUTLET HYDROCARBONS (as METHANE)			
No. OF SAMPLING POINTS	1	1	1
SAMPLING TIME (min)	60	60	60
SAMPLE RATE (ℓ/min)	1	1	1
INLET & OUTLET MOISTURE			
No. OF SAMPLING POINTS	1	1	1
SAMPLING TIME (min)	60	60	60
SAMPLE RATE (cfm)	0.5	0.5	0.5
OUTLET NITROGEN OXIDES (as NO_2)			
No. OF SAMPLING POINTS	1	1	1
SAMPLING TIME (min)	60	60	60
SAMPLE RATE (ℓ/min)	1	1	1

SELECTED NOMENCLATURE

Time	= military time
min	= minutes
°F	= degrees Fahrenheit
°C	= degrees Centigrade
"H_2O	= inches water (pressure or vacuum)
"Hg	= inches mercury (pressure or vacuum)
mm Hg	= millimeters of mercury (pressure or vacuum)
psig	= pounds of pressure per square inch-gage
sq ft	= square feet
in	= inches
micron	= 10^{-6} meters
ft/sec	= feet per second
ft/min	= feet per minute
acfm	= cubic feet per minute of total gas flow at flowing conditions
scfm	= cubic feet per minute of total gas flow at 70°F, 29.92"Hg
dscfm	= dry cubic feet per minute of dry gas flow at 70°F, 29.92"Hg
pounds/hour	= pounds per hour
pounds/hour	= pounds per hour
BTU/hr	= British thermal units per hour
%	= volume per cent when referred to gases and water vapor
	= weight percent for solids, liquids
% vol	= volume per cent
% wgt	= weight percent
ppmv	= volumes of gaseous contaminants per million volumes of total gas
grains	= grams x 15.4
ug	= micrograms = 10^{-6} grams
mg	= milligrams = 10^{-3} grams
grains/dscf	= grains of pollutants per cubic foot of dry stack gas at 70°F, 29.92 "Hg
gr/dscf	= grains/dscf
ug/m^3	= micrograms of pollutants per cubic meter of total stack gas at 25°C, 760 mm Hg
mg/l	= milligrams/liter of liquid = ppm by weight if specific gravity of liquid = 1.0
C	= elemental carbon
CO_2	= carbon dioxide
H	= elemental hydrogen
H_2	= molecular hydrogen
H_2O	= water
N	= elemental nitrogen
N_2	= molecular nitrogen
$NO_x = NO + NO_2$	= nitrogen oxides = nitric oxide plus nitrogen dioxide reported as equivalent nitrogen dioxide
S	= elemental sulfur
SO_2	= sulfur dioxide
SO_3	= sulfur trioxide
SO_4	= sulfate
H_2SO_4	= sulfuric acid
H_2S	= hydrogen sulfide
Cl	= elemental chlorine or chloride
Cl_2	= molecular chlorine
HCl	= hydrogen chloride
F	= elemental fluorine or fluoride
CH_4	= methane
O	= elemental oxygen
O_2	= molecular oxygen
A	= argon
<	= less than; represents the minimum detectability limits
≤	= equal to or less than
ND	= none detected

Front half (dry catch particulate) = particulate matter collected in/on nozzle, probe, cyclone, flask heated hose, and filter of EPA sampling train

Back Half (wet catch particulate) = material collected in impingers after filter of EPA sampling train

Organic wet catch = residue after low temperature (70°F) evaporation of ether/chloroform used to extract soluble materials from the wet catch

Aqueous wet catch = residue after high temperature (220°F) evaporation of water left after ether/chloroform extraction

Combustibles = volatiles = loss on heating @ 550°C after drying @ 100°C

Ash = residue after heating @550°C

Aqua Air A2 Analytical

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PO Box 130
Raritan, NJ 08869-0130

908 725-7744 / FAX 908 526-7886

LABORATORY INFORMATION SHEET

ANALYTICAL REMARKS

a	=	possibly significant, unidentified peaks observed during normal run time
b	=	possibly significant, unidentified peaks observed subsequent to normal run time
dx	=	minimum detection limits are x times those listed; e.g. d10 indicates that the minimum detection limits are 10 times those listed

INSTRUMENT ABBREVIATIONS

FID	=	Flame Ionization Detector
TCD	=	Thermal Conductivity Detector
ECD	=	Electron Capture Detector
PID	=	Photoionization Detector
HECD	=	Hall Electrolytic Conductivity Detector
MS	=	Mass Spectrometer Detector
IR	=	Infrared Spectrometer
GC	=	Gas Chromatograph

UNITS

ug/l	=	micrograms per liter
mg/l	=	milligrams per liter
ml/l	=	milliliters per liter
ug/kg	=	micrograms per kilogram, dry weight basis (unless otherwise noted)
mg/kg	=	milligrams per kilogram, dry weight basis (unless otherwise noted)
m^3	=	cubic meter
in/yr	=	inches per year
lbs/yd^3	=	pounds per cubic yard
pCi/l	=	picocuries per liter
ppm	=	parts per million
ppmv	=	parts per million by volume, dry basis (unless otherwise noted)
ppbv	=	parts per billion by volume, dry basis (unless otherwise noted)
°F	=	degrees Fahrenheit
°C	=	degrees Celsius
vol %	=	percent by volume
wt %	=	percent by weight
cc	=	cubic centimeter
ug	=	microgram
mg	=	milligram
g	=	gram
kg	=	kilogram
ul	=	microliter
ml	=	milliliter
l	=	liter
su	=	standard units
cu	=	color units
NTU	=	nephelometric turbidity units
MF	=	Million Fibers

Samples for this project will be retained for sixty (60) days from the date of this report unless otherwise noted.

New Jersey State Certified Laboratory Certification No. 18196
New York State Certified Laboratory Certification No. 11239

Aqua Air A2 Analytical
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908 725-7744 / FAX 908 526-7886

LABORATORY INFORMATION SHEET

METHODOLOGY

ASTM	=	American Society for Testing Materials
EPA	=	United States Environmental Protection Agency SW-846 3rd Edition; or EPA 600/4-79-020 Methods for Chemical Analysis of Water and Wastes; or 40 CFR, most recent edition; or Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water
Method No.	=	EPA Methods unless otherwise noted
Mod	=	Modified; e.g. 8015Mod indicates that the 8015 method has been modified by the lab
NIOSH	=	National Institute for Occupational Safety and Health
NJDEPE	=	New Jersey Department of Environmental Protection and Energy
RECON	=	RECON SYSTEMS, Inc. in-house method
SM	=	Standard Methods for the Examination of Water and Wastewater 16th Edition

COMMON NOMENCLATURE (including Data Qualifiers)

A	=	tentatively identified compound is a suspected aldol-condensation product
B	=	compound was found in laboratory blank
C	=	probable lab contamination
E	=	estimated value; concentration exceeds instrument calibration range
G	=	surrogated recoveries not reported because of required sample dilutions
H	=	compound is target compound that was analyzed for a different analytical fraction. It's presence is "inappropriate" in this fraction and is probable lab contamination
I	=	compound is target compound that was analyzed for and detected in a different analytical fraction. It's presence is "inappropriate" in this fraction and may be negated. (NJDEPE-BEMQA SOP No. 5.A.131, 10/91)
J	=	compound was detected but below the MDL
M	=	surrogate recoveries out of limits due to matrix interference, verified by reanalysis
Q	=	data qualifiers
X	=	compound was probable background due to solvent or CO_2
++	=	as measured on site
+	=	analysis performed by subcontract laboratory, report attached
<	=	less than detection limit
≤	=	less than or equal to detection limit
>	=	greater than detection limit
≥	=	greater than or equal to detection limit
#	=	column used to flag recoveries that have exceeded limits
bdl	=	compound was detected but below the MDL
nd	=	none detected
nd<	=	none detected, less than detection limit
GPM	=	gallons per minute
GPD	=	gallons per day
MPN	=	most probable number
MDL	=	minimum detection limit
MGD	=	million gallons per day
MBAS	=	Methylene Blue Active Substances
NJDEPE	=	New Jersey Department of Environmental Protection and Energy
NI	=	not ignitable solid
NA	=	not applicable
NR	=	not requested
NL	=	no limits set
RPD	=	relative percent deviation
RCRA	=	Resource Conservation and Recovery Act
ECRA	=	Environmental Cleanup Responsibility Act
TCLP	=	Toxicity Characteristic Leaching Procedure
USEPA	=	United States Environmental Protection Agency
ZHE	=	Zero Headspace Extraction

APPENDIX I

APPROVED PROTOCOL

AirRecon
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New York (212) 545-7440
Los Angeles (714) 752-1818
San Francisco (415) 742-9900

015

ENTRY 2 UPS DELIVERY TRACKING NUMBER 1Z 079 331 08 9995 225 3

November 30, 1995

Mr. Tim Telepak
LFG SPECIALTIES INC.
7550 Lucerne Drive
Suite 110
Cleveland OH 44130

Re: Compliance stack test protocol for
Landfill gas flare to be installed @
BETHLEHEM LANDFILL, Bethlehem PA
AirRECON Project No. AR5-6922

Dear Mr. Telepak:

Enclosed please find three revised copies of the test protocol for the above-referenced project. One copy is for your records, and the others are for GANNETT FLEMING and the CITY OF BETHLEHEM.

We have also sent two copies to the PA-DEP for their review and comments.

Please do not hesitate to call me at extension 519 with any questions or comments you may have.

Submitted by,

John R. Geissler, IHIT
Sr Air Quality Chemist

Approved By:

Frank W. Swetits
Vice President
AirRECON Division

JRG/vjm (D.53)
Enclosure

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Division of
RECON Environmental Corp.

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FAX (908) 526-7886

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San Francisco (415) 742-9900

016

November 30, 1995

ENTRY 4 UPS DELIVERY TRACKING NUMBER 1Z 079 331 08 9995 227 1

Mr. Michael Safko
Bureau of Air Quality
PENNSYLVANIA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
Cross Valley Centre
667 North River Street
Plains PA 18705-1099

Re: Compliance stack test protocol for
Landfill gas flare to be installed @
BETHLEHEM LANDFILL, Bethlehem PA
AirRECON Project No. AR5-6922

Dear Mr. Safko:

Enclosed, please find a compliance stack test protocol for the above-referenced source.

A copy of the protocol is also being forwarded to Mr. St. Louis of your office for his technical comments.

If you have any questions, feel free to call me at extension 519.

Submitted by:

John R. Geissler, IHIT
Sr Air Quality Chemist

Approved by:

Frank W. Swetits
Vice President
AirRECON Division

JRG/vjm (D.53)
Enclosure

cc: T. Telepak/LFG Specialties
R. St. Louis/PADEP

ENTRY 5 UPS DELIVERY TRACKING NUMBER 1Z 079 331 08 9995 226 2

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Division of
RECON Environmental Corp.

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San Francisco (415) 742-9900

COMPLIANCE STACK TEST PROTOCOL

Prepared For:

LFG SPECIALTIES INC.
7550 Lucerne Drive, Suite 110
Cleveland OH 44130
Attn: Tim Telepak

Source:

Bethlehem Landfill
Flare Inlet/Outlet

Submitted to:

Mr. Michael Safko
Bureau of Air Quality
PENNSYLVANIA DEPARTMENT OF
ENVIRONMENTAL RESOURCES
Cross Valley Centre
667 North River Street
Plains PA 18705-1099

Prepared by:

John R. Geissler, IHIT (Ext. 519)
Senior Air Quality Chemist

AirRECON Project No. AR5-6922

November 30, 1995

D.53

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ATTACHMENTS

1 - AIR PERMIT
2 - SAMPLE LOCATION DIAGRAMS

1.0 INTRODUCTION

An emission test program will be performed at the BETHLEHEM LANDFILL, Bethlehem PA. An enclosed landfill gas flare system is currently being constructed at this site. The purpose of the test program is to demonstrate compliance with applicable PADEP flare emission regulations.

LFG Specialties of Cleveland OH, retained AirRECON, a division of RECON ENVIRONMENTAL CORP. (RECON), to author a test protocol and conduct the actual testing onsite. The goal of the test program is to determine destruction efficiency of total non-methane hydrocarbons and to quantify emissions of non-methane hydrocarbons and nitrogen oxides (NO_X as NO_2).

1.1 JOB-SITE

BETHLEHEM LANDFILL
2335 Applebutter Road
Bethlehem PA 18015
Contact: Chris Campman, Landfill Manager
Phone: 610-865-7103
Fax: 610-865-7224

1.2 SOURCE INFORMATION

LANDFILL GAS ENCLOSED GROUND FLARE

LFG SPECIALTIES INC.
7550 Lucerne Drive, Suite 110
Cleveland OH 44130
Contact: Tim Telepak
Phone: 216-891-0305
Fax: 216-891-8288

1.3 PERMIT INFORMATION

A copy of the permit information is included in Attachment I.

1.4 PLANT SAFETY REQUIREMENTS

It is recommended that all personnel wear safety shoes, hard hats and hearing protection.

2.0 PROCESS INFORMATION

The process will be operated at maximum permit conditions (± 5%). The flare's operating temperature will be monitored and continuously recorded during the test period.

2.1 SOURCE DESCRIPTION

Landfill decomposition gases are negative draft ducted to a vertically arranged, enclosed flare. Diagrams detailing the inlet and outlet sources are included in Attachment 2.

2.2 CONTROL DEVICE

Emission control is achieved through an LFG landfill flare. The flare's specifications are included in the permit information included in Attachment 1.

2.3 CONTINUOUS EMISSION MONITORS

There are no continuous emission monitors associated with this source.

Inlet flow and the outlet temperature are continuously measured and recorded.

3.0 SAMPLING LOCATIONS

Sample diagrams of the test locations are presented in Attachment 2. All measurements will be field-verified and conform to US EPA Reference Method 1 (outlet).

3.1 INLET

See Letter Flow Det? Rev 1-4

Measurement will take place in a horizontally arranged circular stack with an inside diameter of twelve inches (12"). No velocity traverses shall be conducted on this source. Inlet velocities for the testing program shall be provided by the on-site flowmeter; a PANAMETRICS Model-GP68 ultrasonic. The output from this flow meter is continuously recorded by a DAHS.

3.2 OUTLET

Measurement will take place in a vertically arranged circular stack with an inside diameter of seven feet (84"). Four test ports are located 31 feet downstream (EPA Distance "B" = 4.4 duct diameters) and 3.5 feet upstream (EPA Distance "A" = 0.5 duct diameters) from the nearest flow disturbances. For velocity measurements, sixteen traverse points (eight points/port, using two ports located at 90°) will be measured.

3.3 ACCESSIBILITY

The inlet test location is accessible from the ground. The outlet test location is only accessible from an elevated platform or scaffolding.

4.0 TEST METHODOLOGIES

The parameters and methods used for this proposed emission test program are specified in Table 1. Three tests of at least one hour duration will be performed.

All proposed test methods conform to Title 40, Code of Federal Regulations, Part 60, Appendix A test procedures or those of the PADEP.

TABLE 1 TEST METHODOLOGIES

PARAMETER	METHOD
Flow rates (outlet)	US EPA Method 1, "Sample and Velocity Traverse for Stationary Sources"
	US EPA Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type-S Pitot Tube)
Oxygen & carbon dioxide (Outlet)	US EPA Reference Method 3A, "Determination of Oxygen and Carbon Dioxide Concentrations in Emissions From Stationary Sources" (Instrumental Analyzer Procedure).
Moisture (outlet)	US EPA Reference Method 4, "Determination of Moisture Content in Stack Gases."
Nitrogen Oxides (as NO_2) (Outlet)	USEPA Method 7E, "Determination of Nitrogen Oxide Emissions From Stationary Sources (Instrumental Analyzer Procedure)"
Total non-methane hydrocarbons (as methane) (Inlet/Outlet)	USEPA Method 18, "Measurement of Gaseous Organic Compound Emissions by Gas Chromatography."

5.0 SAMPLING PROCEDURES

Nitrogen oxides and total non-methane hydrocarbon (as methane) emissions will be calculated using the additional information outlined below:

- Location of the sampling points within the stack (using USEPA Method 1 and 1A).
- Volumetric flow rate measurements taken prior to and after each test run for average flow rate (using USEPA Method 2 on the outlet and the output from the on-site flow monitor for the inlet).
- Molecular composition by weight of flue gases (using USEPA Method 3A on the outlet only).
- Moisture content of flue gas by gravimetric analysis (using USEPA Method 4 on the inlet and outlet).
- Absence of cyclonic flow (outlet location only).

5.1 NITROGEN OXIDES

SUMMARY: Nitrogen oxides (NO_x) emissions will be determined in accordance with EPA Method 7E. A continuous gas sample is extracted from a single sampling point near the centroid of the stack, and analyzed for NO_x using a chemiluminescent analyzer.

CALIBRATION GASES: A zero gas and three certified master standards ($\pm$ 2%) of nitrogen oxide (NO) in nitrogen will be used to calibrate the instrument.

The concentration of the low-, mid- and high-range standards will be approximately 20-30, 50-60 and 80-90 percent of the selected instrument operating range.

OPERATING RANGE: The NO_x monitor will be operated at a range of 0-200 ppmv. If NO_x concentrations exceed this range, then an appropriate, higher range will be selected.

SAMPLE VOLUMES AND DETECTION LIMITS: For each test, the instrument will run at approximately one liter per minute.

Using a chemiluminescent analyzer, the analytical method detection limit for NO_x (as NO_2) is 1 ppmv. Based on an estimated outlet stack gas flow rate of 24,000 standard cubic feet/minute, the analytical method detection limit mentioned above yields an in-stack detection limit for NO_x (as NO_2) of 0.17 pounds/hour.

SAMPLE TRAIN OPERATION: A representative exhaust gas sample is extracted from the emission source through a stainless steel probe and a heated Teflon sample line. Within the laboratory trailer, the gas is passed through a chilled semi non-contact condenser for moisture removal prior to being introduced to the instrument for immediate analysis.

The principle of the analyzer is the following reaction

$$NO + O_3 => NO_2 + O_2 + hv$$

The intensity of the chemiluminescence (*hv*) is proportional to the concentration of NO present in the gas stream.

The *hv* is measured by a photomultiplier tube and is directly proportional to the NO concentration; therefore the measured value for *hv* is recorded as the concentration for NO.

NO_x is comprised of NO and NO_2. Any NO_2 present in the sample gas is converted into NO prior to entering the measurement cavity by a NO_2 to NO converter.

5.2 TOTAL NON-METHANE HYDROCARBONS AND METHANE

SUMMARY: Total non-methane hydrocarbon emissions will be determined in accordance with EPA Method 18 - "Measurement of Gaseous Organic Compound Emissions by Gas Chromatography".

Methane and total hydrocarbons (as methane) at the flare outlet as well as total non-methane hydrocarbons (as methane) at the flare inlet will be determined in accordance with Method 18, using the "Direct Interface Sampling Procedure." Sample gas will be drawn from the stack by a pump through a stainless steel probe, a heated Teflon sample line and a heated gas sampling valve interfaced to a portable GC.

Periodically, the gas sampling valve shall be opened, and the sample flushed onto the GC column with carrier gas. After elution of the methane peak, the column will be back-flushed into the detector to quantify the non-methane hydrocarbons. Upon elution of the non-methane components, the back-flush valve will be closed and the procedure repeated. At least four cycles shall be completed during each 1 hour test.

CALIBRATION GASES (OUTLET METHANE, INLET/OUTLET TOTAL HYDROCARBONS): A zero gas and three certified master standards ($\pm$ 2%) of methane in air will be used to calibrate the instrument.

The concentration of the low-, mid- and high-range standards will be approximately 20-30, 50-60 and 80-90 percent of the working GC operating range.

OPERATING RANGE: To quantify the outlet methane and total hydrocarbons, the GC will be calibrated and operated on a range of 0-100 ppmv. For quantify the inlet non-methane hydrocarbons, the GC shall be calibrated and operated on a range of 0-10,000 ppmv. The inlet methane concentrations will exceed this range, and therefore will not be quantified. Only the non-methane organic compounds shall be quantified on the inlet. If analyte concentrations exceed any of these ranges, then an appropriate, higher range will be selected, or a smaller sample loop installed on the GC to facilitate a sample dilution.

SAMPLE VOLUMES AND DETECTION LIMITS (OUTLET METHANE, INLET/OUTLET TOTAL HYDROCARBONS): For each test, the pump will run at approximately one liter per minute. The gas sample loops used in the GC shall be 1 ml in size.

Using an FID, the analytical method detection limit for methane and total hydrocarbons (as methane) is approximately 3 ppmv. Based on an estimated outlet stack gas flow rate of 24,000 dry standard cubic feet/minute, the analytical method detection limit mentioned above yields an approximate in-stack detection limit for total hydrocarbons (as methane) and methane of 0.2 pounds/hour. The in-stack detection limit for non-methane hydrocarbons on the flare inlet is 0.006 pounds/hour, based on a flow rate of 800 dry standard cubic feet/minute.

SAMPLE TRAIN OPERATION (OUTLET METHANE, INLET/OUTLET TOTAL HYDROCARBONS): A representative exhaust gas sample is extracted from the emission source through a stainless steel probe, heated Teflon sample line and into a heated gas sample valve prior to being introduced to the GC for immediate analysis.

The analytical columns to be used in the GC shall be 60 m long with an ID of 0.53 mm. The stationary phase shall be 5u, RTx-1. The GC column oven shall be operated at 125°C. Helium shall be used as the carrier gas, with a column head pressure of approximately 20 psi. The hydrogen detector gas shall be run at approximately 20 ml/min., and the air run at approximately 120 ml/min. These parameters may be modified in the field to optimize the analysis.

After elution of the methane peak, the column is back-flushed into the detector. Any peaks eluting after the back-flush are non-methane hydrocarbons, and are quantified using the methane calibration curve for that detector. For the inlet samples, the methane peak will go off-scale, allowing only the non-methane hydrocarbons to be quantified.

The FID uses a well controlled flame to combust the hydrocarbons eluting from the column. Hydrocarbons are ionized by the flame, and the detector (typically a thin, platinum wire) measures the ionization energy of the carbon-hydrogen bonds which are broken.

The detector's response is directly related to the number of carbon atoms contained in each organic molecule of the sample. Output from the detector is electronically converted into a concentration based on the compounds used to calibrate the instrument. Compound identification is based upon the elution time of a peak with regard to a known standard.

5.3 AirRECON's REAL-TIME MONITORING SYSTEM

RECON's real time monitoring system (RTMS) consists of a sampling interface system (SIS) and instrument control panel, which has several continuous emission monitors. All monitors conform to the design and performance criteria outlined in the 40 CFR 60 Appendix A.

The sampling interface system consists of the following components:

1. Three-point averaging, stainless steel probe
2. Particulate filter
3. Calibration overflow assembly
4. Heated sampling line
5. Calibration gas line
6. VIA MAK2 Thermoelectric

The SIS allows for transporting filtered stack gases to the individual instruments while maintaining the temperature well above the dew point of the gases. All instrument output signals are recorded by a Model 3702 data logger and conveyed to a portable computer.

The analyzer calibration error test, also called rack calibration, is performed to establish the linearity and accuracy of the reference method analyzer. A total of four standards will be used to perform the rack calibration: a zero- and low- range standard (20 to 30 percent of the selected operating range), a mid-range standard (50-60 percent), and a high-range standard (80-95 percent).

The zero standard is introduced to the analyzer, (not to the probe) and any necessary adjustments are made, and the zero potentiometer is then locked in place. The mid-range standard is introduced next. Any necessary adjustments are made and the span potentiometer is locked in place. The analyzer is now calibrated. No further adjustments will be made during the test program.

The low-range standard is introduced, and then the high-range standard is introduced.

If the response of the analyzer to either the low or high standard deviates from the reference value of the respective standard by more than 2 percent of the span, the analyzer is not acceptable. The problem is addressed and corrected, and the rack calibration procedure is re-initiated.

Once the analyzer calibration error check has been successfully completed, the sampling system bias check (stack calibration) is performed. First, the zero standard is introduced to the entire sampling system at the junction of the probe and the heated sample line.

The mid-range standard is then introduced to the entire sampling system. If the response to either the zero or mid-range standard deviates by more than 5 percent of the span from the response recorded for the respective analyzer calibration error test, the sampling system is unacceptable. The problem is addressed and corrected, and the sampling system bias check is repeated.

The interference response check is performed by introducing the gaseous components into the entire sampling system either as a combination gas or separately. The response from the measuring system is observed and recorded. If the sum of interference of the measuring system is greater than two percent of the applicable span value, testing will be delayed until the interference can be removed.

After the system performance tests are completed, the testing will begin. Immediately proceeding and following each test run, a calibration drift test will be performed in the same manner as the sampling system bias check was performed.

Whenever possible, the instrument operating range will be as indicated in the appropriate reference method. However, should concentration exceed range, an appropriate higher range shall be selected.

The specific instrument type and model number are identified on the following pages and will conform to the following criteria, as outlined in 40 CFR 60, Appendix A.

Analyzer Calibration Error: $\pm$2% of the instrument span for zero, low-range, mid-range, and high-range calibration gases.

Analyzer Calibration Error (Hydrocarbon Instrument Only): ±5% of the low-range, mid-range and high- range calibration gas concentration value.

Sampling System Bias: ±5% of the instrument span for the zero, and an upscale calibration gas relative to the recorded response during the analyzer calibration-error test.

Zero Drift: ±3% of the instrument span relative to the respective system bias response over the period of each run.

Calibration Drift: ± 3% of the instrument span relative to the respective system bias response over the period of each run.

6.0 QUALITY ASSURANCE

This test protocol was developed in accordance with and closely follows the principles and recommendations outlined in the EPA Quality Assurance Handbook for Air Pollution Measurement Systems.

6.1 CHAIN-OF-CUSTODY

Each sample requires its own chain-of-custody (COC)/request for analysis form. The COC is completed to ensure the integrity of the samples collected. Before relinquishing the sample, the project manager must complete a COC with his/her name, the name of the person receiving the results, the RECON project number, the sample description (media), the sample date/time, and who performed the sampling.

The source is also identified. A description of the container holding the sample and the preservative is also listed. Additional comments or notes can be placed at the bottom of the page. Samples will be stored in-house at RECON.

6.2 CALIBRATION DATA

All pre-test calibration data for sampling and equipment will be made available onsite, at the time of testing to any regulatory representatives. Copies of all calibration data will be included in the final report.

6.3 CALIBRATION PROCEDURES

Detailed standard operating procedures (SOPs) for applicable equipment and instrumentation are documented in the AirRECON Quality Assurance/ Quality Control Plan.

PITOT TUBES: All standard pitot tubes are given a baseline coefficient of 0.99. A standard pitot tube design shall conform to EPA Reference Method 2, sections 2.7.1-2.7.5.

All S-Type pitot tubes are initially provided from the manufacturer in accordance with the specifications listed in EPA Reference Method 2.1.

Before each use, a visual inspection of the pitot tube is made to verify the face openings to be in alignment within the specifications illustrated in figure 2-2 and 2-3. All pitot tubes are calibrated annually in accordance with sections 4.1.3 through 4.1.5.

An identification number is assigned to a calibrated pitot tube. If the pitot tube is not marked, a baseline coefficient of 0.84 is assigned.

DRY GAS METERS: Field-use gas meter calibration is checked prior to use and at the end of each test program against a reference gas meter in accordance with USEPA Method 5, Section 7.

The calibration meter, kept in the laboratory solely for the purpose of checking the calibration of dry gas meters used in the field, is re-calibrated against a bell prover annually.

If the dry gas meter coefficient obtained before and after the test series differ by more than five percent, the calculations for the test series shall be performed using whichever coefficient gives the lower value for sample volume.

THERMOCOUPLES: Thermocouples are calibrated by immersing them side-by-side with a reference mercury-in-glass thermometer. The thermocouples are immersed in an ice bath, boiling water and a hot oil bath. If the absolute temperature reading between the thermocouple and the reference thermometer agree within $\pm 1.5\%$ at all three calibration points, the actual thermocouple reading is considered acceptable.

SPAN GAS CERTIFICATIONS: Span gas certifications are provided by the supplier and copies will be included in the final test report.

6.4 FINAL REPORT

Emissions of nitrogen oxides (as NO_2) and total non-methane hydrocarbons (as CH_4) will be reported as ppmv (wet), ppmv (dry), pounds/hour. Emissions of CO_2 and O_2 will be reported as a percent by volume. Non-methane hydrocarbon destruction efficiency will be reported as a percentage of the mass emission rate.

AirRECON's final test report for this project will include the following items:

- Summary
- Personnel and Certifications
- Sampling location diagrams
- Velocity and flow rate data
- Gas composition data
- Emissions data
- Process information
- Approved test protocol
- Procedures
- Selected nomenclature
- Equipment calibration data
- Original test data
- Calculations
- Laboratory analysis reports with labeled chromatographs
- Chain of Custody forms

Submitted by:

John R. Geissler, IHIT
Sr. Air Quality Chemist

Approved by:

Thomas F. Mattei

Thomas F. Mattei
Manager, Special Projects
AirRECON Division

JRG/vjm (D.53)

Air Recon
Division of
RECON Environmental Corp.
Raritan, NJ 08869-0130

[redacted]

ATTACHMENT 1

PERMIT INFORMATION

File 29607.12c ~~[illegible]~~

cc: GHB

[redacted]

RECEIVED
SEP 12 1995
GANNETT FLEMING
ENGINEERS & PLANNERS

City of Bethlehem

INDUSTRY • EDUCATION • RELIGION • MUSIC • RECREATION
AN EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF PUBLIC WORKS
LANDFILL BUREAU
Tel (610) 865-7103
Fax (610) 865-7224

September 8, 1995

Babu H. Patel
Pennsylvania Department of Environmental Protection
Air Quality Program
Northeast Regional Office
2 Public Square
Wilkes-Barre, PA 18711-0797

Re: 48-322-002A
Approval to Construct a Landfill Gas
Extraction System
Lower Saucon Township
Northampton County

Dear Mr. Patel:

Please find the enclosed information to supplement our existing Plan Approval for a landfill gas flare:

1. Application for Issuance of an Air Quality Plan Approval Extension with condition to Authorize Temporary Operation.

2. Modified Application for Plan Approval.

3. A check for $200 made out to the Commonwealth of Pennsylvania, Clean Air Fund.

The requested extension of time for the Plan Approval is required because the contractor hired by the City will not install the gas flare unit until the landfill is capped. An extension of 180 days, until March 29, 1996, is expected to provide the City with sufficient time to install the flare.

We have modified the original permit application to reflect the change from a Model #TO-F flare manufactured by John Zinc, to a Model EF 740I12 flare manufactured by LFG Specialties, Inc.

Please do not hesitate to contact me if you have any questions.

Very truly yours,
CITY OF BETHLEHEM

Christopher K. Campman
Manager Landfill Operations

CKC:lmh

Enclosures

cc: W. Sherman
M. Everett
FILE\0908952C.DOC

036

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

APPLICATION FOR ISSUANCE OF AN AIR QUALITY PLAN APPROVAL EXTENSION WITH CONDITION TO AUTHORIZE TEMPORARY OPERATION

Application is hereby made for a plan approval extension to allow temporary operation to facilitate the shake-down of sources and/or air cleaning devices or to permit the evaluation of the source(s) for compliance with all applicable regulations and requirements.

APPROVAL/PERMIT NO. 48-322-002A

Owner/ Operator: City of Bethlehem Department of Public Works

Address: 10 East Church Street Bethlehem, PA 18018

Attention: Mr. Wendall Sherman

Director of Public Works

Source &: Landfill Gas Flare

Air: ~~Model #ZTO-F~~ MODEL EF740I12

Cleaning:

Device:

Location: Lower Saucon Township

Northampton County

Current Approval/Permit:

Issue Date: November 7, 1994

Expiration Date: September 30, 1995

Operation Commenced (Is to Commence):

Specify reason(s) for this request for temporary operation (include the reasons compliance with all applicable regulations and Plan Approval requirements has not been established, a projected schedule for completion of any needed equipment changes and a detailed schedule for achieving full compliance). Attach additional sheets as necessary.

See Attachment A

FEE

A fee of two hundred dollars ($200.00) is enclosed pursuant to 25 Pa. Code §127.34 and Section 6.3(j) of the Pennsylvania Air Pollution Control Act.

p. ation for Issuance of an Air Quality
an Approval Extension with Condition to
thorize Temporary Operation

AFFIDAVIT

I, WENDELL S. SHERMAN, being duly sworn according to law, depose and state, der penalty of law as provided in 18 Pa. C.S. §4904 and Section 9(b)(2) of the Air llution Control Act, 35 P.S. §4009(b)(2), that I am the representative of the Applicant, entified above, authorized to make this affidavit. I further state that the information ovided with this application is true and complete.

orn to and subscribed before me
is 11th day of September, 1995

Cynthia A. Schick
Notary Public

Notarial Seal
Cynthia A. Schick, Notary Public
Bethlehem, Northampton County
My Commission Expires Aug. 15, 1998

Wendell S. Sherman
Signature

WENDELL S. SHERMAN
Name (typed)

DIRECTOR OF PUBLIC WORKS
Title

t this completed form, check(s) and completed Compliance History Form to:

Department of Environmental Resources
Air Quality Program
Northeast Regional Office
Cross Valley Centre
667 North River Street
Plains, PA 18705-1099
Attn.: Chief, Engineering Services

ER-MTS-2: 1/92

We are looking for ways to improve our service to the public and the regulated community. Please take a few moments to respond to the following questions and statements about your recent experience in applying for a DER permit. If the permitting process required you to submit a bond, please answer the questions in the Bonding Survey portion, and enclose it with the completed DER Permit Questionnaire. Your comments and recommendations are important to us. A postage-paid return envelope is enclosed for your use. If you have any questions regarding this questionnaire, please call Brian Showalter at (717) 787-8102. We thank you for providing us with this information.

DEPARTMENT OF ENVIRONMENTAL RESOURCES LICENSING/PERMIT QUESTIONNAIRE

130

1. For what type of license or permit did you apply? Please see the reverse for license/permit types and enter the number that precedes the appropriate permit type.
2. Are you the ___ Applicant X Consultant
3. Was the permit application prepared by the ___ Applicant X Consultant ___ Both
4. Please indicate the county in which the facility or activity exists. NORTHAMPTON County
5. How long did it take to get your license/permit? Please specify. 120 DAYS
6. Do you think this was: X Too Long ___ Reasonable ___ Faster Than Expected
7. Did you have to resubmit or revise your application? ___ Yes X No

   If yes, why? ___ Administratively Incomplete ___ Technically Incomplete ___ Other (Explain) ___ Administrative Errors ___ Technical Errors
8. During the Department's review of your application, did you have to supply additional information? ___ Yes ___ Number of Times X No
9. Did you participate in any type of pre-application review? X Yes ___ No
10. Did DER staff visit the site or facility during the course of the permit review? ___ Yes ___ Number of Visits ___ No X Unknown
11. Had you previously applied for any DER permit? X Yes ___ No
12. Do you plan to apply for other DER permits in the future? X Yes ___ No

The following set of statements concern your feelings about certain aspects of DER's permitting process. Please circle the one response that bes describes your feelings.

13. The Department provides a reasonable explanation of all administrative requirements of the application.
    Strongly Agree 1 | Agree 2 | Disagree (3) | Strongly Disagree 4
14. The Department provides a reasonable explanation of all technical requirements of the application.
    Strongly Agree 1 | Agree 2 | Disagree (3) | Strongly Disagree 4
15. DER staff presented a professional appearance when performing on-site visits.
    Strongly Agree 1 | Agree 2 | Disagree 3 | Strongly Disagree 4
16. I was treated courteously and professionally by DER staff.
    Strongly Agree 1 | Agree (2) | Disagree 3 | Strongly Disagree 4
17. The Department performed professionally in processing this application.
    Strongly Agree 1 | Agree (2) | Disagree 3 | Strongly Disagree 4
18. If you or your company do business throughout Pennsylvania, do you find that the different DER regional offices are generally consiste in their requirements and procedures for permits?
    Yes 1 | Usually 2 | Seldom (3) | Never 4
19. If you or your company do business outside of Pennsylvania, how does DER's service compare with that of regulatory bodies in ot states?
    Better 1 | Roughly Equal (2) | Slightly Worse 3 | Much Worse 4
20. Do you have suggestions for improvements to the licensing or permit application process? If yes, please attach them to this survey.

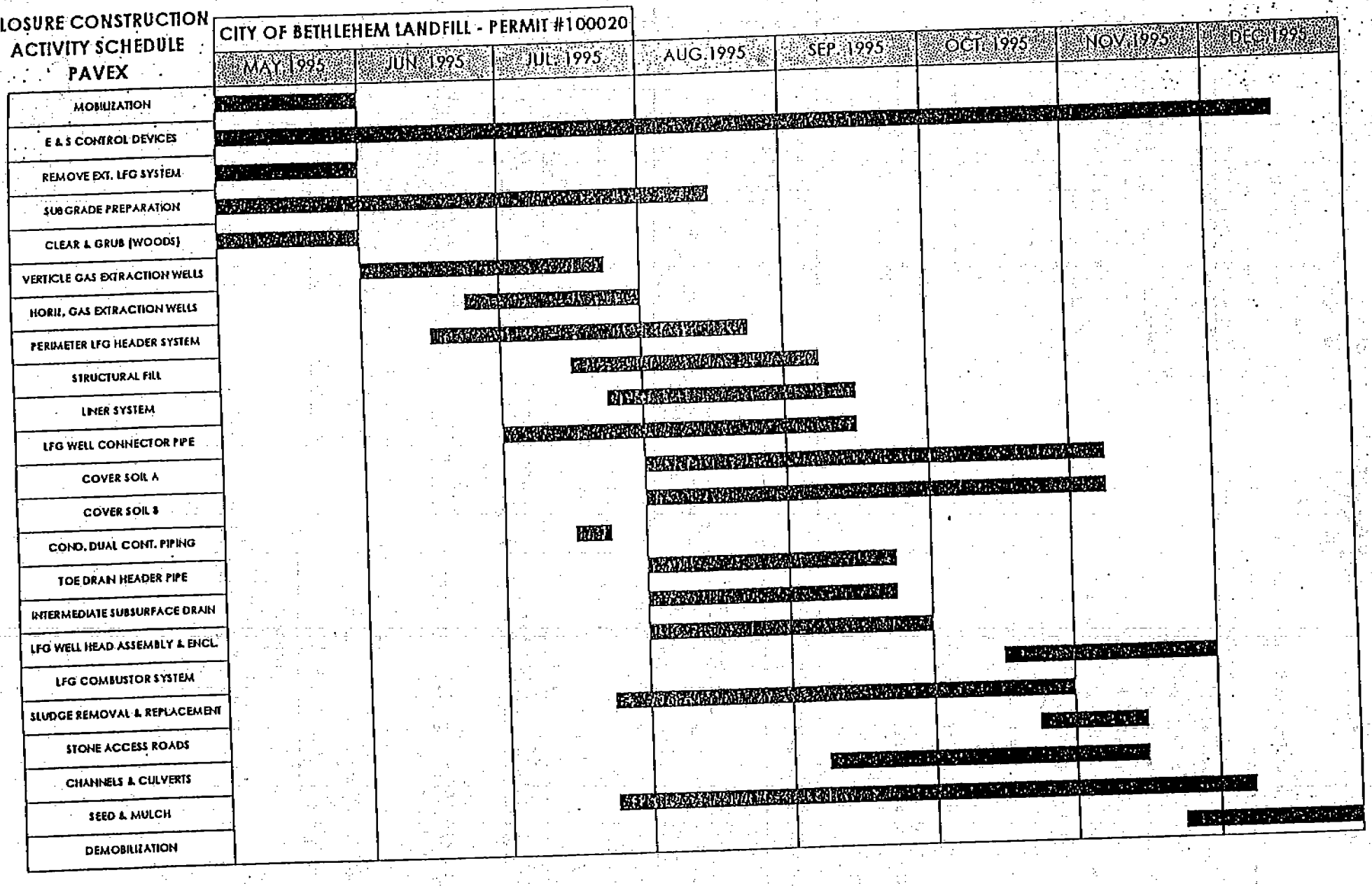
ATTACHMENT A

The City of Bethlehem requests a 180 day extension of time.

The request for extension has been made because the City contractor completing the work will not install the gas flare until the landfill is capped. Pavex, Inc. is under contract to the City to complete capping of the Original Landfill area. This work includes all work associated with the gas management system. The schedule for compiling this work is attached.

CLOSURE CONSTRUCTION ACTIVITY SCHEDULE PAVEX

CITY OF BETHLEHEM LANDFILL - PERMIT #100020



040

ER-AQ-16: Rev. 3/86

Submit in Triplicate

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF AIR QUALITY CONTROL

INCINERATION W/CONTROL

Application for Plan Approval to Construct, Modify or Reactivate an Air Contamination Source and/or Air Cleaning Device and for a Permit to Operate

Section A - Identity and Location of Air Contamination Source

1A. Application is being made for:

- ☐ Construction of New Source/Operating Permit
- ☐ Reactivation of a Source/Operating Permit
- ☐ Modification of Existing Source/Operating Permit
- ☒ Installation of Air Cleaning Device/Operating Permit
- ☐ Amendment to a Previous Application
  Previous Application No. ___ - ___ - ___
- ☐ Other ___

OFFICIAL USE ONLY

Application No. ___ - ___ - ___
Plant Code ___ Unit ID ___
Date Received ___
Reviewed By ___

Potential Emissions (TPY)
PM ___ SO_2 ___ VOC ___
NO_x ___ CO ___ Other ___

Actual Emissions (TPY)
PM ___ SO_2 ___ VOC ___
NO_x ___ CO ___ Other ___

Change in Actual Emissions (+ or -)
PM ___ SO_2 ___ VOC ___
NO_x ___ CO ___ Other ___

1B. Type of source

LANDFILL GAS EXTRACTION SYSTEM

1C. Plant in which source is located

☐ NEW ☒ EXISTING

1D. If source is new, does it replace another source (describe source replaced) ☐ YES ☐ NO
NA

1E. Expected date of completion
March 29, 1996

2A. Owner of source CITY OF BETHLEHEM DEPARTMENT OF PUBLIC WORKS

2B. Employer I.D. No. (Federal IRS No.)
24-6000689

3A. Owners designation of source and/or plant if any
CITY OF BETHLEHAM LANDFILL

3B. Location of source (Street address or Route No.) APPLEBUTTER ROAD
Political Subdivision (Township, etc.) LOWER SAUCON
County NORTHAMPTON

3C. Mailing address (Street or P.O. Box, City, Zip Code)
10 EAST CHURCH STREET, BETHLEHEM, PA 18018

3D. Telephone No.
(610) 865-7103

4A. Person to contact regarding this Application (name and title)
WENDELL SHERMAN, P.E.

4B. Mailing address (Street or P.O. Box, City, State, Zip Code)
10 E. CHURCH ST., BETHLEHEM, PA 18018

4C. Telephone No.
(610) 865-7050

5. Official signing application must be an agent of the Company having primary responsibilities for operation of the facility to which this application applies. Although he may not have participated in the design of the facility he should be responsible for approval of the design.

AFFIDAVIT

I, WENDELL S. SHERMAN, being duly sworn according to law depose and say that I am the official having primary responsibility for the design and operation of the facilities to which this application applies and that the information included in the foregoing application is true to the best of my knowledge, information and belief.

Sworn to and subscribed before me this 11th day of September, 1995.

Cynthia A. Schick
Notary Public

Signature

DIRECTOR OF PUBLIC WORKS
Title

Notarial Seal
Cynthia A. Schick, Notary Public
Bethlehem, Northampton County
My Commission Expires Aug. 15, 1998

Section B.1 - Incinerators and Flares

1. INCINERATOR AND WASTE N/A

A. Manufacturer N/A	B. Model	C. Class	D. ☐ Multiple chambered ☐ Controlled air
E. Rated capacity	F. Type of waste	G. Btu content as fired	
H. If type 5.6 or special waste attach proximate and ultimate analysis.	I. Density of waste (lbs/cu. yd.)	J. Daily amount ☐ Estimated ☐ Actual	

2. PRIMARY COMBUSTION CHAMBER N/A

A. Volume (cu. ft.)	B. Effective grate area (sq. ft.)	C. % Excess air
D. % Air applied as overfire air	E. % As underfire	
F. Ignition burner type and fuel	G. Number of burners	H. Capacity of each (Btu/hr.)

3. SECONDARY COMBUSTION CHAMBER AND/OR AFTERBURNERS N/A

A. Volume (cu. ft.)	B. Maximum gas velocity (ft./sec.)	C. Temperature (°F)
D. Estimated hold time of gases (sec). Show calculations		
E. Burner type and fuel	F. Number of burners	G. Capacity of each (Btu/hr.)

4. DRAFT CONTROLS N/A

☐ A. Barometric damper — Windshielding ☐ YES ☐ NO

☐ B. Guillotine or sliding damper

☐ C. Induced draft fan
Capacity (SCFM)

5. TOTAL HEAT RELEASE (if multiple chambered) EXCLUDING AH PIT IN Btu/hr/cu. ft. N/A

6. MISCELLANEOUS DEVICES AND CONTROLS N/A

☐ A. Automatic loading device (Describe)

☐ B. Self-closing doors

☐ C. Spark arrestor

☐ D. Flame failure protection equipment

☐ E. Method of creating turbulence for combustion gases (Describe)

☐ F. Method of cleaning secondary or settling chamber (Describe)

☐ G. Other interlocking devices or controls (Describe)

7. ☐ Outdoor
☐ Indoor installation (Describe method of supplying combustion air) N/A

Section B.1 - Incinerators and Flares, Continued

043

8. FLARES

A. Maximum and average SCFM burned: 1500 SCFM MAXIMUM 800 SCFM AVERAGE

B. % Sulfur of waste gas: 0.01% ESTIMATED

☒ C. Automatic ignition system: ELECTRONIC SPARK IGNITION, FLAME SCANNER, AND AUTO RESTART

☒ D. Controls to prevent smoking: AUTO/MANUAL SYSTEM CONTROLS IGNITION, GAS FLOW, COMBUSTION AIR SUPPLY, & COMBUSTION TEMPERATURE

☐ E. Steam injection: NONE

☒ F. Noise reducing device: REFRACTORY LINED STACK

9. OPERATING SCHEDULE

24 hours/day 7 days/week 52 weeks/year

10. SEASONAL PERIODS (MONTHS) N/A

Operating: _____ to YEAR-ROUND OPERATION

Non-Operating: _____ to _____

11. If incinerator is rated at 50 tons per day or more, describe fully the facilities provided to record the daily burning rate and hours of operation.

N/A

12. Describe modifications to incinerator in detail

NONE

13. Has application been made for a Solid Waste Disposal Permit? NOT REQUIRED FOR FLARE

☐ YES ☐ NO SOLID WASTE PERMIT NO. 100020 ISSUED TO LANDFILL

14. Briefly describe the method of handling any waste water from this installation and associated air pollution control equipment (Is a Water Quality Management Permit nec

☐ YES (☒ NO) CONDENSATE WILL BE COLLECTED AND COMBINED WITH LEACHATE FOR DISCHARGE TO CITY'S POTW

15. Attach any and all additional information necessary to perform a thorough evaluation of the extent and nature of emissions from this incinerator.

SEE ATTACHMENT 1 - LANDFILL GAS FLARE SYSTEM

Section D - Flue and Air Contaminant Emission Information

1. STACK AND EXHAUSTER

A. Exhauster Static Pressure _____ in w.g. _____ HP @ _____ RPM N/A NATURAL DRAFT

B. Stack height above grade (ft)	C. Stack diameter (ft) or outlet duct area (sq. ft.)	D. Weather Cap
40 FT.	7 FT. DIAMETER	☐ YES ☒ NO
Grade elevation (ft) 624 FT.		

E. Indicate on an attached sheet the location of sampling ports with respect to exhaust fans, breeching, etc. Give all necessary dimensions.

SEE ATTACHMENT 2 – SAMPLING PORT LOCATION

F. Can the control equipment be bypassed: (If Yes, explain) ☐ YES ☒ NO

2. ATMOSPHERIC EMISSIONS

A. Particulate matter emissions (lbs/hr or gr/SCF Dry)

< 0.04 GR/DSCF

B. Gaseous contaminant emissions

Contaminant	Concentration	VOC	Contaminants	Concentration
(1) SO_x	_____ ppm (Vol.) 0.73 lbs/hr	(4)	VOC'S	_____ ppm (Vol.) 1.75 lbs/hr
(2) NO_x	_____ ppm (Vol.) 1.30 lbs/hr	(5)	_____	_____ ppm (Vol.) _____ lbs/hr
(3) CO	_____ ppm (Vol.) 6.5 lbs/hr	(6)	_____	_____ ppm (Vol.) _____ lbs/hr

C. Outlet volume of exhaust gases

9400 DS CFM

@ 1500 °F

10 % Moisture

Section E - Miscellaneous Information

04

1. Describe fully facilities to monitor and record the emission of air contaminants. Provide detailed information to show that the facilities provided are adequate. Include cost and maintenance information. Periodic maintenance reports are to be submitted to the Department.

   - ☐ Opacity monitor
   - ☐ SO_2 monitor
   - ☐ Other _____

   NONE

   If checked, provide manufacturer name, model no. and pertinent technical specifications.

2. Attach Air Pollution Episode Strategy (if applicable)

   N/A

3. The following requirements are applicable only to construction of a new source.

   a. Briefly describe the nature of the area in which the proposed source is located. Attach a copy of the appropriate portion of the quadrangle map (7 1/2' scale) published by the U.S. Geological Survey and identify the location of proposed source.

   SEE ATTACHMENT 3

   b. Demonstrate that the establishment of the new source is justifiable as a result of necessary economic or social development.

   N/A

4. Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of Article III of the rules and regulations of the Department of Environmental Resources and those requirements promulgated by the Administrator of the United States Environmental Protection Agency pursuant to the provisions of the Clean Air Act.

5. List all attachments made to this Application.

   ATTACHMENT 1 LANDFILL GAS FLARE DESCRIPTION
   2 SAMPLE PORT LOCATION
   3 SITE MAP
   4 NOTIFICATION OF MUNICIPALITIES
   5 COMPLIANCE HISTORY

CITY OF BETHLEHEM LANDFILL

ATTACHMENT 1 - SYSTEM DESCRIPTION FOR A LANDFILL GAS FLARE

INTRODUCTION

The City of Bethlehem Landfill has been in operation since the late 1940's. The City proposes to control landfill gases in existing and future disposal areas of the landfill by installing an active gas extraction system. The existing disposal areas of the landfill that are affected by the gas extraction system are the "original landfill area", the Phase I and Phase II Disposal Area. The Phase III disposal area is a new disposal area currently being developed.

Extracted gases will be burned in a flare resulting in the destruction of volatile organics contained in the gases.

LANDFILL GAS FEED TO THE FLARE

The extraction system is designed to accommodate the maximum predicted gas generation from both existing and proposed disposal areas. The landfill gas generation and recovery calculations are summarized in Table 3 of the Application for Permit Modification - Phase III Disposal Area Gas Management System attached to this document as Exhibit 1. This table shows that for the year 1994, LFG will be generated at a peak rate of 693 SCFM, of which 644 SCFM or 93% is estimated to be recovered by the gas collection system. This generation rate is based on gases produced from a combination of all existing disposal areas. Landfill gas generation will decline until the Phase III disposal area is completed and operational. Disposal in the Phase III area will begin in 1994 and is not expected to be completed until the year 2005. At that time gas generation will again peak to a maximum flow of 1,324 SCFM, of which 1,237 SCFM or 93% is estimated to be recovered by the collection system.

The flare system design and emission estimates contained in this document are based on a present maximum gas flow rate of 800 SCFM. Prior to the first stage of closure for the Phase III area in the year 2005, an air permit modification will be submitted to PADER modifying the emissions to accommodate the projected maximum flow rate of 1,260 SCFM (or future adjusted rates). A conservative design value of 1,500 SCFM has been assumed to provide sufficient flexibility for future gas generation rates.

The following is a summary of the landfill gas characteristics used as a basis of design for the flare system "Application for Plan Approval to Construct and Permit to Operate":

Flow Rate:	800 SCFM	
Moisture:	Saturated	
Temperature:	70-85 °F	
Composition (volume):		
	Methane	50 %
	Carbon Dioxide	42 %
	Oxygen	1 %
	Nitrogen	4 %
	Water	3 %
	VOC's	8,000 ppm
	Sulfur	100 ppm
	Particulates	Negligible

GAS FLARING SYSTEM DESCRIPTION

The flare has been designed as an enclosed flare Model EF740I12 as manufactured by LFG Specialties, Inc., or approved equal, and will incorporate burners to accommodate current as well as future landfill gas requirements. The Piping & Instrumentation and the Assembly Plan drawings for the flare are found in Attachment 1, Appendices A and B. The flame will be enclosed at maximum design flow rates and hydrocarbon concentrations. The flare stack will be equipped with two rows of sample ports for compliance testing. One row of ports will be located to facilitate testing at the present landfill gas flow rate of 800 SCFM as applied for in this application. The other row of sample ports will be located to facilitate testing to accommodate a future gas flow rate 1,500 SCFM.

The burners supplied with the flare system are designed for a landfill gas flow of 800 SCFM and will also accommodate gas flows down to 200 SCFM without auxiliary fuel as long as the methane content is greater than 30 % by volume.

The flare stack will incorporate three thermocouple connections located to monitor and control outlet gas temperature.

The landfill gas flare system will be supplied with two blowers designed to maintain a negative pressure in the gas collection system. Only one blower will be required for the initial gas flow of between 200 to 800 SCFM. Operation of the blowers will be alternated to extend the blower life and provide for continuous system operation in the event one of the blowers is taken out of service for maintenance. The system will be designed to accommodate a third blower to be used as an inline standby should future gas volumes require constant operation of the original blowers.

Combustion air will be supplied to the enclosed flare through controlled air dampers. The flare will be supplied with both manual and automatic dampers to control the combustion air requirements for initial design through potential future increases. 048

SYSTEM PERFORMANCE

The flare will operate at a gas temperature of 1600 °F for a minimum retention of 0.3 seconds at the design gas flow rates. The destruction/removal efficiency (DRE) at these conditions for nonmethane organic compounds will be greater than 98 %.

The following is a summary of the anticipated flue gas conditions (supporting calculations are contained in Attachment 1, Appendix C):

Destruction/Removal Efficiency (minimum):		98 %
Exhaust Gas Volume:		10,500 SCFM
Exhaust Gas Temperature:		1500 °F
Exhaust Gas Conditions (volume):		
	CO_2	7 %
	N_2	72 %
	O_2	11 %
	H_2O	10 %
Stack Emissions:		
	NOx	5.7 TPY
	CO	28.5 TPY
	VOC's	7.7 TPY
	SO_2	3.2 TPY
	Particulates (maximum)	0.04 grains/DSCF

EQUIPMENT DESCRIPTION

The following is a summary of the typical landfill gas system components.

A. Enclosed Flare Stack Assembly

The following is a general summary of the equipment supplied with the flare.

*** Constructed of ¼ in. A-36 carbon steel

*** All seams welded inside and out

*** 2 each 2½ in. x 2½ in. x ¼ in. angle iron supports, at top of flare and at ½ OAH, to add strength to flare stack and control resonant vibrations

*** 2 each lifting lugs, 180° apart at top of stack for ease of installation

*** ½ in. A-36 carbon steel 9 in. wide full circumference bottom (baseplate) anchor flange with eight pre-drilled anchor bolt holes and sixteen support gussets

*** 2 rows of 4 each 3 in. NPT sample ports with caps installed at 90° spacing for emission measurement at landfill gas flows of 800 SCFM and 1500 SCFM

*** 3 each 1 in. NPT thermal well connections installed at 10 ft. vertical spacing down the flare stack starting at ½ diameter from the flare top

*** 12 in. 150# flanged LFG inlet connection

*** 3 each 48 in. high x 36 in. wide galvanized air intake louvers with stainless steel bearings, opposed blade design, providing 6:1 turndown

*** Fully lined with 2 in. of A.P. Green or equal refractory blanket (2400 °F hot face) fixed with Inconel pins and keepers

*** 1/4 in. x 3 in. 304 stainless steel plate retainer around all open edges of the insulation refractory blanket

*** Air plenum chamber is lined with 1 in. of refractory insulation to provide safe exterior skin temperature

*** The exterior of the flare stack will be sandblasted, primed and finished with a coat of heat resistant heavy duty enamel

*** 10 in. center burner tip flange connected to LFG inlet piping, top 6 in. of tip is 304 stainless steel

*** 4 each 4 in. burner arms designed to produce optimum swirl, obtaining high efficiency mixing and maximum retention time. Arms flange connected to center burner tip and constructed of 304 stainless steel

*** Full access for repair or replacement of burner assembly components through air intake louver ports

*** 2 in. diameter 304 stainless steel pilot tip with integral spark plug connection/housing

*** Electric spark plug ignitor, eliminates gap problems often incurred with straight rod type ignitors

*** 110/5,000V single pole transformer

*** High temperature ignitor leads in ½ in. conduit

*** Pilot nozzle (60,000 BTU/hr design; propane) in ½ in. stainless steel pipe

*** Gas flowmeter system including microprocessor, preamplifier, and ultrasonic transducers. Unit will transmit a 4-20 mA linear output signal to the PLC and operator display.

*** All aluminum horizontal flame arrestor with clean out cover to facilitate in place maintenance

B. Base Case Control Features

The following general controls will be included with the flare:

*** __2__ each temperature operated automatic louver with controller to maintain optimum operating temperature and __1__ each manually operated louver

*** Chromel-Alumel (Type K) thermocouple in stainless steel thermal well to give pilot confirmation

*** Ultraviolet flame scanner to give flame confirmation and provide flare safety shutdown

*** All control wiring is prefitted to the flare stack and run to a NEMA 4 junction box located at a convenient tie-in location at the base of the flare.

*** Purge air blower with pressure proved switch to evacuate gases remaining in flare stack prior to ignition cycle

*** Three Chromel-Alumel (Type K) thermocouple elements with high temperature Inconel protection tubes will be installed at different elevations down the flare stack. All three thermocouples will be connected to the flare controller through an isothermal, low resistance rotary selector switch. The switch will allow the operator to select the appropriate elevation for temperature sensing depending on actual landfill gas flow

*** Calibrated current transformers and ammeters for flow indication with surge and overload protection

*** Bubble-tight wafer type butterfly valve with a Bettis pneumatic actuator and 3-way solenoid valve. Unit will have a spring operated "fail safe" closing in case of a power failure. Valve will have location limit switches to be used for permissives in flare control system

*** Miscellaneous equipment including required vacuum and pressure gauges or transmitters, and temperature gauges as specified in Contract Documents

C. Control System Operation

The system will incorporate a technically advanced fully integrated, 100% automatic flare controller. The flare controller provides the operator full flexibility to set or change any process variable utilized in the automatic operation of the flare.

All control sequences and strategies associated with the operation of the flare/blower system, as well as all other required field input/outputs, shall be programmed into a programmable logic controller (PLC) unit. The control system will include a graphical operator control interface to allow the monitoring of all field input signals. It also provides full flexibility to set or change any temperature and/or time setting used in the automatic operation of the flare system.

The following is a brief outline of the control system operational features:

PILOT TEMPERATURE CONTROLLER

This PLC based controller senses the pilot temperature and utilizes one event setting, determined by the operator, to begin operation of the landfill gas blower. This setting is referred to as the "blower on" temperature. Once the automatic pilot has been proven by obtaining the blower on temperature the header valve will slowly open and the landfill gas blower will start.

PILOT TIMER

This PLC based timer begins the instant the ignition cycle begins. It is set by the operator at the maximum time required for the pilot to achieve the blower on temperature and the gas supply to be ignited. This time will typically be 3 to 5 minutes. At the end of this time, the pilot gas supply valve will be closed and the pilot flame extinguished, if not already shut-off by the temperature sensor.

PILOT FAILURE INDICATOR AND SHUT-DOWN

The PLC based pilot timer also controls the "pilot failure" function. Upon initiation of the automatic ignition cycle this timer begins timing down. Should the pilot not achieve the "blower on" temperature (set in the pilot temperature controller) in the time set in the pilot timer, the entire system will be shut down. The "pilot failure" indicator light will then come on. The system will not attempt to reignite until the pilot problem has been remedied. If it is determined that the pilot gas supply has not been exhausted or another problem with the pilot system cannot be found the operator may attempt automatic reignition by pushing the "reset" button.

IGNITOR TIMER

The PLC based ignitor timer allows the operator to set the time the ignitor will spark during the ignition cycle. This allows for the adjustment of the spark duration to compensate for the distance of the pilot gas supply from the flare; thus extending the life of the ignitor plug, transformer and other pilot components.

FLARE CHAMBER TEMPERATURE CONTROLLER

The flare controller will constantly monitor the flare combustion chamber temperature through the thermocouple elements on the flare stack. The system will utilize two temperature alarm settings which are:

High temperature safety shutdown - this setting simply shuts down the flare if the temperature should rise to a point of being unsafe or potentially damaging to the flare chamber.

Low temperature shutdown - this setting establishes the minimum acceptable operating temperature for the flare. During operation, if the temperature should fall below this setting, the system will shutdown and then attempt an automatic restart.

ULTRAVIOLET FLAME SCANNER

The ultraviolet scanner and associated controller provide flame confirmation and initiate "flare safety shutdown". Upon loss of flame, the scanner will automatically shutdown the blowers and close the automated header valve. The flame scanner has a maximum response time of 4 seconds, providing almost immediate system shutdown. On completion of the flame out shutdown the flare will attempt an automatic restart. The scanner also provides a safety lockout on the start up of the blowers and opening of the header valve, until confirmation of the pilot flame.

PURGE TIMER

This PLC based timer controls the length of time the purge blower runs prior to the ignition cycle commencing. Again the operator has the option to set this timer at the length of time determined to be sufficient but not unnecessarily lengthy to accomplish a complete purge of the flare chamber.

MAIN HEADER VALVE INDICATORS

The automatic landfill gas header valve is equipped with position switches to indicate when fully closed and fully open.

The fully closed indicator is used as a permissive for automatic start.

The fully open indicator is used for a valve operation check. Should the valve not completely open for any reason, the light will continuously blink to indicate a valve malfunction.

KEY LOCK SWITCH

The controller utilizes a key lock switch as a primary safety, cutting the power supply to the panel in the locked position.

EMERGENCY SHUT-DOWN

An easily accessible emergency shut-down button is mounted on the face of the controller. Pushing the button will immediately shut-down the flare, stop the blower and shut the automatic header valve. The system will be locked out until the shut-down is manually reset.

CONTROL RACK

The automatic flare controller, associated motor starters, main control power supply and pilot supply controls will all be mounted on a free standing control rack. The rack will be fabricated from 6 in. x 2 in. channel A-36, sandblasted and painted with rust resistant zinc oxide primer and overcoat of heavy duty industrial enamel.

The following will be fully mounted, piped and wired on the control rack.

*** Automatic flare controller in NEMA 4X enclosure

*** Induction motor starters, 3 pole, 460 VAC magnetic, full voltage type, with normally open holding circuit, manual reset and overload relay, installed in NEMA 4 enclosure (for landfill gas blower motors)

*** AC ammeters on gas blower motor circuit with 200% scale

*** Hour meters on gas blower motor circuit

*** Purge blower motor starter, full voltage type, with normally open holding circuit, manual reset and overload relay, installed in NEMA 4 enclosure

*** Main power panel for 460V, 3 phase, 60HZ power supply with solid copper neutral and ground bus connections, multi-pole circuit breaker with common trip, installed in a weatherproof enclosure

*** 460V to 120V transformer with terminal board installed in a weatherproof enclosure

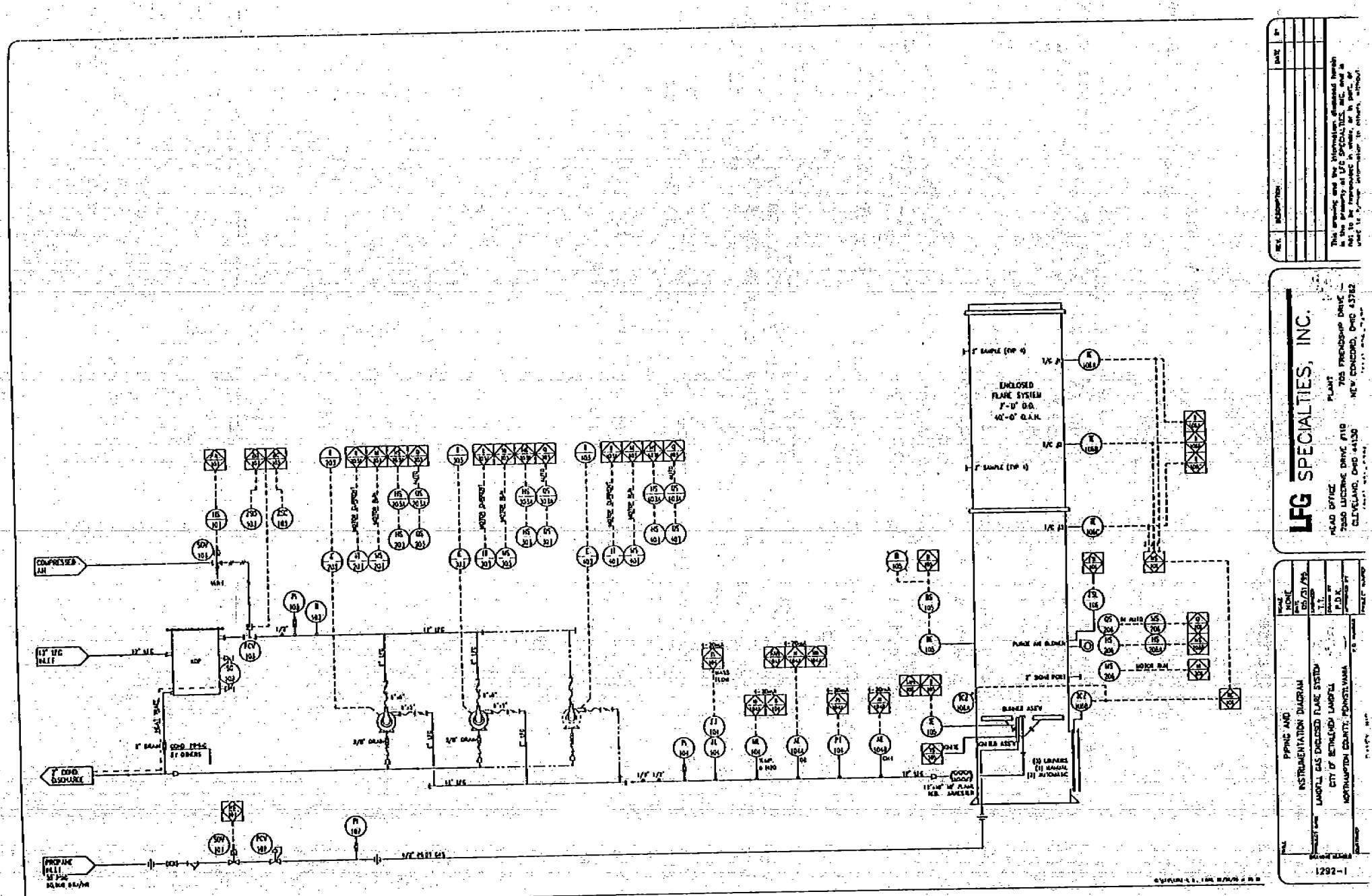
*** 170W mercury vapor security light with photocell and on/off switch (shipped loose for field installation)

*** 120V, 15A duplex outlet in a weatherproof NEMA 5-20R receptacle box with covers

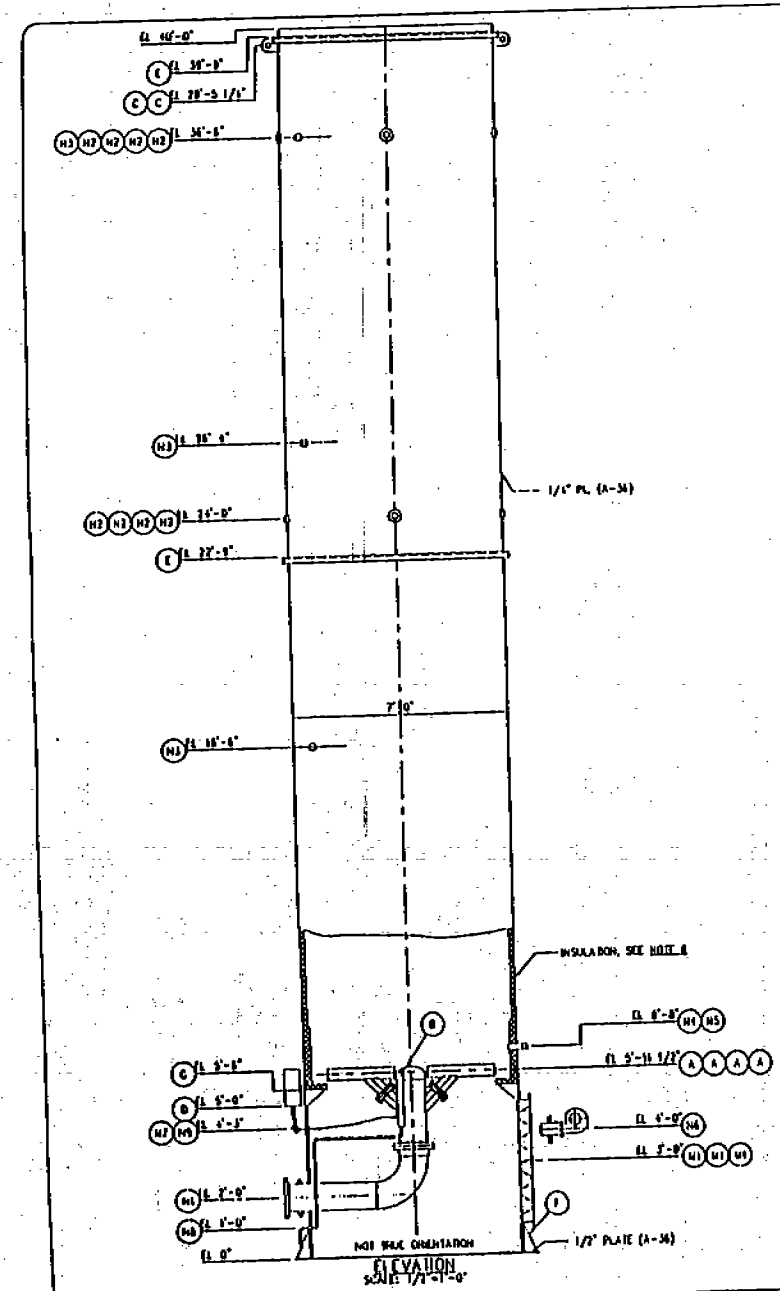
*** Pilot gas control system including: strainer, pressure control regulator, pressure gauge with isolation valve, fail-close solenoid valve, bypass around solenoid valve with manual block valve and main manual shut off valve

*** Landfill gas flowmeter which provides a 4-20 mA signal to the chart recorder and also gives a total flow readout

*** Alarm beacon mounted on top of controller enclosure operates as a local warning device


COMPRESSED AIR
12" LFG INLET
2" COND. DISCHARGE
PROPANE
ENCLOSED FLARE SYSTEM
7'-0" O.D.
40'-0" O.A.H.
BANKS ASSY
CONTROL ASSY
LFG SPECIALTIES, INC.
HEAD OFFICE
7550 LUCERNE DRIVE #110
CLEVELAND, OHIO 44130
PLANT
705 FRIENDSHIP DRIVE
NEW CONCORD, OHIO 43762
PIPING AND
INSTRUMENTATION DIAGRAM
LANDFILL GAS ENCLOSED FLARE SYSTEM
CITY OF BETHLEHEM LANDFILL
NORTHAMPTON COUNTY, PENNSYLVANIA
1292-1

053



ELEVATION
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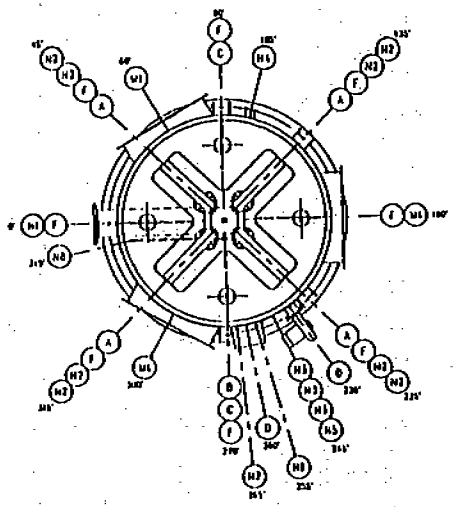

NOZZLE ORIENTATION
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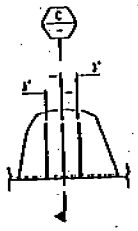
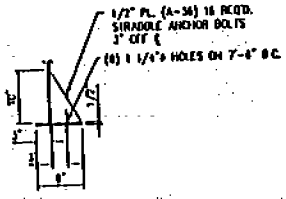


DETAIL
SCALE: 1"=1'-0"



SECTION
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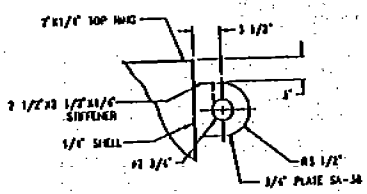
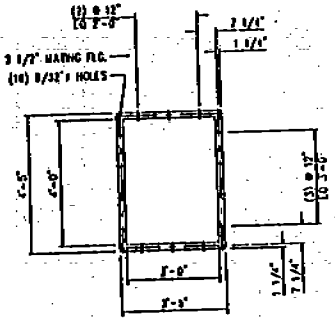


DETAIL
SCALE: 1 1/2"=1'-0"



DETAIL
SCALE: 1/2"=1'-0"

SCHEDULE								
MARK	REQ'D	SIZE	NECK DIAMS	MATL	RATING	TYPE	DETAIL	SERVICE
A	4	3"	SCH 10S	304SS	150#	SS PIPE		FLARE ARMS
B	1	2"	SCH 10S	304SS	150#	SS PIPE		IGNITER ASSEMBLY
C	2	-	3/8	CS	-	PL	DET 2	LIFTING LUGS
D	1	12"x14"x11"	-	-	-	NEMA 4		FLARE JUNCTION BOX
E	1	2 1/2"	1/4"	CS	-	ANGLE		ANGLE STIFFENER
F	8	-	1/2"	CS	-	PLATE	DET 1	ANCHOR CHAIR
G	1	1/4	-	CS	-	PLATE	-	BAFFLE PLATE
H1	1	34"x1.001	1/4"	CS	-	SO FLG	DET 3	FLOWER
H2	1	10"	SCH 40	CS	150#	CS PIPE		LANDFILL GAS INLET
H3	1	1"	-	SS	150#	SW FLG		SAMPLE PORT
H4	1	1"	-	SS	150#	SW FLG		THERMOWELL (FLARE)
H5	1	3/4"	SCH 40	SS	150#	SW FLG		SPOT PORT
H6	1	1"	SCH 40	SS	150#	SW FLG		U.V. SCANNER
H7	1	1"	SCH 40	SS	150#	SW FLG		PURGE BLOWER
H8	1	1"	SCH 40	CS	150#	CS PIPE		THERMOWELL (FLOW)
H9	1	1/2"	-	CS	3000#	FCPLG		PILOT GAS INLET
H10	1	1/2"	-	CS	3000#	FCPLG		SENSOR ROD
H11	1	1/2"	-	CS	3000#	FCPLG		

NOTES

1. ENCLOSED FLARE MODEL EF14010
2. FLARE APPROXIMATE WEIGHT = 17,000 LBS
3. WIND LOADING FOR 100 MPH (PER ASCE 7-88 EXP. C)
4. SHEAR FORCE = 8.8 KIPS
5. COUPLE @ BASE = 164 (1-KIPS
6. INSULATION: MOUNTED ON INCONEL ANCHORS (8" C/C SPACING)
   TYPE 1 - 1" A.P. GREEN, "WOOL-HP" 8# DENSITY (2400F)
   TYPE 2 - 1" A.P. GREEN, "WOOL-HP" 8# DENSITY (2400F)
   a. INSULATE SHELL BELOW BAFFLE PLATE WITH (1) LAYER TYPE 2 INSULATION
   b. INSULATE TOP OF BAFFLE PLATE WITH (3) LAYER TYPE 2 INSULATION OVERLAPPED ON (1) LAYER TYPE 1 INSULATION
   c. INSULATE SHELL ABOVE BAFFLE PLATE CONTINUOUSLY WITH (3) LAYER TYPE 2 INSULATION OVERLAPPED ON (3) LAYER TYPE 1 INSULATION
   d. ADD (1) CIRCUMFERENTIAL BAND OF TYPE 2 INSULATION AGAINST SHELL DIRECTLY ABOVE BAFFLE PLATE

REV.	DESCRIPTION	BY	DATE	APPROVED
1	ISSUED FOR A-95 REVIEW			

This drawing and the information displayed herein is the property of LFG SPECIALTIES, INC. and is not to be reproduced in whole or in part, nor shall it be used for other purposes, without written permission.

