ENTECH ENGINEERING INC.

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October 4, 2007

Mr. Alan Dover
Environmental Specialist
Delek Refining, Ltd.
Tyler Refinery
425 McMurrey Drive
Tyler, Texas 75702

SUBJECT: **TRANSMITTAL OF ENTECH ENGINEERING REPORT NO. ER2007-09-288 ENTITLED "DELEK REFINING, LTD. TYLER REFINERY SULFUR RECOVERY UNIT 2 (SRU2) TAIL GAS INCINERATOR 2 (EPN SRUTGCUINC), EMISSION COMPLIANCE TEST (TCEQ REGULATED ENTITY NUMBER: RN100222512; CUSTOMER REFERENCE NUMBER: CN602831232; ACCOUNT ID NO. SK-0022-A; PERMIT NO. 5955A)"**

Entech Engineering conducted an emission compliance test on the Sulfur Recovery Unit -2 Tail Gas Incinerator 2 at the Delek Refining, Ltd., Tyler Refinery in Tyler, Texas. The test program was conducted on August 22, 2007 under Delek Refining, Ltd. Purchase Order No. PO003775-0000-000.

Six copies of the Entech final report, which documents the findings and results of this program, are enclosed. Please note that the results presented in this report only related to the items tested or the samples as received by Entech's lab; further, this report will not be reproduced, without the written approval of the client. Please contact us at our League City, Texas office if you have any questions or comments concerning the findings of this program.

Sincerely,

for Humberto A. Saenz III
Environmental Scientist

Approved by:

Lisa Stallsworth, Ph.D, CIH, CSP
QA/QC Manager

Approved by:

Edward J. Pasternak
Technical Manager

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DELEK REFINING, LTD.
TYLER REFINERY
SULFUR RECOVERY UNIT 2 (SRU2)
TAIL GAS INCINERATOR 2 (EPN SRUTGCUINC)
EMISSION COMPLIANCE TEST
(TCEQ REGULATED ENTITY NUMBER: RN100222512; CUSTOMER REFERENCE NUMBER: CN602831232;ACCOUNT ID. SK-022-A; PERMIT 5955A)

(ENTECH REPORT NO. ER2007-09-288)

PREPARED BY

ENTECH ENGINEERING INC.
LEAGUE CITY, TEXAS

SEPTEMBER 2007

PREPARED FOR

DELEK REFINING, LTD.
TYLER, SMITH COUNTY, TEXAS

SAMPLING LOCATION

DELEK REFINING, LTD.
TYLER REFINERY SRU2 TAIL GAS INCINERATOR 2 STACK
TYLER, SMITH COUNTY, TEXAS

ENTECH ENGINEERING INC.

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APPENDICES

SECTION 1.0 SUMMARY

Entech Engineering Inc. was retained by Delek Refining, Ltd. to conduct an emission compliance test on the Sulfur Recovery Unit 2 Tail Gas Incinerator at the Tyler Refinery in Tyler, Smith County, Texas. The objective of this program was to demonstrate emission compliance of Sulfur Recovery Unit according to the Texas Commission on Environmental Quality (TCEQ) Permit No. 5955A. The emission compliance test program was performed on August 22, 2007 and was coordinated by Mr. Alan Dover of Delek Refining, Ltd. The TCEQ Tyler Regional Office was notified of the compliance test, but no representative was present to observe the compliance testing.

The Tyler Refinery's Sulfur Recovery Unit 2 (SRU2) operates an incinerator (i.e. Tail Gas Incinerator 2), which is designated in the permit as EPN SRUTGCUINC, to control total reduced sulfur (TRS) emissions from SRU1 and SRU2. Presently, under normal operations, one fourth of the combined acid gas flow and sour gas goes to the SRU1 furnace and the remaining three- fourths is processed by the SRU2 furnace. Combined tail gas from SRU1 and SRU2 is routed to the tail-gas cleanup unit (i.e. SCOT Unit). The tail gas from the SCOT Unit is routed to TGI2 (i.e. EPN SRUTGCUINC). The only off gas routed to SRU1 is from the Sulfur Pit 1 and sulfur loading operations. Sulfur emissions from the Sulfur Pit 2 and sulfur loading are processed by TGI2.

An emission compliance test was performed on SRU2 according to the USEPA Code of Federal Regulations, Title 40, Part 63 (40CFR63), Subpart UUU "National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: *Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units*". The TCEQ Permit No. 5955A requires that a compliance test be conducted on SRU2 for NO_X, CO, SO_2, and TRS emissions. Velocity and moisture content of the incinerator were also measured to calculate volumetric flow rates and mass emissions. Additionally, three fuel samples were collected during each of the three compliance tests and analyzed for fuel composition.

A summary of the emission compliance test results are presented in Table 1. Test methods and equipment descriptions are presented in Section 2.0 and results and discussion are presented in Section 3.0.

Table 1
Delek Refining, Ltd.
Tyler Refinery
Tyler, Smith County, Texas
Sulfur Recovery Unit 2 (SRU2)Tail Gas Incinerator 2 (EPN SRUTGCUINC)
Emission Compliance Test Summary
(TCEQ Regulated Entity Number: RN100222512;
Customer Reference Number CN602831232; Account ID No. SK-0022-A; Permit 5955A)

Pollutant	Pollutant Conc.		Allowable Permit	Allowable Exceeded (Yes/No)
	ppmv, dry	lb/hr	lb/hr	
CO	43.25	0.47	0.41	Yes
SO_2	146.07	3.61	13.08	No
NO_x	19.37	0.34	0.49	No

SECTION 2.0 TEST METHOD AND EQUIPMENT DESCRIPTION

The emission test equipment, procedures, and analytical methods used in this program were those described in the Environmental Protection Agency (EPA) Code of Federal Regulations (CFR), Title 40 (Protection of the Environment), Part 60 (New Source Performance Standard), Appendix A. Sampling equipment was prepared and calibrated at the Entech Engineering facility prior to transportation. At the site, sampling equipment was set up, checked out, and employed according to the following Reference Method procedures.

EPA Reference Method 1- "*Sample and Velocity Traverses for Stationary Sources*". The SRU -2 outlet is a circular stack with an internal diameter (ID) measuring 48 inches with two three-inch ports installed at 90° apart that conform to the requirements specified in the EPA Reference Method 1. Based on the sample port locations, Entech Engineering determined that a minimum of sixteen traverse points was required to obtain representative emission samples. Each traverse point was sampled for four-minutes to obtain representative samples. Reference Method 1 procedures were also used to verify the absence of cyclonic flow; a schematic of the outlet sampling location is shown in Figure 1.

EPA Reference Method 2- "*Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)*". Volumetric flow rate was determined by measuring the velocity using a Type S (Stausscheibe or reverse type) pitot tube with an assigned baseline coefficient of 0.84 and differential pressure gauge (inclined manometer).

EPA Reference Method 3A - "*Determination of Oxygen and Carbon Dioxide Concentrations in Emissions From Stationary Sources (Instrumental Analyzer Procedure)*". Excess oxygen (O_2) was measured by instrumental methods.

EPA Reference Method 3 - "*Gas Analysis for the Determination of Dry Molecular Weight*". Excess Oxygen (O_2) and carbon dioxide (CO_2) concentrations were measured per Reference Method 3. Tedlar bag sample was collected using an evacuation tank and analyzed for O_2 and CO_2 concentrations using an Orsat Gas Analyzer. The results were used to determine the stack gas molecular weight.

EPA Reference Method 4 - "*Determination of Moisture Content in Stack Gases*". Moisture content of the stack gas was measured by condensing flue gas moisture in Modified and Greenburg-Smith impingers immersed in an ice water bath and determining the moisture gain by gravimetric analysis. Stack gas SO_2 concentrations were verified using Reference Method 6. Impingers 1 and 2 contained 200 ml of 6% H_2O_2. A sample from each impinger was titrated within 7% of the SO_2 ppmv dry concentration determined with RM 6C . A schematic of the RM 4 sampling train is shown in Figure 3.

EPA Reference Method 6C- "*Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure)*".

EPA Reference Method 7E - "*Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure)*".

EPA Reference Method 10 - "*Determination of Carbon Monoxide Emissions From Stationary Sources*".

EPA Reference Method 15- "*Determination of Hydrogen Sulfide, Carbonyl Sulfide, and Carbon Disulfide Emissions From Stationary Sources*". Sulfide concentrations were determined using a Shimadzu gas chromatograph equipped with a flame photometric detector (GC/FPD). Sulfide calibrations were performed with a VICI Metronics Dynacalibrator using sulfide permeation tubes. Off-gas samples were conditioned with a particulate filter and SO_2 (citrate buffer) scrubber. A schematic of the RM 15 sampling configuration is shown in Figure 2.

EPA Reference Method 19 - F_d Factor - "*Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxide Emission Rates*".

In this test program, Continuous Emission Monitoring Systems (CEMS) were used to determine the gaseous concentrations of Nitrogen Oxides (NO_X), Sulfur Dioxide (SO_2), Carbon Monoxide (CO) and excess Oxygen (O_2). An Entech test trailer equipped with a sampling systems conforming to the Reference Method specifications was used for the test. A description of the Entech Engineering CEM systems is presented as follows:

Thermo Environmental Instruments, Inc. NO_X Analyzer-

Model No.	:	42C
Serial No.	:	42CHL-77922-387
Principal	:	Chemiluminescence
Calibration	:	High Span - 95.6 ppmv NO_x in N_2
		Mid Span - 24.7 ppmv NO_x in N_2
		Low Span - N_2 Zero Gas
Full Span	:	0 - 95.6 ppmv NO_X

Bovar Western Research SO_2 Analyzer -

Model No.	:	920
Serial No.	:	VW-920-8639-1
Principal	:	Non-dispersive Ultraviolet
Calibration	:	High Span - 227.0 ppmv SO_2 in N_2
		Mid Span - 94.7 ppmv SO_2 in N_2
		Low Span - N_2 Zero Gas
Full Span	:	0 - 227.0 ppmv SO_2

California Analytical Instruments, Inc. $CO/CO_2/O_2$ Analyzer-

Model No.	:	300
Serial No.	:	1M08015
Principal	:	NDIR
Calibration	:	High Span - 295.0 ppmv CO in N_2
		Mid Span - 120.0 ppmv CO in N_2
		Low Span - N_2 Zero Gas
Full Span	:	0 - 295 ppmv CO
Calibration	:	High Span - 10.000 % O_2 in N_2
		Mid Span - 5.020 % O_2 in N_2
		Low Span - N_2 Zero Gas
Full Span	:	0 - 10.0 % O_2

Sampling System ($NO_X/SO_2/CO/O_2$ CEMS) - A diaphragm pump was used to draw samples continuously from the sampling points through a heated probe and a heated Teflon® sample line. A condenser and a series of filters were used to condition the samples by removing moisture and particulate matter from the samples. Control valves and rotameters were used to regulate the conditioned gas flow to the instruments. All emission concentrations were measured on a dry-basis.

Instrument Calibration - Calibration gases for NO_X, SO_2, CO and O_2 were first sent directly to the instruments to check linearity of the instruments (Calibration Error Check). The calibration gases were then sent via a sample line to a three-way valve located behind the sample probe and back to the instrument to verify system bias (System Bias Check). Procedures used in the system bias check were repeated after each test run to measure the instrument drift (Calibration Drift). The calibration gases for the NO_X, SO_2, CO and O_2 calibrations were EPA Protocol 1 gases.

Data Acquisition - A Yokogawa HR1300 hybrid recorder was used to record the CEMS output on a continuous basis. Final NO_X, SO_2, CO and O_2 readings were corrected for the system bias and instrument drift.

The Reference Methods 2, 3C, and 4 results were used to calculate the stack flow rates, which were then used to determine the pollutant mass emission rates in pounds-per-hour (lb/hr). Fuel gas composition analysis was conducted by analyzing C_1-C_6 paraffins/olefins and miscellaneous gases using gas chromatographs per the Reference Method 18 w/o recovery studies and ASTM Method D1946-90. The Entech Engineering gaseous emission sampling configurations and schematic of the stack sampling location is presented in Figure 1. Reference Method 4 sampling equipment is presented in Figure 3.

Figure 1.

Delek Refining, Ltd.
Tyler, TX
Sulfur Recovery Unit 2
Tail Gas Incinerator 2 (EPN SRUTGUINC)
Gaseous Emission Sampling Configuration

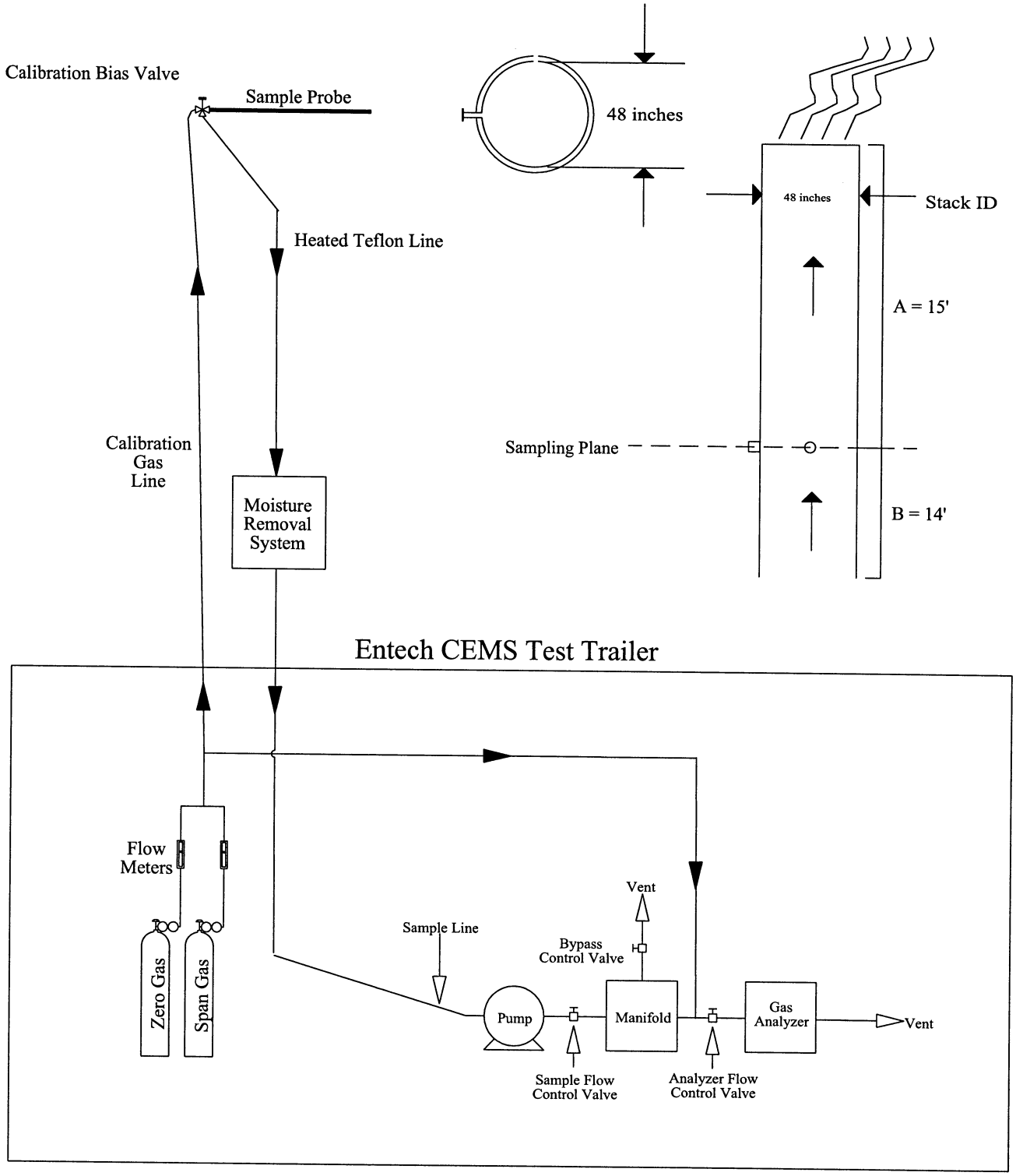


Figure 2.

Delek Refining, Ltd.
Tyler, TX
Sulfur Recovery Unit 2
Tail Gas Incinerator 2 (EPN SRUTGUINC)
Reference Method 15 Sampling Configuration

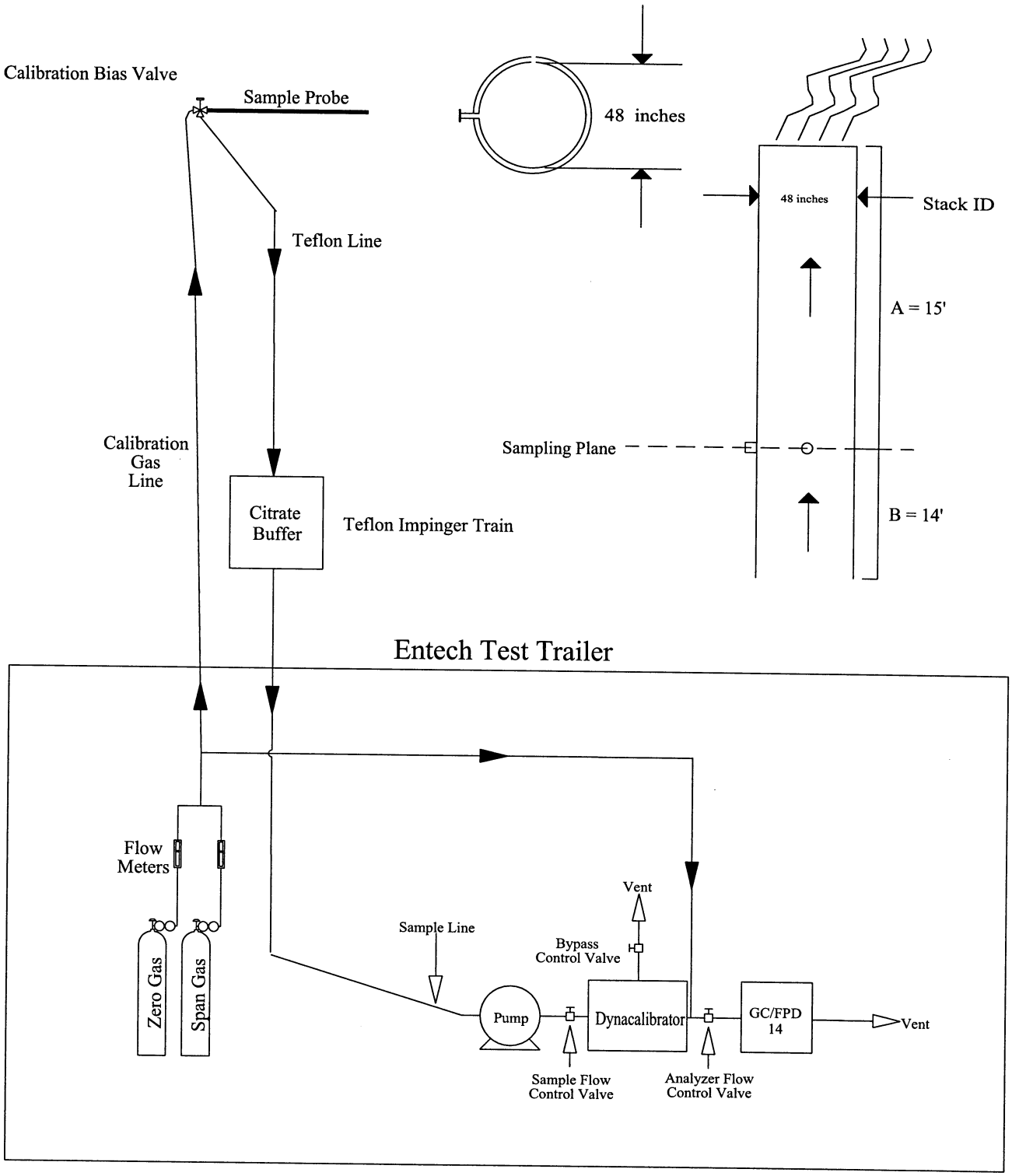
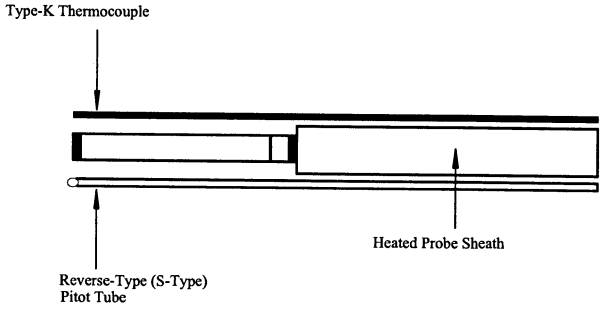
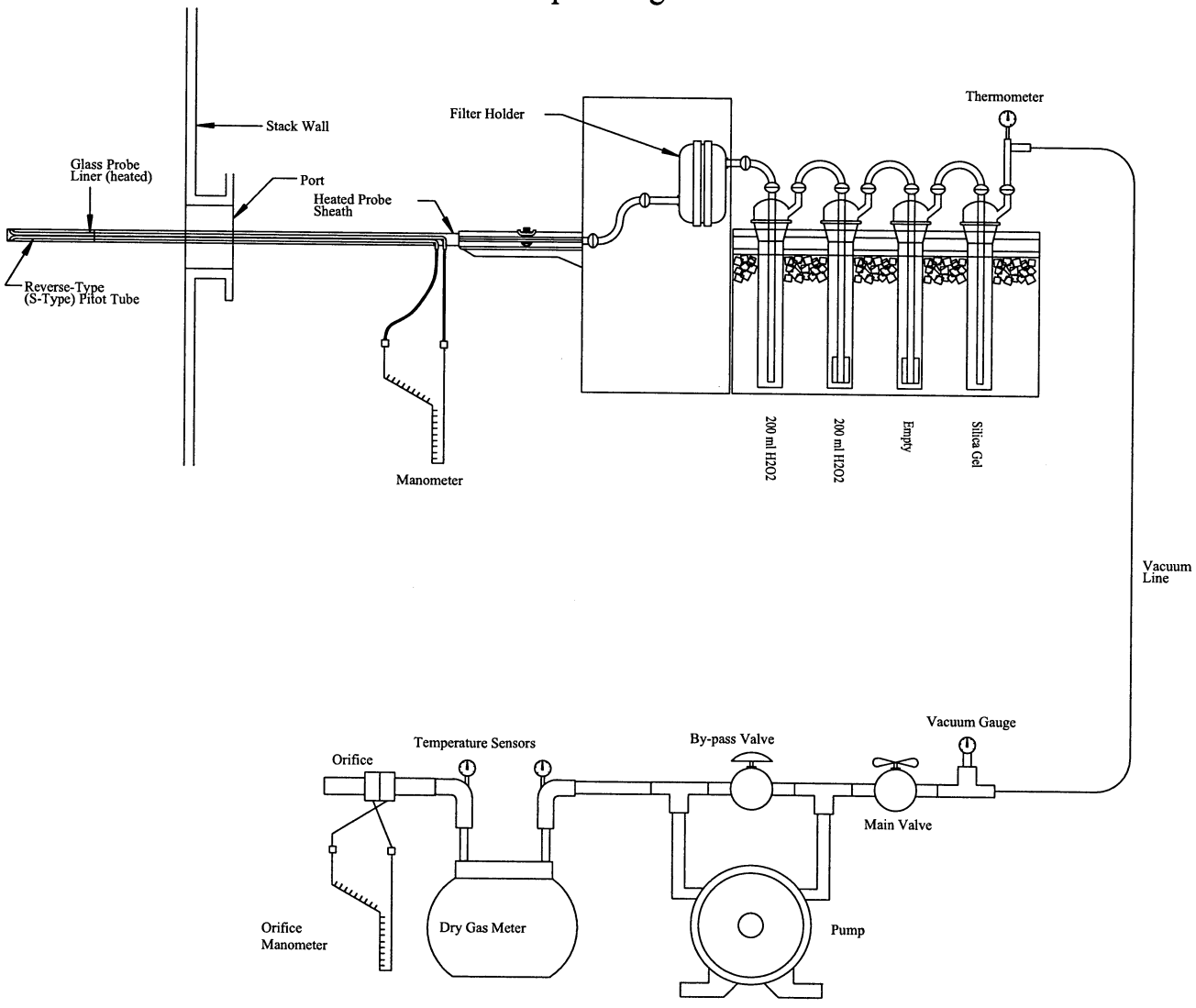


Figure 3
Method 4
Sampling Train



Probe Tip Configuration



SECTION 3.0 RESULTS AND DISCUSSIONS

Entech Engineering conducted an emission compliance test of the Sulfur Recovery Unit 2 Tail Gas Incinerator 2 at the Delek Refining Ltd., Tyler Refinery in Tyler, Smith County, Texas. The objective of the program was to determine emission compliance of the incinerator according to TCEQ Permit 5955A. The compliance test was conducted on August 22, 2007 with the unit operating at maximum achievable conditions.

The stoichiometric Fd factor cannot be calculated using the equations in Reference Method 19 due to multiple streams of tail gas feeding the burner and combustion system. As a result, the mass emission rates in pounds-per-hour (lb/hr) were calculated by multiplying the emission concentrations in ppmv by the stack flow rates in dry-standard-cubic-feet-per-minute (dscfm).

During the compliance test, the NO_X emissions averaged 19.37 part-per-million-by-volume-dry-basis (ppmvd) and 0.34 pounds-per-hour (lb/hr). SO_2 emissions averaged 146.07 ppmvd and 3.61 lb/hr. The CO emissions averaged 43.25 part-per-million-by-volume-dry-basis (ppmvd) and 0.47 pounds-per-hour (lb/hr). The RM 15 (TRS) test results averaged 0.20 ppmv for Carbonyl Sulfide (COS), 0.32 ppmv for Hydrogen Sulfide (H_2S), and 0.25 ppmv Carbon Disulfide (CS_2).

Test results and selected test parameters for the incinerator are presented in Table 1. All other pertinent data of the test program is contained in the appendices. The field raw data and laboratory analysis are contained in Appendices A and B. Example calculations and QA/QC data and instrument specifications are presented in Appendices C and D. Equipment calibrations, calibration gas certifications, process data, resumes, chain of custody, and personnel information are presented in Appendices E through J.

Table 2
Delek Refining, Ltd., Tyler Refinery
Tyler, Smith County, Texas
Sulfur Recovery Unit 2 (SRU2) Tail Gas Incinerator 2 (EPN SRUTGCUINC)
Emission Compliance Test Results
(TCEQ Regulated Entity Number: RN100222512;
Customer Reference Number: CN602831232; Account ID No. SK-0022-A;
Permit No. 5955A)

Test ID		Test 1	Test 2	Test 3	Average
Sampling Date		08/22/07	08/22/07	08/22/07	-
Sampling Time		11:55 - 12:59	16:05 - 17:14	19:22 - 20:30	-
Sampling Duration	Minutes	64	64	64	64
Operation and Fuel Gas Data					
Fuel Gas Flow Rate	MSCF/hr	NA	NA	NA	NA
Fuel F Factor	dscf/MMBtu	8662.89	8671.19	8662.42	8665.5
Stack Data					
Oxygen (O_2)	vol%, dry	1.84	1.88	2.15	1.96
Carbon Dioxide (CO_2)	vol%, dry	10.00	11.00	10.90	10.63
Moisture	%	13.93	13.87	13.12	13.64
Stack Temperature	°F	1214.6	1210.4	1218.6	1214.5
Stack Gas Velocity	ft/sec	12.64	12.31	12.51	12.49
Volumetric Flow Rate	DSCFM	2502.98	2445.80	2494.99	2481.26
Emission Data					
Nitrogen Oxides (NO_X)	ppmv, dry	19.40	19.30	19.40	19.37
	lb/hr	0.35	0.34	0.35	0.34
Sulfur Dioxide (SO_2)	ppmv, dry	148.00	153.00	137.20	146.07
	lb/hr	3.69	3.73	3.41	3.61
Carbon Monoxide (CO)	ppmv, dry	45.48	44.31	39.95	43.25
	lb/hr	0.50	0.47	0.43	0.47
Carbonyl Sulfide (COS)	ppmv, dry *	0.20	0.20	0.20	0.20
	lb/hr	0.005	0.005	0.005	0.005
Hydrogen Sulfide (H_2S)	ppmv, dry	0.35	0.24	0.37	0.32
	lb/hr	0.005	0.003	0.005	0.004
Carbon Disulfide (CS_2)	ppmv, dry *	0.25	0.25	0.25	0.25
	lb/hr	0.007	0.007	0.007	0.007

* Represents Minimum Detection Limits
NA - Not Available

APPENDICES

Appendix

A. FIELD "RAW" DATA

B. LABORATORY ANALYSIS

C. EXAMPLE CALCULATIONS AND QA/QC DATA

D. INSTRUMENT SPECIFICATIONS

E. EQUIPMENT CALIBRATIONS

F. CALIBRATION GAS CERTIFICATIONS

G. PROCESS DATA

H. RESUMES

I. CHAIN OF CUSTODY

J. PERSONNEL INFORMATION

APPENDIX A.