LFG SPECIALTIES, INC.

HEAD OFFICE
7550 LORAINE DRIVE #110
CLEVELAND, OHIO 44130
(216) 574-0100

PLANT
7701 FRIENDSHIP DRIVE
NEW CONCORD, OHIO 43762
(614) 826-7422

SCALE: AS NOTED
DATE: 03/95
DRAWN BY: T.T.
CHECKED BY: P.D.K.
APPROVED BY:

TITLE: LFG ENCLOSED FLARE ASSEMBLY PLAN, SECTIONS & DETAILS

PROJECT: LANDFILL GAS ENCLOSED FLARE SYSTEM
CITY OF BETHLEHEM LANDFILL
NORTHAMPTON COUNTY, PENNSYLVANIA

DRAWING NO.: 1292-3

RAVES INC.

60

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
AIR QUALITY PROGRAM

PLAN APPROVAL

Permit No.	48-322-002A	Source &	Landfill Gas Flare
Owner	City of Bethlehem Department of Public Works	Air	Model EF740I12
Address	10 East Church Street	Cleaning	
	Bethlehem, PA 18018	Device	
Attention:	Mr. Wendall Sherman	Location	Lower Saucon Township
	Director of Public Works		Northampton County

In accordance with provisions of the Air Pollution Control Act, the Act of January 8, 1960, P. L. 2119, as amended, and with Chapter 127 of the rules and regulations of the Department of Environmental Protection, the Department on SEP 25 1995 approved plan for construction of the above indicated air contamination source.

This PLAN APPROVAL expires March 30, 1996.

The plan Approval is subject to the following conditions:

(1) The source is to be constructed in accordance with the plans submitted with the application (as approved herein).

(SEE ATTACHED)

Notify the person noted below when the installation is completed so that the source can be inspected for issuance of an OPERATING PERMIT.

NOTE: Babu H. Patel
Chief, Engineering Services
Air Quality Program
Department of Environmental Protection
2 Public Square
Wilkes-Barre, PA 18711-0790

Thomas A. DiLazaro
Program Manager
Air Quality Program

RECEIVED

SEP 27 1995

CITY OF BETHLEHEM
DIRECTOR OF PUBLIC WORKS

(2) Nothing in this permit shall be construed to supercede, amend or authorize violation of the provisions of any valid and applicable local law, ordinance or regulation, provided that said local law, ordinance or regulation is not preempted by the Pennsylvania Air Pollution Control Act, the Act of January 8, 1960, P.L. 2119, as amended, 35 P.S. §§4001-4015, et seq.

(3) The permittee shall comply with the Pennsylvania Air Pollution Control Act, the Act of January 8, 1960, P.L. 2119, as amended, 35 P.S. §§4001-4015, et seq. and Title 25, Rules and Regulations, Article III, Air Resources promulgated thereunder.

(4) This Plan Approval authorizes temporary operation of the source(s) covered by this Plan Approval provided the following conditions are met.

(a) Operation is authorized only to facilitate the shake-down of sources and air cleaning devices, to permit operations pending the issuance of an Operating Permit or to permit the evaluation of the source(s) for the compliance with all applicable regulations and requirements.

(b) This condition authorizes temporary operation of the source(s) for a period of 120 days from the date of issuance of this Plan Approval extension.

(c) The Owner/Operator may request an extension if compliance with all applicable regulations and Plan Approval requirements has not been established. The extension request shall be submitted in writing at least 15 days prior to the end of this period of temporary operation and shall provide a description of the compliance status of the source, a detailed schedule for establishing compliance, and the reasons compliance has not been established.

059

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPLICATION FOR A PERMIT TO OPERATE

Application is hereby made for a permit to operate the following air contamination source(s) which was/were constructed and operating in accordance with a valid plan approval.

PLAN APPROVAL NO. 48-322-002A

Permittee:	City of Bethlehem Department of Public Works	Source &:	Landfill Gas Flare
Address:	10 East Church Street Bethlehem, PA 18018	Air:	Model EF740I12
		Cleaning:	
Attention:	Mr. Wendall Sherman	Device:	
	Director of Public Works	Location:	Lower Saucon Township Northampton County

Plan Approval:

Issue Date: SEP 25 1995

Expiration Date: March 30, 1996

FEES

In accordance with Sections 6.3(d) and 6.3(j) of the Pennsylvania Air Pollution Control Act (as amended) the following fees shall be submitted along with this application:

1. Two hundred fifty dollars ($250.00) for processing the application;
2. Two hundred fifty dollars ($250.00) for the annual operating permit administration fee.

A check in the amount of five hundred dollars ($500.00) payable to the "Commonwealth of Pennsylvania - Clean Air Fund" is enclosed with the application.

060

AFFIDAVIT

I, _____, being duly sworn according to law, depose and state under penalty of law as provided in 18 Pa. C.S. §4904 and Section 9(b)(2) of the Air Pollution Control Act, 35 P.S. §4009(b)(2), that I am the representative of the Permitte identified above, authorized to make this affidavit. I further state that the sources covered by the application are being operated in accordance with the terms and condition of the operating permit (if any), plan approval, Air Pollution Control Act, and rules an regulations adopted under the Air Pollution Control Act. I understand, acknowledge and agree that the conditions of the plan approval, the Air Pollution Control Act, and the rules and regulations adopted under the Air Pollution Control Act are incorporated by re erence into the operating permit.

Sworn to and subscribed before me
this _____ day of _____, 199_

_____
Notary Public

_____
Signature

_____
Name (typed)

_____
Title

Return this completed form, check(s) and completed Compliance History Form to:

Department of Environmental Protection
Air Quality Program
Northeast Regional Office
2 Public Square
Wilkes-Barre, PA 18711-0790
Attn.: Chief, Engineering Services

061

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPLICATION FOR
ISSUANCE OF AN AIR QUALITY PLAN APPROVAL EXTENSION
WITH CONDITION TO AUTHORIZE TEMPORARY OPERATION

Application is hereby made for a plan approval extension to allow temporary operation to facilitate the shake-down of sources and/or air cleaning devices or to permit the evaluation of the source(s) for compliance with all applicable regulations and requirements.

APPROVAL/PERMIT NO. 48-322-002A

Owner/ Operator:	City of Bethlehem Department of Public Works	Source &:	Landfill Gas Flare
Address:	10 East Church Street Bethlehem, PA 18018	Air:	Model EF740I12
		Cleaning:	
Attention:	Mr. Wendall Sherman	Device:	
	Director of Public Works	Location:	Lower Saucon Township
			Northampton County

Current Approval/Permit:

Issue Date: SEP 25 1995

Expiration Date: March 30, 1996

Operation Commenced (Is to Commence): _____

Specify reason(s) for this request for temporary operation (include the reasons compliance with all applicable regulations and Plan Approval requirements has not been established, a projected schedule for completion of any needed equipment changes and a detailed schedule for achieving full compliance). Attach additional sheets as necessary

FEE

A fee of two hundred dollars ($200.00) is enclosed pursuant to 25 Pa. Code §127.34 and Section 6.3(j) of the Pennsylvania Air Pollution Control Act.

AFFIDAVIT

I, _____, being duly sworn according to law, depose and state under penalty of law as provided in 18 Pa. C.S. §4904 and Section 9(b)(2) of the Air Pollution Control Act, 35 P.S. §4009(b)(2), that I am the representative of the Applicant identified above, authorized to make this affidavit. I further state that the information provided with this application is true and complete.

Sworn to and subscribed before me
this _____ day of _____, 199_

_____
Notary Public

_____
Signature

_____
Name (typed)

_____
Title

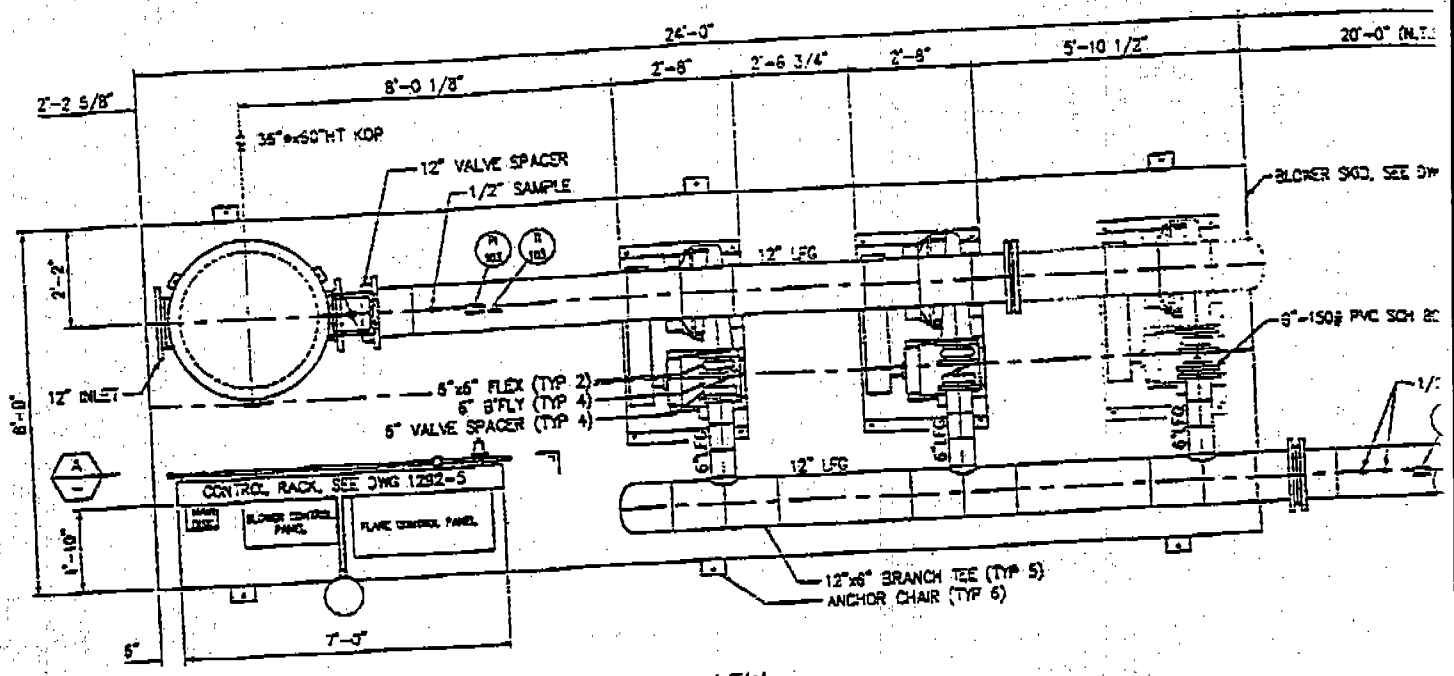
Return this completed form, check(s) and completed Compliance History Form to:

Department of Environmental Protection
Air Quality Program
Northeast Regional Office
2 Public Square
Wilkes-Barre, PA 18711-0790
Attn.: Chief, Engineering Services

ATTACHMENT 2

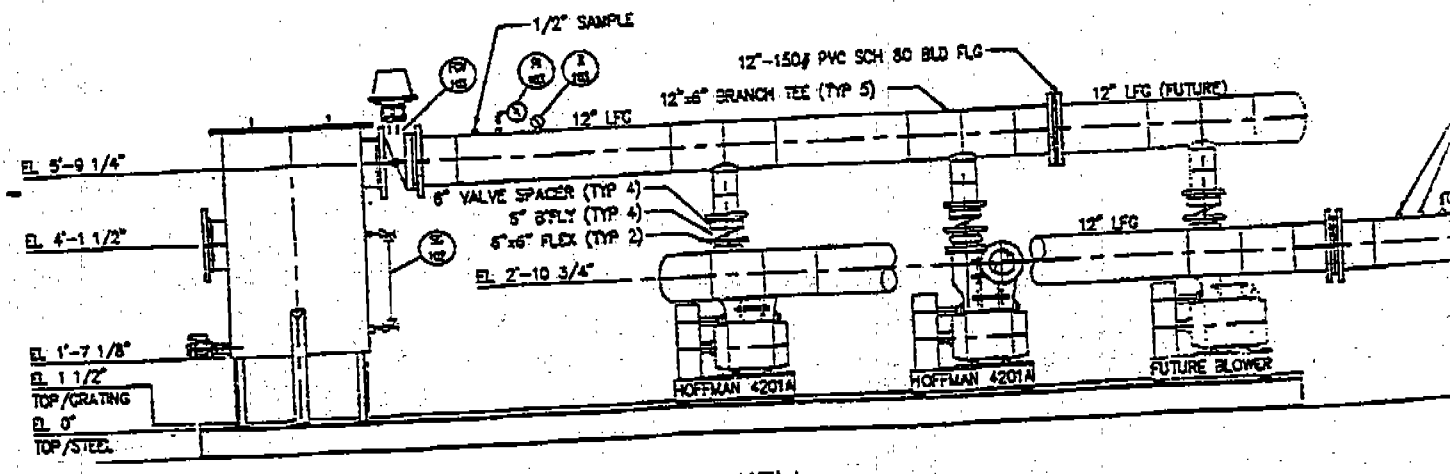
SAMPLE LOCATION DIAGRAMS

INLET



TOP VIEW

PLAN
SCALE: 1/2"=1'-0"



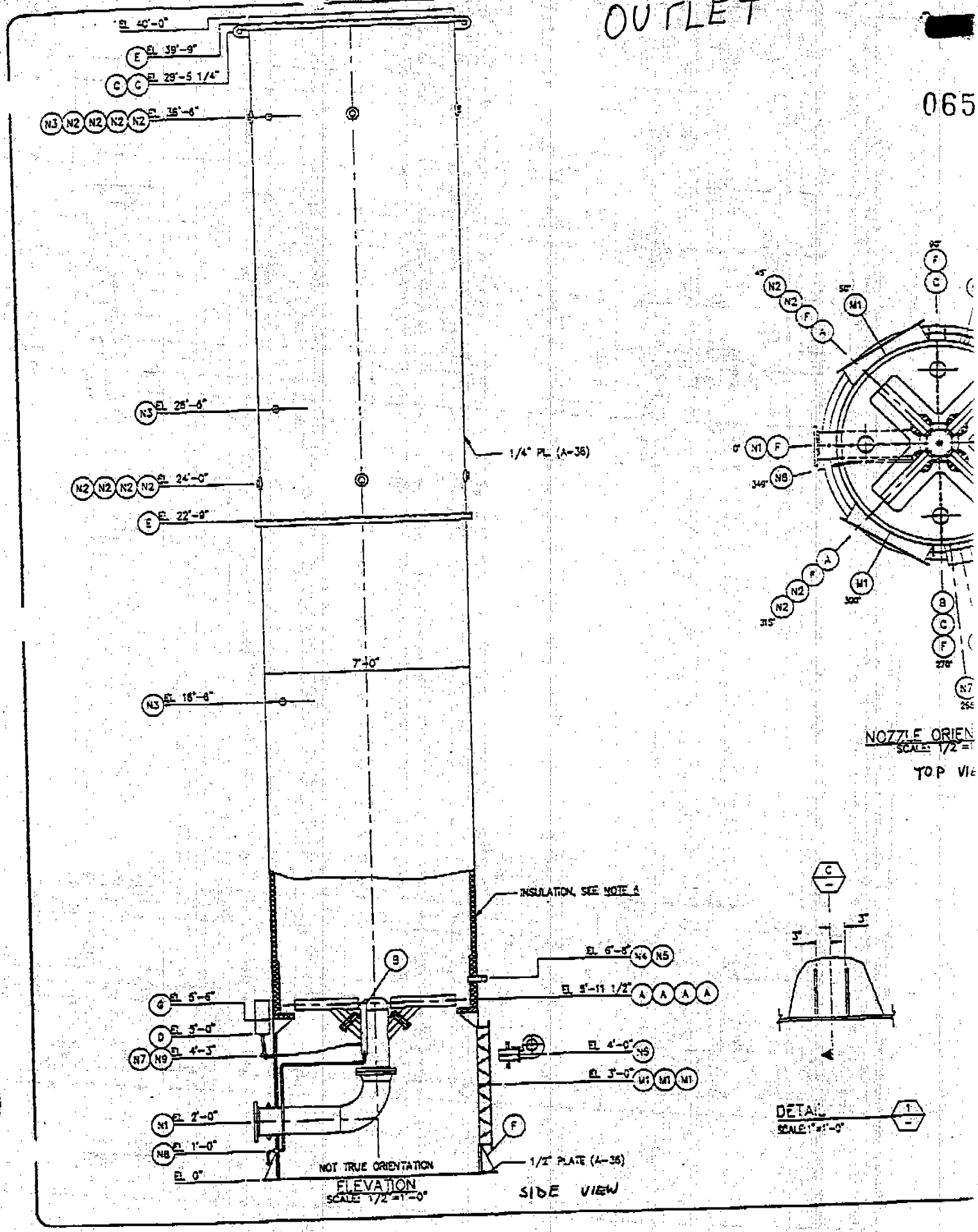
SIDE VIEW

SECTION A
SCALE: 1/2"=1'-0"

OUTLET

[redacted]

065



APPENDIX II

EMISSION CALCULATIONS

Linear Regression Calculations
Gas Chromatography Analyses

CALIBRATION STANDARDS
Methane, GC Channel 2

Conc. (ppmv)	Injection-1 Area Counts	Injection-2 Area Counts	Average Area Counts	% From Mean
0.0	0.00	0.00	0.00	--
2617	1488.52	1453.05	1470.79	1.21
4916	3282.87	3178.26	3230.57	1.62
9175	5020.23	5132.38	5076.31	1.10

Coefficient of Determination:
0.952661

Coefficient of Correlation:
0.991293

Standard Error of Estimate:
3.512E+02

Amount / Area Ratio:
1.802E+00

Sample ID	Run Number	Sample Area Counts	Dil. Factor	Dil. Samp. Conc. (ppmvw)	Actual Conc. (ppmvw)	Stack Gas Moisture (%)	Actual Conc. (ppmvd)	Stack Flow Rate (DSCFM)	Stack Emission Rate (lbs/hr)
Flare Inlet	Run 1-1	528.19	1.0	951.91	952	2.20	973	1112	2.692
Flare Inlet	Run 1-2	468.36	1.0	844.09	844	2.20	863	1112	2.387
Flare Inlet	Run 1-3	509.80	1.0	918.77	919	2.20	939	1112	2.598
Flare Inlet	Run 1-4	504.86	1.0	909.87	910	2.20	930	1112	2.573
Flare Inlet	Run 1-5	487.86	1.0	879.23	879	2.20	899	1112	2.486
Flare Inlet	Run 1-6	469.37	1.0	845.91	846	2.20	865	1112	2.392
				Averages:	892	2.20	912	1112	2.521
				MDL:	10.0	2.20	10.2	1112	0.028
Flare Inlet	Run 1-1	439.78	1.0	792.58	793	1.84	807	1116	2.241
Flare Inlet	Run 2-2	408.32	1.0	732.26	732	1.84	746	1116	2.071
Flare Inlet	Run 2-3	423.11	1.0	762.54	763	1.84	777	1116	2.156
Flare Inlet	Run 2-4	406.91	1.0	733.34	733	1.84	747	1116	2.074
Flare Inlet	Run 2-5	402.48	1.0	725.36	725	1.84	739	1116	2.051
Flare Inlet	Run 2-6	424.56	1.0	765.15	765	1.84	779	1116	2.163
				Average:	752	1.84	766	1116	2.126
				MDL:	10.0	1.84	10.2	1116	0.028
Flare Inlet	Run 3-1	380.87	1.0	686.41	686	1.87	699	1107	1.926
Flare Inlet	Run 3-2	398.15	1.0	717.55	718	1.87	731	1107	2.013
Flare Inlet	Run 3-3	459.87	1.0	828.79	829	1.87	845	1107	2.325
Flare Inlet	Run 3-4	452.19	1.0	814.95	815	1.87	830	1107	2.286
Flare Inlet	Run 3-5	397.46	1.0	716.35	716	1.87	730	1107	2.010
Flare Inlet	Run 3-6								
				Average:	753	1.87	767	1107	2.112
				MDL:	10.0	1.87	10.2	1107	0.028

AIRECON, Division of RECON ENVIRONMENTAL CORP.
Mobile Laboratory-2

CLIENT:	LFG Specialties
JOB NO.:	AR5-6922
COMPOUND:	Total Non-Methane Hydrocarbons
M.W. (grams/mole):	16.04
SAMPLING DATE:	10/09/96
ANALYSIS DATE:	10/09/96
REPORT DATE:	11/20/96
SAMPLE MATRIX:	GAS
VOLUME INJ. (cc):	1
NO. SAMPLES RUN:	17
ANALYST:	JRG
MDL (ppmv):	10
LOCATION:	Bethlehem Landfill
METHOD NO.:	US EPA-18 On-Line GC/FID

Linear Regression Calculations
Gas Chromatography Analyses

CALIBRATION STANDARDS Methane, GC Channel 1				
Conc. (ppmv)	Injection-1 Area Counts	Injection-2 Area Counts	Average Area Counts	% From Mean
0.0	0.00	0.00	0.00	--
21.3	116.31	119.16	117.74	1.21
61.3	286.40	287.57	286.99	0.20
88.7	535.96	500.73	518.36	3.40

Coefficient of Determination:
0.997624

Coefficient of Correlation:
0.998811

Standard Error of Estimate:
1.390E+01

Amount / Area Ratio:
1.656E-01

Sample ID	Run Number	Sample Area Counts	Dil. Factor	Dil. Samp. Conc. (ppmvw)	Actual Conc. (ppmvw)	Stack Gas Moisture (%)	Actual Conc. (ppmvd)	Stack Flow Rate (DSCFM)	Stack Emission Rate (lbs/hr)
Flare Outlet	Run 1-1	0.00	1.0	0.00	nd	5.65	0	7698	0.000
Flare Outlet	Run 1-2	0.00	1.0	0.00	nd	5.65	0	7698	0.000
Flare Outlet	Run 1-3	0.00	1.0	0.00	nd	5.65	0	7698	0.000
Flare Outlet	Run 1-4	0.00	1.0	0.00	nd	5.65	0	7698	0.000
Flare Outlet	Run 1-5	0.00	1.0	0.00	nd	5.65	0	7698	0.000
Flare Outlet	Run 1-6	0.00	1.0	0.00	nd	5.65	0	7698	0.000
				Averages:	0	5.65	0	7698	0.000
				MDL:	1.0	5.65	1.1	7698	0.020
Flare Outlet	Run 1-1	0.00	1.0	0.00	nd	8.96	0	7506	0.000
Flare Outlet	Run 2-2	0.00	1.0	0.00	nd	8.96	0	7506	0.000
Flare Outlet	Run 2-3	0.00	1.0	0.00	nd	8.96	0	7506	0.000
Flare Outlet	Run 2-4	0.00	1.0	0.00	nd	8.96	0	7506	0.000
Flare Outlet	Run 2-5	0.00	1.0	0.00	nd	8.96	0	7506	0.000
Flare Outlet	Run 2-6	0.00	1.0	0.00	nd	8.96	0	7506	0.000
				Average:	0	8.96	0	7506	0.000
				MDL:	1.0	8.96	1.1	7506	0.021
Flare Outlet	Run 3-1	0.00	1.0	0.00	nd	8.34	0	6491	0.000
Flare Outlet	Run 3-2	0.00	1.0	0.00	nd	8.34	0	6491	0.000
Flare Outlet	Run 3-3	0.00	1.0	0.00	nd	8.34	0	6491	0.000
Flare Outlet	Run 3-4	0.00	1.0	0.00	nd	8.34	0	6491	0.000
Flare Outlet	Run 3-5	0.00	1.0	0.00	nd	8.34	0	6491	0.000
Flare Outlet	Run 3-6	0.00	1.0	0.00	nd	8.34	0	6491	0.000
				Average:	0	8.34	0	6491	0.000
				MDL:	1.0	8.34	1.1	6491	0.018

AIRECON, Division of RECON ENVIRONMENTAL CORP.
Mobile Laboratory-2

CLIENT:	LFG Specialties
JOB NO.:	AR5-6922
COMPOUND:	Total Non-Methane Hydrocarbons
M.W. (grams/mole):	16.04
SAMPLING DATE:	10/09/96
ANALYSIS DATE:	10/09/96
REPORT DATE:	10/16/96
SAMPLE MATRIX:	GAS
VOLUME INJ. (cc):	1
NO. SAMPLES RUN:	18
ANALYST:	JRG
MDL (ppmv):	1
LOCATION:	Bethlehem Landfill
METHOD NO.:	US EPA-18 On-Line GC/FID

068

AirRECON Destruction Efficiency Summary

PROJECT NAME:	LFG Specialties
SAMPLE LOCATION:	Bethlehem Landfill
PROCESS DESCRIPTION:	Enclosed Ground Flare
COMBUSTION FUEL:	Landfill Gas
AirRECON PROJECT NO.:	AR5-6922
LAB TRAILER NO.:	Two

AirRECON Stack Test ID Number:	1	2	3	4	5
Test Date:	10/09/96	10/09/96	10/09/96		
Test Start-End Times:	1006-1106	1220-1320	1405-1515		

Analyte: Total Hydrocarbons (as Methane) via EPA Method 25A Molar Mass = 16.04 (E)					
Inlet Emission Rate (lbs/hr) (A):					
Outlet Emission Rate (lbs/hr) (B):					
Destruction Efficiency (%) (C):					

Analyte: Methane via EPA Method 18 (Remote Gas Bag Analysis) Molar Mass = 16.04 (E)					
Inlet Emission Rate (lbs/hr) (A):					
Outlet Emission Rate (lbs/hr) (B):					
Destruction Efficiency (%) (C):					

Analyte: Total Non-Methane Hydrocarbons (as CH4) by GC/FID Molar Mass = 16.04 (E)					
Inlet Emission Rate (lbs/hr) (A):	2.521	2.126	2.112		
Outlet Emission Rate (lbs/hr) (B):	< 0.020	< 0.021	< 0.018		
Destruction Efficiency (%) (C):	> 99.21	> 99.01	> 99.15		

The Following Calculation Equation Is Used In This Spreadsheet:

Destruction Efficiency (%) (C):	(A – B) / (A) * 100

Reference CEMS Calibration Drift Corrections

Client Name:	LFG Specialties
Jobsite:	Bethlehem landfill
Emission Source(s):	Enclosed Ground Flare Outlet
AirRECON Project Number	AR5-6922

Gas Tested	Sample Location	Sample Run Identification	Run Date	Certified Calibration Standard A	Pre-Test Standard Response B	Post-Test Standard Response C	Pre-Test Zero Response D	Post-Test Zero Response E	Average Raw Test Result F	Corrected Test Result G
O2	Flare Outlet	Run-1	10/09/96	11.0	11.0	11.0	0.1	0.1	10.835	10.833
O2	Flare Outlet	Run-2	10/09/96	11.0	11.0	11.0	0.1	0.1	10.683	10.680
O2	Flare Outlet	Run-3	10/09/96	11.0	11.0	11.1	0.1	0.1	10.570	10.518
CO2	Flare Outlet	Run-1	10/09/96	10.0	9.9	9.9	0.0	0.0	9.055	9.146
CO2	Flare Outlet	Run-2	10/09/96	10.0	9.9	9.9	0.0	0.0	9.184	9.277
CO2	Flare Outlet	Run-3	10/09/96	10.0	9.9	9.8	0.0	0.0	9.259	9.400
NOx	Flare Outlet	Run-1	10/09/96	54.8	52.5	53.3	0.7	-0.4	6.704	6.809
NOx	Flare Outlet	Run-2	10/09/96	54.8	53.3	54.5	-0.4	-0.2	8.077	8.470
NOx	Flare Outlet	Run-3	10/09/96	54.8	54.5	55.6	-0.2	-0.1	8.266	8.355

The Following Calculations Are Used In This Spreadsheet:

$$G = (F-((D+E)/2)) \times (A/((B+C)/2)-((D+E)/2))$$

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AirRECON CEMS Emission Calculation Summary

✓

PROJECT NAME:	LFG Specialties
SAMPLE LOCATION:	Bethlehem Landfill
PROCESS DESCRIPTION:	Enclosed Ground Flare Outlet
COMBUSTION FUEL:	Landfill Gas
AirRECON PROJECT NO.:	AR5-6922
LAB TRAILER NO.:	Two (2)

AirRECON Stack Test ID Number:	1	2	3	4	5
Test Date:	10/09/96	10/09/96	10/09/96		
Test Start--End Times:	1006-1106	1220-1320	1405-1514		
Measured Stack Flowrate (DSCFM) (A):	7698	7508	6491		
Measured Stack Moisture (%) (B):	5.65	8.96	8.34		
Measured Stack Oxygen (%) (C):	10.833	10.680	10.518		
Fuel Factor Constant (dscf/mmBTU) (D):					
Results Corrected To % O2 (L):	7	7	7		

Analyte: Nitrogen Oxides (as NO2) via EPA Method 7E Molar Mass = 46.01 (E)					
ppmv, dry (F):	6.809	8.470	8.355		
ppmv, wet (G):	6.424	7.711	7.658		
pounds/hour (H):	0.3738	0.4534	0.3868		
pounds/mmBTU (J):					
ppmv, dry @ 7 % O2 (K):	9.40	11.52	11.19		

Analyte: Carbon Monoxide via EPA Method 10 Molar Mass = 28.01 (E)					
ppmv, dry (F):					
ppmv, wet (G):					
pounds/hour (H):					
pounds/mmBTU (J):					
ppmv, dry @ 7 % O2 (K):					

Analyte: Total Hydrocarbons (as Methane) via EPA Method 25A Molar Mass = 16.04 (E)					
ppmv, wet (F):					
ppmv, dry (G):					
pounds/hour (H):					
pounds/mmBTU (J):					
ppmv, dry @ 7 % O2 (K):					

Analyte: Sulfur Dioxide via EPA Method 6C Molar Mass = 64.06 (E)					
ppmv, dry (F):					
ppmv, wet (G):					
pounds/hour (H):					
pounds/mmBTU (J):					
ppmv, dry @ 7 % O2 (K):					

The Following Emission Calculation Equations Are Used In This Spreadsheet:

ppmv, wet:	(G) = (F)(100 - B) / 100
ppmv, dry (For THC):	(F) = (G) / ((100 - B) / 100)
pounds/hour:	(H) = (A)(E)(F)(0.15505)(10^-6)
pounds/mmBTU:	(J) = (20.9 / (20.9 - C))(D)(E)(F)(2.585)(10^-9)
ppmv, dry @ X% Oxygen:	(K) = ((20.9 - L) / (20.9 - C)) (F)

Stack Flowrate Calculator

Company:	LFG Specialties	Date:	10/09/96
Unit:	Enclosed Flare Inlet	Time:	1006–1106
Location:	Bethlehem Landfill	Run No.:	One (1)

Input Data	
Beginning Meter Setting (cubic feet):	758.634
Ending Meter Setting (cubic feet):	794.667
Metered Volume (cubic feet) [Vm]:	36.033
Water Caught (grams) [Wo]:	16.8
Stack Static Pressures (" H2O)	
Pre–Test [Ps1]:	1.8
Post–Test [Ps2]:	1.8
Barometric Pressure (" Hg) [Pb]:	29.73
Stack Carbon Dioxide Content (%) [CO2]:	25.4
Stack Oxygen Content (%) [O2]:	1.8
Stack Methane Content (%) [CH4]:	24.2
Delta–H (" H2O) [H]:	1.00
Pitot Tube Factor [Cp]:	0.99
Meter Correction Factor [Y]:	1.01
Stack Cross–Section (square feet) [CSA]:	0.785

Output Data	
Metered Volume (Dry cubic feet @STP) [Vms]:	35.214
Moisture Volume (cubic feet @STP) [Vws]:	0.792
Stack Moisture Content (%) [Bws]:	2.20
Gas Dry Molecular Weight (lb/lb–Mol) [MWd]:	29.23
Gas Wet Molecular Weight (lb/lb–Mol) [MWw]:	28.98
Absolute Stack Pressure (" Hg) [Pa]:	29.86
Stack Gas Velocities (feet/second)	
Pre–Test, Actual (ft/sec) [Vsa1]:	25.14
Post–Test, Actual (ft/sec) [Vsa2]:	25.18
Average, Actual (ft/sec) [Vsa–Avg]:	25.16
Standard, Average (SFS) [Vss]:	24.15
Stack Flowrate (cubic feet/minute)	
Average Actual (ACFM):	1185
Standard Average (SCFM):	1137
Dry, Standard Avg (DSCFM):	1112
Stack Temperature, Average (Deg. F):	91

	Pre–test Traverse					Post–test Traverse		
POINT	Delta–P ("H2O)	Stack Temp. (Deg. F)	Square Root Delta–P	Box Temp. In	Box Temp. Out	Delta–P ("H2O)	Stack Temp. (Deg. F)	Square Root Delta–P
1	0.09	87	0.300	78	75	0.07	94	0.265
2	0.08	88	0.283	83	75	0.15	94	0.387
3	0.12	88	0.346	85	76	0.16	94	0.400
4	0.15	88	0.387	88	77	0.17	94	0.412
5	0.17	88	0.412	89	79	0.16	94	0.400
6	0.16	88	0.400	90	80	0.14	94	0.374
7	0.12	88	0.346	92	82	0.06	94	0.245
8	0.17	88	0.412	94	83	0.11	94	0.332
9	0.19	88	0.436	94	84	0.15	94	0.387
10	0.19	88	0.436	96	85	0.18	94	0.424
11	0.14	88	0.374	96	86	0.18	94	0.424
12	0.12	88	0.346	98	87	0.17	94	0.412
13			0.000					0.000
14			0.000					0.000
15			0.000					0.000
16			0.000					0.000
17			0.000					0.000
18			0.000					0.000
19			0.000					0.000
20			0.000					0.000
21			0.000					0.000
22			0.000					0.000
23			0.000					0.000
24			0.000					0.000
			0.000					0.000
			0.000					0.000
Avgs.:	0.142	88 [Ts1]	0.373 [dP1]		85.5 [Tm]	0.142	94 [Ts2]	0.372 [dP2]

This Spreadsheet Uses The Following Calculations/Equations:
Vms = (17.71)(Y)(Vm)(((H / 13.6) + Pb) / (Tm + 460))
Vws = Wo / 21.2
Bws = (100)(Vws) / (Vms + Vws)
MWd = (CO2)(0.44) + (O2)(0.32) + (CH4)(0.16) + (100 – (CO2 + O2 + CH4))(.28)
MWw = (Bws)(0.18) + ((MWd)(100 – Bws) / 100)
Pa = Pb + ((Ps1 + Ps2) / 2) / 13.6
Vsa1 = (((Ts1 + 460) / (((Ps1 / 13.6) + Pb)(MWw))) ^ 0.5)(Cp)(dP1)(85.48)
Vsa2 = (((Ts2 + 460) / (((Ps2 / 13.6) + Pb)(MWw))) ^ 0.5)(Cp)(dP2)(85.48)
Vsa–Avg = (Vsa1 + Vsa2) / 2
Vss = (((Vsa1)(((Ps1 / 13.6) + Pb) / (Ts1 + 460)) + ((Vsa2)(((Ps2 / 13.6) + Pb) / (Ts2 + 460)))(17.71 / 2)
ACFM = (Vsa–avg)(CSA)(60)
SCFM = (Vss)(CSA)(60)
DSCFM = ((100 – Bws)/ 100)(SCFM)

STP = Standard Conditions = 70 deg. F, 29.92" Hg.

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11.68
0.58
3.872
13.61

Stack Flowrate Calculator

Company:	LFG Specialties	Date:	10/09/96
Unit:	Enclosed Flare Inlet	Time:	1220–1320
Location:	Bethlehem Landfill	Run No.:	Two (2)

Input Data

Beginning Meter Setting (cubic feet):	794.771
Ending Meter Setting (cubic feet):	830.486
Metered Volume (cubic feet) [Vm]:	35.715
Water Caught (grams) [Wc]:	13.6
Stack Static Pressures (" H2O)	
Pre–Test [Ps1]:	1.8
Post–Test [Ps2]:	1.8
Barometric Pressure (" Hg) [Pb]:	29.72
Stack Carbon Dioxide Content (%) [CO2]:	25.6
Stack Oxygen Content (%) [O2]:	1.4
Stack Methane Content (%) [CH4]:	24.3
Delta–H (" H2O) [H]:	1.00
Pitot Tube Factor [Cp]:	0.99
Meter Correction Factor [Y]:	1.01
Stack Cross–Section (square feet) [CSA]:	0.785

Output Data

Metered Volume (Dry cubic feet @STP) [Vms]:	34.307
Moisture Volume (cubic feet @STP) [Vws]:	0.642
Stack Moisture Content (%) [Bws]:	1.84
Gas Dry Molecular Weight (lb/lb–Mol) [MWd]:	29.27
Gas Wet Molecular Weight (lb/lb–Mol) [MWw]:	29.06
Absolute Stack Pressure (" Hg) [Pa]:	29.85
Stack Gas Velocities (feet/second)	
Pre–Test, Actual (ft/sec) [Vsa1]:	25.15
Post–Test, Actual (ft/sec) [Vsa2]:	25.32
Average, Actual (ft/sec) [Vsa–Avg]:	25.23
Standard, Average (SFS) [Vss]:	24.14
Stack Flowrate (cubic feet/minute)	
Average Actual (ACFM):	1189
Standard Average (SCFM):	1137
Dry, Standard Avg (DSCFM):	1116
Stack Temperature, Average (Deg. F):	93

POINT	Pre–test Traverse Delta–P ("H2O)	Pre–test Traverse Stack Temp. (Deg. F)	Pre–test Traverse Square Root Delta–P	Box Temp. In	Box Temp. Out	Post–test Traverse Delta–P ("H2O)	Post–test Traverse Stack Temp. (Deg. F)	Post–test Traverse Square Root Delta–P
1	0.07	94	0.265	88	88	0.09	91	0.300
2	0.15	94	0.387	94	89	0.13	92	0.361
3	0.16	94	0.400	97	89	0.17	92	0.412
4	0.17	94	0.412	100	90	0.19	92	0.436
5	0.16	94	0.400	101	92	0.18	92	0.424
6	0.14	94	0.374	101	92	0.14	92	0.374
7	0.06	94	0.245	100	92	0.07	90	0.265
8	0.11	94	0.332	101	92	0.11	91	0.332
9	0.15	94	0.387	102	93	0.16	91	0.400
10	0.18	94	0.424	101	93	0.17	92	0.412
11	0.18	94	0.424	99	92	0.16	91	0.400
12	0.17	94	0.412	98	91	0.15	91	0.387
13			0.000					0.000
14			0.000					0.000
15			0.000					0.000
16			0.000					0.000
17			0.000					0.000
18			0.000					0.000
19			0.000					0.000
20			0.000					0.000
21			0.000					0.000
22			0.000					0.000
23			0.000					0.000
24			0.000					0.000
			0.000					0.000
			0.000					0.000
Avgs.:	0.142	94 [Ts1]	0.372 [dP1]		94.8 [Tm]	0.143	91 [Ts2]	0.375 [dP2]

This Spreadsheet Uses The Following Calculations/Equations:

Vms = (17.71)(Y)(Vm)(((H / 13.6) + Pb) / (Tm + 460))

Vws = Wc / 21.2

Bws = (100)(Vws) / (Vms + Vws)

MWd = (CO2)(0.44) + (O2)(0.32) + (CH4)(0.16) + (100 – (CO2 + O2 + CH4))(.28)

MWw = (Bws)(0.18) + ((MWd)(100 – Bws) / 100)

Pa = Pb + ((Ps1 + Ps2) / 2) / 13.6

Vsa1 = (((Ts1 + 460) / (((Ps1 / 13.6) + Pb)(MWw))^0.5)(Cp)(dP1)(85.48)

Vsa2 = (((Ts2 + 460) / (((Ps2 / 13.6) + Pb)(MWw)))^0.5)(Cp)(dP2)(85.48)

Vsa–Avg = (Vsa1 + Vsa2) / 2

Vss = (((Vsa1)(((Ps1 / 13.6) + Pb) / (Ts1 + 460)) + ((Vsa2)(((Ps2 / 13.6) + Pb) / (Ts2 + 460)))(17.71 / 2)

ACFM = (Vsa–avg)(CSA)(60)

SCFM = (Vss)(CSA)(60)

DSCFM = ((100 – Bws)/ 100)(SCFM)

STP = Standard Conditions = 70 deg. F, 29.92" Hg.

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073

Stack Flowrate Calculator

Company:	LFG Specialties	Date:	10/09/96
Unit:	Enclosed Flare Inlet	Time:	1405-1515
Location:	Bethlehem Landfill	Run No.:	Three (3)

Input Data

Beginning Meter Setting (cubic feet):	830.620
Ending Meter Setting (cubic feet):	867.090
Metered Volume (cubic feet) [Vm]:	36.470
Water Caught (grams) [Wc]:	14.4
Stack Static Pressures (" H2O)	
Pre-Test [Ps1]:	1.8
Post-Test [Ps2]:	1.8
Barometric Pressure (" Hg) [Pb]:	29.72
Stack Carbon Dioxide Content (%) [CO2]:	26.2
Stack Oxygen Content (%) [O2]:	1.2
Stack Methane Content (%) [CH4]:	24.7
Delta-H (" H2O) [H]:	1.00
Pitot Tube Factor [Cp]:	0.99
Meter Correction Factor [Y]:	1.01
Stack Cross-Section (square feet) [CSA]:	0.785

Output Data

Metered Volume (Dry cubic feet @STP) [Vms]:	35.652
Moisture Volume (cubic feet @STP) [Vws]:	0.679
Stack Moisture Content (%) [Bws]:	1.87
Gas Dry Molecular Weight (lb/lb-Mol) [MWd]:	29.28
Gas Wet Molecular Weight (lb/lb-Mol) [MWw]:	29.07
Absolute Stack Pressure (" Hg) [Pa]:	29.85
Stack Gas Velocities (feet/second)	
Pre-Test, Actual (ft/sec) [Vsa1]:	25.32
Post-Test, Actual (ft/sec) [Vsa2]:	24.67
Average, Actual (ft/sec) [Vsa-Avg]:	24.99
Standard, Average (SFS) [Vss]:	23.95
Stack Flowrate (cubic feet/minute)	
Average Actual (ACFM):	1177
Standard Average (SCFM):	1128
Dry, Standard Avg (DSCFM):	1107
Stack Temperature, Average (Deg. F):	92

POINT	Pre-test Traverse Delta-P ("H2O)	Pre-test Traverse Stack Temp. (Deg. F)	Pre-test Traverse Square Root Delta-P	Box Temp. In	Box Temp. Out	Post-test Traverse Delta-P ("H2O)	Post-test Traverse Stack Temp. (Deg. F)	Post-test Traverse Square Root Delta-P
1	0.09	91	0.300	82	80	0.07	92	0.265
2	0.13	92	0.361	85	81	0.11	92	0.332
3	0.17	92	0.412	89	81	0.16	92	0.400
4	0.19	92	0.436	89	81	0.17	92	0.412
5	0.18	92	0.424	92	82	0.17	92	0.412
6	0.14	92	0.374	92	84	0.14	92	0.374
7	0.07	90	0.265	92	84	0.06	92	0.245
8	0.11	91	0.332	85	82	0.12	92	0.346
9	0.16	91	0.400	87	82	0.16	92	0.400
10	0.17	92	0.412	87	81	0.16	92	0.400
11	0.16	91	0.400	88	81	0.17	92	0.412
12	0.15	91	0.387	90	81	0.15	92	0.387
13			0.000	93	83			0.000
14			0.000					0.000
15			0.000					0.000
16			0.000					0.000
17			0.000					0.000
18			0.000					0.000
19			0.000					0.000
20			0.000					0.000
21			0.000					0.000
22			0.000					0.000
23			0.000					0.000
24			0.000					0.000
			0.000					0.000
			0.000					0.000
Avgs.:	0.143	91 [Ts1]	0.375 [dP1]		85.2 [Tm]	0.137	92 [Ts2]	0.365 [dP2]

This Spreadsheet Uses The Following Calculations/Equations:
Vms = (17.71)(Y)(Vm)(((H / 13.6) + Pb) / (Tm + 460))
Vws = Wc / 21.2
Bws = (100)(Vws) / (Vms + Vws)
MWd = (CO2)(0.44) + (O2)(0.32) + (CH4)(0.16) + (100 - (CO2 + O2 + CH4))(.28)
MWw = (Bws)(0.18) + ((MWd)(100 - Bws) / 100)
Pa = Pb + ((Ps1 + Ps2) / 2) / 13.6
Vsa1 = (((Ts1 + 460) / (((Ps1 / 13.6) + Pb)(MWw)))^0.5)(Cp)(dP1)(85.48)
Vsa2 = (((Ts2 + 460) / (((Ps2 / 13.6) + Pb)(MWw)))^0.5)(Cp)(dP2)(85.48)
Vsa-Avg = (Vsa1 + Vsa2) / 2
Vss = (((Vsa1)(((Ps1 / 13.6) + Pb) / (Ts1 + 460)) + ((Vsa2)(((Ps2 / 13.6) + Pb) / (Ts2 + 460)))(17.71 / 2)
ACFM = (Vsa-avg)(CSA)(60)
SCFM = (Vss)(CSA)(60)
DSCFM = ((100 - Bws)/ 100)(SCFM)

STP = Standard Conditions = 70 deg. F, 29.92" Hg.

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Stack Flowrate Calculator

Company:	LFG Specialties	Date:	10/09/96
Unit:	Enclosed Flare Outlet	Time:	1006–1106
Location:	Bethlehem Landfill	Run No.:	One (1)

Input Data

Beginning Meter Setting (cubic feet):	414.200
Ending Meter Setting (cubic feet):	445.845
Metered Volume (cubic feet) [Vm]:	31.645
Water Caught (grams) [Wc]:	38.8
Stack Static Pressures (" H2O)	
Pre–Test [Ps1]:	–0.06
Post–Test [Ps2]:	–0.06
Barometric Pressure (" Hg) [Pb]:	29.73
Stack Carbon Dioxide Content (%) [CO2]:	9.146
Stack Oxygen Content (%) [O2]:	10.833
Delta–H (" H2O) [H]:	1.00
Pitot Tube Factor [Cp]:	0.85
Meter Correction Factor [Y]:	0.98
Stack Cross–Section (square feet) [CSA]:	38.48

Output Data

Metered Volume (Dry cubic feet @STP) [Vms]:	30.567
Moisture Volume (cubic feet @STP) [Vws]:	1.830
Stack Moisture Content (%) [Bws]:	5.65
Gas Dry Molecular Weight (lb/lb–Mol) [MWd]:	29.90
Gas Wet Molecular Weight (lb/lb–Mol) [MWw]:	29.22
Absolute Stack Pressure (" Hg) [Pa]:	29.73
Stack Gas Velocities (feet/second)	
Pre–Test, Actual (ft/sec) [Vsa1]:	11.04
Post–Test, Actual (ft/sec) [Vsa2]:	14.85
Average, Actual (ft/sec) [Vsa–Avg]:	12.95
Standard, Average (SFS) [Vss]:	3.53
Stack Flowrate (cubic feet/minute)	
Average Actual (ACFM):	29894
Standard Average (SCFM):	8159
Dry, Standard Avg (DSCFM):	7698
Stack Temperature, Average (Deg. F):	1469

	Pre–test Traverse					Post–test Traverse		
POINT	Delta–P ("H2O)	Stack Temp. (Deg. F)	Square Root Delta–P	Box Temp. In	Box Temp. Out	Delta–P ("H2O)	Stack Temp. (Deg. F)	Square Root Delta–P
1	0.005	1392	0.071	57	70	0.010	1387	0.100
2	0.010	1451	0.100	65	70	0.020	1492	0.141
3	0.020	1511	0.141	65	70	0.025	1513	0.158
4	0.020	1521	0.141	67	70	0.025	1501	0.158
5	0.020	1482	0.141	75	70	0.020	1465	0.141
6	0.010	1479	0.100	76	70	0.020	1469	0.141
7	0.010	1460	0.100	82	72	0.020	1450	0.141
8	0.005	1455	0.071	85	74	0.015	1444	0.122
9	0.005	1400	0.071	88	75	0.010	1401	0.100
10	0.005	1421	0.071	90	76	0.010	1481	0.100
11	0.010	1484	0.100	92	78	0.015	1501	0.122
12	0.005	1505	0.071	93	80	0.015	1521	0.122
13	0.005	1521	0.071			0.020	1472	0.141
14	0.010	1490	0.100			0.025	1462	0.158
15	0.020	1482	0.141			0.030	1460	0.173
16	0.020	1461	0.141			0.030	1451	0.173
17			0.000					0.000
18			0.000					0.000
19			0.000					0.000
20			0.000					0.000
21			0.000					0.000
22			0.000					0.000
23			0.000					0.000
24			0.000					0.000
25			0.000					0.000
Avgs.:	0.011	1470 [Ts1]	0.102 [dP1]		75.5 [Tm]	0.019	1468 [Ts2]	0.137 [dP2]

This Spreadsheet Uses The Following Calculations/Equations:

Vms = (17.71)(Y)(Vm)(((H / 13.6) + Pb) / (Tm + 460))
Vws = Wc / 21.2
Bws = (100)(Vws) / (Vms + Vws)
MWd = (CO2)(0.44) + (O2)(0.32) + (100 – (CO2 + O2))(.28)
MWw = (Bws)(0.18) + ((MWd)(100 – Bws) / 100)
Pa = Pb + ((Ps1 + Ps2) / 2) / 13.6
Vsa1 = (((Ts1 + 460) / (((Ps1 / 13.6) + Pb)(MWw))) ^ 0.5)(Cp)(dP1)(85.48)
Vsa2 = (((Ts2 + 460) / (((Ps2 / 13.6) + Pb)(MWw))) ^ 0.5)(Cp)(dP2)(85.48)
Vsa–Avg = (Vsa1 + Vsa2) / 2
Vss = (((Vsa1)(((Ps1 / 13.6) + Pb) / (Ts1 + 460)) + ((Vsa2)(((Ps2 / 13.6) + Pb) / (Ts2 + 460)))(17.71 / 2)
ACFM = (Vsa–avg)(CSA)(60)
SCFM = (Vss)(CSA)(60)
DSCFM = ((100 – Bws)/ 100)(SCFM)

STP = Standard Conditions = 70 deg. F, 29.92" Hg.

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Stack Flowrate Calculator

Company:	LFG Specialties	Date:	10/09/98
Unit:	Enclosed Flare Outlet	Time:	1220–1320
Location:	Bethlehem Landfill	Run No.:	Two (2)

Input Data

Beginning Meter Setting (cubic feet):	445.952
Ending Meter Setting (cubic feet):	478.259
Metered Volume (cubic feet) [Vm]:	32.307
Water Caught (grams) [Wc]:	63.7
Stack Static Pressures (" H2O)	
Pre–Test [Ps1]:	–0.06
Post–Test [Ps2]:	–0.06
Barometric Pressure (" Hg) [Pb]:	29.72
Stack Carbon Dioxide Content (%) [CO2]:	9.277
Stack Oxygen Content (%) [O2]:	10.680
Delta–H (" H2O) [H]:	1.00
Pitot Tube Factor [Cp]:	0.85
Meter Correction Factor [Y]:	0.98
Stack Cross–Section (square feet) [CSA]:	38.48

Output Data

Metered Volume (Dry cubic feet @STP) [Vms]:	30.517
Moisture Volume (cubic feet @STP) [Vws]:	3.005
Stack Moisture Content (%) [Bws]:	8.96
Gas Dry Molecular Weight (lb/lb–Mol) [MWd]:	29.91
Gas Wet Molecular Weight (lb/lb–Mol) [MWw]:	28.84
Absolute Stack Pressure (" Hg) [Pa]:	29.72
Stack Gas Velocities (feet/second)	
Pre–Test, Actual (ft/sec) [Vsa1]:	14.95
Post–Test, Actual (ft/sec) [Vsa2]:	11.37
Average, Actual (ft/sec) [Vsa–Avg]:	13.16
Standard, Average (SFS) [Vss]:	3.57
Stack Flowrate (cubic feet/minute)	
Average Actual (ACFM):	30390
Standard Average (SCFM):	8246
Dry, Standard Avg (DSCFM):	7506
Stack Temperature, Average (Deg. F):	1482

POINT	Pre–test Traverse Delta–P ("H2O)	Stack Temp. (Deg. F)	Square Root Delta–P	Box Temp. In	Box Temp. Out	Post–test Traverse Delta–P ("H2O)	Stack Temp. (Deg. F)	Square Root Delta–P
1	0.010	1387	0.100	80	82	0.005	1462	0.071
2	0.020	1492	0.141	82	82	0.005	1493	0.071
3	0.025	1513	0.158	86	82	0.010	1505	0.100
4	0.025	1501	0.158	91	83	0.010	1521	0.100
5	0.020	1485	0.141	91	84	0.020	1499	0.141
6	0.020	1469	0.141	92	84	0.025	1501	0.158
7	0.020	1450	0.141	92	85	0.025	1482	0.158
8	0.015	1444	0.122	93	82	0.020	1473	0.141
9	0.010	1401	0.100	96	86	0.005	1472	0.071
10	0.010	1481	0.100	96	87	0.005	1498	0.071
11	0.015	1501	0.122	95	86	0.015	1505	0.122
12	0.015	1521	0.122	94	87	0.020	1521	0.141
13	0.020	1472	0.141			0.010	1510	0.100
14	0.025	1462	0.158			0.005	1498	0.071
15	0.030	1460	0.173			0.005	1489	0.071
16	0.030	1451	0.173			0.005	1489	0.071
17			0.000					0.000
18			0.000					0.000
19			0.000					0.000
20			0.000					0.000
21			0.000					0.000
22			0.000					0.000
23			0.000					0.000
24			0.000					0.000
25			0.000					0.000
Avgs.:	0.019	1468 [Ts1]	0.137 [dP1]		87.4 [Tm]	0.012	1495 [Ts2]	0.104 [dP2]

This Spreadsheet Uses The Following Calculations/Equations:

Vms = (17.71)(Y)(Vm)(((H / 13.6) + Pb) / (Tm + 460))

Vws = Wo / 21.2

Bws = (100)(Vws) / (Vms + Vws)

MWd = (CO2)(0.44) + (O2)(0.32) + (100 – (CO2 + O2))(.28)

MWw = (Bws)(0.18) + ((MWd)(100 – Bws) / 100)

Pa = Pb + ((Ps1 + Ps2) / 2) / 13.6

Vsa1 = (((Ts1 + 460) / (((Ps1 / 13.6) + Pb)(MWw))) ^ 0.5)(Cp)(dP1)(85.48)

Vsa2 = (((Ts2 + 460) / (((Ps2 / 13.6) + Pb)(MWw))) ^ 0.5)(Cp)(dP2)(85.48)

Vsa–Avg = (Vsa1 + Vsa2) / 2

Vss = (((Vsa1)(((Ps1 / 13.6) + Pb) / (Ts1 + 460)) + ((Vsa2)(((Ps2 / 13.6) + Pb) / (Ts2 + 460)))(17.71 / 2)

ACFM = (Vsa–avg)(CSA)(60)

SCFM = (Vss)(CSA)(60)

DSCFM = ((100 – Bws)/ 100)(SCFM)

STP = Standard Conditions = 70 deg. F, 29.92" Hg.

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Stack Flowrate Calculator

Company:	LFG Specialties	Date:	10/09/96
Unit:	Enclosed Flare Outlet	Time:	1405–1514
Location:	Bethlehem Landfill	Run No.:	Three (3)

Input Data

Beginning Meter Setting (cubic feet):	478.411
Ending Meter Setting (cubic feet):	510.585
Metered Volume (cubic feet) [Vm]:	32.174
Water Caught (grams) [Wc]:	58.9
Stack Static Pressures (" H2O)	
Pre–Test [Ps1]:	–0.06
Post–Test [Ps2]:	–0.06
Barometric Pressure (" Hg) [Pb]:	29.72
Stack Carbon Dioxide Content (%) [CO2]:	9.400
Stack Oxygen Content (%) [O2]:	10.518
Delta–H (" H2O) [H]:	1.00
Pitot Tube Factor [Cp]:	0.85
Meter Correction Factor [Y]:	0.98
Stack Cross–Section (square feet) [CSA]:	38.48

Output Data

Metered Volume (Dry cubic feet @STP) [Vms]:	30.546
Moisture Volume (cubic feet @STP) [Vws]:	2.778
Stack Moisture Content (%) [Bws]:	8.34
Gas Dry Molecular Weight (lb/lb–Mol) [MWd]:	29.92
Gas Wet Molecular Weight (lb/lb–Mol) [MWw]:	28.93
Absolute Stack Pressure (" Hg) [Pa]:	29.72
Stack Gas Velocities (feet/second)	
Pre–Test, Actual (ft/sec) [Vsa1]:	11.35
Post–Test, Actual (ft/sec) [Vsa2]:	11.45
Average, Actual (ft/sec) [Vsa–Avg]:	11.40
Standard, Average (SFS) [Vss]:	3.07
Stack Flowrate (cubic feet/minute)	
Average Actual (ACFM):	26321
Standard Average (SCFM):	7081
Dry, Standard Avg (DSCFM):	6491
Stack Temperature, Average (Deg. F):	1496

POINT	Pre–test Traverse Delta–P ("H2O)	Pre–test Traverse Stack Temp. (Deg. F)	Pre–test Traverse Square Root Delta–P	Box Temp. In	Box Temp. Out	Post–test Traverse Delta–P ("H2O)	Post–test Traverse Stack Temp. (Deg. F)	Post–test Traverse Square Root Delta–P
1	0.005	1462	0.071	78	80	0.005	1469	0.071
2	0.005	1493	0.071	80	80	0.005	1492	0.071
3	0.010	1505	0.100	85	80	0.005	1521	0.071
4	0.010	1521	0.100	87	80	0.015	1517	0.122
5	0.020	1499	0.141	91	81	0.020	1500	0.141
6	0.025	1501	0.158	91	82	0.030	1505	0.173
7	0.025	1482	0.158	84	82	0.020	1481	0.141
8	0.020	1473	0.141	85	81	0.015	1481	0.122
9	0.005	1472	0.071	91	81	0.010	1483	0.100
10	0.005	1498	0.071	91	81	0.010	1490	0.100
11	0.015	1505	0.122	91	81	0.010	1510	0.100
12	0.020	1521	0.141	95	82	0.015	1530	0.122
13	0.010	1510	0.100	97	84	0.015	1500	0.122
14	0.005	1498	0.071			0.005	1499	0.071
15	0.005	1489	0.071			0.005	1493	0.071
16	0.005	1489	0.071			0.005	1490	0.071
17			0.000					0.000
18			0.000					0.000
19			0.000					0.000
20			0.000					0.000
21			0.000					0.000
22			0.000					0.000
23			0.000					0.000
24			0.000					0.000
25			0.000					0.000
Avgs.:	0.012	1495 [Ts1]	0.104 [dP1]		84.7 [Tm]	0.012	1498 [Ts2]	0.104 [dP2]

This Spreadsheet Uses The Following Calculations/Equations:

Vms = (17.71)(Y)(Vm)(((H / 13.6) + Pb) / (Tm + 460))
Vws = Wc / 21.2
Bws = (100)(Vws) / (Vms + Vws)
MWd = (CO2)(0.44) + (O2)(0.32) + (100 – (CO2 + O2))(.28)
MWw = (Bws)(0.18) + ((MWd)(100 – Bws) / 100)
Pa = Pb + ((Ps1 + Ps2) / 2) / 13.6
Vsa1 = (((Ts1 + 460) / (((Ps1 / 13.6) + Pb)(MWw))) ^ 0.5)(Cp)(dP1)(85.48)
Vsa2 = (((Ts2 + 460) / (((Ps2 / 13.6) + Pb)(MWw))) ^ 0.5)(Cp)(dP2)(85.48)
Vsa–Avg = (Vsa1 + Vsa2) / 2
Vss = (((Vsa1)(((Ps1 / 13.6) + Pb) / (Ts1 + 460)) + ((Vsa2)(((Ps2 / 13.6) + Pb) / (Ts2 + 460)))(17.71 / 2)
ACFM = (Vsa–avg)(CSA)(60)
SCFM = (Vss)(CSA)(60)
DSCFM = ((100 – Bws)/ 100)(SCFM)

STP = Standard Conditions = 70 deg. F, 29.92" Hg.

AirRECON, Division of RECON ENVIRONMENTAL CORP.

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APPENDIX III

CEM DATA SUMMARIES

079

Client Name:	LFG Specialties
Jobsite:	Bethlehem Landfill
Emission Source(s):	Enclosed Ground Flare Outlet
AirRECON Project Number:	AR5-6922
Run Number:	One (1)

Date and Time	O2	CO2	NOx
9/Oct/96 10: 6: 9	10.8 %	9.1 %	6.4 ppm,d
9/Oct/96 10: 6:39	11.0 %	8.9 %	6.2 ppm,d
9/Oct/96 10: 7: 9	11.1 %	8.9 %	6.5 ppm,d
9/Oct/96 10: 7:39	11.0 %	9.0 %	6.5 ppm,d
9/Oct/96 10: 8: 9	10.9 %	9.0 %	6.5 ppm,d
9/Oct/96 10: 8:39	10.8 %	9.0 %	6.3 ppm,d
9/Oct/96 10: 9: 9	10.9 %	9.0 %	6.3 ppm,d
9/Oct/96 10: 9:39	10.9 %	9.0 %	6.5 ppm,d
9/Oct/96 10:10: 9	10.7 %	9.1 %	6.3 ppm,d
9/Oct/96 10:10:39	11.0 %	9.0 %	6.4 ppm,d
9/Oct/96 10:11: 9	10.8 %	9.0 %	6.5 ppm,d
9/Oct/96 10:11:39	10.8 %	9.0 %	6.4 ppm,d
9/Oct/96 10:12: 9	10.8 %	9.1 %	6.0 ppm,d
9/Oct/96 10:12:39	11.1 %	8.8 %	6.4 ppm,d
9/Oct/96 10:13: 9	11.1 %	8.8 %	6.2 ppm,d
9/Oct/96 10:13:39	11.0 %	8.9 %	6.2 ppm,d
9/Oct/96 10:14: 9	10.9 %	9.0 %	6.5 ppm,d
9/Oct/96 10:14:39	10.9 %	8.9 %	6.4 ppm,d
9/Oct/96 10:15: 9	10.9 %	9.1 %	6.2 ppm,d
9/Oct/96 10:15:39	10.8 %	9.1 %	6.6 ppm,d
9/Oct/96 10:16: 9	11.0 %	8.9 %	6.8 ppm,d
9/Oct/96 10:16:39	10.7 %	9.3 %	6.9 ppm,d
9/Oct/96 10:17: 9	10.8 %	9.1 %	6.5 ppm,d
9/Oct/96 10:17:39	10.9 %	9.0 %	6.6 ppm,d
9/Oct/96 10:18: 9	10.7 %	9.4 %	7.2 ppm,d
9/Oct/96 10:18:39	11.0 %	8.9 %	6.9 ppm,d
9/Oct/96 10:19: 9	10.9 %	9.0 %	6.9 ppm,d
9/Oct/96 10:19:39	11.1 %	8.8 %	6.5 ppm,d
9/Oct/96 10:20: 9	10.9 %	9.0 %	6.9 ppm,d
9/Oct/96 10:20:39	10.7 %	9.2 %	7.1 ppm,d
9/Oct/96 10:21: 9	10.9 %	9.0 %	6.8 ppm,d
9/Oct/96 10:21:39	10.9 %	9.1 %	6.8 ppm,d
9/Oct/96 10:22: 9	11.1 %	8.9 %	6.8 ppm,d
9/Oct/96 10:22:39	10.7 %	9.1 %	6.4 ppm,d
9/Oct/96 10:23: 9	10.9 %	8.9 %	6.8 ppm,d
9/Oct/96 10:23:39	10.6 %	9.2 %	6.6 ppm,d
9/Oct/96 10:24: 9	10.9 %	9.1 %	6.7 ppm,d
9/Oct/96 10:24:39	10.8 %	9.1 %	6.6 ppm,d
9/Oct/96 10:25: 9	11.0 %	8.8 %	6.1 ppm,d
9/Oct/96 10:25:39	10.7 %	9.1 %	6.2 ppm,d
9/Oct/96 10:26: 9	10.8 %	9.1 %	6.5 ppm,d
9/Oct/96 10:26:39	10.7 %	9.1 %	6.6 ppm,d
9/Oct/96 10:27: 9	10.9 %	9.0 %	6.7 ppm,d
9/Oct/96 10:27:39	10.9 %	9.1 %	6.7 ppm,d
9/Oct/96 10:28: 9	10.8 %	9.1 %	6.7 ppm,d
9/Oct/96 10:28:38	10.5 %	9.2 %	6.6 ppm,d
9/Oct/96 10:29: 9	11.0 %	9.0 %	6.8 ppm,d
9/Oct/96 10:29:39	10.5 %	9.3 %	6.6 ppm,d
9/Oct/96 10:30: 8	10.8 %	9.0 %	6.6 ppm,d
9/Oct/96 10:30:39	11.0 %	9.1 %	6.7 ppm,d
9/Oct/96 10:31: 9	10.9 %	8.9 %	6.4 ppm,d
9/Oct/96 10:31:39	11.0 %	8.9 %	6.6 ppm,d
9/Oct/96 10:32: 9	11.0 %	8.9 %	6.7 ppm,d
9/Oct/96 10:32:39	10.8 %	9.1 %	6.3 ppm,d
9/Oct/96 10:33: 9	10.8 %	9.1 %	6.9 ppm,d
9/Oct/96 10:33:39	11.0 %	8.9 %	6.9 ppm,d
9/Oct/96 10:34: 9	10.9 %	9.1 %	6.9 ppm,d
9/Oct/96 10:34:39	10.9 %	9.1 %	6.8 ppm,d
9/Oct/96 10:35: 9	10.7 %	9.2 %	6.8 ppm,d
9/Oct/96 10:35:39	10.9 %	9.0 %	6.7 ppm,d
9/Oct/96 10:36: 9	10.8 %	9.2 %	6.7 ppm,d
9/Oct/96 10:36:39	10.8 %	9.1 %	6.5 ppm,d
9/Oct/96 10:37: 8	11.2 %	8.8 %	6.8 ppm,d
9/Oct/96 10:37:39	10.9 %	9.1 %	7.0 ppm,d
9/Oct/96 10:38: 9	10.7 %	9.2 %	7.0 ppm,d

9/Oct/96 10:38:39	10.7 %	9.1 %	6.9 ppm,d
9/Oct/96 10:39: 9	10.9 %	9.0 %	6.5 ppm,d
9/Oct/96 10:39:39	10.8 %	9.1 %	7.1 ppm,d
9/Oct/96 10:40: 9	10.7 %	9.1 %	7.0 ppm,d
9/Oct/96 10:40:38	10.6 %	9.2 %	6.6 ppm,d
9/Oct/96 10:41: 9	11.1 %	8.9 %	6.5 ppm,d
9/Oct/96 10:41:39	10.8 %	9.1 %	6.9 ppm,d
9/Oct/96 10:42: 9	10.7 %	9.0 %	6.5 ppm,d
9/Oct/96 10:42:39	10.6 %	9.1 %	6.5 ppm,d
9/Oct/96 10:43: 9	10.7 %	9.2 %	6.6 ppm,d
9/Oct/96 10:43:39	11.0 %	9.0 %	6.8 ppm,d
9/Oct/96 10:44: 8	10.6 %	9.2 %	6.9 ppm,d
9/Oct/96 10:44:39	10.8 %	9.1 %	6.8 ppm,d
9/Oct/96 10:45: 9	10.6 %	9.2 %	6.5 ppm,d
9/Oct/96 10:45:38	10.9 %	9.0 %	6.5 ppm,d
9/Oct/96 10:46: 9	11.0 %	8.9 %	6.9 ppm,d
9/Oct/96 10:46:39	10.8 %	9.1 %	7.0 ppm,d
9/Oct/96 10:47: 9	10.8 %	9.1 %	6.9 ppm,d
9/Oct/96 10:47:39	10.6 %	9.2 %	6.7 ppm,d
9/Oct/96 10:48: 9	11.1 %	8.9 %	7.0 ppm,d
9/Oct/96 10:48:38	10.9 %	9.1 %	6.6 ppm,d
9/Oct/96 10:49: 9	10.7 %	9.1 %	6.9 ppm,d
9/Oct/96 10:49:39	10.9 %	9.0 %	6.9 ppm,d
9/Oct/96 10:50: 9	10.8 %	9.0 %	7.1 ppm,d
9/Oct/96 10:50:39	11.1 %	8.7 %	6.7 ppm,d
9/Oct/96 10:51: 9	11.0 %	8.9 %	6.7 ppm,d
9/Oct/96 10:51:39	10.7 %	9.2 %	7.1 ppm,d
9/Oct/96 10:52: 9	10.6 %	9.3 %	6.9 ppm,d
9/Oct/96 10:52:39	10.8 %	9.0 %	6.8 ppm,d
9/Oct/96 10:53: 9	10.7 %	9.2 %	6.8 ppm,d
9/Oct/96 10:53:39	10.9 %	9.1 %	7.0 ppm,d
9/Oct/96 10:54: 8	10.7 %	9.2 %	6.8 ppm,d
9/Oct/96 10:54:39	10.8 %	8.9 %	7.3 ppm,d
9/Oct/96 10:55: 9	10.7 %	9.2 %	7.0 ppm,d
9/Oct/96 10:55:39	10.7 %	9.2 %	6.9 ppm,d
9/Oct/96 10:56: 8	11.0 %	8.9 %	6.7 ppm,d
9/Oct/96 10:56:39	10.7 %	9.1 %	6.9 ppm,d
9/Oct/96 10:57: 9	10.8 %	9.2 %	7.1 ppm,d
9/Oct/96 10:57:39	10.8 %	9.0 %	6.7 ppm,d
9/Oct/96 10:58: 9	10.6 %	9.2 %	6.8 ppm,d
9/Oct/96 10:58:38	11.0 %	9.0 %	6.8 ppm,d
9/Oct/96 10:59: 9	10.7 %	9.3 %	6.9 ppm,d
9/Oct/96 10:59:39	10.6 %	9.2 %	7.0 ppm,d
9/Oct/96 11: 0: 9	10.6 %	9.3 %	6.9 ppm,d
9/Oct/96 11: 0:39	10.7 %	9.1 %	6.9 ppm,d
9/Oct/96 11: 1: 9	10.6 %	9.2 %	7.2 ppm,d
9/Oct/96 11: 1:39	10.7 %	9.1 %	7.1 ppm,d
9/Oct/96 11: 2: 9	11.1 %	8.8 %	6.5 ppm,d
9/Oct/96 11: 2:39	10.9 %	9.0 %	6.6 ppm,d
9/Oct/96 11: 3: 8	11.0 %	9.0 %	7.4 ppm,d
9/Oct/96 11: 3:39	10.7 %	9.1 %	6.8 ppm,d
9/Oct/96 11: 4: 9	10.7 %	9.1 %	6.6 ppm,d
9/Oct/96 11: 4:39	10.8 %	9.2 %	6.6 ppm,d
9/Oct/96 11: 5: 8	11.0 %	9.0 %	6.9 ppm,d
9/Oct/96 11: 5:39	10.8 %	9.0 %	6.6 ppm,d

Client Name:	LFG Specialties
Jobsite:	Bethlehem Landfill
Emission Source(s):	Enclosed Ground Flare Outlet
AirRECON Project Number:	AR5-6922
Run Number:	One (1)

	O2	CO2	NOx
Raw Test Averages:	10.835 %	9.055 %	6.704 ppm,d

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Client Name:	LFG Specialties
Jobsite:	Bethlehem Landfill
Emission Source(s):	Enclosed Ground Flare Outlet
AirRECON Project Number:	AR5-6922
Run Number:	Two (2)

Date and Time	O2	CO2	NOx
9/Oct/96 12:20: 9	10.8 %	9.0 %	8.3 ppm,d
9/Oct/96 12:20:38	10.6 %	9.3 %	8.1 ppm,d
9/Oct/96 12:21: 8	10.6 %	9.3 %	8.3 ppm,d
9/Oct/96 12:21:38	10.7 %	9.2 %	8.5 ppm,d
9/Oct/96 12:22: 8	10.7 %	9.1 %	8.2 ppm,d
9/Oct/96 12:22:38	10.7 %	9.2 %	8.2 ppm,d
9/Oct/96 12:23: 7	10.4 %	9.4 %	8.5 ppm,d
9/Oct/96 12:23:38	10.6 %	9.3 %	8.5 ppm,d
9/Oct/96 12:24: 8	10.5 %	9.3 %	7.8 ppm,d
9/Oct/96 12:24:38	11.1 %	8.8 %	8.1 ppm,d
9/Oct/96 12:25: 8	10.6 %	9.3 %	8.1 ppm,d
9/Oct/96 12:25:38	10.5 %	9.4 %	8.8 ppm,d
9/Oct/96 12:26: 8	10.5 %	9.4 %	8.5 ppm,d
9/Oct/96 12:26:37	10.6 %	9.2 %	8.5 ppm,d
9/Oct/96 12:27: 8	10.6 %	9.3 %	8.2 ppm,d
9/Oct/96 12:27:38	10.8 %	9.1 %	8.3 ppm,d
9/Oct/96 12:28: 8	10.9 %	9.1 %	8.4 ppm,d
9/Oct/96 12:28:38	10.8 %	9.0 %	7.8 ppm,d
9/Oct/96 12:29: 8	10.6 %	9.3 %	8.0 ppm,d
9/Oct/96 12:29:38	10.7 %	9.2 %	8.1 ppm,d
9/Oct/96 12:30: 7	11.0 %	9.0 %	8.3 ppm,d
9/Oct/96 12:30:38	10.7 %	9.3 %	8.4 ppm,d
9/Oct/96 12:31: 8	10.8 %	9.1 %	8.2 ppm,d
9/Oct/96 12:31:37	10.6 %	9.2 %	8.7 ppm,d
9/Oct/96 12:32: 8	10.7 %	9.0 %	8.4 ppm,d
9/Oct/96 12:32:38	10.6 %	9.2 %	8.3 ppm,d
9/Oct/96 12:33: 7	10.7 %	9.2 %	8.3 ppm,d
9/Oct/96 12:33:38	10.8 %	9.1 %	8.4 ppm,d
9/Oct/96 12:34: 8	10.4 %	9.3 %	8.3 ppm,d
9/Oct/96 12:34:38	10.5 %	9.3 %	8.2 ppm,d
9/Oct/96 12:35: 7	10.8 %	9.2 %	8.6 ppm,d
9/Oct/96 12:35:38	10.9 %	9.1 %	7.7 ppm,d
9/Oct/96 12:36: 8	10.7 %	9.3 %	8.4 ppm,d
9/Oct/96 12:36:38	10.8 %	9.1 %	7.8 ppm,d
9/Oct/96 12:37: 8	10.7 %	9.2 %	7.7 ppm,d
9/Oct/96 12:37:38	10.8 %	9.0 %	8.1 ppm,d
9/Oct/96 12:38: 7	10.9 %	9.0 %	8.3 ppm,d
9/Oct/96 12:38:37	10.7 %	9.2 %	8.3 ppm,d
9/Oct/96 12:39: 8	10.8 %	9.1 %	8.1 ppm,d
9/Oct/96 12:39:38	10.5 %	9.4 %	8.2 ppm,d
9/Oct/96 12:40: 7	10.7 %	9.2 %	8.3 ppm,d
9/Oct/96 12:40:38	10.8 %	9.0 %	8.0 ppm,d
9/Oct/96 12:41: 8	10.9 %	9.0 %	7.7 ppm,d
9/Oct/96 12:41:37	11.0 %	8.9 %	7.7 ppm,d
9/Oct/96 12:42: 8	10.9 %	9.0 %	7.7 ppm,d
9/Oct/96 12:42:38	10.8 %	9.2 %	8.0 ppm,d
9/Oct/96 12:43: 8	10.8 %	9.2 %	8.1 ppm,d
9/Oct/96 12:43:38	10.7 %	9.1 %	8.0 ppm,d
9/Oct/96 12:44: 8	10.8 %	9.1 %	8.1 ppm,d
9/Oct/96 12:44:38	10.8 %	9.0 %	7.8 ppm,d
9/Oct/96 12:45: 8	10.6 %	9.2 %	7.7 ppm,d
9/Oct/96 12:45:38	10.7 %	9.1 %	7.9 ppm,d
9/Oct/96 12:46: 8	10.6 %	9.4 %	8.7 ppm,d
9/Oct/96 12:46:38	10.7 %	9.1 %	7.8 ppm,d
9/Oct/96 12:47: 8	10.7 %	9.2 %	8.2 ppm,d
9/Oct/96 12:47:38	10.5 %	9.4 %	8.1 ppm,d
9/Oct/96 12:48: 8	10.5 %	9.3 %	8.2 ppm,d
9/Oct/96 12:48:38	10.4 %	9.4 %	7.8 ppm,d
9/Oct/96 12:49: 8	10.6 %	9.2 %	7.8 ppm,d
9/Oct/96 12:49:38	10.8 %	9.1 %	7.9 ppm,d
9/Oct/96 12:50: 7	10.6 %	9.3 %	8.3 ppm,d
9/Oct/96 12:50:38	10.5 %	9.4 %	8.3 ppm,d
9/Oct/96 12:51: 8	10.8 %	9.1 %	7.6 ppm,d
9/Oct/96 12:51:38	10.8 %	9.2 %	7.8 ppm,d
9/Oct/96 12:52: 8	10.6 %	9.2 %	7.9 ppm,d

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9/Oct/96 12:52:38	10.6 %	9.4 %	8.4 ppm,d
9/Oct/96 12:53: 8	10.5 %	9.3 %	8.1 ppm,d
9/Oct/96 12:53:38	10.7 %	9.2 %	8.1 ppm,d
9/Oct/96 12:54: 7	10.5 %	9.4 %	8.5 ppm,d
9/Oct/96 12:54:38	10.6 %	9.3 %	8.5 ppm,d
9/Oct/96 12:55: 8	10.5 %	9.3 %	8.2 ppm,d
9/Oct/96 12:55:38	10.7 %	9.1 %	8.3 ppm,d
9/Oct/96 12:56: 7	10.8 %	9.1 %	7.8 ppm,d
9/Oct/96 12:56:38	10.6 %	9.2 %	7.9 ppm,d
9/Oct/96 12:57: 7	10.6 %	9.1 %	7.9 ppm,d
9/Oct/96 12:57:38	10.7 %	9.1 %	8.0 ppm,d
9/Oct/96 12:58: 8	10.8 %	9.1 %	8.1 ppm,d
9/Oct/96 12:58:38	10.7 %	9.1 %	8.2 ppm,d
9/Oct/96 12:59: 7	10.9 %	9.0 %	8.0 ppm,d
9/Oct/96 12:59:38	10.7 %	9.2 %	8.3 ppm,d
9/Oct/96 13: 0: 8	10.4 %	9.4 %	8.3 ppm,d
9/Oct/96 13: 0:38	10.3 %	9.6 %	8.7 ppm,d
9/Oct/96 13: 1: 8	10.7 %	9.1 %	7.7 ppm,d
9/Oct/96 13: 1:38	10.7 %	9.1 %	7.7 ppm,d
9/Oct/96 13: 2: 8	10.8 %	9.3 %	7.8 ppm,d
9/Oct/96 13: 2:38	10.8 %	9.1 %	7.6 ppm,d
9/Oct/96 13: 3: 8	10.7 %	9.1 %	7.9 ppm,d
9/Oct/96 13: 3:38	10.7 %	9.2 %	7.8 ppm,d
9/Oct/96 13: 4: 8	10.8 %	9.0 %	7.6 ppm,d
9/Oct/96 13: 4:38	10.6 %	9.3 %	8.0 ppm,d
9/Oct/96 13: 5: 8	10.6 %	9.2 %	7.9 ppm,d
9/Oct/96 13: 5:38	10.5 %	9.3 %	8.1 ppm,d
9/Oct/96 13: 6: 7	10.6 %	9.3 %	8.2 ppm,d
9/Oct/96 13: 6:38	10.9 %	8.8 %	8.0 ppm,d
9/Oct/96 13: 7: 8	10.5 %	9.3 %	8.0 ppm,d
9/Oct/96 13: 7:38	10.8 %	9.0 %	7.7 ppm,d
9/Oct/96 13: 8: 8	10.8 %	9.1 %	8.2 ppm,d
9/Oct/96 13: 8:38	10.8 %	9.1 %	8.2 ppm,d
9/Oct/96 13: 9: 8	10.6 %	9.3 %	8.0 ppm,d
9/Oct/96 13: 9:38	10.9 %	9.1 %	7.8 ppm,d
9/Oct/96 13:10: 8	10.8 %	9.1 %	8.1 ppm,d
9/Oct/96 13:10:38	10.8 %	9.1 %	7.8 ppm,d
9/Oct/96 13:11: 8	10.7 %	9.1 %	7.7 ppm,d
9/Oct/96 13:11:38	10.6 %	9.3 %	8.0 ppm,d
9/Oct/96 13:12: 8	10.8 %	8.9 %	7.4 ppm,d
9/Oct/96 13:12:38	10.8 %	9.0 %	8.0 ppm,d
9/Oct/96 13:13: 8	10.6 %	9.3 %	7.7 ppm,d
9/Oct/96 13:13:37	10.7 %	9.1 %	7.9 ppm,d
9/Oct/96 13:14: 8	10.6 %	9.2 %	7.5 ppm,d
9/Oct/96 13:14:38	10.6 %	9.3 %	7.8 ppm,d
9/Oct/96 13:15: 7	10.7 %	9.2 %	7.8 ppm,d
9/Oct/96 13:15:37	10.8 %	9.1 %	7.6 ppm,d
9/Oct/96 13:16: 8	10.8 %	9.1 %	8.1 ppm,d
9/Oct/96 13:16:38	10.4 %	9.4 %	8.0 ppm,d
9/Oct/96 13:17: 8	10.5 %	9.4 %	8.1 ppm,d
9/Oct/96 13:17:38	10.6 %	9.2 %	7.7 ppm,d
9/Oct/96 13:18: 8	10.5 %	9.3 %	8.1 ppm,d
9/Oct/96 13:18:38	10.9 %	9.0 %	8.4 ppm,d
9/Oct/96 13:19: 7	10.6 %	9.2 %	8.1 ppm,d
9/Oct/96 13:19:38	10.4 %	9.4 %	8.6 ppm,d

Client Name:	LFG Specialties
Jobsite:	Bethlehem Landfill
Emission Source(s):	Enclosed Ground Flare Outlet
AirRECON Project Number:	AR5-6922
Run Number:	Two (2)

	O2	CO2	NOx
Run Test Averages:	10.683 %	9.184 %	8.077 ppm,d

083

Client Name:	LFG Specialties
Location:	Bethlehem Landfill
Emission Source(s):	Enclosed Ground Flare Outlet
AirRECON Project Number:	AR5-6922
Run Number:	Three (3)

Date and Time	O2	CO2	NOx
9/Oct/96 14:05:05	10.3 %	9.5 %	8.8 ppm,d
9/Oct/96 14:05:35	10.4 %	9.3 %	8.6 ppm,d
9/Oct/96 14:06:05	10.4 %	9.4 %	8.6 ppm,d
9/Oct/96 14:06:35	10.3 %	9.5 %	8.9 ppm,d
9/Oct/96 14:07:05	10.5 %	9.3 %	8.7 ppm,d
9/Oct/96 14:07:35	10.5 %	9.4 %	8.8 ppm,d
9/Oct/96 14:08:05	10.5 %	9.3 %	8.7 ppm,d
9/Oct/96 14:08:35	10.5 %	9.3 %	8.7 ppm,d
9/Oct/96 14:09:05	10.8 %	9.1 %	8.4 ppm,d
9/Oct/96 14:09:35	10.6 %	9.3 %	8.8 ppm,d
9/Oct/96 14:10:05	10.6 %	9.2 %	8.8 ppm,d
9/Oct/96 14:10:35	10.3 %	9.4 %	9.0 ppm,d
9/Oct/96 14:11:05	10.5 %	9.3 %	8.6 ppm,d
9/Oct/96 14:11:35	10.5 %	9.3 %	8.8 ppm,d
9/Oct/96 14:12:05	10.7 %	9.1 %	8.6 ppm,d
9/Oct/96 14:12:35	10.7 %	9.2 %	8.3 ppm,d
9/Oct/96 14:13:05	10.6 %	9.2 %	8.3 ppm,d
9/Oct/96 14:13:35	10.8 %	9.1 %	8.2 ppm,d
9/Oct/96 14:14:05	10.6 %	9.3 %	8.5 ppm,d
9/Oct/96 14:14:35	10.6 %	9.2 %	8.5 ppm,d
9/Oct/96 14:15:05	10.2 %	9.5 %	9.1 ppm,d
9/Oct/96 14:15:35	10.6 %	9.2 %	8.6 ppm,d
9/Oct/96 14:16:05	10.5 %	9.3 %	8.6 ppm,d
9/Oct/96 14:16:35	10.7 %	9.2 %	8.5 ppm,d
9/Oct/96 14:17:05	10.7 %	9.1 %	8.2 ppm,d
9/Oct/96 14:17:35	10.6 %	9.3 %	8.3 ppm,d
9/Oct/96 14:18:05	10.8 %	9.1 %	8.0 ppm,d
9/Oct/96 14:18:35	10.8 %	9.1 %	8.7 ppm,d
9/Oct/96 14:19:05	10.6 %	9.3 %	8.3 ppm,d
9/Oct/96 14:19:35	10.7 %	9.2 %	8.1 ppm,d
9/Oct/96 14:20:05	10.6 %	9.2 %	8.7 ppm,d
9/Oct/96 14:20:35	10.4 %	9.5 %	8.6 ppm,d
9/Oct/96 14:21:05	10.5 %	9.3 %	8.2 ppm,d
9/Oct/96 14:21:35	10.6 %	9.2 %	8.2 ppm,d
9/Oct/96 14:22:05	10.4 %	9.4 %	8.6 ppm,d
9/Oct/96 14:22:35	10.6 %	9.3 %	8.7 ppm,d
9/Oct/96 14:23:05	10.7 %	9.1 %	8.2 ppm,d
9/Oct/96 14:23:35	10.5 %	9.3 %	8.2 ppm,d
9/Oct/96 14:24:05	10.5 %	9.3 %	8.3 ppm,d
9/Oct/96 14:24:35	10.6 %	9.4 %	8.8 ppm,d
9/Oct/96 14:25:05	10.6 %	9.2 %	8.2 ppm,d
9/Oct/96 14:25:35	10.5 %	9.2 %	8.0 ppm,d
9/Oct/96 14:26:05	10.4 %	9.3 %	8.2 ppm,d
9/Oct/96 14:26:35	10.9 %	9.1 %	8.3 ppm,d
9/Oct/96 14:27:05	10.6 %	9.2 %	7.8 ppm,d
9/Oct/96 14:27:35	11.0 %	9.0 %	8.3 ppm,d
9/Oct/96 14:28:05	10.5 %	9.3 %	8.5 ppm,d
9/Oct/96 14:28:35	10.4 %	9.4 %	8.1 ppm,d
9/Oct/96 14:29:05	10.7 %	9.2 %	7.9 ppm,d
9/Oct/96 14:29:35	10.6 %	9.3 %	8.1 ppm,d
9/Oct/96 14:30:05	10.7 %	9.2 %	8.2 ppm,d
9/Oct/96 14:30:35	10.5 %	9.3 %	7.9 ppm,d
9/Oct/96 14:31:05	10.5 %	9.3 %	8.1 ppm,d
9/Oct/96 14:31:35	10.8 %	9.1 %	8.1 ppm,d
9/Oct/96 14:32:05	10.6 %	9.2 %	7.7 ppm,d
9/Oct/96 14:32:35	10.5 %	9.4 %	8.3 ppm,d
9/Oct/96 14:33:05	10.6 %	9.3 %	7.8 ppm,d
9/Oct/96 14:33:35	10.4 %	9.4 %	8.0 ppm,d
9/Oct/96 14:34:05	10.6 %	9.2 %	8.0 ppm,d
9/Oct/96 14:34:35	10.6 %	9.3 %	8.6 ppm,d
9/Oct/96 14:43:40	10.5 %	9.3 %	8.3 ppm,d
9/Oct/96 14:44:11	10.4 %	9.5 %	8.3 ppm,d
9/Oct/96 14:44:41	10.4 %	9.3 %	7.9 ppm,d
9/Oct/96 14:45:11	10.8 %	9.1 %	8.4 ppm,d
9/Oct/96 14:45:41	10.4 %	9.3 %	8.1 ppm,d

084

9/Oct/96 14:46:11	10.4 %	9.4 %	8.4 ppm,d
9/Oct/96 14:46:41	10.2 %	9.5 %	8.3 ppm,d
9/Oct/96 14:47:11	10.5 %	9.3 %	8.5 ppm,d
9/Oct/96 14:47:41	10.4 %	9.4 %	8.3 ppm,d
9/Oct/96 14:48:11	10.5 %	9.4 %	7.9 ppm,d
9/Oct/96 14:48:41	10.5 %	9.4 %	8.3 ppm,d
9/Oct/96 14:49:11	10.7 %	9.0 %	7.8 ppm,d
9/Oct/96 14:49:40	10.7 %	9.2 %	8.2 ppm,d
9/Oct/96 14:50:11	10.7 %	9.3 %	8.7 ppm,d
9/Oct/96 14:50:41	10.9 %	9.0 %	7.9 ppm,d
9/Oct/96 14:51:11	10.6 %	9.2 %	7.9 ppm,d
9/Oct/96 14:51:41	10.5 %	9.3 %	8.2 ppm,d
9/Oct/96 14:52:11	10.6 %	9.2 %	8.3 ppm,d
9/Oct/96 14:52:41	10.5 %	9.4 %	8.2 ppm,d
9/Oct/96 14:53:10	10.7 %	9.1 %	7.9 ppm,d
9/Oct/96 14:53:41	10.6 %	9.2 %	8.0 ppm,d
9/Oct/96 14:54:11	10.6 %	9.3 %	8.2 ppm,d
9/Oct/96 14:54:41	10.8 %	9.0 %	8.0 ppm,d
9/Oct/96 14:55:11	11.0 %	9.0 %	8.2 ppm,d
9/Oct/96 14:55:41	10.7 %	9.2 %	8.4 ppm,d
9/Oct/96 14:56:11	10.6 %	9.2 %	8.1 ppm,d
9/Oct/96 14:56:41	10.7 %	9.2 %	8.2 ppm,d
9/Oct/96 14:57:11	10.5 %	9.2 %	8.4 ppm,d
9/Oct/96 14:57:41	10.7 %	9.2 %	7.7 ppm,d
9/Oct/96 14:58:11	10.6 %	9.2 %	8.2 ppm,d
9/Oct/96 14:58:40	10.7 %	9.1 %	8.2 ppm,d
9/Oct/96 14:59:11	10.6 %	9.3 %	8.6 ppm,d
9/Oct/96 14:59:40	10.6 %	9.2 %	8.4 ppm,d
9/Oct/96 15: 0:11	10.5 %	9.3 %	8.2 ppm,d
9/Oct/96 15: 0:41	10.4 %	9.3 %	8.2 ppm,d
9/Oct/96 15: 1:10	10.3 %	9.5 %	8.4 ppm,d
9/Oct/96 15: 1:41	10.2 %	9.5 %	8.8 ppm,d
9/Oct/96 15: 2:11	10.2 %	9.5 %	8.8 ppm,d
9/Oct/96 15: 2:41	10.4 %	9.4 %	8.6 ppm,d
9/Oct/96 15: 3:11	10.6 %	9.3 %	8.0 ppm,d
9/Oct/96 15: 3:41	10.3 %	9.5 %	8.8 ppm,d
9/Oct/96 15: 4:10	10.3 %	9.5 %	9.0 ppm,d
9/Oct/96 15: 4:41	10.5 %	9.2 %	8.2 ppm,d
9/Oct/96 15: 5:11	10.6 %	9.2 %	7.9 ppm,d
9/Oct/96 15: 5:41	10.6 %	9.3 %	8.0 ppm,d
9/Oct/96 15: 6:11	10.5 %	9.3 %	7.7 ppm,d
9/Oct/96 15: 6:40	10.6 %	9.3 %	8.5 ppm,d
9/Oct/96 15: 7:11	10.5 %	9.2 %	7.5 ppm,d
9/Oct/96 15: 7:41	10.7 %	9.2 %	7.7 ppm,d
9/Oct/96 15: 8:11	10.7 %	9.1 %	7.5 ppm,d
9/Oct/96 15: 8:41	10.9 %	8.9 %	7.8 ppm,d
9/Oct/96 15: 9:10	10.9 %	9.0 %	7.8 ppm,d
9/Oct/96 15: 9:40	10.6 %	9.2 %	7.5 ppm,d
9/Oct/96 15:10:11	10.7 %	9.2 %	7.9 ppm,d
9/Oct/96 15:10:40	10.7 %	9.2 %	7.8 ppm,d
9/Oct/96 15:11:10	10.6 %	9.3 %	7.9 ppm,d
9/Oct/96 15:11:41	10.6 %	9.3 %	7.8 ppm,d
9/Oct/96 15:12:11	10.6 %	9.2 %	7.9 ppm,d
9/Oct/96 15:12:41	10.5 %	9.2 %	8.1 ppm,d
9/Oct/96 15:13:11	10.5 %	9.2 %	7.6 ppm,d

Client Name:	LFG Specialties
Jobsite:	Bethlehem Landfill
Emission Source(s):	Enclosed Ground Flare Outlet
AirRECON Project Number:	AR5-6922
Run Number:	Three (3)

	O2	CO2	NOx
Raw Test Averages:	10.570 %	9.259 %	8.266 ppm,d

AirRecon®
Division of
RECON Environmental Corp.
Raritan, NJ 08869-0130

APPENDIX IV

FIELD DATA SHEETS

CEM Calibration Summaries

Project Name: LFG Specialties – Bethlehem PA
Project No.: AR5-6922
Date: 10/8, 10/9/96
Operator: John Geissler
Trailer No.: Two

AirRECON, Div. of RECON ENVIRONMENTAL CORP.
5 Johnson Drive
P.O. Box 130
Raritan, NJ 08869
Office: (908) 526-1000
Fax: (908) 526-7886

Sheet 1 of 1

	Run 1	Run 2	Run 3			
Run Start Time (hrs):	1006	1220	~~1405~~			
Run Stop Time (hrs):	1106	1320	~~1505~~			

Gas Type	Rack Pos.	Standard Concentration (Units)	Starting Cylinder Pressure (psi)	Rack Calibration Response	Post. Cal. Bias Response	Run 1 Cal. Drift Response	Run 2 Cal. Drift Response	Run 3 Cal. Drift Response	Run Cal. Drift Response	Run Cal. Drift Response	Run Cal. Drift Response	Ending Cylinder Pressure (psi)
O_2	1	Zero		0.0	0.1	0.1	0.1	0.1				
	L											
	M	11.0	1600	11.0	11.0	11.0	11.0	11.1				
	H	20.92	400	20.7								
CO_2	2	Zero		0.0	0.0	0.0	0.0	0.0				
	L											
	M	10.0	900	10.0	9.9	9.9	9.9	9.8				
	H	18.21	800	18.3								
NO_x	3	Zero		0.1	0.7	-0.4	-0.2	-0.1				
	L	54.8	1050	53.4	52.5	53.3	54.5	55.6				
	M	111	500	111.2								
	H	171.2	1350	173.7								
GC Outlet CH_4 0-100	4	Zero										
	L	21.3	1100	117.74								
	M	51.3	1100	286.99								
	H	88.7	1350	518.36								
GC Inlet CH_4 0-10000	5	Zero										
	L	2617	1250	1470.79								
	M	4916	550	3230.57								
	H	9175	900	5076.31								
		Zero										
	L											
	M											
	H											
				Molydacq File Name:		LFG1	LFG2	LFG3 +LFG4				

Avg. Area Counts

NOTE: Remember to mark cylinder pressures on the tank and worksheet.

1405

(C:\AIRRECON\FORMS\CEM_SUM.xls)

980

AirRecon
Division of
RECON SYSTEMS, Inc.

5 Johnson Drive, P.O. Box 130
Raritan, NJ 08869-0130
(908) 526-1000
FAX (908) 526-7887

Connecticut (203) 293-1212
Massachusetts (508) 752-4217
New Hampshire (603) 431-7500
Pennsylvania (215) 433-5511

087

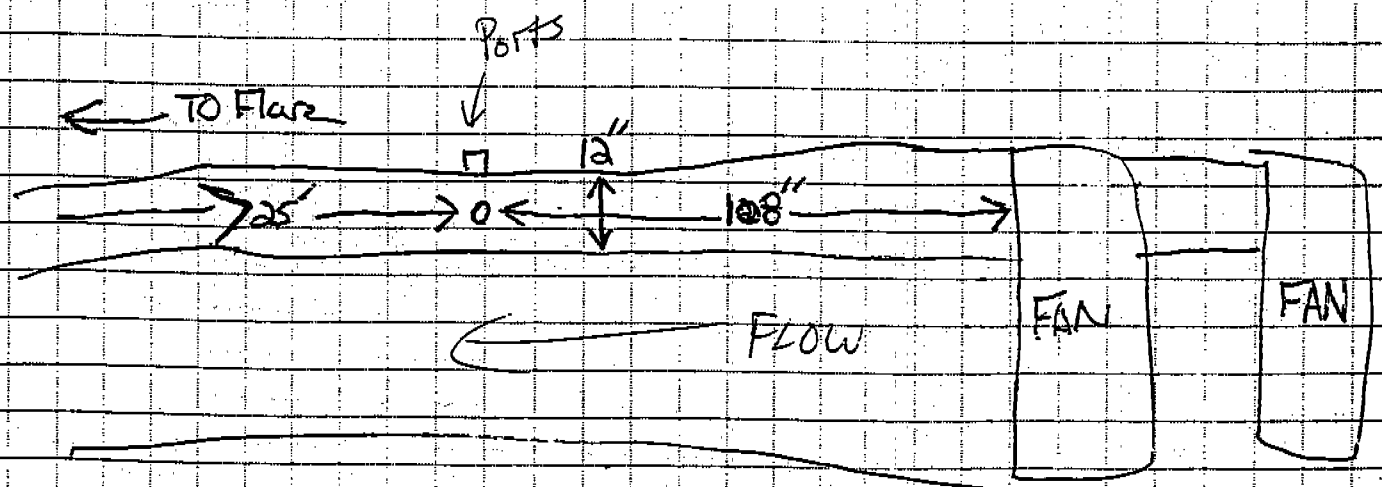
VELOCITY FIELD DATA BOOKS

10/9/96
ARS-6922
Inlet

AIR RECON/DIV.
OF RECON SYS. INC.
5 Johnson Drive P.O. Box 130
RARITAN, NEW JERSEY 08869-0130
(908) 526-1000 FAX (908) 526-7886

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

088



PRODUCT 204-1 NEBS Inc., Groton, Mass. 01471

PROBE MARKINGS - CIRCULAR STACK

STACK ID @ PORT 12" INCHES PORT EXTENSION 1.5" INCHES

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

EPA DISTANCE "A" >25 DIAMETERS EPA DISTANCE "B" 9 DIAMETERS 108"

TRAVERSE POINT NUMBER	LENGTH FACTOR FROM EPA MT. 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	4.4	0.53	2.03	2[illegible]"
2	14.6	1.75	3.25	3¼"
3	29.6	3.55	5.05	5"
4	70.4	8.45	9.95	10"
5	85.4	10.25	11.75	11¾"
6	95.6	11.47	12.97	13"
7				
8				
9				
10				
11				
12				

CIRCULAR STACK CROSS SECTIONAL AREA (CSA) = $\frac{0.785}{144}$ (ID^2) = $\frac{ID^2}{183.35}$ = 0.785 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 $d_e = \frac{2\,LW}{(L + W)}$ d_e =

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 = $\frac{L \times W}{144}$ = $\frac{(\quad ") \times (\quad ")}{144}$ = _____ FT^2

AirRECON
RARITAN, NJ

VELOCITY FIELD DATA SHEETS

COMPANY: LFG Specialities DATE: 10/9/96

SAMPLE LOCATION: Inlet BAROMETRIC PRESSURE: 29.73 "Hg

PITOT TUBE NO: std C_p: .99 STATIC PRESSURE PRE-/POST-TRAVERSE: +1.8, +1.8 "H_2O

RUN NO.: 1 RAC BOX NO.: 12 SAMPLE PUMP ID _____ THERMOCOUPLE #: _____

PRE-TEST TRAVERSE			POST-TEST TRAVERSE		
PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F	PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F
A1	0.09	87	A1	0.07	94
2	0.08	88	2	0.05	94
3	0.12	88	3	0.16	94
4	0.15	88	4	0.17	94
5	0.17	88	5	0.16	94
6	0.16	88	6	0.14	94
A1	0.12	88	B1	0.06	94
2	0.17	88	2	0.11	94
3	0.19	88	3	0.15	94
4	0.19	88	4	0.18	94
5	0.14	88	5	0.18	94
6	0.12	88	6	0.17	94

MOISTURE SAMPLING DATA

ICE DOWN IMPINGERS ✓

TIME	METER READING	INLET METER TEMPERATURE, °F	OUTLET METER TEMPERATURE, °F	VACUUM "Hg
	~~758.634~~			
1006	758.634	78	75	4
11		83	75	4
16		85	76	4
21		88	77	4
26		89	79	4
31		91	80	4
36		92	82	4
41		94	83	4
46		94	84	4
51		96	85	4
56		96	86	4
1101		98	87	4
06	794.667			

PRE-LEAK CHECK 0.000 @ 15" Hg POST-LEAK CHECK 0.000 @ 4" Hg DELTA H SETTING 1.0

MOISTURE DETERMINATION

SAMPLE LOCATION Inlet RUN NO. 1 DATE 10/9/96

		GRAMS		GRAMS
IMPINGER 1	FINAL WEIGHT	633.4	IMPINGER 1	0.2
	INITIAL WEIGHT	633.2		
	INCREASE			
IMPINGER 2	FINAL WEIGHT	596.5	IMPINGER 2	5.6
	INITIAL WEIGHT	590.9		
	INCREASE			
IMPINGER 3	FINAL WEIGHT	492.2	IMPINGER 3	1.4
	INITIAL WEIGHT	490.8		
	INCREASE			
SILICA GEL	FINAL WEIGHT	766.8	SILICA GEL	9.6
	INITIAL WEIGHT	757.2		
	INCREASE			

TOTAL MASS OF WATER CAUGHT 16.8 ✓ GRAMS

CALCULATIONS

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

$= 85.48\ (\quad) \sqrt{\dfrac{(\quad)}{(\quad)(\quad)}} \sqrt{\text{DELTA P}}$

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

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

ACFM = (V_s) (CSA) (60) = ( ) ( ) (60) = _____

VELOCITY @ Stp. V_s - std = V_s (17.71) $\dfrac{P_s}{T_s + 460} = \dfrac{(\quad)(17.71)(\quad)}{(\quad)} =$ _____ FT/SEC

SCFM = (V_s - std) (CSA) (60) = ( ) ( ) (60) = _____

DSCFM = $\dfrac{100 - \%H_2O}{100}$ (SCFM) = ( ) ( ) = _____

F-15/VEL.92

AirRECON
RARITAN, NJ

VELOCITY FIELD DATA SHEETS

COMPANY: LFG Specialities

DATE: 10/9/96

SAMPLE LOCATION: Inlet

BAROMETRIC PRESSURE: 29.72 "Hg

PITOT TUBE NO: Std C_p: .99

STATIC PRESSURE PRE-/POST-TRAVERSE: +1.8, +1.8 "H_2O

RUN NO.: 2 RAC BOX NO.: 12

SAMPLE PUMP ID _____ THERMOCOUPLE #: _____

PRE-TEST TRAVERSE			POST-TEST TRAVERSE		
PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F	PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F
A1	.07	94	A1	0.09	91
2	.15	94	2	0.13	92
3	.16	94	3	0.17	92
4	.17	94	4	0.19	92
5	.16	94	5	0.18	92
6	.14	94	6	0.14	92
B1	.06	94	B1	0.07	90
2	.11	94	2	0.11	91
3	.15	94	3	0.16	91
4	.18	94	4	0.17	92
5	.18	94	5	0.16	91
6	.17	94	6	0.15	91

AirRECC
RARITAN,

MOISTURE SAMPLING DATA

ICE DOWN IMPINGERS ✓

TIME	METER READING	INLET METER TEMPERATURE, °F	OUTLET METER TEMPERATURE, °F	VACUUM "Hg
1220	794.771	88	88	8
25		94	89	7
30		97	89	7
35		100	90	7
40		101	92	7
45		101	92	7
50		100	92	7
55		101	92	7
1300		102	93	7
05		101	93	7
10		99	92	7
15		98	91	7
1320	830.486			

PRE-LEAK CHECK 0.000@15" Hg POST-LEAK CHECK 0.000@7" Hg DELTA H SETTING 1.0

MOISTURE DETERMINATION

SAMPLE LOCATION Inlet RUN NO. 2 DATE 10/9/96

		GRAMS		GRAMS
IMPINGER 1	FINAL WEIGHT	574.5	IMPINGER 1	2.5
	INITIAL WEIGHT	572.0		
	INCREASE			
IMPINGER 2	FINAL WEIGHT	535.2	IMPINGER 2	1.0
	INITIAL WEIGHT	534.2		
	INCREASE			
IMPINGER 3	FINAL WEIGHT		IMPINGER 3	
	INITIAL WEIGHT			
	INCREASE			
SILICA GEL	FINAL WEIGHT	705.6	SILICA GEL	10.1
	INITIAL WEIGHT	695.5		
	INCREASE			

TOTAL MASS OF WATER CAUGHT 13.6 GRAMS

CALCULATIONS

VELOCITY (ACTUAL) IN STACK

$$= 85.48\ (C_p) \sqrt{\frac{T_s + 460}{P_s\ (MW)}} \sqrt{\text{DELTA P}}$$

$$= 85.48\ (\quad) \sqrt{\frac{(\quad)}{(\quad)(\quad)}} \sqrt{\text{DELTA P}}$$

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

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

$$\text{ACFM} = (V_s)\ (\text{CSA})\ (60) = (\quad)\ (\quad)\ (60) = \_\_\_\_\_$$

$$\text{VELOCITY @ Stp. } V_s\text{ - std} = V_s\ (17.71)\ \frac{P_s}{T_s + 460} = \frac{(\quad)(17.71)(\quad)}{(\quad)} = \_\_\_\_\_ \text{ FT/SEC}$$

$$\text{SCFM} = (V_s\text{ - std})\ (\text{CSA})\ (60) = (\quad)\ (\quad)\ (60) = \_\_\_\_\_$$

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

VELOCITY FIELD DATA SHEETS

COMPANY: LFG Specialities

DATE: 10/9/96

SAMPLE LOCATION: Inlet

BAROMETRIC PRESSURE: 29.72 "Hg

PITOT TUBE NO: std C_p: .99

STATIC PRESSURE PRE-/POST-TRAVERSE: +1.8, +1.8 "H_2O

RUN NO.: 3 RAC BOX NO.: 12

SAMPLE PUMP ID _____ THERMOCOUPLE #: _____

PRE-TEST TRAVERSE			POST-TEST TRAVERSE		
PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F	PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F
A1	0.09	91	A1	0.07	92
2	0.13	92	2	0.11	92
3	0.17	92	3	0.16	92
4	0.19	92	4	0.17	92
5	0.18	92	5	0.17	92
6	0.14	92	6	0.14	92
B1	0.07	90	B1	0.06	92
2	0.11	91	2	0.12	92
3	0.16	91	3	0.16	92
4	0.17	92	4	0.16	92
5	0.16	91	5	0.17	92
6	0.15	91	6	0.15	92

HYDROCARBON SAMPLING DATA

SAMPLE LOCATION Inlet RUN NO. 3 DATE 10/9/96

___ ICE DOWN IMPINGERS

097

PUMP CALIBRATION FLOW RATE		CALIBRATION INSTRUMENT
FLOW RATE LITERS/MIN	ROTAMETER SETTING	___ SOAP FILM BURET ___ DRY GAS METER ___ OTHER ___

TIME	°F GAS METER TEMPERATURE	METER VOLUME CORRECTION
		CORRECTING ROTAMETER 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 ROTAMETER (L/m)
		T_{STD} = 70°F + 460°F = 530°F
		P_{STD} = 29.92"HG
		P_M = BAROMETRIC PRESSURE DURING SAMPLING ("HG)
		T_M = AVG. TEMPERATURE OF GAS STREAM (+460°F)
		V_{STD} = $\times \frac{(\quad)}{(\quad)} \times \frac{(530)}{(29.92)}$ = ___
		CFH = V_{STD} (L/MIN) (3.53 X 10^{-2} CF/L) (60 MIN/1 HR) = ( ) (3.53 X 10^{-2}) (60)
		= CFH

PRE-LEAK CHECK ___ POST-LEAK CHECK ___

✓ ICE DOWN IMPINGERS

MOISTURE SAMPLING DATA

TIME	METER READING	INLET GAS METER TEMPERATURE, °F	OUTLET GAS METER TEMPERATURE, °F	VACUUM "Hg
1405	830.620	82	80	3
10		85	81	3
15		89	81	3
20		89	81	3
25		92	82	3
30		92	84	3
35	stopped 848.422	92	84	3
45	start 848.422	85	82	3
50		87	82	3
55		87	81	3
1500		88	81	3
05		90	81	3
10		93	83	3
1515	867.090			

PRE-LEAK CHECK 0.000 16" Hg POST-LEAK CHECK 0.000 3" Hg DELTA H SETTING 1.8

MOISTURE DETERMINATION

SAMPLE LOCATION Inlet RUN NO. 3 DATE 10/9/96

		GRAMS		GRAMS
IMPINGER 1	FINAL WEIGHT	638.2	IMPINGER 1	4.8
	INITIAL WEIGHT	633.4		
	INCREASE			
IMPINGER 2	FINAL WEIGHT	597.9	IMPINGER 2	1.4
	INITIAL WEIGHT	596.5		
	INCREASE			
IMPINGER 3	FINAL WEIGHT	492.8	IMPINGER 3	0.6
	INITIAL WEIGHT	492.2		
	INCREASE			
SILICA GEL	FINAL WEIGHT	713.2	SILICA GEL	7.6
	INITIAL WEIGHT	705.6		
	INCREASE			

TOTAL MASS OF WATER CAUGHT 14.4 ✓ GRAMS

CALCULATIONS

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

$= 85.48\ (\quad) \sqrt{\dfrac{(\quad)}{(\quad)(\quad)}} \sqrt{\text{DELTA P}}$

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

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

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

VELOCITY @ Stp. V_s - std $= V_s\ (17.71)\ \dfrac{P_s}{T_s + 460} = \dfrac{(\quad)(17.71)(\quad)}{(\quad)} =$ _____ FT/SEC

$SCFM = (V_s - std)\ (CSA)\ (60) = (\quad)(\quad)(60) =$ _____

$DSCFM = \dfrac{100 - \%H_2O}{100}\ (SCFM) = (\quad)(\quad) =$ _____

AirRecon
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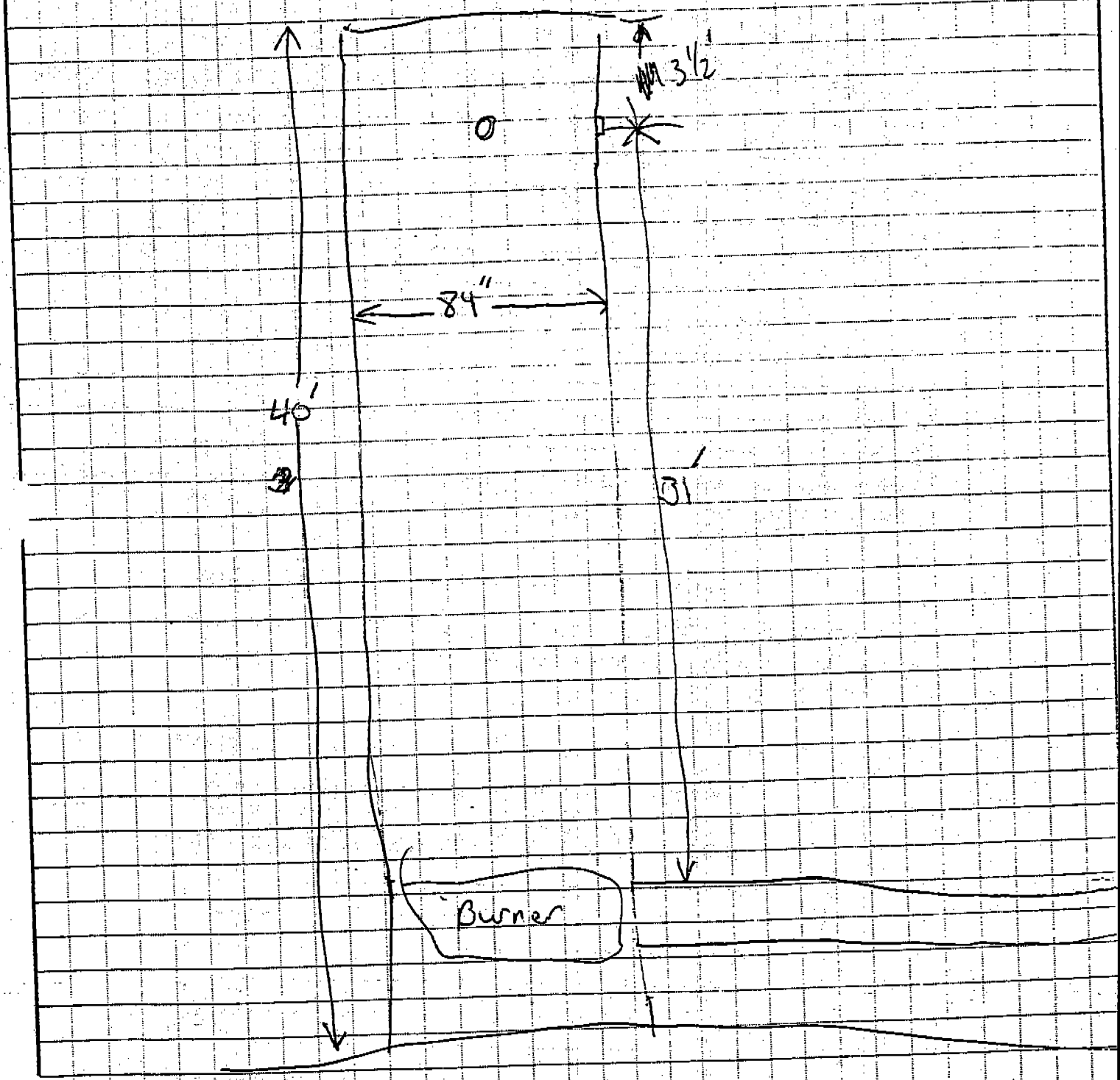
VELOCITY FIELD DATA BOOKS

10/9/96
AR5-6922
Outlet

AIR RECON/DIV.
OF RECON SYS. INC.
5 Johnson Drive P.O. Box 130
RARITAN, NEW JERSEY 08869-0130
(908) 526-1000 FAX (908) 526-7886

JOB
SHEET NO. OF
CALCULATED BY DATE 100
CHECKED BY DATE
SCALE



PROBE MARKINGS - CIRCULAR STACK

STACK ID @ PORT 84" INCHES PORT EXTENSION 0" INCHES

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

EPA DISTANCE "A" 0.5 DIAMETERS EPA DISTANCE "B" 4.4 DIAMETERS

TRAVERSE POINT NUMBER	LENGTH FACTOR FROM EPA M1, TABLE 1-2	PRODUCT OF LENGTH FACTOR TIMES STACK INSIDE DIAMETER (INCHES) K_c X (STACK ID)	SUM OF PREVIOUS COLUMN AND PORT EXTENSION (INCHES) K_c X (STACK ID)+ PORT EXTENSION	CONVERT PREVIOUS COLUMN TO INCHES AND COMMON FRACTIONS
1	3.2	2.69		2 3/4
2	10.5	8.82		8 3/4
3	19.4	16.30		16 1/4
4	32.3	27.13		27 1/4
5	67.7	56.87		56 3/4
6	80.6	67.70		67 3/4
7	89.5	75.18		75 1/4
8	96.8	81.31		81 1/4
9				
10				
11				
12				

CIRCULAR STACK CROSS SECTIONAL AREA (CSA) = $\frac{0.785}{144}$ (ID^2) = $\frac{ID^2}{183.35}$ = 38.484 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 $d_e = \frac{2LW}{(L + W)}$ d_e =

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 = $\frac{L \times W}{144}$ = $\frac{(\quad ") \times (\quad ")}{144}$ = _____ FT^2

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PRELIMINARY DATA

COMPANY: LFG Specialities

SAMPLE LOCATION: Outlet

DATE: 10/9/96

PITOT TUBE NO. 8

PITOT TUBE LINES LEAK CHECK ✓

C_p ✓

ESTIMATED MOISTURE (%) 10

LEVEL AND ZERO MANOMETER ✓

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, "H_2O	STACK TEMPERATURE (°F)
A1	2	0.005	1392
2	4	0.01	1451
3	8	0.02	1511
4	5	0.02	1521
5	2	0.02	1482
6	0	0.01	1479
7	4	0.01	1460
8	2	0.005	1455
B1	0	0.005	1400
2	3	0.005	1421
3	5	0.01	1484
4	2	0.005	1505
5	6	0.005	1521
6	8	0.01	1490
7	6	0.02	1482
8	5	0.02	1461
	AVG.	AVG.	AVG.

AVERAGE ANGLE MUST BE <20 DEGREES

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RARITAN, NJ

F-15/VEL.92

VELOCITY FIELD DATA SHEETS

COMPANY: LFG Specialties

DATE: 10/9/96

SAMPLE LOCATION: Outlet

BAROMETRIC PRESSURE: 29.73 "Hg

PITOT TUBE NO: 8 C_p: _____

STATIC PRESSURE PRE-/POST-TRAVERSE: -0.06/-0.06 "H_2O

RUN NO.: 1 RAC BOX NO.: 8

SAMPLE PUMP ID _____ THERMOCOUPLE #: _____

PRE-TEST TRAVERSE			POST-TEST TRAVERSE		
PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F	PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F
A1	0.005	1392	A1	0.01	1387
2	0.01	1451	2	0.02	1492
3	0.02	1511	3	0.025	1513
4	0.02	1521	4	0.025	1501
5	0.02	1482	5	0.02	1485
6	0.01	1479	6	0.02	1469
7	0.01	1460	7	0.02	1450
8	0.005	1455	8	0.015	1444
B1	0.005	1400	B1	0.01	1401
2	0.005	1421	2	0.01	1481
3	0.01	1484	3	0.015	1501
4	0.005	1505	4	0.015	1521
5	0.005	1521	5	0.02	1472
6	0.01	1490	6	0.025	1462
7	0.02	1482	7	0.03	1460
8	0.02	1461	8	0.03	1451

AirREC
RARITAN,

F-15/VEL.92

MOISTURE SAMPLING DATA

ICE DOWN IMPINGERS ✓

TIME	METER READING	INLET METER TEMPERATURE, °F	OUTLET METER TEMPERATURE, °F	VACUUM "Hg
1006	414.200	57	70	1
11		65	70	1
16		65	70	1
21		67	70	1
26		75	70	1
31		78	70	1
36		82	72	1
41		85	74	1
46		88	75	1
51		90	76	1
56		92	78	1
1101		93	80	1
1106	445.845			

PRE-LEAK CHECK 0.000 @ 15" Hg POST-LEAK CHECK 0.000 @ 3" Hg DELTA H SETTING 1.0

MOISTURE DETERMINATION

SAMPLE LOCATION Outlet RUN NO. 1 DATE 10/9/96

		GRAMS		GRAMS
IMPINGER 1	FINAL WEIGHT	562.9	IMPINGER 1	27.5
	INITIAL WEIGHT	535.4		
	INCREASE			
IMPINGER 2	FINAL WEIGHT	573.2	IMPINGER 2	1.9
	INITIAL WEIGHT	571.3		
	INCREASE			
IMPINGER 3	FINAL WEIGHT	503.2	IMPINGER 3	0.9
	INITIAL WEIGHT	502.3		
	INCREASE			
SILICA GEL	FINAL WEIGHT	708.5	SILICA GEL	8.5
	INITIAL WEIGHT	700.0		
	INCREASE			

TOTAL MASS OF WATER CAUGHT 38.8 ✓ GRAMS

CALCULATIONS

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

$= 85.48\ (\quad)\ \sqrt{\dfrac{(\quad)}{(\quad)(\quad)}}\ \sqrt{\text{DELTA P}}$

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

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

ACFM = (V_s) (CSA) (60) = ( ) ( ) (60) = _____

VELOCITY @ Stp. V_s - std = $V_s\ (17.71)\ \dfrac{P_s}{T_s + 460} = \dfrac{(\quad)(17.71)(\quad)}{(\quad)} =$ _____ FT/SEC

SCFM = (V_s - std) (CSA) (60) = ( ) ( ) (60) = _____

DSCFM = $\dfrac{100 - \%H_2O}{100}$ (SCFM) = ( ) ( ) = _____

F-15/VEL.92

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RARITAN, N.

VELOCITY FIELD DATA SHEETS

COMPANY: LFG Specialities

DATE: 10/9/96

SAMPLE LOCATION: Outlet

BAROMETRIC PRESSURE: 29.72 "Hg

PITOT TUBE NO: 8 C_p: _____

STATIC PRESSURE PRE-/POST-TRAVERSE: 0.06/0.06 "H_2O

RUN NO.: 2 RAC BOX NO.: 8

SAMPLE PUMP ID _____ THERMOCOUPLE #: _____

PRE-TEST TRAVERSE			POST-TEST TRAVERSE		
PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F	PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F
A1	0.01	1387	A1	0.005	1469 1462
2	0.02	1492	2	0.005	1492 1493
3	0.025	1513	3	0.01 ~~0.005~~	1521 1505
4	0.025	1501	4	0.01~~8~~	1517 1521
5	0.02	1485	5	0.02	1500 1499
6	0.02	1469	6	0.025	1505 1501
7	0.02	1450	7	0.025	1481 1482
8	0.015	1444	8	0.02~~0~~	1481 1473
B1	0.01	1406	B1	0.005	1483 1472
2	0.01	1481	2	0.005	1490 1498
3	0.015	1501	3	0.015	1510 1505
4	0.015	1521	4	0.02~~0~~	1530 1521
5	0.02	1472	5	0.01~~8~~	1500 1510
6	0.025	1462	6	0.005	1499 1498
7	0.03	1460	7	0.005	1493 1489
8	0.03	1451	8	0.005	1490 1489

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F-15/VEL.92

MOISTURE SAMPLING DATA

ICE DOWN IMPINGERS ✓

TIME	METER READING	INLET METER TEMPERATURE, °F	OUTLET METER TEMPERATURE, °F	VACUUM "Hg
1220	445.952	80	82	5
25		87	82	5
30		86	82	5
35		91	83	5
40		91	84	5
45		92	84	5
50		92	85	5
55		93	82	5
1300		96	86	5
05		96	87	5
10		95	86	5
15		94	87	5
1320	478.259			

PRE-LEAK CHECK 0.002@15" Hg POST-LEAK CHECK 0.000@5" Hg DELTA H SETTING 1.0

MOISTURE DETERMINATION

SAMPLE LOCATION Outlet RUN NO. 2 DATE 10/9/96

	GRAMS		GRAMS
IMPINGER 1	FINAL WEIGHT 623.8 INITIAL WEIGHT 571.4 INCREASE	IMPINGER 1	52.4
IMPINGER 2	FINAL WEIGHT 581.6 INITIAL WEIGHT 579.0 INCREASE	IMPINGER 2	2.6
IMPINGER 3	FINAL WEIGHT 475.9 INITIAL WEIGHT 474.8 INCREASE	IMPINGER 3	1.1
SILICA GEL	FINAL WEIGHT 822.3 INITIAL WEIGHT 814.7 INCREASE	SILICA GEL	7.6
		TOTAL MASS OF WATER CAUGHT	63.7 ✓ GRAMS

CALCULATIONS

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

$= 85.48\ (\quad) \sqrt{\dfrac{(\quad)}{(\quad)(\quad)}} \sqrt{\text{DELTA P}}$

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

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

ACFM = (V_s) (CSA) (60) = ( ) ( ) (60) = _____

VELOCITY @ Stp. V_s - std = $V_s\ (17.71)\ \dfrac{P_s}{T_s + 460} = \dfrac{(\quad)(17.71)(\quad)}{(\quad)} =$ _____ FT/SEC

SCFM = (V_s - std) (CSA) (60) = ( ) ( ) (60) = _____

DSCFM = $\dfrac{100 - \%H_2O}{100}$ (SCFM) = ( ) ( ) = _____

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VELOCITY FIELD DATA SHEETS

COMPANY: LFG Specialities

DATE: 10/9/96

SAMPLE LOCATION: Outlet

BAROMETRIC PRESSURE: 29.72 "Hg

PITOT TUBE NO: 8 C_p: _____

STATIC PRESSURE PRE-/POST-TRAVERSE: 0.06 / 0.06 H_2O

RUN NO.: 3 RAC BOX NO.: 8

SAMPLE PUMP ID _____ THERMOCOUPLE #: _____

PRE-TEST TRAVERSE			POST-TEST TRAVERSE		
PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F	PORT/POINT	PITOT TUBE DELTA P "H_2O	STACK TEMPERATURE °F
A1	0.005	1462	A1	0.005	1469
2	0.005	1493	2	0.005	1492
3	0.01	1505	3	0.005	1521
4	0.01	1521	4	0.015	1517
5	0.02	1499	5	0.02	1500
6	0.025	1501	6	0.03	1505
7	0.025	1482	7	0.02	1481
8	0.02	1473	8	0.015	1481
B1	0.005	1472	B1	0.01	1483
2	0.005	1498	2	0.01	1490
3	0.015	1505	3	0.01	1510
4	0.02	1521	4	0.015	1530
5	0.01	1510	5	0.015	1500
6	0.005	1498	6	0.005	1499
7	0.005	1489	7	0.005	1493
8	0.005	1489	8	0.005	1490

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HYDROCARBON SAMPLING DATA

SAMPLE LOCATION Outlet RUN NO. 3 DATE 10/9/92

____ ICE DOWN IMPINGERS

110

PUMP CALIBRATION FLOW RATE		CALIBRATION INSTRUMENT
FLOW RATE LITERS/MIN	ROTAMETER SETTING	____ SOAP FILM BURET ____ DRY GAS METER ____ OTHER ____

TIME	°F GAS METER TEMPERATURE

METER VOLUME CORRECTION

CORRECTING ROTAMETER 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 ROTAMETER (L/m)

T_{STD} = 70°F + 460°F = 530°F

P_{STD} = 29.92"HG

P_M = BAROMETRIC PRESSURE DURING SAMPLING ("HG)

T_M = AVG. TEMPERATURE OF GAS STREAM (+460°F)

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

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

= CFH

PRE-LEAK CHECK ____ POST-LEAK CHECK ____

✓ ICE DOWN IMPINGERS

MOISTURE SAMPLING DATA

TIME	METER READING	INLET GAS METER TEMPERATURE, °F	OUTLET GAS METER TEMPERATURE, °F	VACUUM "Hg
1405	478.411	78	80	8
10		80	80	8
15		85	80	8
20		87	80	8
25		91	81	8
30		91	82	8
35	stopped 493.305	84	82	9
45	493.305	85	81	9
50		91	81	9
55		91	81	9
1500		91	81	9
05		95	82	10
10		97	84	10
1515	510.585			

PRE-LEAK CHECK 0.000 @ 15" Hg POST-LEAK CHECK 0.000 @ 10" Hg DELTA H SETTING 1.0

AirRECON/RARITAN,

F-14/HC.92

MOISTURE DETERMINATION

SAMPLE LOCATION Outlet RUN NO. 3 DATE 10/9/96

		GRAMS		GRAMS
IMPINGER 1	FINAL WEIGHT	672.5	IMPINGER 1	48.7
	INITIAL WEIGHT	623.8		
	INCREASE			
IMPINGER 2	FINAL WEIGHT	583.3	IMPINGER 2	1.7
	INITIAL WEIGHT	581.6		
	INCREASE			
IMPINGER 3	FINAL WEIGHT	476.1	IMPINGER 3	0.2
	INITIAL WEIGHT	475.9		
	INCREASE			
SILICA GEL	FINAL WEIGHT	830.6	SILICA GEL	8.3
	INITIAL WEIGHT	822.3		
	INCREASE			

TOTAL MASS OF WATER CAUGHT 58.9 ✓ GRAMS

CALCULATIONS

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

$= 85.48\ (\quad) \sqrt{\dfrac{(\quad)}{(\quad)\ (\quad)}} \sqrt{\text{DELTA P}}$

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

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

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

VELOCITY @ Stp. V_s - std $= V_s\ (17.71)\ \dfrac{P_s}{T_s + 460} = \dfrac{(\quad)(17.71)(\quad)}{(\quad)} =$ _____ FT/SEC

$SCFM = (V_s - std)\ (CSA)\ (60) = (\quad)\ (\quad)\ (60) =$ _____

$DSCFM = \dfrac{100 - \%H_2O}{100}\ (SCFM) = (\quad)\ (\quad) =$ _____

F-15/VEL.92

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APPENDIX V

CALIBRATION DATA & CYLINDER GAS CERTIFICATES

NOx Monitor Converter Efficiency Check Summary

Project Name:	LFG Specialties
Sample Location:	Bethlehem Landfill
Emission Source(s):	Enclosed Ground Flare Outlet
AirRECON Project No.:	AR5-6922
NOx Monitor Make and Model No.:	Thermo-Environmental Model 10
NOx Monitor Serial Number:	10AR-13695-140
C.E. Check Date:	October 9, 1996

Input Data

Conc. of NOx standard added to 1:1 Mixture (ppmv,dry):	171.2
Conc. of O2 standard added to 1:1 Mixture (% by vol.):	20.92
Converter Efficiency Check Start Time:	07:15
Converter Efficiency Check End Time:	07:45
Time of Peak NOx Concentration:	07:27
NOx Concentration at Peak Time (ppmv,dry) [A]:	110.8
NOx Concentration at C.E. Completion (ppmv,dry) [B]:	110.1

Output Data

Abs. Diff. From Peak Response to End Response (ppmv,dry):	0.7
Converter Efficiency (% of Peak Response) [CE]:	0.6

Method-20, Sect. 5.6.1 Conformance

Converter Efficiency [CE] Is Less Than 2.0 %, Therefore Monitor Passes

This Spreadsheet Uses The Following Calculations/Equations:

Absolute Difference = |A − B|

CE = (|A − B| \ A) x 100

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METERING SYSTEM CALIBRATION DATA SHEET
FOR CALIBRTION AFTER USE

SYSTEM ID NO: 8 DATE: 10/10/96 BY DPF

FIELD METER S/N: 600833 STD. MTR. S/N: 5175176

INTERMEDIATE DELTA H 1.0 INCHES H_2O, MAX. VACUUM 10 INCHES Hg

BAROMETRIC PRESSURE 29.72 INCHES Hg = Pb

LEAK CHECK 0.000 CFM a 25 INCHES Hg and PRESSURE CHECK ok

RUN NO.		STD DRY GAS METER V_s ft^3	FIELD DRY GAS METER V_f ft^3	STD METER t_s °F	FIELD METER IN t_i °F	FIELD METER OUT t_o °F	FIELD METER AVG t_f °F	TIME θ MIN	DGM CALIB FACTOR Y NO UNITS
	F	850.605	516.263						
	I	845.405	511.135	68	63	62	62.5	10	1.00
1	D	5.200	5.128						
	F	856.110	521.722						
	I	850.605	516.263	69	84	70	77	10.5	1.02
2	D	5.505	5.459						
	F	861.208	526.827						
	I	856.110	521.722	69	85	71	78	10	1.01
3	D	5.098	5.105						

* FINAL, INITIAL & DIFFERENCE VOLUMES

AVG. 1.01 **

**IF THE VALUE HAS CHANGED MORE THAN FIVE PERCENT FROM PREVIOUS VALUES REFER TO U.S. EPA METHOD 5, PARAGRAPH 5.3.2.

$$Y = \frac{V_s P_b (t_f + 460)}{V_f \left(P_b + \frac{\text{DELTA H}}{13.6} \right) (t_s + 460)}$$

(SEE US EPA METHOD 5, PARAGRAPH 5.3 & 7.1)

L-32 AFTER (2.2.90) (AND ADD TO M-137)

AirRecon

5 Johnson Drive, P.O. Box 130
Raritan, NJ 08869-0130
(908) 526-1000
FAX (908) 526-7887

METERING SYSTEM CALIBRATION DATA SHEET
FOR CALIBRTION PRIOR TO USE

SYSTEM ID NO: 8 DATE: 10·10·95 BY NSK

FIELD METER S/N: 600833 STD. METER S/N: J175176

BAROMETRIC PRESSURE 30.26 INCHES Hg = Pb

LEAK CHECK 0.000 CFM @ 26 INCHES Hg and PRESSURE CHECK OK

ORIFICE MANOMETER DELTA H in H_2O		STD DRY GAS METER V_s ft^3	FIELD DRY GAS METER V_f ft^3	STD METER t_s °F	FIELD METER IN t_i °F	FIELD METER OUT t_o °F	FIELD METER AVG t_f °F	TIME θ MIN	DGM CALIB FACTOR Y NO UNITS **	ORIFICE CALIB FACTOR DELTA H @ in H_2O ***
0.5	* F	728.453	704.560	64	78	72	75	13	0.97	1.66
	I	723.431	699.326							
	D	5.022	5.234							
1.0	F	734.696	711.117	64	88	76	82	9.75	0.98	1.87
	I	729.546	705.702							
	D	5.150	5.415							
2.0	F	742.312	719.127	64	88	80	84	9.00	0.98	1.96
	I	735.749	712.217							
	D	6.563	6.910							
3.0	F	747.838	724.914	64	88	82	85	5.50	0.98	1.88
	I	742.818	719.650							
	D	5.020	5.264							
4.0	F	753.915	731.256	64	88	82	85	4.5	0.99	1.65
	I	748.822	725.946							
	D	5.093	5.310							
								AVG	0.98	1.80

* FINAL, INITIAL & DIFFERENCE VOLUMES

**INDIVIDUAL VALUES MAY VARY BY ±0.02 FROM AVG.
***INDIVIDUAL VALUES MAY VARY BY ±0.20 FROM AVG.

$$Y = \frac{V_s P_b (t_f + 460)}{V_f \left(P_b + \frac{\text{DELTA H}}{13.6}\right)(t_s + 460)}$$

$$\text{DELTA H @} = \left[\frac{0.0317 \text{ DELTA H}}{P_b (t_o + 460)}\right] \left(\frac{(t_s + 460)\,\theta}{V_s}\right)^2$$

(SEE US EPA METHOD 5, PARAGRAPH 5.3 & 7.1)

AirRecon
5 Johnson Drive, P.O. Box 130
Raritan, NJ 08869-0130
(908) 526-1000
FAX (908) 526-7887

METERING SYSTEM CALIBRATION DATA SHEET
FOR CALIBRTION AFTER USE

SYSTEM ID NO: 12 DATE: 10/10/96 BY DPF

FIELD METER S/N: J175176 STD. MTR. S/N: 300301

INTERMEDIATE DELTA H 1.0 INCHES H_2O, MAX. VACUUM 8 INCHES Hg

BAROMETRIC PRESSURE 29.72 INCHES Hg = Pb

LEAK CHECK 0.000 CFM @ 24 INCHES Hg and PRESSURE CHECK OK

RUN NO.		STD DRY GAS METER V_s ft^3	FIELD DRY GAS METER V_f ft^3	STD METER t_s °F	FIELD METER IN t_i °F	FIELD METER OUT t_o °F	FIELD METER AVG t_f °F	TIME θ MIN	DGM CALIB FACTOR Y NO UNITS
	F	834.333	873.010						
	I	829.207	867.834	65	64	62	63	8	0.98
1	D	5.126	5.176						
	F	839.805	878.555						
	I	834.333	873.010	66	70	69	69.5	8	0.99
2	D	5.472	5.545						
	F	844.909	883.772						
	I	839.805	878.555	67	74	71	72.5	8	0.99
	D	5.104	5.217						

* FINAL, INITIAL & DIFFERENCE VOLUMES

AVG. 0.99 **

**IF THE VALUE HAS CHANGED MORE THAN FIVE PERCENT FROM PREVIOUS VALUES REFER TO U.S. EPA METHOD 5, PARAGRAPH 5.3.2.

$$Y = \frac{V_s P_b (t_f + 460)}{V_f \left(P_b + \frac{\text{DELTA H}}{13.6} \right) (t_s + 460)}$$

(SEE US EPA METHOD 5, PARAGRAPH 5.3 & 7.1)

AirRecon
5 Johnson Drive, P.O. Box 130
Raritan, NJ 08869-0130
(908) 526-1000
FAX (908) 526-7887

METERING SYSTEM CALIBRATION DATA SHEET
FOR CALIBRTION PRIOR TO USE

SYSTEM ID NO: 12 DATE: 8.7.96 BY NSK

FIELD METER S/N: 300301 STD. METER S/N: 175176

BAROMETRIC PRESSURE 30.23 INCHES Hg = Pb

LEAK CHECK 0.000 CFM @ 26 INCHES Hg and PRESSURE CHECK OK

ORIFICE MANOMETER DELTA H in H_2O		STD DRY GAS METER V_{s3} ft^3	FIELD DRY GAS METER V_{f3} ft^3	STD METER t_s °F	FIELD METER IN t_i °F	FIELD METER OUT t_o °F	FIELD METER AVG t_f °F	TIME θ MIN	DGM CALIB FACTOR Y NO UNITS **	ORIFICE CALIB FACTOR DELTA H @ in H_2O ***
0.5	* F	331.354	215.613	76	82	82	82	15	1.01	1.45
	I	325.018	209.259							
	D	6.336	6.354							
1.0	F	336.818	221.125	76	85	83	84	8½	1.04	1.54
	I	331.758	216.016							
	D	5.060	5.109							
2.0	F	324.325	208.589	76	82	82	82	6.75	1.00	1.80
	I	319.074	203.290							
	D	5.251	5.279							
3.0	F	343.532	227.928	76	89	84	87	5.75	1.00	1.73
	I	337.930	222.252							
	D	5.602	5.676							
4.0	F	350.365	234.841	76	85	84	85	5.0	1.00	1.68
	I	344.635	229.043							
	D	5.730	5.798							
								AVG	1.01	1.64

* FINAL, INITIAL & DIFFERENCE VOLUMES

**INDIVIDUAL VALUES MAY VARY BY ±0.02 FROM AVG.
***INDIVIDUAL VALUES MAY VARY BY ±0.20 FROM AVG.

$$Y = \frac{V_s P_b (t_f + 460)}{V_f \left(P_b + \frac{\text{DELTA H}}{13.6}\right)(t_s + 460)}$$

$$\text{DELTA H @} = \left[\frac{0.0317 \text{ DELTA H}}{P_b (t_o + 460)}\right] \left(\frac{(t_s + 460)\,\theta}{V_s}\right)^2$$

(SEE US EPA METHOD 5, PARAGRAPH 5.3 & 7.1)

L-32 PRIOR (2.2.90) (AND ADD TO M-137)

AirRecon®
Division of
RECON Environmental Corp.
Raritan, NJ 08869-0130

PITOT TUBE CALIBRATION

Pitot tube calibration number 8 Date 8/16/95
Calibrated by DPF
Effective length 103"

____ Standard value option (yes/no)
Baseline coefficient values of 0.84 assigned. Pitot meets all specifications of 40 CFR, Part 60, App. A, Method 2.

A Side Calibration

Run No.	Δ Pstd cm H_2O (in. H_2O)	Δ Ps cm H_2O (in. H_2O)	Cp(s)	Deviation Cp(s) - $\bar{C}p(A)$
1	0.72	0.97	0.85	0.00
2	0.39	0.53	0.85	0.00
3	0.25	0.35	0.84	-0.01
		$\bar{C}p$(side A)	0.85	δ= 0.003 *

B Side Calibration

Run No.	Δ Pstd cm H_2O (in. H_2O)	Δ Ps cm H_2O (in. H_2O)	Cp(s)	Deviation Cp(s) - $\bar{C}p(B)$
1	0.72	0.99	0.84	0.00
2	0.39	0.54	0.84	0.00
3	0.25	0.35	0.84	0.00
		$\bar{C}p$(side B)	0.84	δ= 0.00 *

Cp (A) - Cp (B) = -0.01 *

Figure 4-10. Pitot tube calibration data.

*VALUE MUST BE ≤ ± 0.01

SPECTRA GASES

277 Coit St. • Irvington, NJ 07111 USA Tel.: (201) 372-2060 • (800) 932-0624 • Fax: (201) 372-8551

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G1

SHIPPED FROM: 80 INDUSTRIAL DRIVE
ALPHA, NJ. 08865

TEL:(908)454-7455 FAX:(908)454-7784

CUSTOMER: AIR RECON
SGI ORDER # : 117993
ITEM# : 1
P.O.# : 23859

CYLINDER # : CC63190
CYLINDER PRES: 2000 PSIG
CGA OUTLET: 590

CERTIFICATION DATE: 5/24/96
EXPIRATION DATE: 5/24/99

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
OXYGEN	5/24/96	11.0 %	11.0 %	+/- 1%

BALANCE NITROGEN

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
OXYGEN	SRM2659A	CLM006747	20.72%

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE
OXYGEN	HORIBA-MPA510	570694081	PM	5/24/96

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: Ted Neeme
TED NEEME

DATE: 5-24-96

215-691-2474
FAX# 215-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

120

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER RECON SYSTEMS

P.O NUMBER

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
OXYGEN 21.09% GMIS VS.	2659A	FF-27650	20.71%

ANALYZER READINGS

R=REFERENCE STANDARD Z=ZERO GAS C=GAS CANDIDATE

1. COMPONENT OXYGEN 21.09% GMIS VS. ANALYZER MAKE-MODEL-S/N SYBRON SERVOMEX 244A 244/701/953

ANALYTICAL PRINCIPLE PARAMAGNETIC LAST CALIBRATION DATE 11/30/93

FIRST ANALYSIS DATE 1-31-94 SECOND ANALYSIS DATE

Z	0	R	21.09	C	20.93	CONC.	20.93	Z		R		C	CONC.
R	21.14	Z	0.02	C	20.96	CONC.	20.91	R		Z		C	CONC.
Z	0.01	C	20.95	R	21.12	CONC.	20.92	Z		C		R	CONC.
U/M	VOLTS				MEAN TEST ASSAY		20.92	U/M	VOLTS			MEAN TEST ASSAY	

THIS CYLINDER NO. SA10687
HAS BEEN CERTIFIED ACCORDING TO SECTION 3.0.4
OF TRACEABILITY PROTOCOL NO. 1
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 2000 PSIG
CERTIFICATION DATE 1/31/94
EXPIRATION DATE 1/31/97

CERTIFIED CONCENTRATION

OXYGEN	20.92%
NITROGEN	BALANCE

ANALYZED BY ROBERT HILLARD

CERTIFIED BY STEPHEN POLLACK

SPECTRA GASES

277 Coit St. • Irvington, NJ 07111 USA Tel.: (201) 372-2060 • (800) 932-0624 • Fax: (201) 372-8551

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G2

SHIPPED FROM: 80 INDUSTRIAL DRIVE
ALPHA, NJ. 08865

TEL:(908)454-7455 FAX:(908)454-7784

CUSTOMER: AIR RECON
SGI ORDER # : 115333
ITEM# : 1
P.O.# : 26126

CYLINDER # : CC53295
CYLINDER PRES: 1900 PSIG
CGA OUTLET: 580

CERTIFICATION DATE: 12/4/95
EXPIRATION DATE: 12/4/98

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
CARBON DIOXIDE	12/4/95	10.0%	10.0%	+/- 2%

BALANCE NITROGEN

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
CARBON DIOXIDE	SRM1675B	CLM006352	14.010%

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE
CARBON DIOXIDE	HORIBA-VIA510	571417045	NDIR	11/22/95

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: Ted Neeme
TED NEEME

DATE: 12-4-95

610-691-2474
FAX# 610-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER RECON SYSTEMS

P.O NUMBER 27480

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON DIOXIDE 14.22% GMIS VS.	1675B	FF28127	14.04%

ANALYZER READINGS

R=REFERENCE STANDARD Z=ZERO GAS C=GAS CANDIDATE

1. COMPONENT CARBON DIOXIDE 14.22% GMIS ANALYZER MAKE-MODEL-S/N SIEMENS ULTRAMAT 5E C7-228

ANALYTICAL PRINCIPLE NDIR

LAST CALIBRATION DATE 03/31/94

FIRST ANALYSIS DATE 09/26/94

SECOND ANALYSIS DATE

Z	0.00	R	13.58	C	17.38	CONC.	18.20	Z	R	C	CONC.
R	13.58	Z	0.00	C	17.40	CONC.	18.22	R	Z	C	CONC.
Z	0.00	C	17.40	R	13.58	CONC.	18.22	Z	C	R	CONC.

U/M % MEAN TEST ASSAY 18.21 U/M % MEAN TEST ASSAY

THIS CYLINDER NO. SA13410
HAS BEEN CERTIFIED ACCORDING TO SECTION 3.0.4
OF TRACEABILITY PROTOCOL NO. 1
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 2000 PSIG
CERTIFICATION DATE 09/26/94
EXPIRATION DATE 09/26/97

CERTIFIED CONCENTRATION

CARBON DIOXIDE	18.21 %
NITROGEN	BALANCE

ANALYZED BY STAN LECK

CERTIFIED BY KEVIN BRADY

SPECTRA GASES

277 Coit St. • Irvington, NJ 07111 USA Tel.: (201) 372-2060 • (800) 932-0624 • Fax: (201) 372-8551

CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G2

SHIPPED FROM: 80 INDUSTRIAL DRIVE
ALPHA, NJ. 08865

TEL:(908)454-7455 FAX:(908)454-7784

CUSTOMER: AIR RECON
SGI ORDER # : 114846
ITEM# : 15
P.O.# : 26398

CYLINDER # : CC38315
CYLINDER PRES: 1900 PSIG
CGA OUTLET: 660

CERTIFICATION DATE: 11/13/95
EXPIRATION DATE: 11/13/97

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
NITRIC OXIDE	11/4/95 11/13/95	54.6 PPM 54.7 PPM	54.6 PPM	+/- 2%
NOX			54.8 PPM	REFERENCE VALUE ONLY

BALANCE NITROGEN

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
NITRIC OXIDE	NTRM81685	LL2986	245.2PPM

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE
NITRIC OXIDE	TECO-10	10AR-34979-249	CHEMI	11/2/95

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.
DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: Ted Neeme
TED NEEME

DATE: 11-13-95

SPECTRA GASES

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CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE # : G2

TEL:(908)454-7455 FAX:(908)454-7784

SHIPPED FROM: 80 INDUSTRIAL DRIVE
ALPHA, NJ. 08865

CUSTOMER: AIR RECON
SGI ORDER # : 115333
ITEM# : 5
P.O.# : 26126

CYLINDER # : CC38220
CYLINDER PRES: 1900 PSIG
CGA OUTLET: 660

CERTIFICATION DATE: 12/5/95
EXPIRATION DATE: 12/5/97

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
NITRIC OXIDE	11/28/95 12/5/95	110.7 PPM 110.3 PPM	110 PPM	+/- 2%
NOX			111 PPM	REFERENCE VALUE ONLY

BALANCE NITROGEN

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
NITRIC OXIDE	NTRM81685	LL2986	245.2PPM

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL #	DETECTOR	CALIBRATION DATE
NITRIC OXIDE	TECO-10	10AR-34979-249	CHEMI	11/28/95

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.

DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: Ted Neeme
TED NEEME

DATE: 12-5-95

610-691-2474
FAX # 610-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER RECON

P.O NUMBER 56748

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE 118.4 PPM GMIS VS.	1684B	CLM-002038	94.7 PPM

ANALYZER READINGS

R=REFERENCE STANDARD Z=ZERO GAS C=GAS CANDIDATE

1. COMPONENT NITRIC OXIDE 118.4 PPM GMIS ANALYZER MAKE-MODEL-S/N THERMO ENVIRON. 14A 14A-35387-250

ANALYTICAL PRINCIPLE CHEMILUMINESCENCE LAST CALIBRATION DATE 05/30/95

FIRST ANALYSIS DATE 06/06/95 SECOND ANALYSIS DATE 06/13/95

Z	0.00	R	0.93	C	1.35	CONC.	171.9	Z	0.00	R	0.93	C	1.34	CONC.	170.6
R	0.93	Z	0.00	C	1.35	CONC.	171.9	R	0.93	Z	0.00	C	1.34	CONC.	170.6
Z	0.00	C	1.35	R	0.93	CONC.	171.9	Z	0.00	C	1.34	R	0.93	CONC.	170.6
U/M	VOLTS					MEAN TEST ASSAY	171.9	U/M	VOLTS					MEAN TEST ASSAY	170.6

2. COMPONENT ANALYZER MAKE-MODEL-S/N

ANALYTICAL PRINCIPLE LAST CALIBRATION DATE

FIRST ANALYSIS DATE SECOND ANALYSIS DATE

Z	R	C	CONC.	Z	R	C	CONC.
R	Z	C	CONC.	R	Z	C	CONC.
Z	C	R	CONC.	Z	C	R	CONC.
U/M			MEAN TEST ASSAY	U/M			MEAN TEST ASSAY

THIS CYLINDER NO. SA9994
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R93/224
OF TRACEABILITY PROTOCOL NO. REV. 9/93
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 2000 PSIG
CERTIFICATION DATE 6/13/95
EXPIRATION DATE 6/13/97

CERTIFIED CONCENTRATION

NITRIC OXIDE	171.2PPM
NITROGEN	BALANCE
NOx(FOR REFERENCE ONLY)	171.2PPM

ANALYZED BY DANIEL J. DAY

CERTIFIED BY BOB HILLARD

610-691-2474
FAX# 610-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

CERTIFICATE OF ANALYSIS

CUSTOMER: RECON
ORDER: 37915

PRODUCT NUMBER: 4SMECAZ-OAH

PRODUCT DESCRIPTION: 20 ppm METHANE IN ZERO AIR - AH

CYLINDER SERIAL NUMBER: SA7040

DATE OF ANALYSIS: DECEMBER 15, 1994

COMPONENTS	REQUESTED CONCENTRATION	PREPARATION TOLERANCE	CERTIFIED CONCENTRATION
Methane	20 ppm	16-24 ppm	21.3 ppm
Zero Air	Balance		Balance

±2% ANALYTICAL ACCURACY

CYLINDER VOLUME/WEIGHT: 140 CU.FT.

CGA VALVE NUMBER: 590

TOTAL CYLINDER PRESSURE: 2000 PSIG

METHODS OF ANALYSIS: Gas Chromatography
Specific Oxygen Analyzer

Certified concentrations were determined by individual analysis.

ANALYZED BY: BILL REIGHTLER ,Chemist

It is recommended that cylinders not be deplated below 50 psig unless otherwise indicated.

610-691-2474
FAX # 610-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

CERTIFICATE OF ANALYSIS

CUSTOMER: RECON SYSTEMS
ORDER #: 52824

PRODUCT NUMBER: 4SMECAZ-OAH

PRODUCT DESCRIPTION: 46-54 PPM METHANE BALANCE AIR - AH

CYLINDER SERIAL NUMBER: SA9382

DATE OF ANALYSIS: MAY 03, 1995

COMPONENTS	REQUESTED CONCENTRATION	PREPARATION TOLERANCE	CERTIFIED CONCENTRATION
METHANE	46-54 PPM		51.3 PPM
AIR	BALANCE		BALANCE

ANALYTICAL ACCURACY ±2%

CYLINDER VOLUME/WEIGHT: 135 CU.FT.

CGA VALVE NUMBER: 590

TOTAL CYLINDER PRESSURE: 2000 PSIG

METHODS OF ANALYSIS: Gas Chromatography-FID

Certified concentrations were determined by individual analysis.

ANALYZED BY: STEVE BOGAR SB, Chemist

It is recommended that cylinders not be depleted below 50 psig unless otherwise indicated.

610-691-2474
FAX # 610-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

CERTIFICATE OF ANALYSIS

CUSTOMER: RECON SYSTEMS
ORDER #: 52824

PRODUCT NUMBER: 4SMECAZ-OAH

PRODUCT DESCRIPTION: 87-92 PPM METHANE BALANCE AIR - AH

CYLINDER SERIAL NUMBER: SA647SG

DATE OF ANALYSIS: MAY 04, 1995

COMPONENTS	REQUESTED CONCENTRATION	PREPARATION TOLERANCE	CERTIFIED CONCENTRATION
METHANE	87-92 PPM		88.7 PPM
AIR	BALANCE		BALANCE

ANALYTICAL ACCURACY ±2%

CYLINDER VOLUME/WEIGHT: 135 CU.FT.

CGA VALVE NUMBER: 590

TOTAL CYLINDER PRESSURE: 2000 PSIG

METHODS OF ANALYSIS: Gas Chromatography

Certified concentrations were determined by individual analysis.

ANALYZED BY: STEVE BOGAR S.B. , Chemist

It is recommended that cylinders not be depleted below 50 psig unless otherwise indicated.

610-691-2474
FAX# 610-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

CERTIFICATE OF ANALYSIS

CUSTOMER: Recon Systems
ORDER: 20823

PRODUCT NUMBER: 4SMECAZ-OAH

PRODUCT DESCRIPTION: 2500 ppm METHANE IN AIR - AH

CYLINDER SERIAL NUMBER: SA12042

DATE OF ANALYSIS: July 13, 1994

COMPONENTS	REQUESTED CONCENTRATION	PREPARATION TOLERANCE	CERTIFIED CONCENTRATION
Methane	2500 ppm	±5 %	2616.9 ppm
Hydrocarbon Free Air	Balance		Balance
21.04% Oxygen			

Analytical Accuracy ± 2%

CYLINDER VOLUME/WEIGHT: 136 CU.FT.

CGA VALVE NUMBER: 590

TOTAL CYLINDER PRESSURE: 2000 PSIG

METHODS OF ANALYSIS: Gas Chromatograph
Specific Oxygen Analyzer

Certified concentrations were determined by individual analysis.

ANALYZED BY: _____ ,Chemist

It is recommended that cylinders not be depleted below 50 psig unless otherwise indicated.

610-691-2474
FAX# 610-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

CERTIFICATE OF ANALYSIS

CUSTOMER: RECON SYSTEMS
ORDER NO: 28853

PRODUCT NUMBER: 4SMECAZ-OAH

PRODUCT DESCRIPTION: 5000 PPM METHANE IN HYDROCARBON-FREE AIR - AH
+/- 2% ANALYTICAL ACCURACY

CYLINDER NUMBER: SA 12389

DATE OF ANALYSIS: OCTOBER 7, 1994

COMPONENTS	REQUESTED CONCENTRATION	PREPARATION TOLERANCE	CERTIFIED CONCENTRATION
METHANE	5000 PPM	4800-5300	4916.1 PPM
HYDROCARBON-FREE AIR	BALANCE		BALANCE

CYLINDER VOLUME/WEIGHT: 135 Cu.Ft.

CGA VALVE NUMBER: 590

TOTAL CYLINDER PRESSURE: 2000 PSIG

METHOD OF ANALYSIS: GAS CHROMATOGRAPHY

Certified concentrations were determined by individual analysis.

ANALYZED BY: R M Allen ,Chemist

It is recommended that cylinders not be depleted below 50 psig unless otherwise indicated.

215-691-2474
FAX# 215-758-8384

LIQUID CARBONIC

CYLINDER GAS PRODUCTS

EAST COAST REGION
145 SHIMERSVILLE RD., BETHLEHEM, PA 18015

CERTIFICATE OF ANALYSIS

PRODUCT NUMBER: 4SMECAZ-OAH

CUSTOMER: RECON SYSTEMS

ORDER NUMBER: 5576

PRODUCT DESCRIPTION: 9000 ppm METHANE IN HYDROCARBON-FREE AIR - AH

CYLINDER SERIAL NUMBER: SA-8013

DATE OF ANALYSIS: 02-28-94

COMPONENTS	REQUESTED CONCENTRATION	PREPARATION TOLERANCE	CERTIFIED CONCENTRATION
METHANE	9000 ppm	±5 %	9175 ppm
AIR (HYDROCARBON-FREE)	BALANCE		BALANCE

21.20% OXYGEN

CYLINDER VOLUME/WEIGHT: 140 CU.FT.

CGA VALVE NUMBER: 590

TOTAL CYLINDER PRESSURE: 2000 PSIG

METHODS OF ANALYSIS: GAS CHROMATOGRAPH
SPECIFIC OXYGEN ANALYZER

Certified concentrations were determined by individual analysis.

ANALYZED BY: Al Markantz, Chemist

It is recommended that cylinders not be depleted below 50 psig unless otherwise indicated.

APPENDIX VI

CEM STRIP CHARTS

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 53.4 PPM NOX

9/OCT/96 6:45:24

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 53.3 PPM NOX

9/OCT/96 6:45:12

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 53.4 PPM NOX

9/OCT/96 6:45:1

64.8 PPM NOX

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 173.5 PPM NOX

9/OCT/96 6:44:8

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 173.8 PPM NOX

9/OCT/96 6:43:56

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 173.7 PPM NOX

9/OCT/96 6:43:44

171.2 PPM NOX

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 111.1 PPM NOX

9/OCT/96 6:40:45

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 111.3 PPM NOX

9/OCT/96 6:40:33

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 111.2 PPM NOX

9/OCT/96 6:40:21

111 PPM NOX@ ZERO O2 AND CO2

RACK CALIBRATIONS

0IR-RECON 9PROJECT NO 80 AR6-5P22

0TRAILER-21 0OPERATOR: 20JOHN GEISSLER

1 = 40.7 % O2 6 = 0.0 % CO2 8 = 0.1 PPM NOX
9/OCT/96 6:59:44

20.9 % O2

1 = 11.0 % O2 6 = 0.0 % CO2 8 = 0.1 PPM NOX
9/OCT/96 6:58: 8
1 = 11.0 % O2 6 = 0.0 % CO2 8 = 0.1 PPM NOX
9/OCT/96 6:57:54
1 = 11.0 % O2 6 = 0.0 % CO2 8 = 0.2 PPM NOX
9/OCT/96 6:57:43

100 90 80 70 60 50 40 30 20 10 0
11.0 % O2
0 10 20 30 40 50 60 70 80 90 100

1 = 0.0 % O2 6 = 18.4 % CO2 8 = 0.1 PPM NOX
9/OCT/96 6:50:27
1 = 0.0 % O2 6 = 18.3 % CO2 8 = 0.1 PPM NOX
9/OCT/96 6:50:15
1 = 0.0 % O2 6 = 18.3 % CO2 8 = 0.1 PPM NOX
9/OCT/96 6:50: 4

18.2 % CO2

1 = 0.0 % O2 6 = 10.0 % CO2 8 = 0.1 PPM NOX
9/OCT/96 6:49: 6
1 = 0.0 % O2 6 = 10.0 % CO2 8 = 0.1 PPM NOX
9/OCT/96 6:48:54
1 = 0.0 % O2 6 = 10.0 % CO2 8 = 0.2 PPM NOX
9/OCT/96 6:48:42

10.0 % CO2: ZERO NOX

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 53.4 PPM NOX

8 = 116.5 PPM NOX
9/OCT/96 7:30:21
8 = 116.6 PPM NOX
9/OCT/96 7:29:21
8 = 116.7 PPM NOX
9/OCT/96 7:28:21
8 = 116.8 PPM NOX
9/OCT/96 7:27:21
8 = 116.8 PPM NOX
9/OCT/96 7:26:21
8 = 116.8 PPM NOX
9/OCT/96 7:25:21
8 = 116.7 PPM NOX
9/OCT/96 7:24:21
8 = 116.6 PPM NOX
9/OCT/96 7:23:21
8 = 116.6 PPM NOX
9/OCT/96 7:22:21
8 = 116.5 PPM NOX
9/OCT/96 7:21:21
8 = 116.4 PPM NOX
9/OCT/96 7:20:21
8 = 116.4 PPM NOX
9/OCT/96 7:19:21
8 = 116.3 PPM NOX
9/OCT/96 7:18:21
8 = 116.1 PPM NOX
9/OCT/96 7:17:21
8 = 116.0 PPM NOX
9/OCT/96 7:16:21
8 = 109.5 PPM NOX

100 90 80 70 60 50 40 30 20 10 0
0 30 40 50 60 70 80 90 100

ATTACH BAG
1-1 MIN OF 12 2 PPM NOX STD. & 20.92 % O2 STD.
NOX MONITOR CONVERTER EFFICIENCY TEST

1 = 20.7 % O2 6 = 0.0 % CO2 8 = 0.1 PPM NOX
9/OCT/96 7:0:7

CHART NO. 414446

BC-1

9/0 [illegible] 0:30:00

11.0 % O2; ZERO CO2 AND NOX

INITIAL STACK BIAS CHECKS

100 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

END OF NOX MONITOR CONVERTER EFFICIENCY TEST

8 = 110.1 PPM NOX
9/OCT/96 7:45:21
8 = 110.0 PPM NOX
9/OCT/96 7:44:21
8 = 110.1 PPM NOX
9/OCT/96 7:43:21
8 = 110.1 PPM NOX
9/OCT/96 7:42:21
8 = 110.1 PPM NOX
9/OCT/96 7:41:21
8 = 110.1 PPM NOX
9/OCT/96 7:40:21
8 = 110.1 PPM NOX
9/OCT/96 7:39:21
8 = 110.2 PPM NOX
9/OCT/96 7:38:21
8 = 110.2 PPM NOX
9/OCT/96 7:37:21
8 = 110.2 PPM NOX
9/OCT/96 7:36:21
8 = 110.2 PPM NOX
9/OCT/96 7:35:21
8 = 110.3 PPM NOX
9/OCT/96 7:34:21
8 = 110.0 PPM NOX
9/OCT/96 7:33:21
8 = 110.4 PPM NOX
9/OCT/96 7:32:21
8 = 110.4 PPM NOX
9/OCT/96 7:31:21
8 = 110.6 PPM NOX
9/OCT/96 7:30:21
8 = 110.6 PPM NOX

100 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

MOLTEK PRINTED IN U.S.A.

9/OCT/96 10: 8: 8

1 = 0 % O2 6 = 9.0 % O2 8 = 6.6 PPM NOX

9/OCT/96 10: 7:38

1 = 11.0 % O2 6 = 9.0 % CO2 8 = 6.4 PPM NOX

9/OCT/96 10: 7: 8

1 = 11.0 % O2 6 = 8.8 % CO2 8 = 6.2 PPM NOX

9/OCT/96 10: 6:38

1 = 10.8 % O2 6 = 9.1 % CO2 8 = 6.3 PPM NOX

9/OCT/96 10: 6: 8

(LFG1)

COMPLIANCE RUN-1

1 = 6.0 % O2 6 = 0.0 % CO2 8 = 52.6 PPM NOX

9/OCT/96 8:56: 4

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 52.4 PPM NOX

100 90 80 70 60 50 40 30 20 10 0

9/OCT/96 8:55:52

0 10 20 30 40 50 60 70 80 90 100

1 = 0.0 % O2 6 = 0.0 % CO2 8 = 52.6 PPM NOX

9/OCT/96 8:55:40

54.8 PPM NOX

1 = 0.1 % O2 6 = 9.9 % CO2 8 = 0.6 PPM NOX

9/OCT/96 8:44:16

1 = 0.1 % O2 6 = 9.9 % CO2 8 = 0.6 PPM NOX

9/OCT/96 8:44: 6

1 = 0.1 % O2 6 = 9.9 % CO2 8 = 0.6 PPM NOX

9/OCT/96 8:43:54

ZERO O2

10.0 % CO2

1 = 11.0 % O2 6 = 0.0 % CO2 8 = 0.7 PPM NOX

9/OCT/96 8:39:16

1 = 11.0 % O2 6 = 0.0 % CO2 8 = 0.7 PPM NOX

9/OCT/96 8:39: 6

CHART NO. 41446

1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 6.3	PPM	NOX											
9/OCT/96 10:17: 8																			
1 = 10.6	%	O2	6 = 9.3	%	CO2	8 = 6.6	PPM	NOX											
9/OCT/96 10:16:38																			
1 = 11.0	%	O2	6 = 9.0	%	CO2	8 = 6.8	PPM	NOX											
9/OCT/96 10:16: 8																			
1 = 10.6	%	O2	6 = 9.1	%	CO2	8 = 6.4	PPM	NOX											
9/OCT/96 10:15:38																			
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 6.2	PPM	NOX											
9/OCT/96 10:15: 8																			
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.5	PPM	NOX											
9/OCT/96 10:14:38																			
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.4	PPM	NOX											
9/OCT/96 10:14: 8																			
1 = 11.0	%	O2	6 = 8.8	%	CO2	8 = 6.3	PPM	NOX											
9/OCT/96 10:13:38																			
1 = 11.1	%	O2	6 = 8.9	%	CO2	8 = 6.3	PPM	NOX											
9/OCT/96 10:13: 8																			
1 = 11.1	%	O2	6 = 8.9	%	CO2	8 = 6.5	PPM	NOX											
9/OCT/96 10:12:38																			
1 = 10.8	%	O2	6 = 9.0	%	CO2	8 = 6.0	PPM	NOX											
9/OCT/96 10:12: 8																			
1 = 10.8	%	O2	6 = 9.0	%	CO2	8 = 6.4	PPM	NOX											
9/OCT/96 10:11:38																			
1 = 10.8	%	O2	6 = 9.0	%	CO2	8 = 6.5	PPM	NOX											
9/OCT/96 10:11: 8																			
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.6	PPM	NOX											
9/OCT/96 10:10:38																			
1 = 10.7	%	O2	6 = 9.0	%	CO2	8 = 6.2	PPM	NOX											
9/OCT/96 10:10: 8																			
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.6	PPM	NOX											
9/OCT/96 10: 9:38																			
1 = 10.9	%	O2	6 = 8.9	%	CO2	8 = 6.4	PPM	NOX											
9/OCT/96 10: 9: 8																			
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.5	PPM	NOX											
9/OCT/96 10: 8:38																			
1 = 10.9	%	O2	6 = 9.1	%	CO2	8 = 6.4	PPM	NOX											
9/OCT/96 10: 8: 8																			
1 = 11.0	%	O2	6 = 9.0	%	CO2	8 = 6.5	PPM	NOX											
9/OCT/96 10: 7:38																			
1 = 11.0	%	O2	6 = 9.0	%	CO2	8 = 6.4	PPM	NOX											

100 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

MOLTEK

9/OC 96 10:28: 8

1 = 10.9 % O2 6 = 9.0 % CO2 8 = 6.7 PPM NOX

9/OCT/96 10:27:38

1 = 10.9 % O2 6 = 9.0 % CO2 8 = 6.8 PPM NOX

9/OCT/96 10:27: 8

1 = 10.9 % O2 6 = 9.0 % CO2 8 = 6.9 PPM NOX

9/OCT/96 10:26:38

100 1 = 10.8 90 % 80 O2 70 6 = 9.0 60 % 50 CO2 40 8 = 6.4 30 PPM 20 NOX 10 0

0 9/OCT/96 10:26: 8 20 30 40 50 60 70 80 90 100

1 = 10.8 % O2 6 = 8.9 % CO2 8 = 6.4 PPM NOX

9/OCT/96 10:25:38

1 = 11.1 % O2 6 = 8.6 % CO2 8 = 6.5 PPM NOX

9/OCT/96 10:25: 8

1 = 10.8 % O2 6 = 9.2 % CO2 8 = 6.6 PPM NOX

9/OCT/96 10:24:38

1 = 10.8 % O2 6 = 9.1 % CO2 8 = 6.5 PPM NOX

9/OCT/96 10:24: 8

1 = 10.7 % O2 6 = 9.1 % CO2 8 = 6.6 PPM NOX

9/OCT/96 10:23:38

1 = 11.0 % O2 6 = 8.9 % CO2 8 = 7.0 PPM NOX

9/OCT/96 10:23: 8

1 = 10.7 % O2 6 = 9.1 % CO2 8 = 6.3 PPM NOX

9/OCT/96 10:22:38

1 = 10.9 % O2 6 = 9.1 % CO2 8 = 6.9 PPM NOX

9/OCT/96 10:22: 8

1 = 10.8 % O2 6 = 9.2 % CO2 8 = 6.7 PPM NOX

9/OCT/96 10:21:38

1 = 10.9 % O2 6 = 9.0 % CO2 8 = 6.8 PPM NOX

9/OCT/96 10:21: 8

1 = 10.7 % O2 6 = 9.2 % CO2 8 = 7.0 PPM NOX

9/OCT/96 10:20:38

1 = 10.9 % O2 6 = 9.0 % CO2 8 = 6.9 PPM NOX

9/OCT/96 10:20: 8

1 = 11.1 % O2 6 = 8.8 % CO2 8 = 6.5 PPM NOX

9/OCT/96 10:19:38

1 = 10.9 % O2 6 = 8.9 % CO2 8 = 6.7 PPM NOX

9/OCT/96 10:19: 8

100 1 = 11.0 90 % 80 O2 70 6 = 8.8 60 % 50 CO2 40 8 = 6.9 30 PPM 20 NOX 10 0

0 9/OCT/96 10:18:38 20 30 40 50 60 70 80 90 100

1 = 10.6 % O2 6 = 9.4 % CO2 8 = 7.0 PPM NOX

9/OCT/96 10:18: 8

CHART NO. 414446

PRINTED

FIG 3

1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 6.4	PPM	NOX											
9/OCT/96 10:36:38																			
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 6.7	PPM	NOX											
9/OCT/96 10:36: 8																			
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.6	PPM	NOX											
9/OCT/96 10:35:38																			
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 6.9	PPM	NOX											
9/OCT/96 10:35: 8																			
1 = 10.8	%	O2	6 = 9.2	%	CO2	8 = 6.8	PPM	NOX											
9/OCT/96 10:34:38																			
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 6.7	PPM	NOX											
9/OCT/96 10:34: 8																			
100 = 11.1 90	%	O2 80	70 6 = 8.8	80 %	50 CO2	40	8 = 7.0	30 PPM	20 NOX	10	0								
0 9/OCT/96 10:33:38		10 20	30	40	50	60		70	80		90	100							
1 = 10.8	%	O2	6 = 9.2	%	CO2	8 = 6.9	PPM	NOX											
9/OCT/96 10:33: 8																			
1 = 10.8	%	O2	6 = 8.9	%	CO2	8 = 6.3	PPM	NOX											
9/OCT/96 10:32:38																			
1 = 11.0	%	O2	6 = 9.0	%	CO2	8 = 6.6	PPM	NOX											
9/OCT/96 10:32: 8																			
1 = 11.0	%	O2	6 = 8.9	%	CO2	8 = 6.9	PPM	NOX											
9/OCT/96 10:31:38																			
1 = 11.0	%	O2	6 = 8.9	%	CO2	8 = 6.5	PPM	NOX											
9/OCT/96 10:31: 8																			
1 = 10.9	%	O2	6 = 9.1	%	CO2	8 = 6.7	PPM	NOX											
9/OCT/96 10:30:38																			
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.3	PPM	NOX											
9/OCT/96 10:30: 8																			
1 = 10.9	%	O2	6 = 9.3	%	CO2	8 = 6.6	PPM	NOX											
9/OCT/96 10:29:38																			
1 = 10.9	%	O2	6 = 9.1	%	CO2	8 = 7.0	PPM	NOX											
9/OCT/96 10:29: 8																			
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 6.6	PPM	NOX											
9/OCT/96 10:28:38																			
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 6.9	PPM	NOX											
9/OCT/96 10:28: 8																			
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.7	PPM	NOX											
9/OCT/96 10:27:38																			
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.8	PPM	NOX											

1 = [illegible] 6	%	O2	6 = 9.1	%	CO2	8 = 6.7	PPM	NOX																	
9/OCT/96 10 47 38																									
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 7.0	PPM	NOX																	
9/OCT/96 10 47 8																									
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 7.2	PPM	NOX																	
9/OCT/96 10 46 38																									
1 = 11.0	%	O2	6 = 9.0	%	CO2	8 = 6.8	PPM	NOX																	
9/OCT/96 10 46 8																									
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.2	PPM	NOX																	
9/OCT/96 10 45 38																									
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 6.4	PPM	NOX																	
9/OCT/96 10 45 8																									
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 6.7	PPM	NOX																	
9/OCT/96 10 44 38																									
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 6.9	PPM	NOX																	
9/OCT/96 10 44 8																									
1 = 11.0	%	O2	6 = 9.0	%	CO2	8 = 6.9	PPM	NOX																	
9/OCT/96 10 43 38																									
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 6.6	PPM	NOX																	
9/OCT/96 10 43 8																									
1 = 10.7	%	O2	6 = 9.0	%	CO2	8 = 6.5	PPM	NOX																	
9/OCT/96 10 42 38																									
1 = 10.8	%	O2	6 = 9.0	%	CO2	8 = 6.8	PPM	NOX																	
9/OCT/96 10 42 8																									
1 = 10.8	%	O2	6 = 9.2	%	CO2	8 = 6.8	PPM	NOX																	
9/OCT/96 10 41 38																									
100 1 = 11.0	90 %	O2	80	70	6 = 9.0	0 %	50 CO2	40	8 = 6.7	PPM	20	NOX	10	0											
0 9/OCT/96 10 41 8		20	30	40			50	60	70		80		90	100											
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 6.9	PPM	NOX																	
9/OCT/96 10 40 38																									
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 7.1	PPM	NOX																	
9/OCT/96 10 40 8																									
1 = 10.8	%	O2	6 = 9.2	%	CO2	8 = 7.0	PPM	NOX																	
9/OCT/96 10 39 38																									
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 6.8	PPM	NOX																	
9/OCT/96 10 39 8																									
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 6.8	PPM	NOX																	
9/OCT/96 10 38 38																									
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 7.0	PPM	NOX																	
9/OCT/96 10 38 8																									
1 = 10.9	%	O2	6 = 9.1	%	CO2	8 = 7.2	PPM	NOX																	

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1 = 11.7 % O2 6 = 9.1 % CO2 8 = 6.8 PPM NOX
9/OCT/96 10:56 38
1 = 11.0 % O2 6 = 8.9 % CO2 8 = 6.8 PPM NOX
9/OCT/96 10:56 8
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 6.8 PPM NOX
9/OCT/96 10:55 38
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 6.7 PPM NOX
9/OCT/96 10:55 8
1 = 11.0 % O2 6 = 9.0 % CO2 8 = 7.1 PPM NOX
9/OCT/96 10:54 38
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 6.7 PPM NOX
9/OCT/96 10:54 8
1 = 10.8 % O2 6 = 9.2 % CO2 8 = 7.0 PPM NOX
9/OCT/96 10:53 38
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 6.7 PPM NOX
9/OCT/96 10:53 8
1 = 10.9 % O2 6 = 9.0 % CO2 8 = 6.8 PPM NOX
9/OCT/96 10:52 38
1 = 10.5 % O2 6 = 9.3 % CO2 8 = 6.8 PPM NOX
9/OCT/96 10:52 8
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 7.1 PPM NOX
9/OCT/96 10:51 38
1 = 11.0 % O2 6 = 9.1 % CO2 8 = 6.7 PPM NOX
9/OCT/96 10:51 8
1 = 11.2 % O2 6 = 8.8 % CO2 8 = 6.7 PPM NOX
9/OCT/96 10:50 38
1 = 10.8 % O2 6 = 9.1 % CO2 8 = 7.0 PPM NOX
9/OCT/96 10:50 8
1 = 10.9 % O2 6 = 9.0 % CO2 8 = 7.0 PPM NOX
9/OCT/96 10:49 38
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 6.7 PPM NOX
9/OCT/96 10:49 8
1 = 10.8 % O2 6 = 9.1 % CO2 8 = 6.6 PPM NOX
9/OCT/96 10:48 38
1 = 11.0 % O2 6 = 9.0 % CO2 8 = 7.0 PPM NOX
9/OCT/96 10:48 8
1 = 10.6 % O2 6 = 9.1 % CO2 8 = 6.7 PPM NOX
9/OCT/96 10:47 38
1 = 10.8 % O2 6 = 9.1 % CO2 8 = 7.0 PPM NOX
9/OCT/96 10:47 8

00 90 80 70 60 50 40 30 20 10 0
0 10 20 30 40 50 60 70 80 90 100

CHART NO. 41446

11 0 O2, ZERO CO2 AND NOX

STACK BIAS CHECKS

END OF RUN-1

1 = 10.9 % O2 6 = 9.0 % CO2 8 = 6.8 PPM NOX
9/OCT/96 11: 5 38
1 = 10.9 % O2 6 = 9.1 % CO2 8 = 6.7 PPM NOX
9/OCT/96 11: 5 8
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 6.7 PPM NOX
9/OCT/96 11: 4 38
1 = 10.8 % O2 6 = 9.0 % CO2 8 = 6.7 PPM NOX
9/OCT/96 11: 4 8
1 = 10.8 % O2 6 = 9.0 % CO2 8 = 6.4 PPM NOX
9/OCT/96 11: 3 38
1 = 10.8 % O2 6 = 9.3 % CO2 8 = 7.0 PPM NOX
9/OCT/96 11: 3 8
1 = 10.9 % O2 6 = 9.0 % CO2 8 = 6.7 PPM NOX
9/OCT/96 11: 2 38
1 = 11.1 % O2 6 = 8.8 % CO2 8 = 6.8 PPM NOX
9/OCT/96 11: 2 8
1 = 10.8 % O2 6 = 9.1 % CO2 8 = 7.0 PPM NOX
9/OCT/96 11: 1 38
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 7.0 PPM NOX
9/OCT/96 11: 1 8
1 = 10.8 % O2 6 = 9.0 % CO2 8 = 6.8 PPM NOX
9/OCT/96 11: 0 38
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 6.9 PPM NOX
9/OCT/96 11: 0 8
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 6.8 PPM NOX
9/OCT/96 10:59 38
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 7.0 PPM NOX
9/OCT/96 10:59 8
1 = 10.9 % O2 6 = 9.1 % CO2 8 = 6.8 PPM NOX
9/OCT/96 10:58 38
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 6.6 PPM NOX
9/OCT/96 10:58 8
1 = 10.9 % O2 6 = 8.9 % CO2 8 = 6.8 PPM NOX
9/OCT/96 10:57 38

1 = 10.8 % O2 6 = 9.1 % CO2 8 = 8.2 PPM NOX
9/OCT/96 12:20: 7

(LFG2)
COMPLIANCE RUN-2

1 = 0.1 % O2 6 = 0.3 % CO2 8 = 63.3 PPM NOX
9/OCT/96 11:13:34

1 = 0.1 % O2 6 = 0.3 % CO2 8 = 63.3 PPM NOX
9/OCT/96 11:13:22

1 = 0.1 % O2 6 = 0.3 % CO2 8 = 63.2 PPM NOX
9/OCT/96 11:13:11

54.8 PPM NOX

1 = 0.1 % O2 6 = 9.9 % CO2 8 = -0.4 PPM NOX
9/OCT/96 11:15:42

1 = 0.1 % O2 6 = 9.9 % CO2 8 = -0.4 PPM NOX
9/OCT/96 11:15:31

1 = 0.1 % O2 6 = 9.9 % CO2 8 = -0.4 PPM NOX
9/OCT/96 11:15:19

10.8 % CO2; ZERO O2

1 = 11.6 % O2 6 = 0.0 % CO2 8 = -0.4 PPM NOX
9/OCT/96 11:12:21

1 = 11.6 % O2 6 = 0.0 % CO2 8 = -0.4 PPM NOX
9/OCT/96 11:12: 9

1 = 11.6 % O2 6 = 0.0 % CO2 8 = -0.4 PPM NOX
9/OCT/96 11:11:57

11.6 % O2; ZERO CO2 AND NOX

CHART NO. 47449

9/ /96 12:31: 7							
1 = 10.6	%	O2	6 = 9.3	%	CO2	8 = 8.1	PPM NOX
9/OCT/96 12:30:37							
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 8.4	PPM NOX
9/OCT/96 12:30: 7							
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 8.1	PPM NOX
9/OCT/96 12:29:37							
1 = 10.6	%	O2	6 = 9.2	%	CO2	8 = 8.1	PPM NOX
9/OCT/96 12:29: 7							
1 = 10.9	%	O2	6 = 8.9	%	CO2	8 = 7.9	PPM NOX
9/OCT/96 12:28:37							
1 = 10.8	%	O2	6 = 9.2	%	CO2	8 = 8.3	PPM NOX
9/OCT/96 12:28: 7							
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 8.0	PPM NOX
9/OCT/96 12:27:37							
1 = 10.6	%	O2	6 = 9.2	%	CO2	8 = 8.2	PPM NOX
9/OCT/96 12:27: 7							
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 8.8	PPM NOX
9/OCT/96 12:26:37							
1 = 10.4	%	O2	6 = 9.4	%	CO2	8 = 8.6	PPM NOX
9/OCT/96 12:26: 7							
1 = 10.4	%	O2	6 = 9.6	%	CO2	8 = 8.6	PPM NOX
9/OCT/96 12:25:37							
1 = 10.6	%	O2	6 = 9.2	%	CO2	8 = 8.2	PPM NOX
9/OCT/96 12:25: 7							
1 = 11.1	%	O2	6 = 8.9	%	CO2	8 = 8.2	PPM NOX
9/OCT/96 12:24:37							
1 = 10.6	%	O2	6 = 9.1	%	CO2	8 = 7.8	PPM NOX
9/OCT/96 12:24: 7							
1 = 10.6	%	O2	6 = 9.3	%	CO2	8 = 8.4	PPM NOX
9/OCT/96 12:23:37							
1 = 10.6	%	O2	6 = 9.3	%	CO2	8 = 8.4	PPM NOX
9/OCT/96 12:23: 7							
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 8.4	PPM NOX
9/OCT/96 12:22:37							
1 = 10.7	%	O2	6 = 9.0	%	CO2	8 = 8.3	PPM NOX
9/OCT/96 12:22: 7							
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 8.6	PPM NOX
9/OCT/96 12:21:37							
1 = 10.6	%	O2	6 = 9.3	%	CO2	8 = 8.6	PPM NOX

PRINTED IN U.S.A.
MOLTEK

1 =	1.6	%	O2	6 =	9.3	%	CO2	8 =	8.1	PPM	NOX								
9/OCT/96	12:40: 7																		
1 =	10.5	%	O2	6 =	9.3	%	CO2	8 =	8.1	PPM	NOX								
9/OCT/96	12:39:37																		
1 =	10.8	%	O2	6 =	9.1	%	CO2	8 =	8.1	PPM	NOX								
9/OCT/96	12:39: 7																		
1 =	10.7	%	O2	6 =	9.2	%	CO2	8 =	8.4	PPM	NOX								
9/OCT/96	12:38:37																		
1 =	10.9	%	O2	6 =	9.1	%	CO2	8 =	8.4	PPM	NOX								
9/OCT/96	12:38: 7																		
1 =	10.9	%	O2	6 =	9.1	%	CO2	8 =	8.0	PPM	NOX								
9/OCT/96	12:37:37																		
1 =	10.7	%	O2	6 =	9.0	%	CO2	8 =	8.8	PPM	NOX								
9/OCT/96	12:37: 7																		
1 =	10.8	%	O2	6 =	9.1	%	CO2	8 =	7.9	PPM	NOX								
9/OCT/96	12:35:37																		
1 =	10.6	%	O2	6 =	9.4	%	CO2	8 =	8.1	PPM	NOX								
9/OCT/96	12:35: 7																		
1 =	10.8	%	O2	6 =	9.1	%	CO2	8 =	7.8	PPM	NOX								
9/OCT/96	12:35:37																		
1 =	10.6	%	O2	6 =	9.3	%	CO2	8 =	8.5	PPM	NOX								
9/OCT/96	12:35: 7																		
1 =	10.6	%	O2	6 =	9.2	%	CO2	8 =	8.2	PPM	NOX								
9/OCT/96	12:34:37																		
1 =	10.6	%	O2	6 =	9.3	%	CO2	8 =	8.4	PPM	NOX								
9/OCT/96	12:34: 7																		
1 =	10.6	%	O2	6 =	9.1	%	CO2	8 =	8.4	PPM	NOX								
9/OCT/96	12:33:37																		
1 =	10.7	%	O2	6 =	9.1	%	CO2	8 =	8.3	PPM	NOX								
9/OCT/96	12:33: 7																		
1 =	10.6	%	O2	6 =	9.2	%	CO2	8 =	8.1	PPM	NOX								
9/OCT/96	12:32:37																		
1 =	10.9	%	O2	6 =	9.0	%	CO2	8 =	8.2	PPM	NOX								
9/OCT/96	12:32: 7																		
1 =	10.6	%	O2	6 =	9.3	%	CO2	8 =	8.7	PPM	NOX								
9/OCT/96	12:31:37																		
1 =	10.9	%	O2	6 =	9.1	%	CO2	8 =	8.3	PPM	NOX								
9/OCT/96	12:31: 7																		
1 =	10.6	%	O2	6 =	9.3	%	CO2	8 =	8.1	PPM	NOX								
9/OCT/96	12:30:37																		
				6 =	9.0	%	CO2	8 =	8.4	PPM	NOX								

100 90 80 70 60 50 40 30 20 10 0

0 10 20 30 40 50 60 70 80 90 100

9/OCT/96 12:51 7					
1 = 10.5 % O2	6 = 9.3 % CO2	8 = 8.3 PPM NOX			
9/OCT/96 12:50 37					
1 = 10.6 % O2	6 = 9.3 % CO2	8 = 8.3 PPM NOX			
9/OCT/96 12:50 7					
1 = 10.8 % O2	6 = 9.1 % CO2	8 = 8.0 PPM NOX			
9/OCT/96 12:49 37					
1 = 10.6 % O2	6 = 9.3 % CO2	8 = 7.7 PPM NOX			
9/OCT/96 12:49 7					
1 = 10.5 % O2	6 = 9.3 % CO2	8 = 7.7 PPM NOX			
9/OCT/96 12:48 37					
1 = 10.5 % O2	6 = 9.3 % CO2	8 = 8.3 PPM NOX			
9/OCT/96 12:48 7					
1 = 10.4 % O2	6 = 9.4 % CO2	8 = 8.0 PPM NOX			
9/OCT/96 12:47 37					
1 = 10.7 % O2	6 = 9.2 % CO2	8 = 8.3 PPM NOX			
9/OCT/96 12:47 7					
1 = 10.7 % O2	6 = 9.1 % CO2	8 = 7.9 PPM NOX			
9/OCT/96 12:46 37					
1 = 10.4 % O2	6 = 9.6 % CO2	8 = 8.6 PPM NOX			
9/OCT/96 12:46 7					
1 = 10.8 % O2	6 = 9.1 % CO2	8 = 7.8 PPM NOX			
9/OCT/96 12:45 37					
1 = 10.7 % O2	6 = 9.0 % CO2	8 = 7.9 PPM NOX			
9/OCT/96 12:45 7					
00 = 10.9 % O2	6 = 9.0 % CO2	8 = 7.8 PPM NOX			
9/OCT/96 12:44 37					
1 = 10.8 % O2	6 = 9.2 % CO2	8 = 7.9 PPM NOX			
9/OCT/96 12:44 7					
1 = 10.8 % O2	6 = 9.1 % CO2	8 = 7.7 PPM NOX			
9/OCT/96 12:43 37					
1 = 10.7 % O2	6 = 9.3 % CO2	8 = 8.0 PPM NOX			
9/OCT/96 12:43 7					
1 = 10.7 % O2	6 = 9.2 % CO2	8 = 7.9 PPM NOX			
9/OCT/96 12:42 37					
1 = 10.9 % O2	6 = 9.1 % CO2	8 = 7.7 PPM NOX			
9/OCT/96 12:42 7					
1 = 11.0 % O2	6 = 9.0 % CO2	8 = 7.7 PPM NOX			
9/OCT/96 12:41 37					
1 = 10.8 % O2	6 = 9.1 % CO2	8 = 7.6 PPM NOX			

0 10 20 30 40 50 60 70 80 90 100

MOLTER

1 = [illegible]2	%	O2	6 = 9.6	%	CO2	8 = 8.6	PPM	NOX
9/OCT/96	13	0	37					
1 = 10.4	%	O2	6 = 9.4	%	CO2	8 = 8.3	PPM	NOX
9/OCT/96	13	0	7					
1 = 10.5	%	O2	6 = 9.2	%	CO2	8 = 8.4	PPM	NOX
9/OCT/96	12	59	37					
1 = 10.9	%	O2	6 = 9.1	%	CO2	8 = 8.1	PPM	NOX
9/OCT/96	12	59	7					
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 8.2	PPM	NOX
9/OCT/96	12	58	37					
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 8.1	PPM	NOX
9/OCT/96	12	58	7					
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 8.2	PPM	NOX
9/OCT/96	12	57	37					
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 7.7	PPM	NOX
9/OCT/96	12	57	7					
1 = 10.6	%	O2	6 = 9.2	%	CO2	8 = 8.1	PPM	NOX
9/OCT/96	12	56	37					
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 7.9	PPM	NOX
9/OCT/96	12	56	7					
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 8.2	PPM	NOX
9/OCT/96	12	55	37					
1 = 10.5	%	O2	6 = 9.3	%	CO2	8 = 8.2	PPM	NOX
9/OCT/96	12	55	7					
1 = 10.5	%	O2	6 = 9.4	%	CO2	8 = 8.4	PPM	NOX
9/OCT/96	12	54	37					
1 = 10.5	%	O2	6 = 9.4	%	CO2	8 = 8.3	PPM	NOX
9/OCT/96	12	54	7					
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 8.6	PPM	NOX
9/OCT/96	12	53	37					
1 = 10.5	%	O2	6 = 9.2	%	CO2	8 = 8.1	PPM	NOX
9/OCT/96	12	53	7					
1 = 10.5	%	O2	6 = 9.4	%	CO2	8 = 8.3	PPM	NOX
9/OCT/96	12	52	37					
1 = 10.6	%	O2	6 = 9.2	%	CO2	8 = 7.9	PPM	NOX
9/OCT/96	12	52	7					
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 7.9	PPM	NOX
9/OCT/96	12	51	37					
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 7.7	PPM	NOX
9/OCT/96	12	51	7					
1 = 10.5	%	O2	6 = 9.3	%	CO2	8 = [illegible]7	PPM	NOX

CHART NO. 41446

PRINTED IN U.S.A.

1 = 8	%	O2	6 = 9.6	%	CO2	8 = 7.9	PPM	NOX							
9/OCT/96 13: 11 7															
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 8.1	PPM	NOX							
9/OCT/96 13: 10 37															
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 8.2	PPM	NOX							
9/OCT/96 13: 10 7															
1 = 10.8	%	O2	6 = 9.2	%	CO2	8 = 7.9	PPM	NOX							
9/OCT/96 13: 9 37															
1 = 10.8	%	O2	6 = 9.3	%	CO2	8 = 7.8	PPM	NOX							
9/OCT/96 13: 9 7															
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 8.4	PPM	NOX							
9/OCT/96 13: 8 37															
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 8.6	PPM	NOX							
9/OCT/96 13: 8 7															
1 = 10.9	%	O2	6 = 9.0	%	CO2	8 = 7.9	PPM	NOX							
9/OCT/96 13: 7 37															
1 = 10.5	%	O2	6 = 9.2	%	CO2	8 = 8.1	PPM	NOX							
9/OCT/96 13: 7 7															
1 = 11.1	%	O2	6 = 8.8	%	CO2	8 = 8.2	PPM	NOX							
9/OCT/96 13: 6 37															
1 = 10.6	%	O2	6 = 9.2	%	CO2	8 = 8.6	PPM	NOX							
9/OCT/96 13: 6 7															
1 = 10.5	%	O2	6 = 9.3	%	CO2	8 = 8.0	PPM	NOX							
9/OCT/96 13: 6 37															
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 7.9	PPM	NOX							
9/OCT/96 13: 6 7															
1 = 10.6	%	O2	6 = 9.2	%	CO2	8 = 8.0	PPM	NOX							
9/OCT/96 13: 4 37															
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 7.6	PPM	NOX							
9/OCT/96 13: 4 7															
1 = 10.7	%	O2	6 = 9.1	%	CO2	8 = 8.0	PPM	NOX							
9/OCT/96 13: 3 37															
1 = 10.7	%	O2	6 = 9.0	%	CO2	8 = 7.9	PPM	NOX							
9/OCT/96 13: 3 7															
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 7.7	PPM	NOX							
9/OCT/96 13: 2 37															
1 = 10.6	%	O2	6 = 9.3	%	CO2	8 = 7.6	PPM	NOX							
9/OCT/96 13: 2 7															
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 7.7	PPM	NOX							
9/OCT/96 13: 1 37															

9/OCT/96 13:24:28

11 0 % O2: ZERO CO2 AND NOX

STACK BIAS CHECKS

END OF RUN-2

9/OCT/96 13:20: 7
1 = 10.4 % O2 6 = 9.6 % CO2 8 = 8.6 PPM NOX

9/OCT/96 13:19:37
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 7.9 PPM NOX

9/OCT/96 13:19: 7
1 = 10.9 % O2 6 = 9.0 % CO2 8 = 8.3 PPM NOX

9/OCT/96 13:18:37
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 8.0 PPM NOX

9/OCT/96 13:18: 7
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 7.9 PPM NOX

9/OCT/96 13:17:37
1 = 10.4 % O2 6 = 9.4 % CO2 8 = 8.0 PPM NOX

9/OCT/96 13:17: 7
1 = 10.4 % O2 6 = 9.3 % CO2 8 = 8.2 PPM NOX

9/OCT/96 13:16:37
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 8.0 PPM NOX

9/OCT/96 13:16: 7
1 = 10.8 % O2 6 = 9.0 % CO2 8 = 7.7 PPM NOX

9/OCT/96 13:15:37
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 7.9 PPM NOX

9/OCT/96 13:15: 7
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 8.0 PPM NOX

9/OCT/96 13:14:37
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 7.4 PPM NOX

9/OCT/96 13:14: 7
1 = 10.8 % O2 6 = 9.1 % CO2 8 = 8.0 PPM NOX

9/OCT/96 13:13:37
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 7.9 PPM NOX

9/OCT/96 13:13: 7
1 = 10.8 % O2 6 = 9.1 % CO2 8 = 7.7 PPM NOX

9/OCT/96 13:12:37
1 = 10.9 % O2 6 = 8.9 % CO2 8 = 7.4 PPM NOX

9/OCT/96 13:12: 7
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 8.2 PPM NOX

OCT

1 = 0 % O2 6 = 9 3
9/OCT/96 14: 7: 5
1 = 10 3 % O2 6 = 9 6
9/OCT/96 14: 6:35
1 = 10 4 % O2 6 = 9 4
9/OCT/96 14: 6: 5
1 = 10 4 % O2 6 = 9 3
9/OCT/96 14: 5:35
1 = 10 3 % O2 6 = 9 6
9/OCT/96 14: 5: 5

QQ_FG3) 90 80 70 60
0 COMPLIANCE 0 RUN-3 20 30 40

1 = 0 1 % O2 6 = 0 0
9/OCT/96 13:36:16
1 = 0 1 % O2 6 = 0 0
9/OCT/96 13:36: 4
1 = 0 1 % O2 6 = 0 0
9/OCT/96 13:35:52

54.8 PPM NOX

1 = 0 1 % O2 6 = 9 9
9/OCT/96 13:28:57
1 = 0 1 % O2 6 = 9 9
9/OCT/96 13:28:45
1 = 0 1 % O2 6 = 9 8
9/OCT/96 13:28:33

10.0 % CO2: ZERO O2

1 = 11 0 % O2 6 = 0 0
9/OCT/96 13:24:52
1 = 11 0 % O2 6 = 0 0

% O2 8 = 8 7 PPM NOX
% CO2 8 = 8 9 PPM NOX
% CO2 8 = 8 6 PPM NOX
% CO2 8 = 8 6 PPM NOX
% CO2 8 = 8 8 PPM NOX

50 40 30 20 10 0
50 60 70 80 90 100

% CO2 8 = 64 5 PPM NOX
% CO2 8 = 54 6 PPM NOX
% CO2 8 = 54 4 PPM NOX

% CO2 8 =-0 2 PPM NOX
% CO2 8 =-0 2 PPM NOX
% CO2 8 =-0 2 PPM NOX
% CO2 8 =-0 2 PPM NOX
% CO2 8 =-0 2 PPM NOX

MOLYTEK
CHART NO.

9/OCT/96 14:17 35
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 8.2 PPM NOX

9/OCT/96 14:17 5
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 8.6 PPM NOX

9/OCT/96 14:16 35
1 = 10.5 % O2 6 = 9.3 % CO2 8 = 8.6 PPM NOX

9/OCT/96 14:16 5
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 8.6 PPM NOX

9/OCT/96 14:15 35
1 = 10.2 % O2 6 = 9.5 % CO2 8 = 9.1 PPM NOX

9/OCT/96 14:15 5
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 8.5 PPM NOX

9/OCT/96 14:14 35
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 8.6 PPM NOX

9/OCT/96 14:14 5
1 = 10.8 % O2 6 = 9.1 % CO2 8 = 8.2 PPM NOX

9/OCT/96 14:13 35
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 8.3 PPM NOX

9/OCT/96 14:13 5
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 8.3 PPM NOX

9/OCT/96 14:12 35
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 8.6 PPM NOX

9/OCT/96 14:12 5
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 8.8 PPM NOX

9/OCT/96 14:11 35
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 8.6 PPM NOX

9/OCT/96 14:11 5
1 = 10.3 % O2 6 = 9.4 % CO2 8 = 9.0 PPM NOX

9/OCT/96 14:10 35
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 8.8 PPM NOX

9/OCT/96 14:10 5
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 8.8 PPM NOX

9/OCT/96 14: 9 35
1 = 10.8 % O2 6 = 9.1 % CO2 8 = 8.4 PPM NOX

9/OCT/96 14: 9 5
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 8.7 PPM NOX

9/OCT/96 14: 8 35
1 = 10.5 % O2 6 = 9.3 % CO2 8 = 8.7 PPM NOX

9/OCT/96 14: 8 5
1 = 10.6 % O2 6 = 9.4 % CO2 8 = 8.8 PPM NOX

9/OCT/96 14:28 6			
1 = 11.9 % O2	6 = 9.0	% CO2	8 = 8.3 PPM NOX
9/OCT/96 14:27 36			
1 = 10.5 % O2	6 = 9.2	% CO2	8 = 7.8 PPM NOX
9/OCT/96 14:27 6			
1 = 10.9 % O2	6 = 9.1	% CO2	8 = 8.3 PPM NOX
9/OCT/96 14:26 36			
1 = 10.4 % O2	6 = 9.3	% CO2	8 = 8.2 PPM NOX
9/OCT/96 14:26 6			
1 = 10.5 % O2	6 = 9.2	% CO2	8 = 8.0 PPM NOX
9/OCT/96 14:26 36			
1 = 10.5 % O2	6 = 9.2	% CO2	8 = 8.2 PPM NOX
9/OCT/96 14:25 6			
1 = 10.6 % O2	6 = 9.4	% CO2	8 = 8.8 PPM NOX
9/OCT/96 14:24 36			
1 = 10.5 % O2	6 = 9.3	% CO2	8 = 8.3 PPM NOX
9/OCT/96 14:24 6			
1 = 10.5 % O2	6 = 9.3	% CO2	8 = 8.2 PPM NOX
9/OCT/96 14:23 36			
1 = 10.7 % O2	6 = 9.1	% CO2	8 = 8.2 PPM NOX
9/OCT/96 14:23 6			
1 = 10.5 % O2	6 = 9.3	% CO2	8 = 8.7 PPM NOX
9/OCT/96 14:22 36			
1 = 10.4 % O2	6 = 9.4	% CO2	8 = 8.6 PPM NOX
9/OCT/96 14:22 6			
1 = 10.6 % O2	6 = 9.2	% CO2	8 = 8.2 PPM NOX
9/OCT/96 14:21 36			
1 = 10.5 % O2	6 = 9.3	% CO2	8 = 8.2 PPM NOX
9/OCT/96 14:21 6			
1 = 10.4 % O2	6 = 9.5	% CO2	8 = 8.6 PPM NOX
9/OCT/96 14:20 36			
1 = 10.5 % O2	6 = 9.2	% CO2	8 = 8.7 PPM NOX
9/OCT/96 14:20 6			
1 = 10.7 % O2	6 = 9.2	% CO2	8 = 8.1 PPM NOX
9/OCT/96 14:19 36			
1 = 10.5 % O2	6 = 9.3	% CO2	8 = 8.3 PPM NOX
9/OCT/96 14:19 6			
1 = 10.8 % O2	6 = 9.1	% CO2	8 = 8.7 PPM NOX
9/OCT/96 14:18 36			
			8 = 8.6 PPM NOX

CHART NO. 6

1 = [illegible].3	%	O2	6 = 9.6	%	CO2	8 = 8.1	PPM	NOX							
9/OCT/96 14:44 10															
1 = 10.5	%	O2	6 = 9.4	%	CO2	8 = 8.1	PPM	NOX							
9/OCT/96 14:43 40															
RESUME TEST															
1 = 10.5	%	O2	6 = 9.4	%	CO2	8 = 8.1	PPM	NOX							
9/OCT/96 14:39 43															
1 = 11.0	%	O2	6 = 8.9	%	CO2	8 = 7.9	PPM	NOX							
9/OCT/96 14:39 13															
1 = 10.6	%	O2	6 = 9.3	%	CO2	8 = 8.6	PPM	NOX							
9/OCT/96 14:38 43															
1 = 13.3	%	O2	6 = 8.0	%	CO2	8 = 8.3	PPM	NOX							
9/OCT/96 14:38 13															
RECORDER/DATA LOGGER VRS 5I-1-XX															
100 90 80 70 60 50 40 30 20 10 0															
0 10 20 30 40 50 60 70 80 90 100															
1 = 10.6	%	O2	6 = 9.2	%	CO2	8 = 8.0	PPM	NOX							
9/OCT/96 14:34 6															
1 = 10.4	%	O2	6 = 9.4	%	CO2	8 = 8.0	PPM	NOX							
9/OCT/96 14:33 36															
1 = 10.6	%	O2	6 = 9.3	%	CO2	8 = 7.8	PPM	NOX							
9/OCT/96 14:33 6															
1 = 10.5	%	O2	6 = 9.4	%	CO2	8 = 8.3	PPM	NOX							
9/OCT/96 14:32 36															
1 = 10.6	%	O2	6 = 9.2	%	CO2	8 = 7.7	PPM	NOX							
9/OCT/96 14:32 6															
1 = 10.8	%	O2	6 = 9.1	%	CO2	8 = 8.1	PPM	NOX							
9/OCT/96 14:31 36															
1 = 10.5	%	O2	6 = 9.3	%	CO2	8 = 8.1	PPM	NOX							
9/OCT/96 14:31 6															
1 = 10.5	%	O2	6 = 9.3	%	CO2	8 = 7.9	PPM	NOX							
9/OCT/96 14:30 36															
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 8.2	PPM	NOX							
9/OCT/96 14:30 6															
1 = 10.6	%	O2	6 = 9.3	%	CO2	8 = 8.1	PPM	NOX							
9/OCT/96 14:29 36															
1 = 10.7	%	O2	6 = 9.2	%	CO2	8 = 7.5	PPM	NOX							
9/OCT/96 14:29 6															
1 = 10.4	%	O2	6 = 9.4	%	CO2	8 = 8.1	PPM	NOX							
9/OCT/96 14:28 36															

9/OCT/96	14:55:10	%	O2	6 = 8.9	%	CO2	8 = 8.2	PPM	NOX
9/OCT/96	14:54:40	%	O2	6 = 9.3	%	CO2	8 = 8.1	PPM	NOX
9/OCT/96	14:54:10	%	O2	6 = 9.3	%	CO2	8 = 7.8	PPM	NOX
9/OCT/96	14:53:40	%	O2	6 = 9.0	%	CO2	8 = 8.1	PPM	NOX
9/OCT/96	14:53:10	%	O2	6 = 9.2	%	CO2	8 = 8.2	PPM	NOX
9/OCT/96	14:52:40	%	O2	6 = 9.2	%	CO2	8 = 8.1	PPM	NOX
9/OCT/96	14:52:10	%	O2	6 = 9.2	%	CO2	8 = 8.2	PPM	NOX
9/OCT/96	14:51:40	%	O2	6 = 9.2	%	CO2	8 = 7.9	PPM	NOX
9/OCT/96	14:51:10	%	O2	6 = 9.0	%	CO2	8 = 8.0	PPM	NOX
9/OCT/96	14:50:40	%	O2	6 = 9.4	%	CO2	8 = 8.4	PPM	NOX
9/OCT/96	14:50:10	%	O2	6 = 9.3	%	CO2	8 = 7.9	PPM	NOX
9/OCT/96	14:49:40	%	O2	6 = 9.0	%	CO2	8 = 8.0	PPM	NOX
9/OCT/96	14:49:10	%	O2	6 = 9.4	%	CO2	8 = 8.2	PPM	NOX
9/OCT/96	14:48:40	%	O2	6 = 9.3	%	CO2	8 = 7.8	PPM	NOX
9/OCT/96	14:48:10	%	O2	6 = 9.3	%	CO2	8 = 8.4	PPM	NOX
9/OCT/96	14:47:40	%	O2	6 = 9.3	%	CO2	8 = 8.3	PPM	NOX
9/OCT/96	14:47:10	%	O2	6 = 9.4	%	CO2	8 = 8.0	PPM	NOX
9/OCT/96	14:46:40	%	O2	6 = 9.3	%	CO2	8 = 8.3	PPM	NOX
9/OCT/96	14:46:10	%	O2	6 = 9.3	%	CO2	8 = 8.1	PPM	NOX
9/OCT/96	14:45:40	%	O2	6 = 9.2	%	CO2	8 = 8.4	PPM	NOX
9/OCT/96	14:46:10								

9/OCT/96 16: 5:10
1 = 10.5 % O2 6 = 9.3 % CO2 8 = 8.2 PPM NOX
9/OCT/96 16: 4:40
1 = 10.3 % O2 6 = 9.5 % CO2 8 = 9.0 PPM NOX
9/OCT/96 16: 4:10
1 = 10.2 % O2 6 = 9.6 % CO2 8 = 8.9 PPM NOX
9/OCT/96 16: 3:40
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 8.4 PPM NOX
9/OCT/96 16: 3:10
1 = 10.4 % O2 6 = 9.6 % CO2 8 = 8.6 PPM NOX
9/OCT/96 16: 2:40
1 = 10.3 % O2 6 = 9.4 % CO2 8 = 9.1 PPM NOX
9/OCT/96 16: 2:10
1 = 10.3 % O2 6 = 9.4 % CO2 8 = 8.8 PPM NOX
9/OCT/96 16: 1:40
1 = 10.3 % O2 6 = 9.5 % CO2 8 = 8.6 PPM NOX
9/OCT/96 16: 1:10
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 8.2 PPM NOX
9/OCT/96 16: 0:40
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 8.3 PPM NOX
9/OCT/96 16: 0:10
1 = 10.7 % O2 6 = 9.4 % CO2 8 = 8.4 PPM NOX
9/OCT/96 14:59:40
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 8.8 PPM NOX
9/OCT/96 14:59:10
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 8.3 PPM NOX
9/OCT/96 14:58:40
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 8.2 PPM NOX
9/OCT/96 14:58:10
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 7.6 PPM NOX
9/OCT/96 14:57:40
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 8.0 PPM NOX
9/OCT/96 14:57:10
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 8.2 PPM NOX
9/OCT/96 14:56:40
1 = 10.6 % O2 6 = 9.1 % CO2 8 = 8.2 PPM NOX
9/OCT/96 14:56:10
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 8.3 PPM NOX
9/OCT/96 14:55:40

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1 = 10.6 % O2 6 = 9.2 % CO2 8 = 78 PPM NOX
9/OCT/96 15:15:40
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 79 PPM NOX
9/OCT/96 15:15:10
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 76 PPM NOX
9/OCT/96 15:14:40
1 = 10.6 % O2 6 = 9.4 % CO2 8 = 84 PPM NOX
9/OCT/96 15:14:10
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 78 PPM NOX
9/OCT/96 15:13:40
1 = 10.6 % O2 6 = 9.1 % CO2 8 = 78 PPM NOX
9/OCT/96 15:13:10
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 79 PPM NOX
9/OCT/96 15:12:40
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 80 PPM NOX
9/OCT/96 15:12:10
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 77 PPM NOX
9/OCT/96 15:11:40
1 = 10.6 % O2 6 = 9.3 % CO2 8 = 79 PPM NOX
9/OCT/96 15:11:10
1 = 10.7 % O2 6 = 9.2 % CO2 8 = 70 PPM NOX
9/OCT/96 15:10:40
1 = 10.7 % O2 6 = 9.0 % CO2 8 = 80 PPM NOX
9/OCT/96 15:10:10
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 76 PPM NOX
9/OCT/96 15: 9:40
1 = 10.9 % O2 6 = 9.0 % CO2 8 = 81 PPM NOX
9/OCT/96 15: 9:10
1 = 11.6 % O2 6 = 8.9 % CO2 8 = 77 PPM NOX
9/OCT/96 15: 8:40
1 = 10.7 % O2 6 = 9.1 % CO2 8 = 73 PPM NOX
9/OCT/96 15: 8:10
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 76 PPM NOX
9/OCT/96 15: 7:40
1 = 10.6 % O2 6 = 9.1 % CO2 8 = 73 PPM NOX
9/OCT/96 15: 7:10
1 = 10.6 % O2 6 = 9.4 % CO2 8 = 85 PPM NOX
9/OCT/96 15: 6:40
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 78 PPM NOX
9/OCT/96 15: 6:10

64.8 PPM NOX

1 = 6.1 % O2 6 = 9.8 % CO2 8 = 0.1 PPM NOX
9/OCT/96 15:25: 2

1 = 6.1 % O2 6 = 9.9 % CO2 8 = 0.1 PPM NOX
9/OCT/96 15:25:60

1 = 6.1 % O2 6 = 9.8 % CO2 8 = 0.1 PPM NOX
9/OCT/96 15:25:38

11.0 % CO2; ZERO O2

1 = 11.0 % O2 6 = 0.0 % CO2 8 =-0.1 PPM NOX
9/OCT/96 15:20:23

1 = 11.1 % O2 6 = 0.0 % CO2 8 =-0.1 PPM NOX
9/OCT/96 15:20:11

1 = 11.1 % O2 6 = 0.0 % CO2 8 =-0.1 PPM NOX
9/OCT/96 15:19:59

11.0 % O2; ZERO CO2 AND NOX

STACK BIAS CHECKS

END OF RUN-3

1 = 10.6 % O2 6 = 9.8 % CO2 8 = 30.8 PPM NOX
9/OCT/96 15:17:40

1 = 10.4 % O2 6 = 9.2 % CO2 8 = 8.1 PPM NOX
9/OCT/96 15:17:10

1 = 10.6 % O2 6 = 9.2 % CO2 8 = 8.0 PPM NOX
9/OCT/96 15:16:40

1 = 10.7 % O2 6 = 9.1 % CO2 8 = 7.6 PPM NOX
9/OCT/96 15:16:10

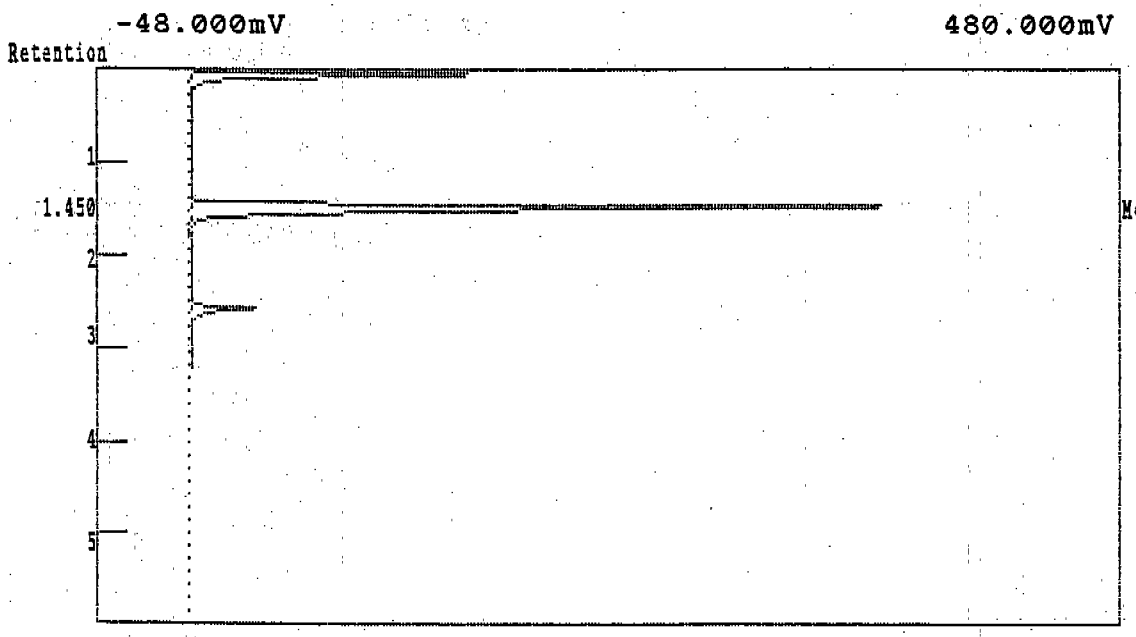
1 = 10.6 % O2 6 = 9.2 % CO2 8 = 7.9 PPM NOX
9/OCT/96 15:15:40

1 = 10.6 % O2 6 = 9.2 % CO2 8 = 7.9 PPM NOX

APPENDIX VII

LABORATORY DATA

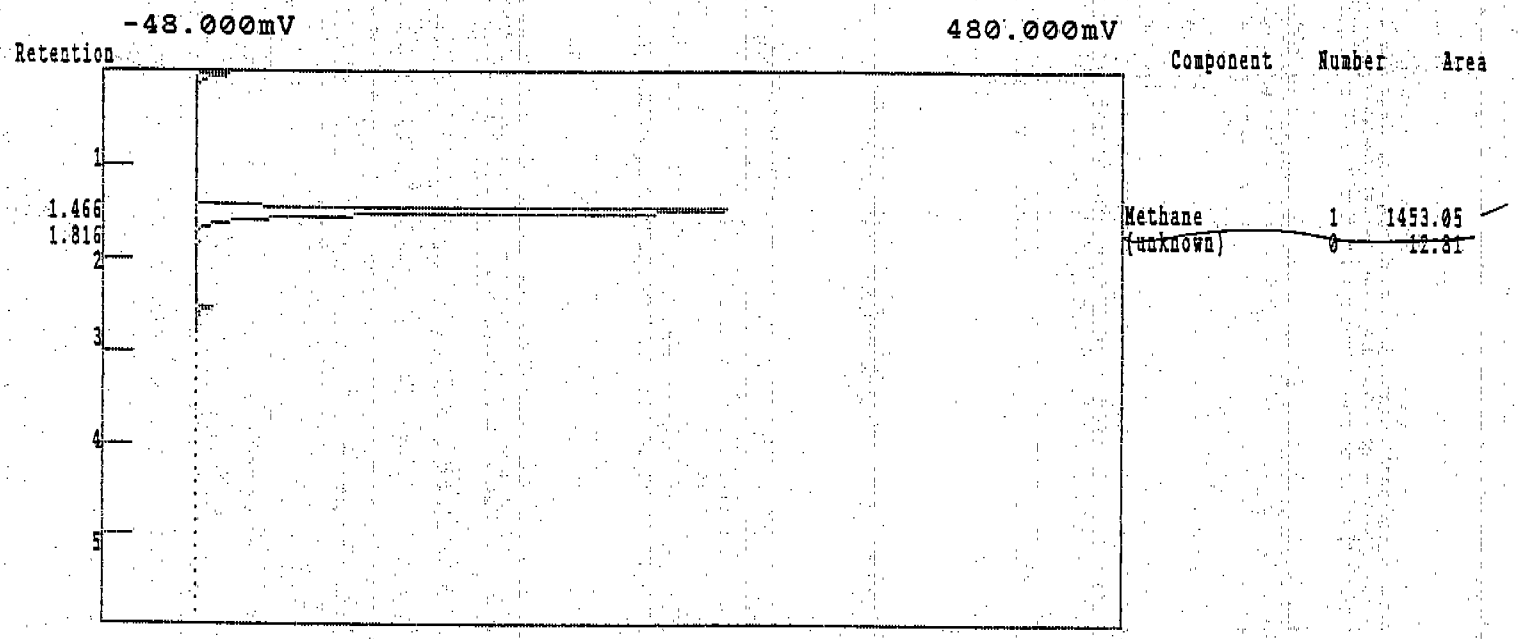
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 07:42:52
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 2617 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG20 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.450	470.645	1488.52	100.00
1				1488.52	100.00

Undetected components:

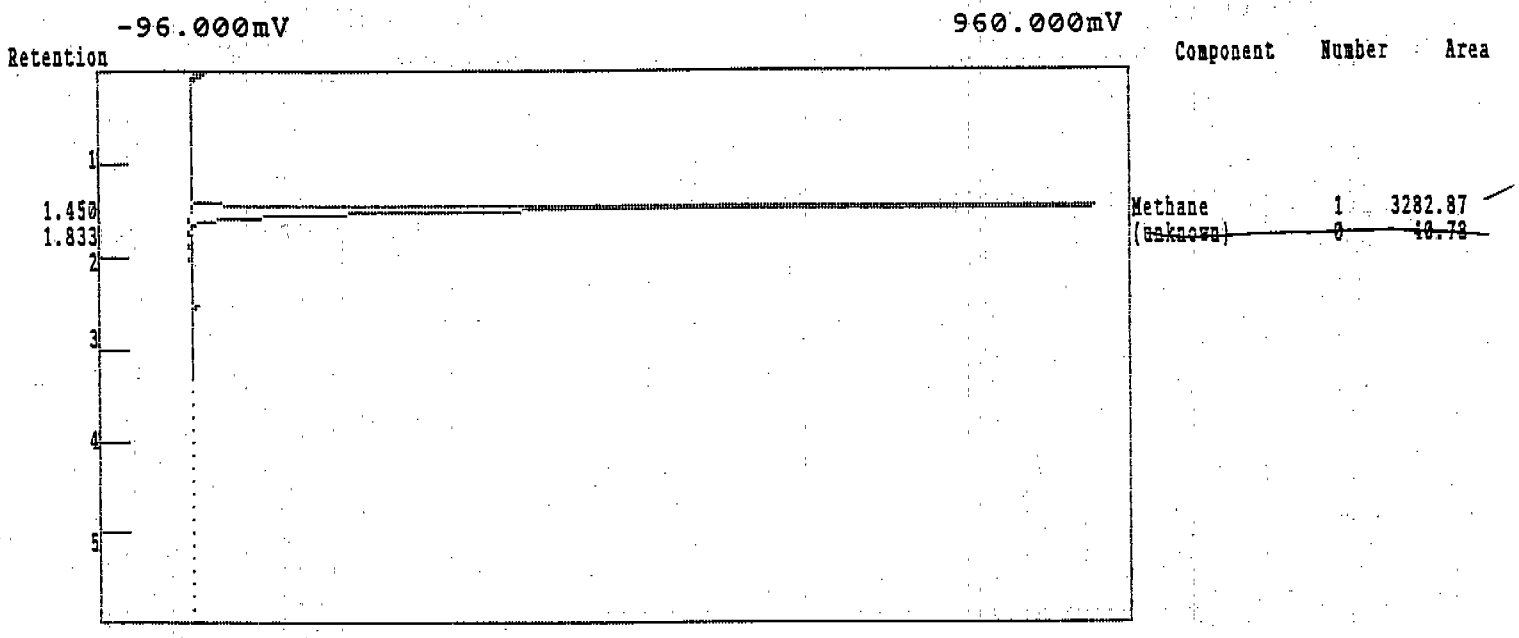
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 07:49:52
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 2617 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG21 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	472.740	1453.05	99.13
(unknown)	0	1.816	1.378	12.81	0.87
2				1465.85	100.00

Undetected components:

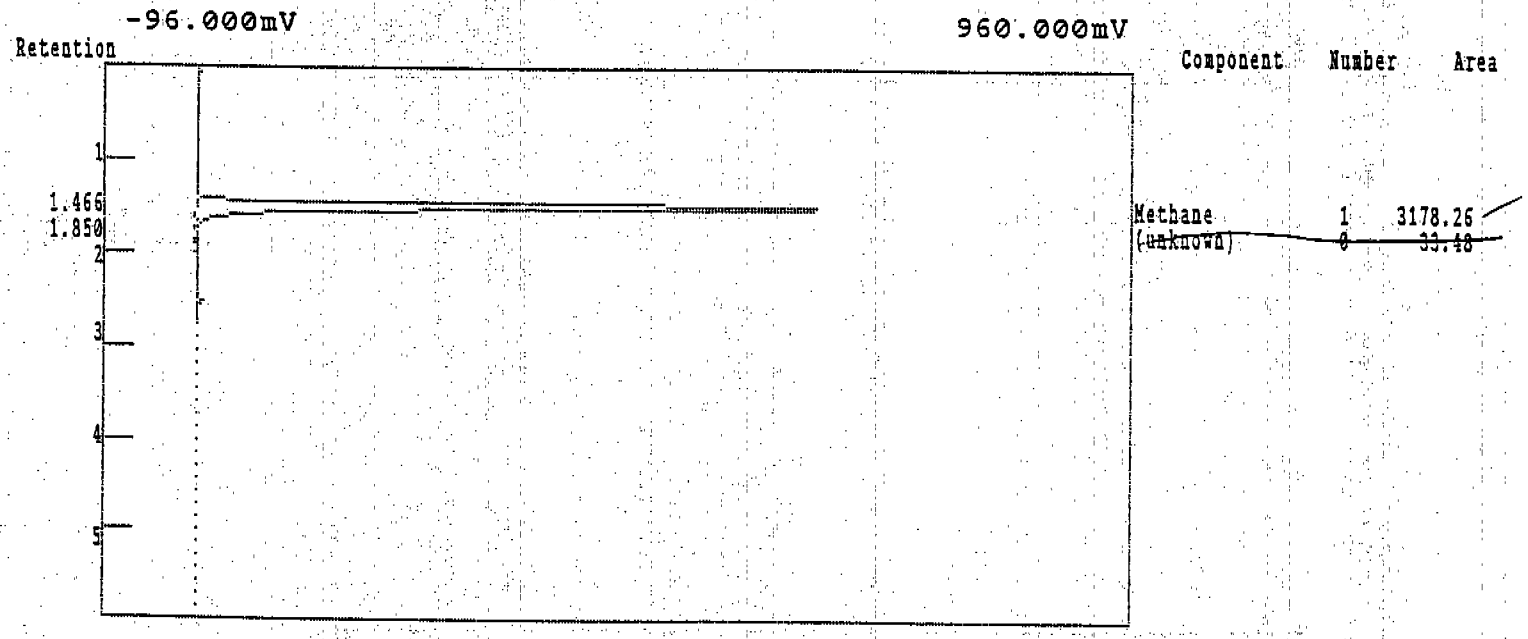
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 07:55:19
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 4916 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG22 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.450	925.546	3282.87	98.77
(unknown)	0	1.833	2.716	40.78	1.23
	2			3323.65	100.00

Undetected components:

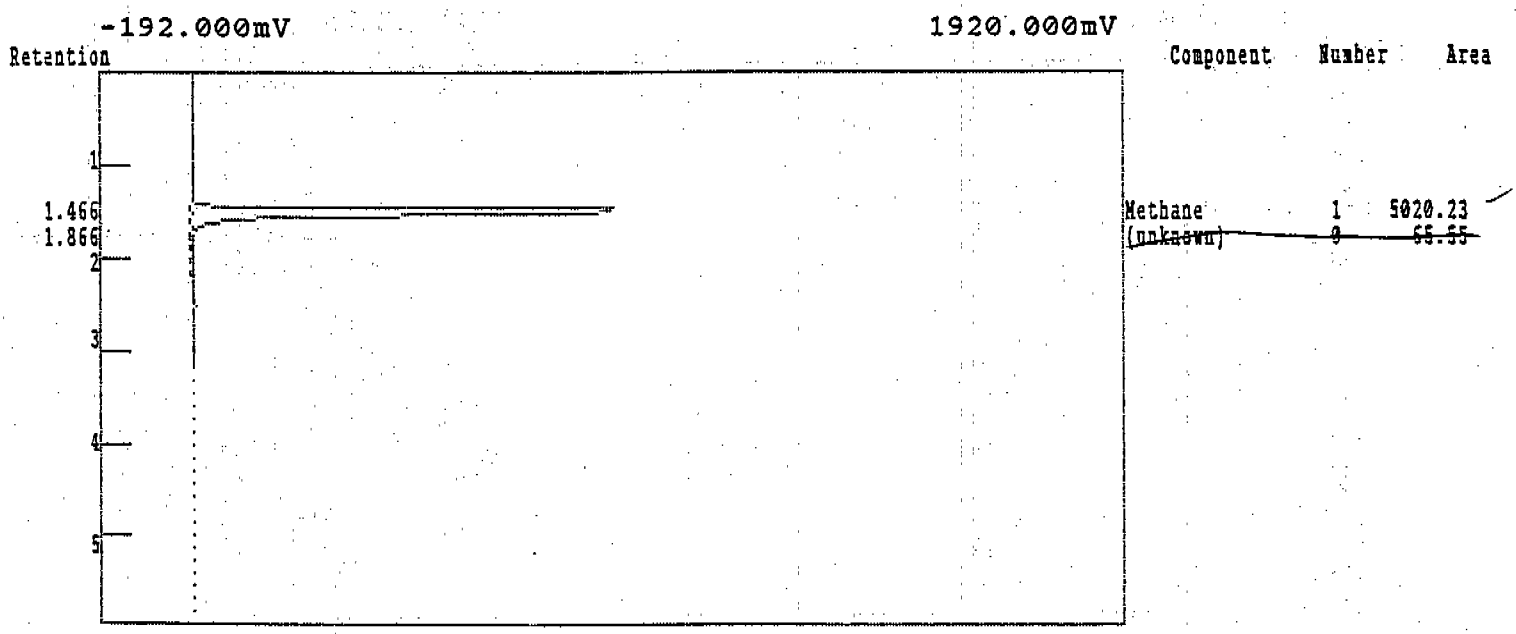
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 08:00:34
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 4916 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG23 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	895.902	3178.26	98.96
(unknown)	0	1.850	2.699	33.48	1.04
2				3211.74	100.00

Undetected components:

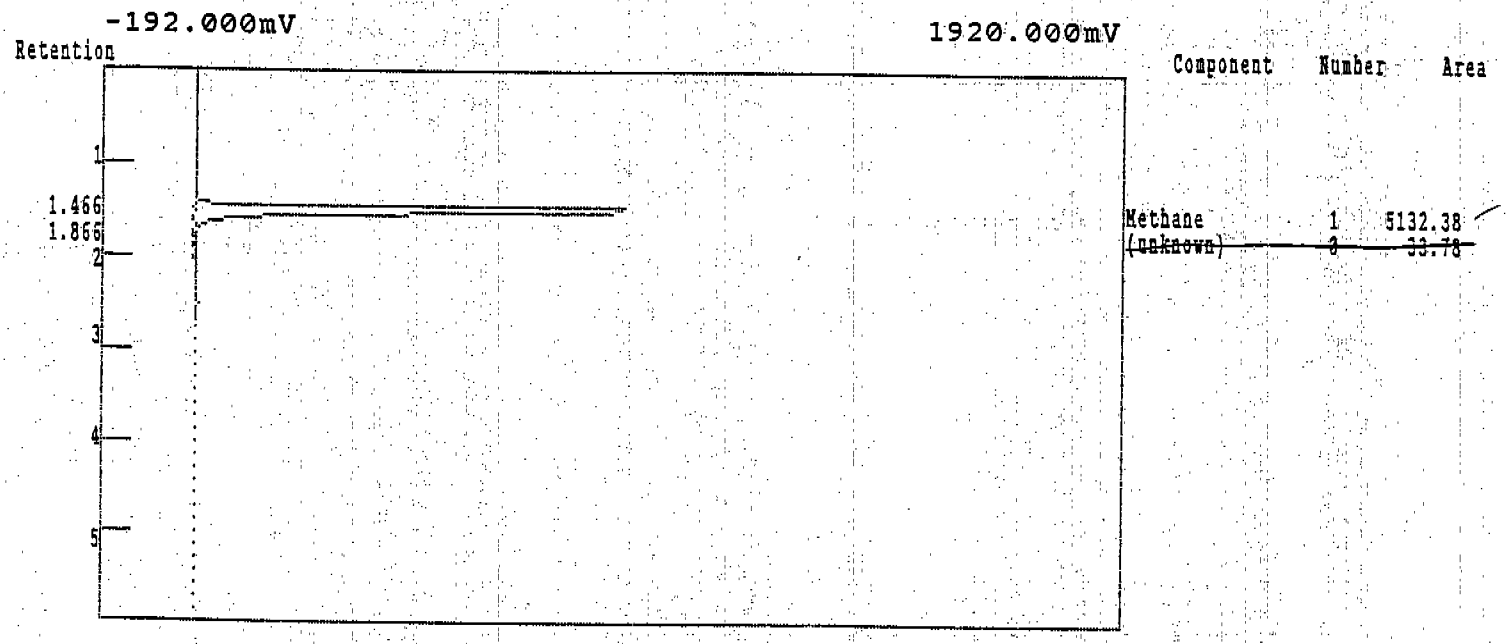
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 08:07:23
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 9175 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG24 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	1655.803	5020.23	98.71
(unknown)	0	1.866	3.999	65.55	1.29
	2			5085.78	100.00

Undetected components:

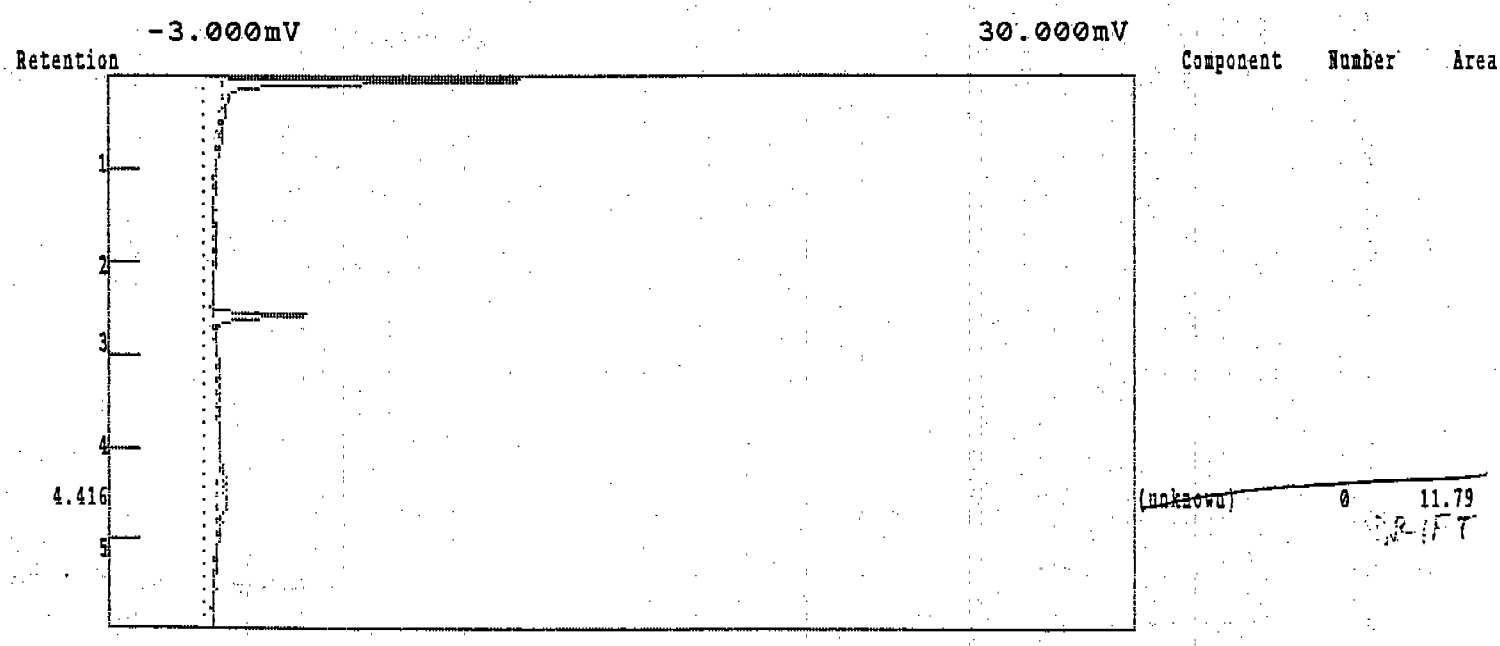
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 08:13:22
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 9175 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG25 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	1713.220	5132.38	99.35
(unknown)	0	1.866	3.376	33.78	0.65
	2			5166.16	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 08:19:58
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG26 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

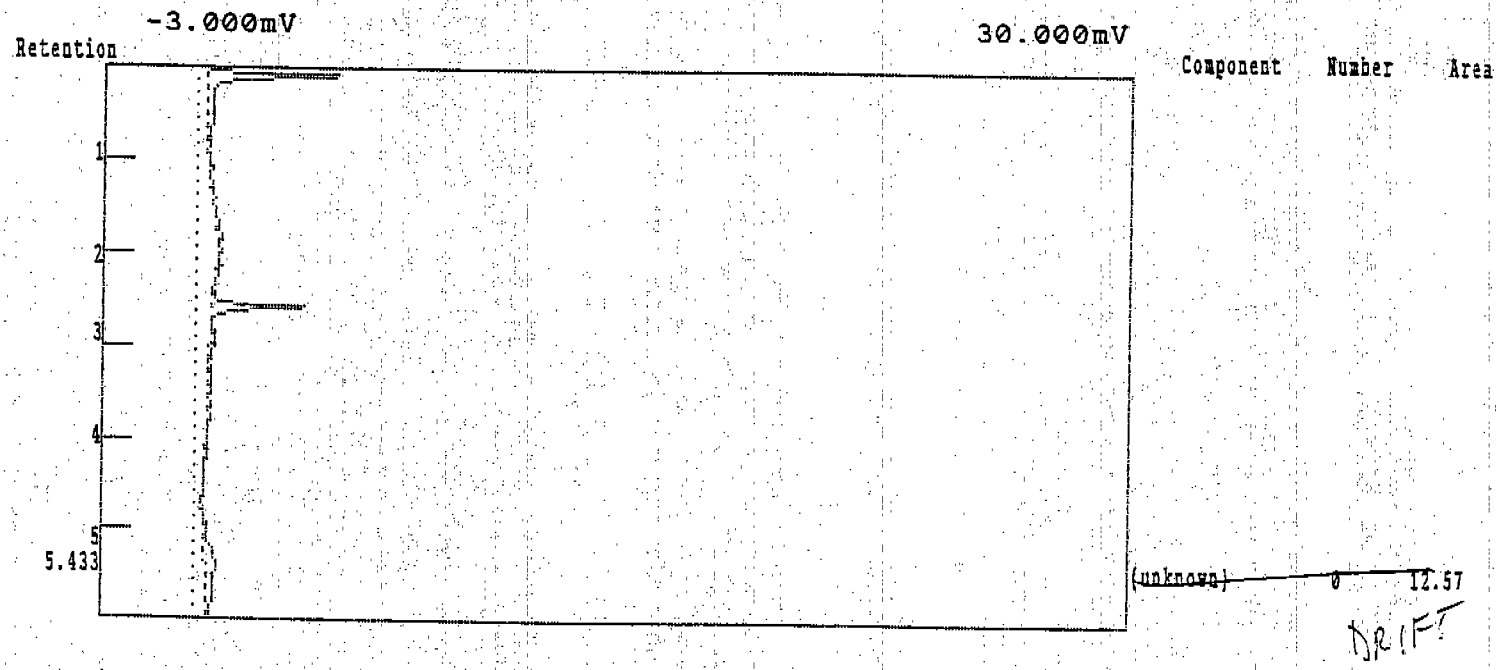


Component	Number	Retention	Height	Area	Area %
(unknown)	0	4.416	0.251	11.79	100.00
1				11.79	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 08:27:47
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG27 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

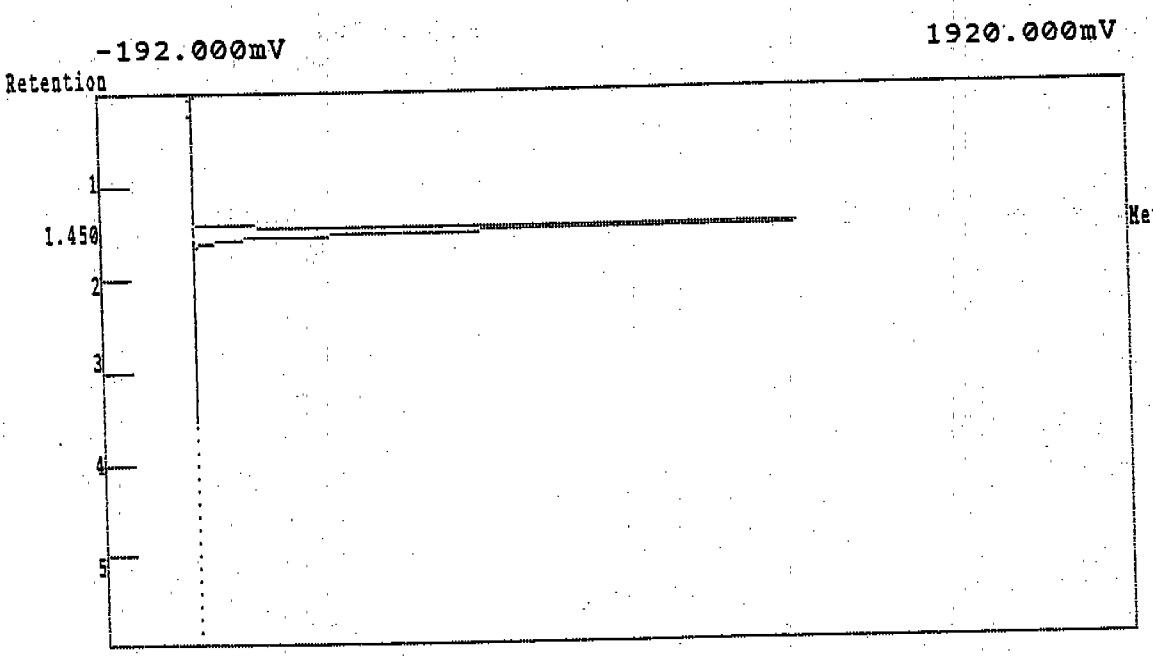


Component	Number	Retention	Height	Area	Area %
(unknown)	0	5.433	0.342	12.57	100.00
1				12.57	100.00

Undetected components:

Methane

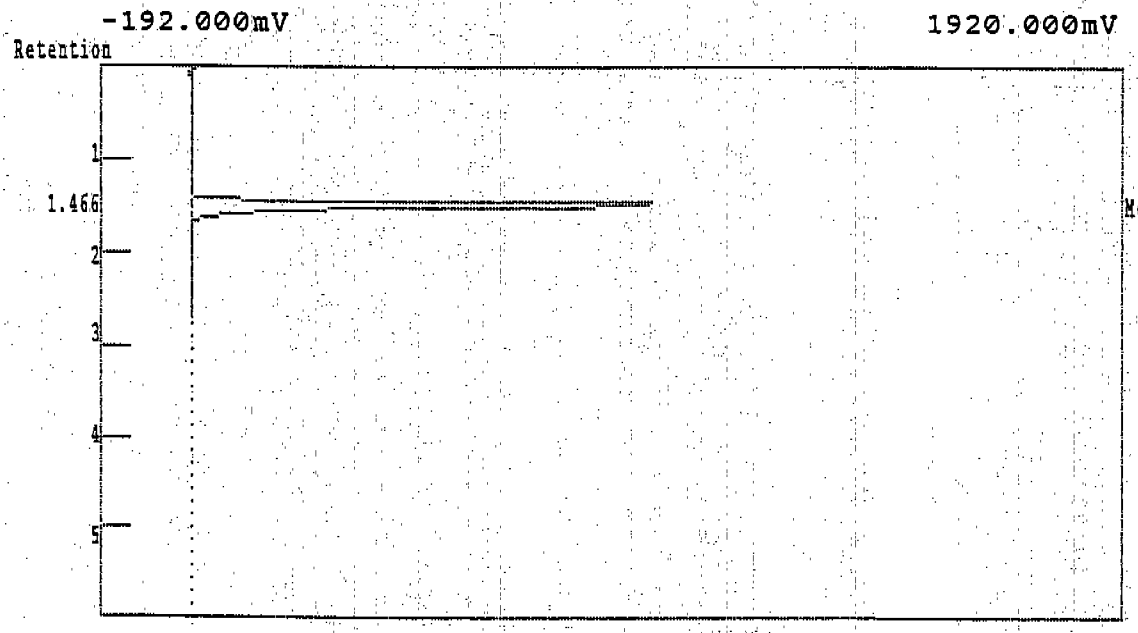
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 08:58:23
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 9175 ppmv CH4 Bias Cal.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG30 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.450	1641.940	5037.99	100.00
	1			5037.99	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 09:04:23
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 9175 ppmv CH4 Bias Cal.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG31 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Area
Methane	1	5042.94

Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	1647.530	5042.94	100.00
	1			5042.94	100.00

Undetected components:

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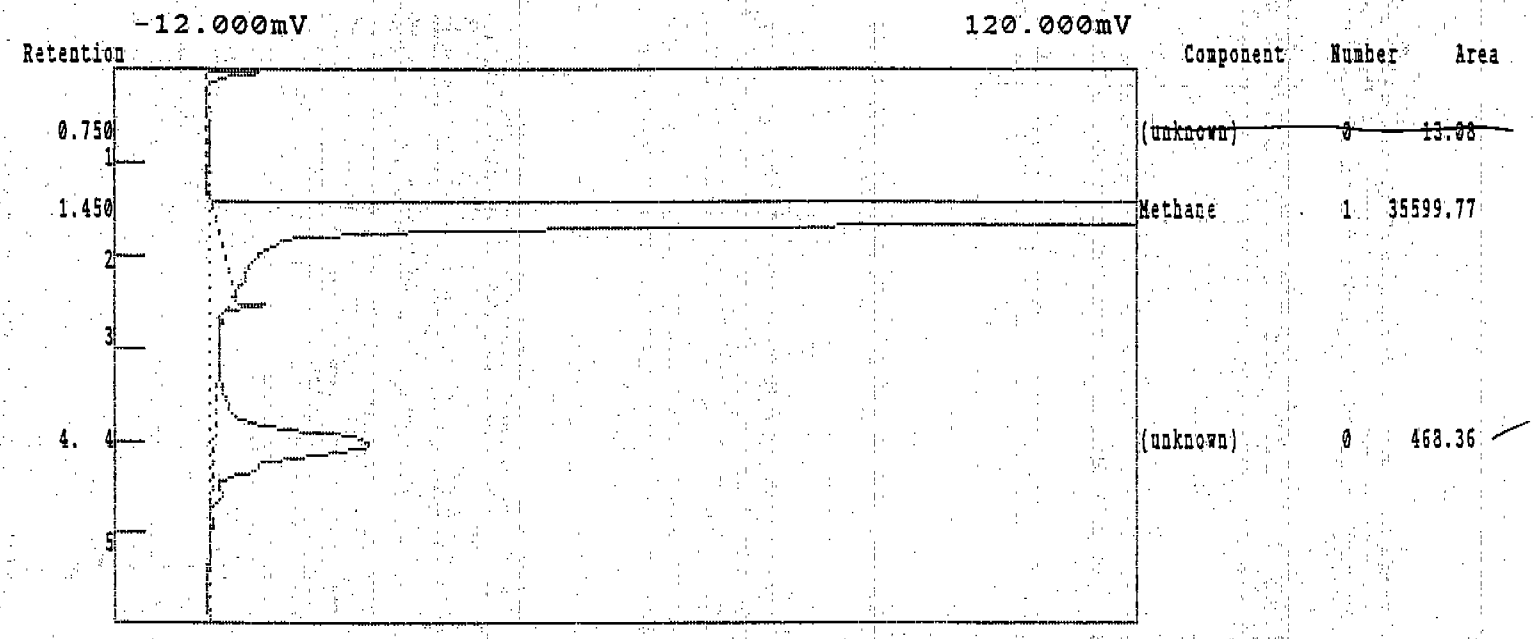
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 10:08:08
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG35 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

Component	Number	Retention	Height	Area	Area %
Methane	1	1.500	5008.310	29974.67	98.23
(unknown)	0	4.066	21.459	528.19	1.73
(unknown)	0	5.466	0.502	11.90	0.04
	3			30514.76	100.00

Undetected components:

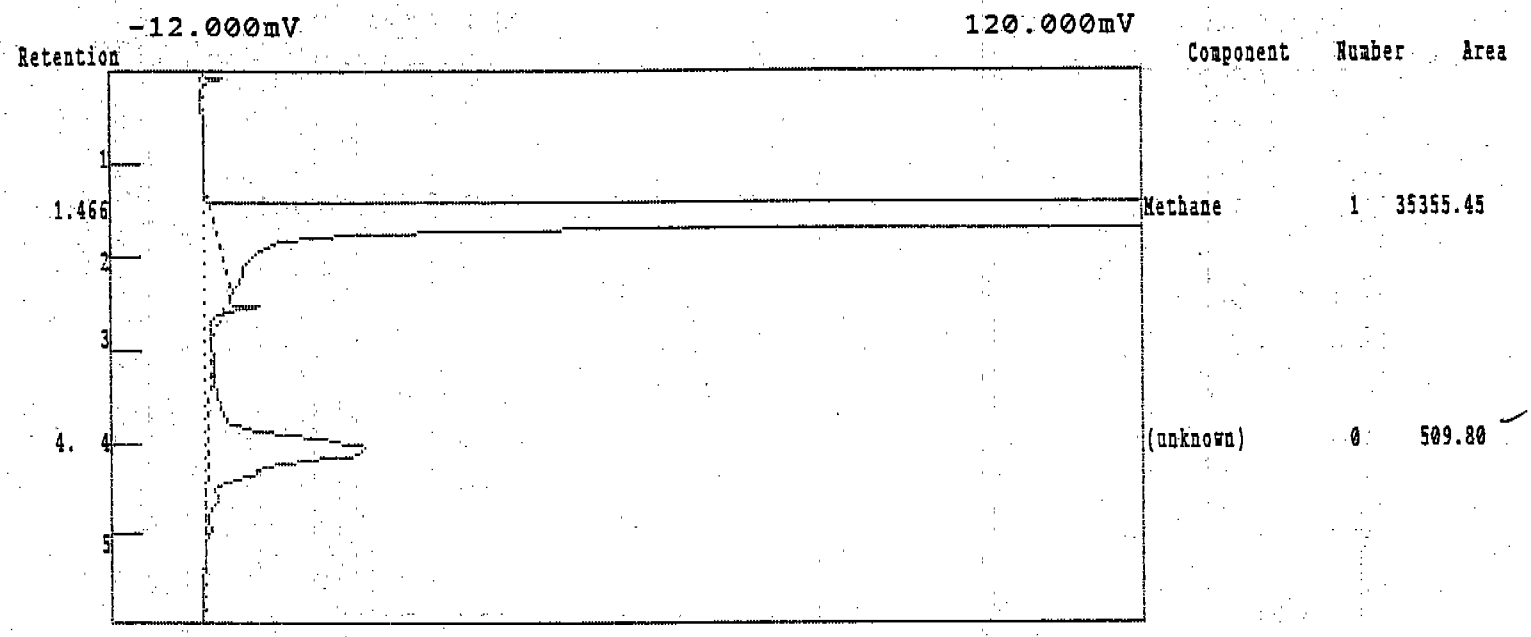
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 10:23:11
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG37 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
(unknown)	0	0.750	0.515	13.08	0.04
Methane	1	1.450	5007.827	35599.77	98.67
(unknown)	0	4.033	19.649	468.36	1.30
	3			36081.21	100.00

Undetected components:

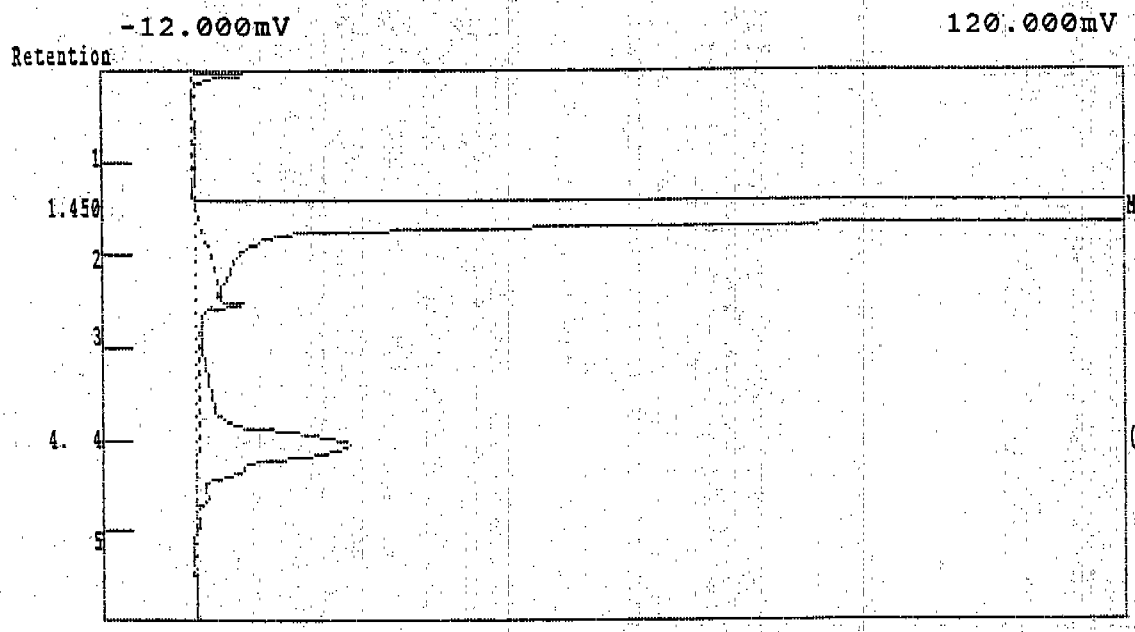
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 10:30:45
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG38 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	5007.512	35355.45	98.58
(unknown)	0	4.066	20.270	509.80	1.42
	2			35865.25	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 10:45:43
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : MFG40 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

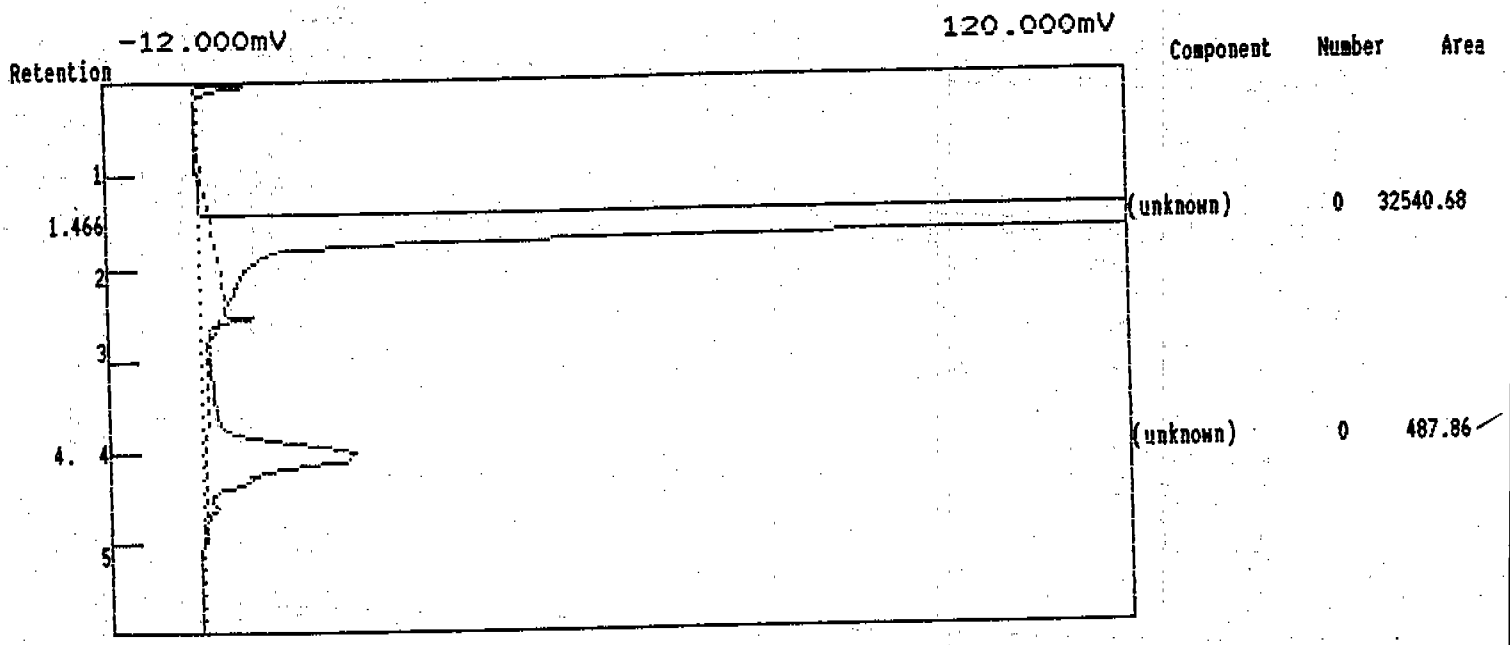


Component	Number	Area
Methane	1	37437.31
(unknown)	0	504.86

Component	Number	Retention	Height	Area	Area %
Methane	1	1.450	5008.265	37437.31	98.67
(unknown)	0	4.050	19.739	504.86	1.33
	2			37942.18	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 10:53:12
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg41 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

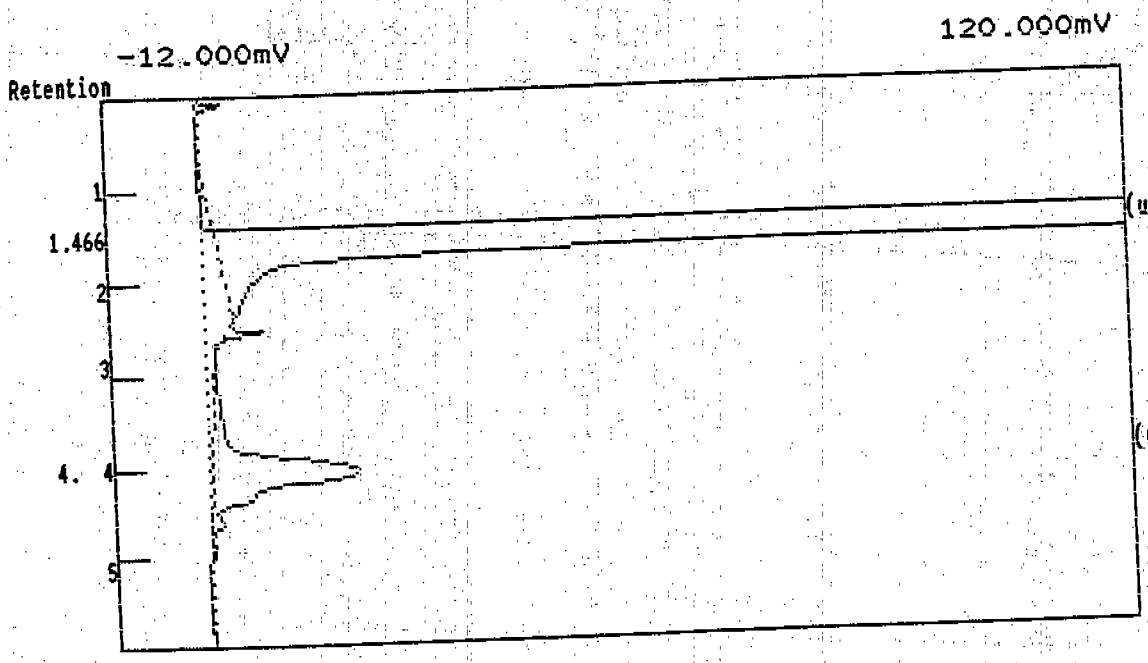


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.466	5006.681	32540.68	98.52
(unknown)	0	4.033	19.878	487.86	1.48
2				33028.54	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 11:00:41
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg42 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Area
(unknown)	0	31999.44
(unknown)	0	469.37

Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.466	5006.578	31999.44	98.55
(unknown)	0	4.050	19.147	469.37	1.45
	2			32468.81	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 11:51:43
Method : EPA-18: On-Line GC-FID
Description : 4916 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : mfg53 (c:\peak3\data)
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

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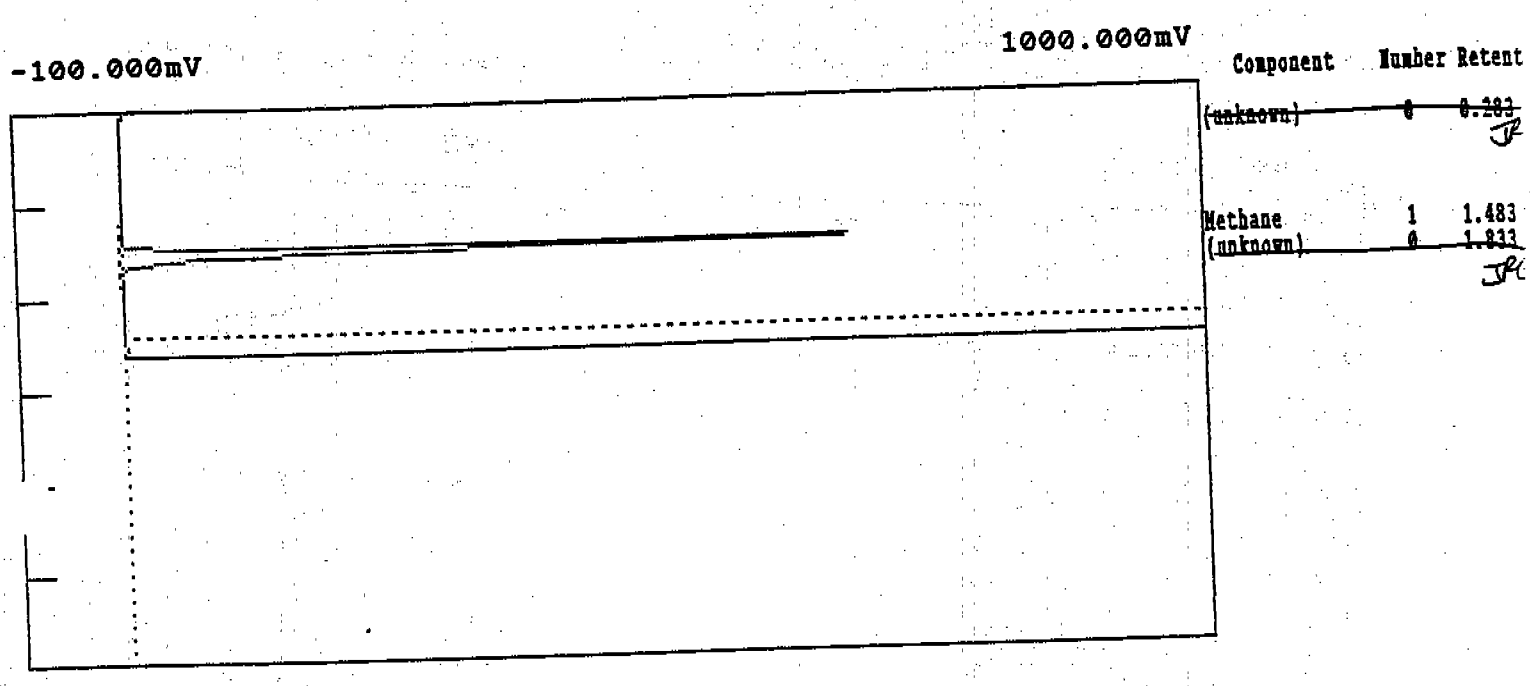
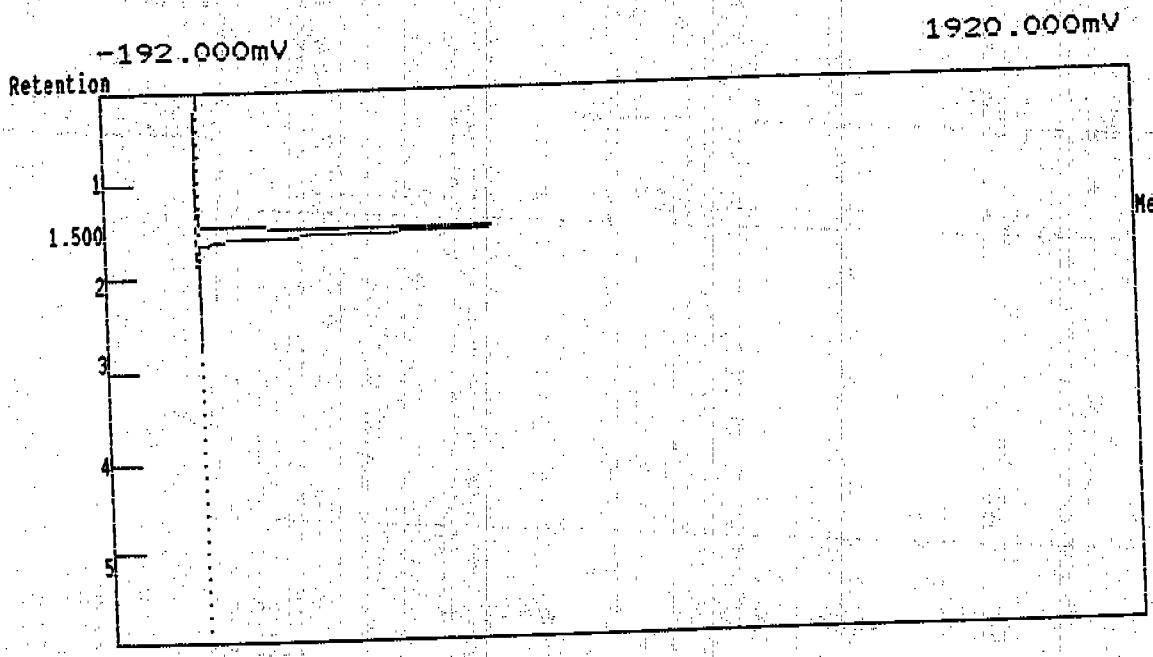


Component	Number	Retention	Height	Area	Area %
(unknown)	0	0.283	0.000	~~1.29~~	0.05
Methane	1	1.483	934.980	2822.62	99.19
(unknown)	0	1.833	2.383	~~21.63~~	0.76
	3			2845.54	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 11:54:59
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 4916 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg54 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

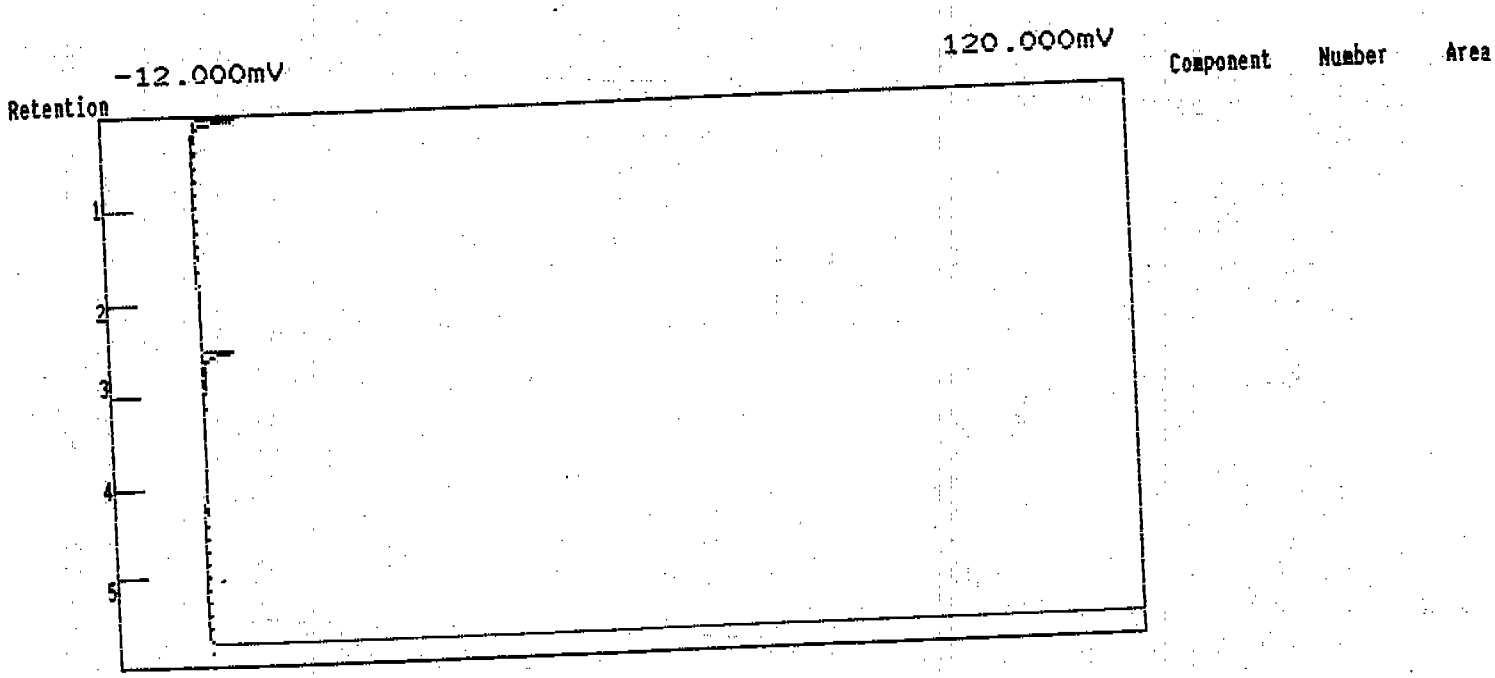


Component	Number	Area
Methane	1	2987.96

Component	Number	Retention	Height	Area	Area %
Methane	1	1.500	832.382	2987.96	100.00
	1			2987.96	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 12:06:40
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg57 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

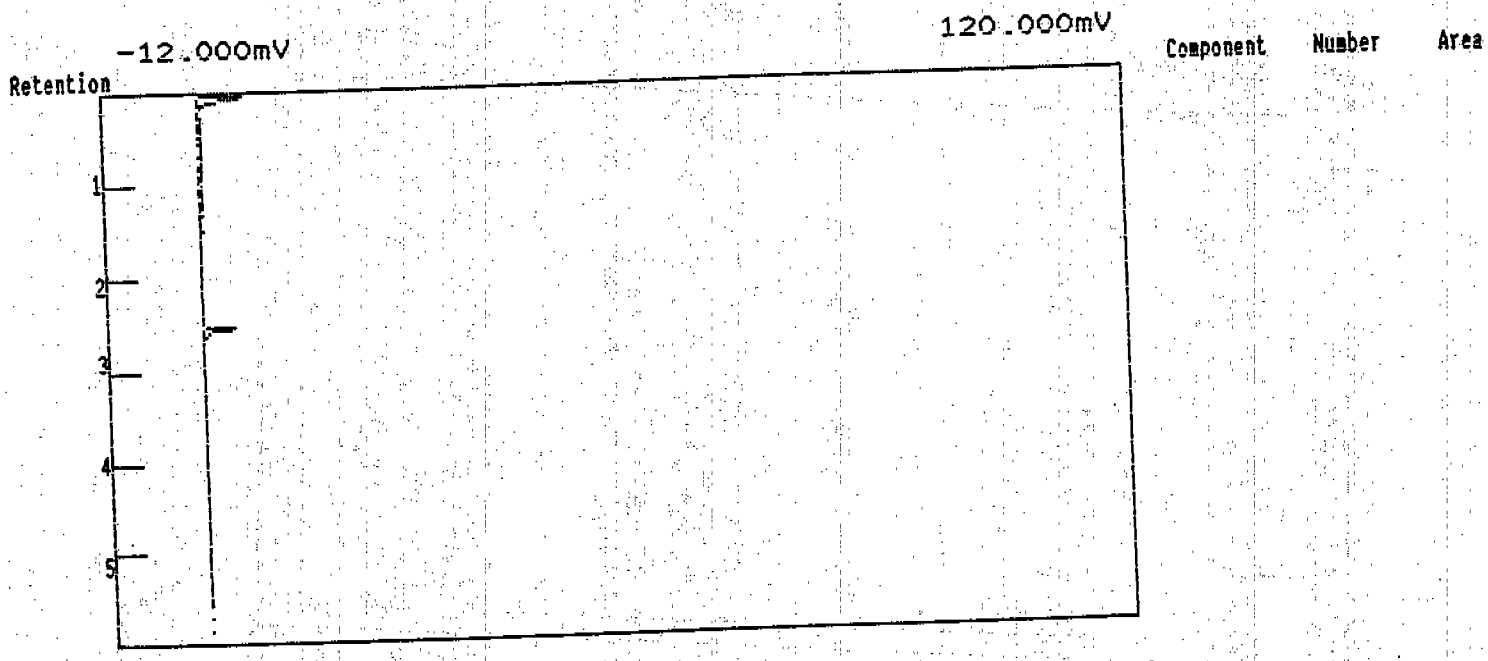


Component	Number	Retention	Height	Area	Area %
	0			0.00	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 12:12:24
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg58 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

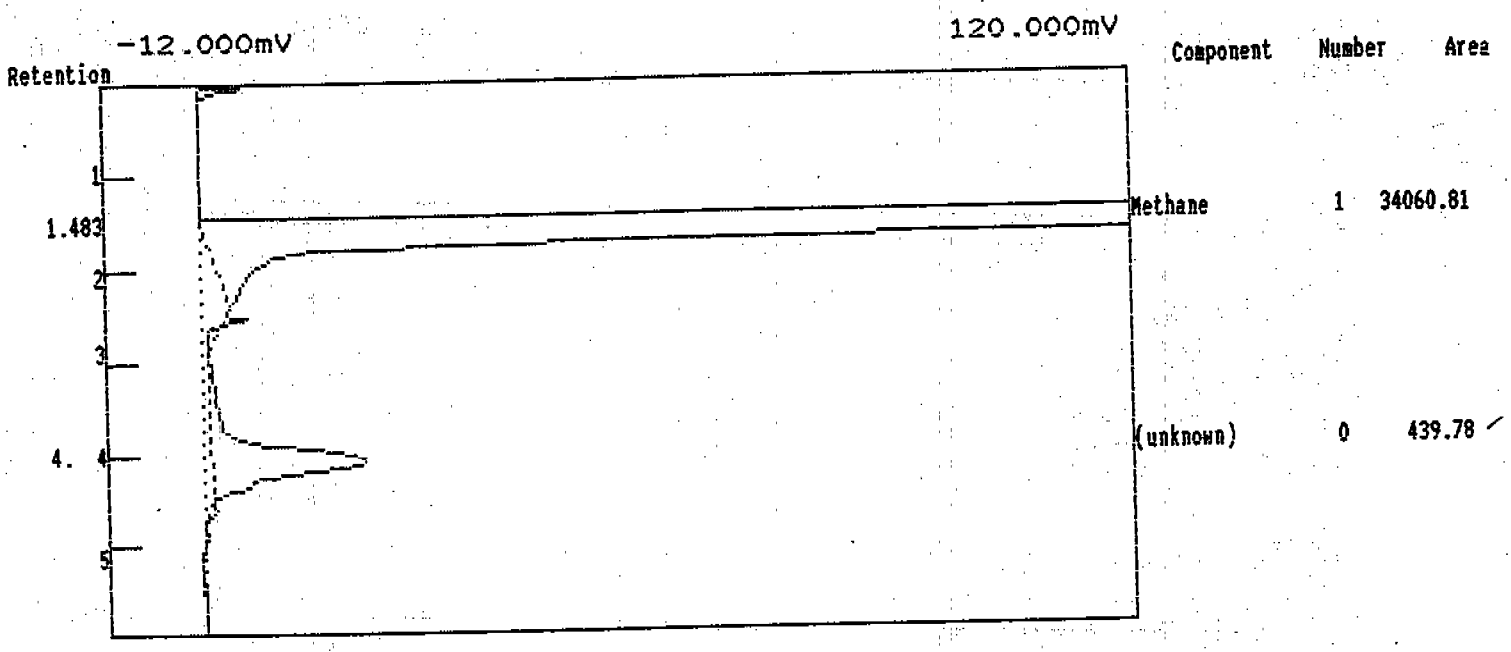


Component	Number	Retention	Height	Area	Area %
	0			0.00	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 12:38:10
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg62 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

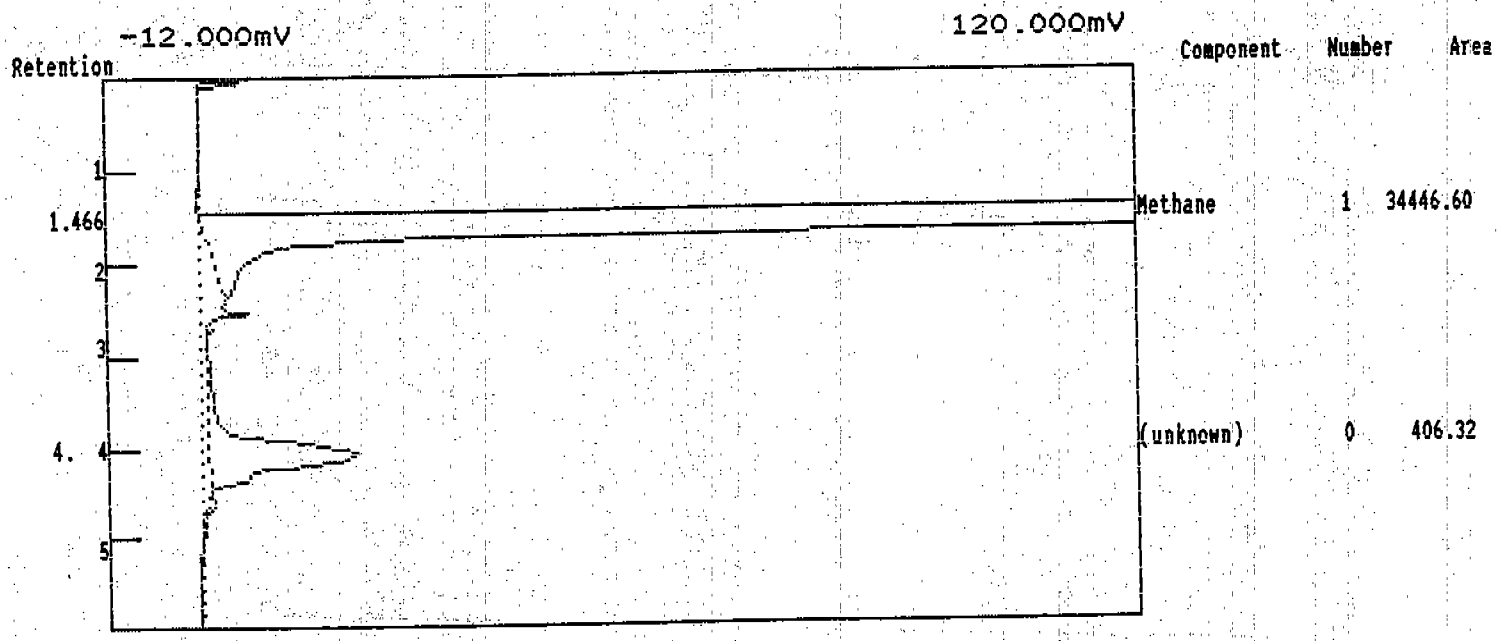


Component	Number	Retention	Height	Area	Area %
Methane	1	1.483	5008.142	34060.81	98.73
(unknown)	0	4.050	19.719	439.78	1.27
				34500.60	100.00

2

Undetected components:

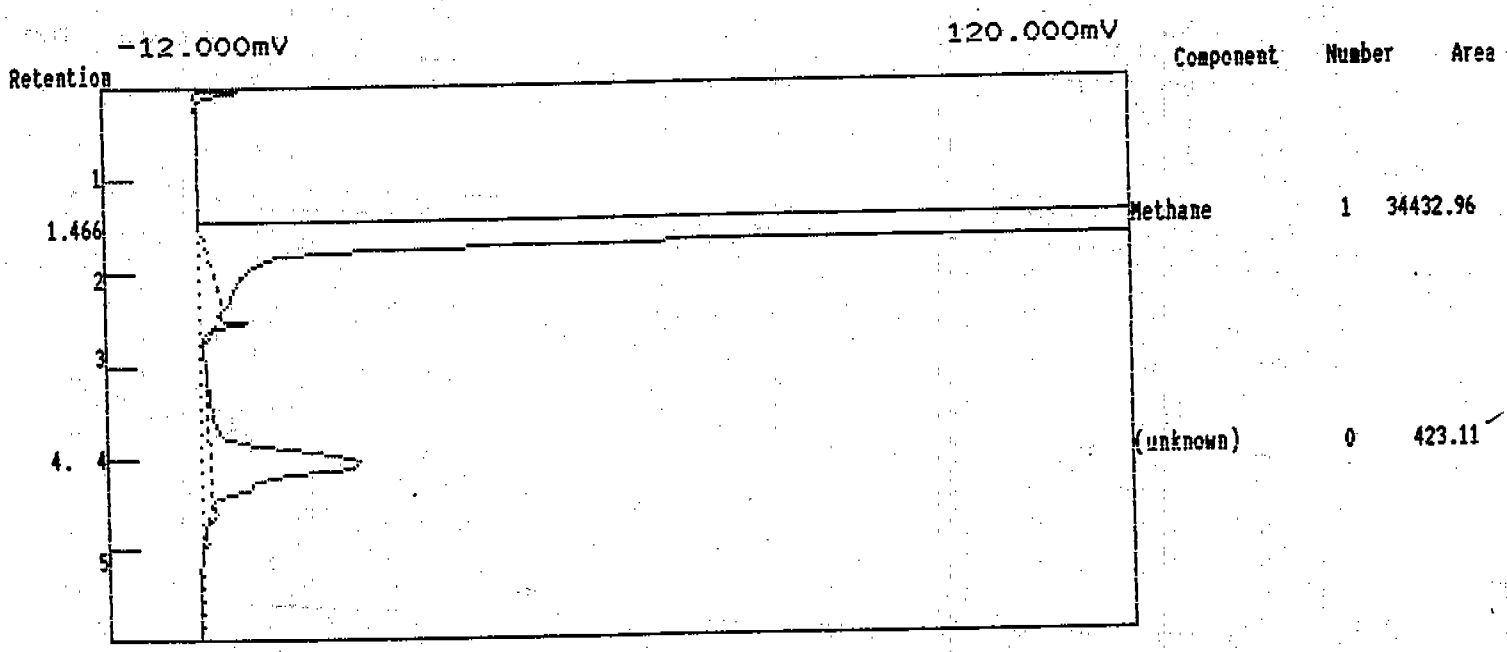
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 12:44:10
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg63 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	5008.214	34446.60	98.83
(unknown)	0	4.066	19.208	406.32	1.17
2				34852.93	100.00

Undetected components:

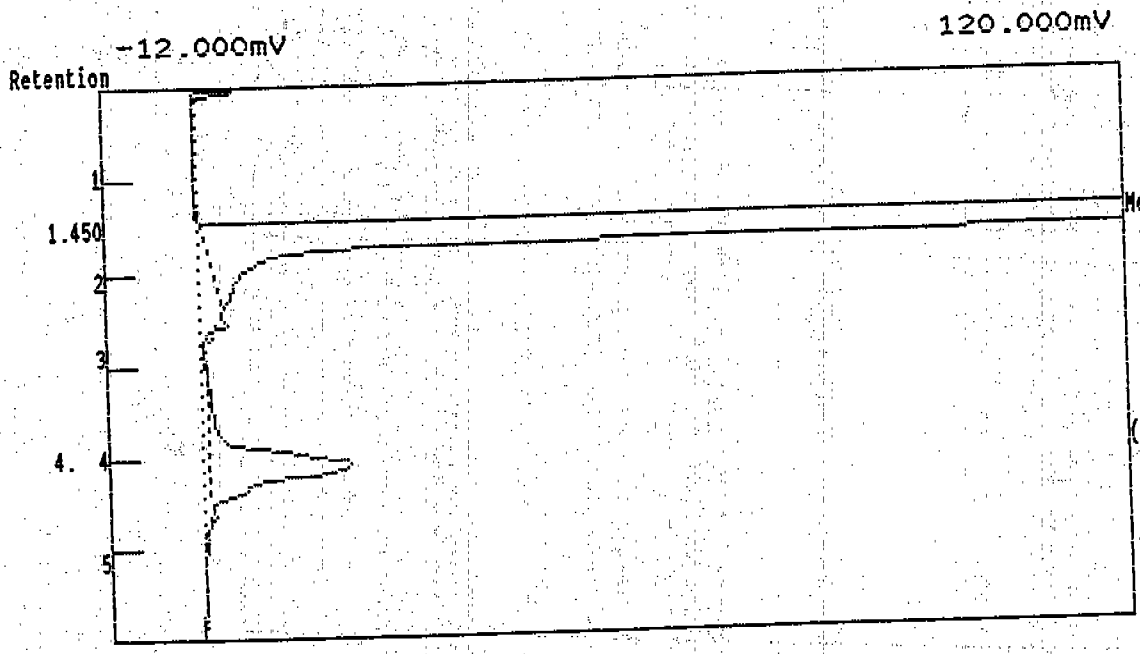
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 12:50:11
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg64 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	5008.069	34432.96	98.79
(unknown)	0	4.066	19.538	423.11	1.21
	2			34856.07	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 12:56:12
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg65 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

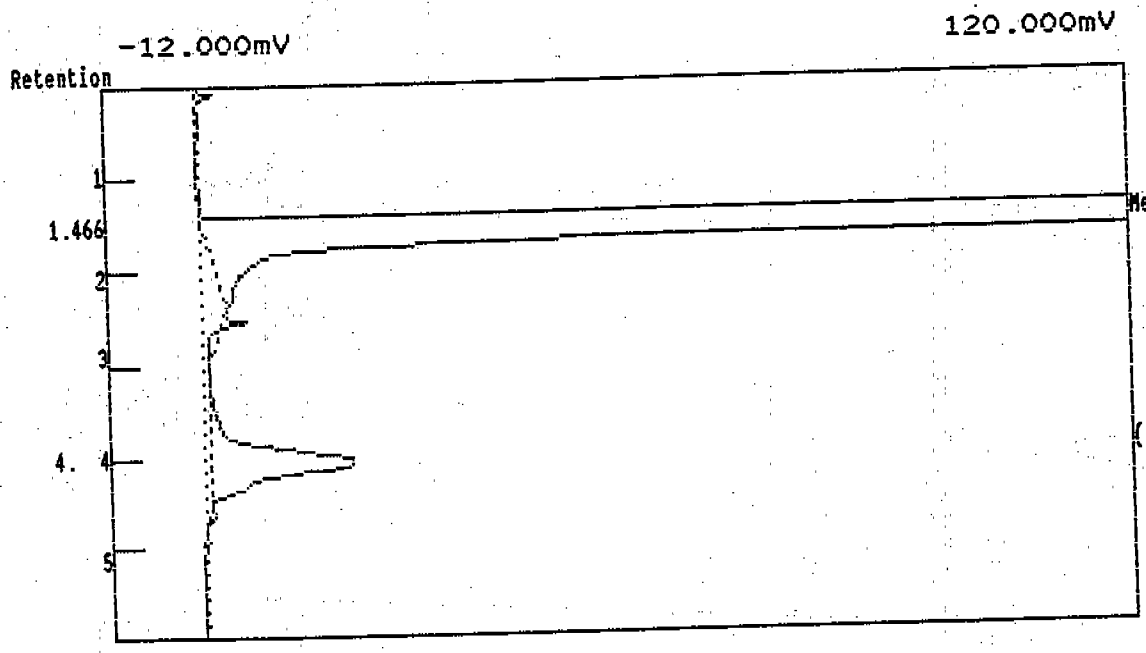


Component	Number	Area
Methane	1	30534.58
(unknown)	0	406.91

Component	Number	Retention	Height	Area	Area %
Methane	1	1.450	5007.917	30534.58	98.68
(unknown)	0	4.066	18.571	406.91	1.32
	2			30941.49	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 13:08:14
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg67 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

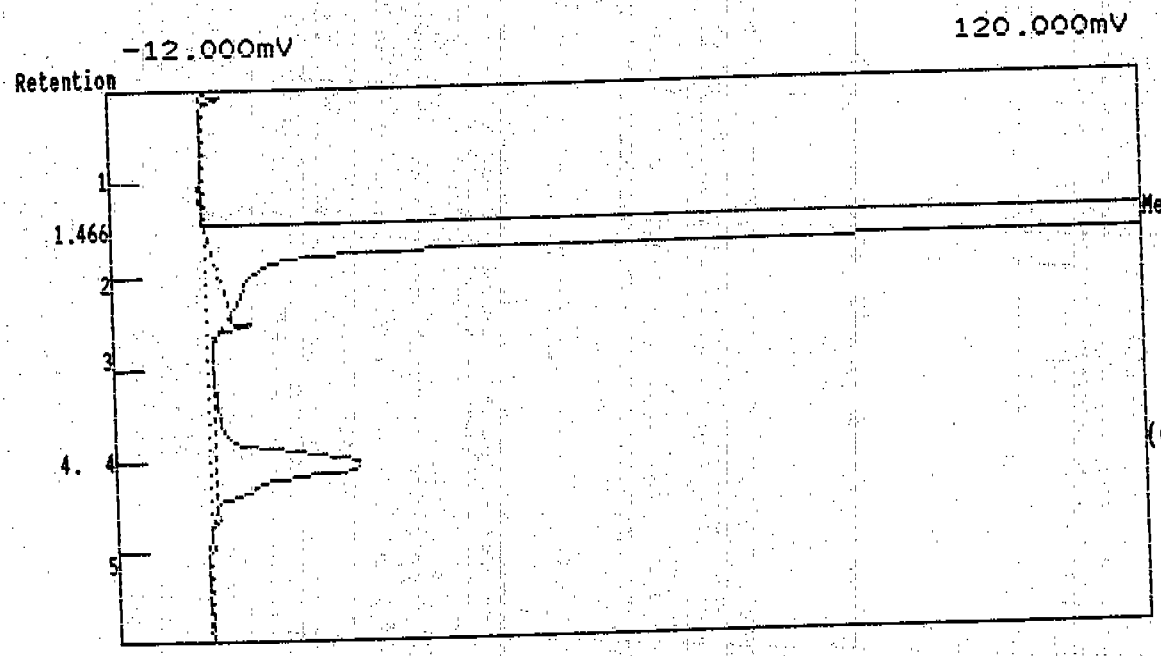


Component	Number	Area
Methane	1	31666.26
(unknown)	0	402.48

Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	5008.084	31666.26	98.74
(unknown)	0	4.066	18.337	402.48	1.26
	2			32068.74	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 13:16:20
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg68 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

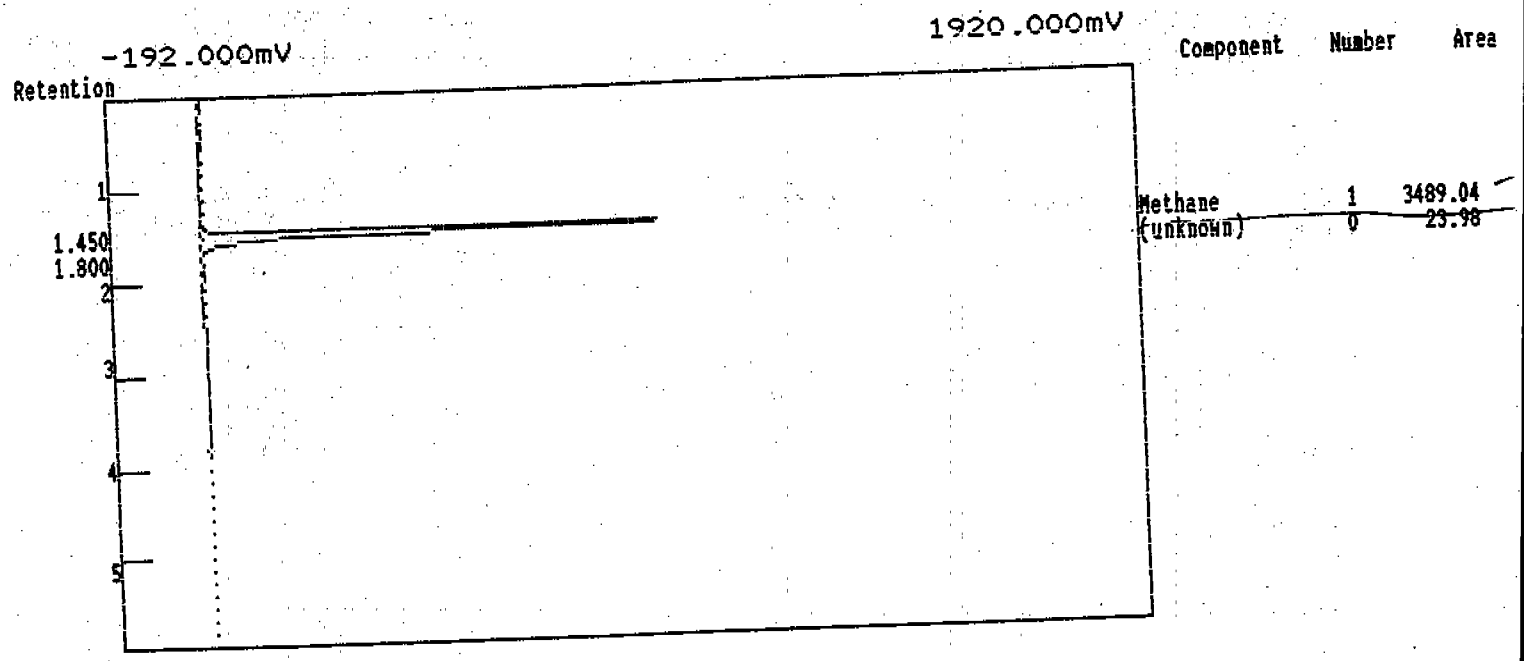


Component	Number	Area
Methane	1	32953.93
(unknown)	0	424.56

Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	5008.392	32953.93	98.73
(unknown)	0	4.033	19.062	424.56	1.27
	2			33378.49	100.00

Undetected components:

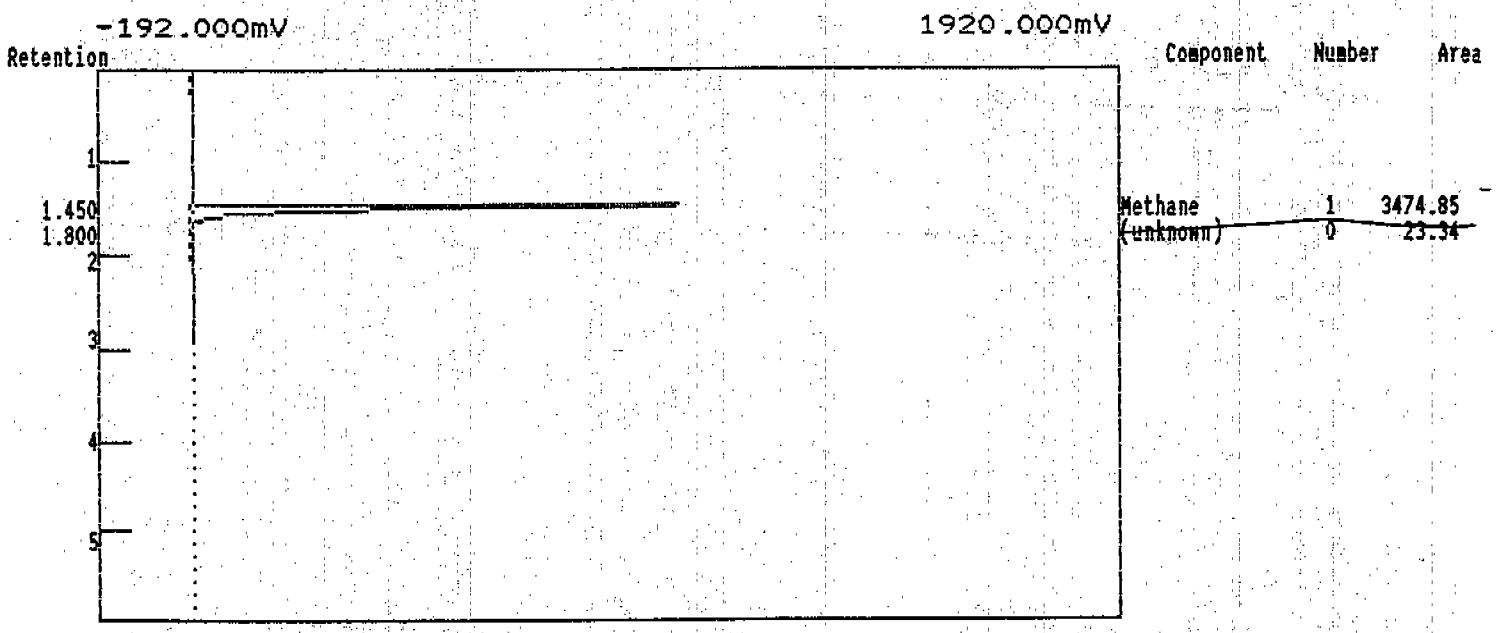
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 13:37:59
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 4916 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg71 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.450	928.050	3489.04	99.32
(unknown)	0	1.800	2.479	23.98	0.68
	2			3513.02	100.00

Undetected components:

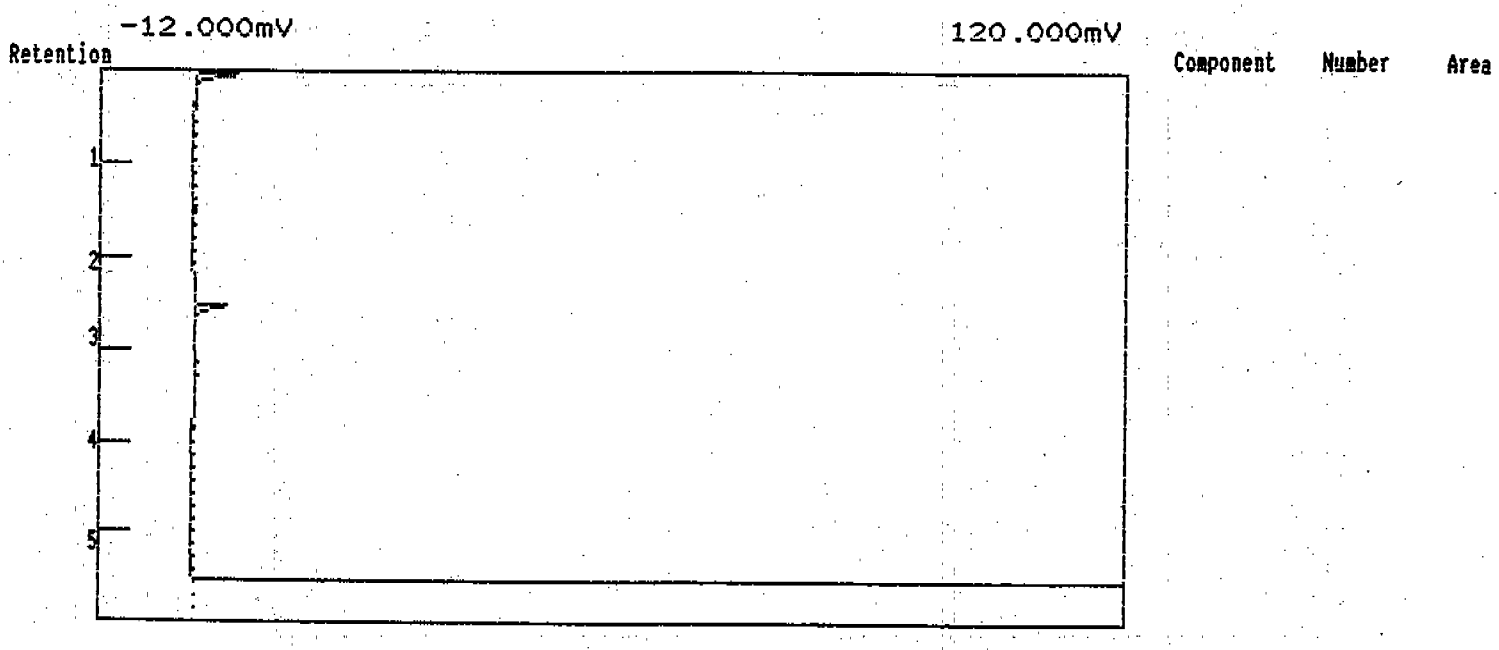
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 13:45:52
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 4916 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg72 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.450	1016.637	3474.85	99.33
(unknown)	0	1.800	2.422	23.34	0.67
2				3498.19	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 13:52:59
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg74 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

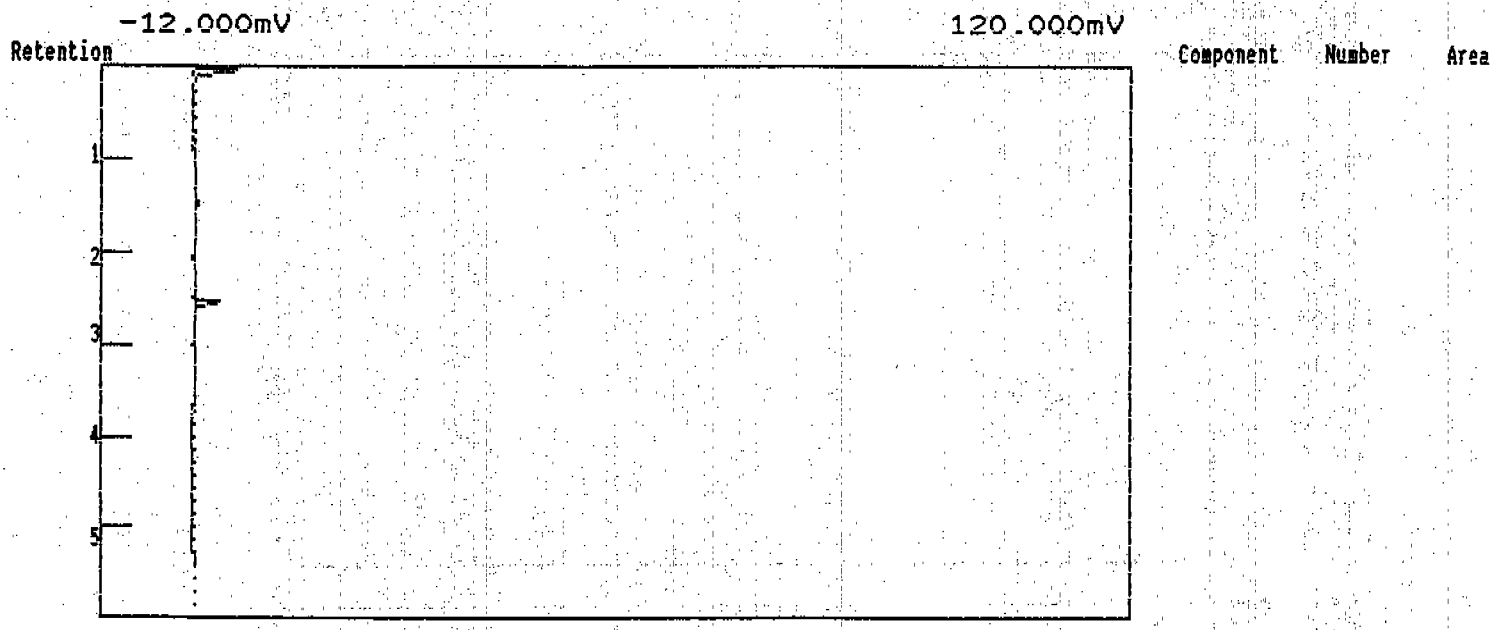


Component	Number	Retention	Height	Area	Area %
	0			0.00	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 13:58:34
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg75 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