FIELD "RAW" DATA

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SRU-2

Determination of Minimum Number of Traverse Points
(40CFR60 Appendix A, Reference Method 1 or 1A)

By using the appropriate minimum number of traverse points figure in RM1 determine the number of traverse points recommended by both distance A and distance B, which have units of distance "stack duct diameters". This figure must be read vertically from either the top down, for distance A, or from bottom up, for distance B. The greater number of traverse points, as determined by each of the two distances will be the number of traverse points recommended for use. ***Sketch a drawing of the stack below with both distances A and B and duct diameter shown. Show both elevation and plane views. Place an "X" at location of sampling console (if applicable) and include its height with respect to grade.***

How distances are determined: measured / schematic (circle one) other _____

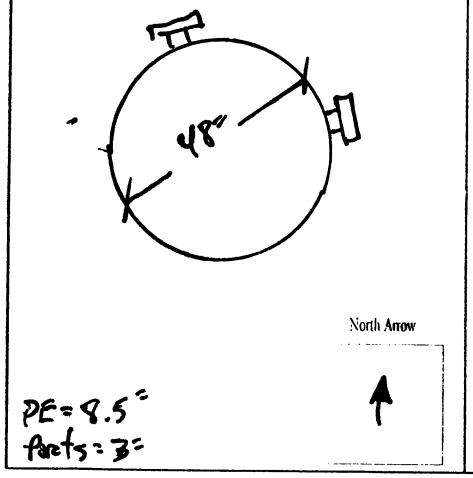
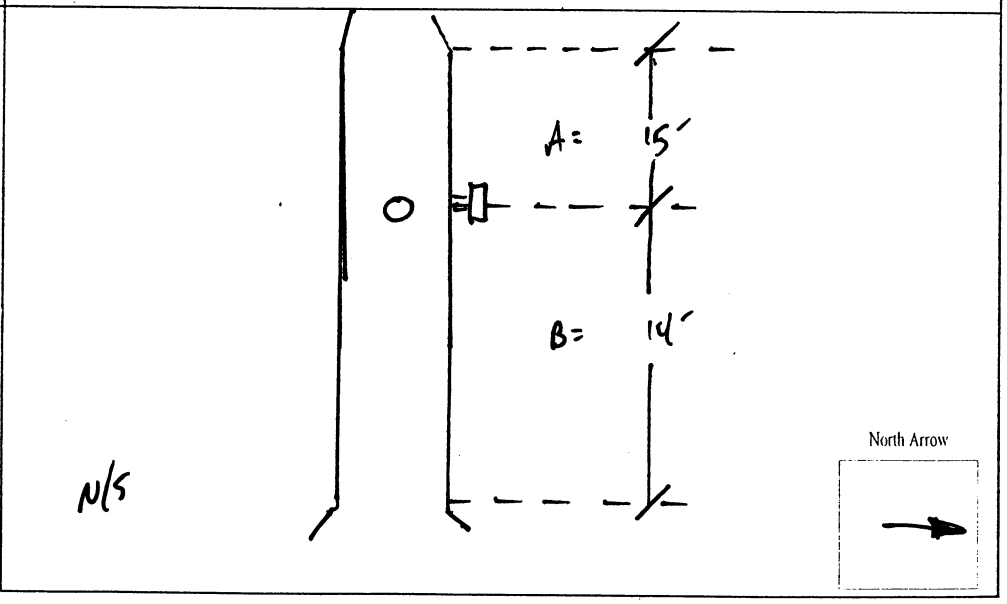
Distance A 15' (feet / inches (circle one)) Duct diameters 3.75

Recommended number of traverse points as determined by **Distance A** 12

Distance B 14' (feet / inches (circle one)) Duct diameters 3.5

Recommended number of traverse points as determined by **Distance B** 16

Stack diameter at port 48" feet / (inches (circle one)

Plane View	Elevation View
	

Date: 8-2107

Signature (Personnel): T-48

Signature (Team Leader): T-48

A1

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Traverse Point Layout for Circular Stacks

Stack ID at Port 48" feet / inches (circle one) Port Extension 8.5" feet / inches (circle one)

Traverse Point No.	Column A Length Factor K_L	Column B Traverse Points K_L x Stack ID	Column C Traverse Pt. + Reference (K_L x Stack ID) + Port Ext.
1	3.2	1.5	10
2	10.5	5.0	13.5
3	19.4	9.3	17.8
4	32.3	15.5	24.0
5	67.7	32.5	41.0
6	80.6	38.7	47.2
7	89.5	43.0	51.5
8	96.8	46.5	55.0
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Date: 8-21-07

Signature (Personnel): T-MS

Signature (Team Leader): T-MS 8-21-07

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Preliminary Velocity Determination

Traverse Point	ΔP (in H_2O)	Temperature (°F)	Yaw Angle (degrees)
1	0.010	1207	ϕ
2	0.010	1205	ϕ
3	0.009	1204	ϕ
4	0.011	1206	ϕ
5	0.009	1207	ϕ
6	0.008	1204	ϕ
7	0.010	1205	ϕ
8	0.010	1208	ϕ
9	0.010	1209	ϕ
10	0.011	1210	ϕ
11	0.012	1207	ϕ
12	0.012	1208	ϕ
13	0.010	1210	ϕ
14	0.011	1208	ϕ
15	0.010	1209	ϕ
16	0.012	1210	ϕ
17			
18			
19			
20			
21			
22			
23			
24			
	Average	1207.31	

Calculation:

Sum the square roots of all Δ P's and divide by N (number of measurements).

Avg $\sqrt{\Delta P} = (\Sigma \sqrt{\Delta P}) / N$

Avg $\sqrt{\Delta P}$ = (0.165) / (16)

Avg $\sqrt{\Delta P}$ = 0.1015 in $H_2O^{½}$

Pitot tube calibration factor (PTCF) = 0.84

Calculate Absolute Stack Pressure (P$_s$):

Static P = − 0.2 in H_2O

Barometric P = 29.00 in Hg

P_s = (−0.2 in H_2O)(0.07355) + (29.0 in Hg)

P_s = 28.995 in Hg

Calculate Stack Temperature (T$_s$):

(1207.31 °F) + 460 = 1667.31 °R

Calculate average preliminary velocity (V) in ft/sec:

$V = (85.48) \times (PTCF) \times \sqrt{(T_s)} / (MW)(P_s) \times (Avg \sqrt{\Delta P})$

V = (85.48) x (0.84) x $\sqrt{(1667.31)}$ / (29.5) x (28.995) x (0.1015)

V = 10.395 ft/sec

Date: 9-22-07

Signature: T-B

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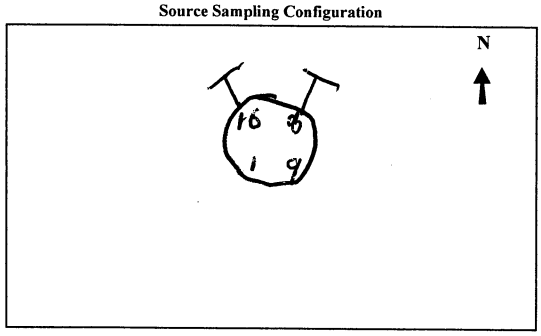
12.6
24.812
13.9

Sampling Field Data Sheet

Plant:	DYK	Barometer ID:	#5	Probe ID:	7A
Location:	TYLER	Barometric Pressure (in. Hg):	29.00	Thermocouple ID:	7A
Unit:	SRU #2	Static Pressure (in H_2O):	-.2	Post-Test Thermocouple Check:	89 89 (Thermometer / Thermocouple)
Source/ EPN:	FIN SRUTGCUINC	Ambient Temperature (°F):	89	Pitot Tube ID:	7A
Date:	6-22-07	Meter Pre Leak Check:	<.0059 @ 15" Hg	PTCF:	.840
Test ID:	1	Meter Post Leak Check:	<.0059 @ 5" Hg	Pump ID:	11
Test Operator:	MAL	Pitot (+) Tube Leak Check:	✓ @ 3" H_2O	Meter ID:	11
Team Leader:	TR	Pitot (-) Tube Leak Check:	✓ @ 3" H_2O	DGMCF:	1.012
		Nozzle ID:	—	ΔH Std:	1.65
		Filter ID:	—	K factor:	—

Traverse Point	Clock Time	Dry Gas Meter Reading (ft^3)	ΔP (in H_2O)	Sq Rt ΔP (in H_2O)	ΔH (in H_2O)	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Pump Vacuum (in Hg)	Probe Temperature (°F)	Filter Temperature (°F)	Impinger Exit Temperature (°F)	Stack Temperature (°F)
1	1155	953.972	.008	.089	.6		103	2			67	1189
2	1159	955.500	.010	.100	.6		103	2			66	1218
3	1203	957.300	.015	.122	.6		103	2			66	1218
4	1207	959.000	.016	.126	.6		103	2			65	1213
5	1211	960.600	.016	.126	.6		103	2			66	1215
6	1215	962.300	.018	.134	.6		103	2			66	1218
7	1219	964.100	.017	.130	.6		103	2			66	1220
8	1220	965.900	.016	.126	.6		104	2			66	1210
	1224	967.546										
9	1231	967.546	.008	.089	.6		104	2			67	1205
10	1235	969.250	.019	.136	.6		105	2			65	1230
11	1239	970.800	.021	.145	.6		105	2			65	1224
12	1243	972.500	.018	.134	.6		105	2			65	1217
13	1247	974.200	.018	.134	.6		105	2			66	1211
14	1251	975.900	.018	.134	.6		105	2			66	1216
15	1255	977.600	.015	.122	.6		106	2			66	1215
16	1259	979.300	.012	.110	.6		106	2			66	1204
		180.962										
	64	26.990	0.0153	0.122	0.6		104.1					1214.6
	Elapsed Time (min)	Gas Volume (ft^3)	Average ΔP	Average Sq Rt ΔP	Average ΔH		Average Meter Temperature					Average Stack Temp.

Source Sampling Configuration



Source Measurements

Emission Point Height (ft):	100
Sampling Point Height (ft):	35
Stack Diameter (@ Exit):	2.08
Stack Diameter (@ Port):	48
Port Length (in.):	6.5
Port Size (in.):	3"

QA/QC Check

Completeness ✓ Legibility ✓ Reasonableness ✓

A-1

Certified by: _____ Personnel (Signature/Date)

T-GS 8/22/07
Team Leader (Signature/Date)

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Impinger Catch

Client:	Delek
Location:	Tyler
Unit:	SRU #2
Sampling Location:	Stack
Date:	8-22-07
Test No:	1

Impinger Number	Solution Used	Amount of Solution (ml)	Impinger Tip Configuration	Final Weight (g)	Initial Weight (g)	Weight Difference (g)
1	H_2O	100	MOD	225.6	154.7	70.9
2	H_2O	100	b/s	166.3	154.5	11.8
3	—	—	MOD	—	—	—
4	Silica Gel	—	MOD	268.6	266.2	2.4
5						
6						

Total Weight Gain of Impingers (g) = 85.1

Date: 8-22-07

Signature: [signature]

Independent Verification of Calculations

Explanation: Someone other than the person who performed the original work and associated calculations must verify that these calculations have been performed correctly.

Date: 8-22-07

Signature [signature]

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Sampling Field Data Sheet

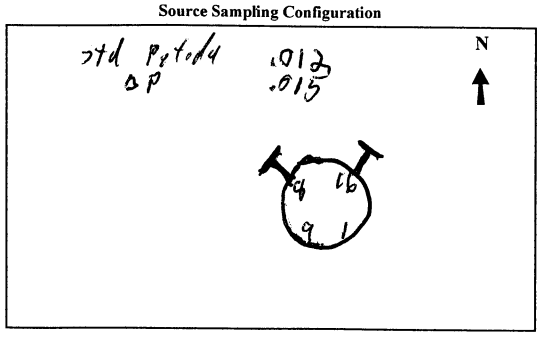
Plant:	Dilla	Barometer ID:	#5	Probe ID:	7A
Location:	Tyler	Barometric Pressure (in. Hg):	24.00	Thermocouple ID:	7A
Unit:	SRU #2	Static Pressure (in HO):	-.2	Post-Test Thermocouple Check:	Thermometer / Thermocouple 91 91
Source/ EPN:	Stack	Ambient Temperature (°F):	91	Pitot Tube ID:	7A
Date:	9-22-07	Meter Pre Leak Check:	≤.005 @ 15" Hg	PTCF:	.840
Test ID:	2	Meter Post Leak Check:	≤.005 @ 15" Hg	Pump ID:	11
Test Operator:	MAL	Pitot (+) Tube Leak Check:	✓ @ 3" H_2O	Meter ID:	11
Team Leader:	TR	Pitot (-) Tube Leak Check:	✓ @ 3" H_2O	DGMCF:	1.017
		Nozzle ID:	—	ΔH Std:	1.65
		Filter ID:	~	K factor:	

Traverse Point	Clock Time	Dry Gas Meter Reading (ft^3)	ΔP (in H_2O)	Sq Rt ΔP (in H_2O)	ΔH (in H_2O)	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Pump Vacuum (in Hg)	Probe Temperature (°F)	Filter Temperature (°F)	Impinger Exit Temperature (°F)	Stack Temperature (°F)
1	1605	991.301	.012	0.1095	.6		109	2			66	1206
2	1609	983.000	.016	0.1265	.6		108	2			66	1207
3	1613	984.700	.017	0.1304	.6		108	2			65	1221
4	1617	986.400	.017	0.1304	.6		108	2			65	1230
5	1621	988.000	.016	0.1265	.6		108	2			66	1215
6	1625	989.700	.014	0.1183	.6		108	2			66	1205
7	1629	991.400	.012	0.1095	.6		108	2			66	1204
8	1633	993.100	.012	0.1095	.6		108	2			67	1200
	1637	994.816										
9	1642	994.816	.007	0.0837	.6		109	2			65	1205
10	1646	996.500	.014	0.1183	.6		109	2			66	1210
11	1650	998.200	.015	0.1225	.6		109	2			66	1230
12	1654	999.900	.017	0.1304	.6		109	2			66	1221
13	1658	1001.600	.019	0.1378	.6		109	2			66	1210
14	1702	1003.300	.019	0.1378	.6		109	2			66	1205
15	1706	1005.000	.014	0.1183	.6		109	2			66	1200
16	1710	1006.700	.012	0.1095	.6		109	2			66	1198
	1714	1008.422										
	64	27.121	0.0146	0.1199	.6		108.6					1210.4
	Elapsed Time (min)	Gas Volume (ft^3)	Average ΔP	Average Sq Rt ΔP	Average ΔH		Average Meter Temperature					Average Stack Temp.

Source Measurements

Emission Point Height (ft):	100
Sampling Point Height (ft):	35
Stack Diameter (@ Exit):	3 ft 8 in
Stack Diameter (@ Port):	46
Port Length (in.):	8.5 =
Port Size (in.):	3 11

Source Sampling Configuration



QA/QC Check

Completeness ✓ Legibility ✓ Reasonableness ✓

Certified by: _____ Personnel (Signature/Date)

T H 8/27/07
Team Leader (Signature/Date)

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Impinger Catch

Client:	Delta
Location:	Tyler
Unit:	SRU #2
Sampling Location:	Stack
Date:	8-22-07
Test No:	2

Impinger Number	Solution Used	Amount of Solution (ml)	Impinger Tip Configuration	Final Weight (g)	Initial Weight (g)	Weight Difference (g)
1	H_2O	100	M	242.4	168.3	74.1
2	H_2O	200	GS	164.9	156.9	8
3	—	dry	M	—	—	—
4	Silica Gel	—	M	282.1	279.8	2.3
5						
6						

Total Weight Gain of Impingers (g) = 84.4

Date: 8-22-07

Signature: [signature]

Independent Verification of Calculations

Explanation: Someone other than the person who performed the original work and associated calculations must verify that these calculations have been performed correctly.

Date: 8-22-07

Signature [signature]

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Sampling Field Data Sheet

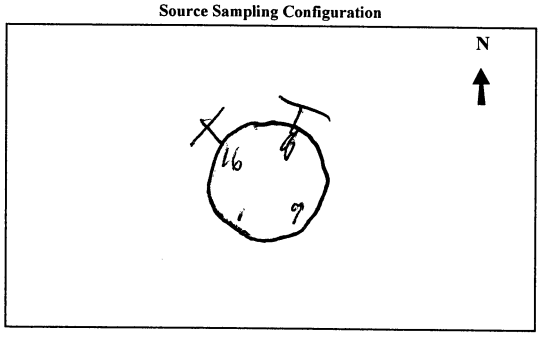
Plant:	D-I-H	Barometer ID:	#5	Probe ID:	7A
Location:	Ty/Is	Barometric Pressure (in. Hg):	29.00	Thermocouple ID:	7A (Thermometer / Thermocouple)
Unit:	SRU #2	Static Pressure (in H2O):	-.2	Post-Test Thermocouple Check:	91 / 91
Source/ EPN:	Stack	Ambient Temperature (°F):	91	Pitot Tube ID:	7A
Date:	8-22-07	Meter Pre Leak Check:	<.0050 15"Hg	PTCF:	.840
Test ID:	3	Meter Post Leak Check:	<.0050 5"Hg	Pump ID:	11
Test Operator:	MAL	Pitot (+) Tube Leak Check:	✓ 3" H2O	Meter ID:	11
Team Leader:	TR	Pitot (-) Tube Leak Check:	✓ 3" H2O	DGMCF:	1.012
		Nozzle ID:	—	ΔH Std:	1.65
		Filter ID:	—	K factor:	—

Traverse Point	Clock Time	Dry Gas Meter Reading (ft³)	ΔP (in H2O)	Sq Rt ΔP (in H2O)	ΔH (in H2O)	Meter Temperature Inlet (°F)	Meter Temperature Outlet (°F)	Pump Vacuum (in Hg)	Probe Temperature (°F)	Filter Temperature (°F)	Impinger Exit Temperature (°F)	Stack Temperature (°F)
1	1922	009.196	.009	0.0949	.6		103	2			66	1214
2	1926	010.900	.016	0.1265	.6		103	2			66	1217
3	1930	012.600	.016	0.1265	.6		103	2			65	1216
4	1934	014.300	.017	0.1304	.6		103	2			65	1220
5	1938	016.000	.016	0.1265	.6		102	2			65	1226
6	1942	017.700	.014	0.1183	.6		102	2			65	1225
7	1946	019.400	.017	0.1304	.6		102	2			66	1220
8	1950	022.100	.016	0.1265	.6		102	2			66	1205
CP	1954	023.836	—	—	—	—	—	—	—	—	—	—
9	1958	023.836	.012		.6		102	2			66	1210
10	2002	025.500	.016	0.1265	.6		102	2			66	1222
11	2006	027.200	.015	0.1225	.6		102	2			66	1222
12	2010	029.900	.017	0.1304	.6		102	2			66	1227
13	2014	030.400	.018	0.1342	.6		102	2			67	1221
14	2018	032.100	.015	0.1225	.6		102	2			67	1227
15	2022	033.800	.014	0.1183	.6		102	2			66	1215
16	2026	035.500	.012	0.1095	.6		101	2			68	1203
	2030	037.200	—	—	—	—	—	—	—	—	—	—
	64	28.014	0.0149	0.1217	.6		102.1					1218.6
	Elapsed Time (min)	Gas Volume (ft³)	Average ΔP	Average Sq Rt ΔP	Average ΔH	Average Meter Temperature						Average Stack Temp.

Source Measurements

Emission Point Height (ft):	100
Sampling Point Height (ft):	35
Stack Diameter (@ Exit):	≈ 48"
Stack Diameter (@ Port):	48"
Port Length (in.):	8.5"
Port Size (in.):	3"

Source Sampling Configuration



QA/QC Check

Completeness ✓ Legibility ✓ Reasonableness ✓

Certified by: _____ Personnel (Signature/Date) A-8

T-48 9/22/07
Team Leader (Signature/Date)

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Impinger Catch

Client:	DLH
Location:	Tyler
Unit:	SRU #2
Sampling Location:	stack
Date:	6-22-07
Test No:	3

Impinger Number	Solution Used	Amount of Solution (ml)	Impinger Tip Configuration	Final Weight (g)	Initial Weight (g)	Weight Difference (g)
1	6% H_2O_2	100	M	232.9	157.6	75.1
2	6% H_2O_2	100	GS	121.9	116.0	5.9
3	dry	–	M	–	–	–
4	Silica Gel	–	M	270.2	268.5	1.7
5						
6						

Total Weight Gain of Impingers (g) = 82.7

Date: 6-22-07

Signature: [signature]

Independent Verification of Calculations

Explanation: Someone other than the person who performed the original work and associated calculations must verify that these calculations have been performed correctly.

Date: 8/22/07

Signature [signature]

ENTECH ENGINEERING INC.

P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Orsat Analysis Results

Client:	Balrk
Location:	Tyler, TX
Unit:	SRU-2
Sampling Location:	Stack
Date:	8/22/07
Leak Check:	✓
Personnel:	TR

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
1	1	10.0		3.0
	2	10.0		3.1
	3	10.0		2.9
	Average	10.0		3.0

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
2	1	11.0		3.0
	2	11.0		3.2
	3	11.0		3.1
	Average	11.0		3.1

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
3	1	11.0		2.90
	2	10.80		2.90
	3	10.90		2.90
	Average	10.90		2.90

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
	1			
	2			
	3			
	Average			

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
	1			
	2			
	3			
	Average			

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
	1			
	2			
	3			
	Average			

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
	1			
	2			
	3			
	Average			

Test No.	Run No.	CO_2 (%)	O_2+CO_2 (%)	O_2 (%)
	1			
	2			
	3			
	Average			

CALERR01

Calibration Error Test at Run 1 . STRATA Version 2.0

		O2 %	CO ppm	SO2 ppm	NOx ppm	O2 Volts	CO Volts	SO2 Volts	NOx Volts
08-22-2007	08:42:15			0.017	0.16	39.09	12.771	0.017	0.0016
1.722	1.336								
08-22-2007	08:43:16			0.008	0.16	-0.17	0.412	0.008	0.0016
-0.007	0.043								
08-22-2007	08:44:16			4.122	0.16	57.23	14.265	4.122	0.0016
2.521	1.492								
08-22-2007	08:45:15			5.026	0.16	98.43	26.487	5.026	0.0016
4.336	2.771								
08-22-2007	08:46:16			6.222	0.16	110.45	27.009	6.222	0.0016
4.865	2.825								
08-22-2007	08:47:16			10.034	0.16	223.20	87.844	10.034	0.0016
9.833	9.189								
08-22-2007	08:48:15			10.039	0.17	226.99	95.790	10.039	0.0017
10.000	10.020								
08-22-2007	08:49:15			10.040	0.16	226.98	95.788	10.040	0.0016
9.999	10.020								
08-22-2007	08:50:16			10.041	0.16	226.85	95.786	10.041	0.0016
9.994	10.019								
08-22-2007	08:51:16			9.931	0.16	110.37	58.230	9.931	0.0016
4.862	6.091								
08-22-2007	08:52:15			9.927	0.16	1.97	26.267	9.927	0.0016
0.087	2.748								
08-22-2007	08:53:16			9.902	0.16	0.66	26.161	9.902	0.0016
0.029	2.737								
08-22-2007	08:54:16			1.338	102.62	0.27	21.349	1.338	1.0262
0.012	2.233								
08-22-2007	08:55:15			0.096	154.07	0.04	10.053	0.096	1.5407
0.002	1.052								
08-22-2007	08:56:15			0.022	296.20	-0.14	0.301	0.022	2.9620
-0.006	0.031								

Calibration Error Test at Run 1

Operator: TR

Plant Name: Delek SRU-2

Location: Tyler, TX

Reference Cylinder Numbers

	Zero	Low-range	Mid-range	High-range
O2				
CO				
SO2				
NOx				

Date/Time	08-22-2007		08:56:45	PASSED
Analyte O2	CO	SO2	NOx	
Units %	ppm	ppm	ppm	
Zero Ref Cyl	0.000	0.00	0.00	0.000
Zero Avg	0.008	0.16	-0.17	0.412
Zero Error%	0.1	0.1	0.1	0.4
Low Ref Cyl				
Low Avg				
Low Error%				
Mid Ref Cyl	5.020	120.00	94.70	24.700
Mid Avg 5.027	119.75	98.30	26.270	
Mid Error%	0.1	0.1	1.6	1.6
High Ref Cyl	10.000	295.00	227.00	95.600
High Avg	10.041	296.42	226.97	95.787
High Error%	0.4	0.5	0.0	0.2

IBIAS01

Initial System Bias Check for Run 1 . STRATA Version 2.0

	O2 %	CO ppm	SO2 ppm	NOx ppm	O2 Volts	CO Volts	SO2 Volts	NOx Volts
08-22-2007	09:41:04		0.034	-2.83	4.12	-0.065	0.034	-0.0283
0.181 -0.007								
08-22-2007	09:42:04		0.033	-2.80	3.26	-0.065	0.033	-0.0280
0.143 -0.007								
08-22-2007	09:43:05		3.107	0.53	2.19	-0.065	3.107	0.0053
0.096 -0.007								
08-22-2007	09:44:03		4.968	-2.63	1.38	-0.161	4.968	-0.0263
0.061 -0.017								
08-22-2007	09:45:04		4.150	13.41	1.17	-0.162	4.150	0.1341
0.051 -0.017								
08-22-2007	09:46:05		0.039	115.37	1.55	-0.162	0.039	1.1537
0.068 -0.017								
08-22-2007	09:47:03		0.025	116.09	2.00	-0.161	0.025	1.1609
0.088 -0.017								
08-22-2007	09:48:04		0.038	59.79	11.71	1.183	0.038	0.5979
0.516 0.124								
08-22-2007	09:49:04		0.030	-2.17	60.10	0.003	0.030	-0.0217
2.648 0.000								
08-22-2007	09:50:05		0.030	-2.04	80.68	-0.127	0.030	-0.0204
3.554 -0.013								
08-22-2007	09:51:04		0.030	-2.14	85.48	-0.159	0.030	-0.0214
3.766 -0.017								
08-22-2007	09:52:04		0.029	-2.20	87.73	-0.158	0.029	-0.0220
3.865 -0.017								
08-22-2007	09:53:05		0.028	-1.91	88.75	-0.159	0.028	-0.0191
3.910 -0.017								
08-22-2007	09:54:03		0.025	-1.91	73.99	6.700	0.025	-0.0191
3.260 0.701								
08-22-2007	09:55:04		0.021	-1.84	18.60	23.566	0.021	-0.0184
0.819 2.465								

Initial System Bias Check for Run 1
Operator: TR
Plant Name: Delek SRU-2
Location: Tyler, TX

	Reference Cylinder Numbers Zero	Span
O2		
CO		
SO2		
NOx		

Date/Time	08-22-2007	09:55:33		PASSED
Analyte O2	CO	SO2	NOx	
Units %	ppm	ppm	ppm	
Zero Ref Cyl	0.000	0.00	0.00	0.000
Zero Cal	0.008	0.16	-0.17	0.412
Zero Avg	0.033	-2.83	3.42	-0.065
Zero Bias%	0.3	1.0	1.6	0.5
Zero Drift%				
Span Ref Cyl	5.020	120.00	94.70	24.700
Span Cal	5.027	119.75	98.30	26.270
Span Avg	4.970	116.09	88.64	23.693
Span Bias%	0.6	1.2	4.3	2.7
Span Drift%				

RUN01

Test Run 1 Begin. STRATA Version 2.0
Operator: TR
Plant Name: Delek SRU-2
Location: Tyler, TX

		O2 %	CO ppm	SO2 ppm	NOx ppm	O2 Volts	CO Volts	SO2 Volts	NOx Volts
08-22-2007	09:56:34			0.405	7.92	6.89	23.797	0.405	0.0792
0.303	2.489								
08-22-2007	09:57:34			3.161	50.35	69.56	17.912	3.161	0.5035
3.064	1.874								
08-22-2007	09:58:35			3.129	45.80	117.18	16.969	3.129	0.4580
5.162	1.775								
08-22-2007	09:59:33			3.153	45.82	116.84	17.132	3.153	0.4582
5.147	1.792								
08-22-2007	10:00:34			3.880	81.53	117.46	16.771	3.880	0.8153
5.174	1.754								
08-22-2007	10:01:35			4.818	203.90	106.27	14.625	4.818	2.0390
4.682	1.530								
08-22-2007	10:02:33			4.549	155.17	108.26	15.351	4.549	1.5517
4.769	1.606								
08-22-2007	10:03:34			4.723	142.48	107.20	15.358	4.723	1.4248
4.723	1.607								
08-22-2007	10:04:34			4.609	138.54	104.54	15.495	4.609	1.3854
4.605	1.621								
08-22-2007	10:05:35			4.668	173.48	102.88	15.331	4.668	1.7348
4.532	1.604								
08-22-2007	10:06:33			4.303	139.53	102.69	15.328	4.303	1.3953
4.524	1.603								
08-22-2007	10:07:34			4.478	122.65	102.87	15.694	4.478	1.2265
4.532	1.642								
08-22-2007	10:08:35			4.476	100.09	99.98	15.724	4.476	1.0009
4.404	1.645								
08-22-2007	10:09:33			4.469	122.36	98.05	15.811	4.469	1.2236
4.319	1.654								
08-22-2007	10:10:34			4.476	132.84	97.68	15.721	4.476	1.3284
4.303	1.644								
08-22-2007	10:11:35			3.969	123.21	97.20	15.754	3.969	1.2321
4.282	1.648								
08-22-2007	10:12:33			1.517	8.50	111.14	17.973	1.517	0.0850
4.896	1.880								
08-22-2007	10:13:34			1.947	14.33	120.08	17.987	1.947	0.1433
5.290	1.881								
08-22-2007	10:14:35			2.344	41.22	122.95	17.300	2.344	0.4122
5.416	1.810								
08-22-2007	10:15:34			2.263	40.45	127.60	17.124	2.263	0.4045
5.621	1.791								
08-22-2007	10:16:35			2.223	37.39	133.86	17.287	2.223	0.3739
5.897	1.808								
08-22-2007	10:17:33			2.250	38.51	136.32	17.096	2.250	0.3851
6.005	1.788								
08-22-2007	10:18:36			2.312	47.15	140.19	16.943	2.312	0.4715
6.176	1.772								
08-22-2007	10:19:35			2.367	60.89	139.91	16.609	2.367	0.6089
6.163	1.737								
08-22-2007	10:20:33			2.406	68.03	138.03	16.678	2.406	0.6803
6.080	1.745								
08-22-2007	10:21:34			2.483	88.92	135.75	16.504	2.483	0.8892
5.980	1.726								
08-22-2007	10:22:35			2.541	119.25	132.85	16.617	2.541	1.1925
5.852	1.738								
08-22-2007	10:23:33			2.402	90.67	129.58	16.986	2.402	0.9067
5.709	1.777								
08-22-2007	10:24:34			2.325	72.01	129.70	17.414	2.325	0.7201

5.714 1.822							
08-22-2007	10:25:35	2.303	64.78	128.16	17.532	2.303	0.6478
5.646 1.834							
08-22-2007	10:26:33	2.265	62.00	127.74	17.772	2.265	0.6200
5.627 1.859							
08-22-2007	10:27:34	3.142	112.74	125.55	17.226	3.142	1.1274
5.531 1.802							
08-22-2007	10:28:34	3.090	88.53	123.62	17.177	3.090	0.8853
5.446 1.797							
08-22-2007	10:29:35	2.910	55.77	130.50	17.485	2.910	0.5577
5.749 1.829							
08-22-2007	10:30:34	2.766	36.37	137.73	17.770	2.766	0.3637
6.067 1.859							
08-22-2007	10:31:34	2.677	25.34	141.05	17.935	2.677	0.2534
6.214 1.876							
08-22-2007	10:32:34	2.886	38.76	138.06	17.620	2.886	0.3876
6.082 1.843							
08-22-2007	10:33:34	3.055	62.68	134.35	17.014	3.055	0.6268
5.919 1.780							
08-22-2007	10:34:35	3.074	68.67	130.16	16.901	3.074	0.6867
5.734 1.768							
08-22-2007	10:35:34	3.109	67.86	129.24	17.130	3.109	0.6786
5.693 1.792							
08-22-2007	10:36:34	3.164	68.53	128.73	17.247	3.164	0.6853
5.671 1.804							
08-22-2007	10:37:35	3.132	85.96	128.66	17.087	3.132	0.8596
5.668 1.787							
08-22-2007	10:38:33	3.128	77.85	130.62	17.030	3.128	0.7785
5.754 1.781							
08-22-2007	10:39:34	3.067	69.96	130.65	17.260	3.067	0.6996
5.756 1.805							
08-22-2007	10:40:34	3.096	66.02	131.27	17.252	3.096	0.6602
5.783 1.805							
08-22-2007	10:41:35	2.994	54.09	131.01	17.314	2.994	0.5409
5.771 1.811							
08-22-2007	10:42:34	2.978	55.21	129.62	17.177	2.978	0.5521
5.710 1.797							
08-22-2007	10:43:34	2.997	53.65	127.99	17.389	2.997	0.5365
5.638 1.819							
08-22-2007	10:44:35	3.030	59.06	126.23	17.316	3.030	0.5906
5.561 1.811							
08-22-2007	10:45:33	3.093	67.44	123.97	17.202	3.093	0.6744
5.461 1.799							
08-22-2007	10:46:34	3.130	79.16	122.15	17.129	3.130	0.7916
5.381 1.792							
08-22-2007	10:47:35	3.288	96.80	120.31	16.997	3.288	0.9680
5.300 1.778							
08-22-2007	10:48:35	3.291	100.62	119.08	16.942	3.291	1.0062
5.246 1.772							
08-22-2007	10:49:34	3.168	74.13	118.56	17.429	3.168	0.7413
5.223 1.823							
08-22-2007	10:50:34	3.059	69.03	121.46	17.656	3.059	0.6903
5.351 1.847							
08-22-2007	10:51:35	3.022	63.37	125.21	17.354	3.022	0.6337
5.516 1.815							
08-22-2007	10:52:33	3.030	46.97	127.23	17.801	3.030	0.4697
5.605 1.862							
08-22-2007	10:53:34	2.908	46.06	127.70	17.849	2.908	0.4606
5.625 1.867							
08-22-2007	10:54:35	2.978	37.64	127.53	17.909	2.978	0.3764
5.618 1.873							
08-22-2007	10:55:35	3.017	40.82	123.98	17.846	3.017	0.4082
5.462 1.867							

08-22-2007	10:56:34	3.096	50.13	122.87	17.914	3.096	0.5013
5.413 1.874							
08-22-2007	10:57:35	3.178	59.01	123.28	17.485	3.178	0.5901
5.431 1.829							
08-22-2007	10:58:33	3.165	65.06	125.15	17.612	3.165	0.6506
5.513 1.842							
08-22-2007	10:59:34	3.176	63.43	126.46	17.321	3.176	0.6343
5.571 1.812							
08-22-2007	11:00:34	3.152	54.59	127.02	17.544	3.152	0.5459
5.596 1.835							
08-22-2007	11:01:35	3.132	53.22	128.56	17.444	3.132	0.5322
5.664 1.825							
08-22-2007	11:02:33	3.254	53.93	125.97	17.476	3.254	0.5393
5.549 1.828							
08-22-2007	11:03:34	3.227	59.83	123.98	17.543	3.227	0.5983
5.462 1.835							
08-22-2007	11:04:35	3.266	58.31	121.16	17.573	3.266	0.5831
5.337 1.838							
08-22-2007	11:05:33	3.340	68.00	120.03	17.643	3.340	0.6800
5.288 1.845							
08-22-2007	11:06:34	3.379	70.46	118.02	17.511	3.379	0.7046
5.199 1.832							
08-22-2007	11:07:34	3.405	75.32	117.58	17.502	3.405	0.7532
5.180 1.831							
08-22-2007	11:08:35	3.456	69.37	118.23	17.655	3.456	0.6937
5.208 1.847							
08-22-2007	11:09:33	3.379	74.89	119.46	17.577	3.379	0.7489
5.262 1.839							
08-22-2007	11:10:34	3.371	65.94	121.71	17.574	3.371	0.6594
5.362 1.838							
08-22-2007	11:11:35	3.296	60.49	121.83	17.660	3.296	0.6049
5.367 1.847							
08-22-2007	11:12:33	3.339	60.04	121.78	17.562	3.339	0.6004
5.365 1.837							
08-22-2007	11:13:34	0.963	19.47	107.18	12.853	0.963	0.1947
4.721 1.344							
08-22-2007	11:14:34	0.037	-1.62	33.20	0.613	0.037	-0.0162
1.463 0.064							
08-22-2007	11:15:35	0.042	13.57	15.16	0.512	0.042	0.1357
0.668 0.054							
08-22-2007	11:16:34	0.038	113.47	9.65	1.864	0.038	1.1347
0.425 0.195							
08-22-2007	11:17:34	2.527	62.23	37.87	7.441	2.527	0.6223
1.668 0.778							
08-22-2007	11:18:35	3.248	47.96	106.74	17.590	3.248	0.4796
4.702 1.840							
08-22-2007	11:19:34	3.277	51.44	120.89	17.858	3.277	0.5144
5.326 1.868							
08-22-2007	11:20:35	4.109	120.27	121.57	16.963	4.109	1.2027
5.356 1.774							
08-22-2007	11:21:33	4.517	143.69	113.46	16.409	4.517	1.4369
4.998 1.716							
08-22-2007	11:22:34	4.272	135.94	111.69	16.504	4.272	1.3594
4.920 1.726							
08-22-2007	11:23:35	1.676	13.45	121.74	18.850	1.676	0.1345
5.363 1.972							
08-22-2007	11:24:35	1.563	9.49	126.10	19.525	1.563	0.0949
5.555 2.042							
08-22-2007	11:25:34	2.062	27.74	124.14	18.756	2.062	0.2774
5.469 1.962							
08-22-2007	11:26:34	2.174	37.63	122.39	18.473	2.174	0.3763
5.392 1.932							
08-22-2007	11:27:35	2.569	51.84	121.03	18.507	2.569	0.5184

5.332 1.936							
08-22-2007	11:28:33	2.450	51.90	117.09	17.946	2.450	0.5190
5.158 1.877							
08-22-2007	11:29:34	2.216	55.35	123.00	18.365	2.216	0.5535
5.419 1.921							
08-22-2007	11:30:35	2.017	41.02	123.53	18.464	2.017	0.4102
5.442 1.931							
08-22-2007	11:31:35	1.949	36.04	126.41	18.427	1.949	0.3604
5.569 1.928							
08-22-2007	11:32:34	2.026	36.13	127.93	18.471	2.026	0.3613
5.636 1.932							
08-22-2007	11:33:34	1.985	32.72	127.89	18.695	1.985	0.3272
5.634 1.956							
08-22-2007	11:34:35	2.044	36.00	127.28	18.434	2.044	0.3600
5.607 1.928							
08-22-2007	11:35:33	2.105	37.79	126.81	18.561	2.105	0.3779
5.587 1.941							
08-22-2007	11:36:34	2.126	46.22	126.72	18.371	2.126	0.4622
5.582 1.922							
08-22-2007	11:37:35	2.191	48.79	129.20	18.016	2.191	0.4879
5.692 1.884							
08-22-2007	11:38:34	2.211	50.68	127.59	18.221	2.211	0.5068
5.621 1.906							
08-22-2007	11:39:35	2.178	53.29	127.06	18.270	2.178	0.5329
5.597 1.911							
08-22-2007	11:40:33	2.255	64.24	133.82	18.260	2.255	0.6424
5.895 1.910							
08-22-2007	11:41:34	2.979	97.96	129.82	17.652	2.979	0.9796
5.719 1.846							
08-22-2007	11:42:34	1.841	192.62	132.04	17.969	1.841	1.9262
5.817 1.880							
08-22-2007	11:43:35	0.864	486.46	142.17	18.671	0.864	4.8646
6.263 1.953							
08-22-2007	11:44:34	-0.005	1053.93	161.26	13.804	-0.005	10.5393
7.104 1.444							
08-22-2007	11:45:34	0.260	1001.55	167.09	13.201	0.260	10.0155
7.361 1.381							
08-22-2007	11:46:35	2.096	80.56	150.68	17.459	2.096	0.8056
6.638 1.826							
08-22-2007	11:47:33	2.092	75.52	138.26	18.372	2.092	0.7552
6.091 1.922							
08-22-2007	11:48:34	2.122	70.25	136.76	18.604	2.122	0.7025
6.025 1.946							
08-22-2007	11:49:35	1.724	132.16	137.46	18.563	1.724	1.3216
6.056 1.942							
08-22-2007	11:50:35	1.477	105.99	169.58	18.272	1.477	1.0599
7.471 1.911							
08-22-2007	11:51:34	1.563	71.72	161.17	18.760	1.563	0.7172
7.100 1.962							
08-22-2007	11:52:34	1.672	36.25	159.57	18.911	1.672	0.3625
7.029 1.978							
08-22-2007	11:53:34	1.675	24.07	148.59	19.275	1.675	0.2407
6.546 2.016							
08-22-2007	11:54:35	1.668	21.56	144.94	19.476	1.668	0.2156
6.385 2.037							
Begin calculating run averages							
08-22-2007	11:55:54	1.746	29.73	143.60	18.736	1.746	0.2973
6.326 1.960							
08-22-2007	11:56:55	1.912	39.97	142.52	18.527	1.912	0.3997
6.279 1.938							
08-22-2007	11:57:55	1.938	41.69	140.23	18.612	1.938	0.4169
6.177 1.947							
08-22-2007	11:58:54	1.882	39.04	140.58	18.728	1.882	0.3904

6.193 1.959							
08-22-2007	11:59:55	1.881	39.11	140.36	18.710	1.881	0.3911
6.183 1.957							
08-22-2007	12:00:55	1.887	40.82	139.21	18.786	1.887	0.4082
6.133 1.965							
08-22-2007	12:01:54	1.918	47.54	140.50	18.637	1.918	0.4754
6.190 1.950							
08-22-2007	12:02:54	1.973	53.24	139.00	18.560	1.973	0.5324
6.123 1.941							
08-22-2007	12:03:55	1.990	59.40	138.19	18.627	1.990	0.5940
6.087 1.948							
08-22-2007	12:04:55	2.037	59.34	136.91	18.707	2.037	0.5934
6.031 1.957							
08-22-2007	12:05:54	1.983	54.26	138.94	18.756	1.983	0.5426
6.121 1.962							
08-22-2007	12:06:55	1.997	61.88	138.28	18.592	1.997	0.6188
6.092 1.945							
08-22-2007	12:07:55	1.918	52.88	138.46	18.951	1.918	0.5288
6.100 1.982							
08-22-2007	12:08:54	1.806	39.28	139.42	18.914	1.806	0.3928
6.142 1.978							
08-22-2007	12:09:54	1.815	45.15	135.65	18.752	1.815	0.4515
5.976 1.962							
08-22-2007	12:10:55	1.867	44.71	136.78	18.777	1.867	0.4471
6.026 1.964							
08-22-2007	12:11:56	1.844	43.74	134.20	19.196	1.844	0.4374
5.912 2.008							
08-22-2007	12:12:54	1.803	40.93	135.06	19.106	1.803	0.4093
5.950 1.999							
08-22-2007	12:13:55	1.846	39.01	136.10	19.088	1.846	0.3901
5.995 1.997							
08-22-2007	12:14:55	1.739	33.69	137.07	19.071	1.739	0.3369
6.038 1.995							
08-22-2007	12:15:54	1.793	31.16	137.99	19.207	1.793	0.3116
6.079 2.009							
08-22-2007	12:16:54	1.761	28.95	138.81	19.152	1.761	0.2895
6.115 2.003							
08-22-2007	12:17:55	1.835	34.89	136.84	19.041	1.835	0.3489
6.028 1.992							
08-22-2007	12:18:56	1.835	35.26	132.43	18.974	1.835	0.3526
5.834 1.985							
08-22-2007	12:19:54	1.788	36.97	132.03	19.020	1.788	0.3697
5.817 1.990							
08-22-2007	12:20:55	1.807	38.80	134.37	18.883	1.807	0.3880
5.920 1.975							
08-22-2007	12:21:55	1.885	43.91	134.16	18.987	1.885	0.4391
5.910 1.986							
08-22-2007	12:22:54	1.856	43.49	135.12	19.035	1.856	0.4349
5.953 1.991							
08-22-2007	12:23:55	1.859	41.55	135.30	18.782	1.859	0.4155
5.960 1.965							
08-22-2007	12:24:55	1.907	45.55	136.37	18.923	1.907	0.4555
6.008 1.979							
08-22-2007	12:25:54	1.917	48.17	133.39	19.036	1.917	0.4817
5.876 1.991							
08-22-2007	12:26:54	1.943	48.98	134.00	18.956	1.943	0.4898
5.903 1.983							
08-22-2007	12:27:55	1.933	50.61	133.50	19.035	1.933	0.5061
5.881 1.991							
08-22-2007	12:28:56	1.875	44.89	135.92	19.209	1.875	0.4489
5.988 2.009							
08-22-2007	12:29:54	1.860	37.75	137.21	18.957	1.860	0.3775
6.045 1.983							

RUN01

08-22-2007	12:30:55	1.825	32.30	138.16	19.115	1.825	0.3230	
6.086	2.000							
08-22-2007	12:31:55	1.781	31.94	135.39	19.529	1.781	0.3194	
5.964	2.043							
08-22-2007	12:32:54	1.618	73.28	138.33	19.071	1.618	0.7328	
6.094	1.995							
08-22-2007	12:33:54	1.631	67.01	140.26	18.988	1.631	0.6701	
6.179	1.986							
08-22-2007	12:34:55	1.597	51.61	140.52	19.198	1.597	0.5161	
6.190	2.008							
08-22-2007	12:35:56	1.643	40.10	138.40	19.073	1.643	0.4010	
6.097	1.995							
08-22-2007	12:36:54	1.596	23.82	136.36	19.337	1.596	0.2382	
6.007	2.023							
08-22-2007	12:37:55	1.599	16.84	139.52	19.415	1.599	0.1684	
6.146	2.031							
08-22-2007	12:38:55	1.826	30.50	140.29	19.144	1.826	0.3050	
6.180	2.003							
08-22-2007	12:39:54	1.886	38.65	141.70	18.708	1.886	0.3865	
6.242	1.957							
08-22-2007	12:40:54	1.952	43.09	139.88	18.620	1.952	0.4309	
6.162	1.948							
08-22-2007	12:41:55	1.974	47.33	137.55	18.878	1.974	0.4733	
6.060	1.975							
08-22-2007	12:42:56	2.050	52.45	136.20	18.695	2.050	0.5245	
6.000	1.956							
08-22-2007	12:43:54	1.947	51.33	137.16	19.152	1.947	0.5133	
6.042	2.003							
08-22-2007	12:44:55	1.955	52.82	139.27	19.105	1.955	0.5282	
6.135	1.998							
08-22-2007	12:45:55	1.994	52.32	137.85	19.125	1.994	0.5232	
6.073	2.001							
08-22-2007	12:46:54	2.031	55.24	135.12	19.176	2.031	0.5524	
5.952	2.006							
08-22-2007	12:47:54	1.985	49.30	132.96	19.269	1.985	0.4930	
5.857	2.016							
08-22-2007	12:48:55	1.896	41.14	131.80	19.364	1.896	0.4114	
5.806	2.026							
08-22-2007	12:49:56	1.870	45.95	130.94	19.177	1.870	0.4595	
5.768	2.006							
08-22-2007	12:50:54	1.822	36.96	135.99	19.163	1.822	0.3696	
5.991	2.005							
08-22-2007	12:51:55	1.684	30.98	140.21	19.074	1.684	0.3098	
6.177	1.995							
08-22-2007	12:52:55	1.729	27.25	139.17	19.331	1.729	0.2725	
6.131	2.022							
08-22-2007	12:53:54	1.683	26.33	142.18	19.062	1.683	0.2633	
6.263	1.994							
08-22-2007	12:54:54	1.649	24.35	141.23	19.331	1.649	0.2435	
6.221	2.022							
Average of Test Run		O2	CO	SO2	NOx	O2	CO	SO2
NOx								
	% ppm	ppm	ppm	%	ppm	ppm	ppm	
08-22-2007	12:54:54	1.848	42.65	137.42	18.985	1.848	0.4265	
6.054	1.986							

Test Run 1 End

FBIAS01

Final System Bias Check for Run 1 . STRATA Version 2.0

		O2 %	CO ppm	SO2 ppm	NOx ppm	O2 Volts	CO Volts	SO2 Volts	NOx Volts
08-22-2007	12:56:22			1.787	24.10	140.46	19.002	1.787	0.2410
6.188	1.988								
08-22-2007	12:57:21			1.054	3.49	114.47	9.763	1.054	0.0349
5.043	1.021								
08-22-2007	12:58:21			0.033	-2.11	39.15	0.740	0.033	-0.0211
1.725	0.077								
08-22-2007	12:59:22			0.030	-2.51	18.27	0.415	0.030	-0.0251
0.805	0.043								
08-22-2007	13:00:20			0.030	-2.55	11.32	0.328	0.030	-0.0255
0.499	0.034								
08-22-2007	13:01:21			0.029	-2.38	8.38	0.250	0.029	-0.0238
0.369	0.026								
08-22-2007	13:02:22			0.028	-2.34	6.65	0.231	0.028	-0.0234
0.293	0.024								
08-22-2007	13:03:22			0.028	-2.43	5.70	0.231	0.028	-0.0243
0.251	0.024								
08-22-2007	13:04:21			0.028	-2.32	4.98	0.230	0.028	-0.0232
0.219	0.024								
08-22-2007	13:05:21			0.026	-2.11	4.57	0.217	0.026	-0.0211
0.201	0.023								
08-22-2007	13:06:22			3.121	0.78	3.57	0.168	3.121	0.0078
0.157	0.018								
08-22-2007	13:07:20			4.973	-1.82	2.64	0.135	4.973	-0.0182
0.116	0.014								
08-22-2007	13:08:21			3.744	23.12	2.50	0.136	3.744	0.2312
0.110	0.014								
08-22-2007	13:09:22			0.029	116.87	3.03	0.135	0.029	1.1687
0.133	0.014								
08-22-2007	13:10:22			0.023	92.26	3.00	0.193	0.023	0.9226
0.132	0.020								
08-22-2007	13:11:21			0.020	-1.45	3.25	21.687	0.020	-0.0145
0.143	2.269								
08-22-2007	13:12:21			0.019	-1.70	3.14	24.438	0.019	-0.0170
0.138	2.556								
08-22-2007	13:13:22			0.045	-1.66	6.51	19.517	0.045	-0.0166
0.287	2.042								
08-22-2007	13:14:20			0.026	-1.90	53.41	0.413	0.026	-0.0190
2.353	0.043								
08-22-2007	13:15:21			0.027	-1.97	79.25	0.138	0.027	-0.0197
3.491	0.014								
08-22-2007	13:16:22			0.027	-2.07	86.57	0.138	0.027	-0.0207
3.814	0.014								
08-22-2007	13:17:22			0.027	-2.17	89.36	0.137	0.027	-0.0217
3.937	0.014								
08-22-2007	13:18:21			0.022	-1.82	79.25	5.509	0.022	-0.0182
3.491	0.576								
08-22-2007	13:19:21			0.018	-1.71	27.08	24.335	0.018	-0.0171
1.193	2.545								

Final System Bias Check for Run 1

Operator: TR

Plant Name: Delek SRU-2

Location: Tyler, TX

	Reference Cylinder Numbers	
	Zero	Span
O2		
CO		
SO2		
NOx		

FBIAS01

Date/Time	08-22-2007		13:19:57		PASSED
Analyte	O2	CO	SO2	NOx	
Units	%	ppm	ppm	ppm	
Zero Ref Cyl		0.000	0.00	0.00	0.000
Zero Cal		0.008	0.16	-0.17	0.412
Zero Avg		0.026	-2.18	4.63	0.231
Zero Bias%		0.2	0.8	2.1	0.2
Zero Drift%		-0.1	0.2	0.5	0.3
Span Ref Cyl		5.020	120.00	94.70	24.700
Span Cal		5.027	119.75	98.30	26.270
Span Avg		4.973	117.16	89.13	24.553
Span Bias%		0.5	0.9	4.0	1.8
Span Drift%		0.0	0.4	0.2	0.9
Ini Zero Avg		0.033	-2.83	3.42	-0.065
Ini Span Avg		4.970	116.09	88.64	23.693
Run Avg	1.848	42.65	137.42	18.985	
Co	0.030	-2.50	4.02	0.083	
Cm	4.971	116.63	88.88	24.123	
Correct Avg		1.847	45.49	148.86	19.421

Test Run 2 Begin. STRATA Version 2.0
Operator: TR
Plant Name: Delek SRU-2
Location: Tyler, TX

		O2 %	CO ppm	SO2 ppm	NOx ppm	O2 Volts	CO Volts	SO2 Volts	NOx Volts
08-22-2007	13:20:58			0.018	-1.64	8.85	24.593	0.018	-0.0164
0.390	2.572								
08-22-2007	13:21:59			0.018	-1.67	6.23	24.633	0.018	-0.0167
0.274	2.577								
08-22-2007	13:22:57			0.017	-1.63	4.85	24.650	0.017	-0.0163
0.214	2.578								
08-22-2007	13:23:58			0.017	-1.63	4.15	24.650	0.017	-0.0163
0.183	2.578								
08-22-2007	13:24:59			0.017	-1.63	3.76	24.651	0.017	-0.0163
0.166	2.579								
08-22-2007	13:25:57			0.017	-1.66	3.45	24.656	0.017	-0.0166
0.152	2.579								
08-22-2007	13:26:58			0.037	0.96	3.43	17.515	0.037	0.0096
0.151	1.832								
08-22-2007	13:27:58			0.067	-1.77	4.43	1.038	0.067	-0.0177
0.195	0.109								
08-22-2007	13:28:59			0.029	-8.94	3.92	0.212	0.029	-0.0894
0.173	0.022								
08-22-2007	13:29:58			0.059	4.07	3.87	6.464	0.059	0.0407
0.170	0.676								
08-22-2007	13:30:58			0.533	10.85	7.66	7.374	0.533	0.1085
0.337	0.771								
08-22-2007	13:31:59			1.861	33.54	98.94	15.951	1.861	0.3354
4.359	1.669								
08-22-2007	13:32:57			1.844	38.77	136.00	18.941	1.844	0.3877
5.991	1.981								
08-22-2007	13:33:58			1.914	43.86	140.61	18.963	1.914	0.4386
6.194	1.984								
08-22-2007	13:34:58			1.987	49.24	142.02	18.993	1.987	0.4924
6.256	1.987								
08-22-2007	13:35:59			1.993	51.85	141.30	19.022	1.993	0.5185
6.225	1.990								
08-22-2007	13:36:58			1.977	58.40	141.58	18.903	1.977	0.5840
6.237	1.977								
08-22-2007	13:37:58			2.000	55.26	138.95	18.833	2.000	0.5526
6.121	1.970								
08-22-2007	13:38:59			1.992	56.60	139.01	18.880	1.992	0.5660
6.124	1.975								
08-22-2007	13:39:57			1.912	48.75	136.42	19.053	1.912	0.4875
6.010	1.993								
08-22-2007	13:40:58			1.829	42.62	134.18	19.000	1.829	0.4262
5.911	1.987								
08-22-2007	13:41:58			1.874	45.88	132.88	19.030	1.874	0.4588
5.854	1.991								
08-22-2007	13:42:57			1.873	38.64	128.27	19.318	1.873	0.3864
5.651	2.021								
08-22-2007	13:43:58			1.888	38.39	127.00	19.439	1.888	0.3839
5.595	2.033								
08-22-2007	13:44:58			1.883	37.81	129.68	19.364	1.883	0.3781
5.713	2.026								
08-22-2007	13:45:59			1.886	37.33	128.91	19.466	1.886	0.3733
5.679	2.036								
08-22-2007	13:46:57			1.798	32.16	129.75	19.417	1.798	0.3216
5.716	2.031								
08-22-2007	13:47:58			1.863	31.66	130.74	19.665	1.863	0.3166
5.760	2.057								
08-22-2007	13:48:59			1.859	31.74	129.64	19.308	1.859	0.3174

5.711 2.020							
08-22-2007	13:49:57	1.802	35.94	130.46	19.236	1.802	0.3594
5.747 2.012							
08-22-2007	13:50:58	1.871	36.00	131.58	19.304	1.871	0.3600
5.796 2.019							
08-22-2007	13:51:58	1.693	78.85	136.14	18.632	1.693	0.7885
5.997 1.949							
08-22-2007	13:52:59	1.803	60.94	134.42	18.718	1.803	0.6094
5.922 1.958							
08-22-2007	13:53:57	1.870	44.38	134.46	18.964	1.870	0.4438
5.923 1.984							
08-22-2007	13:54:58	1.816	41.40	136.03	19.120	1.816	0.4140
5.992 2.000							
08-22-2007	13:55:59	1.758	42.89	134.74	19.287	1.758	0.4289
5.936 2.017							
08-22-2007	13:56:57	1.734	35.06	136.53	19.139	1.734	0.3506
6.015 2.002							
08-22-2007	13:57:58	1.809	28.21	137.55	19.164	1.809	0.2821
6.059 2.005							
08-22-2007	13:58:58	1.780	25.41	136.47	19.501	1.780	0.2541
6.012 2.040							
08-22-2007	13:59:59	1.711	23.39	135.21	19.334	1.711	0.2339
5.956 2.022							
08-22-2007	14:00:57	1.681	20.85	133.78	19.403	1.681	0.2085
5.894 2.030							
08-22-2007	14:01:58	1.826	28.17	133.58	19.341	1.826	0.2817
5.885 2.023							
08-22-2007	14:02:59	1.895	30.21	133.18	19.116	1.895	0.3021
5.867 2.000							
08-22-2007	14:03:57	1.956	35.63	134.32	19.158	1.956	0.3563
5.917 2.004							
08-22-2007	14:04:58	1.932	39.74	135.74	18.915	1.932	0.3974
5.980 1.979							
08-22-2007	14:05:58	1.929	39.04	133.42	19.197	1.929	0.3904
5.878 2.008							
08-22-2007	14:06:59	1.976	45.69	134.62	18.836	1.976	0.4569
5.930 1.970							
08-22-2007	14:07:57	1.969	40.08	133.72	19.146	1.969	0.4008
5.891 2.003							
08-22-2007	14:08:58	1.996	46.29	131.35	19.052	1.996	0.4629
5.786 1.993							
08-22-2007	14:09:59	2.024	53.99	129.70	18.868	2.024	0.5399
5.714 1.974							
08-22-2007	14:10:57	2.107	53.01	127.95	18.880	2.107	0.5301
5.637 1.975							
08-22-2007	14:11:58	2.102	62.98	127.74	18.752	2.102	0.6298
5.627 1.961							
08-22-2007	14:12:58	2.007	48.24	128.65	19.009	2.007	0.4824
5.668 1.988							
08-22-2007	14:13:59	1.991	45.38	131.04	18.881	1.991	0.4538
5.773 1.975							
08-22-2007	14:14:57	1.984	44.46	131.23	18.805	1.984	0.4446
5.781 1.967							
08-22-2007	14:15:58	1.951	39.12	132.53	18.547	1.951	0.3912
5.838 1.940							
08-22-2007	14:16:59	1.869	30.37	132.16	18.974	1.869	0.3037
5.822 1.985							
08-22-2007	14:17:57	1.818	26.68	133.66	19.197	1.818	0.2668
5.888 2.008							
08-22-2007	14:18:58	1.753	23.34	135.58	19.226	1.753	0.2334
5.973 2.011							
08-22-2007	14:19:58	1.703	22.68	137.32	19.269	1.703	0.2268
6.049 2.016							

RUN02

08-22-2007	14:20:59	1.611	26.24	137.00	18.903	1.611	0.2624
6.035 1.977							
08-22-2007	14:21:57	1.517	60.38	138.21	18.706	1.517	0.6038
6.088 1.957							
08-22-2007	14:22:58	1.613	76.27	145.70	18.494	1.613	0.7627
6.418 1.934							
08-22-2007	14:23:59	1.813	54.96	153.98	18.510	1.813	0.5496
6.783 1.936							
08-22-2007	14:24:57	1.811	37.61	143.18	18.645	1.811	0.3761
6.308 1.950							
08-22-2007	14:25:58	1.875	40.39	139.46	18.614	1.875	0.4039
6.144 1.947							
08-22-2007	14:26:58	1.918	41.60	139.78	18.631	1.918	0.4160
6.158 1.949							
08-22-2007	14:27:59	1.931	40.55	136.25	18.935	1.931	0.4055
6.002 1.981							
08-22-2007	14:28:57	1.947	38.04	132.27	19.042	1.947	0.3804
5.827 1.992							
08-22-2007	14:29:58	1.977	39.69	130.79	19.143	1.977	0.3969
5.762 2.002							
08-22-2007	14:30:59	1.950	43.03	131.80	18.785	1.950	0.4303
5.806 1.965							
08-22-2007	14:31:57	1.914	48.12	133.28	18.548	1.914	0.4812
5.871 1.940							
08-22-2007	14:32:58	1.923	43.39	133.11	18.662	1.923	0.4339
5.864 1.952							
08-22-2007	14:33:58	2.002	52.31	132.97	18.611	2.002	0.5231
5.858 1.947							
08-22-2007	14:34:59	2.032	50.08	130.06	18.882	2.032	0.5008
5.730 1.975							
08-22-2007	14:35:57	1.941	80.42	129.46	18.779	1.941	0.8042
5.703 1.964							
08-22-2007	14:36:58	1.997	62.26	128.83	18.830	1.997	0.6226
5.675 1.970							
08-22-2007	14:37:59	1.930	40.77	129.20	19.083	1.930	0.4077
5.692 1.996							
08-22-2007	14:38:57	1.894	31.95	129.39	19.476	1.894	0.3195
5.700 2.037							
08-22-2007	14:39:58	1.872	31.50	129.96	19.272	1.872	0.3150
5.725 2.016							
08-22-2007	14:40:58	1.899	32.57	130.65	19.399	1.899	0.3257
5.756 2.029							
08-22-2007	14:41:59	1.929	30.16	129.60	19.297	1.929	0.3016
5.709 2.018							
08-22-2007	14:42:58	1.960	31.62	131.25	18.787	1.960	0.3162
5.782 1.965							
08-22-2007	14:43:58	1.981	29.29	123.17	19.365	1.981	0.2929
5.426 2.026							
08-22-2007	14:44:59	1.981	31.48	129.36	19.399	1.981	0.3148
5.698 2.029							
08-22-2007	14:45:57	1.998	33.57	132.03	19.413	1.998	0.3357
5.816 2.031							
08-22-2007	14:46:58	2.041	33.26	129.14	19.462	2.041	0.3326
5.689 2.036							
08-22-2007	14:47:58	2.055	33.67	128.03	19.379	2.055	0.3367
5.640 2.027							
08-22-2007	14:48:59	3.290	34.23	121.09	18.246	3.290	0.3423
5.334 1.909							
08-22-2007	14:49:58	1.985	34.77	125.81	19.188	1.985	0.3477
5.542 2.007							
08-22-2007	14:50:58	1.918	33.90	132.79	19.034	1.918	0.3390
5.850 1.991							
08-22-2007	14:51:59	1.839	39.09	131.03	19.101	1.839	0.3909