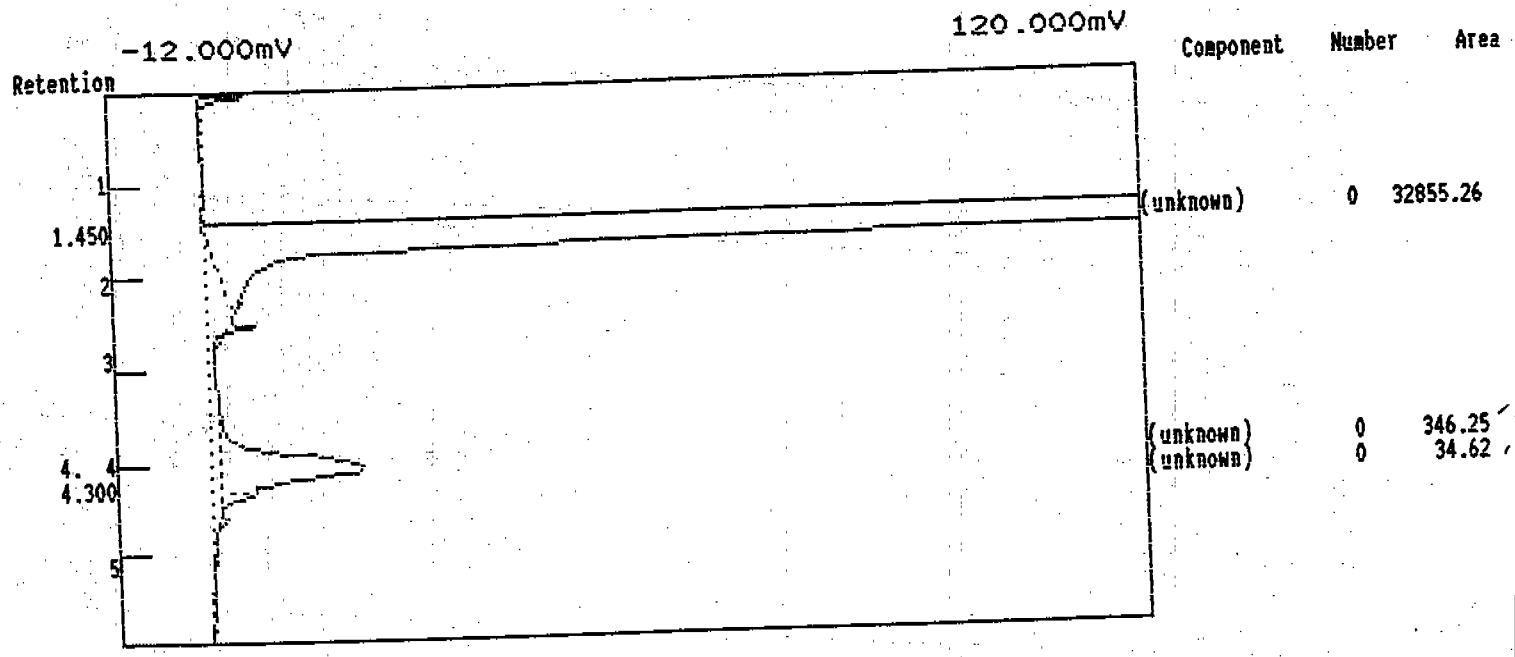


Component	Number	Retention	Height	Area	Area %
	0			0.00	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 14:47:52
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg101 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

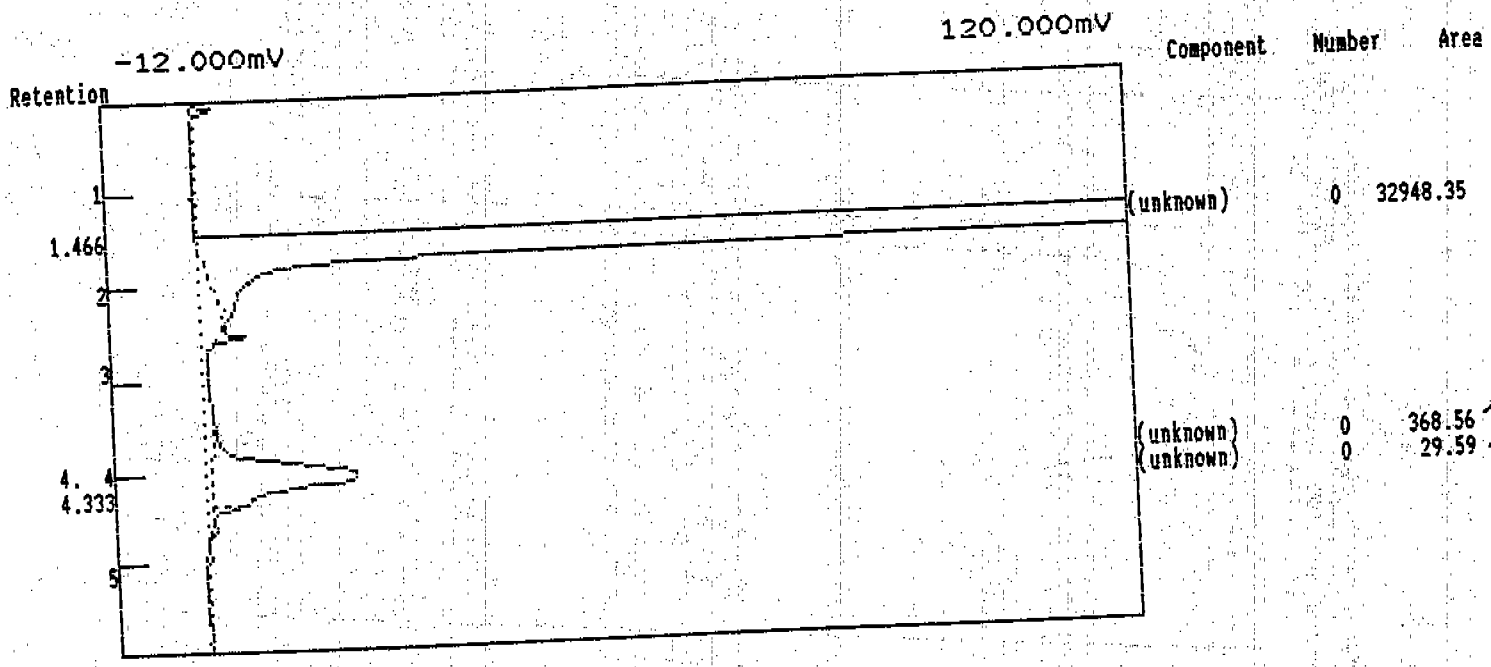


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.450	5008.549	32855.26	98.85
(unknown)	0	4.050	18.694	346.25	1.04
(unknown)	0	4.300	4.783	34.62	0.10
3				33236.13	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 14:53:53
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg102 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

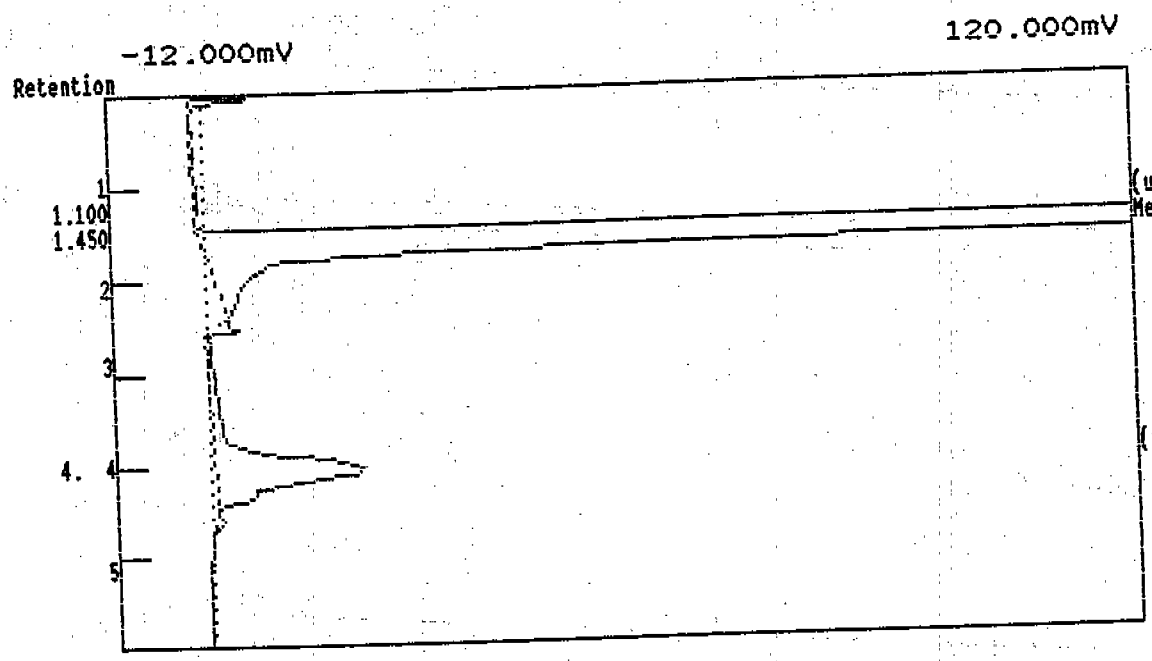


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.466	5008.626	32948.35	98.81
(unknown)	0	4.033	18.872	368.56	1.11
(unknown)	0	4.333	5.019	29.59	0.09
	3			33346.50	100.00

Undetected components:

Methane

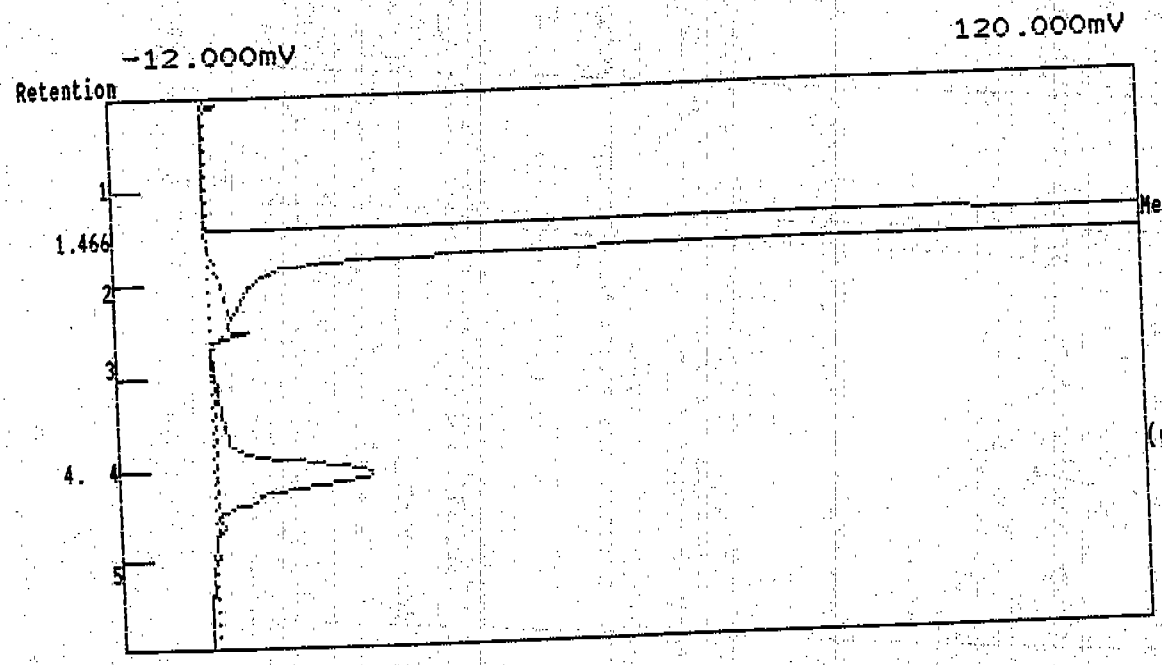
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 14:59:54
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg103 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.100	0.517	10.07	0.03
Methane	1	1.450	5008.872	32081.62	98.56
(unknown)	0	4.050	19.263	459.87	1.41
	3			32551.55	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 15:05:55
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg104 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

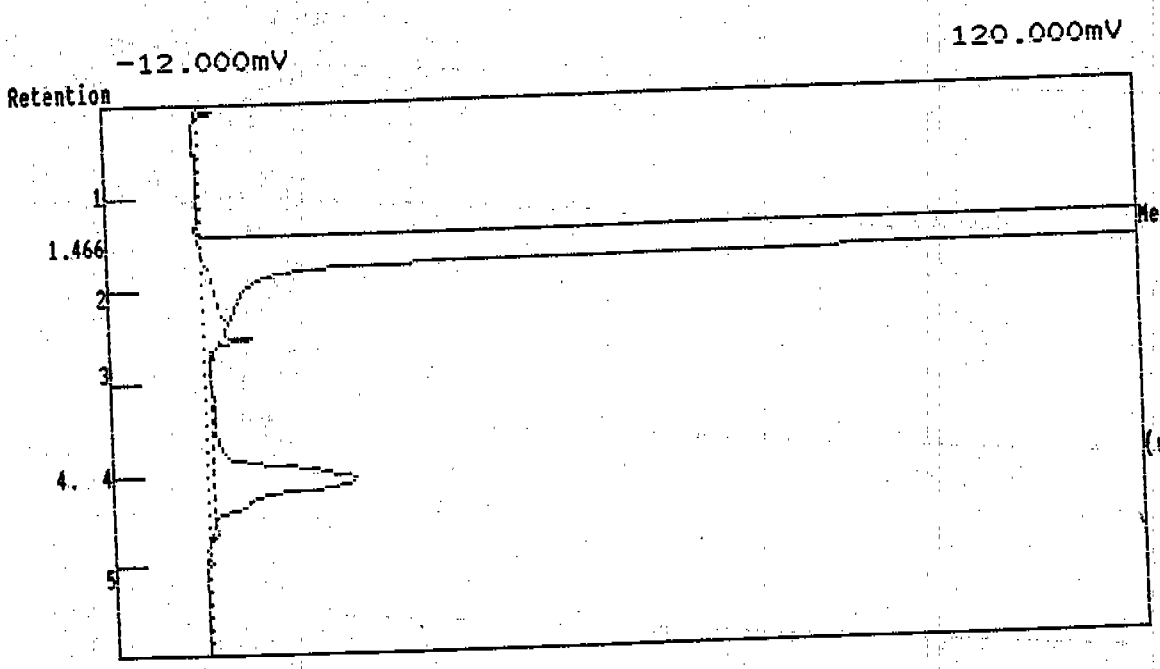


Component	Number	Area
Methane	1	31882.51
(unknown)	0	452.19

Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	5008.184	31882.51	98.60
(unknown)	0	4.050	19.919	452.19	1.40
	2			32334.70	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 15:12:11
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Inlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg105 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

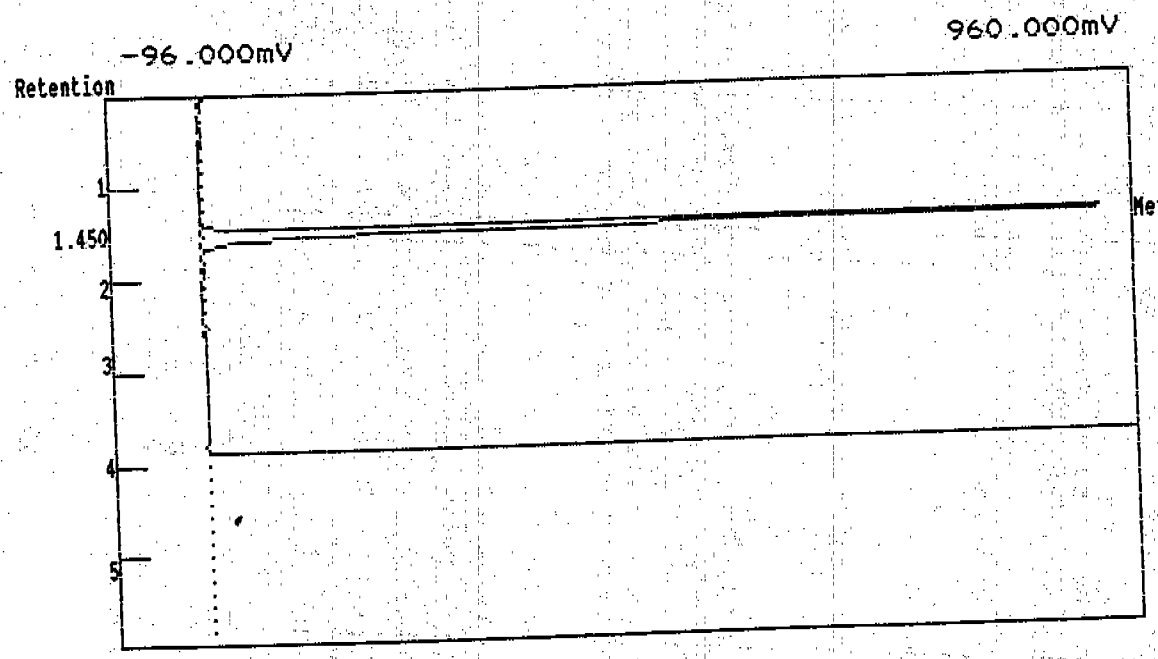


Component	Number	Retention	Height	Area	Area %
Methane	1	1.466	5008.260	32469.12	98.79
(unknown)	0	4.050	18.622	397.48	1.21
				32866.60	100.00

2

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 15:32:22
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 4916 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg108 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

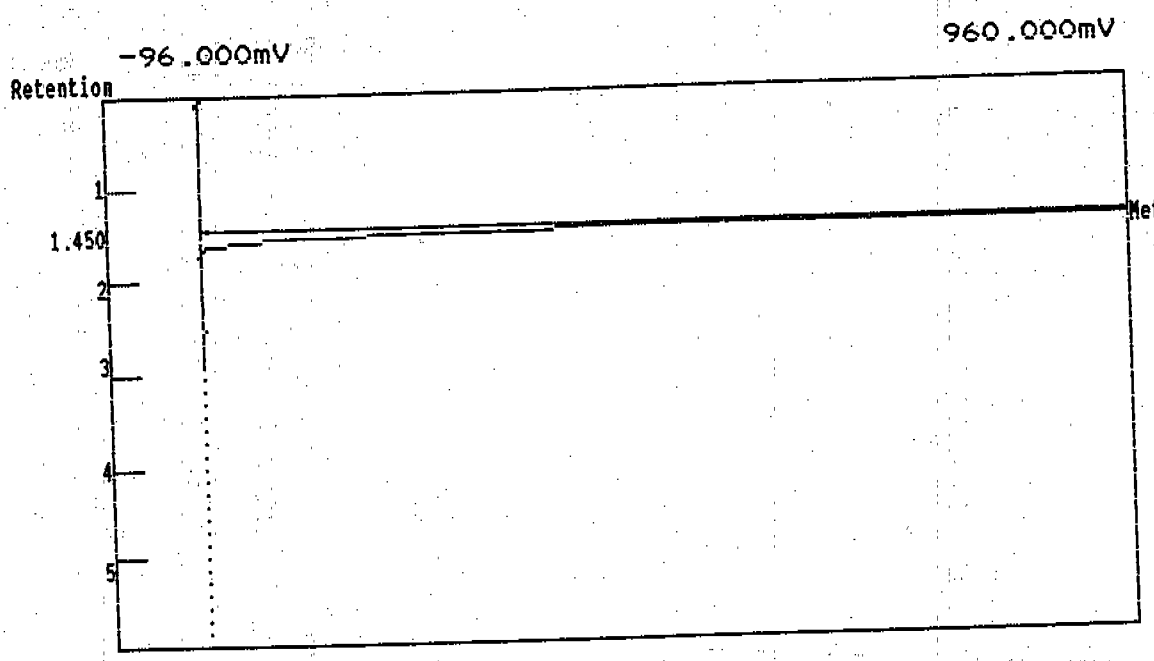


Component	Number	Area
Methane	1	3484.89

Component	Number	Retention	Height	Area	Area %
Methane	1	1.450	927.879	3484.89	100.00
	1			3484.89	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 15:37:27
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 4916 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg109 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

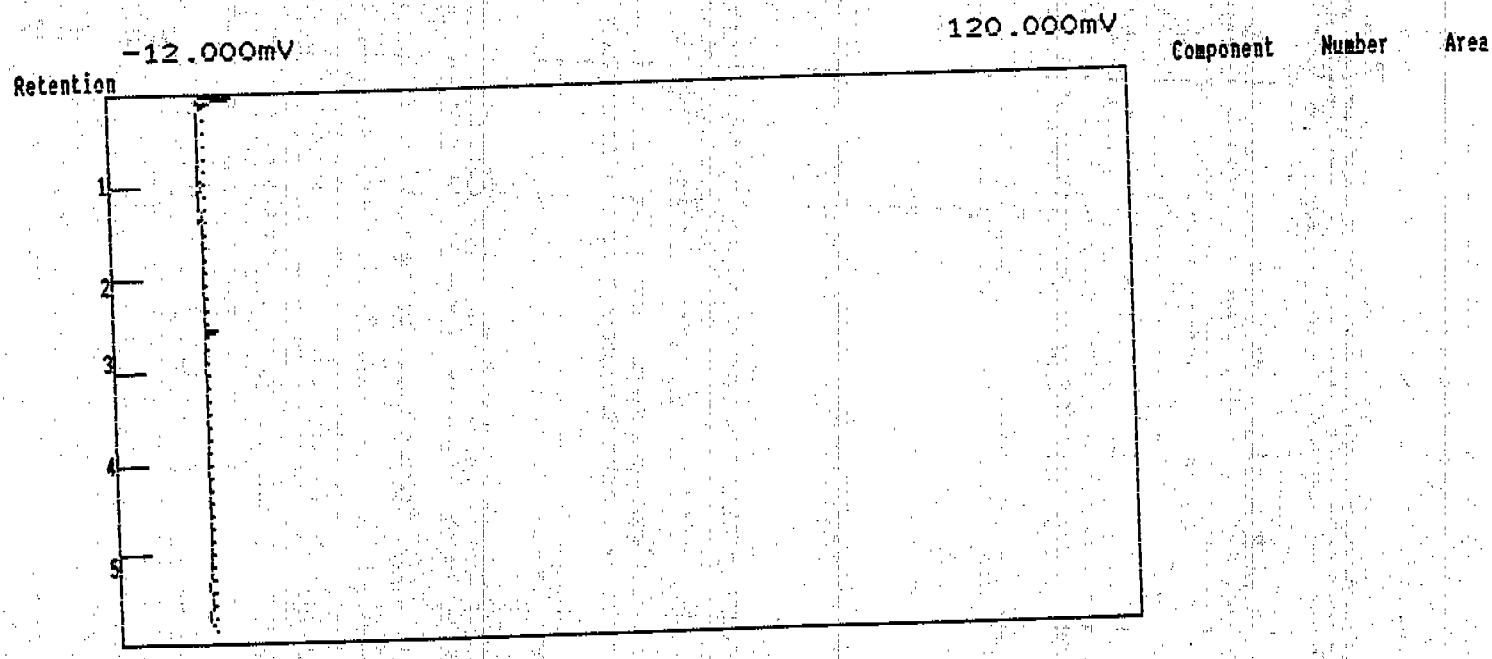


Component	Number	Retention	Height	Area	Area %
Methane	1	1.450	1016.301	3468.63	100.00
				3468.63	100.00
1					

Component	Number	Area
Methane	1	3468.63

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 15:43:01
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg110 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

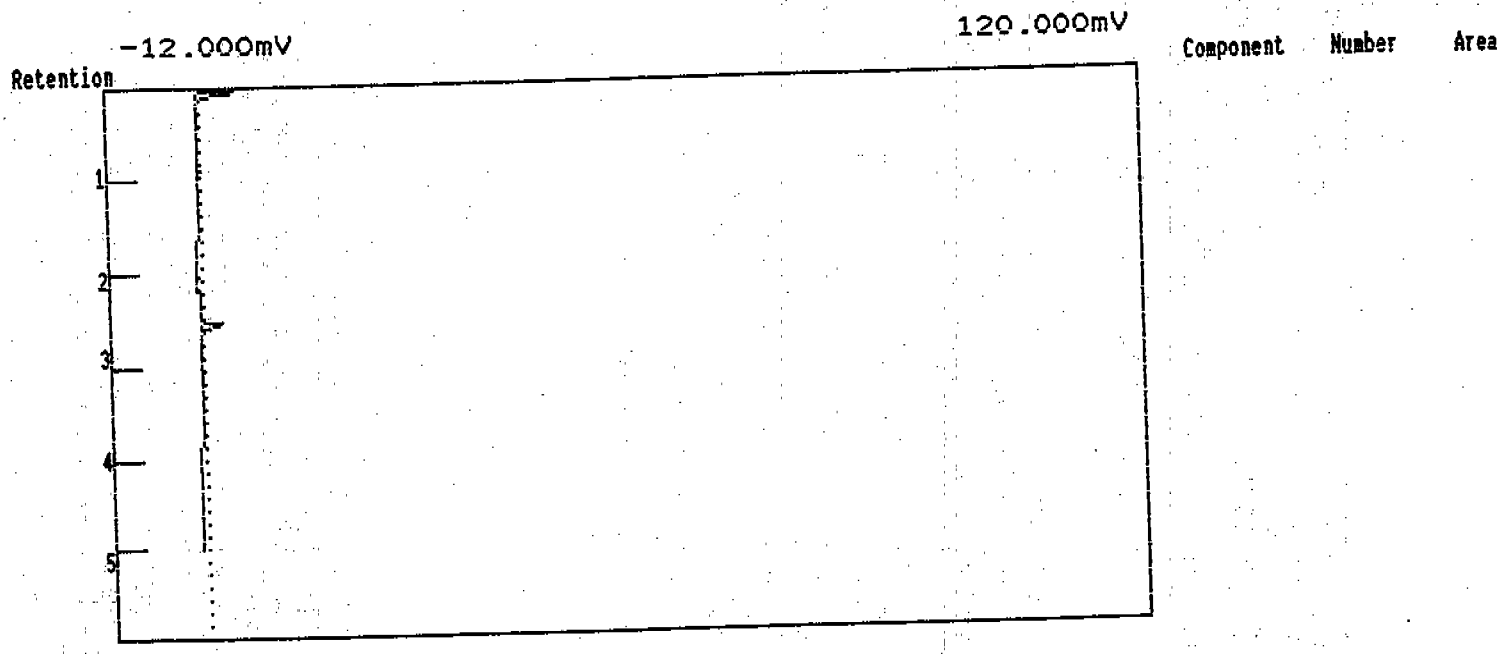


Component	Number	Retention	Height	Area	Area %
	0			0.00	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Holding time : 48 Hours
Analysis date : 10/09/1996 15:48:48
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Control file : DEFAULT.CON
Data file : mfg111 (c:\peak3\data)
Sample : Channel-2
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 105 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 0.25 1ml On-Column Injections, Atten.=1

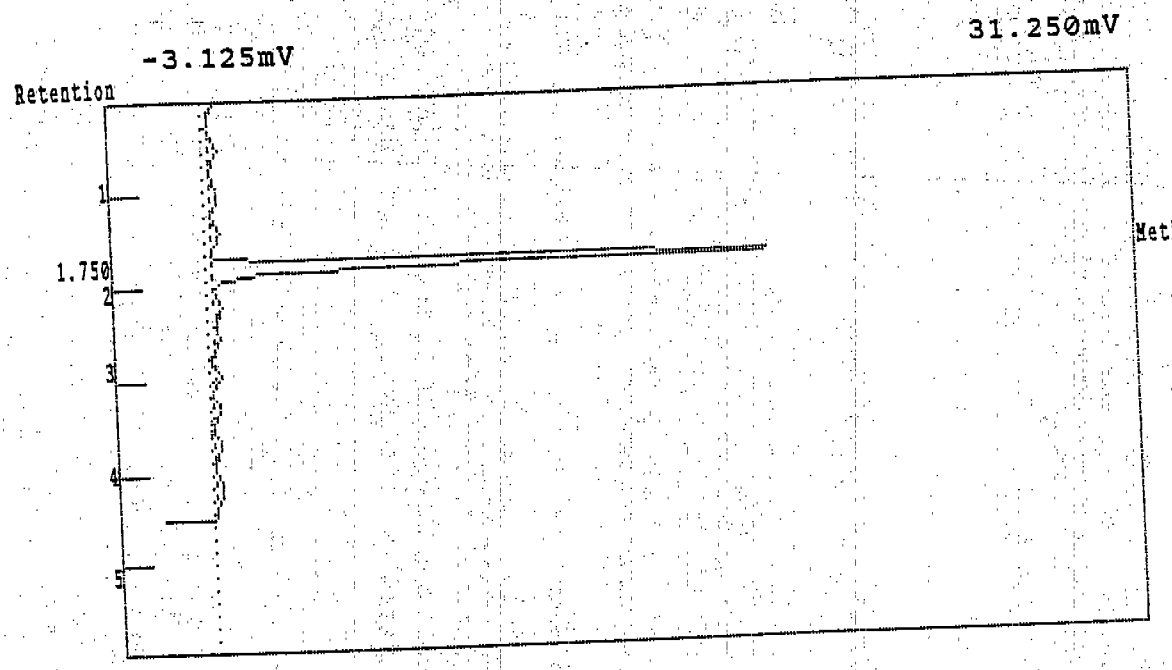


Component	Number	Retention	Height	Area	Area %
	0			0.00	100.00

Undetected components:

Methane

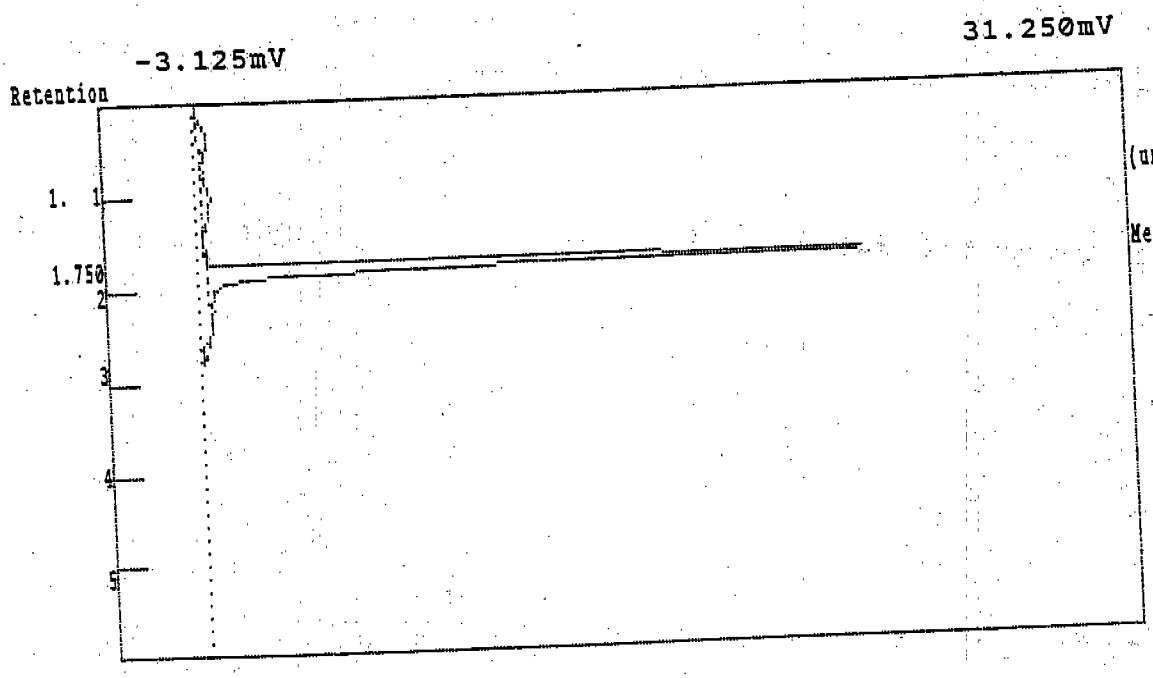
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 06:53:23
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 21.3 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG12 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.750	23.120	116.31	100.00
	1			116.31	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 07:02:47
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 21.3 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG13 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



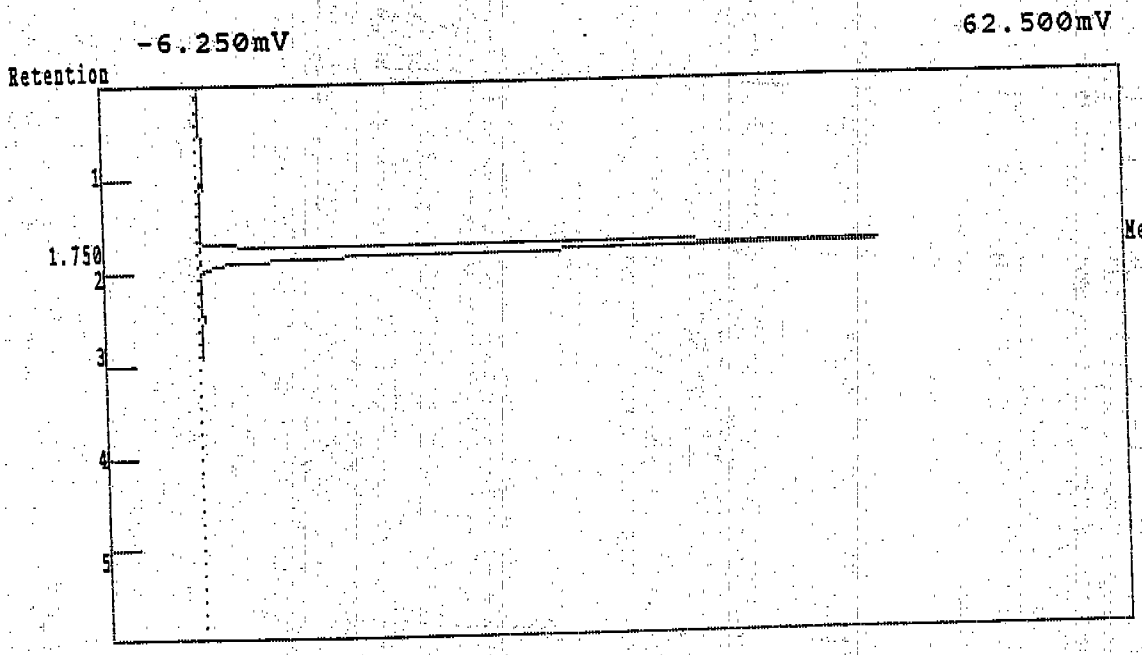
Component	Number	Area
(unknown)	0	7.09
Methane	1	119.16

Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.033	0.336	7.09	5.62
Methane	1	1.750	23.100	119.16	94.38
				126.25	100.00

2

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 07:07:40
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 51.3 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG14 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

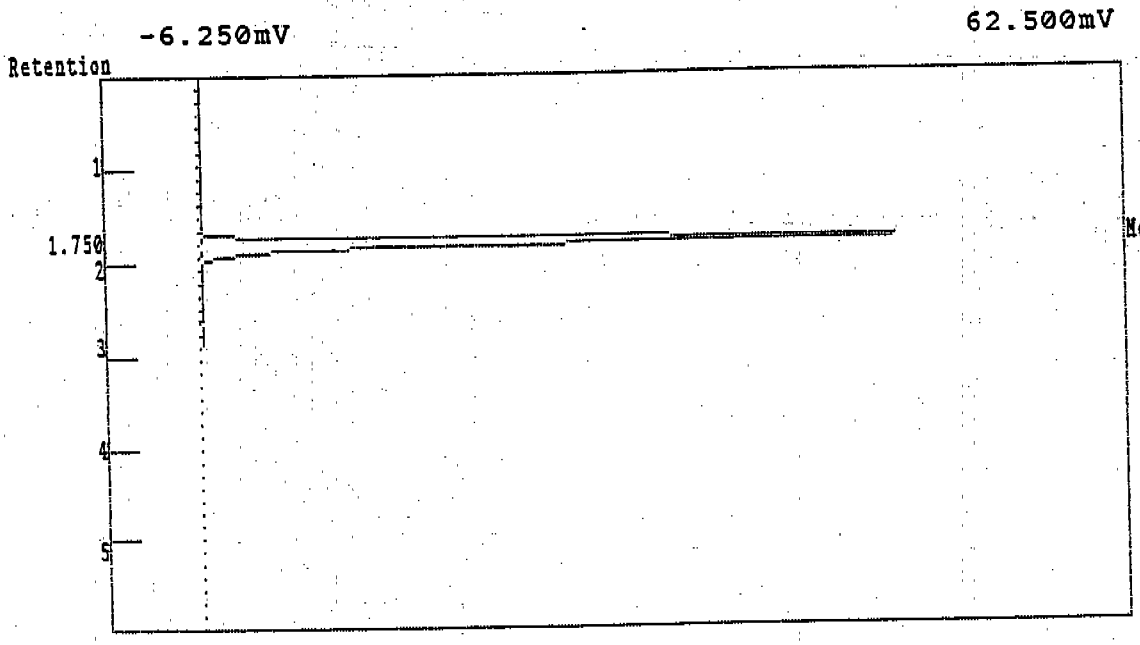


Component	Number	Area
Methane	1	286.40

Component	Number	Retention	Height	Area	Area %
Methane	1	1.750	54.279	286.40	100.00
	1			286.40	100.00

Undetected components:

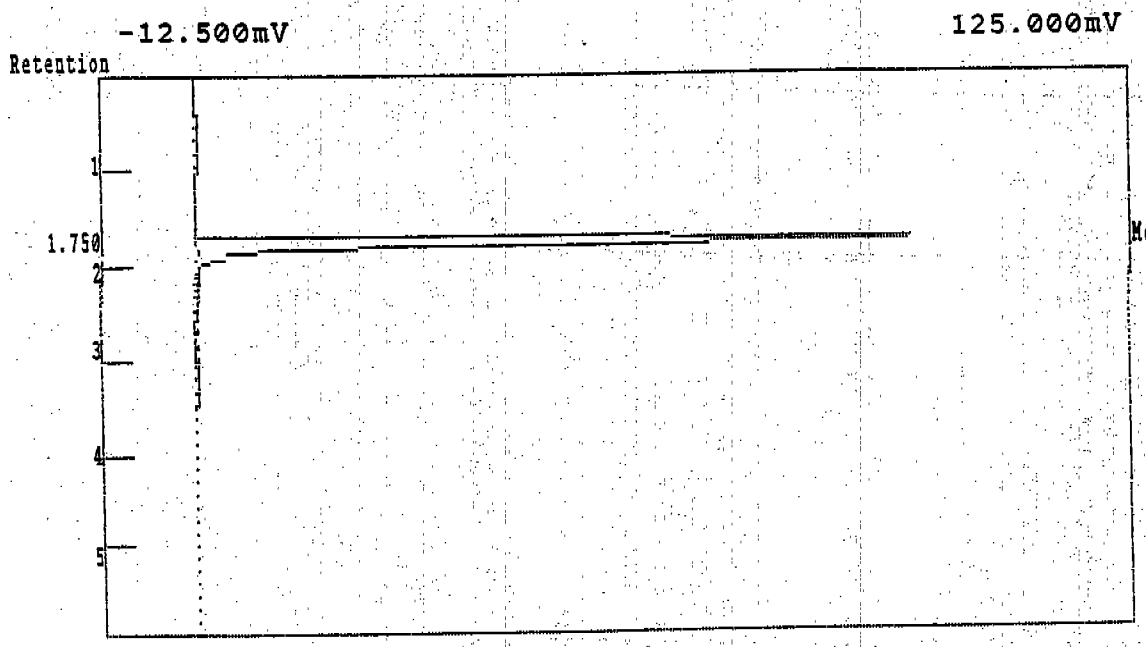
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 07:12:12
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 51.3 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG15 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.750	53.611	287.57	100.00
	1			287.57	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 07:19:32
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 88.7 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG16 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

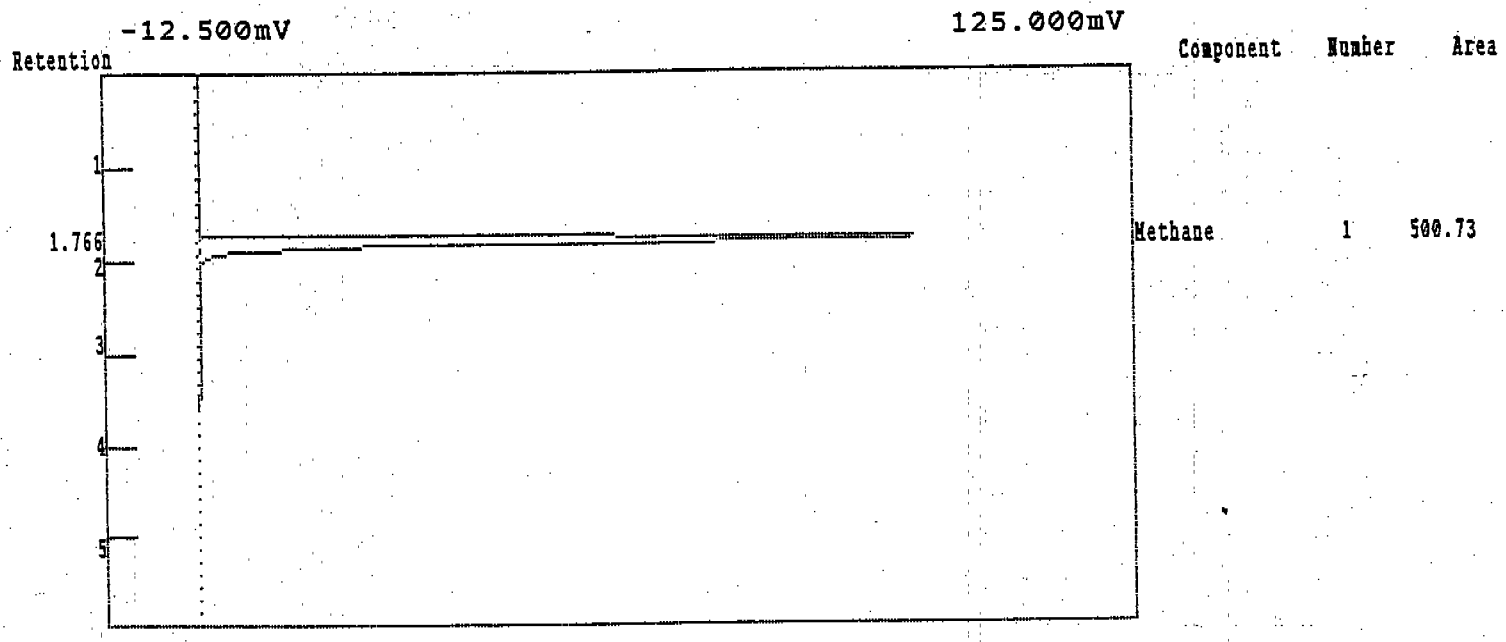


Component	Number	Area
Methane	1	535.98

Component	Number	Retention	Height	Area	Area %
Methane	1	1.750	99.583	535.98	100.00
	1			535.98	100.00

Undetected components:

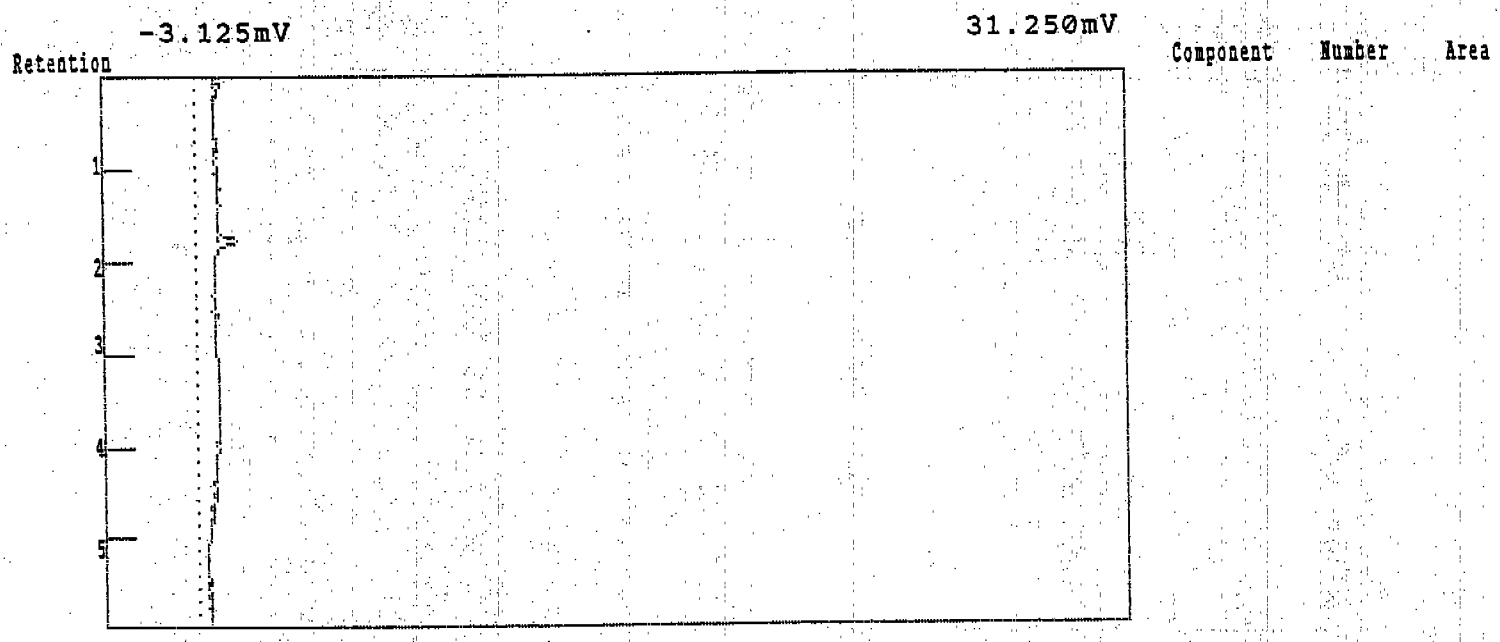
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 07:24:53
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 88.7 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG17 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.766	99.772	500.73	100.00
1				500.73	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 08:19:58
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG26 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

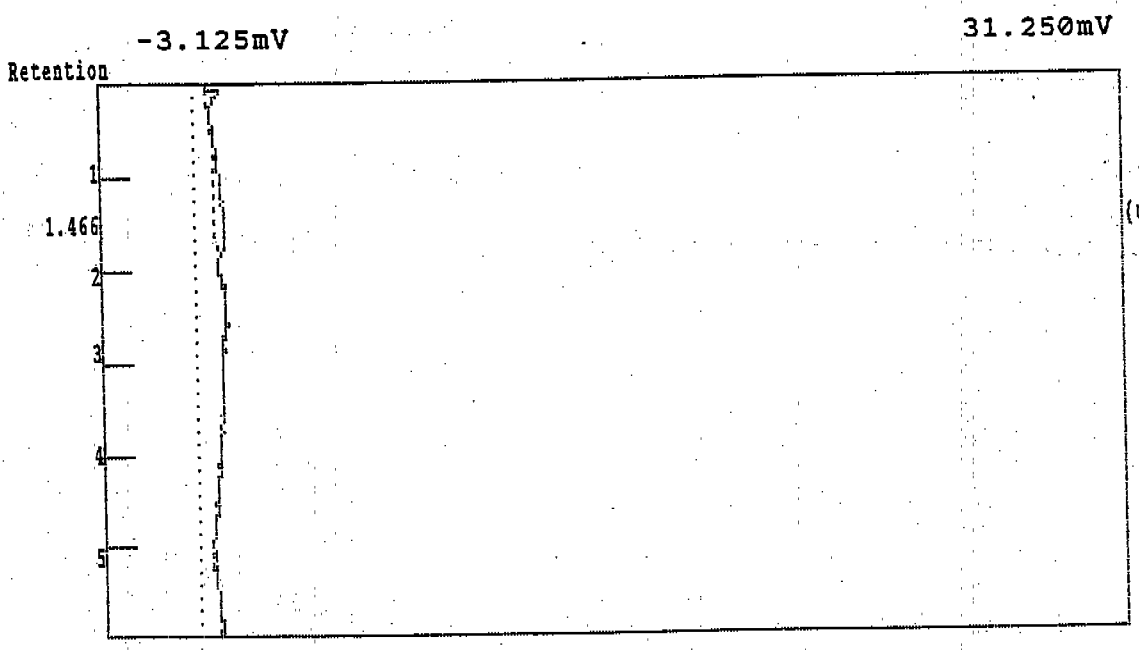


Component	Number	Retention	Height	Area	Area %
	0			0.00	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 08:27:47
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG27 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



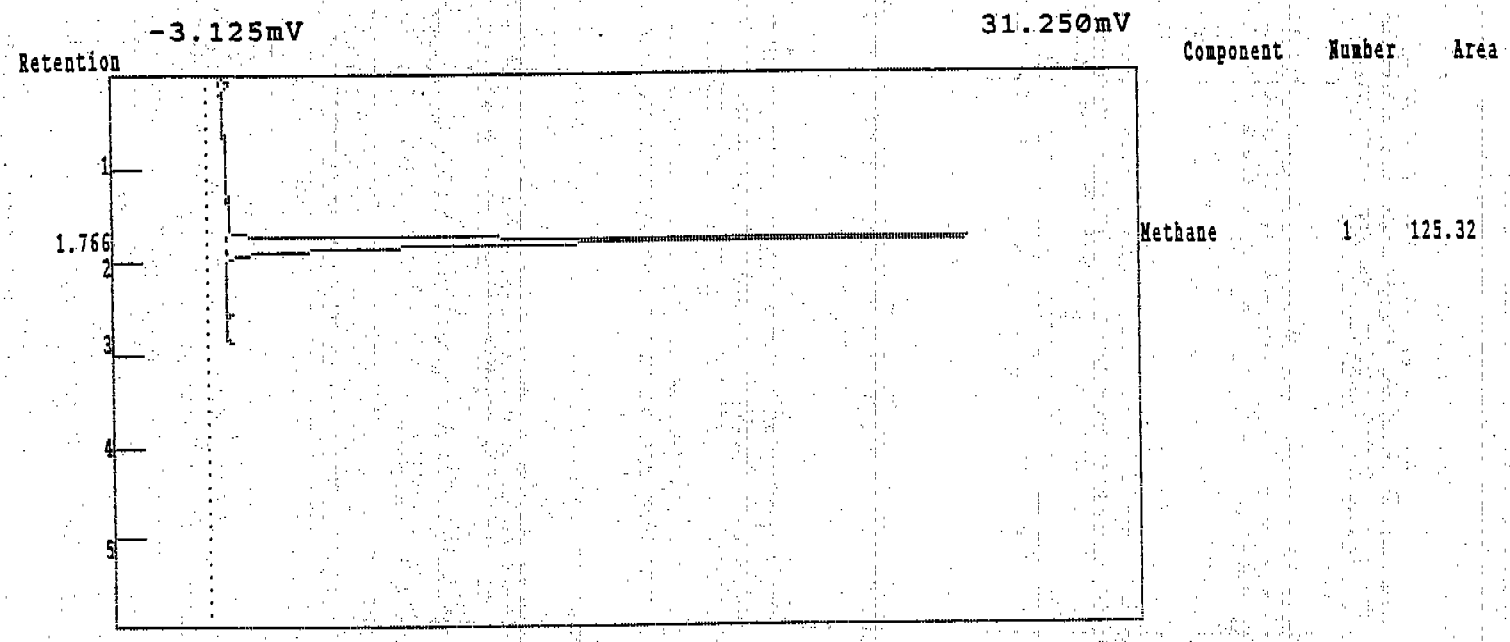
Component	Number	Area
(unknown)	0	16.39

Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.466	0.322	16.39	100.00
	1			16.39	100.00

Undetected components:

Methane

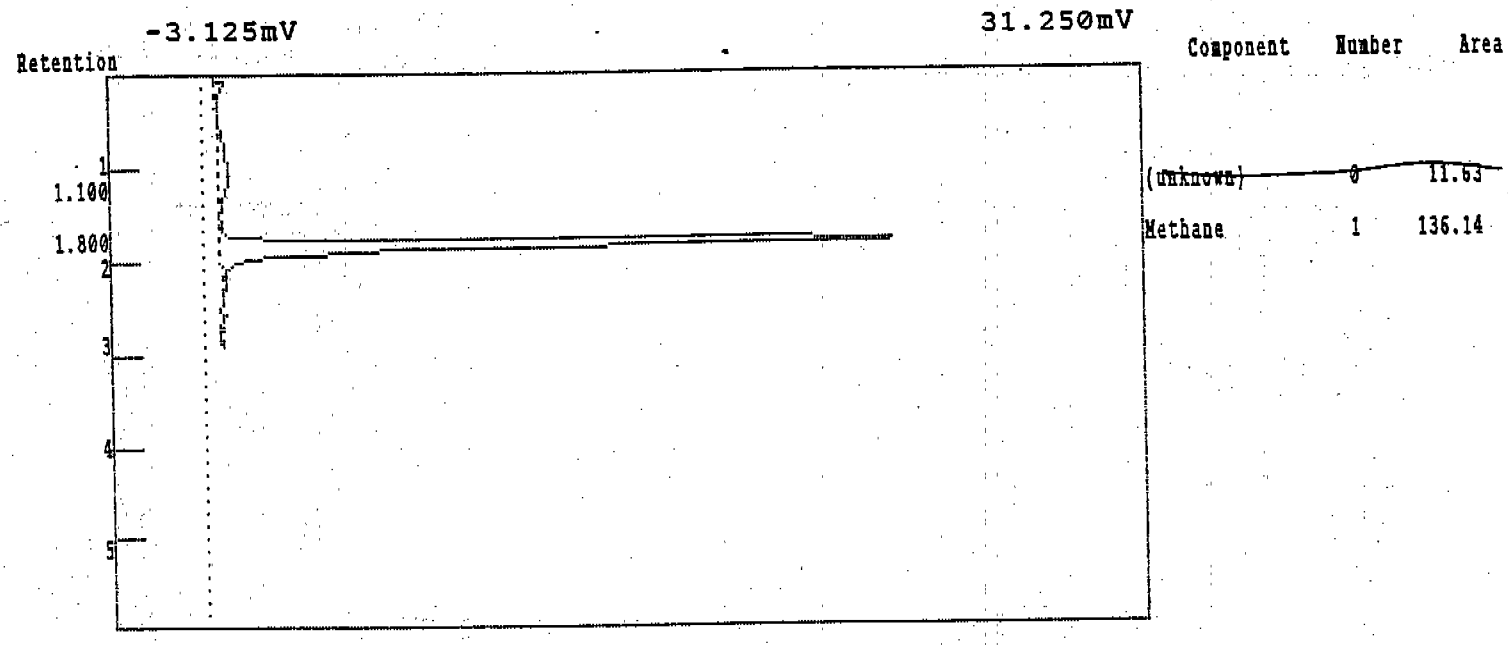
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 08:46:35
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 21.3 ppmv CH4 Bias Cal.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG28 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.766	24.698	125.32	100.00
1				125.32	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 08:50:56
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 21.3 ppmv CH4 Bias Cal.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG29 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

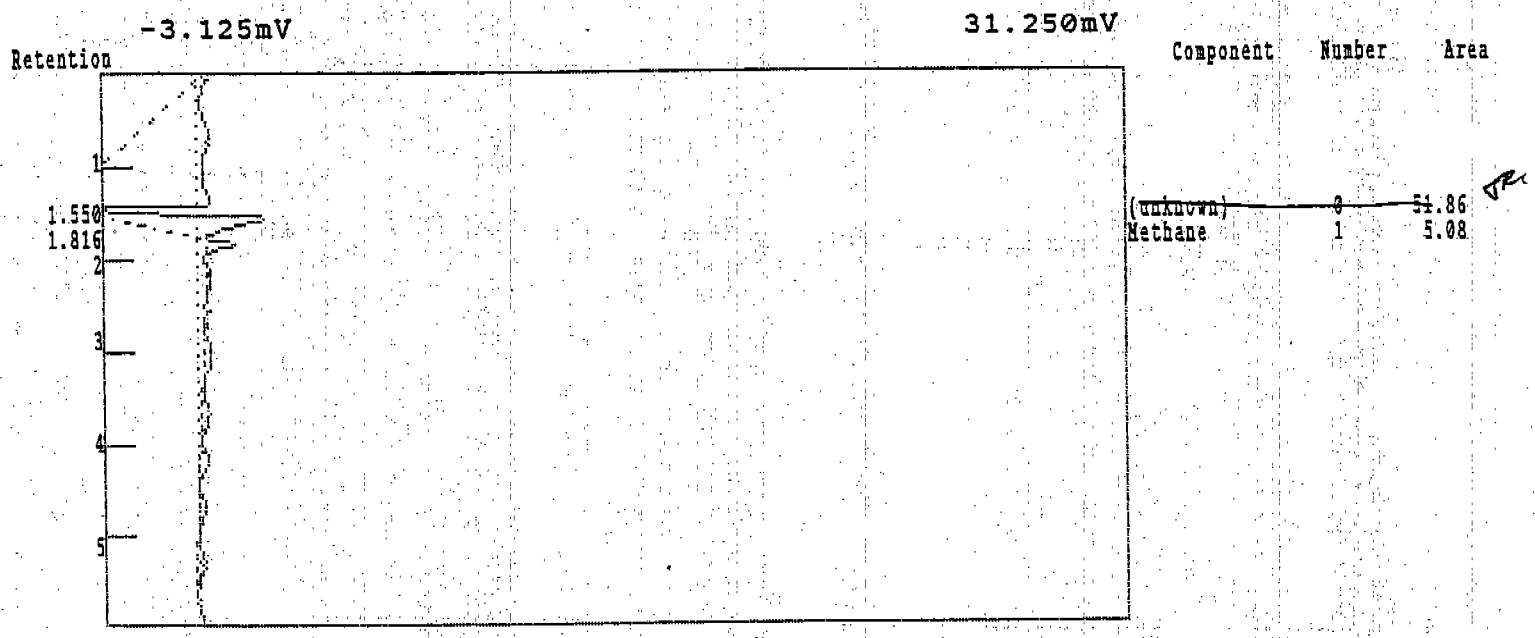


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.100	0.346	11.63	7.87
Methane	1	1.800	25.540	136.14	92.13
2				147.77	100.00

Undetected components:

209

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 10:15:42
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG36 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

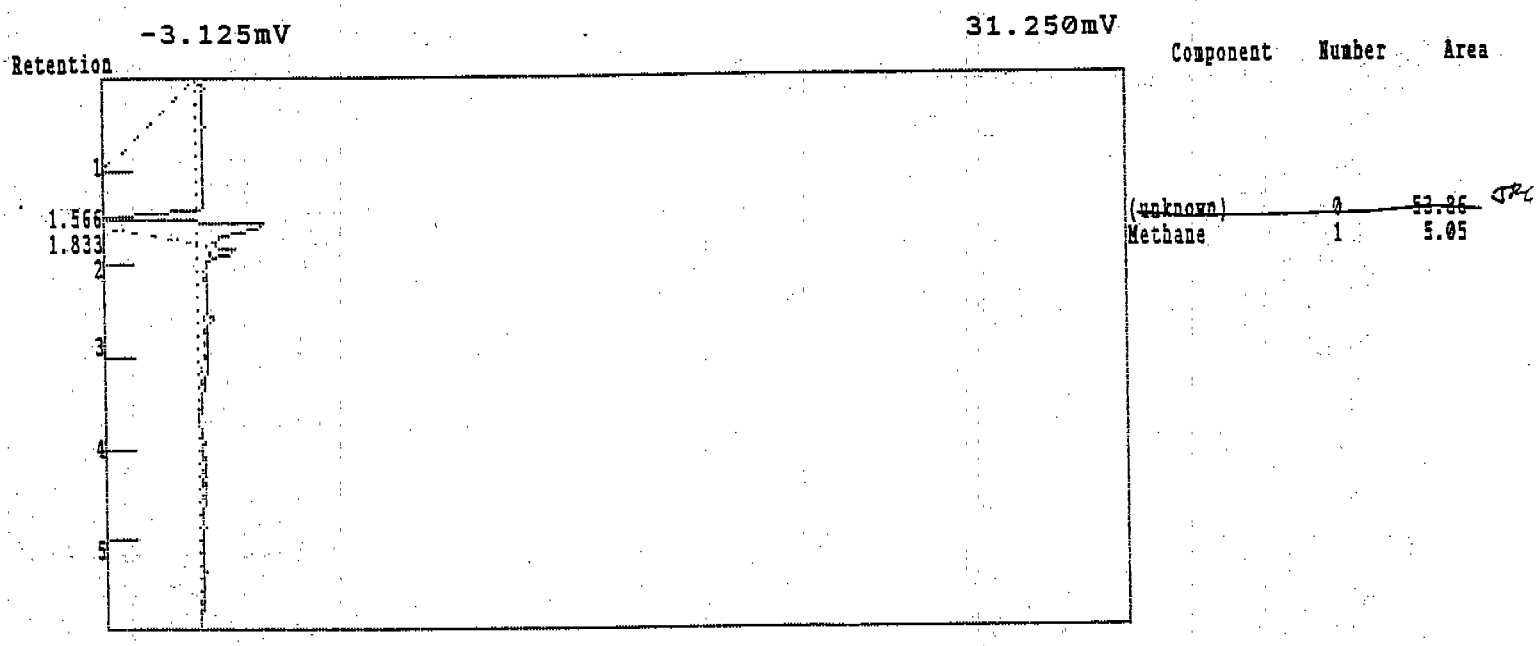


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.550	5.391	51.86	91.08
Methane	1	1.816	1.014	5.08	8.92
	2			56.94	100.00

Undetected components:

210

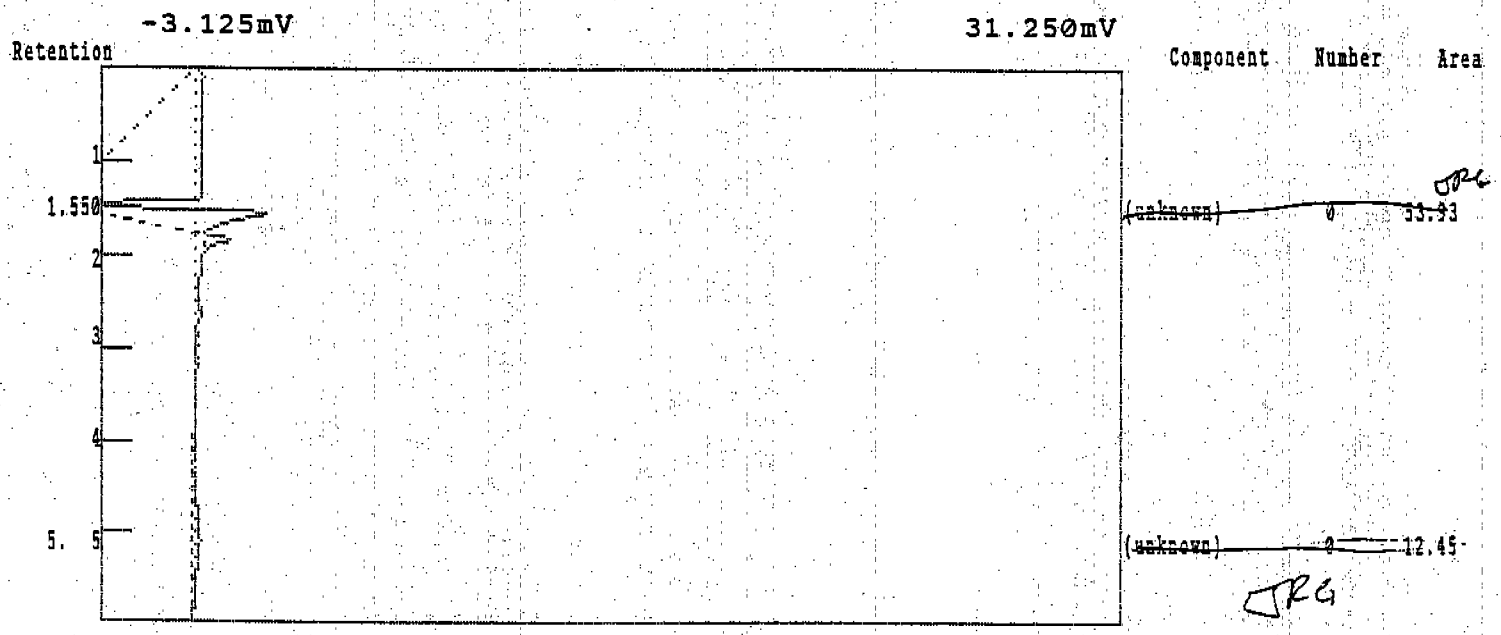
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 10:30:45
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG38 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.566	5.976	53.86	91.42
Methane	1	1.833	0.864	5.05	8.58
	2			58.91	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 10:38:14
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG39 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



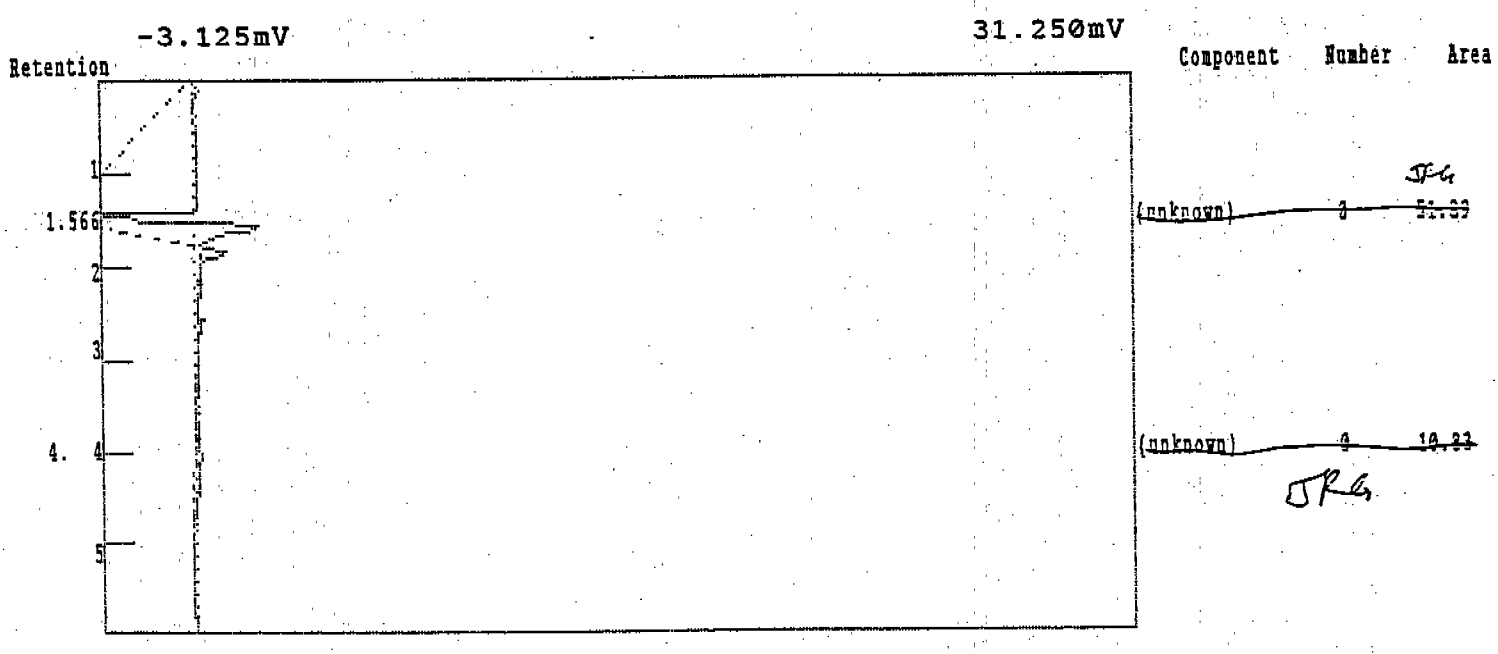
Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.550	5.911	53.93	81.25
(unknown)	0	5.100	0.244	12.45	18.75
2				66.38	100.00

Undetected components:

Methane

212

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 10:45:43
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG40 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

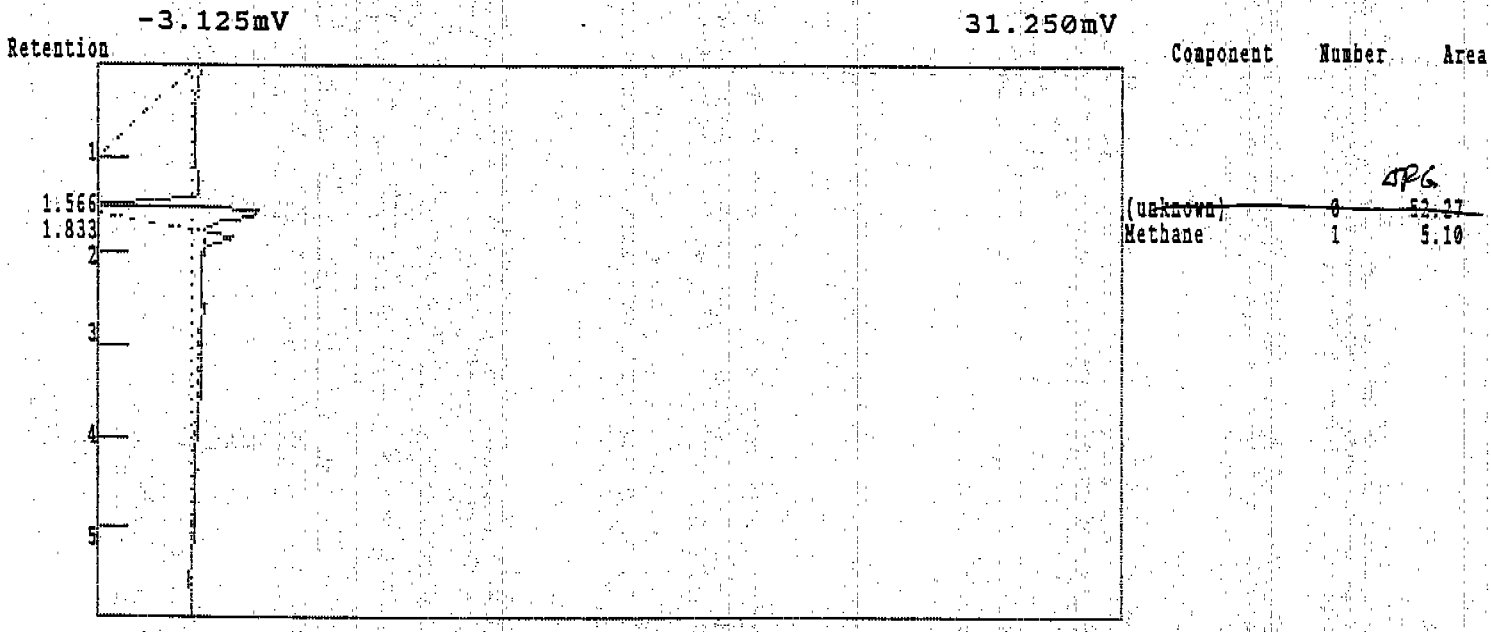


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.566	5.543	51.89	82.74
(unknown)	0	4.050	0.238	10.83	17.26
2				62.71	100.00

Undetected components:

Methane

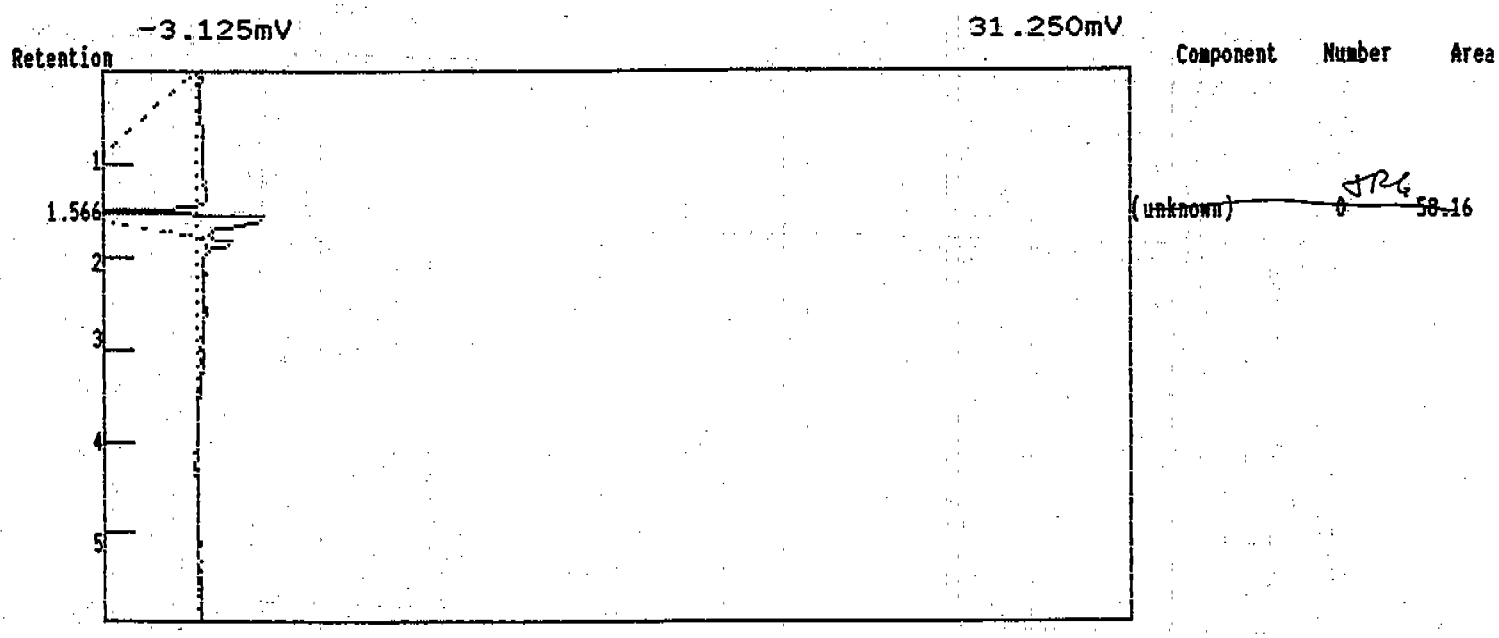
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 10:53:12
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : LFG41 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.566	5.926	52.27	91.12
Methane	1	1.833	0.991	5.10	8.88
	2			57.37	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 11:00:41
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-1
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg42 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

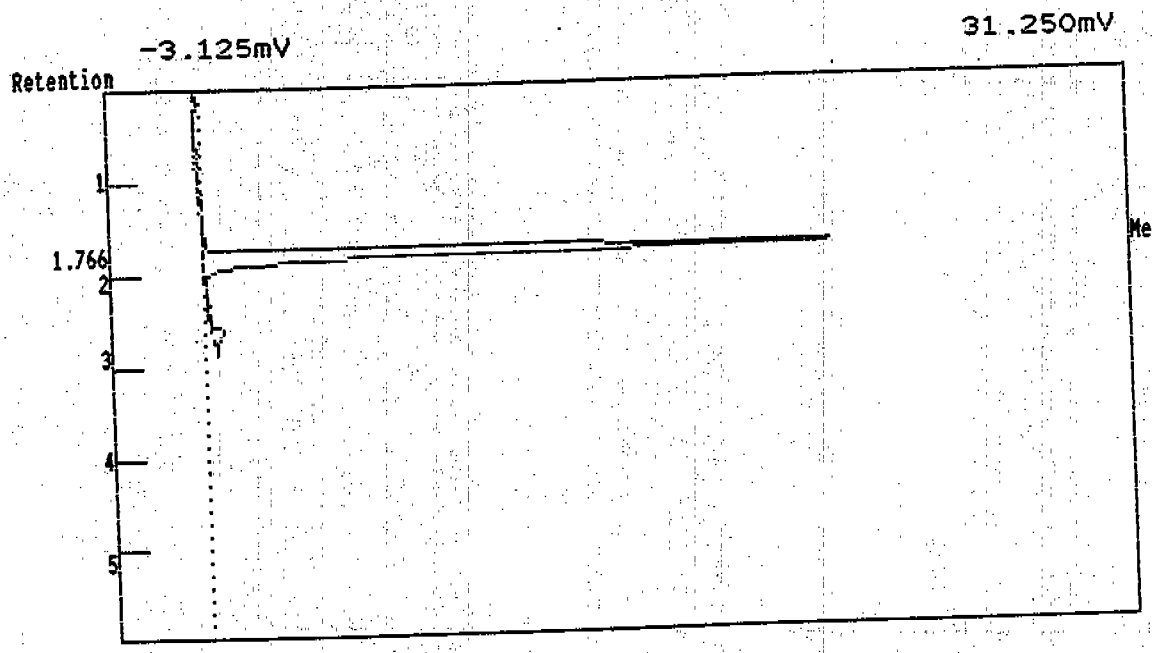


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.566	6.467	58.16	100.00
1				58.16	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 11:20:14
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 21.3 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg45 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

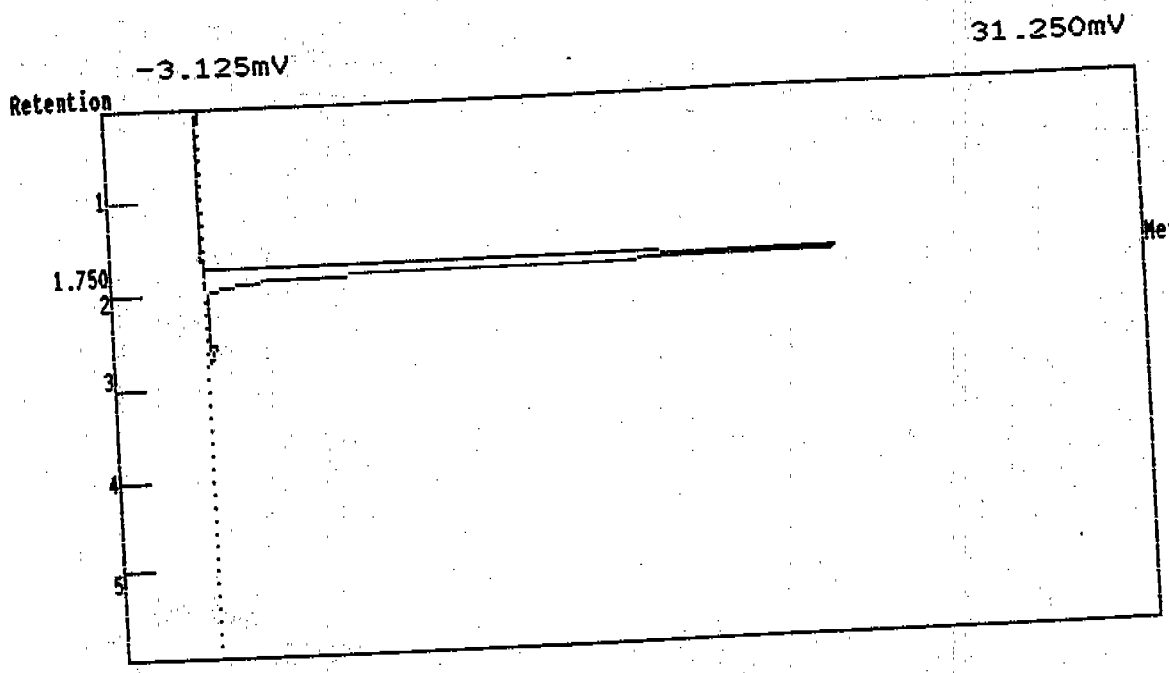


Component	Number	Area
Methane	1	114.45

Component	Number	Retention	Height	Area	Area %
Methane	1	1.766	22.446	114.45	100.00
	1			114.45	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 11:24:46
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 21.3 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg46 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

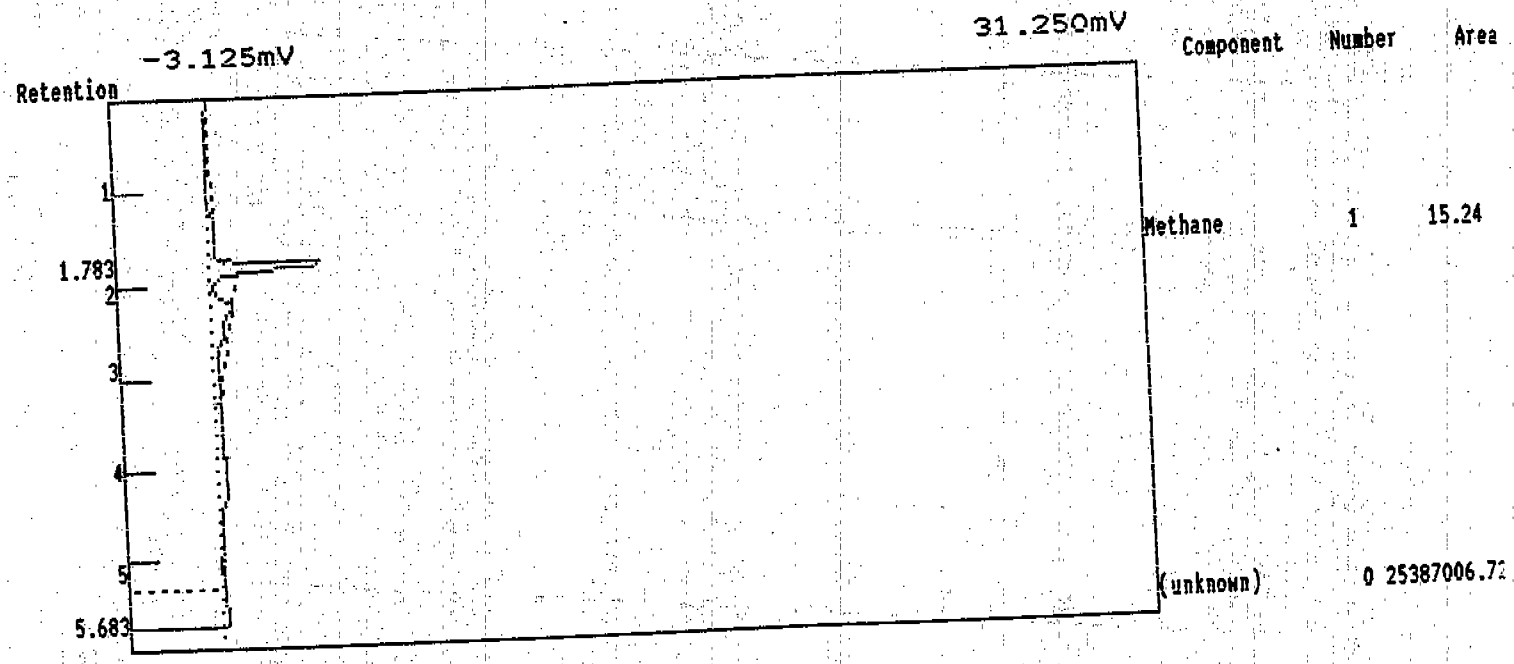


Component	Number	Area
Methane	1	118.06

Component	Number	Retention	Height	Area	Area %
Methane	1	1.750	22.148	118.06	100.00
	1			118.06	100.00

Undetected components:

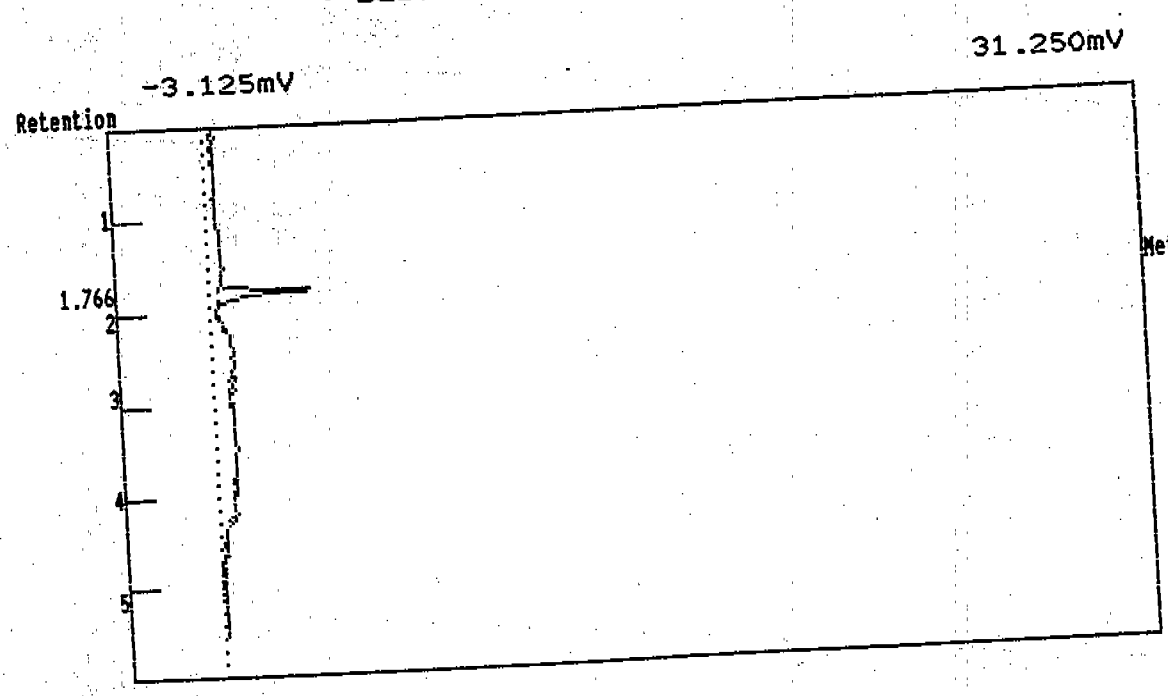
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 12:06:40
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg57 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.783	3.548	15.24	0.00
(unknown)	0	5.683	1868483.	25387006.72	100.00
	2			25387021.96	100.00

Undetected components:

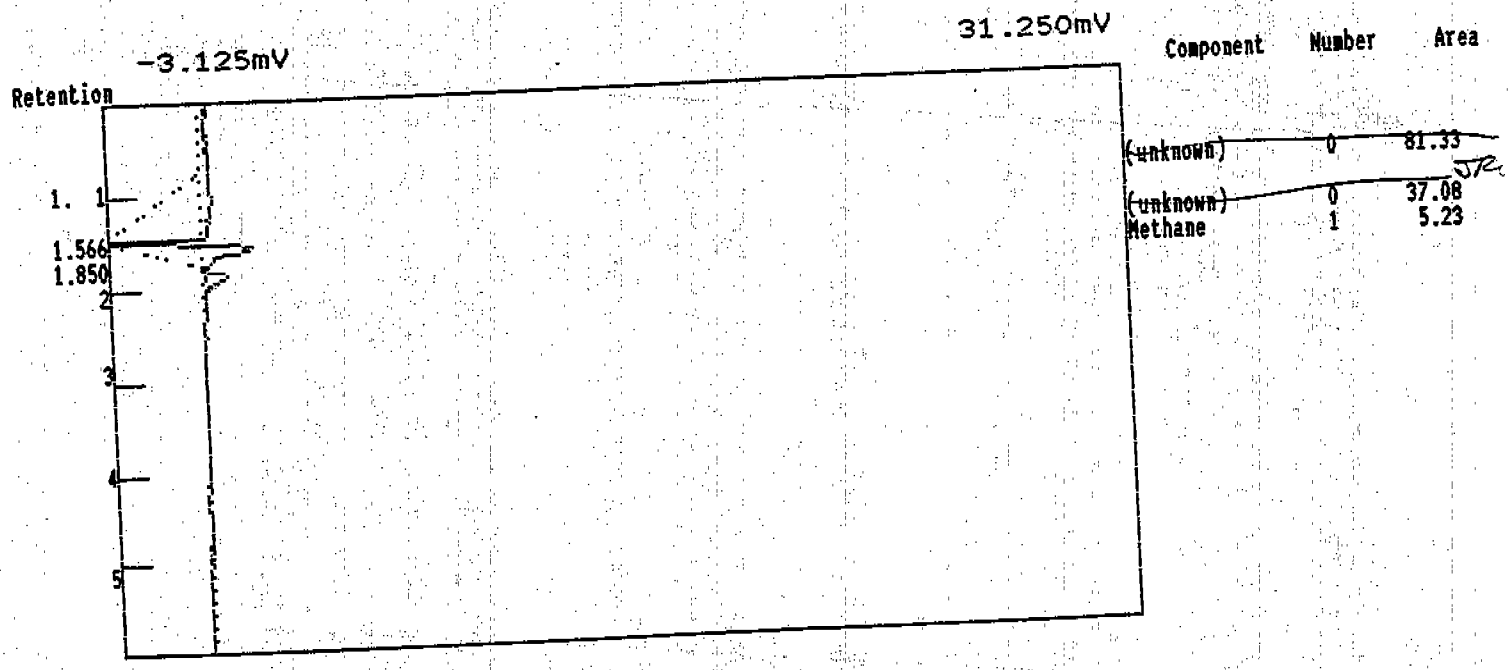
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 12:12:24
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg58 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.766	2.978	15.11	100.00
	1			15.11	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 12:26:09
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg60 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

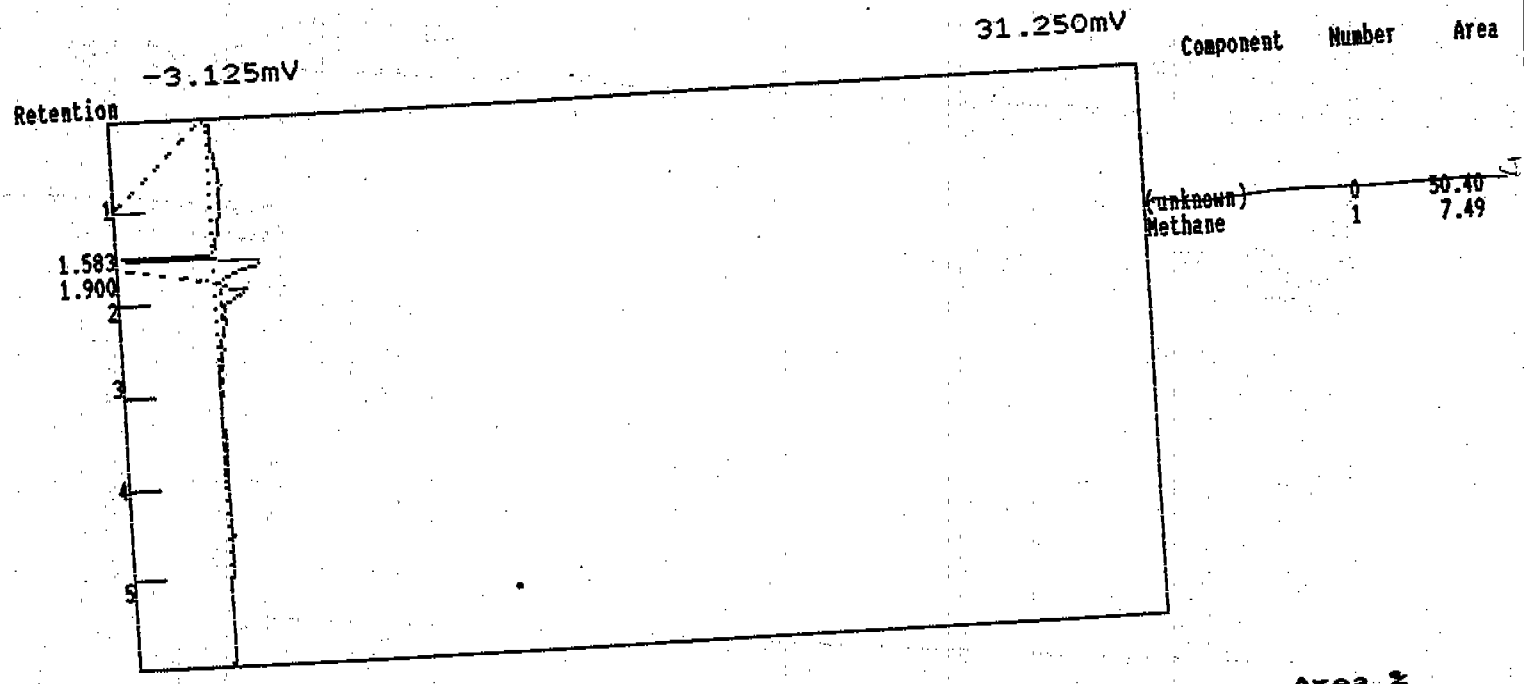


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.050	1.766	81.33	65.78
(unknown)	0	1.566	3.870	37.08	29.99
Methane	1	1.850	0.794	5.23	4.23
	3			123.63	100.00

Undetected components:

218A

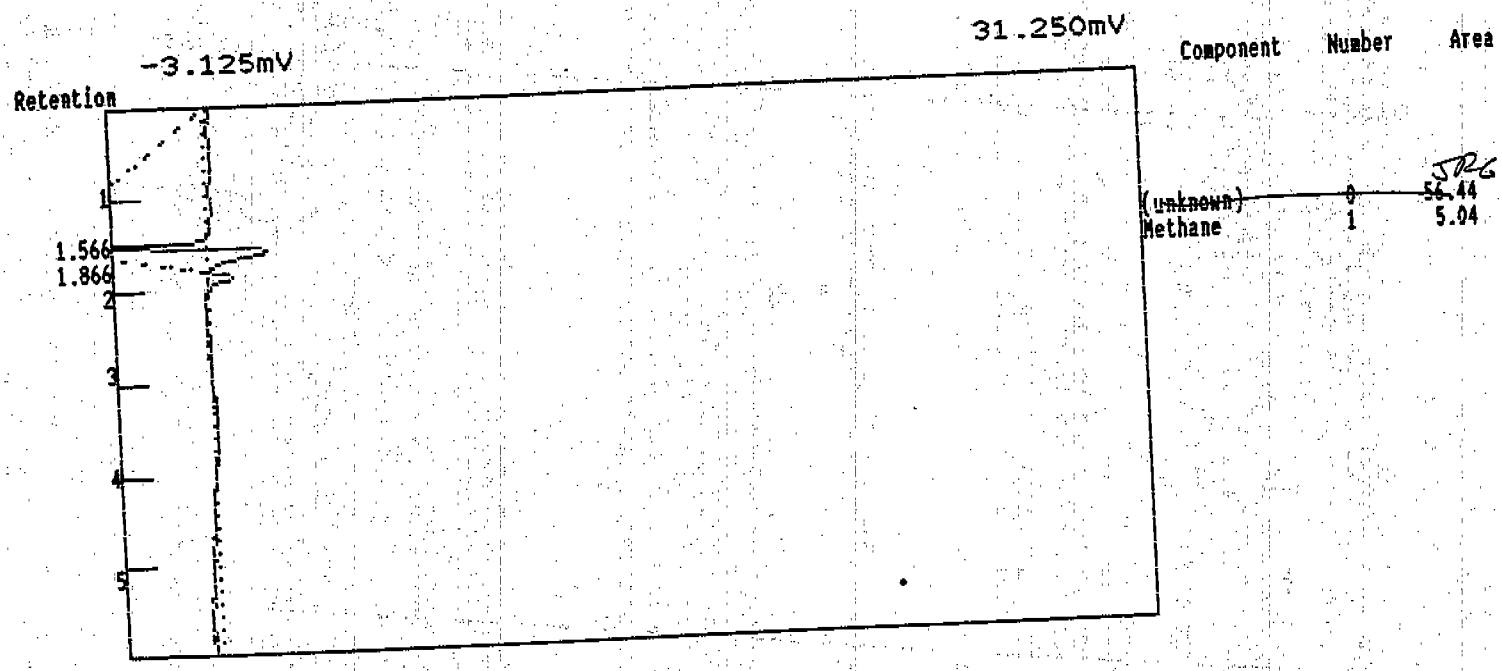
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 12:32:09
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg61 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.583	5.154	50.40	87.06
Methane	1	1.900	0.822	7.49	12.94
	2			57.89	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 12:50:11
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg64 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

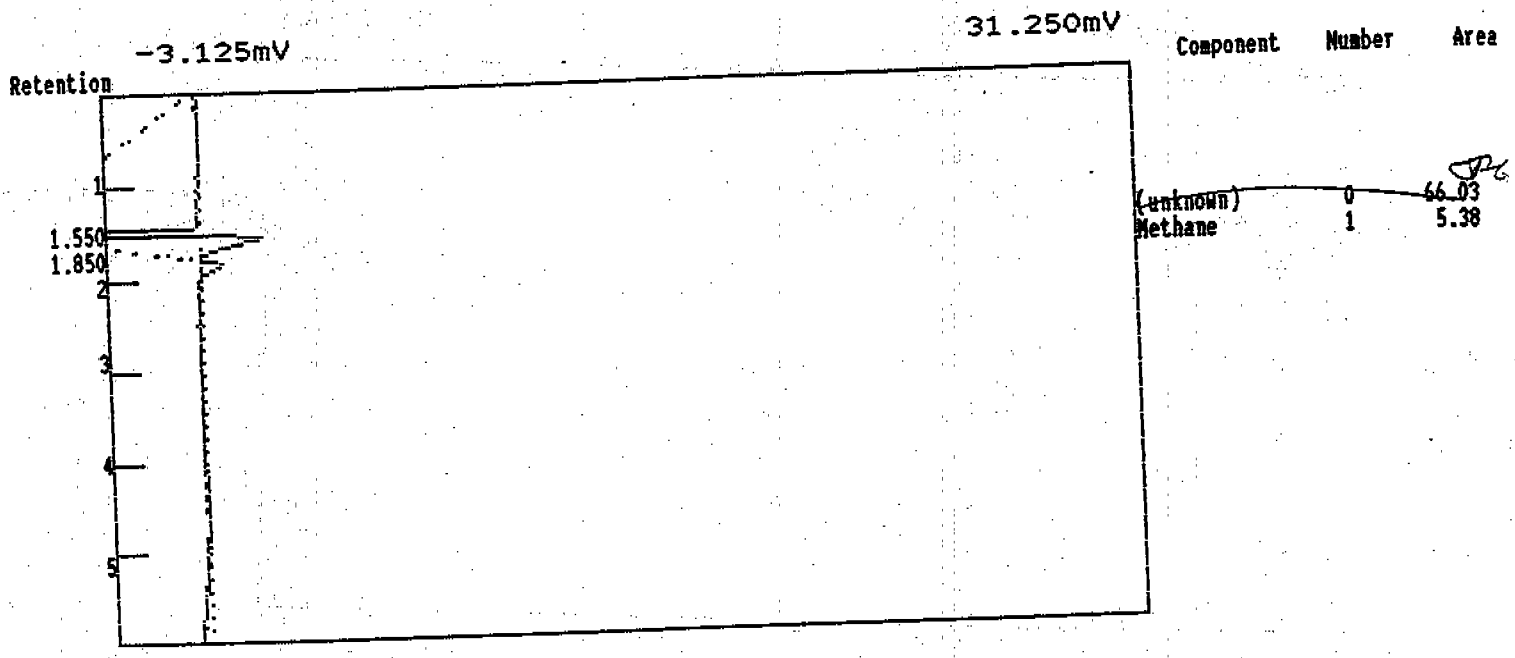


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.566	6.424	56.44	91.81
Methane	1	1.866	0.883	5.04	8.19
				61.48	100.00

2

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 12:56:12
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg65 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



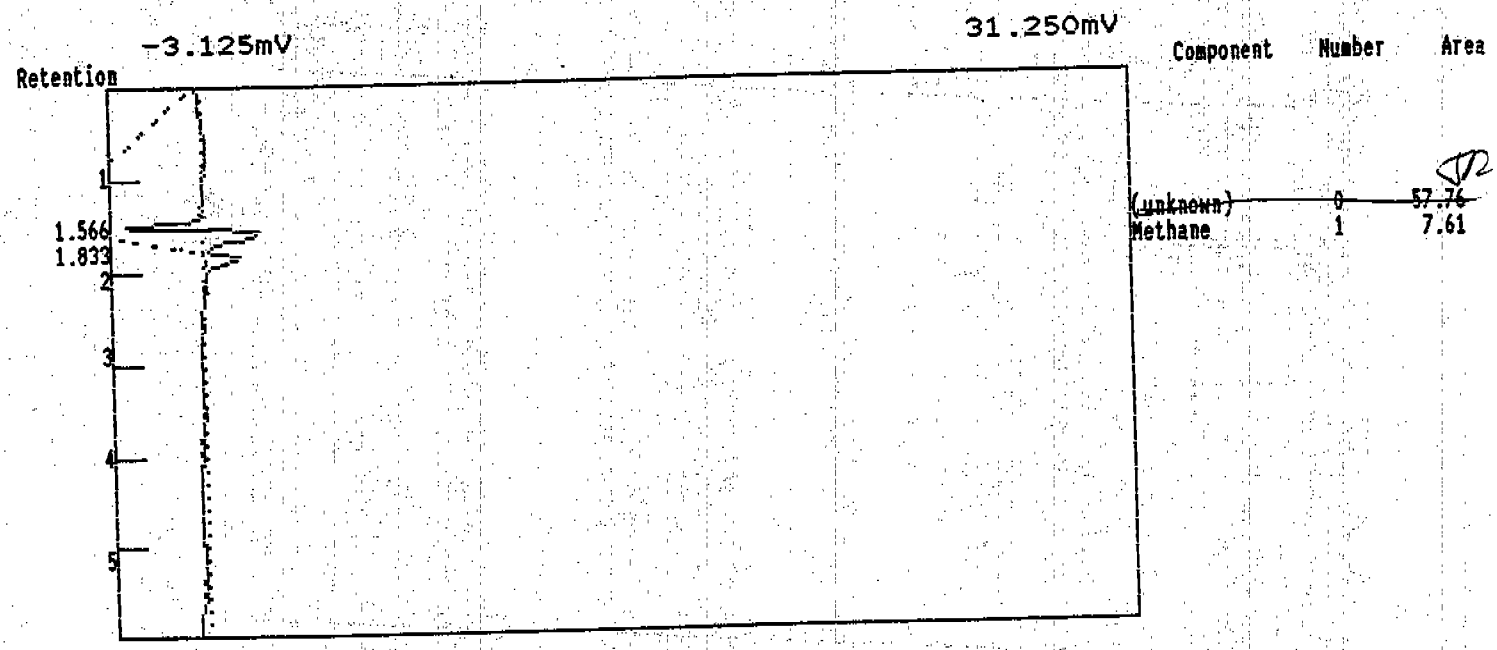
Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.550	7.118	66.03	92.47
Methane	1	1.850	0.867	5.38	7.53
				71.41	100.00

2

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 13:02:13
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg66 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

221

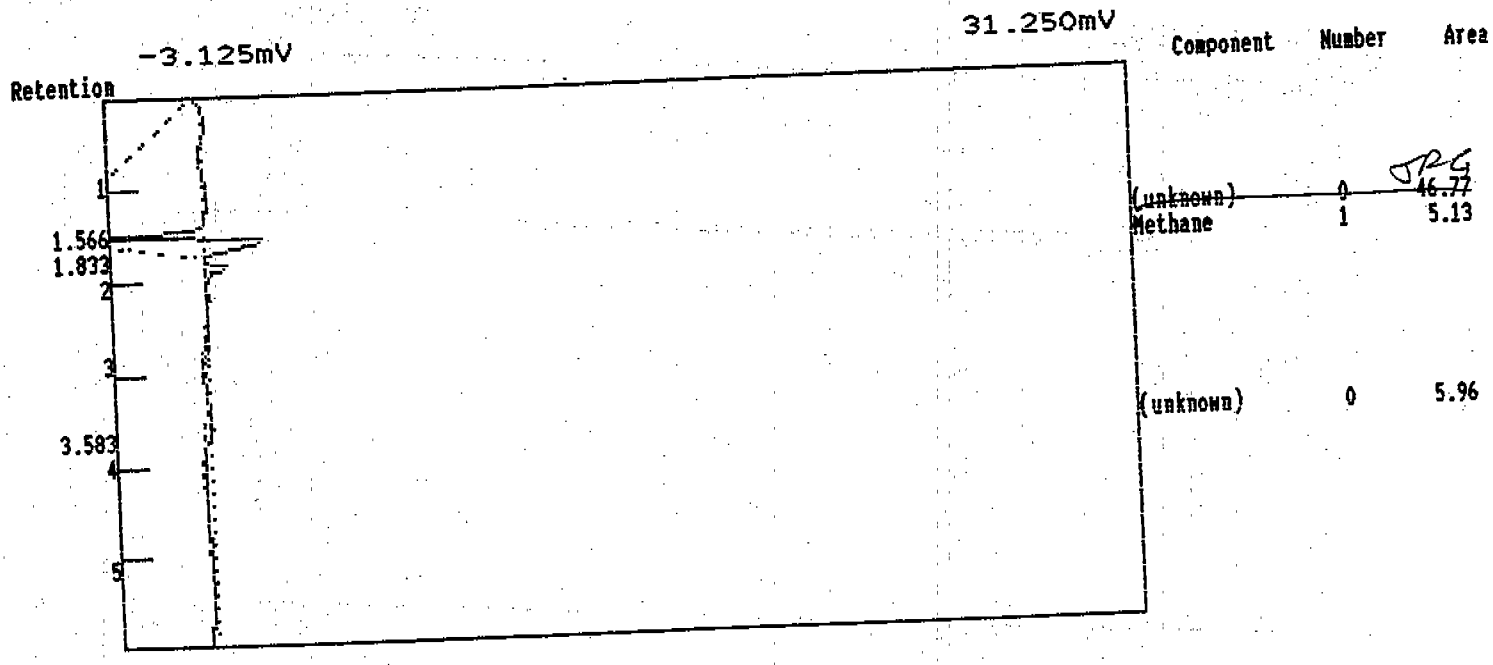


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.566	6.056	57.76	88.36
Methane	1	1.833	1.151	7.61	11.64
	2			65.37	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 13:08:14
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-2
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg67 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

222

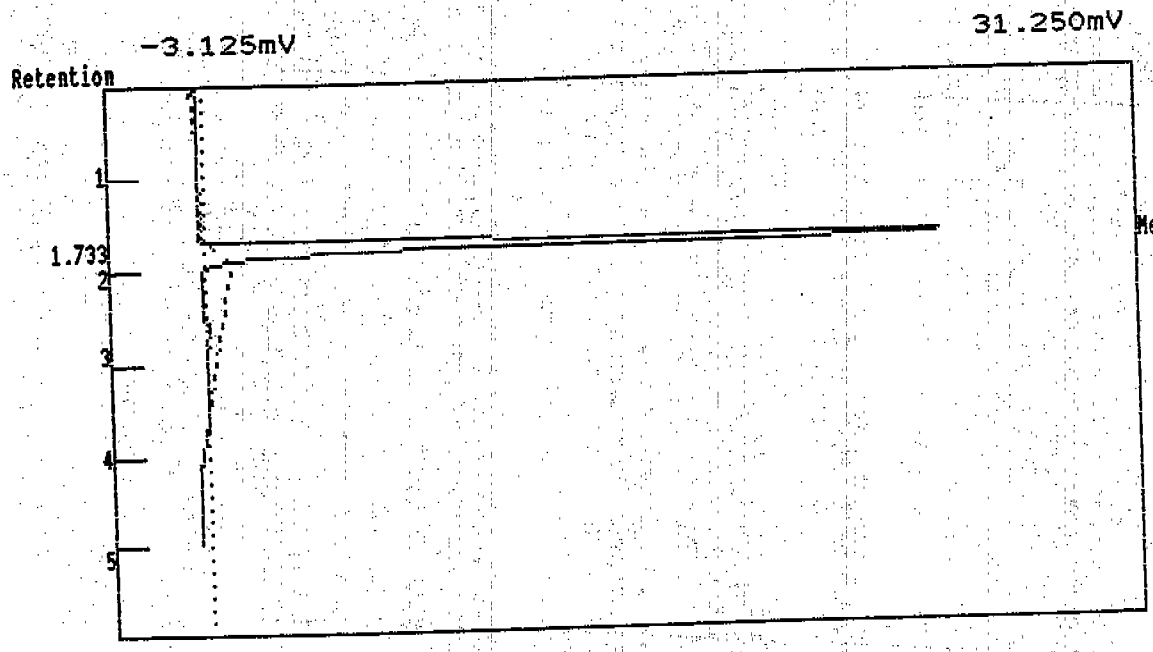


JRG

Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.566	5.939	46.77	80.83
Methane	1	1.833	0.727	5.13	8.86
(unknown)	0	3.583	0.253	5.96	10.31
	3			57.86	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 13:26:17
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 21.3 ppmc Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg69 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

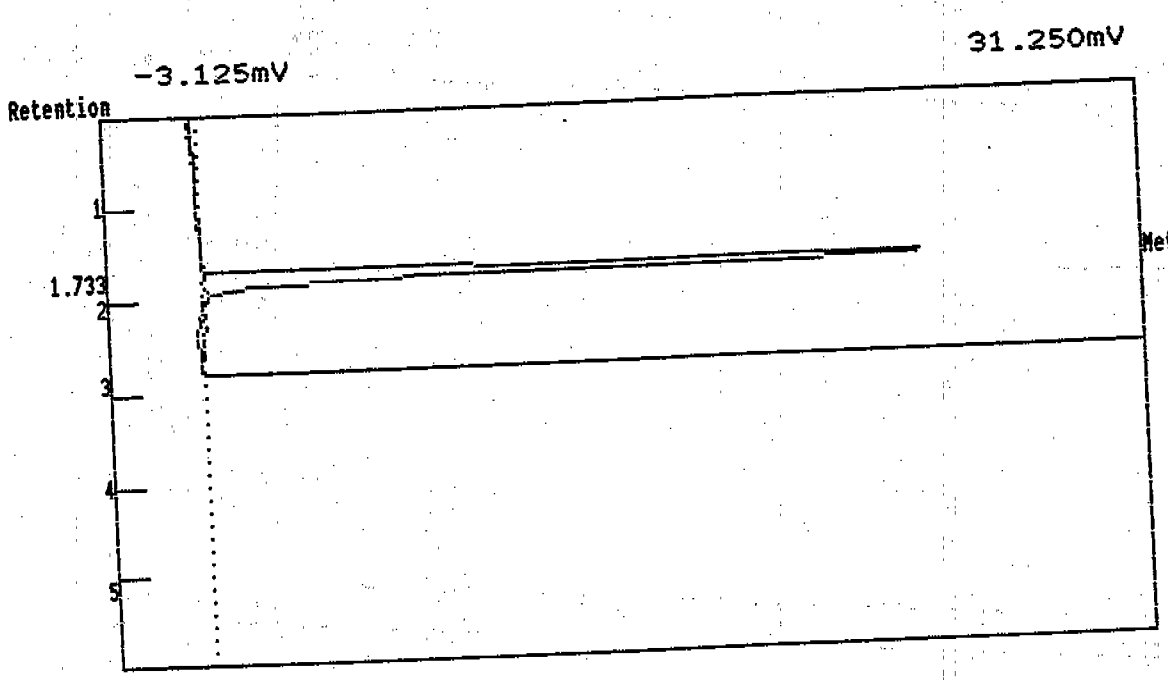


Component	Number	Area
Methane	1	121.37

Component	Number	Retention	Height	Area	Area %
Methane	1	1.733	24.616	121.37	100.00
	1			121.37	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 13:31:21
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 21.3 ppmc Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg70 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

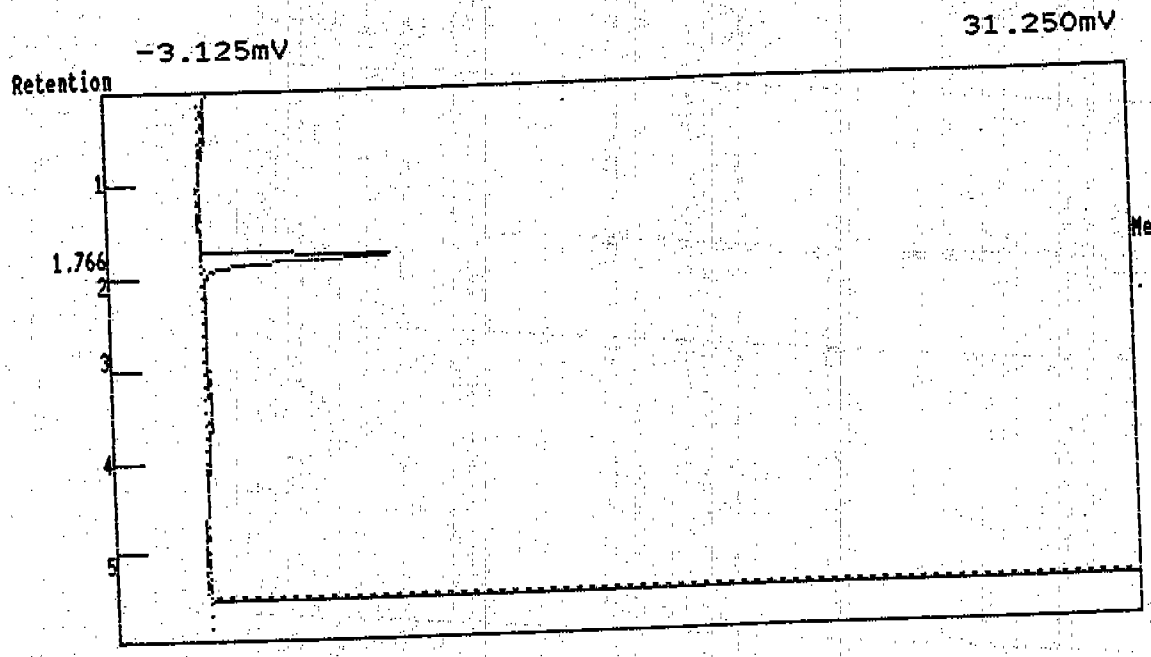


Component	Number	Area
Methane	1	125.70

Component	Number	Retention	Height	Area	Area %
Methane	1	1.733	24.089	125.70	100.00
	1			125.70	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 13:52:59
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg74 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

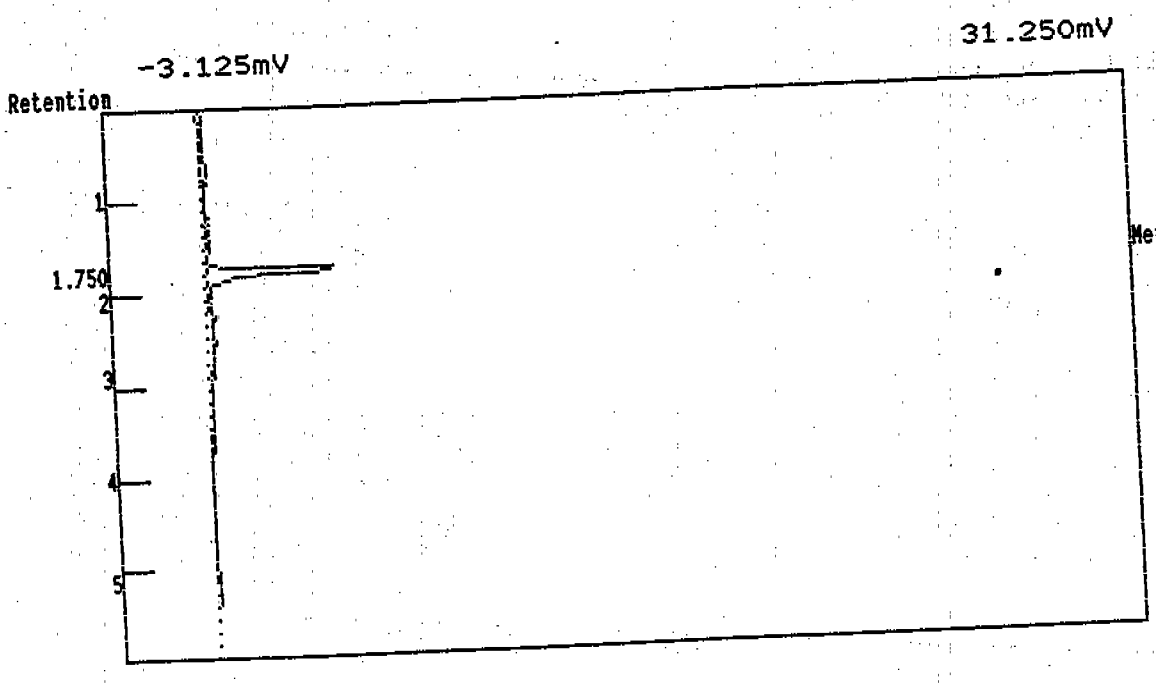


Component	Number	Area
Methane	1	36.02

Component	Number	Retention	Height	Area	Area %
Methane	1	1.766	6.594	36.02	100.00
	1			36.02	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 13:58:34
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg75 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.750	5.681	28.31	100.00
				28.31	100.00

Component	Number	Area
Methane	1	28.31

Undetected components:

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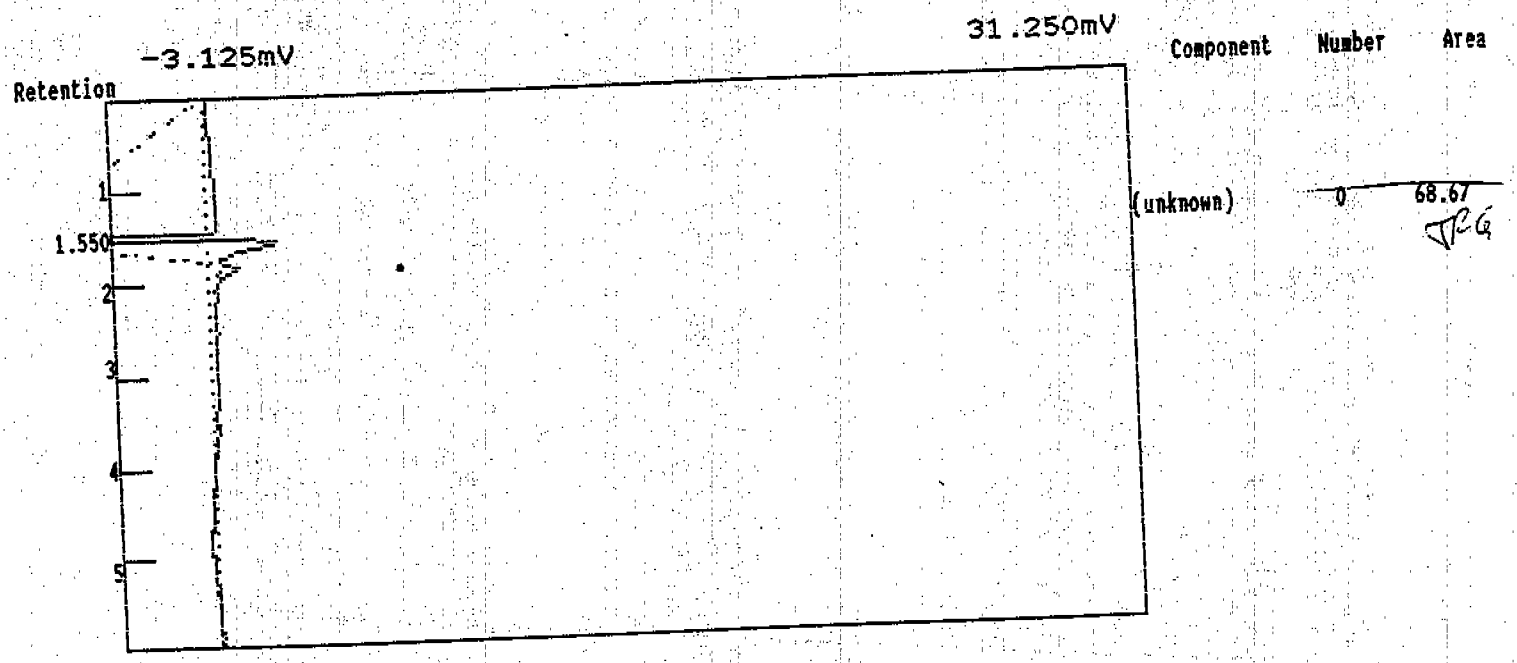
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 14:05:16
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg76 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



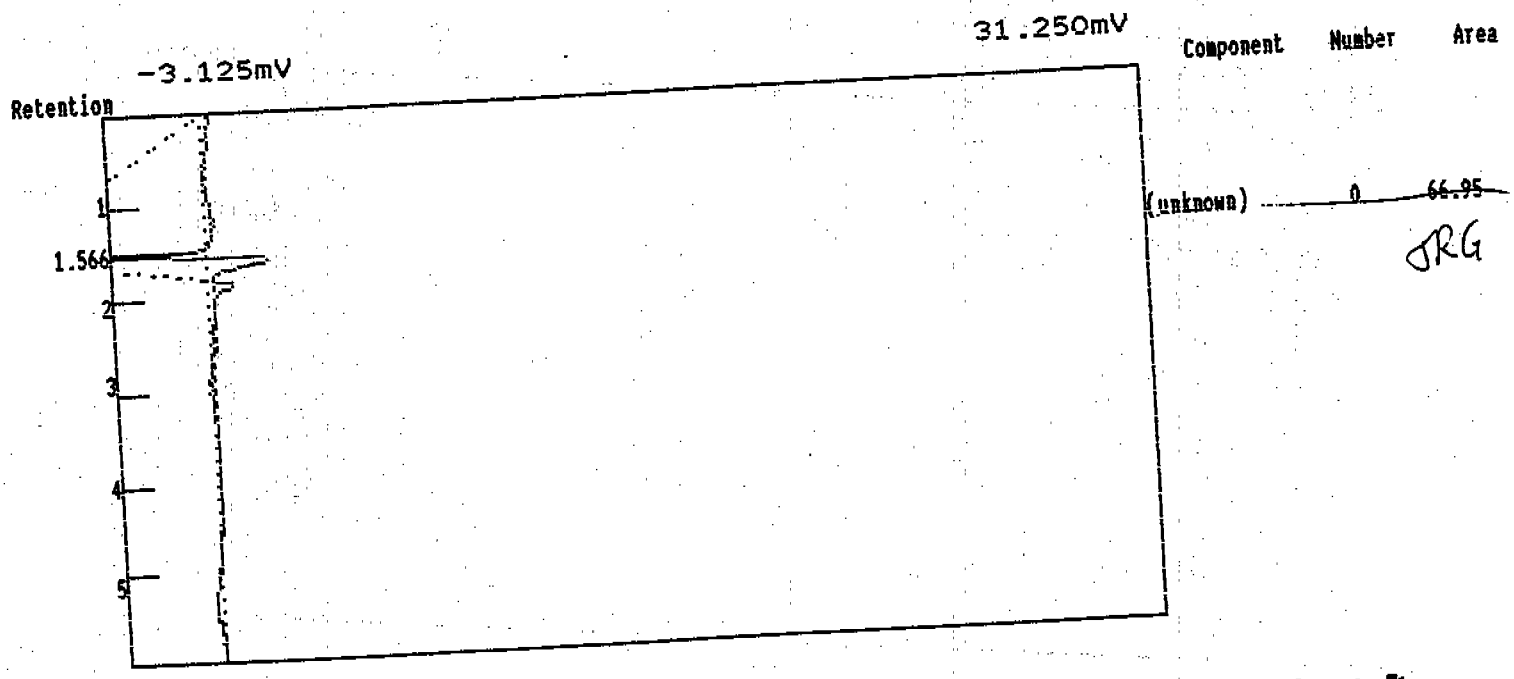
Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.550	7.393	68.67	100.00
	1			68.67	100.00

Undetected components:

Methane

228

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 14:11:16
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg77 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



JRG

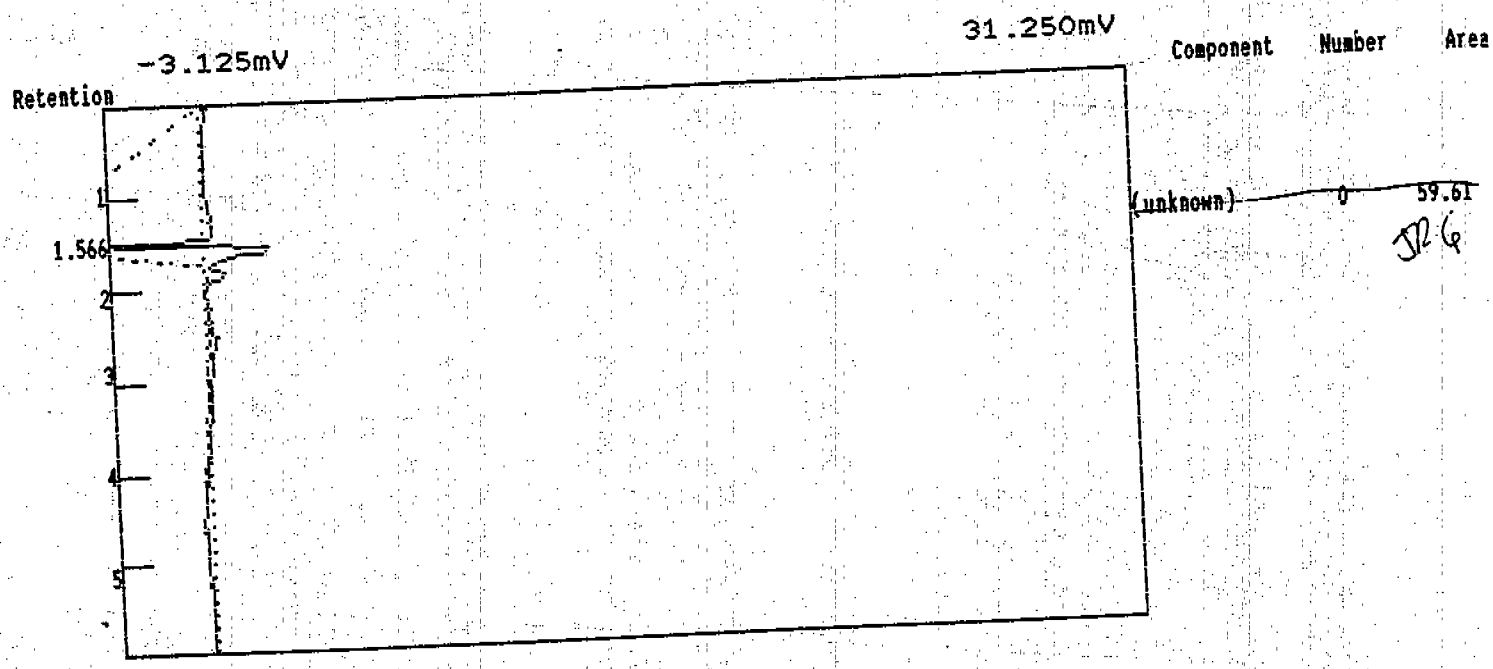
Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.566	7.450	66.95	100.00
	1			66.95	100.00

Undetected components:

Methane

229

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 14:17:17
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg78 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



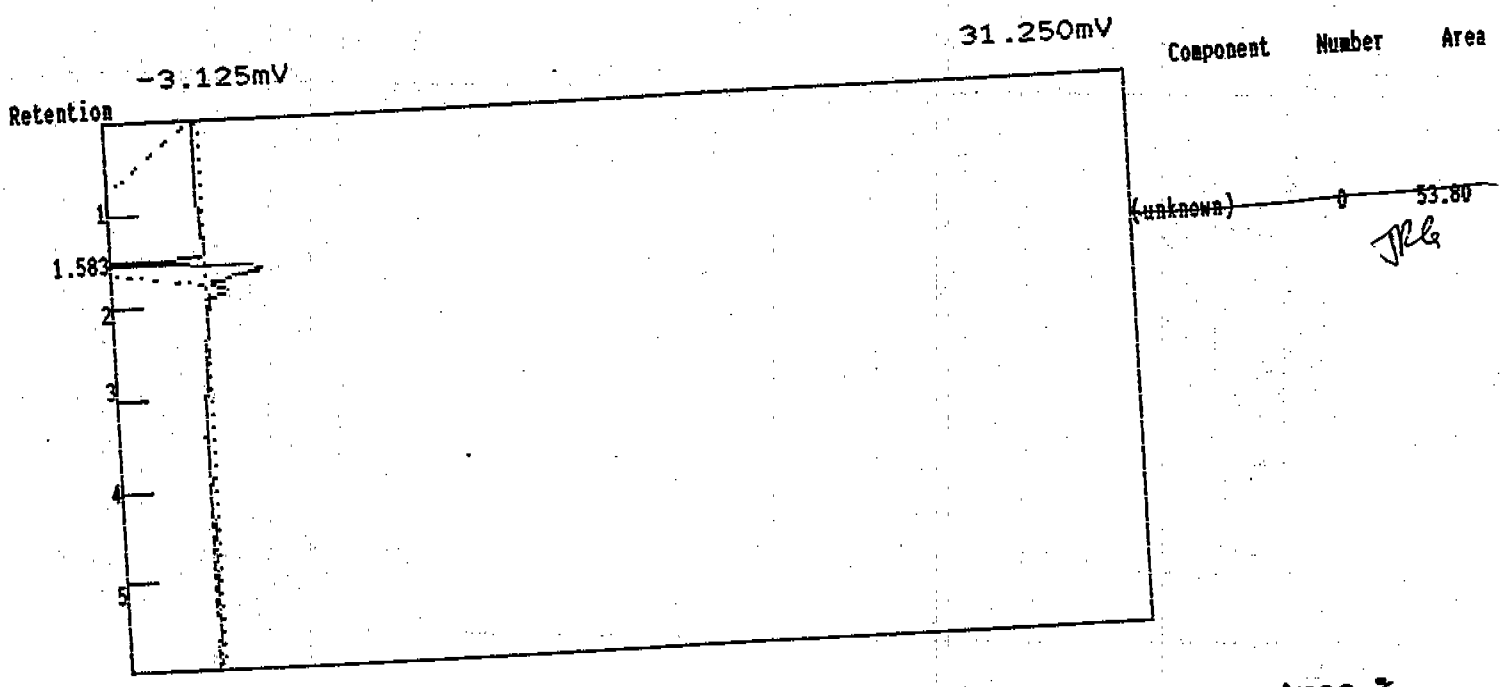
JR 6

Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.566	6.796	59.61	100.00
	1			59.61	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 14:29:19
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg80 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

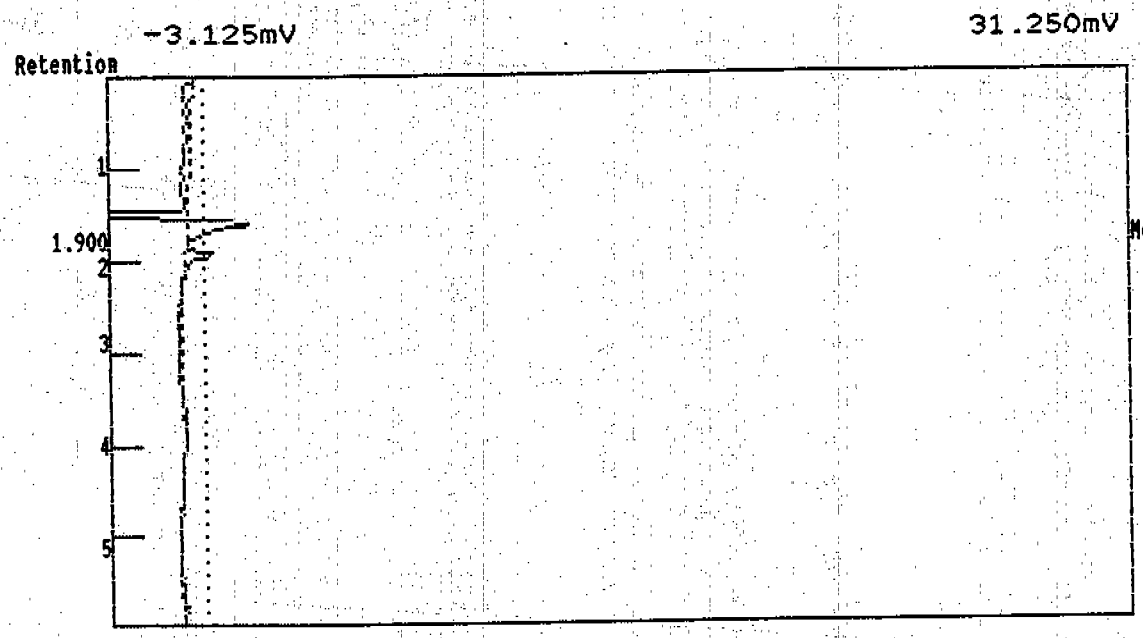


Component	Number	Retention	Height	Area	Area %
(unknown)	0	1.583	6.171	53.80	100.00
	1			53.80	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 14:47:52
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg101 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

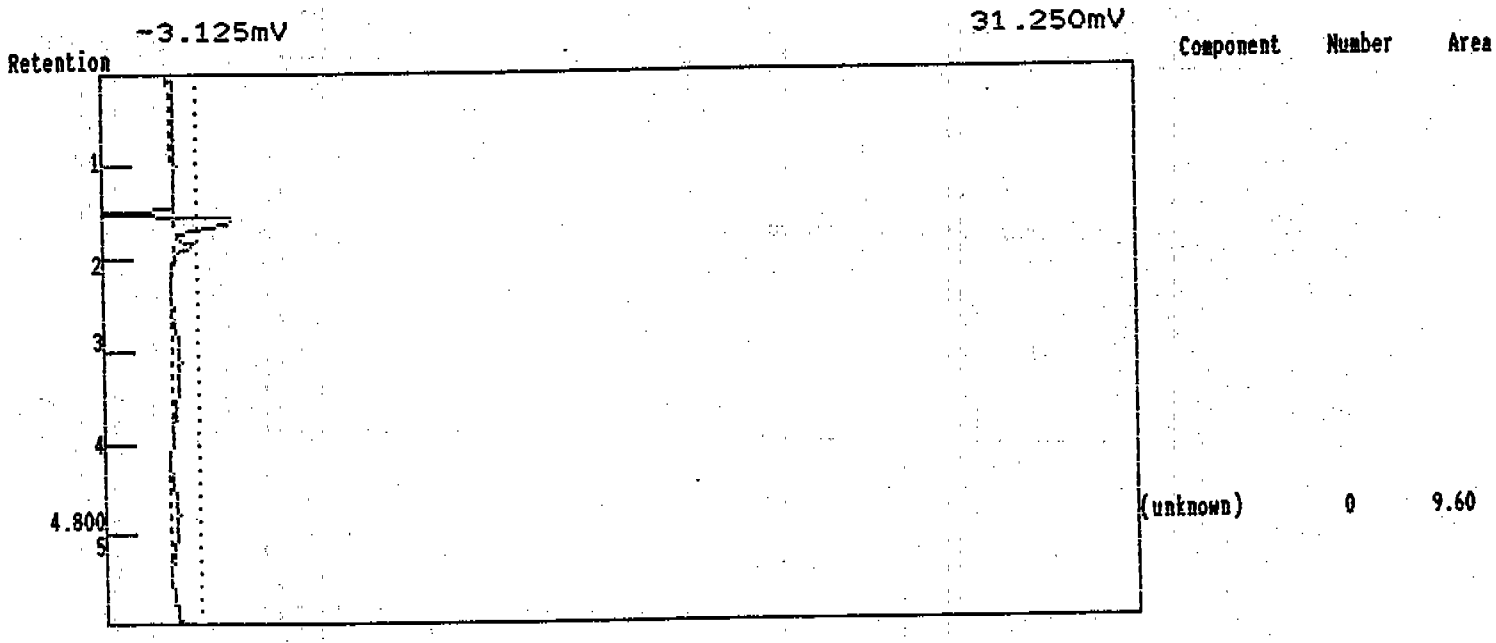


Component	Number	Area
Methane	1	6.05

Component	Number	Retention	Height	Area	Area %
Methane	1	1.900	0.916	6.05	100.00
	1			6.05	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 15:05:55
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Outlet, Run-3
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg104 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

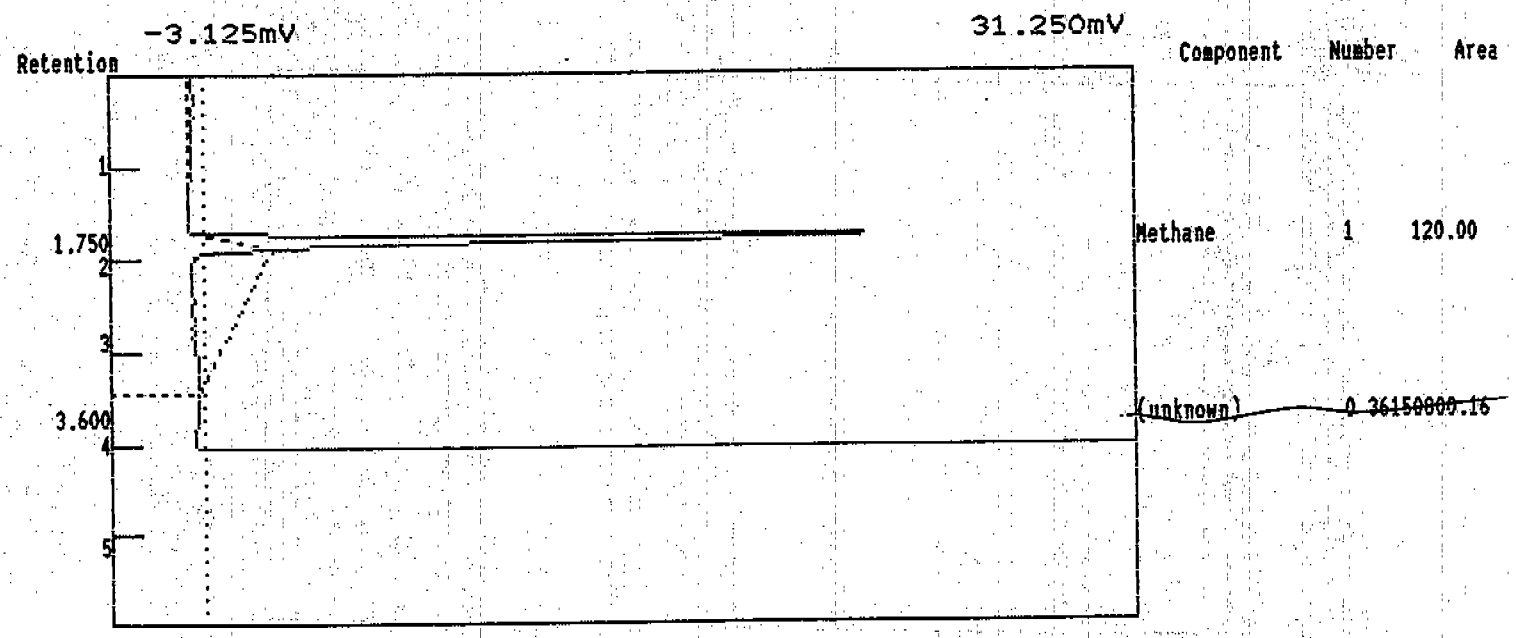


Component	Number	Retention	Height	Area	Area %
(unknown)	0	4.800	0.256	9.60	100.00
	1			9.60	100.00

Undetected components:

Methane

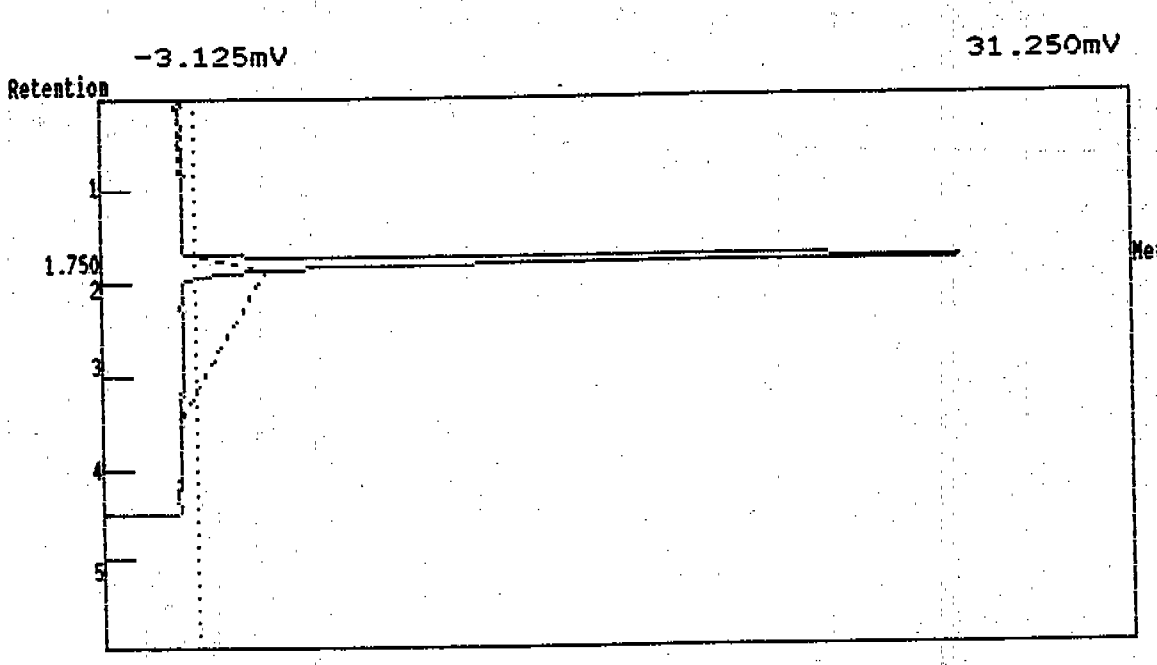
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 15:22:34
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : 21.3 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg106 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.750	27.733	120.00	0.00
~~(unknown)~~	~~0~~	~~3.600~~	~~472173.7~~	~~36150000.16~~	~~100.00~~
	2			36150920.16	100.00

Undetected components:

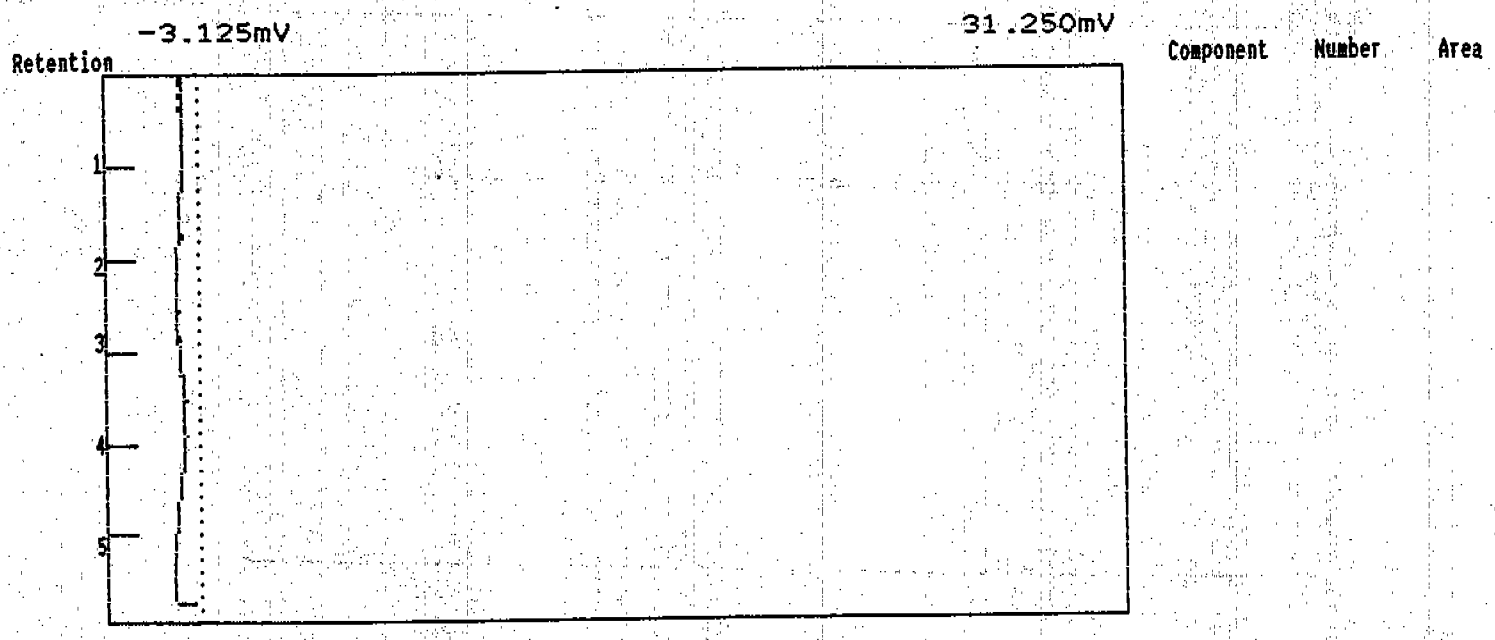
Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 15:27:49
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : ~~4516~~ 112 ppmv Methane Std.
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg107 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
Methane	1	1.750	27.354	128.22	100.00
	1			128.22	100.00

Undetected components:

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 15:43:01
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg110 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1

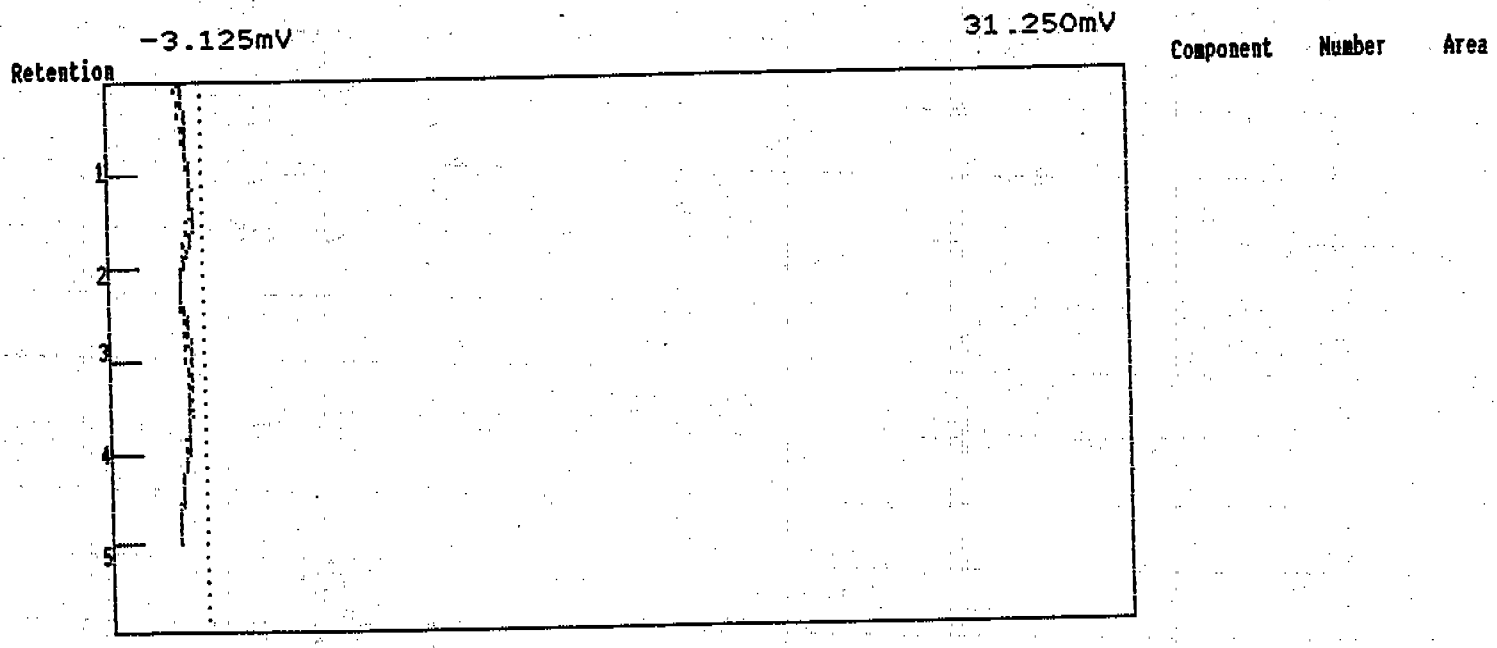


Component	Number	Retention	Height	Area	Area %
	0			0.00	100.00

Undetected components:

Methane

Lab name : AirRECON Mobile Lab
Client : LFG Specialties Project
Client ID : AR5-6922
Collected : 10/09/96
Analysis date : 10/09/1996 15:48:48
Method : EPA-18: On-Line GC-FID
Lab ID : Trailer-2
Description : Zero Air Blank
Column : 60m x 0.53mm RTx-1, 5u
Carrier : Helium at 18 psi
Components : CH4_CH2.CPT
Data file : lfg111 (c:\peak3\data)
Sample : Channel-1
Operator : John R. Geissler
Comments : 20ml/min Total Hydrogen Flow
: 100ml/min Air
: 120 deg. Isothermal Oven
: Backflush To Detector At 2.5 min.
: Based On 1ml On-Column Injections, Atten.=1



Component	Number	Retention	Height	Area	Area %
	0			0.00	100.00

Undetected components:

Methane

INLET

2617 → 1470.79

4916 → 3230.57

9175 → 5076.31

9175ppm bias → 5040.47
98.6%

Post R-1 Cal. Check 4916 ppm
~~2881.46~~ → ~~94.6%~~
2905.29 95.0

Post R-2 Cal. Check 4916ppm
3481.95 → 96.3%

Post R-3 Cal. Check 4916ppm
3476.76 → 96.5%

OUTLET

21.3 → 117.74

51.3 → 286.99

88.7 → 518.36

21.3ppm
130.73 bias → 95.0%

Post R-1 Check 21.3ppm
116.26 → 99.4%

Post R-2 Check 21.3ppm
123.54 → 97.7%

Post R-3 Check 21.3ppm
124.11 → 97.4%

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Aqua Air Analytical

Raritan, NJ 08869-0130

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ANALYSIS REPORT
Project No. AR6922
10/30/96
W

LFG SPECIALTIES
Project

Attn: John R. Geissler

Sample Town: BETHLEHEM, PA
Sample Matrix: GAS

Sample Date:			10/09/96
Sample ID:			Inlet Run 1
	Method No.	MDL	
Aqua Air Sample No.:			AA25196
Parameter (Units)			
Methane (%)	NJATM-3	0.01	24.2

SEE ATTACHED LABORATORY INFORMATION SHEET
FOR DEFINITIONS OF SYMBOLS AND QUALIFIERS

Submitted By:

Robert M. Stelma

Robert M. Stelma
Acting Organic Laboratory Manager

Approved By:

Patrick J. Mulrooney

Patrick J. Mulrooney, CIH
Vice President
Laboratory

Aqua Air A2 Analytical

Raritan, NJ 08869-0130

239

ANALYSIS REPORT
Project No. AR6922
10/30/96

LFG SPECIALTIES
Project

Attn: John R. Geissler

Sample Town: BETHLEHEM, PA
Sample Matrix: GAS

Sample Date:			10/09/96	10/09/96
Sample ID:			Inlet Run 2	Inlet Run 3
Aqua Air Sample No.:	Method No.	MDL	AA25197	AA25198
Parameter (Units)				
Methane (%)	NJATM-3	0.01	24.3	24.7

SEE ATTACHED LABORATORY INFORMATION SHEET
FOR DEFINITIONS OF SYMBOLS AND QUALIFIERS

Submitted By:

Robert M. Stelma
Acting Organic Laboratory Manager

Approved By:

Patrick J. Mulrooney, CIH
Vice President
Laboratory

CHAIN OF CUSTODY RECORD

Aqua Air A2 Analytical

25 Mathewson Drive Weymouth, MA 02189-2364
617 337-9334 / FAX 617 337-7642

5 Johnson Drive, P.O. Box 130, Raritan, NJ 08869
908 526-1000 / FAX 908 526-7886

WORK ORDER NO. ____-____-____

DUE DATE ____-____-____

COMPANY: LFG Specialties Project
Bethlehem Landfill
Enclosed Ground Flare

PHONE: ( ) ____ FAX #: ( ) ____

P.O.#:

CLIENT CONTACT: John Geissler

A² PROJECT #: AR5-6922

SAMPLE TYPE
1. WATER
2. SOIL
3. SLUDGE
4. OIL
5. CHIPS
6. WIPES
7. AIR CASSETTE
8. OTHER (Gas Bag)

CONTAINER TYPE
P - PLASTIC
G - GLASS
V - VOA

A² SAMPLE #	CLIENT SAMPLE IDENTIFICATION	SAMPLE TYPE	CONTAINER SIZE	CONTAINER TYPE	CONTAINER #	SAMPLING INFORMATION DATE	TIME	TECH	PRESERVATIVES	% Methane	Sample pH at Login
25196	Inlet, Run-1	8	80l	Bag	1	10/9	1006-1106	DPF	None	X	
25197	Inlet, Run-2	↓	↓	↓	↓	↓	1220-1320	DPF	↓	X	
25198	Inlet, Run-3	↓	↓	↓	↓	↓	1405-1505	DPF	↓	X	

REPORT PACKAGES
- MWRA ☐
- NJPDES ☐
- RDR ☐
- MA. DEP ☐
- NJDEP (AIR) ☐
- COMPLIANCE ☒
- OTHER ____ ☐

SAMPLED BY: John A. Geissler	DATE: 10/9/96 TIME: 1600	RECEIVED BY: [signature]	DATE: 10/10/96 TIME: 9:30
RELINQUISHED BY:	DATE: TIME:	RECEIVED BY	DATE: TIME:
RELINQUISHED BY:	DATE: TIME:	RECEIVED BY	DATE: TIME:

Temperature upon receipt ____

SPECIAL INSTRUCTIONS

☐ RUSH DATE REQUIRED (ADDITIONAL COST MAY APPLY)

☒ REGULAR (10 BUSINESS DAYS) ☐ RUSH-TAT (5 DAY VERBAL)

Shade areas for laboratory use only.