5.772 1.998							
08-22-2007	14:52:57	1.774	31.00	133.93	19.162	1.774	0.3100
5.900 2.004							
08-22-2007	14:53:58	1.734	24.77	133.79	19.374	1.734	0.2477
5.894 2.027							
08-22-2007	14:54:58	1.754	24.55	132.97	19.247	1.754	0.2455
5.858 2.013							
08-22-2007	14:55:57	1.868	30.86	132.44	18.973	1.868	0.3086
5.834 1.985							
08-22-2007	14:56:58	1.986	38.91	130.89	18.787	1.986	0.3891
5.766 1.965							
08-22-2007	14:57:58	1.992	63.92	132.26	18.541	1.992	0.6392
5.827 1.939							
08-22-2007	14:58:59	2.065	43.04	130.09	18.853	2.065	0.4304
5.731 1.972							
08-22-2007	14:59:57	2.135	48.96	128.14	18.704	2.135	0.4896
5.645 1.956							
08-22-2007	15:00:58	2.085	44.64	127.81	18.895	2.085	0.4464
5.630 1.976							
08-22-2007	15:01:59	2.102	46.59	128.57	18.940	2.102	0.4659
5.664 1.981							
08-22-2007	15:02:57	2.079	43.63	129.57	18.828	2.079	0.4363
5.708 1.969							
08-22-2007	15:03:58	2.127	42.98	128.74	19.047	2.127	0.4298
5.671 1.992							
08-22-2007	15:04:58	2.094	45.42	129.01	18.960	2.094	0.4542
5.683 1.983							
08-22-2007	15:05:59	2.064	40.49	129.01	18.927	2.064	0.4049
5.683 1.980							
08-22-2007	15:06:57	2.063	38.56	129.00	19.037	2.063	0.3856
5.683 1.991							
08-22-2007	15:07:58	2.027	42.32	128.14	18.963	2.027	0.4232
5.645 1.984							
08-22-2007	15:08:59	1.887	33.00	129.04	19.217	1.887	0.3300
5.684 2.010							
08-22-2007	15:09:57	1.796	36.11	127.78	18.982	1.796	0.3611
5.629 1.986							
08-22-2007	15:10:58	1.812	33.09	133.72	18.949	1.812	0.3309
5.891 1.982							
08-22-2007	15:11:58	1.844	25.52	132.08	19.102	1.844	0.2552
5.818 1.998							
08-22-2007	15:12:59	1.745	21.29	131.96	19.222	1.745	0.2129
5.813 2.011							
08-22-2007	15:13:57	1.862	25.62	135.89	19.097	1.862	0.2562
5.986 1.998							
08-22-2007	15:14:58	2.063	36.60	136.19	18.433	2.063	0.3660
6.000 1.928							
08-22-2007	15:15:59	2.105	45.08	135.00	18.515	2.105	0.4508
5.947 1.937							
08-22-2007	15:16:57	2.146	51.82	133.21	18.396	2.146	0.5182
5.868 1.924							
08-22-2007	15:17:58	2.185	58.61	131.62	18.481	2.185	0.5861
5.798 1.933							
08-22-2007	15:18:58	2.193	58.02	130.86	18.579	2.193	0.5802
5.765 1.943							
08-22-2007	15:19:59	2.143	55.69	132.41	18.461	2.143	0.5569
5.833 1.931							
08-22-2007	15:20:57	2.026	43.84	129.63	18.706	2.026	0.4384
5.711 1.957							
08-22-2007	15:21:58	2.156	50.24	128.76	18.702	2.156	0.5024
5.672 1.956							
08-22-2007	15:22:59	2.149	49.74	124.73	19.101	2.149	0.4974
5.495 1.998							

08-22-2007	15:23:57	1.871	122.66	120.62	18.913	1.871	1.2266
5.314 1.978							
08-22-2007	15:24:58	1.895	97.95	118.82	18.993	1.895	0.9795
5.234 1.987							
08-22-2007	15:25:58	1.731	76.11	124.30	19.172	1.731	0.7611
5.476 2.005							
08-22-2007	15:26:59	1.757	49.06	138.48	19.434	1.757	0.4906
6.101 2.033							
08-22-2007	15:27:57	1.511	17.46	153.07	19.744	1.511	0.1746
6.743 2.065							
08-22-2007	15:28:58	1.375	7.51	163.40	20.121	1.375	0.0751
7.198 2.105							
08-22-2007	15:29:59	1.985	26.87	165.26	19.124	1.985	0.2687
7.280 2.000							
08-22-2007	15:30:57	2.143	44.66	157.97	18.401	2.143	0.4466
6.959 1.925							
08-22-2007	15:31:58	2.180	53.39	152.69	18.447	2.180	0.5339
6.726 1.930							
08-22-2007	15:32:58	2.198	59.91	147.67	18.455	2.198	0.5991
6.505 1.930							
08-22-2007	15:33:59	2.161	59.58	145.00	18.238	2.161	0.5958
6.388 1.908							
08-22-2007	15:34:57	1.977	39.07	144.57	18.768	1.977	0.3907
6.369 1.963							
08-22-2007	15:35:58	1.932	36.92	147.33	18.716	1.932	0.3692
6.490 1.958							
08-22-2007	15:36:59	1.908	36.67	150.36	18.575	1.908	0.3667
6.624 1.943							
08-22-2007	15:37:57	1.930	40.32	148.54	18.756	1.930	0.4032
6.544 1.962							
08-22-2007	15:38:58	2.013	44.79	144.21	18.656	2.013	0.4479
6.353 1.951							
08-22-2007	15:39:58	2.032	47.28	140.93	18.467	2.032	0.4728
6.209 1.932							
08-22-2007	15:40:59	1.931	44.05	137.55	18.703	1.931	0.4405
6.059 1.956							
08-22-2007	15:41:57	1.798	32.70	137.64	18.971	1.798	0.3270
6.064 1.984							
08-22-2007	15:42:58	1.740	27.86	139.11	18.937	1.740	0.2786
6.128 1.981							
08-22-2007	15:43:59	1.722	25.93	144.44	19.006	1.722	0.2593
6.363 1.988							
08-22-2007	15:44:57	1.750	29.91	144.94	18.757	1.750	0.2991
6.385 1.962							
08-22-2007	15:45:58	1.829	33.53	143.53	18.636	1.829	0.3353
6.323 1.949							
08-22-2007	15:46:58	1.878	39.27	143.50	18.648	1.878	0.3927
6.321 1.951							
08-22-2007	15:47:59	1.869	41.69	141.97	18.615	1.869	0.4169
6.254 1.947							
08-22-2007	15:48:57	1.921	50.63	140.82	18.697	1.921	0.5063
6.204 1.956							
08-22-2007	15:49:58	1.933	46.29	140.69	18.567	1.933	0.4629
6.198 1.942							
08-22-2007	15:50:59	1.879	42.47	142.03	18.922	1.879	0.4247
6.257 1.979							
08-22-2007	15:51:57	1.894	43.55	144.59	18.481	1.894	0.4355
6.369 1.933							
08-22-2007	15:52:58	1.909	45.42	142.70	18.562	1.909	0.4542
6.286 1.942							
08-22-2007	15:53:58	1.949	56.00	141.81	18.539	1.949	0.5600
6.247 1.939							
08-22-2007	15:54:59	2.037	73.77	138.97	18.297	2.037	0.7377

6.122 1.914							
08-22-2007	15:55:58	2.073	68.39	136.49	18.304	2.073	0.6839
6.013 1.915							
08-22-2007	15:56:58	1.914	54.83	135.42	19.081	1.914	0.5483
5.966 1.996							
08-22-2007	15:57:59	1.893	45.31	136.19	19.404	1.893	0.4531
5.999 2.030							
08-22-2007	15:58:59	1.865	39.48	136.75	19.357	1.865	0.3948
6.024 2.025							
08-22-2007	15:59:58	1.868	40.72	138.24	19.042	1.868	0.4072
6.090 1.992							
08-22-2007	16:00:58	1.815	34.55	138.95	19.333	1.815	0.3455
6.121 2.022							
08-22-2007	16:01:59	1.776	29.98	142.18	19.110	1.776	0.2998
6.263 1.999							
08-22-2007	16:02:57	1.651	23.73	144.65	19.385	1.651	0.2373
6.372 2.028							
08-22-2007	16:03:58	1.567	16.97	146.07	19.590	1.567	0.1697
6.435 2.049							
08-22-2007	16:04:58	1.693	19.18	146.70	19.603	1.693	0.1918
6.463 2.051							
Begin calculating run averages							
08-22-2007	16:06:03	1.851	30.36	145.91	18.933	1.851	0.3036
6.428 1.980							
08-22-2007	16:07:04	1.923	41.00	142.88	18.739	1.923	0.4100
6.294 1.960							
08-22-2007	16:08:04	1.994	41.01	141.94	18.759	1.994	0.4101
6.253 1.962							
08-22-2007	16:09:03	2.019	47.54	141.76	18.707	2.019	0.4754
6.245 1.957							
08-22-2007	16:10:04	2.026	50.52	138.86	18.680	2.026	0.5052
6.117 1.954							
08-22-2007	16:11:04	2.035	51.90	141.70	18.872	2.035	0.5190
6.242 1.974							
08-22-2007	16:12:03	2.032	69.99	142.56	18.688	2.032	0.6999
6.280 1.955							
08-22-2007	16:13:03	2.053	61.91	142.48	18.510	2.053	0.6191
6.277 1.936							
08-22-2007	16:14:04	1.934	41.64	142.89	19.048	1.934	0.4164
6.295 1.992							
08-22-2007	16:15:04	1.826	33.80	141.83	19.163	1.826	0.3380
6.248 2.004							
08-22-2007	16:16:03	1.797	29.47	141.02	19.267	1.797	0.2947
6.212 2.015							
08-22-2007	16:17:04	1.773	26.92	143.40	19.258	1.773	0.2692
6.317 2.014							
08-22-2007	16:18:04	1.780	25.72	143.66	19.232	1.780	0.2572
6.329 2.012							
08-22-2007	16:19:03	1.748	25.52	144.51	19.116	1.748	0.2552
6.366 2.000							
08-22-2007	16:20:03	1.729	25.54	145.66	19.406	1.729	0.2554
6.417 2.030							
08-22-2007	16:21:04	1.859	30.21	147.18	18.792	1.859	0.3021
6.484 1.966							
08-22-2007	16:22:03	1.897	34.11	149.30	18.162	1.897	0.3411
6.577 1.900							
08-22-2007	16:23:03	1.979	45.09	153.45	18.042	1.979	0.4509
6.760 1.887							
08-22-2007	16:24:04	1.979	53.31	151.40	18.153	1.979	0.5331
6.670 1.899							
08-22-2007	16:25:04	2.060	58.30	148.67	18.004	2.060	0.5830
6.549 1.883							
08-22-2007	16:26:03	2.098	67.70	146.48	17.806	2.098	0.6770

6.453 1.863							
08-22-2007	16:27:04	2.098	72.80	144.44	17.890	2.098	0.7280
6.363 1.871							
08-22-2007	16:28:04	1.972	54.53	141.62	18.766	1.972	0.5453
6.239 1.963							
08-22-2007	16:29:03	1.945	49.69	139.94	19.083	1.945	0.4969
6.165 1.996							
08-22-2007	16:30:03	1.886	48.31	138.53	18.999	1.886	0.4831
6.103 1.987							
08-22-2007	16:31:04	1.909	49.66	136.90	18.974	1.909	0.4966
6.031 1.985							
08-22-2007	16:32:04	1.888	42.01	137.57	19.134	1.888	0.4201
6.060 2.001							
08-22-2007	16:33:03	1.881	35.68	138.84	19.304	1.881	0.3568
6.116 2.019							
08-22-2007	16:34:04	1.795	32.00	142.87	19.563	1.795	0.3200
6.294 2.046							
08-22-2007	16:35:04	1.746	27.20	145.69	19.387	1.746	0.2720
6.418 2.028							
08-22-2007	16:36:03	1.686	21.76	147.39	19.779	1.686	0.2176
6.493 2.069							
08-22-2007	16:37:03	1.574	18.33	148.28	19.772	1.574	0.1833
6.532 2.068							
08-22-2007	16:38:03	1.610	18.16	148.05	19.722	1.610	0.1816
6.522 2.063							
08-22-2007	16:39:04	1.839	30.33	147.38	19.053	1.839	0.3033
6.492 1.993							
08-22-2007	16:40:05	1.853	39.57	147.77	18.702	1.853	0.3957
6.510 1.956							
08-22-2007	16:41:03	1.944	36.75	146.40	19.165	1.944	0.3675
6.449 2.005							
08-22-2007	16:42:04	1.924	36.50	143.28	19.463	1.924	0.3650
6.312 2.036							
08-22-2007	16:43:04	1.907	41.27	143.44	19.233	1.907	0.4127
6.319 2.012							
08-22-2007	16:44:03	1.959	48.33	142.81	19.382	1.959	0.4833
6.291 2.027							
08-22-2007	16:45:03	2.047	52.19	142.48	19.270	2.047	0.5219
6.277 2.016							
08-22-2007	16:46:04	2.086	59.79	137.70	19.476	2.086	0.5979
6.066 2.037							
08-22-2007	16:47:05	2.034	52.34	137.97	19.546	2.034	0.5234
6.078 2.045							
08-22-2007	16:48:03	1.922	43.92	137.07	19.694	1.922	0.4392
6.039 2.060							
08-22-2007	16:49:04	1.898	37.37	138.10	19.647	1.898	0.3737
6.084 2.055							
08-22-2007	16:50:04	1.758	61.04	139.44	19.477	1.758	0.6104
6.143 2.037							
08-22-2007	16:51:03	1.739	73.14	144.83	19.071	1.739	0.7314
6.380 1.995							
08-22-2007	16:52:03	1.768	32.02	141.12	19.731	1.768	0.3202
6.217 2.064							
08-22-2007	16:53:04	1.718	26.68	142.14	19.718	1.718	0.2668
6.262 2.063							
08-22-2007	16:54:04	1.678	22.27	143.02	19.838	1.678	0.2227
6.300 2.075							
08-22-2007	16:55:04	1.702	21.26	142.34	19.947	1.702	0.2126
6.271 2.087							
08-22-2007	16:56:03	1.735	20.33	141.36	20.090	1.735	0.2033
6.227 2.101							
08-22-2007	16:57:03	1.747	24.39	139.99	19.813	1.747	0.2439
6.167 2.072							

			RUNO2					
08-22-2007	16:58:04	1.898	34.86	138.89	19.295	1.898	0.3486	
6.119 2.018								
08-22-2007	16:59:03	1.919	35.83	138.27	19.542	1.919	0.3583	
6.091 2.044								
08-22-2007	17:00:03	1.933	37.14	137.18	19.379	1.933	0.3714	
6.043 2.027								
08-22-2007	17:01:04	1.915	35.29	135.11	19.490	1.915	0.3529	
5.952 2.039								
08-22-2007	17:02:04	1.915	41.04	137.61	19.165	1.915	0.4104	
6.062 2.005								
08-22-2007	17:03:03	1.917	35.39	135.62	19.599	1.917	0.3539	
5.974 2.050								
08-22-2007	17:04:03	1.936	44.17	137.41	19.253	1.936	0.4417	
6.053 2.014								
08-22-2007	17:05:04	1.839	123.35	136.50	18.951	1.839	1.2335	
6.013 1.982								
Average of Test Run		O2	CO	SO2	NOx	O2	CO	SO2
NOx								
	% ppm	ppm	ppm	%	ppm	ppm	ppm	
08-22-2007	17:05:04	1.882	41.83	142.38	19.144	1.882	0.4183	
6.272 2.003								
Test Run 2 End								

FBIAS02

Final System Bias Check for Run 2 . STRATA Version 2.0

		O2 %	CO ppm	SO2 ppm	NOx ppm	O2 Volts	CO Volts	SO2 Volts	NOx Volts
08-22-2007	17:06:07			2.328	74.11	132.93	18.996	2.328	0.7411
5.856	1.987								
08-22-2007	17:07:05			0.270	0.28	71.23	6.935	0.270	0.0028
3.138	0.725								
08-22-2007	17:08:06			0.014	-1.71	17.03	0.460	0.014	-0.0171
0.750	0.048								
08-22-2007	17:09:06			0.013	-1.70	7.73	0.231	0.013	-0.0170
0.341	0.024								
08-22-2007	17:10:07			0.012	-1.77	5.21	0.164	0.012	-0.0177
0.229	0.017								
08-22-2007	17:11:06			3.877	-1.49	4.26	0.127	3.877	-0.0149
0.188	0.013								
08-22-2007	17:12:06			6.156	-10.22	3.95	0.123	6.156	-0.1022
0.174	0.013								
08-22-2007	17:13:07			6.096	-10.33	3.59	0.116	6.096	-0.1033
0.158	0.012								
08-22-2007	17:14:05			5.516	-7.58	3.56	0.125	5.516	-0.0758
0.157	0.013								
08-22-2007	17:15:06			4.953	-1.89	3.26	0.126	4.953	-0.0189
0.144	0.013								
08-22-2007	17:16:06			4.952	-1.93	3.03	0.125	4.952	-0.0193
0.134	0.013								
08-22-2007	17:17:07			2.270	59.06	3.09	0.125	2.270	0.5906
0.136	0.013								
08-22-2007	17:18:06			0.024	116.18	3.46	0.126	0.024	1.1618
0.153	0.013								
08-22-2007	17:19:06			0.022	116.18	3.42	0.126	0.022	1.1618
0.151	0.013								
08-22-2007	17:20:07			0.028	114.38	3.26	0.126	0.028	1.1438
0.144	0.013								
08-22-2007	17:21:05			0.037	4.31	30.49	0.309	0.037	0.0431
1.343	0.032								
08-22-2007	17:22:06			0.019	-2.41	76.17	0.127	0.019	-0.0241
3.355	0.013								
08-22-2007	17:23:07			0.018	-2.53	87.69	0.127	0.018	-0.0253
3.863	0.013								
08-22-2007	17:24:07			0.018	-2.67	90.92	0.127	0.018	-0.0267
4.005	0.013								
08-22-2007	17:25:06			0.016	-2.71	88.58	1.286	0.016	-0.0271
3.902	0.135								
08-22-2007	17:26:06			0.012	-2.33	32.60	21.917	0.012	-0.0233
1.436	2.293								

Final System Bias Check for Run 2

Operator: TR
Plant Name: Delek SRU-2
Location: Tyler, TX

	Reference Cylinder Numbers Zero	Span
O2		
CO		
SO2		
NOx		

Date/Time	08-22-2007	17:26:36		PASSED
Analyte O2	CO	SO2	NOx	
Units %	ppm	ppm	ppm	
Zero Ref Cyl	0.000	0.00	0.00	0.000
Zero Cal	0.008	0.16	-0.17	0.412
Zero Avg	0.012	-1.77	5.67	0.190

				FBIAS02
Zero Bias%	0.0	0.7	2.6	0.2
Zero Drift%	-0.1	0.1	0.5	0.0
Span Ref Cyl	5.020	120.00	94.70	24.700
Span Cal	5.027	119.75	98.30	26.270
Span Avg	4.952	116.15	91.00	24.208
Span Bias%	0.7	1.2	3.2	2.2
Span Drift%	-0.2	-0.3	0.8	-0.4
Ini Zero Avg	0.026	-2.18	4.63	0.231
Ini Span Avg	4.973	117.16	89.13	24.553
Run Avg 1.882	41.83	142.38	19.144	
Co 0.019	-1.97	5.15	0.210	
Cm 4.962	116.65	90.06	24.381	
Correct Avg	1.892	44.30	153.04	19.349

RUN03

Test Run 3 Begin. STRATA Version 2.0
Operator: TR
Plant Name: Delek SRU-2
Location: Tyler, TX

		O2 %	CO ppm	SO2 ppm	NOx ppm	O2 Volts	CO Volts	SO2 Volts	NOx Volts
08-22-2007	17:27:36			0.012	-2.23	8.49	24.227	0.012	-0.0223
0.374	2.534								
08-22-2007	17:28:37			0.013	-2.07	5.66	24.203	0.013	-0.0207
0.249	2.532								
08-22-2007	17:29:38			0.013	-1.91	4.59	24.161	0.013	-0.0191
0.202	2.527								
08-22-2007	17:30:36			0.001	-2.08	4.27	23.361	0.001	-0.0208
0.188	2.444								
08-22-2007	17:31:37			0.078	-5.09	3.89	13.643	0.078	-0.0509
0.171	1.427								
08-22-2007	17:32:37			1.673	31.41	63.08	11.094	1.673	0.3141
2.779	1.160								
08-22-2007	17:33:36			1.901	38.33	130.41	18.872	1.901	0.3833
5.745	1.974								
08-22-2007	17:34:36			1.907	31.43	136.77	19.160	1.907	0.3143
6.025	2.004								
08-22-2007	17:35:37			1.849	27.76	139.48	19.767	1.849	0.2776
6.145	2.068								
08-22-2007	17:36:38			1.792	25.49	141.33	19.847	1.792	0.2549
6.226	2.076								
08-22-2007	17:37:36			1.824	24.43	140.22	19.909	1.824	0.2443
6.177	2.082								
08-22-2007	17:38:37			1.802	22.88	138.72	19.958	1.802	0.2288
6.111	2.088								
08-22-2007	17:39:37			1.807	22.34	138.78	19.824	1.807	0.2234
6.113	2.074								
08-22-2007	17:40:36			1.874	26.42	138.60	19.830	1.874	0.2642
6.106	2.074								
08-22-2007	17:41:36			1.927	35.31	136.99	19.470	1.927	0.3531
6.035	2.037								
08-22-2007	17:42:37			1.915	36.43	136.12	19.171	1.915	0.3643
5.996	2.005								
08-22-2007	17:43:38			1.911	33.25	134.28	19.230	1.911	0.3325
5.915	2.012								
08-22-2007	17:44:36			1.922	38.76	135.14	19.144	1.922	0.3876
5.953	2.002								
08-22-2007	17:45:37			1.919	33.69	136.65	19.216	1.919	0.3369
6.020	2.010								
08-22-2007	17:46:37			1.991	33.85	137.44	19.056	1.991	0.3385
6.054	1.993								
08-22-2007	17:47:36			2.016	34.67	135.71	19.247	2.016	0.3467
5.978	2.013								
08-22-2007	17:48:36			2.002	42.42	134.55	19.195	2.002	0.4242
5.927	2.008								
08-22-2007	17:49:37			2.041	46.61	132.52	19.314	2.041	0.4661
5.838	2.020								
08-22-2007	17:50:38			2.056	48.73	130.77	19.252	2.056	0.4873
5.761	2.014								
08-22-2007	17:51:36			2.040	44.57	131.30	19.306	2.040	0.4457
5.784	2.019								
08-22-2007	17:52:37			2.019	50.38	131.89	19.215	2.019	0.5038
5.810	2.010								
08-22-2007	17:53:37			1.979	49.07	133.14	19.293	1.979	0.4907
5.865	2.018								
08-22-2007	17:54:36			1.983	50.74	133.71	19.086	1.983	0.5074
5.890	1.996								
08-22-2007	17:55:37			1.999	41.63	133.48	19.291	1.999	0.4163

5.880 2.018							
08-22-2007	17:56:37	1.966	47.79	133.39	19.340	1.966	0.4779
5.876 2.023							
08-22-2007	17:57:36	2.015	37.50	131.63	19.467	2.015	0.3750
5.799 2.036							
08-22-2007	17:58:36	2.008	38.71	133.62	19.552	2.008	0.3871
5.886 2.045							
08-22-2007	17:59:37	2.027	35.46	133.91	19.392	2.027	0.3546
5.899 2.028							
08-22-2007	18:00:38	2.025	34.87	133.43	19.491	2.025	0.3487
5.878 2.039							
08-22-2007	18:01:36	1.953	36.39	135.03	19.358	1.953	0.3639
5.948 2.025							
08-22-2007	18:02:37	1.925	36.90	135.86	19.160	1.925	0.3690
5.985 2.004							
08-22-2007	18:03:37	1.919	31.30	136.08	19.235	1.919	0.3130
5.995 2.012							
08-22-2007	18:04:36	1.872	33.20	137.60	18.898	1.872	0.3320
6.062 1.977							
08-22-2007	18:05:36	1.829	27.13	139.80	18.940	1.829	0.2713
6.159 1.981							
08-22-2007	18:06:37	1.865	27.92	139.88	19.124	1.865	0.2792
6.162 2.000							
08-22-2007	18:07:36	1.675	39.64	138.73	18.848	1.675	0.3964
6.111 1.972							
08-22-2007	18:08:36	1.643	90.11	143.66	18.448	1.643	0.9011
6.329 1.930							
08-22-2007	18:09:37	1.702	80.02	138.04	18.495	1.702	0.8002
6.081 1.935							
08-22-2007	18:10:37	1.861	89.17	141.08	18.550	1.861	0.8917
6.215 1.940							
08-22-2007	18:11:36	1.878	73.20	138.41	18.557	1.878	0.7320
6.097 1.941							
08-22-2007	18:12:36	1.915	49.93	139.91	18.574	1.915	0.4993
6.164 1.943							
08-22-2007	18:13:37	1.960	43.84	136.59	18.710	1.960	0.4384
6.017 1.957							
08-22-2007	18:14:36	1.957	36.56	136.56	19.052	1.957	0.3656
6.016 1.993							
08-22-2007	18:15:36	1.954	37.39	138.49	19.122	1.954	0.3739
6.101 2.000							
08-22-2007	18:16:37	2.013	43.15	136.37	19.142	2.013	0.4315
6.008 2.002							
08-22-2007	18:17:37	2.053	48.31	133.49	19.158	2.053	0.4831
5.881 2.004							
08-22-2007	18:18:36	2.095	51.75	130.77	19.272	2.095	0.5175
5.761 2.016							
08-22-2007	18:19:37	2.015	40.94	131.02	19.546	2.015	0.4094
5.772 2.045							
08-22-2007	18:20:37	1.978	38.24	132.06	19.454	1.978	0.3824
5.818 2.035							
08-22-2007	18:21:36	1.932	33.17	133.69	19.485	1.932	0.3317
5.890 2.038							
08-22-2007	18:22:36	1.931	29.28	135.48	19.517	1.931	0.2928
5.968 2.042							
08-22-2007	18:23:37	1.853	30.28	137.19	19.536	1.853	0.3028
6.044 2.044							
08-22-2007	18:24:37	1.866	25.21	137.23	19.505	1.866	0.2521
6.046 2.040							
08-22-2007	18:25:37	1.814	22.94	137.30	19.684	1.814	0.2294
6.048 2.059							
08-22-2007	18:26:37	1.810	20.59	138.35	19.627	1.810	0.2059
6.095 2.053							

RUN03

08-22-2007	18:27:36	1.758	20.10	141.38	19.392	1.758	0.2010
6.228 2.028							
08-22-2007	18:28:36	1.911	27.00	143.32	19.013	1.911	0.2700
6.313 1.989							
08-22-2007	18:29:37	1.934	30.81	144.23	18.964	1.934	0.3081
6.354 1.984							
08-22-2007	18:30:36	1.996	37.19	146.34	18.719	1.996	0.3719
6.447 1.958							
08-22-2007	18:31:36	2.049	40.58	142.91	18.766	2.049	0.4058
6.296 1.963							
08-22-2007	18:32:37	2.047	46.59	142.24	18.920	2.047	0.4659
6.266 1.979							
08-22-2007	18:33:37	2.087	49.01	140.55	18.739	2.087	0.4901
6.191 1.960							
08-22-2007	18:34:36	2.099	50.80	140.49	18.812	2.099	0.5080
6.189 1.968							
08-22-2007	18:35:37	2.047	48.87	139.83	18.791	2.047	0.4887
6.160 1.966							
08-22-2007	18:36:37	2.012	45.63	141.19	18.615	2.012	0.4563
6.220 1.947							
08-22-2007	18:37:36	1.993	46.07	141.12	18.686	1.993	0.4607
6.217 1.955							
08-22-2007	18:38:36	2.004	43.91	141.62	18.585	2.004	0.4391
6.239 1.944							
08-22-2007	18:39:37	1.760	86.12	142.21	18.298	1.760	0.8612
6.265 1.914							
08-22-2007	18:40:37	1.750	98.46	144.88	17.788	1.750	0.9846
6.382 1.861							
08-22-2007	18:41:36	1.746	82.75	149.63	17.962	1.746	0.8275
6.592 1.879							
08-22-2007	18:42:37	1.857	50.82	146.65	18.309	1.857	0.5082
6.460 1.915							
08-22-2007	18:43:37	1.852	35.00	143.88	18.635	1.852	0.3500
6.338 1.949							
08-22-2007	18:44:36	1.897	37.68	143.19	18.580	1.897	0.3768
6.308 1.944							
08-22-2007	18:45:36	1.901	37.29	140.52	18.700	1.901	0.3729
6.190 1.956							
08-22-2007	18:46:37	1.935	37.56	141.18	18.812	1.935	0.3756
6.219 1.968							
08-22-2007	18:47:36	1.941	40.73	139.20	18.940	1.941	0.4073
6.132 1.981							
08-22-2007	18:48:36	1.946	41.56	139.51	19.079	1.946	0.4156
6.146 1.996							
08-22-2007	18:49:37	1.974	44.33	138.45	19.036	1.974	0.4433
6.099 1.991							
08-22-2007	18:50:38	1.982	44.15	139.27	19.076	1.982	0.4415
6.135 1.995							
08-22-2007	18:51:36	1.968	43.50	137.33	19.165	1.968	0.4350
6.050 2.005							
08-22-2007	18:52:37	1.957	42.19	137.22	19.206	1.957	0.4219
6.045 2.009							
08-22-2007	18:53:37	1.874	33.46	139.44	19.288	1.874	0.3346
6.143 2.018							
08-22-2007	18:54:36	1.771	44.38	138.23	19.307	1.771	0.4438
6.089 2.020							
08-22-2007	18:55:36	1.710	93.90	141.21	18.659	1.710	0.9390
6.221 1.952							
08-22-2007	18:56:37	1.836	38.96	140.17	18.955	1.836	0.3896
6.175 1.983							
08-22-2007	18:57:38	1.859	40.36	139.00	18.936	1.859	0.4036
6.123 1.981							
08-22-2007	18:58:36	1.839	29.68	139.33	19.160	1.839	0.2968

6.138 2.004
08-22-2007 18:59:37 1.799 26.85 141.58 19.169 1.799 0.2685
6.237 2.005
08-22-2007 19:00:37 1.769 23.75 142.46 19.231 1.769 0.2375
6.276 2.012
08-22-2007 19:01:36 1.763 25.20 142.16 18.878 1.763 0.2520
6.262 1.975
08-22-2007 19:02:36 1.792 23.61 143.06 18.994 1.792 0.2361
6.302 1.987
08-22-2007 19:03:37 1.885 31.14 140.94 19.073 1.885 0.3114
6.209 1.995
08-22-2007 19:04:36 1.972 36.28 138.70 18.711 1.972 0.3628
6.110 1.957
08-22-2007 19:05:36 2.010 38.20 136.86 18.838 2.010 0.3820
6.029 1.970
08-22-2007 19:06:37 2.017 44.35 137.18 18.966 2.017 0.4435
6.043 1.984
08-22-2007 19:07:37 1.783 118.34 137.50 18.665 1.783 1.1834
6.057 1.952
08-22-2007 19:08:36 1.964 104.54 140.06 18.321 1.964 1.0454
6.170 1.916
08-22-2007 19:09:36 1.915 91.12 139.44 18.518 1.915 0.9112
6.143 1.937
08-22-2007 19:10:36 1.922 69.12 137.32 18.507 1.922 0.6912
6.049 1.936
08-22-2007 19:11:36 1.870 49.23 135.27 18.882 1.870 0.4923
5.959 1.975
08-22-2007 19:12:37 1.927 34.08 135.09 19.125 1.927 0.3408
5.951 2.001
08-22-2007 19:13:36 1.920 30.28 134.29 19.190 1.920 0.3028
5.916 2.007
08-22-2007 19:14:36 1.884 30.60 134.38 19.245 1.884 0.3060
5.920 2.013
08-22-2007 19:15:37 1.900 29.87 135.51 19.210 1.900 0.2987
5.970 2.009
08-22-2007 19:16:37 1.886 25.38 135.61 19.235 1.886 0.2538
5.974 2.012
08-22-2007 19:17:36 1.864 23.59 136.44 19.358 1.864 0.2359
6.011 2.025
08-22-2007 19:18:37 1.831 21.55 138.85 19.203 1.831 0.2155
6.117 2.009
08-22-2007 19:19:37 1.911 24.03 140.11 19.259 1.911 0.2403
6.172 2.015
08-22-2007 19:20:36 2.018 34.59 138.63 18.805 2.018 0.3459
6.107 1.967
08-22-2007 19:21:36 2.062 36.56 137.40 18.814 2.062 0.3656
6.053 1.968
Begin calculating run averages
08-22-2007 19:23:17 2.106 39.26 134.84 18.791 2.106 0.3926
5.940 1.966
08-22-2007 19:24:17 2.131 41.56 133.91 18.810 2.131 0.4156
5.899 1.968
08-22-2007 19:25:18 2.096 40.44 134.27 18.734 2.096 0.4044
5.915 1.960
08-22-2007 19:26:16 2.089 39.98 135.77 18.865 2.089 0.3998
5.981 1.973
08-22-2007 19:27:17 2.103 45.35 137.62 18.611 2.103 0.4535
6.063 1.947
08-22-2007 19:28:17 2.090 37.78 137.28 18.662 2.090 0.3778
6.047 1.952
08-22-2007 19:29:16 2.090 44.23 137.20 18.645 2.090 0.4423
6.044 1.950
08-22-2007 19:30:17 2.105 44.05 136.66 18.648 2.105 0.4405

6.020 1.951							
08-22-2007	19:31:17	2.056	41.46	136.05	18.688	2.056	0.4146
5.993 1.955							
08-22-2007	19:32:18	2.065	39.63	136.97	18.577	2.065	0.3963
6.034 1.943							
08-22-2007	19:33:16	2.040	39.54	136.72	18.592	2.040	0.3954
6.023 1.945							
08-22-2007	19:34:17	1.985	32.69	136.97	18.938	1.985	0.3269
6.034 1.981							
08-22-2007	19:35:17	1.997	34.83	136.22	18.821	1.997	0.3483
6.001 1.969							
08-22-2007	19:36:16	1.997	32.54	137.84	18.854	1.997	0.3254
6.072 1.972							
08-22-2007	19:37:17	2.026	33.48	137.75	18.834	2.026	0.3348
6.068 1.970							
08-22-2007	19:38:17	2.043	37.12	135.22	18.800	2.043	0.3712
5.957 1.967							
08-22-2007	19:39:18	2.046	37.36	134.21	18.662	2.046	0.3736
5.912 1.952							
08-22-2007	19:40:16	2.069	37.98	133.85	18.970	2.069	0.3798
5.896 1.984							
08-22-2007	19:41:17	2.073	38.64	133.00	19.039	2.073	0.3864
5.859 1.992							
08-22-2007	19:42:17	2.045	50.10	133.46	18.778	2.045	0.5010
5.879 1.964							
08-22-2007	19:43:16	2.065	42.43	134.45	18.637	2.065	0.4243
5.923 1.949							
08-22-2007	19:44:17	2.079	35.26	133.97	18.884	2.079	0.3526
5.902 1.975							
08-22-2007	19:45:17	2.091	40.61	131.70	18.783	2.091	0.4061
5.802 1.965							
08-22-2007	19:46:18	2.128	43.69	131.36	18.782	2.128	0.4369
5.787 1.965							
08-22-2007	19:47:16	2.150	51.17	131.35	18.391	2.150	0.5117
5.786 1.924							
08-22-2007	19:48:17	2.193	46.19	130.04	18.578	2.193	0.4619
5.729 1.943							
08-22-2007	19:49:17	2.104	39.81	131.32	18.970	2.104	0.3981
5.785 1.984							
08-22-2007	19:50:16	2.126	37.05	131.45	18.984	2.126	0.3705
5.791 1.986							
08-22-2007	19:51:17	2.069	33.05	129.24	19.101	2.069	0.3305
5.693 1.998							
08-22-2007	19:52:17	2.048	31.26	129.85	19.042	2.048	0.3126
5.720 1.992							
08-22-2007	19:53:18	2.003	28.42	132.47	19.218	2.003	0.2842
5.836 2.010							
08-22-2007	19:54:16	2.037	28.28	131.46	19.274	2.037	0.2828
5.791 2.016							
08-22-2007	19:55:17	2.016	27.78	130.72	19.474	2.016	0.2778
5.758 2.037							
08-22-2007	19:56:18	2.023	25.97	130.81	19.450	2.023	0.2597
5.762 2.034							
08-22-2007	19:57:16	2.002	23.38	133.32	19.487	2.002	0.2338
5.873 2.038							
08-22-2007	19:58:17	1.989	22.92	133.88	19.554	1.989	0.2292
5.898 2.045							
08-22-2007	19:59:17	1.997	22.99	132.11	19.539	1.997	0.2299
5.820 2.044							
08-22-2007	20:00:18	1.845	54.19	130.84	18.957	1.845	0.5419
5.764 1.983							
08-22-2007	20:01:16	2.047	31.60	128.64	19.018	2.047	0.3160
5.667 1.989							

RUN03

08-22-2007	20:02:17	3.205*	44.45	126.11	18.971	3.205*	0.4445	
5.556	1.984							
08-22-2007	20:03:16	3.714*	24.44	106.27	14.496	3.714*	0.2444	
4.681	1.516							
08-22-2007	20:04:17	2.061	25.78	122.82	19.562	2.061	0.2578	
5.411	2.046							
08-22-2007	20:05:17	2.133	32.98	140.48	19.327	2.133	0.3298	
6.188	2.022							
08-22-2007	20:06:18	2.114	33.71	133.08	19.000	2.114	0.3371	
5.863	1.987							
08-22-2007	20:07:16	2.149	32.80	126.79	18.895	2.149	0.3280	
5.585	1.977							
08-22-2007	20:08:17	2.104	32.78	124.18	18.891	2.104	0.3278	
5.470	1.976							
08-22-2007	20:09:17	2.100	31.64	122.68	19.000	2.100	0.3164	
5.404	1.987							
08-22-2007	20:10:16	2.096	30.94	123.22	19.029	2.096	0.3094	
5.428	1.990							
08-22-2007	20:11:16	2.137	33.73	121.32	19.004	2.137	0.3373	
5.345	1.988							
08-22-2007	20:12:17	2.025	58.25	121.22	19.013	2.025	0.5825	
5.340	1.989							
08-22-2007	20:13:17	2.119	49.50	120.72	18.825	2.119	0.4950	
5.318	1.969							
08-22-2007	20:14:18	2.158	44.39	119.85	18.944	2.158	0.4439	
5.280	1.982							
08-22-2007	20:15:17	2.211	38.51	119.55	18.973	2.211	0.3851	
5.266	1.985							
08-22-2007	20:16:17	2.190	34.53	119.48	19.104	2.190	0.3453	
5.264	1.998							
08-22-2007	20:17:18	2.223	36.93	119.58	19.107	2.223	0.3693	
5.268	1.999							
08-22-2007	20:18:16	2.257	39.11	119.59	19.071	2.257	0.3911	
5.268	1.995							
08-22-2007	20:19:17	2.245	39.07	119.87	19.125	2.245	0.3907	
5.281	2.000							
08-22-2007	20:20:17	2.242	38.66	120.00	19.198	2.242	0.3866	
5.286	2.008							
08-22-2007	20:21:16	2.211	37.55	121.17	19.216	2.211	0.3755	
5.338	2.010							
08-22-2007	20:22:17	2.171	31.48	123.49	19.174	2.171	0.3148	
5.440	2.006							
Average of Test Run		O2	CO	SO2	NOx	O2	CO	SO2
NOx								
	% ppm	ppm	ppm	%	ppm	ppm	ppm	
08-22-2007	20:22:17	2.135*	37.10	129.79	18.892	2.135*	0.3710	
5.717	1.976							

Test Run 3 End

FBIAS03

Final System Bias Check for Run 3 . STRATA Version 2.0

	O2 %	CO ppm	SO2 ppm	NOx ppm	O2 Volts	CO Volts	SO2 Volts	NOx Volts
08-22-2007	20:23:19		1.140	12.57	110.63	15.113	1.140	0.1257
4.874 1.581								
08-22-2007	20:24:20		0.003	-1.87	24.69	0.592	0.003	-0.0187
1.088 0.062								
08-22-2007	20:25:20		0.001	-1.90	7.98	0.098	0.001	-0.0190
0.352 0.010								
08-22-2007	20:26:19		0.000	-1.86	4.73	0.024	0.000	-0.0186
0.208 0.003								
08-22-2007	20:27:20		0.000	-1.87	3.74	0.024	0.000	-0.0187
0.165 0.002								
08-22-2007	20:28:20		2.552	-1.76	3.16	0.023	2.552	-0.0176
0.139 0.002								
08-22-2007	20:29:21		4.944	-2.73	2.89	0.023	4.944	-0.0273
0.127 0.002								
08-22-2007	20:30:19		3.553	16.65	3.61	0.091	3.553	0.1665
0.159 0.009								
08-22-2007	20:31:20		0.047	112.54	6.25	0.164	0.047	1.1254
0.275 0.017								
08-22-2007	20:32:20		0.110	104.18	6.17	0.239	0.110	1.0418
0.272 0.025								
08-22-2007	20:33:19		0.033	-1.98	41.25	2.377	0.033	-0.0198
1.817 0.249								
08-22-2007	20:34:20		0.015	-2.69	82.87	0.024	0.015	-0.0269
3.651 0.002								
08-22-2007	20:35:20		0.015	-2.61	90.57	0.023	0.015	-0.0261
3.990 0.002								
08-22-2007	20:36:21		0.016	-2.62	65.06	0.537	0.016	-0.0262
2.866 0.056								
08-22-2007	20:37:19		0.017	-2.79	0.42	19.749	0.017	-0.0279
0.018 2.066								

Final System Bias Check for Run 3
Operator: TR
Plant Name: Delek SRU-2
Location: Tyler, TX

	Reference Cylinder Numbers Zero	Span
O2		
CO		
SO2		
NOx		

Date/Time	08-22-2007	20:38:09		PASSED
Analyte	O2	CO	SO2	NOx
Units	%	ppm	ppm	ppm
Zero Ref Cyl	0.000	0.00	0.00	0.000
Zero Cal	0.008	0.16	-0.17	0.412
Zero Avg	0.001	-1.87	3.94	0.024
Zero Bias%	0.1	0.7	1.8	0.4
Zero Drift%	-0.1	0.0	-0.8	-0.2
Span Ref Cyl	5.020	120.00	94.70	24.700
Span Cal	5.027	119.75	98.30	26.270
Span Avg	4.942	114.00	91.10	23.954
Span Bias%	0.8	1.9	3.2	2.4
Span Drift%	-0.1	-0.7	0.0	-0.3
Ini Zero Avg	0.012	-1.77	5.67	0.190
Ini Span Avg	4.952	116.15	91.00	24.208
Run Avg 2.135	37.10	129.79	18.892	
Co 0.006	-1.82	4.80	0.107	

FBIAS03

Cm	4.947	115.07	91.05	24.081	
Correct	Avg	2.163	39.95	137.23	19.353

APPENDIX B.

LABORATORY ANALYSES

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

ASME Gaseous Fuel Composition Calculations
Based on Higher Heating Value (HHV)
(@ 60 Degrees F and 30.00 in Hg)

Client: Delek Refining, Ltd.
Unit ID: SRU - 2 (EPN SRUTGCUINC)
Sampling Date: 08/22/07
Test ID: 1

Component Name	Chemical Formula	Volume Percent (wet)	Volume Percent (dry)	Molecular Weight (component)	Molecular Weight (per fraction)	Weight Percent	Specific Gravity (component)	Specific Gravity (per fraction)	Higher Heating Value Btu/cu.ft. (component)	Higher Heating Value Btu/cu.ft. (per fraction)	Higher Heating Value Btu/Lb (component)	Higher Heating Value Btu/Lb (per fraction)
Methane	CH_4	89.313%	90.89%	16.04	14.33	79.25%	0.5543	0.4951	1012.32	904.13	23875	18921
Ethane	C_2H_6	3.603%	3.67%	30.07	1.08	5.99%	1.0488	0.0378	1773.42	63.90	22323	1338
Ethylene	C_2H_4	0.000%	0.00%	28.05	0.00	0.00%	0.9740	0.0000	1603.75	0.00	21636	0
Propane	C_3H_8	0.933%	0.95%	44.09	0.41	2.28%	1.5617	0.0146	2523.82	23.55	21669	493
Unknowns as C3	C_3	0.000%	0.00%	44.09	0.00	0.00%	1.5617	0.0000	2523.82	0.00	21669	0
n-Butane	C_4H_{10}	0.254%	0.26%	58.12	0.15	0.82%	2.0665	0.0052	3270.69	8.31	21321	174
Isobutane	C_4H_{10}	0.268%	0.27%	58.12	0.16	0.86%	2.0665	0.0055	3261.17	8.74	21271	183
Unknowns as C4	C_4H_{10}	0.000%	0.00%	58.12	0.00	0.00%	2.0665	0.0000	3270.69	0.00	21321	0
Isobutylene	C_4H_8	0.000%	0.00%	56.10	0.00	0.00%	1.9336	0.0000	3069.00	0.00	20737	0
n-Pentane	C_5H_{12}	0.089%	0.09%	72.15	0.06	0.36%	2.4872	0.0022	4019.65	3.58	21095	75
Isopentane	C_5H_{12}	0.164%	0.17%	72.15	0.12	0.65%	2.4872	0.0041	4010.71	6.58	21047	138
Unknowns as C5	C_5H_{12}	0.006%	0.01%	72.15	0.00	0.02%	2.4872	0.0001	3994.00	0.24	20978	5
n-Pentene	C_5H_{10}	0.000%	0.00%	70.13	0.00	0.00%	2.4190	0.0000	3837.00	0.00	20720	0
n-Hexane	C_6H_{14}	0.053%	0.05%	86.17	0.05	0.25%	2.9704	0.0016	4768.27	2.53	20966	53
Benzene	C_6H_6	0.000%	0.00%	78.11	0.00	0.00%	2.6920	0.0000	3751.68	0.00	18184	0
Toluene	C_7H_8	0.000%	0.00%	92.13	0.00	0.00%	3.1760	0.0000	4486.44	0.00	18501	0
Unknowns as C6	C6	0.144%	0.15%	86.17	0.12	0.69%	2.9704	0.0043	4768.27	6.87	20966	144
Methanol	CH_3OH	0.000%	0.00%	32.04	0.00	0.00%	1.1052	0.0000	868.00	0.00	10258	0
Hydrogen	H_2	0.000%	0.00%	2.02	0.00	0.00%	0.06959	0.0000	325.02	0.00	61095	0
Carbon Monoxide	CO	0.000%	0.00%	28.01	0.00	0.00%	0.9672	0.0000	321.37	0.00	4347	0
Carbon Dioxide	CO_2	1.886%	1.92%	44.01	0.83	4.59%	1.5282	0.0288	0.00	0.00	0	0
Hydrogen Sulfide	H_2S	0.000%	0.00%	34.08	0.00	0.00%	1.1898	0.0000	646.00	0.00	7097	0
Nitrogen	N_2	1.060%	1.08%	28.02	0.30	1.64%	0.9672	0.0103	0.00	0.00	0	0
Oxygen	O_2	0.487%	0.50%	32.00	0.16	0.86%	1.1053	0.0054	0.00	0.00	0	0
Water Vapor	H_2O	1.740%	0.00%	18.02	0.31	1.73%	0.6215	0.0108	0.00	0.00	0	0
Total		100.00%	100.00%		18.08	100.00%		0.6258		1028.41		21524

Ultimate Fuel Analysis (Weight %)

Carbon:	70.26%
Hydrogen:	22.16%
Sulfur:	0.00%
Oxygen:	4.20%
Nitrogen:	1.64%
Moisture:	1.73%

Fuel F factor calculations

Fd = 8662.89 dscf/mmBtu

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

ASME Gaseous Fuel Composition Calculations
Based on Higher Heating Value (HHV)
(@ 60 Degrees F and 30.00 in Hg)

Client: Delek Refining, Ltd.
Unit ID: SRU - 2 (EPN SRUTGCUINC)
Sampling Date: 08/22/07
Test ID: 2

Component Name	Chemical Formula	Volume Percent (wet)	Volume Percent (dry)	Molecular Weight (component)	Molecular Weight (per fraction)	Weight Percent	Specific Gravity (component)	Specific Gravity (per fraction)	Higher Heating Value Btu/cu.ft. (component)	Higher Heating Value Btu/cu.ft. (per fraction)	Higher Heating Value Btu/Lb (component)	Higher Heating Value Btu/Lb (per fraction)
Methane	CH_4	87.766%	89.32%	16.04	14.08	76.03%	0.5543	0.4865	1012.32	888.47	23875	18152
Ethane	C_2H_6	3.516%	3.58%	30.07	1.06	5.71%	1.0488	0.0369	1773.42	62.35	22323	1274
Ethylene	C_2H_4	0.000%	0.00%	28.05	0.00	0.00%	0.9740	0.0000	1603.75	0.00	21636	0
Propane	C_3H_8	0.903%	0.92%	44.09	0.40	2.15%	1.5617	0.0141	2523.82	22.79	21669	466
Unknowns as C3	C_3	0.000%	0.00%	44.09	0.00	0.00%	1.5617	0.0000	2523.82	0.00	21669	0
n-Butane	C_4H_{10}	0.250%	0.25%	58.12	0.15	0.78%	2.0665	0.0052	3270.69	8.18	21321	167
Isobutane	C_4H_{10}	0.263%	0.27%	58.12	0.15	0.83%	2.0665	0.0054	3261.17	8.58	21271	176
Unknowns as C4	C_4H_{10}	0.000%	0.00%	58.12	0.00	0.00%	2.0665	0.0000	3270.69	0.00	21321	0
Isobutylene	C_4H_8	0.000%	0.00%	56.10	0.00	0.00%	1.9336	0.0000	3069.00	0.00	20737	0
n-Pentane	C_5H_{12}	0.081%	0.08%	72.15	0.06	0.32%	2.4872	0.0020	4019.65	3.26	21095	67
Isopentane	C_5H_{12}	0.159%	0.16%	72.15	0.11	0.62%	2.4872	0.0040	4010.71	6.38	21047	130
Unknowns as C5	C_5H_{12}	0.006%	0.01%	72.15	0.00	0.02%	2.4872	0.0001	3994.00	0.24	20978	5
n-Pentene	C_5H_{10}	0.000%	0.00%	70.13	0.00	0.00%	2.4190	0.0000	3837.00	0.00	20720	0
n-Hexane	C_6H_{14}	0.508%	0.52%	86.17	0.44	2.36%	2.9704	0.0151	4768.27	24.22	20966	496
Benzene	C_6H_6	0.000%	0.00%	78.11	0.00	0.00%	2.6920	0.0000	3751.68	0.00	18184	0
Toluene	C_7H_8	0.000%	0.00%	92.13	0.00	0.00%	3.1760	0.0000	4486.44	0.00	18501	0
Unknowns as C6	C6	0.128%	0.13%	86.17	0.11	0.60%	2.9704	0.0038	4768.27	6.10	20966	125
Methanol	CH_3OH	0.000%	0.00%	32.04	0.00	0.00%	1.1052	0.0000	868.00	0.00	10258	0
Hydrogen	H_2	0.000%	0.00%	2.02	0.00	0.00%	0.06959	0.0000	325.02	0.00	61095	0
Carbon Monoxide	CO	0.000%	0.00%	28.01	0.00	0.00%	0.9672	0.0000	321.37	0.00	4347	0
Carbon Dioxide	CO_2	1.924%	1.96%	44.01	0.85	4.57%	1.5282	0.0294	0.00	0.00	0	0
Hydrogen Sulfide	H_2S	0.000%	0.00%	34.08	0.00	0.00%	1.1898	0.0000	646.00	0.00	7097	0
Nitrogen	N_2	2.059%	2.10%	28.02	0.58	3.12%	0.9672	0.0199	0.00	0.00	0	0
Oxygen	O_2	0.696%	0.71%	32.00	0.22	1.20%	1.1053	0.0077	0.00	0.00	0	0
Water Vapor	H_2O	1.740%	0.00%	18.02	0.31	1.69%	0.6215	0.0108	0.00	0.00	0	0
Total		100.00%	100.00%		18.52	100.00%		0.6409		1030.57		21058

Ultimate Fuel Analysis (Weight %)

Carbon:	69.09%
Hydrogen:	21.58%
Sulfur:	0.00%
Oxygen:	4.53%
Nitrogen:	3.12%
Moisture:	1.69%

Fuel F factor calculations

Fd = 8671.19 dscf/mmBtu

ASME Gaseous Fuel Composition Calculations
Based on Higher Heating Value (HHV)
(@ 60 Degrees F and 30.00 in Hg)

Client: Delek Refining, Ltd.
Unit ID: SRU - 2 (EPN SRUTGCUINC)
Sampling Date: 08/22/07
Test ID: 3

Component Name	Chemical Formula	Volume Percent (wet)	Volume Percent (dry)	Molecular Weight (component)	Molecular Weight (per fraction)	Weight Percent	Specific Gravity (component)	Specific Gravity (per fraction)	Higher Heating Value Btu/cu.ft. (component)	Higher Heating Value Btu/cu.ft. (per fraction)	Higher Heating Value Btu/Lb (component)	Higher Heating Value Btu/Lb (per fraction)
Methane	CH_4	88.345%	88.35%	16.04	14.17	1618.21%	0.5543	0.4897	1012.32	894.33	23875	386349
Ethane	C_2H_6	3.560%	3.56%	30.07	1.07	122.22%	1.0488	0.0373	1773.42	63.13	22323	27284
Ethylene	C_2H_4	0.000%	0.00%	28.05	0.00	0.00%	0.9740	0.0000	1603.75	0.00	21636	0
Propane	C_3H_8	0.654%	0.65%	44.09	0.29	32.93%	1.5617	0.0102	2523.82	16.51	21669	7135
Unknowns as C3	C_3	0.000%	0.00%	44.09	0.00	0.00%	1.5617	0.0000	2523.82	0.00	21669	0
n-Butane	C_4H_{10}	0.245%	0.25%	58.12	0.14	16.26%	2.0665	0.0051	3270.69	8.01	21321	3467
Isobutane	C_4H_{10}	0.261%	0.26%	58.12	0.15	17.32%	2.0665	0.0054	3261.17	8.51	21271	3684
Unknowns as C4	C_4H_{10}	0.000%	0.00%	58.12	0.00	0.00%	2.0665	0.0000	3270.69	0.00	21321	0
Isobutylene	C_4H_8	0.000%	0.00%	56.10	0.00	0.00%	1.9336	0.0000	3069.00	0.00	20737	0
n-Pentane	C_5H_{12}	0.079%	0.08%	72.15	0.06	6.51%	2.4872	0.0020	4019.65	3.18	21095	1373
Isopentane	C_5H_{12}	0.156%	0.16%	72.15	0.11	12.85%	2.4872	0.0039	4010.71	6.26	21047	2705
Unknowns as C5	C_5H_{12}	0.006%	0.01%	72.15	0.00	0.49%	2.4872	0.0001	3994.00	0.24	20978	104
n-Pentene	C_5H_{10}	0.000%	0.00%	70.13	0.00	0.00%	2.4190	0.0000	3837.00	0.00	20720	0
n-Hexane	C_6H_{14}	0.057%	0.06%	86.17	0.05	5.61%	2.9704	0.0017	4768.27	2.72	20966	1176
Benzene	C_6H_6	0.000%	0.00%	78.11	0.00	0.00%	2.6920	0.0000	3751.68	0.00	18184	0
Toluene	C_7H_8	0.000%	0.00%	92.13	0.00	0.00%	3.1760	0.0000	4486.44	0.00	18501	0
Unknowns as C6	C6	0.140%	0.14%	86.17	0.12	13.77%	2.9704	0.0042	4768.27	6.68	20966	2888
Methanol	CH_3OH	0.000%	0.00%	32.04	0.00	0.00%	1.1052	0.0000	868.00	0.00	10258	0
Hydrogen	H_2	0.000%	0.00%	2.02	0.00	0.00%	0.06959	0.0000	325.02	0.00	61095	0
Carbon Monoxide	CO	0.000%	0.00%	28.01	0.00	0.00%	0.9672	0.0000	321.37	0.00	4347	0
Carbon Dioxide	CO_2	1.990%	1.99%	44.01	0.88	100.00%	1.5282	0.0304	0.00	0.00	0	0
Hydrogen Sulfide	H_2S	0.000%	0.00%	34.08	0.00	0.00%	1.1898	0.0000	646.00	0.00	7097	0
Nitrogen	N_2	2.021%	2.02%	28.02	0.57	64.65%	0.9672	0.0195	0.00	0.00	0	0
Oxygen	O_2	0.747%	0.75%	32.00	0.24	27.29%	1.1053	0.0083	0.00	0.00	0	0
Water Vapor	H_2O	1.740%	0.00%	18.02	0.31	35.79%	0.6215	0.0108	0.00	0.00	0	0
Total		100.00%	98.26%		18.16	2073.92%		0.6286		1009.56		436163

Ultimate Fuel Analysis (Weight %)

Carbon: 1423.81%
Hydrogen: 449.66%
Sulfur: 0.00%
Oxygen: 100.00%
Nitrogen: 64.65%
Moisture: 35.79%

Fuel F factor calculations

Fd = 8662.42 dscf/mmBtu

ENTECH ENGINEERING INC.