AA25196-6922 Processed: 10-10-1996 21:13:48, segment 1, cycle 11
RAW DATA SAVED IN FILE E:OCT1011.PTS

***** EXTERNAL STANDARD TABLE ***** 241

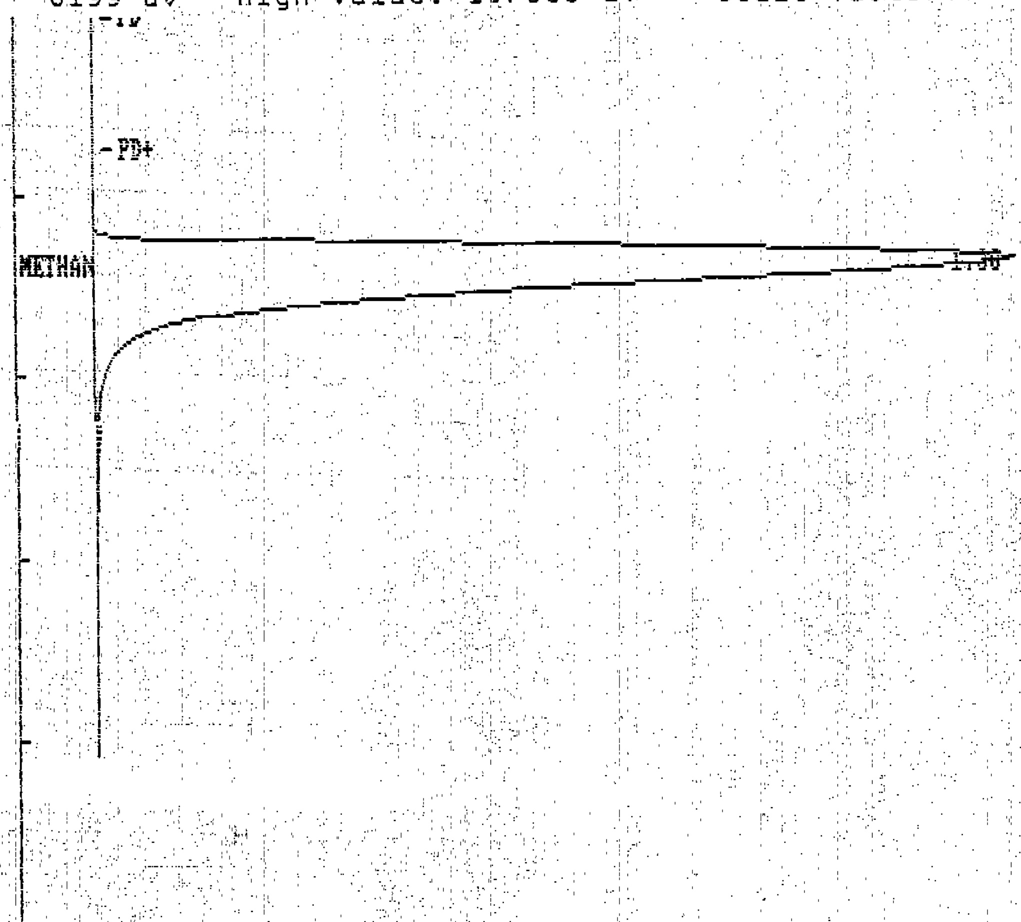
******************* 10-10-1996 21:13:49 Version 5.1.5 *****************
* Sample Name: AA25196-6922 Data File: E:OCT1011 *
Date: 10-10-1996 21:09:35 Method: CH40106 10-10-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 11 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *
****
* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *
****

Starting Delay: 0.00
Area reject: 100
Amount injected: 1.00
Sample Weight: 1.00000

Ending retention time: 5.00
One sample per 1.000 sec.
Dilution factor: 1.00

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.383	METHANE	24.2237	100.0000%	1592411	100828	15.8 1	1	0	1.5212E-05
		TOTAL AMOUNT =	24.2237							

Areas, times, and heights stored in: E:OCT1011.ATD
Data File = E:OCT1011.PTS Printed on 10-10-1996 at 21:13:54
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6199 uv High Value: 107033 uv Scale factor: 1.0



AA25196-6922 Processed: 10-10-1996 21:18:24, segment 2, cycle 12
RAW DATA SAVED IN FILE E:OCT1012.PTS

242

***** EXTERNAL STANDARD TABLE *****

********** 10-10-1996 21:18:26 Version 5.1.5 **********

* Sample Name: AA25196-6922 Data File: E:OCT1012 *
* ate: 10-10-1996 21:14:18 Method: CH40106 10-10-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 12 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

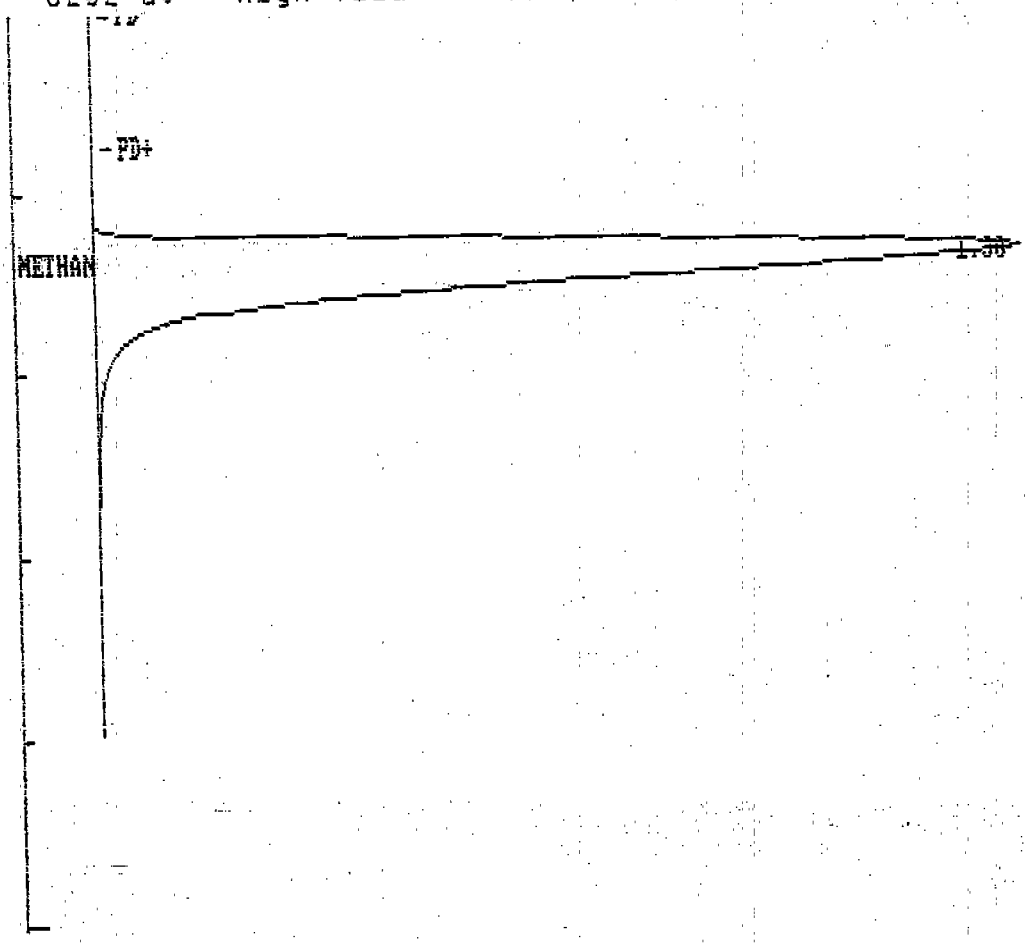
Starting Delay: 0.00
Area reject: 100
Amount injected: 1.00
Sample Weight: 1.00000

Ending retention time: 5.00
One sample per 1.000 sec.
Dilution factor: 1.00

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	HEIGHT BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.383	METHANE	24.2325	100.0000%	1592994	100666	15.8	1	1	0	1.5212E-05

TOTAL AMOUNT = 24.2325

Areas, times, and heights stored in: E:OCT1012.AT3
Data File = E:OCT1012.PTS Printed on 10-10-1996 at 21:18:30
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6202 uv High Value: 106873 uv Scale factor: 1.0



AA25197-6922 Processed: 10-10-1996 21:24:31, segment 1, cycle 13
RAW DATA SAVED IN FILE E:OCT1013.PTS

243

***** EXTERNAL STANDARD TABLE *****

********** 10-10-1996 21:24:32 Version 5.1.5 **********

* Sample Name: AA25197-6922 RMS Data File: E:OCT1013 *
* Date: 10-10-1996 21:20:14 Method: CH40106 10-10-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 13 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

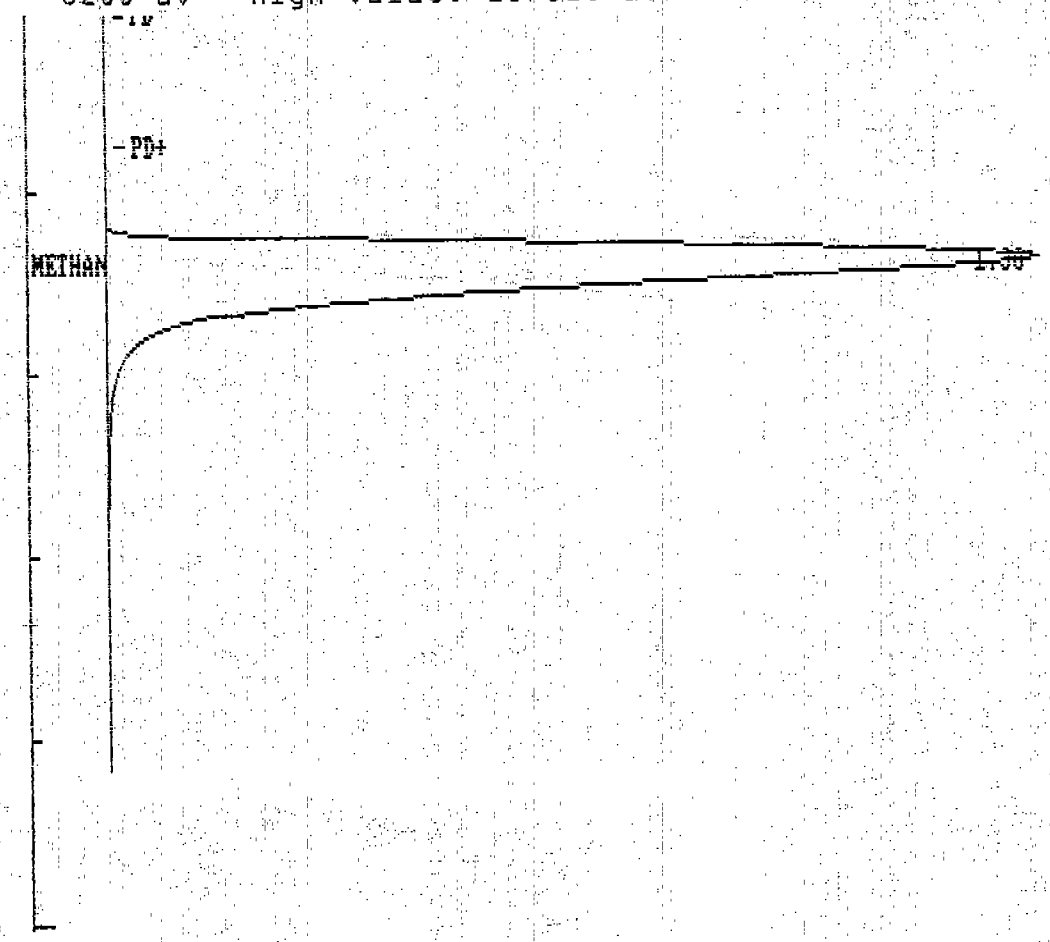
* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

Starting Delay: 0.00 Ending retention time: 5.00
Area reject: 100 One sample per 1.000 sec.
Amount injected: 1.00 Dilution factor: 1.00
Sample Weight: 1.00000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.383	METHANE	24.3789	100.0000%	1602616	101111	15.9	1	1	0	1.5212E-05

TOTAL AMOUNT = 24.3789

Areas, times, and heights stored in: E:OCT1013.ATB
Data File = E:OCT1013.PTS Printed on 10-10-1996 at 21:24:37
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6200 uv High Value: 107316 uv Scale factor: 1.0



AA25197-6922 Processed: 10-10-1996 21:29:50, segment 2, cycle 14
RAW DATA SAVED IN FILE E:OCT1014.PTS

***** EXTERNAL STANDARD TABLE *****

******************** 10-10-1996 21:29:51 Version 5.1.5 ********************

* Sample Name: AA25197-6922 RN Data File: E:OCT1014 **244** *
ate: 10-10-1996 21:24:57 Method: CH40106 10-10-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 14 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100
****
* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL Detector 1: None *
* Detector 0: FID *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *
****

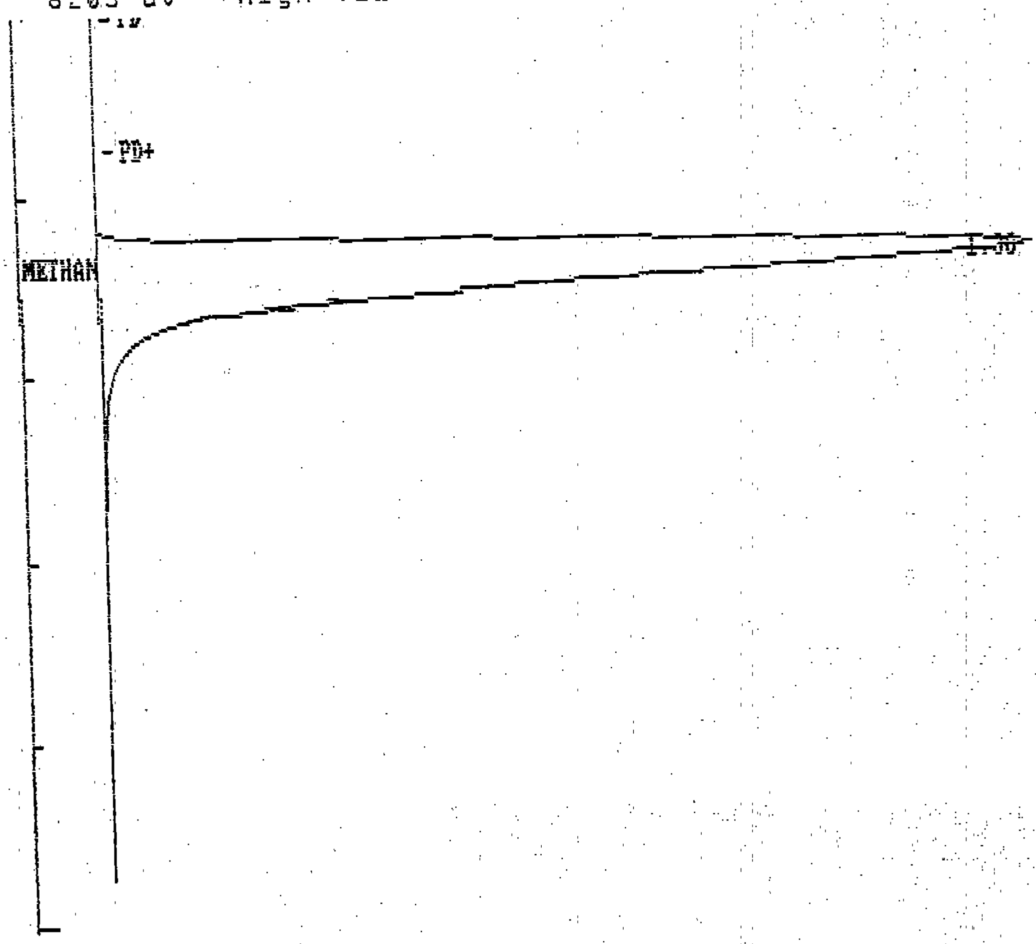
Starting Delay: 0.00
Area reject: 100
Amount injected: 1.00
Sample Weight: 1.00000

Ending retention time: 5.00
One sample per 1.000 sec.
Dilution factor: 1.00

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.383	METHANE	24.1965	100.0000%	1599625	100600	15.9	1	1	0	1.5212E-05

TOTAL AMOUNT = 24.1965

Areas, times, and heights stored in: E:OCT1014.ATB
Data File = E:OCT1014.PTS Printed on 10-10-1996 at 21:29:56
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6203 uv High Value: 106309 uv Scale factor: 1.0



AA25198-6922 Processed: 10-10-1996 21:36:16, segment 1, cycle 15
RAW DATA SAVED IN FILE E:OCT1015.PTS

245

***** EXTERNAL STANDARD TABLE *****

********** 10-10-1996 21:36:18 Version 5.1.5 **********

* Sample Name: AA25198-6922 Data File: E:OCT1015 *
* Date: 10-10-1996 21:31:33 Method: CH40106 10-10-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 15 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

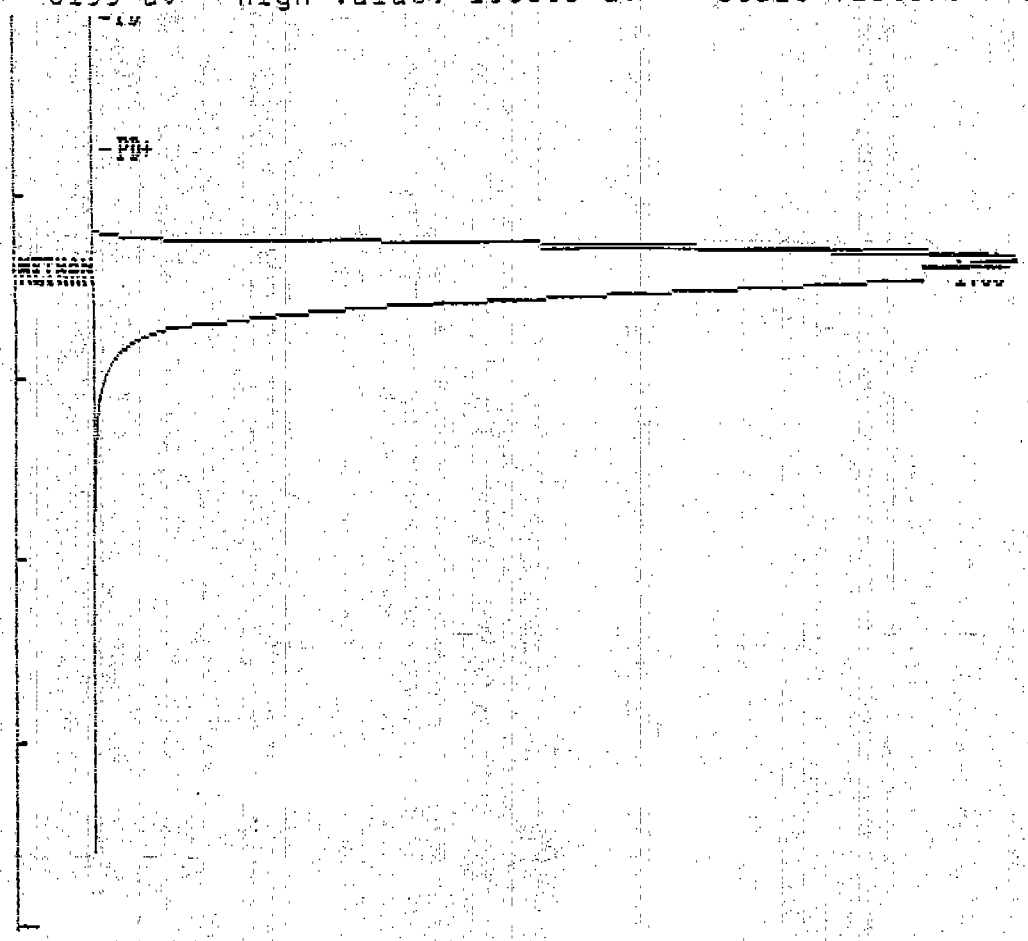
* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

Starting Delay: 0.00 Ending retention time: 5.00
Area reject: 100 One sample per 1.000 sec.
Amount injected: 1.00 Dilution factor: 1.00
Sample Weight: 1.00000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	HEIGHT BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.383	METHANE	24.6744	100.0000%	1622039	102305	15.9	1	1	0	1.5212E-05

TOTAL AMOUNT = 24.6744

Areas, times, and heights stored in: E:OCT1015.ATB
Data File = E:OCT1015.PTS Printed on 10-10-1996 at 21:36:23
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Value: 6199 uv High Value: 108509 uv Scale factor: 1.0



AA25198-6922 Processed: 10-10-1996 21:41:43, segment 2, cycle 16
RAW DATA SAVED IN FILE E:OCT1016.PTS

***** EXTERNAL STANDARD TABLE *****

********** 10-10-1996 21:41:44 Version 5.1.5 ********** 246

* Sample Name: AA25198-6922 RMS Data File: E:OCT1016 *
* Date: 10-10-1996 21:36:42 Method: CH40106 10-10-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 16 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

****

* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

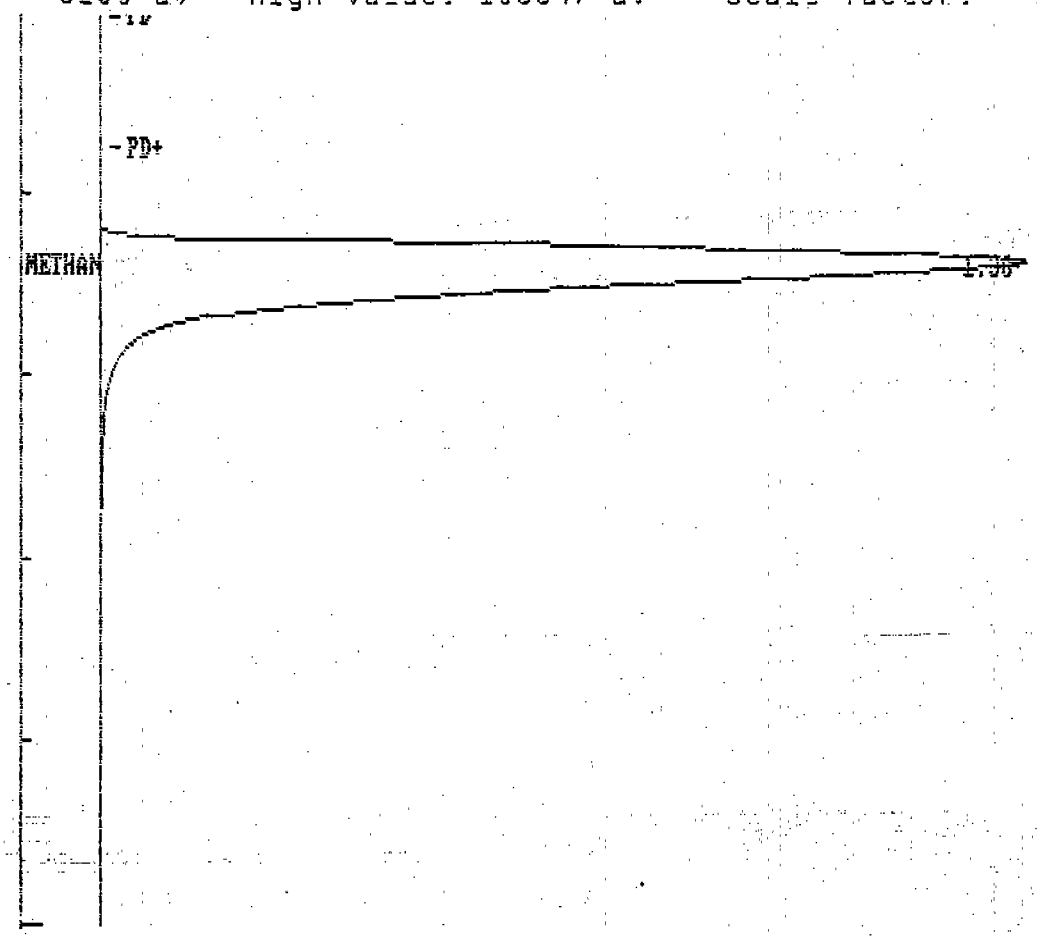
****

Starting Delay: 0.00 Ending retention time: 5.00
Area reject: 100 One sample per 1.000 sec.
Amount injected: 1.00 Dilution factor: 1.00
Sample Weight: 1.00000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.383	METHANE	24.5906	100.0000%	1623189	102342	15.9	1	1	0	1.5212E-05

TOTAL AMOUNT = 24.5906

Areas, times, and heights stored in: E:OCT1016.AT8
Data File = E:OCT1016.PTS Printed on 10-10-1996 at 21:41:49
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6200 uv High Value: 108547 uv Scale factor: 1.0



29.5% CH4 CHK STD. Processed: 10-10-1996 21:49:06, segment 1, cycle 17
RAW DATA SAVED IN FILE E:OCT1017.PTS

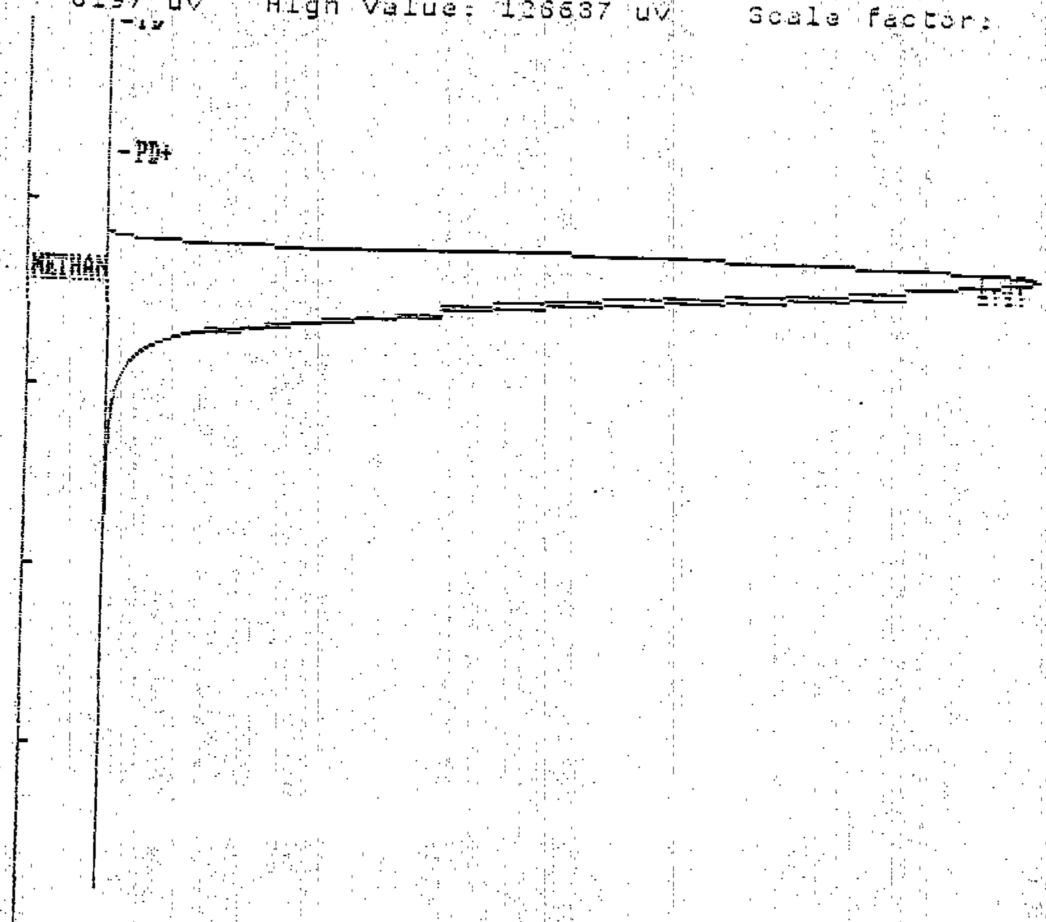
***** EXTERNAL STANDARD TABLE ***
******************* 10-10-1996 21:49:03 Version 5.1.5 ****************
* Sample Name: 29.5% CH4 CHK STD.
ate: 10-10-1996 21:44:11 Method: CH40106 RneData File: E:OCT1017 10-06-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 17 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *
* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

Starting Delay: 0.00
Area reject: 100
Amount injected: 1.00
Sample Weight: 1.00000
Ending retention time: 5.00
One sample per 1.000 sec.
Dilution factor: 1.00

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.367	METHANE	30.1568	100.0000%	1982443	120484	16.5 1	1	0	1.5212E-05

TOTAL AMOUNT = 30.1568

Areas, times, and heights stored in: E:OCT1017.ATB
Data File = E:OCT1017.PTS Printed on 10-10-1996 at 21:49:12
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6197 uv High Value: 126637 uv Scale factor: 1.0



29.5% CH4 CHK STD. Processed: 10-10-1996 21:54:34, segment 2, cycle 18
RAW DATA SAVED IN FILE E:OCT1018.PTS

***** EXTERNAL STANDARD TABLE *****

********** 10-10-1996 21:54:36 Version 5.1.5 **********

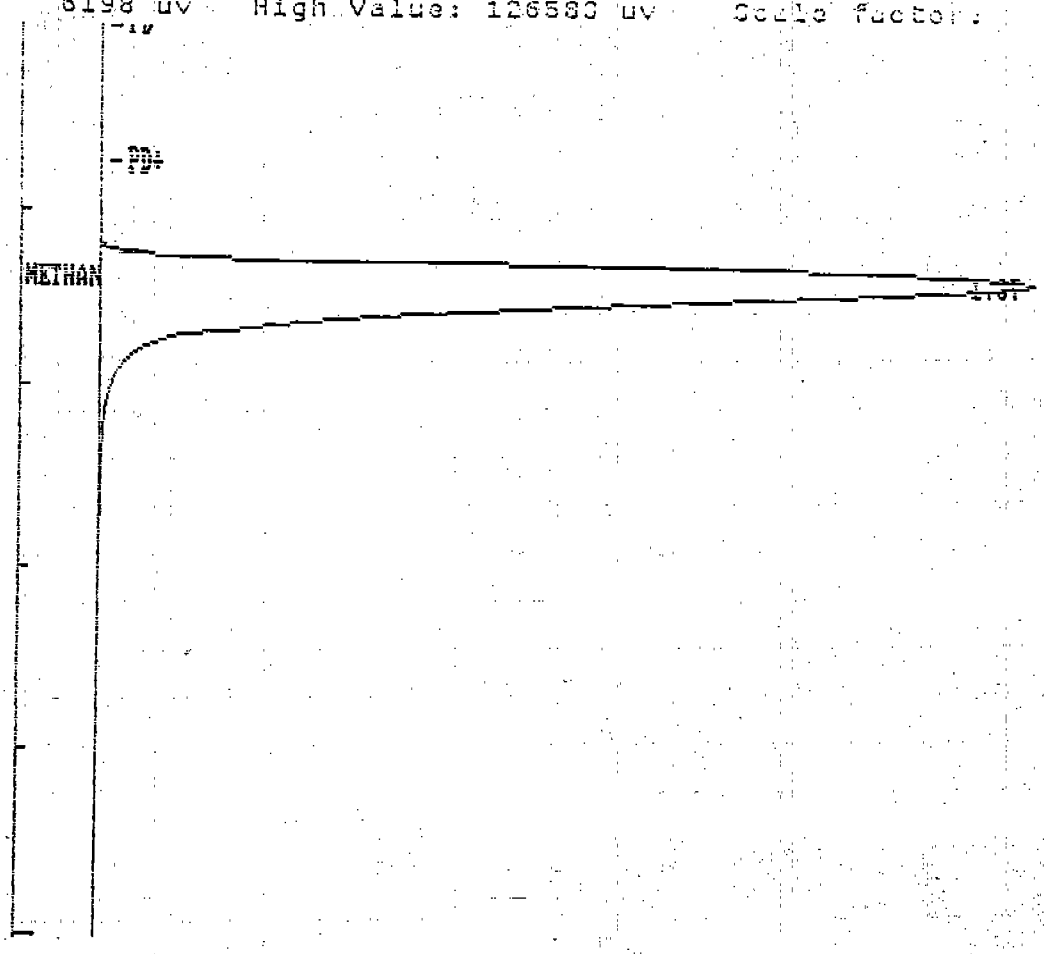
* Sample Name: 29.5% CH4 CHK STD. Data File: E:OCT1018 *
* ate: 10-10-1996 21:49:34 Method: CH40106 10-05-1996 20:57:08 # 248 *
* Interface: 1 Cycle#: 18 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

Starting Delay: 0.00 Ending retention time: 5.00
Area reject: 100 One sample per 1.000 sec.
Amount injected: 1.00 Dilution factor: 1.00
Sample Weight: 1.00000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.367	METHANE	30.1832	100.0000%	1984173	128379	15.5	1	1	0	1.5212E-05
		TOTAL AMOUNT =	30.1832								

Areas, times, and heights stored in: E:OCT1018.ATB
Data File = E:OCT1018.PTS Printed on 10-10-1996 at 21:54:40
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Value: 6198 uv High Value: 126580 uv Scale factor: 1.0



OCTOBER 10, 1996

ANALYTICAL CONDITIONS

TRACOR 540 GC W/FID INPUT ATTN: 100X
8' x 1/8" S.S. COLUMN
5 Å MOLECULAR SIEVE
100°C ISOTHERMAL
150°C INJECTOR TEMP.
250°C DETECTOR TEMP.
H_2 - 30 cc/MIN, AIR - 400 cc/MIN
He - CARRIER GAS - RATIO = 3.0
1 ml INJECTIONS

STANDARDS PREPARATION

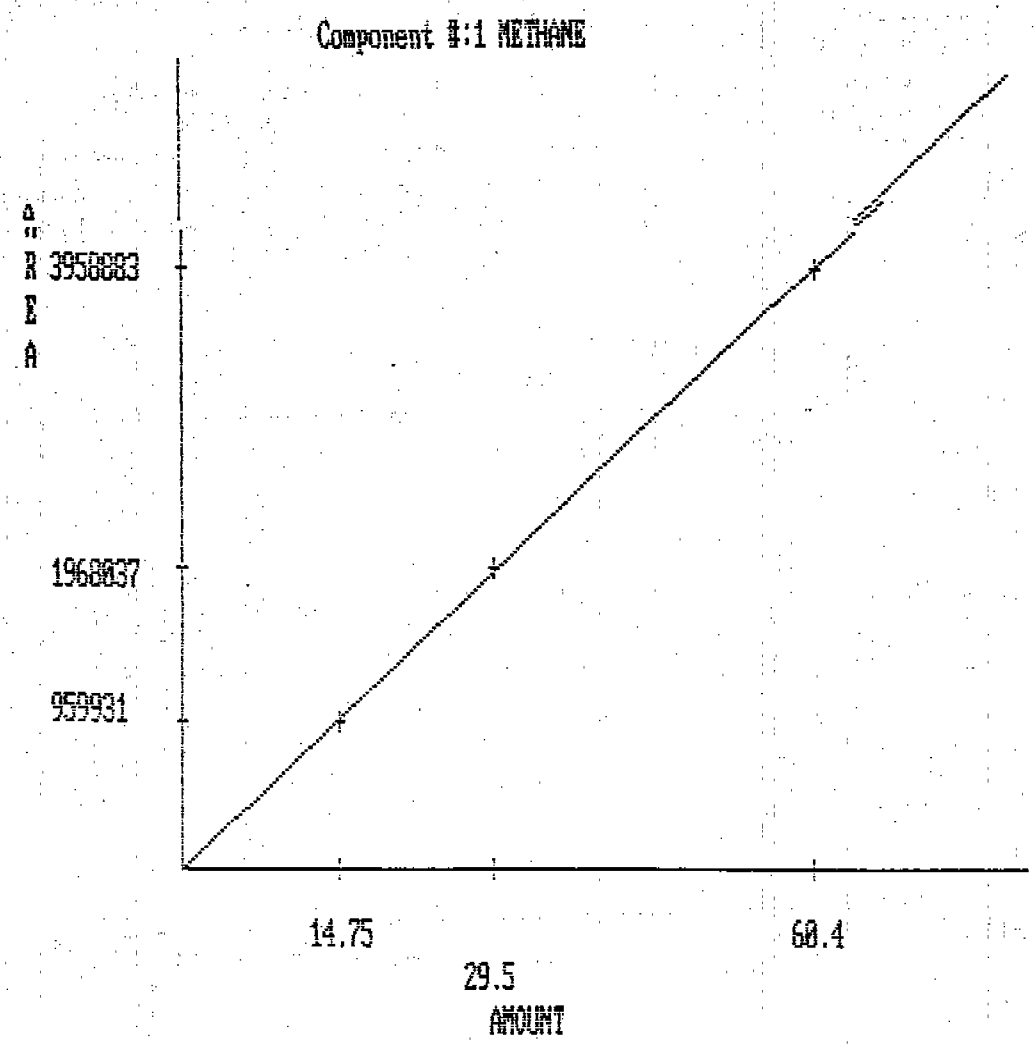
HIGH - 60.4% METHANE BAL. N_2 LIQUID CARBONICS
MID - 29.5% METHANE BAL. N_2 LIQUID CARBONICS
LOW - 2X DILUTION OF MID STANDARD

Continued on Page

Read and Understood By

Signed: [illegible] Date: 10/10/96 Signed: Date:

Method CH40106
Sample METHANE
RMS Operator RMS
Run date 10-10-1996 20:57:08 version: 457
Printed on 10-10-1996 AT 20:57:32
Straight Line Fit forced through Origin.



Component 1 = METHANE
EXTERNAL STANDARD CALIBRATION

LEVEL	AMOUNT	AREA
1	14.7500	959931
2	29.5000	1968037
3	60.4000	3958883

Y = SLOPE * X + INTERCEPT

Area = 6.5738E+04 * Amount + 0.0000E+00
Amount = 1.5212E-05 * Area + 0.0000E+00
R squared = 0.9998

***** EXTERNAL STANDARD TABLE *****

******************** 10-10-1996 21:01:45 Version 5.1.5 ********************

* Sample Name: 14.75% CH4 STD. Data File: E:OCT103
* Date: 10-10-1996 20:19:43 Method: E:CH40106 10-10-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 3 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

****

* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

****

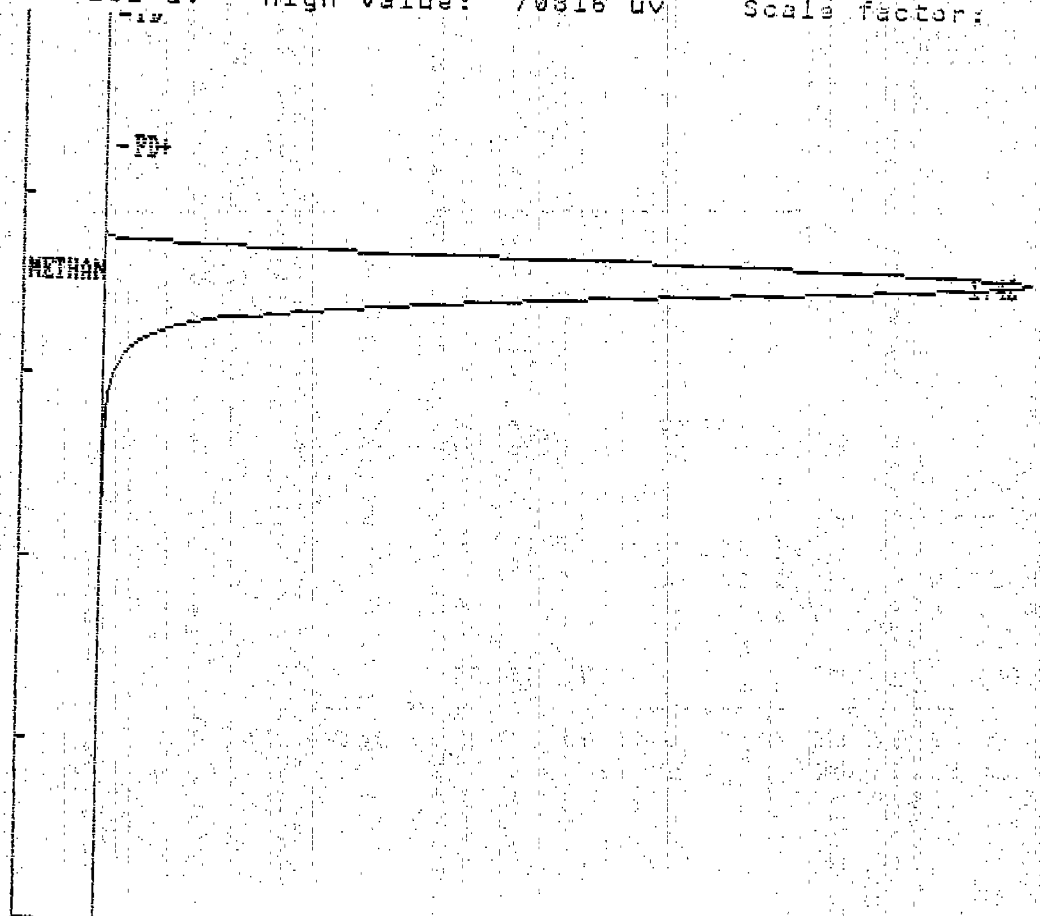
Starting Delay: 0.00
Area reject: 100
Amount injected: 1.00
Sample Weight: 1.00000

Ending retention time: 5.00
One sample per 1.000 sec.
Dilution factor: 1.00

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.417	METHANE	14.5846	100.0000%	958758	64689	14.3	1	1	0	1.5212E-05

TOTAL AMOUNT = 14.5846

Data File = E:OCT103.PTS Printed on 10-10-1996 at 21:01:49
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6201 uv High Value: 70316 uv Scale factor: 1.0



***** EXTERNAL STANDARD TABLE *****

******************** 10-10-1996 21:01:56 Version 5.1.5 ********************

* Sample Name: 14.75% CH4 STD. RMS Data File: E:OCT104
* Date: 10-10-1996 20:26:25 Method: E:CH40106 10-10-1996 20:57:08 # 457
* Interface: 1 Cycle#: 4 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

****

* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

****

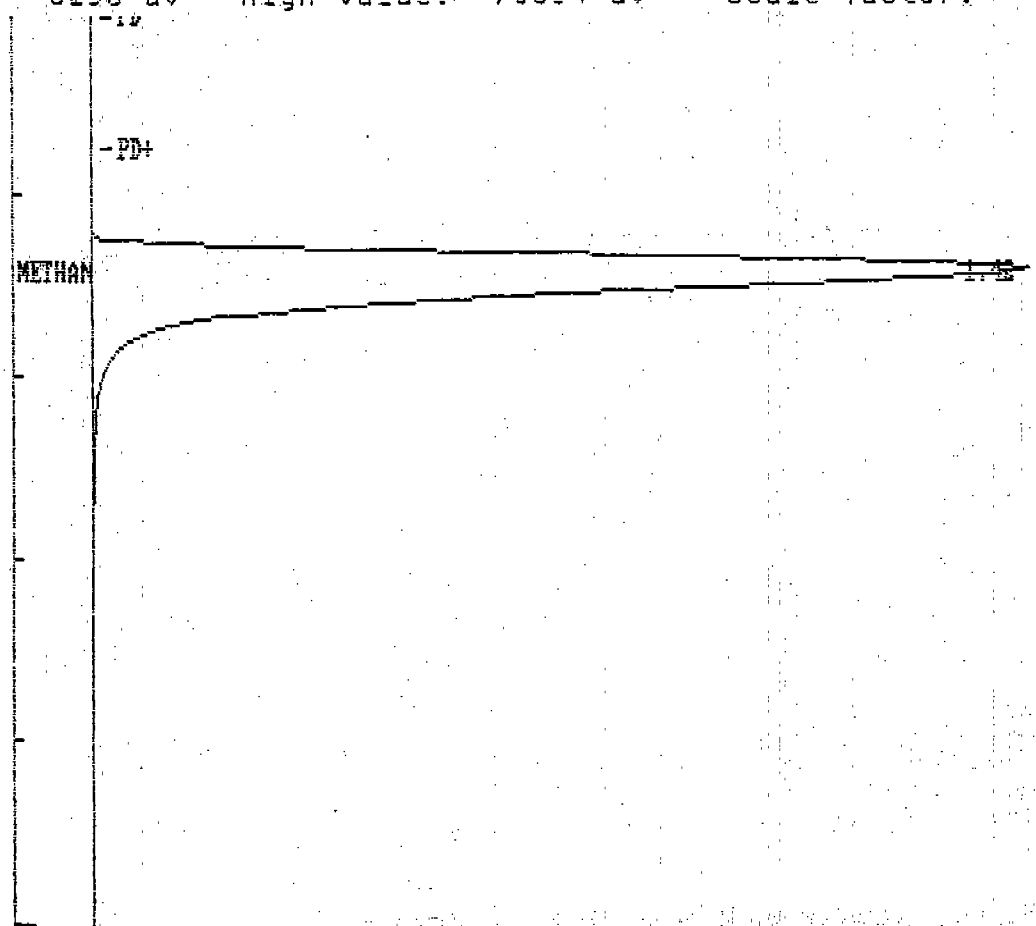
Starting Delay: 0.00 Ending retention time: 5.00
Area reject: 100 One sample per 1.000 sec.
Amount injected: 1.00 Dilution factor: 1.00
Sample Weight: 1.00000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.417	METHANE	14.6203	100.0000%	961104	64390	14.9	1	1	0	1.5212E-05

TOTAL AMOUNT = 14.6203

RMS

Data File = E:OCT104.PTS Printed on 10-10-1996 at 21:01:59
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6198 uv High Value: 70594 uv Scale factor: 1.0



***** EXTERNAL STANDARD TABLE *****

******************** 10-00-1996 21:02:20 Version 5.1.5 ********************
* Sample Name: 29.5% CH4 STD. RMS Data File: E:OCT105
* Date: 10-00-1996 20:34:12 Method: E:CH40106 10-00-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 5 Operator RMS Channel#: 0 Vial#: N.A. *
Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *
****
* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *
****

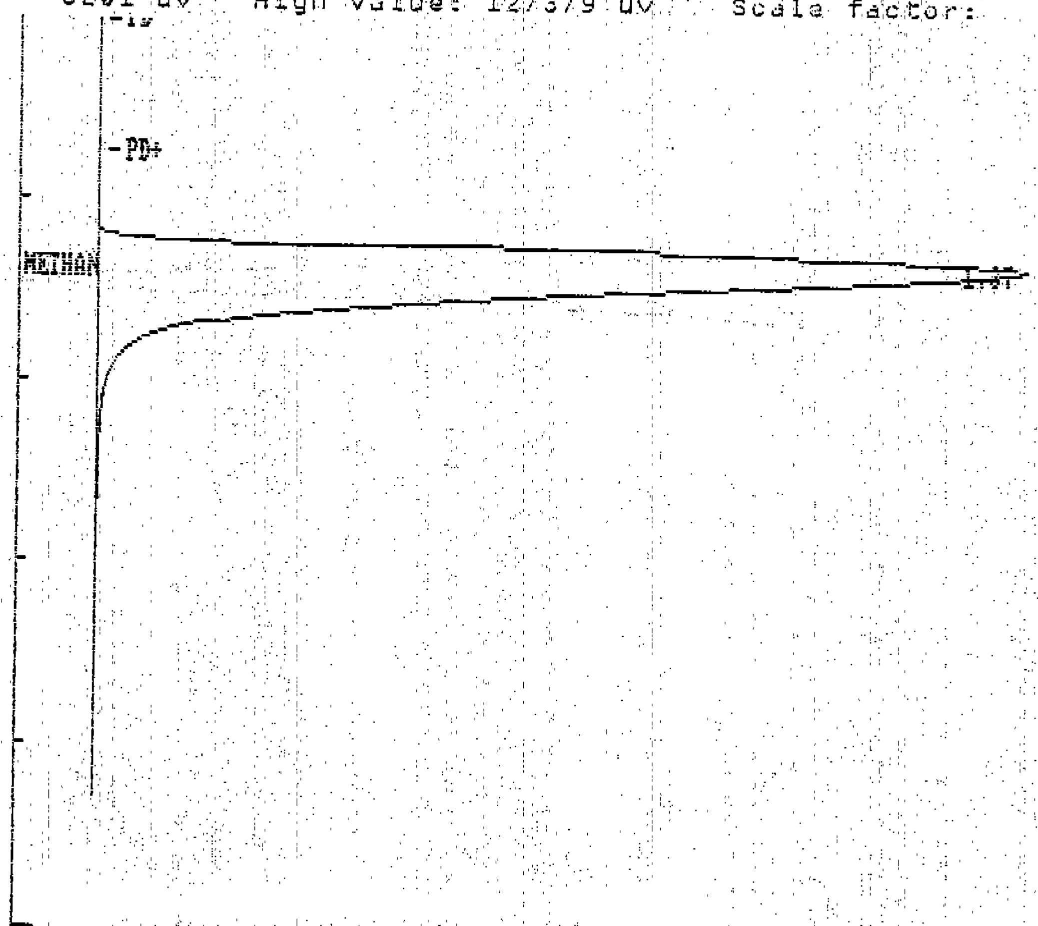
Starting Delay: 0.00
Area reject: 100
Amount injected: 1.00
Sample Weight: 1.00000

Ending retention time: 5.00
One sample per 1.000 sec.
Dilution factor: 1.00

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.367	METHANE	30.0176	100.0000%	1973289	121173	16.3	1	1	0	1.5212E-05

TOTAL AMOUNT = 30.0176

Data File = E:OCT105.PTS Printed on 10-00-1996 at 21:02:43 RMS
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6201 uv High Value: 127379 uv Scale factor: 1.0



***** EXTERNAL STANDARD TABLE *****

********** 10-10-1996 21:03:14 Version 5.1.5 **********

* Sample Name: 29.5% CH4 STD. Data File: E:OCT106 *
* Date: 10-10-1996 20:39:21 Method: E:CH40106 10-10-1996 20:57:08 # 457*
* Interface: 1 Cycle#: 6 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

****

* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

****

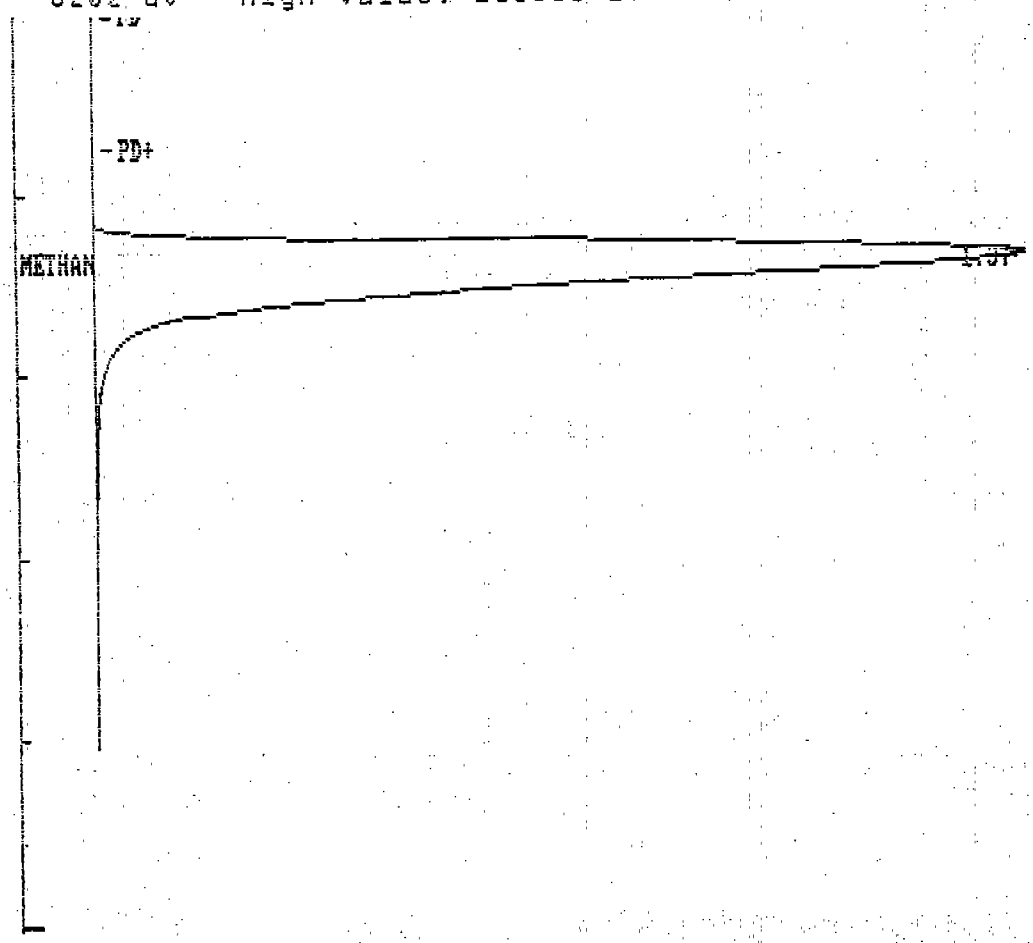
Starting Delay: 0.00
Area reject: 100
Amount injected: 1.00
Sample Weight: 1.00000

Ending retention time: 5.00
One sample per 1.000 sec.
Dilution factor: 1.00

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.367	METHANE	29.8578	100.0000%	1962784	120157	16.3	1	1	0	1.5212E-05

TOTAL AMOUNT = 29.3578

Data File = E:OCT106.PTS Printed on 10-10-1996 at 21:03:35
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6202 uv High Value: 126365 uv Scale factor: 1.0



****** EXTERNAL STANDARD TABLE ******

******************** 10-06-1996 21:04:04 Version 5.1.5 ********************

* Sample Name: 60.4% CH4 STD. Data File: E:OCT107

* Date: 10-06-1996 20:45:01 Method: E:CH40106 10-06-1996 20:57:08 # 457*

* Interface: 1 Cycle#: 7 Operator RMS Channel#: 0 Vial#: N.A. *

* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *

* Solvent Description: 5A Molecular Sieve *

* Conditions: 100C ISOTHERMAL *

* Detector 0: FID Detector 1: None *

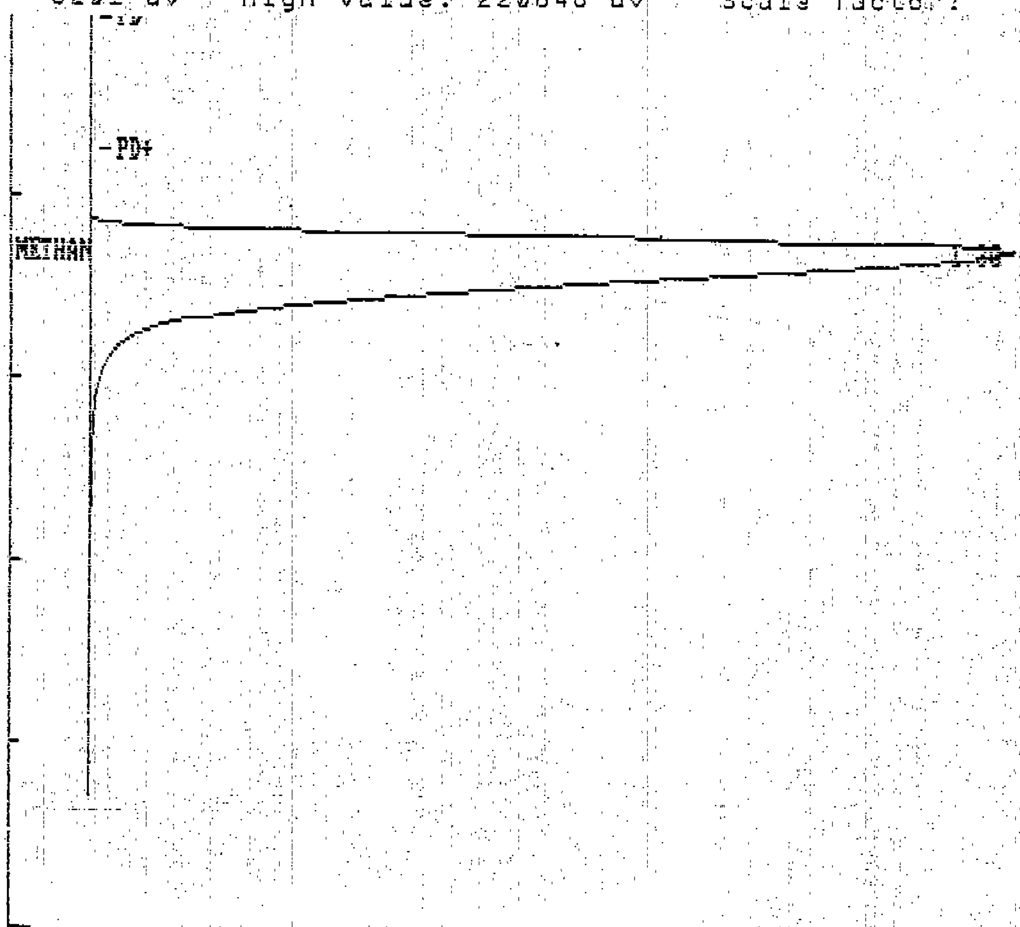
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

Starting Delay: 0.00 Ending retention time: 5.00
Area reject: 100 One sample per 1.000 sec.
Amount injected: 1.00 Dilution factor: 1.00
Sample Weight: 1.00000

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.300	METHANE	60.2611	100.0000%	3961433	214641	18.5 1	1	0	1.5212E-05

TOTAL AMOUNT = 60.2611

Data File = E:OCT107.PTS Printed on 10-06-1996 at 21:04:29
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6201 uv High Value: 220846 uv Scale factor: 1.0



EXTERNAL STANDARD TABLE

RMS

********** 10-00-1996 21:04:58 Version 5.1.5 **********

* Sample Name: 60.4% CH4 STD. RMS Data File: E:OCT108 *
* Date: 10-00-1996 20:50:11 Method: E:CH40106 10-00-1996 20:57:08 # 457*
* Interface: 1 RMS Cycle#: 8 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

****

* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

****

Starting Delay: 0.00
Area reject: 100
Amount injected: 1.00
Sample Weight: 1.00000

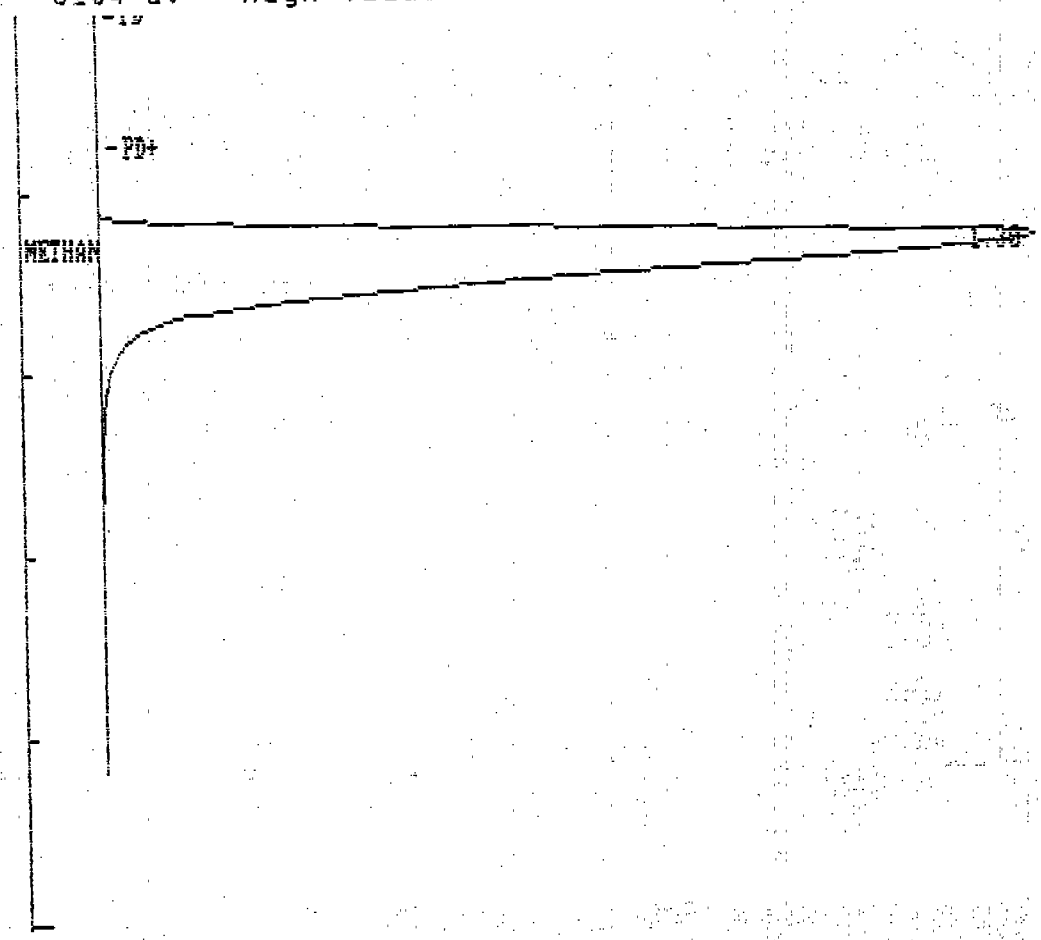
Ending retention time: 5.00
One sample per 1.000 sec.
Dilution factor: 1.00

PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT	BL	REF PEAK	% DELTA RET TIME	CONC/AREA
1	1.300	METHANE	60.1835	100.0000%	3956332	214816	18.4	1	1	0	1.5212E-05

TOTAL AMOUNT = 60.1835

RMS

Data File = E:OCT108.PTS Printed on 10-00-1996 at 21:05:25
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6204 uv High Value: 221025 uv Scale factor: 1.0



METHOD BLANK Processed: 10-05-1996 21:00:34, segment 1, cycle 9
RAW DATA SAVED IN FILE E:OCT109.PTS

***** EXTERNAL STANDARD TABLE ***** 257

******************** 10-05-1996 21:00:36 Version 5.1.5 ********************

* Sample Name: METHOD BLANK Data File: E:OCT109 *
* Date: 10-05-1996 20:55:39 Method: CH40106 10-05-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 9 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

Starting Delay: 0.00 Ending retention time: 5.00
Area reject: 100 One sample per 1.000 sec.
Amount injected: 1.00 Dilution factor: 1.00
Sample Weight: 1.00000

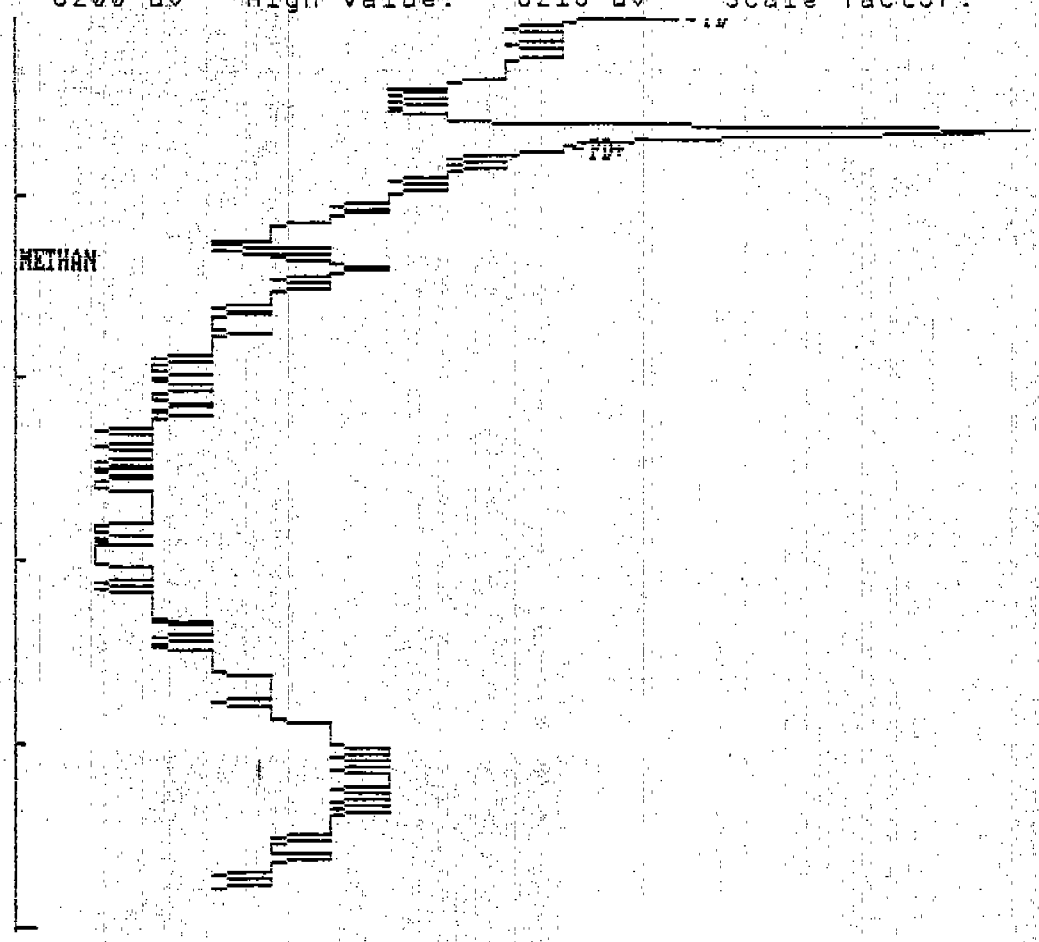
PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT BL	REF PEAK	% DELTA RET TIME	CONC/AREA

TOTAL AMOUNT = 0.0000

PEAKS NOT FOUND IN THIS RUN

NAME	ADJUSTED RET.TIME.	REFERENCE PEAK
METHANE	1.35	METHANE

Areas, times, and heights stored in: E:OCT109.ATS
Data File = E:OCT109.PTS Printed on 10-05-1996 at 21:00:41
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6200 uv High Value: 6216 uv Scale factor: 1.0



METHOD BLANK Processed: 10-05-1996 21:06:04, segment 2, cycle 10
RAW DATA SAVED IN FILE E:OCT1010.PTS

***** EXTERNAL STANDARD TABLE ***** 258

********************* 10-10-1996 21:06:06 Version 5.1.5 *********************

Sample Name: METHOD BLANK Data File: E:OCT1010 *
Date: 10-10-1996 21:01:03 Method: CH40106 10-10-1996 20:57:08 # 457 *
* Interface: 1 Cycle#: 10 Operator RMS Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .1 Area Threshold: 100 *

* Instrument Type: TRACOR 540 GC Column Type: 8'x 1/8'' S.S. *
* Solvent Description: 5A Molecular Sieve *
* Conditions: 100C ISOTHERMAL *
* Detector 0: FID Detector 1: None *
* Misc. Information: He-Carrier Gas-ROTO=3.0, 1ml INJ. *

Starting Delay: 0.00 Ending retention time: 5.00
Area reject: 100 One sample per 1.000 sec.
Amount injected: 1.00 Dilution factor: 1.00
Sample Weight: 1.00000

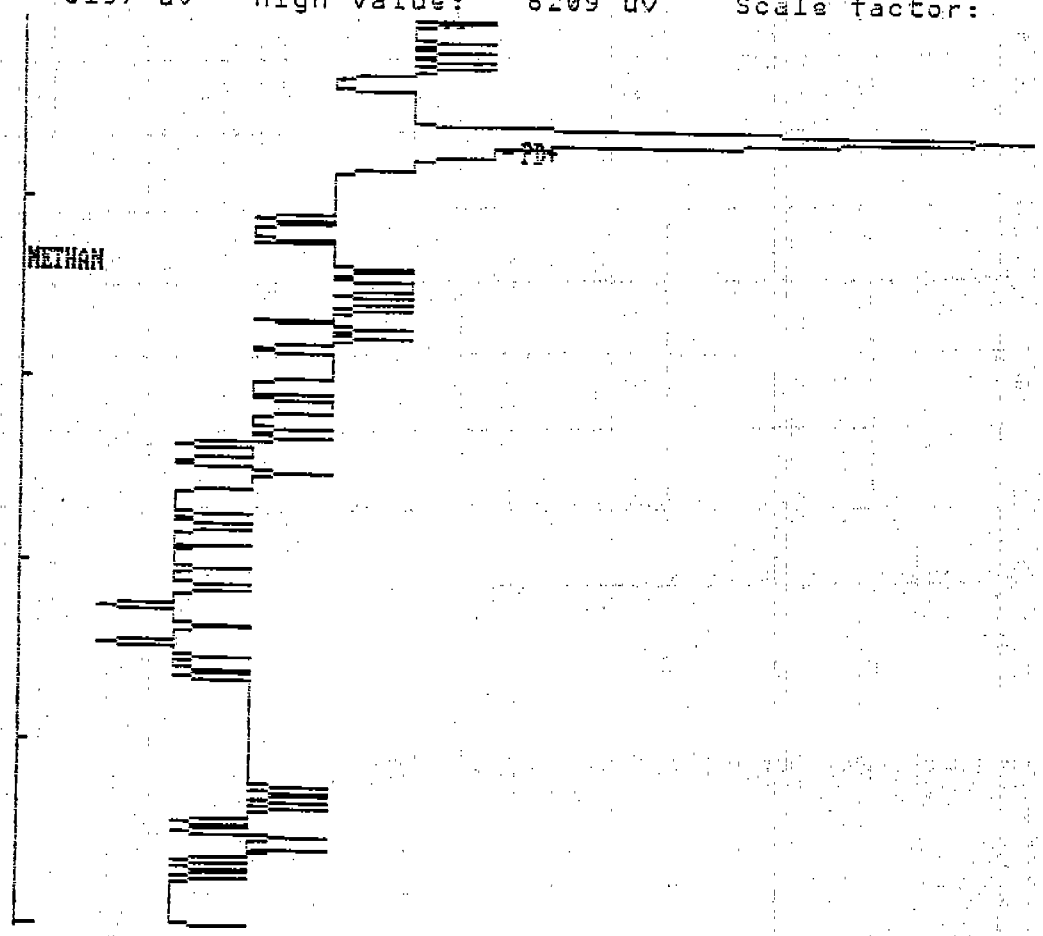
PEAK NUM	RET TIME	PEAK NAME	CONCENTRATION in %	NORMALIZED CONC	AREA	HEIGHT	AREA/ HEIGHT BL	REF PEAK	% DELTA RET TIME	CONC/AREA

TOTAL AMOUNT = 0.0000

PEAKS NOT FOUND IN THIS RUN

NAME	ADJUSTED RET.TIME.	REFERENCE PEAK
METHANE	1.35	METHANE

Gas, times, and heights stored in: E:OCT1010.ATB
Data File = E:OCT1010.PTS Printed on 10-10-1996 at 21:06:20
Start time: 0.00 min. Stop time: 5.00 min. Offset: 0 mv.
Low Value: 6197 uv High Value: 6209 uv Scale factor: 1.0



PLANT BETHLEHEM LAND FILL STACK INLET

SAMPLE NO. _____ OPERATING CONDITIONS _____

JOB NO. AR5-6922 DATE 10/11/96

DRY BASIS

LABORATORY ORSAT OR GC GAS ANALYSIS					
SAMPLE ID	DATE	%CO_2	%O_2	%CO	%N2 (by difference)
INLET RUN 1	10/9/96	25.4 25.4 25.4	1.8 1.8 1.8		
SAMPLE ID	DATE	%CO_2	%O_2	%CO	%N2 (by difference)
INLET RUN 2	10/9/96	25.8 25.8 25.8	1.4 1.4 1.4		
SAMPLE ID	DATE	%CO_2	%O_2	%CO	%N2 (by difference)
INLET RUN 3	10/9/96	26.2 26.2 26.2	1.2 1.2 1.2		
SAMPLE ID	DATE	%CO_2	%O_2	%CO	%N2 (by difference)
SAMPLE ID	DATE	%CO_2	%O_2	%CO	%N2 (by difference)
SAMPLE ID	DATE	%CO_2	%O_2	%CO	%N2 (by difference)
SAMPLE ID	DATE	%CO_2	%O_2	%CO	%N2 (by difference)

CHEMIST: [illegible]

AirRECON
RARITAN, NJ