P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Normalized Fuel Analysis
SRU 2 (EPN SRUTGCUINC)

Test ID		1	2	3	Average
Inerts	Concentration				
Hydrogen	(%, wet)	0.000	0.000	0.000	0.000
Nitrogen	(%, wet)	1.060	2.059	2.021	1.540
Oxygen	(%, wet)	0.487	0.696	0.747	0.617
Argon	(%, wet)	0.000	0.000	0.000	0.000
Carbon Dioxide	(%, wet)	1.886	1.924	1.990	1.938
Carbon Monoxide	(%, wet)	0.000	0.000	0.000	0.000
Moisture	(%, wet)	1.740	1.740	1.740	1.740
Organics	Concentration				
Methane	(%, wet)	89.313	87.766	88.345	88.829
Ethane	(%, wet)	3.603	3.516	3.560	3.581
Ethylene	(%, wet)	0.000	0.000	0.000	0.000
Propane	(%, wet)	0.933	0.903	0.654	0.794
Unknown as Propane	(%, wet)	0.000	0.000	0.000	0.000
Propene	(%, wet)	0.000	0.000	0.000	0.000
iso-Butane	(%, wet)	0.268	0.263	0.261	0.264
iso-Butene	(%, wet)	0.000	0.000	0.000	0.000
n-Butane	(%, wet)	0.254	0.250	0.245	0.249
Unknown as Butane	(%, wet)	0.000	0.000	0.000	0.000
n-Butene	(%, wet)	0.000	0.000	0.000	0.000
Unknown as Pentane	(%, wet)	0.006	0.006	0.006	0.006
iso-Pentane	(%, wet)	0.164	0.159	0.156	0.160
1-pentene	(%, wet)	0.000	0.000	0.000	0.000
n-Pentane	(%, wet)	0.089	0.081	0.079	0.084
n-Hexane	(%, wet)	0.053	0.508	0.057	0.055
Hexene	(%, wet)	0.000	0.000	0.000	0.000
Toluene	(%, wet)	0.000	0.000	0.000	0.000
Unknown as Hexane	(%, wet)	0.144	0.128	0.140	0.142
Total	(%, wet)	100.000	100.000	100.000	100.000

Raw GC Analysis Data
SRU 2 (EPN SRUTGCUINC)

Test ID Run		1	2	3
Inerts	Concentration			
Hydrogen	(%, dry)	0.000	0.000	0.000
Nitrogen	(%, dry)	1.045	2.025	1.961
Oxygen	(%, dry)	0.480	0.684	0.725
Argon	(%, dry)	0.000	0.000	0.000
Carbon Dioxide	(%, dry)	1.859	1.892	1.931
Carbon Monoxide	(%, dry)	0.000	0.000	0.000
Organics	Concentration			
Methane	(%, dry)	88.030	86.315	85.741
Ethane	(%, dry)	3.551	3.458	3.455
Ethylene	(%, dry)	0.000	0.000	0.000
Propane	(%, dry)	0.920	0.888	0.635
Unknown as Propane	(%, dry)	0.000	0.000	0.000
Propene	(%, dry)	0.000	0.000	0.000
iso-Butane	(%, dry)	0.264	0.259	0.253
iso-Butene	(%, dry)	0.000	0.000	0.000
n-Butane	(%, dry)	0.250	0.246	0.238
Unknown as Butane	(%, dry)	0.000	0.000	0.000
n-Butene	(%, dry)	0.000	0.000	0.000
Neopentane	(%, dry)	0.006	0.006	0.006
iso-Pentane	(%, dry)	0.162	0.156	0.151
1-pentene	(%, dry)	0.000	0.000	0.000
n-Pentane	(%, dry)	0.088	0.080	0.077
n-Hexane	(%, dry)	0.052	0.500	0.055
Hexene	(%, dry)	0.000	0.000	0.000
Toluene	(%, dry)	0.000	0.000	0.000
Unknown as Hexane	(%, dry)	0.142	0.126	0.136
Total	(%, dry)	96.849	96.635	95.364

Normalized Fuel Analysis
SRU 2 (EPN SRUTGCUINC)

Test ID Date		1	2	3
Inerts	Concentration			
Hydrogen	(%, dry)	0.000	0.000	0.000
Nitrogen	(%, dry)	1.079	2.096	2.056
Oxygen	(%, dry)	0.496	0.708	0.760
Argon	(%, dry)	0.000	0.000	0.000
Carbon Dioxide	(%, dry)	1.919	1.958	2.025
Carbon Monoxide	(%, dry)	0.000	0.000	0.000
Organics	Concentration			
Methane	(%, dry)	90.894	89.321	89.909
Ethane	(%, dry)	3.667	3.578	3.623
Ethylene	(%, dry)	0.000	0.000	0.000
Propane	(%, dry)	0.950	0.919	0.666
Unknown as Propane	(%, dry)	0.000	0.000	0.000
Propene	(%, dry)	0.000	0.000	0.000
iso-Butane	(%, dry)	0.273	0.268	0.265
iso-Butene	(%, dry)	0.000	0.000	0.000
n-Butane	(%, dry)	0.258	0.255	0.250
Unknown as Butane	(%, dry)	0.000	0.000	0.000
n-Butene	(%, dry)	0.000	0.000	0.000
Unknown as Pentane	(%, dry)	0.006	0.006	0.006
iso-Pentane	(%, dry)	0.167	0.161	0.158
1-pentene	(%, dry)	0.000	0.000	0.000
n-Pentane	(%, dry)	0.091	0.083	0.081
n-Hexane	(%, dry)	0.054	0.517	0.058
Hexene	(%, dry)	0.000	0.000	0.000
Toluene	(%, dry)	0.000	0.000	0.000
Unknown as Hexane	(%, dry)	0.147	0.130	0.143
Total	(%, dry)	100.000	100.000	100.000

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Delek Refining - SRU-2 / Boiler 9. Tyler, TX. Aug 22, 2007

ES07-08-14546 / SRU-2 T1B1

	X Coefficient	Area Counts Run 1	Run 2	Run 3	Average	Concentration (%) Run 1	Run 2	Run 3	Averages	High Standard (%)
Hydrogen	1.75E-02	0	0	0	0.0	0.000	0.000	0.000	0.000	75.00
Nitrogen	2.67E-04	5948	2793	3010	3917.0	1.587	0.745	0.803	1.045	100.00
Oxygen	2.69E-04	2390	1455	1512	1785.7	0.643	0.391	0.407	0.480	15.12
Carbon Monoxi	2.76E-04	0	0	0	0.0	0.000	0.000	0.000	0.000	100.00
Carbon Dioxide	1.57E-04	11972	11960	11697	11876.3	1.874	1.873	1.831	1.859	100.00
Methane	5.32E-05	1666040	1641044	1654785	1653956.3	88.673	87.343	88.074	88.030	99.990
Ethylene	2.29E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	9.996
Ethane	2.29E-05	156244	153729	155438	155137.0	3.576	3.519	3.558	3.551	3.469
unknown as C3	1.54E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	0.990
Propane	1.54E-05	60078	59289	59919	59762.0	0.925	0.913	0.923	0.920	0.990
Isobutane	1.23E-05	21540	21354	21594	21496.0	0.264	0.262	0.265	0.264	0.398
n-Butane	1.22E-05	20596	20388	20618	20534.0	0.251	0.248	0.251	0.250	0.398
unknown as C4	1.22E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	0.398
Neopentane	1.02E-05	615	597	589	600.3	0.006	0.006	0.006	0.006	0.100
Isopentane	1.02E-05	15779	15814	15995	15862.7	0.162	0.162	0.164	0.162	0.149
n-Pentane	1.01E-05	8619	8695	8728	8680.7	0.087	0.088	0.088	0.088	0.150
Unknown as C5	1.01E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	0.150
Unknown as C6	9.23E-06	14551	15783	15777	15370.3	0.134	0.146	0.146	0.142	0.050
n-Hexane	9.23E-06	5915	5455	5426	5598.7	0.055	0.050	0.050	0.052	0.050
				Total		98.238	95.746	96.565	96.850	

GC#3 FID initial Calibration Date: 07-17-2007.

ES07-08-14548 / SRU-2 T2B1

	X Coefficient	rea Count Run 1	Run 2	Run 3	Average	Concentration (%) Run 1	Run 2	Run 3	Averages	High Standard (%)
Hydrogen	1.75E-02	0	0	0	0.0	0.000	0.000	0.000	0.000	75.00
Nitrogen	2.67E-04	5131	12636	4998	7588.3	1.369	3.372	1.334	2.025	100.00
Oxygen	2.69E-04	1837	3993	1803	2544.3	0.494	1.074	0.485	0.684	15.12
Carbon Monoxi	2.76E-04	0	0	0	0.0	0.000	0.000	0.000	0.000	100.00
Carbon Dioxide	1.57E-04	11942	11899	12404	12081.7	1.870	1.863	1.942	1.892	100.00
Methane	5.32E-05	1632328	1607928	1624938	1621731.3	86.879	85.580	86.486	86.315	99.990
Ethylene	2.29E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	9.996
Ethane	2.29E-05	151983	149747	151531	151087.0	3.479	3.428	3.469	3.458	3.469
unknown as C3	1.54E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	0.990
Propane	1.54E-05	57741	57174	58029	57648.0	0.889	0.880	0.894	0.888	0.990
Isobutane	1.23E-05	21090	20941	21229	21086.7	0.259	0.257	0.260	0.259	0.398
n-Butane	1.22E-05	20247	20140	20356	20247.7	0.246	0.245	0.248	0.246	0.398
unknown as C4	1.22E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	0.398
Neopentane	1.02E-05	601	600	598	599.7	0.006	0.006	0.006	0.006	0.100
Isopentane	1.02E-05	15259	15198	15337	15264.7	0.156	0.156	0.157	0.156	0.149
n-Pentane	1.01E-05	7869	8023	8026	7972.7	0.079	0.081	0.081	0.080	0.150
Unknown as C5	1.01E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	0.150
Unknown as C6	9.23E-06	12048	14567	14397	13670.7	0.111	0.134	0.133	0.126	0.050
n-Hexane	9.23E-06	4830	5675	5686	5397.0	0.045	0.052	0.052	0.050	0.050
				Total		95.883	97.129	95.546	96.186	

GC#3 FID initial Calibration Date: 07-17-2007.

ES07-08-14550 / SRU-2 T3B1

	X Coefficient	rea Count Run 1	Run 2	Run 3	Average	Concentration (%) Run 1	Run 2	Run 3	Averages	High Standard (%)
Hydrogen	1.75E-02	0	0	0	0.0	0.000	0.000	0.000	0.000	75.00
Nitrogen	2.67E-04	7408	7428	7211	7349.0	1.977	1.982	1.924	1.961	100.00
Oxygen	2.69E-04	2645	2526	2910	2693.7	0.711	0.679	0.783	0.725	15.12
Carbon Monoxi	2.76E-04	0	0	0	0.0	0.000	0.000	0.000	0.000	100.00
Carbon Dioxide	1.57E-04	11977	11883	13135	12331.7	1.875	1.860	2.057	1.931	100.00
Methane	5.32E-05	1614891	1602546	1615408	1610948.3	85.951	85.294	85.978	85.741	99.990
Ethylene	2.29E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	9.996
Ethane	2.29E-05	151485	150291	151042	150939.3	3.467	3.440	3.457	3.455	3.469
unknown as C3	1.54E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	0.990
Propane	1.54E-05	58982	58833	5874	41229.7	0.908	0.906	0.090	0.635	0.990
Isobutane	1.23E-05	20551	20654	20565	20590.0	0.252	0.253	0.252	0.253	0.398
n-Butane	1.22E-05	19562	19607	19557	19575.3	0.238	0.239	0.238	0.238	0.398
unknown as C4	1.22E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	0.398
Neopentane	1.02E-05	617	574	602	597.7	0.006	0.006	0.006	0.006	0.100
Isopentane	1.02E-05	14620	14635	14915	14723.3	0.150	0.150	0.153	0.151	0.149
n-Pentane	1.01E-05	7531	7604	7745	7626.7	0.076	0.077	0.078	0.077	0.150
Unknown as C5	1.01E-05	0	0	0	0.0	0.000	0.000	0.000	0.000	0.150
Unknown as C6	9.23E-06	14267	12950	17029	14748.7	0.132	0.120	0.157	0.136	0.050
n-Hexane	9.23E-06	5556	5397	6890	5947.7	0.051	0.050	0.064	0.055	0.050
				Total		95.795	95.056	95.238	95.363	

GC#3 FID initial Calibration Date: 07-17-2007.

GC VOC Analysis

Pre-Calibration Standards
(EPA Method 18)

B-8

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Gas Chromatography Data Sheet

Gas Chromatography Information

GC Type:	Shimadzu GC-14A
Detector A/B:	Hydrogen Flame Ionization Detector (FID)
Detector C:	Themal Conductivity Detector (TCD)
GC ID #:	3 DAS: Shimadzu EZChrom
GC Serial #:	C10893300485SA
Column A/B Type:	6' x 1/8" stainless steel column packed with Hayesep Q polymer (80/100 mesh).
Column C Type:	30' x 1/8" stainless steel column packed with Hayesep DB polymer (100/120 mesh).

Gas Chromatography Operating Parameters

GC Oven Temperature Parameters:

Isothermal Column Temperature (C):	na	Injector Temperature (C):	220
Initial Column Temperature (C):	50	Detector Temperature (C):	220
Duration of initial temperature (min):	5.0	Oven Temperature (C):	na
Program Rate (C/min):	10	Methanizer Temperature (C):	na
Final Temperature (C):	175		
Final Time (min):	13		
Carrier Gas A/B Mass Flow Setting (kpa):	80	Carrier Gas A/B Type:	Nitrogen
Carrier Gas C Mass Flow Setting (kpa):	300	Carrier Gas C Type:	Helium
Air Flow (ml/min):	250	Hydrogen Flow (ml/min)	35
Detector A/B Range:	3	Back-flush Time (min):	30
Sample Size A&B/C(ul):	1000 ul/100 ul injec.	TCD Bridge Current (mA):	100

Calibration Data

ID	Reten Time (min)	ID Time Band (+/- min)	Range	Regression Data: y = mx + b Where: x = Area & y = molar ppm m	b	r

* See Data Calculations Section

Application

Fuel, Flare, and Misc. Gas.

CERTIFIED MASTER CLASS

Single-Certified Calibration Standard

Scott Specialty Gases
9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ACCURACY: Certified Master Class Calibration Standard

Product Information
Project No.: 04-37020-001
Item No.: 04027112 PAL
P.O. No.: 51040

Cylinder Number: ALM057523
Cylinder Size: AL
Certification Date: 21Jul2005
Expiration Date: 01Aug2007

Customer

ENTECH ENGINEERING INC.
100 EAST NASA ROAD ONE
SUITE 407
WEBSTER, TX 77598

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)	Accuracy (+/-%)
N-BUTANE	0.398 %	1
CARBON DIOXIDE	2.98 %	1
ETHANE	3.52 %	1
N-HEPTANE	0.02 %	2
N-HEXANE	0.0498 %	1
ISOBUTANE	0.398 %	1
ISOPENTANE	0.149 %	1
NEOPENTANE	0.100 %	1
NITROGEN	2.50 %	1
N-PENTANE	0.150 %	1
PROPANE	0.99 %	1
METHANE	BALANCE	

TRACEABILITY

raceable To

Scott Reference Standard

PROVED BY: SUSAN BRANDON DATE: 7/22/05

B10

PORTAGAS

****
CERTIFICATE OF ANALYSIS
****

DATE : 14-Aug-2006
P.O.#: 51544

MANUFACTURED FOR: 1779.0000
Attn: Steven
Entech Engineering Inc.
408 East Main
League City , TX 77573

CYLINDER SIZE : 58DS
CYLINDER CONTENTS: 58 L (2 CU.FT.) @ 70 F & 1000 PSIG (6890Kpag)
CYLINDER LOT # : 911024
MANUFACTURE DATE : 14-Aug-2006
EXPIRATION DATE : 13-Aug-2009

COMPOSITION	CONCENTRATION
METHANE	99.99%

PREPARATION METHOD : GRAVIMETRIC BALANCES CALIBRATED TO N.I.S.T. WEIGHTS.
N.I.S.T. TEST NUMBER 822/270236-04

DAVID SUN
QUALITY ASSURANCE MANAGER

(800) 548-2268
PORTAGAS 6717-B POLK STREET, HOUSTON, TX 77011

Bll

PORTAGAS

****
CERTIFICATE OF ANALYSIS
****

DATE : 1-Sep-2005
P.O.#: 51094

MANUFACTURED FOR: 1779.0000
Entech Engineering Inc.
100 East Nasa Road 1, Suite 407
Webster , TX 77598

CYLINDER SIZE : 58DS
CYLINDER CONTENTS: 58 L (2 CU.FT.) @ 70 F & 1000 PSIG (6890Kpag)
CYLINDER LOT # : 910008
MANUFACTURE DATE : 1-Sep-2005
EXPIRATION DATE : 31-Aug-2008

COMPOSITION	CONCENTRATION
ETHYLENE	99.96%

PREPARATION METHOD : GRAVIMETRIC BALANCES CALIBRATED TO N.I.S.T. WEIGHTS.
N.I.S.T. TEST NUMBER 822/265036-01

DAVID SUN
QUALITY ASSURANCE MANAGER

(800) 548-2268
PORTAGAS 6717-B POLK STREET, HOUSTON, TX 77011

B12

AIR LIQUIDE™

CERTIFICATE OF ANALYSIS

Customer : Entech Engineering
P.O. Number : 51410
Document # : 20475827-1A
Mix/Lot # : LPX139998
Item Number :
Valid Until : 27 April, 2008

Specification : CERTIFIED
Phase : GAS
Cyl. Size : 30AL Valve : CGA 350
Pressure : 193 psia
Volume : 13 SCF

Cylinder Number: **CC82387**

Component	Requested Concentrations Mole	Actual Concentration Mole	% Analytical Uncertainty	Equipment Used		
				Scale	Analyt. Inst.	Calibration Standard
NITROGEN	Balance	Balance		1391		
ETHYLENE OXIDE	6 %	6.04 %	2%	1391		

This mixture was prepared and certified by weight using one or more scales certified against weights traceable to N.I.S.T.

Comments:

Dewpoint calculated to 40° F, unless otherwise stated. Improper storage or use may affect the accuracy of this standard.

Certified by _____ Date: 28-Apr-2006

11426 Fairmont Pkwy – LaPorte, TX 77571
Phone (281) 474-8400 **Fax** (281) 474-8419 **USA** (800) 248-1427

ISO: 9001-2000

B13

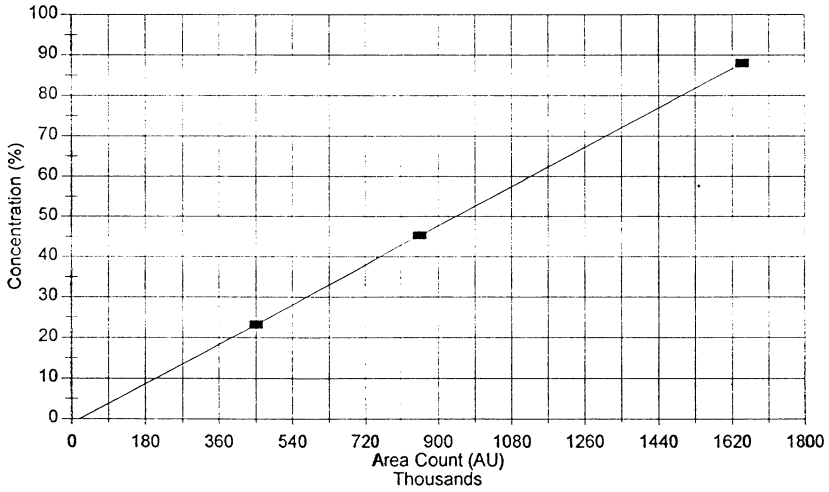
ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 FID-1 (Range 3)
Methane Standards (ALM057523)
07/17/07
(Retention Time = 0.82 min)

Concentration (%)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.000	0	0	0	0.0	NA
22.186	454352	452863	449365	452193.3	0.48%
44.373	849890	861553	859901	857114.7	0.84%
88.745	1678053	1639315	1619077	1645481.7	1.98%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	1.467
R Squared	0.998502
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	5.322389E-05
Std Err of Coef.	7.679624E-07



Operator pm Date July 18 2007

B14

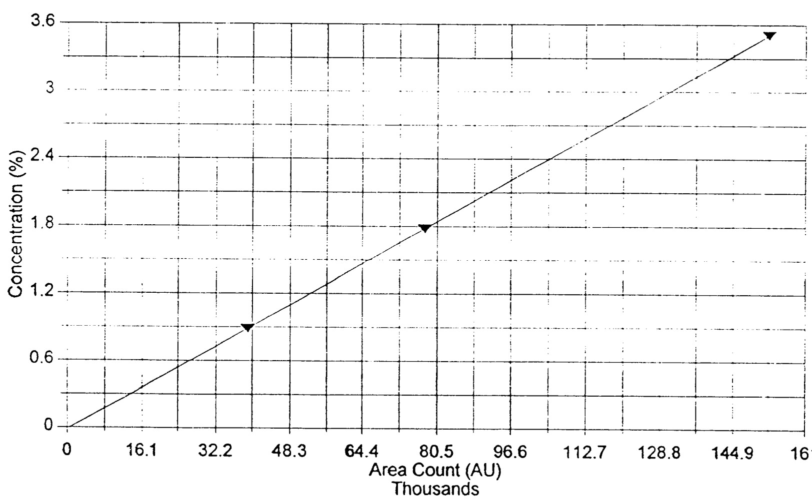
ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 FID-1 (Range 3)
Ethane Standards (ALM057523)
07/17/07
(Retention Time = 3.19 min)

Concentration (%)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.000	0	0	0	0.0	NA
0.880	39462	39384	39113	39319.7	0.36%
1.760	77294	78400	78323	78005.7	0.91%
3.520	156085	152596	150278	152986.3	2.03%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.021
R Squared	0.999796
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	2.288984E-05
Std Err of Coef.	1.218780E-07



Operator ~~km~~ Date July 18/2007

B 15

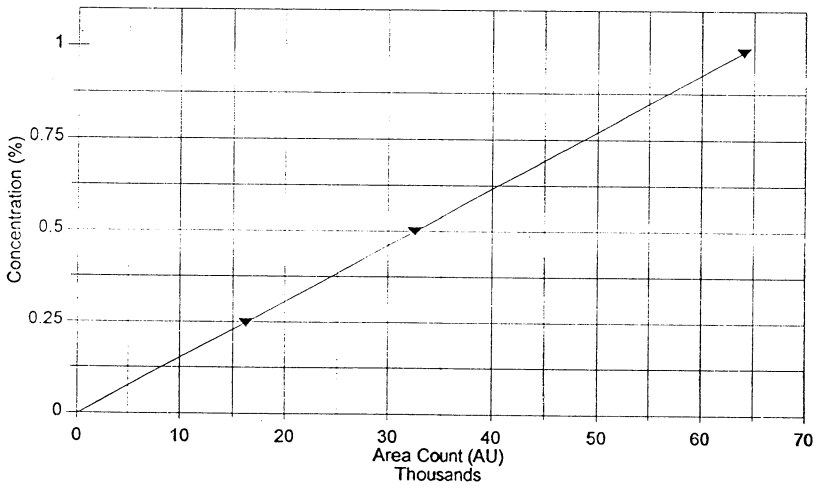
ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 FID-1 (Range 3)
Propane Standards (ALM057523)
07/17/07
(Retention Time = 10.15 min)

Concentration (%)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.000	0	0	0	0.0	NA
0.248	16276	16325	16111	16237.3	0.24%
0.495	32087	32594	32743	32474.7	1.19%
0.990	65135	64055	63058	64082.7	1.64%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.004
R Squared	0.999925
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	1.540020E-05
Std Err of Coef.	4.964522E-08



Operator bm Date July 18/2007

B16

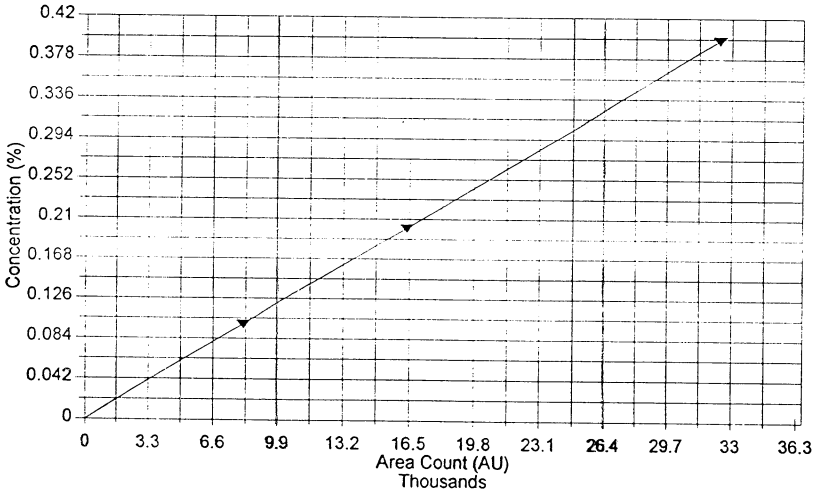
ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 FID-1 (Range 3)
Isobutane Standards (ALM057523)
07/17/07
(Retention Time = 14.48 min)

Concentration (%)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.000	0	0	0	0.0	NA
0.100	8119	8150	8066	8111.7	0.09%
0.199	16158	16413	16524	16365.0	1.26%
0.398	32833	32382	31940	32385.0	1.38%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.001
R Squared	0.999956
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	1.226637E-05
Std Err of Coef.	3.043634E-08



Operator pm Date July 18/2007

B17

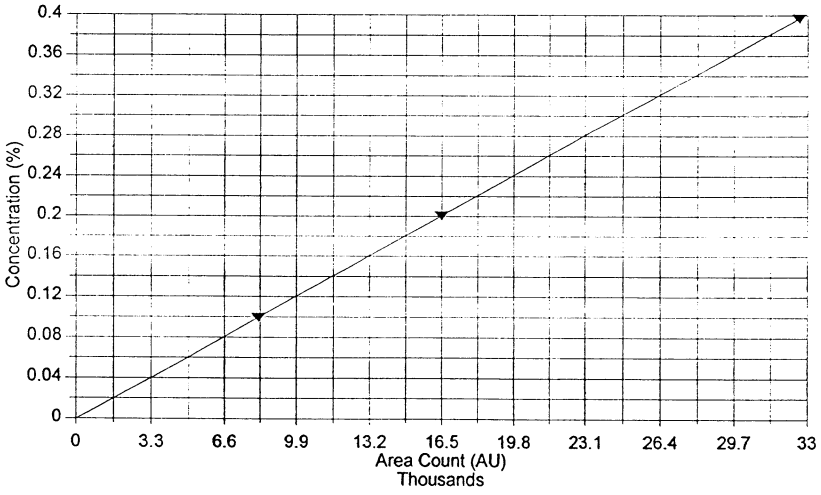
ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 FID-1 (Range 3)
n-Butane Standards (ALM057523 & 912012)
07/17/07
(Retention Time = 15.35 min)

Concentration (%)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.000	0	0	0	0.0	NA
0.100	8224	8268	8148	8213.3	0.13%
0.199	16294	16560	16707	16520.3	1.37%
0.398	33077	32641	32156	32624.7	1.39%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.001
R Squared	0.999941
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	1.216836E-05
Std Err of Coef.	3.488342E-08



Operator jsm Date July 18/2007

B18

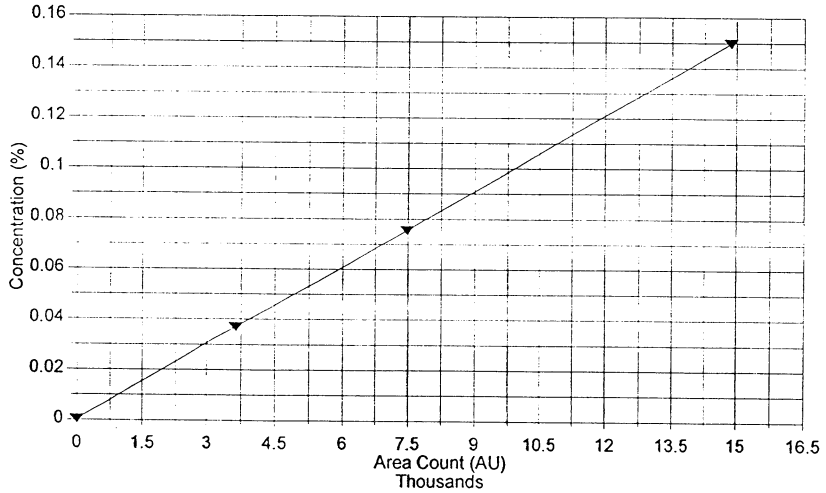
ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 FID-1 (Range 3)
n-Pentane Standards (ALM057523)
07/17/07
(Retention Time = 19.57 min)

Concentration (%)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.000	0	0	0	0.0	NA
0.038	3639	3645	3665	3649.7	0.29%
0.075	7367	7512	7565	7481.3	1.53%
0.150	15165	14808	14684	14885.7	1.88%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.001
R Squared	0.999867
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	1.008217E-05
Std Err of Coef.	4.332408E-08



Operator pm Date July 18/2007

BM

ENTECH ENGINEERING INC.

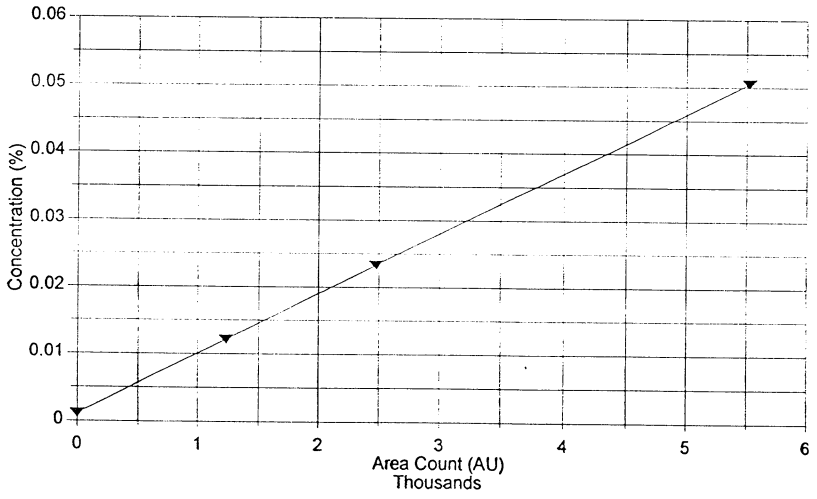
Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 FID-1 (Range 3)
n-Hexane Standards (ALM057523)
07/17/07

(Retention Time = 26.22 min)

Concentration (%)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.0000	0	0	0	0.0	NA
0.0125	1234	1238	1224	1234.0	0.00%
0.0249	2488	2444	2513	2481.7	0.26%
0.0498	5314	5559	5689	5520.7	3.74%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.001
R Squared	0.995171
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	9.228386E-06
Std Err of Coef.	2.391095E-07

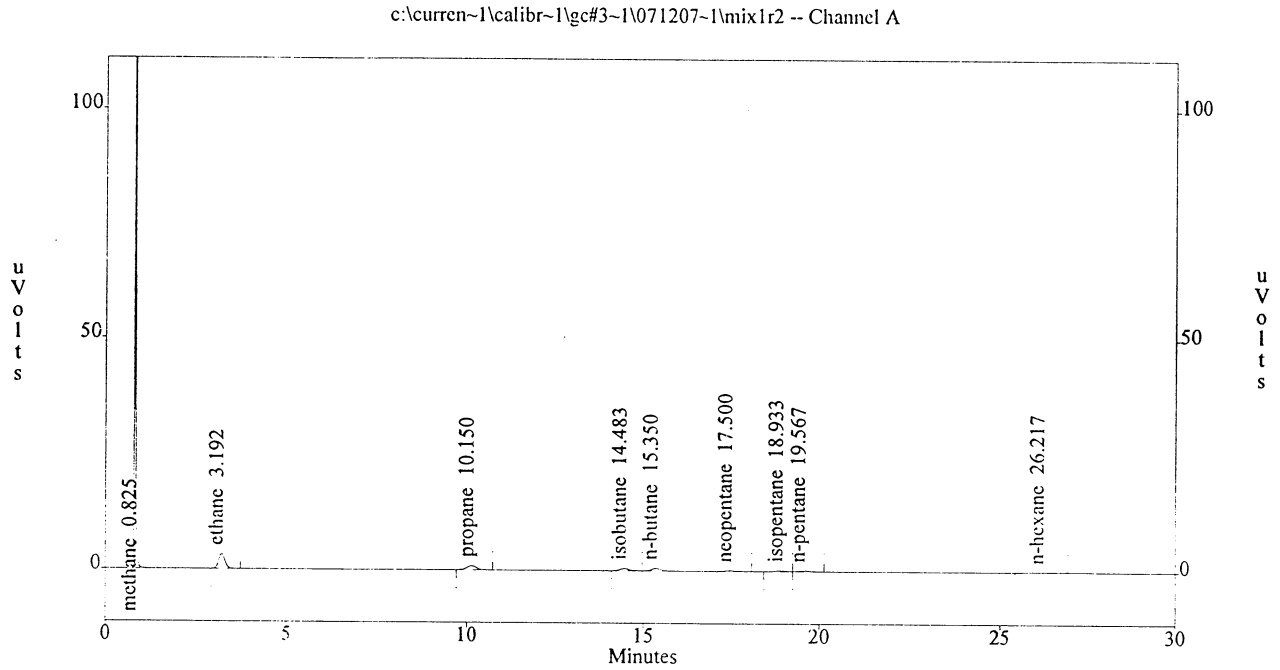


Operator ksm Date July 18/2007

B20

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\mix1r2
Method : c:\curren~1\calibr~1\gc#3~1\fid_gas.met
Sample ID : 0.25xgasmix
Acquired : Jul 17, 2007 14:06:42
Printed : Jul 18, 2007 14:24:19
User : System



Channel A Results

Peak	Retention Time	Area
methane	0.82	454352
ethane	3.19	39462
propane	10.15	16276
isobutane	14.48	8119
n-butane	15.35	8224
neopentane	17.50	2328
isopentane	18.93	3631
n-pentane	19.57	3639
n-hexane	26.22	1234

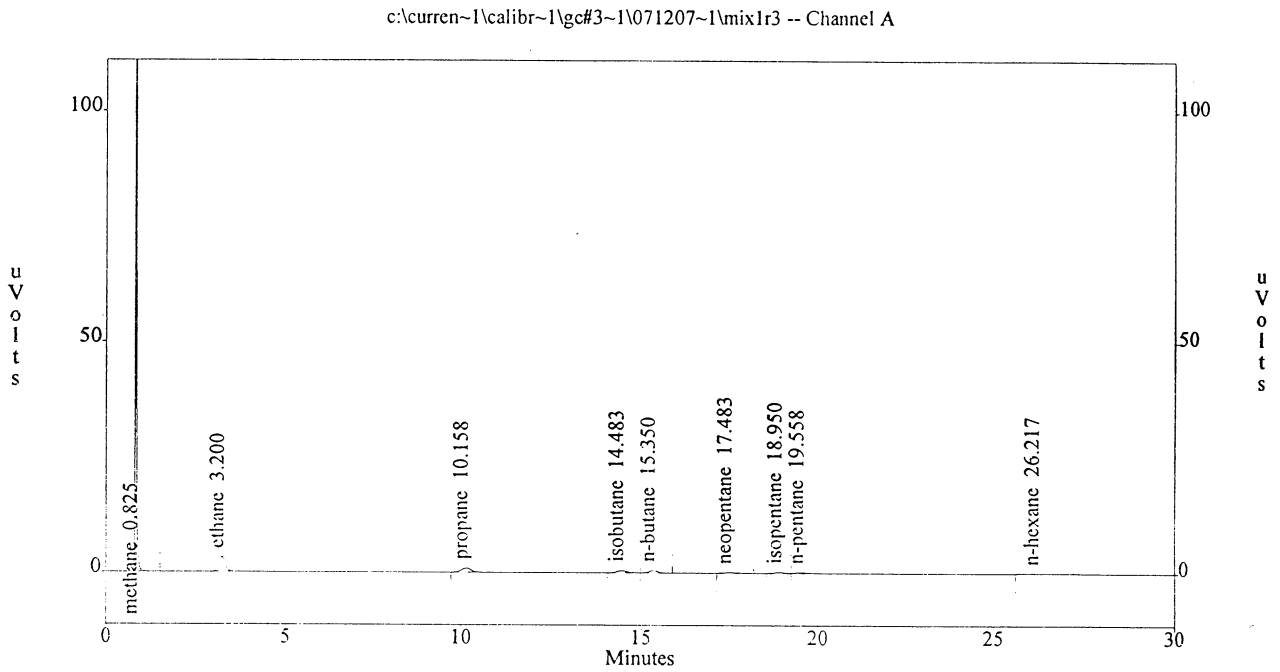
Totals :

537265

B21

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\mix1r3
Method : c:\curren~1\calibr~1\gc#3~1\fid_gas.met
Sample ID : 0.25xgasmix
Acquired : Jul 17, 2007 14:44:09
Printed : Jul 18, 2007 14:26:37
User : System



Channel A Results

Peak	Retention Time	Area
methane	0.82	452863
ethane	3.20	39384
propane	10.16	16325
isobutane	14.48	8150
n-butane	15.35	8268
neopentane	17.48	2352
isopentane	18.95	3553
n-pentane	19.56	3645
n-hexane	26.22	1238

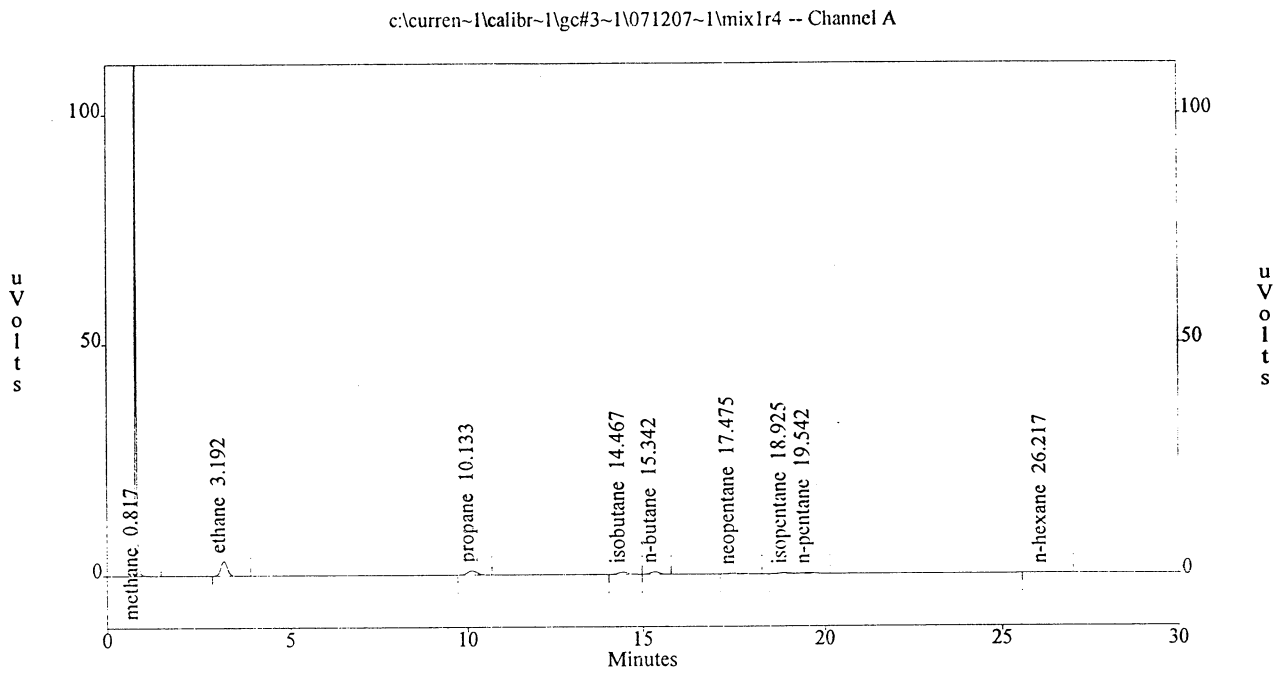
Totals :

535778

B22

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\mix1r4
Method : c:\curren~1\calibr~1\gc#3~1\fid_gas.met
Sample ID : 0.25xgasmix
Acquired : Jul 17, 2007 15:19:25
Printed : Jul 18, 2007 14:29:56
User : System



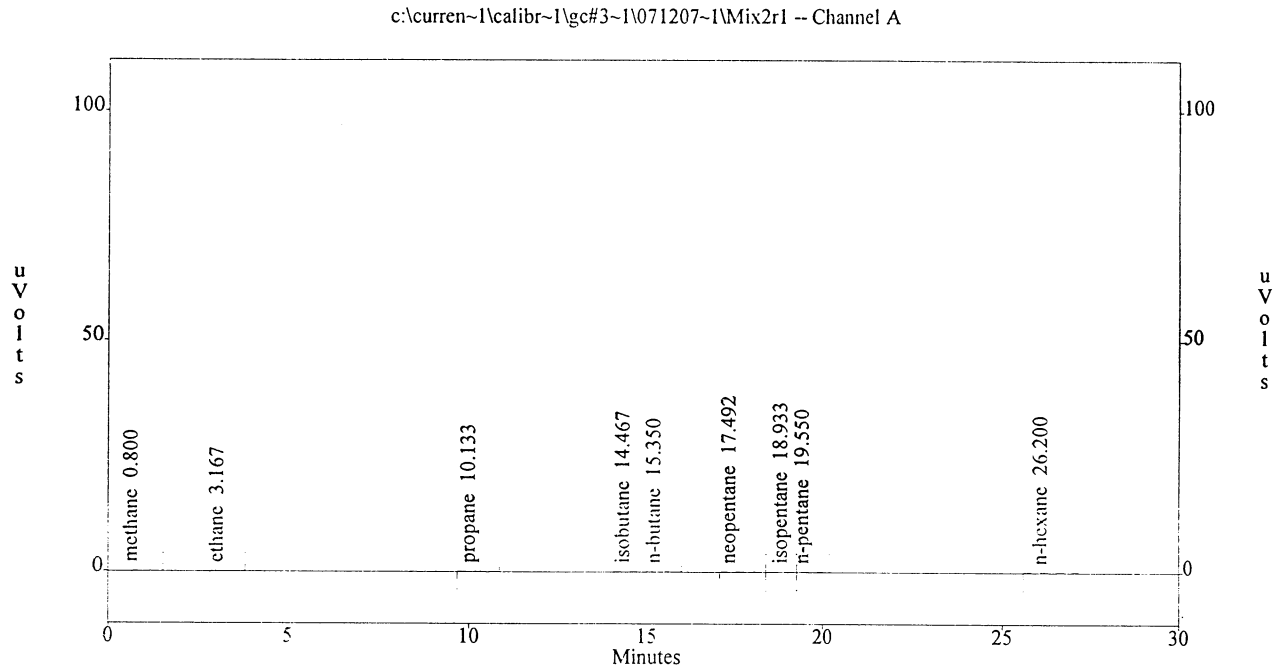
Channel A Results

Peak	Retention Time	Area
methane	0.82	449365
ethane	3.19	39113
propane	10.13	16111
isobutane	14.47	8066
n-butane	15.34	8148
neopentane	17.48	2327
isopentane	18.92	3576
n-pentane	19.54	3665
n-hexane	26.22	1224
Totals :		531595

B 23

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Mix2r1
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 0.5xgasmix
Acquired : Jul 17, 2007 15:56:59
Printed : Jul 17, 2007 16:27:13
User : System



Channel A Results

Peak	Retention Time	Area
methane	0.80	849890
ethane	3.17	77294
propane	10.13	32087
isobutane	14.47	16158
n-butane	15.35	16294
neopentane	17.49	4858
isopentane	18.93	7225
n-pentane	19.55	7367
n-hexane	26.20	2488

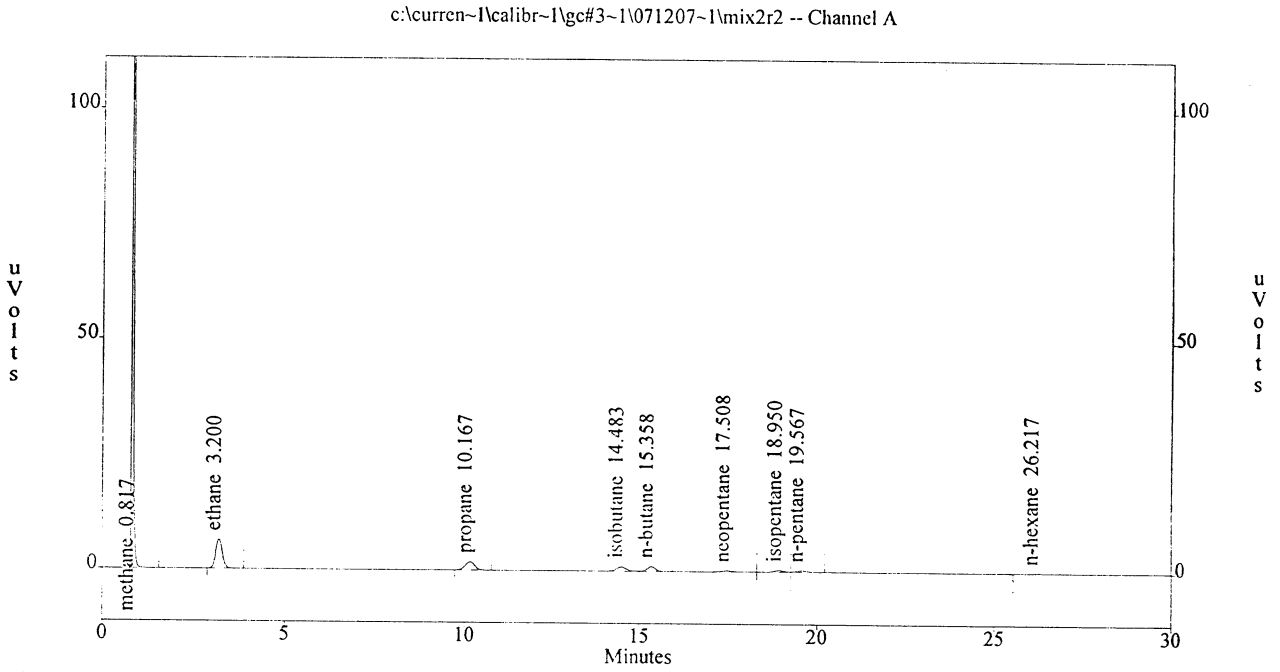
Totals :

1013661

B24

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\mix2r2
Method : c:\curren~1\calibr~1\gc#3~1\fid_gas.met
Sample ID : 0.5xgasmix
Acquired : Jul 17, 2007 16:37:00
Printed : Jul 18, 2007 14:11:58
User : System



Channel A Results

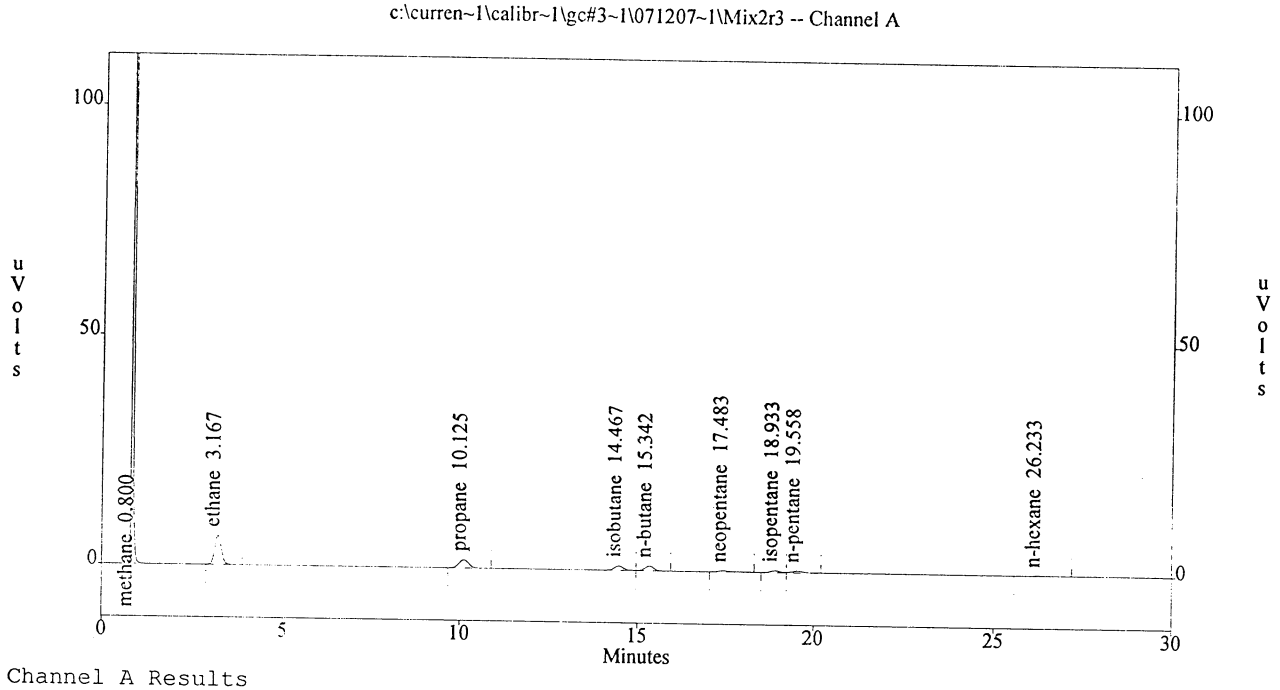
Peak	Retention Time	Area
methane	0.82	861553
ethane	3.20	78400
propane	10.17	32594
isobutane	14.48	16413
n-butane	15.36	16560
neopentane	17.51	4969
isopentane	18.95	7419
n-pentane	19.57	7512
n-hexane	26.22	2444

Totals : 1027864

B24

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Mix2r3
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 0.5xgasmix
Acquired : Jul 17, 2007 18:48:04
Printed : Jul 18, 2007 09:12:21
User : System



Channel A Results

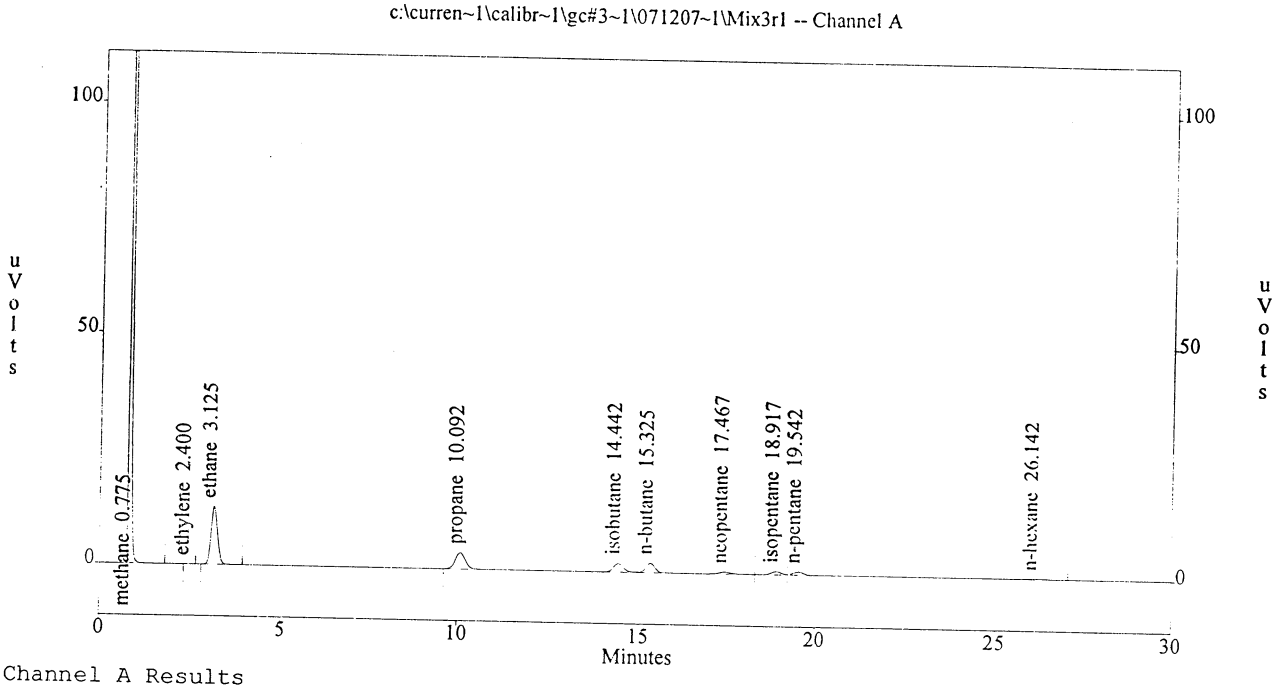
Peak	Retention Time	Area
methane	0.80	859901
ethane	3.17	78323
propane	10.13	32743
isobutane	14.47	16524
n-butane	15.34	16707
neopentane	17.48	4962
isopentane	18.93	7361
n-pentane	19.56	7565
n-hexane	26.23	2513

Totals : 1026599

B76

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Mix3r1
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 1xgasmix
Acquired : Jul 18, 2007 09:13:52
Printed : Jul 18, 2007 09:47:08
User : System



Channel A Results

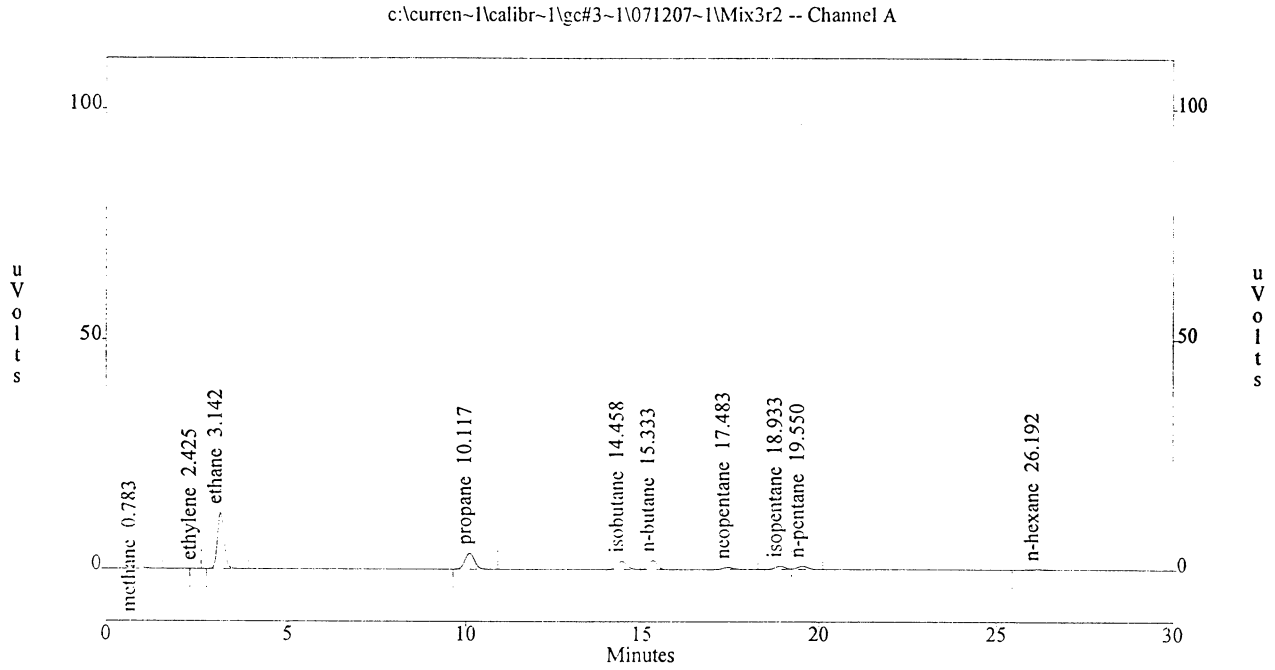
Peak	Retention Time	Area
methane	0.77	1678053
ethylene	2.40	94
ethane	3.13	156085
propane	10.09	65135
isobutane	14.44	32833
n-butane	15.32	33077
neopentane	17.47	10129
isopentane	18.92	14886
n-pentane	19.54	15165
n-hexane	26.14	5314

Totals : 2010771

B29

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Mix3r2
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 1xgasmix
Acquired : Jul 18, 2007 09:55:40
Printed : Jul 18, 2007 10:27:54
User : System



Channel A Results

Peak	Retention Time	Area
methane	0.78	1639315
ethylene	2.42	94
ethane	3.14	152596
propane	10.12	64055
isobutane	14.46	32382
n-butane	15.33	32641
neopentane	17.48	9687
isopentane	18.93	14410
n-pentane	19.55	14808
n-hexane	26.19	5559

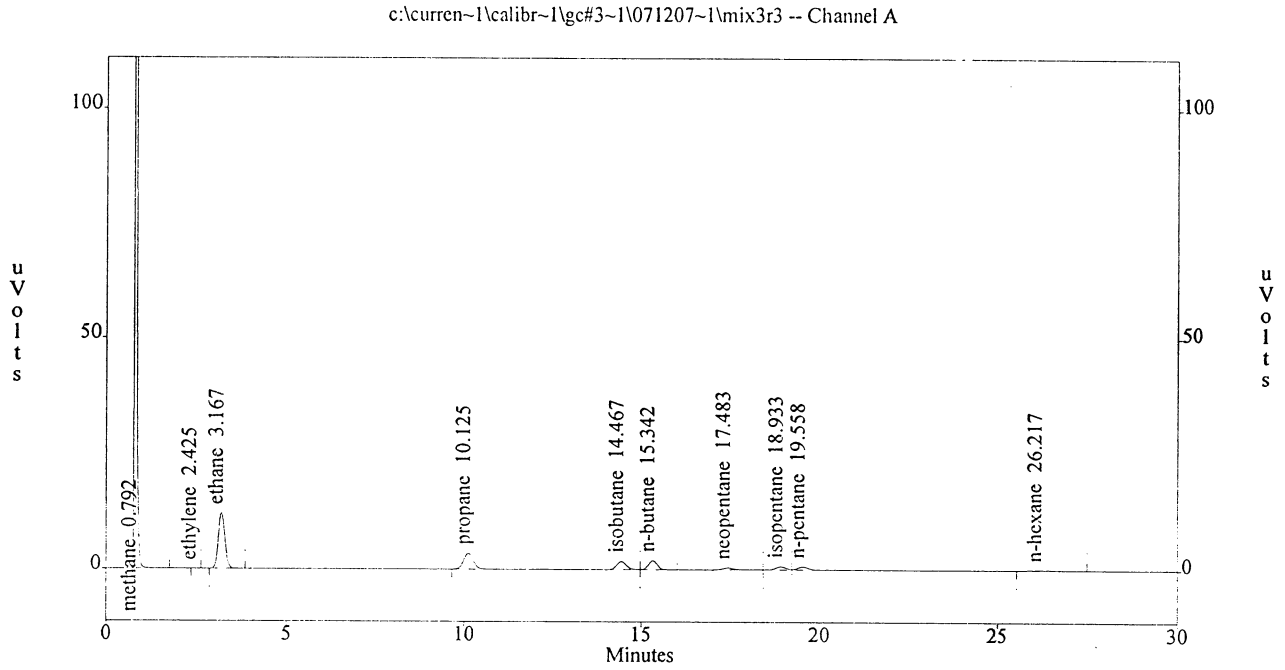
Totals :

1965547

B28

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\mix3r3
Method : c:\curren~1\calibr~1\gc#3~1\fid_gas.met
Sample ID : 1xgasmix
Acquired : Jul 18, 2007 10:33:15
Printed : Jul 18, 2007 14:14:30
User : System



Channel A Results

Peak	Retention Time	Area
methane	0.79	1619077
ethylene	2.42	81
ethane	3.17	150278
propane	10.13	63058
isobutane	14.47	31904
n-butane	15.34	32156
neopentane	17.48	9772
isopentane	18.93	14365
n-pentane	19.56	14684
n-hexane	26.22	5689

Totals :

1941064

829

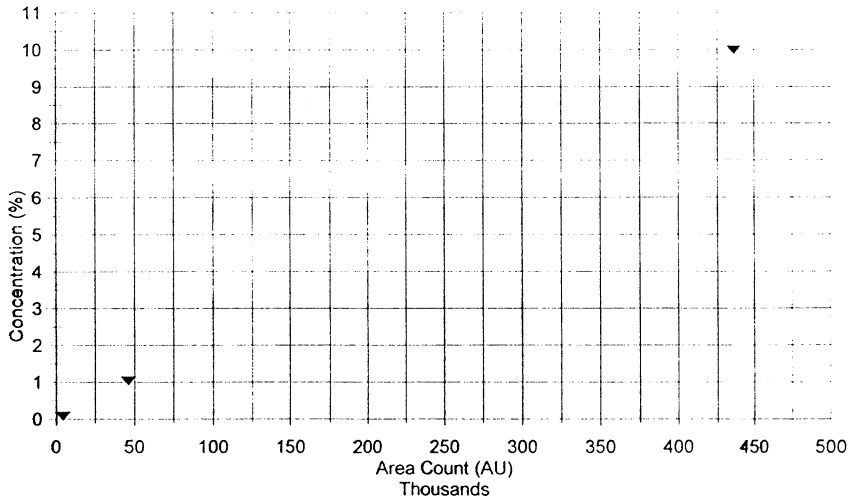
ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 FID-1 (Range 3)
Ethylene Standards (ALM038609 & 910008)
01/16/07
(Retention Time = 2.44 min)

Concentration (%)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.000	0	0	0	0.0	NA
0.100	4443	4376	4365	4394.7	1.10%
1.000	47665	44910	46788	46454.3	2.61%
9.996	426679	444917	436925	436173.7	2.18%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.037
R Squared	0.999940
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	2.290176E-05
Std Err of Coef.	8.509466E-08



Operator _____ Date 1-16-07

B30

PORTA

****
CERTIFICATE OF ANALYSIS
****

DATE : 1-Sep-2005
P.O.#: 51094

MANUFACTURED FOR: 1779.0000
Entech Engineering Inc.
100 East Nasa Road 1, Suite 407
Webster , TX 77598

CYLINDER SIZE : 58DS
CYLINDER CONTENTS: 58 L (2 CU.FT.) @ 70 F & 1000 PSIG (6890Kpag)
CYLINDER LOT # : 910008
MANUFACTURE DATE : 1-Sep-2005
EXPIRATION DATE : 31-Aug-2008

COMPOSITION	CONCENTRATION
ETHYLENE	99.96%

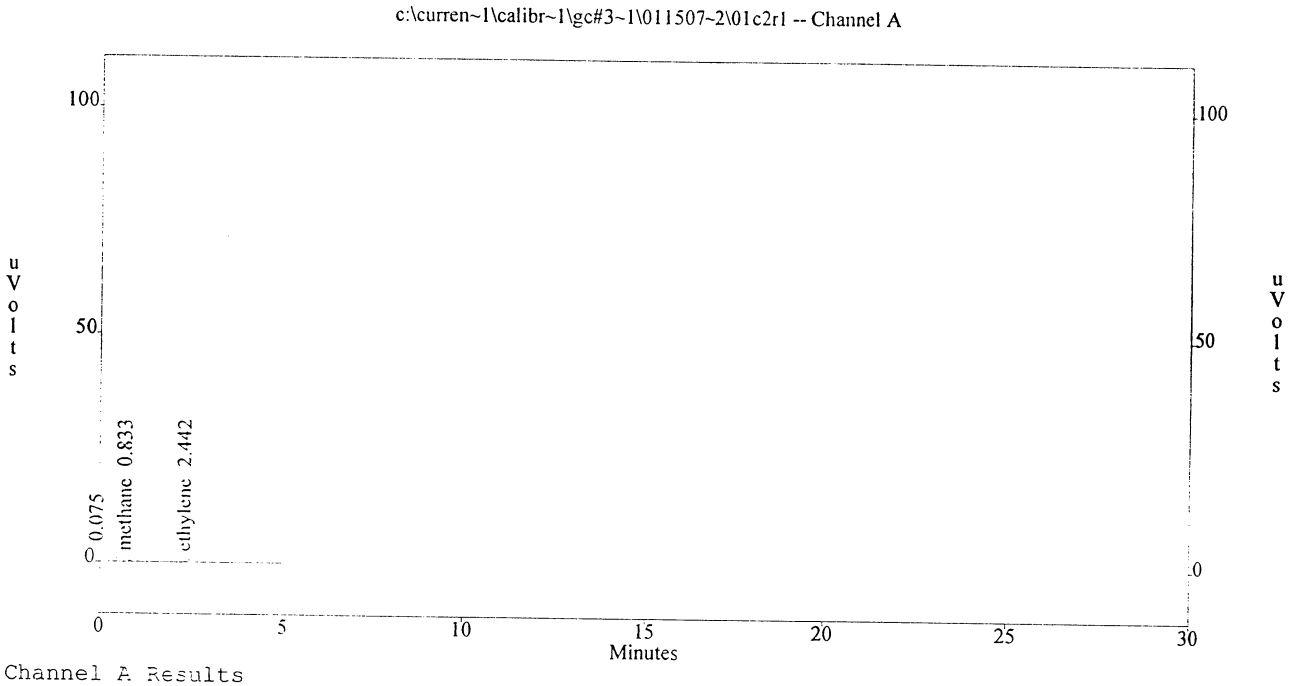
PREPARATION METHOD : GRAVIMETRIC BALANCES CALIBRATED TO N.I.S.T. WEIGHTS.
N.I.S.T. TEST NUMBER 822/265036-01

DAVID SUN (800) 548-2268
QUALITY ASSURANCE MANAGER PORTAGAS 6717-B POLK STREET, HOUSTON, TX 77011

B31

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\011507~2\01c2r1
Method : c:\curren~1\calibr~1\gc#3~1\Gasmix.met
Sample ID : 1000ppm olfine
Acquired : Jan 16, 2007 15:23:16
Printed : Jan 16, 2007 15:28:25
User : System



Channel A Results

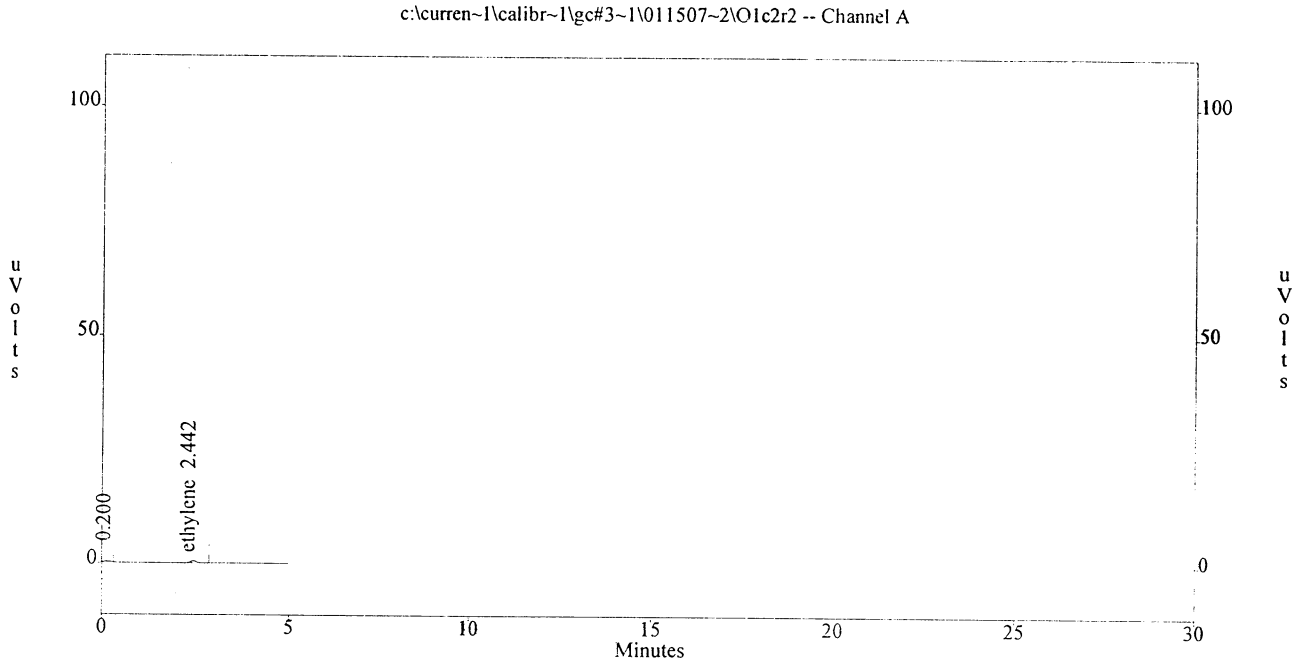
Peak	Retention Time	Area
	0.08	150
methane	0.83	925
ethylene	2.44	4443

Totals :

5518

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\011507~2\O1c2r2
Method : c:\curren~1\calibr~1\gc#3~1\Gasmix.met
Sample ID : 1000ppm olefin
Acquired : Jan 16, 2007 15:31:07
Printed : Jan 16, 2007 15:36:24
User : System



Channel A Results

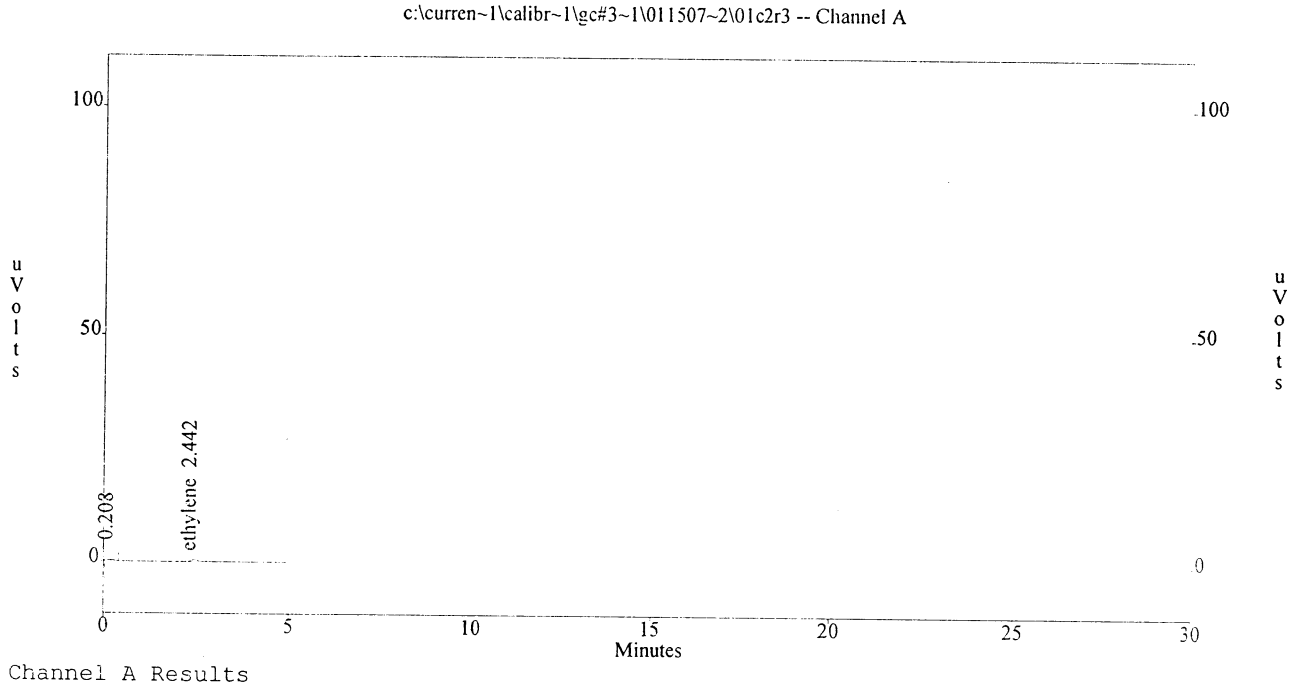
Peak	Retention Time	Area
	0.20	1539
ethylene	2.44	4376

Totals :

5915

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\011507~2\01c2r3
Method : c:\curren~1\calibr~1\gc#3~1\Gasmix.met
Sample ID : 1000ppm olefin
Acquired : Jan 16, 2007 15:38:24
Printed : Jan 16, 2007 15:43:35
User : System



Channel A Results

Peak	Retention Time	Area
	0.21	1408
ethylene	2.44	4365

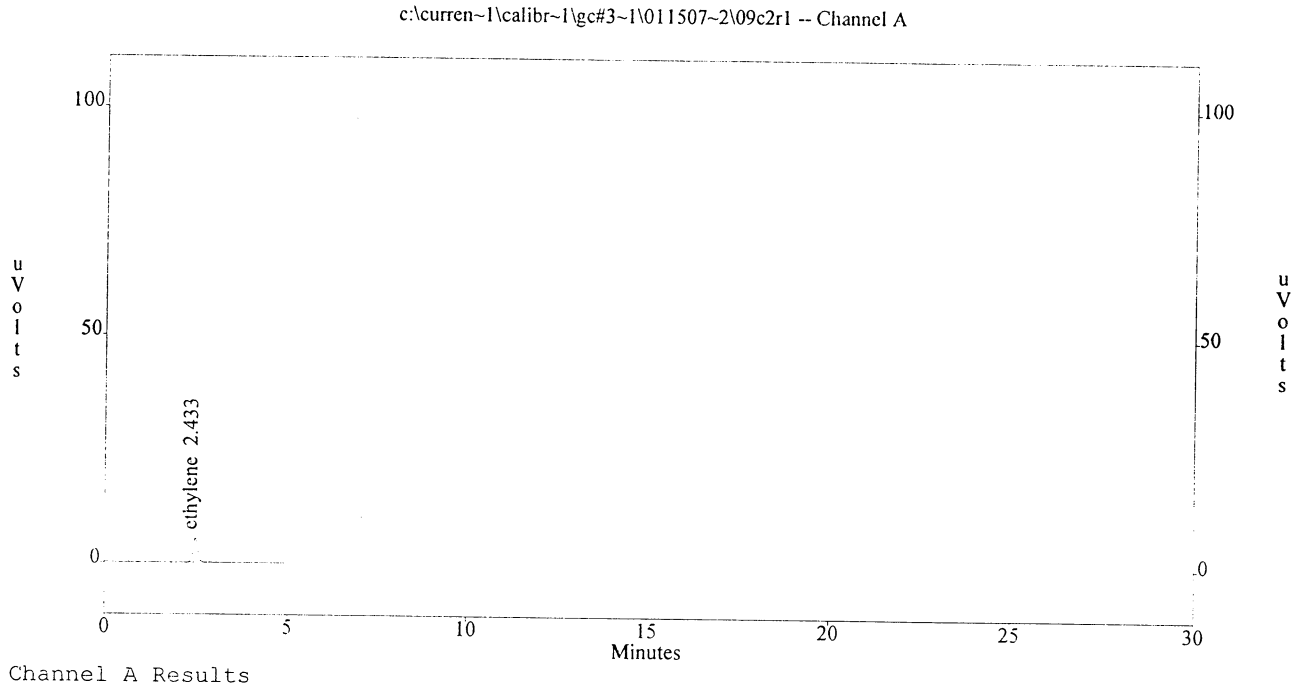
Totals :

5773

B34

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\011507~2\09c2r1
Method : c:\curren~1\calibr~1\gc#3~1\Gasmix.met
Sample ID : 0.9996% ethylene
Acquired : Jan 16, 2007 16:37:28
Printed : Jan 16, 2007 16:43:56
User : System



Channel A Results

Peak	Retention Time	Area
ethylene	2.43	47665

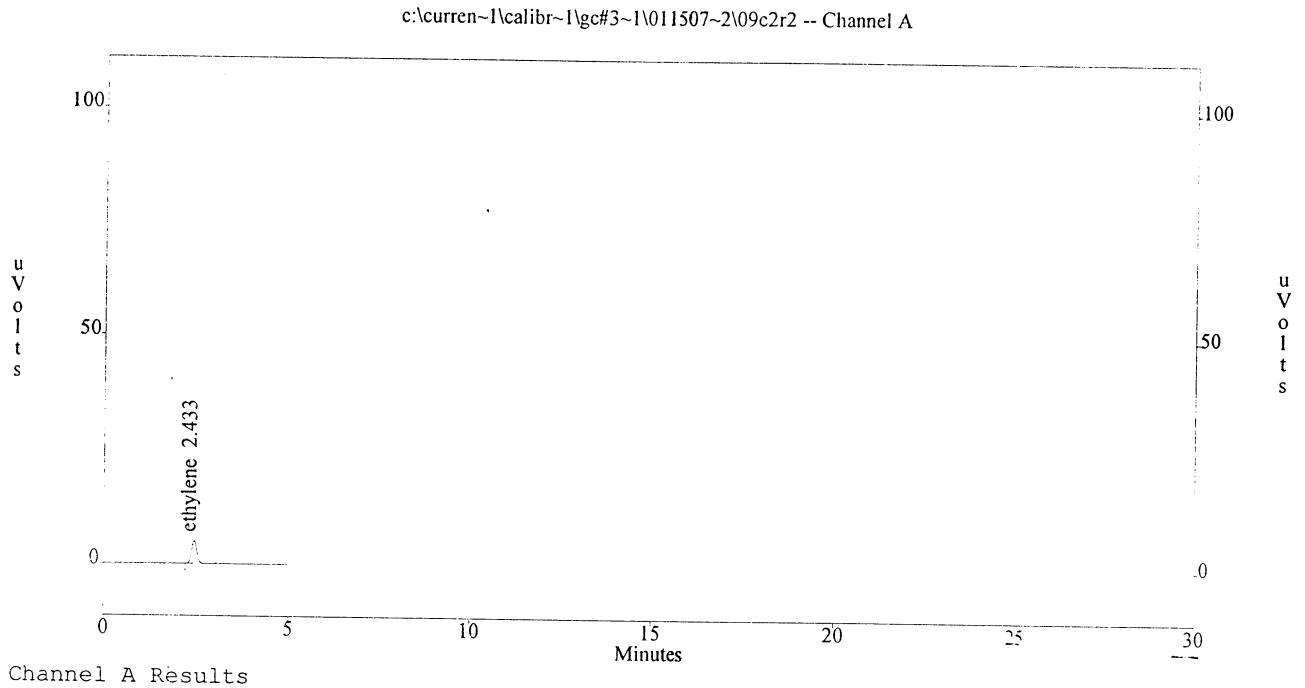
Totals :

47665

B35

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\011507~2\09c2r2
Method : c:\curren~1\calibr~1\gc#3~1\Gasmix.met
Sample ID : 0.9996% ethylene
Acquired : Jan 16, 2007 16:45:41
Printed : Jan 16, 2007 16:51:21
User : System



Channel A Results

Peak	Retention Time	Area
ethylene	2.43	44910

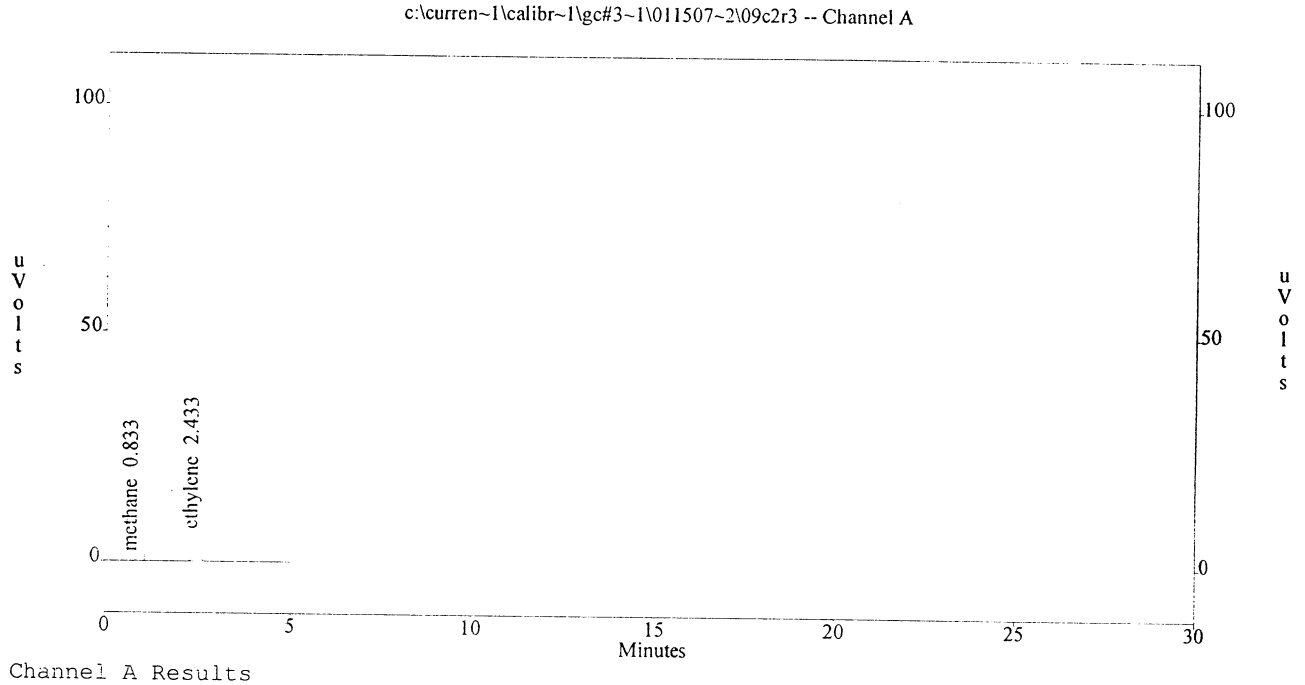
Totals :

44910

B36

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\011507~2\09c2r3
Method : c:\curren~1\calibr~1\gc#3~1\Gasmix.met
Sample ID : 0.9996% ethylene
Acquired : Jan 16, 2007 16:52:54
Printed : Jan 16, 2007 16:59:32
User : System



Channel A Results

Peak	Retention Time	Area
methane	0.83	277
ethylene	2.43	46788

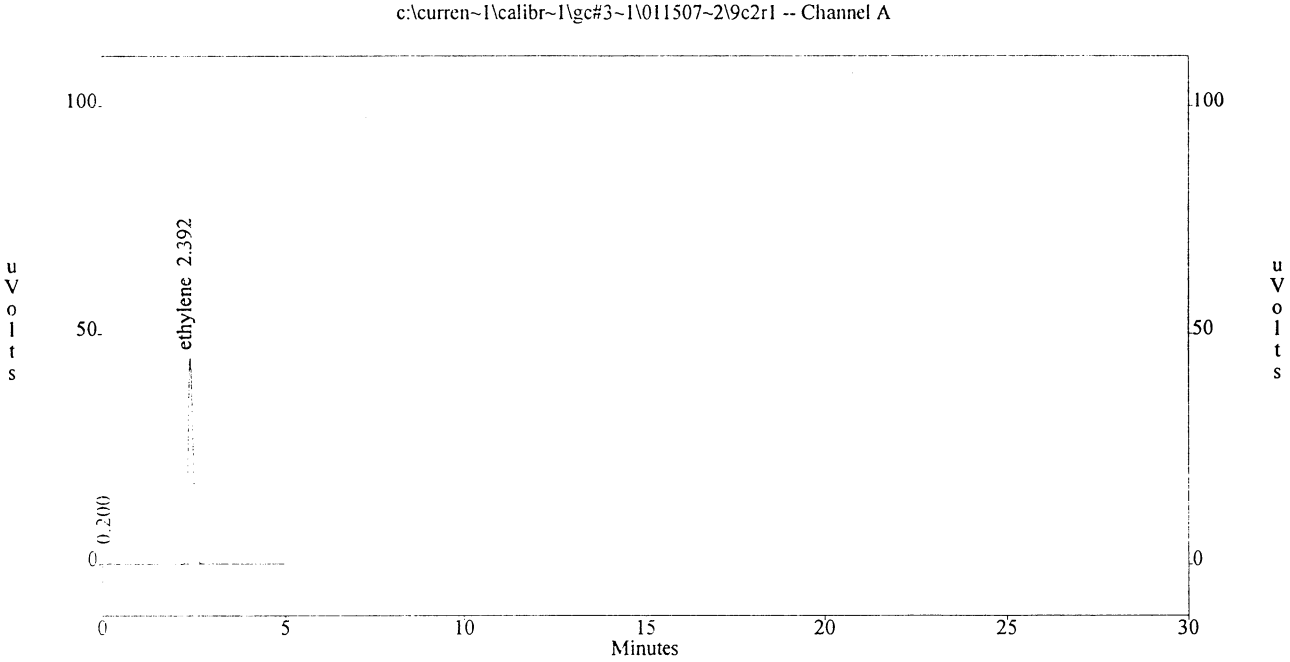
Totals :

47065

B37

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\011507~2\9c2r1
Method : c:\curren~1\calibr~1\gc#3~1\Gasmix.met
Sample ID : 9.996% ethylene
Acquired : Jan 16, 2007 16:08:31
Printed : Jan 16, 2007 16:16:12
User : System



Channel A Results

Peak	Retention Time	Area
	0.20	521
ethylene	2.39	426679

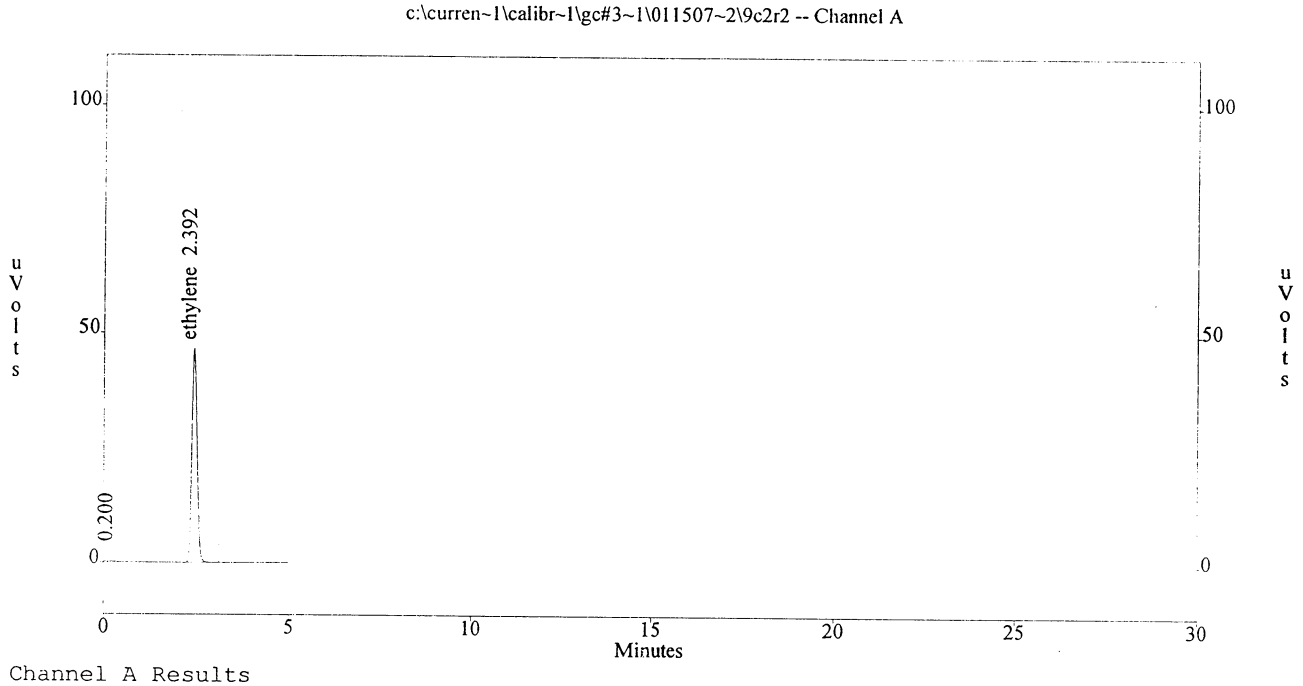
Totals :

427200

B38

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\011507~2\9c2r2
Method : c:\curren~1\calibr~1\gc#3~1\Gasmix.met
Sample ID : 9.996% ethylene
Acquired : Jan 16, 2007 16:17:59
Printed : Jan 16, 2007 16:24:49
User : System



Channel A Results

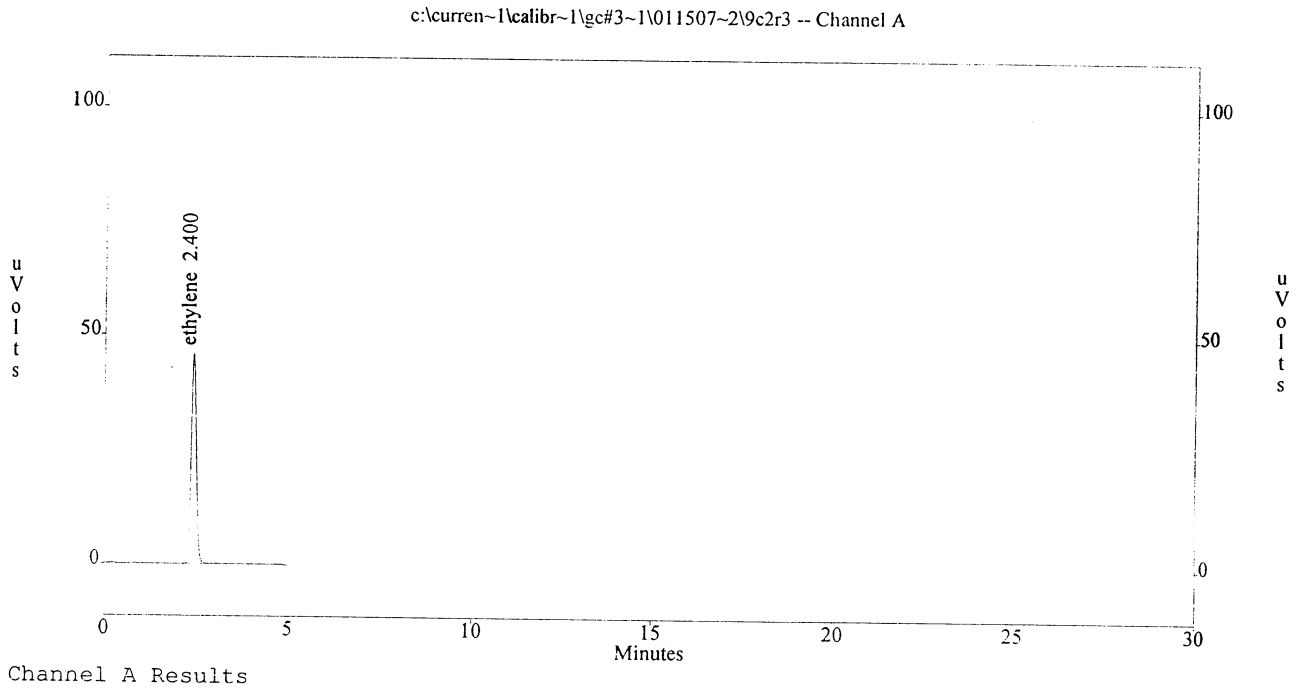
Peak	Retention Time	Area
	0.20	499
ethylene	2.39	444917

Totals :

445416

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\011507~2\9c2r3
Method : c:\curren~1\calibr~1\gc#3~1\Gasmix.met
Sample ID : 9.996% ethylene
Acquired : Jan 16, 2007 16:26:13
Printed : Jan 16, 2007 16:35:26
User : System



Channel A Results

Peak	Retention Time	Area
ethylene	2.40	436925

Totals :

436925

E 40

GC Misc. Gas Analysis

Calibration Standards

B 41

Shipped From: 9810 BAY AREA BLVD
PASADENA TX 77507
Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ANALYSIS

ENTECH ENGINEERING INC.
RICHARD ISHIKAWA
100 EAST NASA ROAD ONE
SUITE 407
WEBSTER TX 77598

PROJECT #: 04-43640-002
PO#: 51389
ITEM #: 0401549 A
DATE: 29Mar2006

CYLINDER #: A2059
FILL PRESSURE: 02200 PSIG

PURE MATERIAL: HYDROGEN CAS# 1333-74-0

GRADE: ULTRA-HIGH

PURITY: 99.999%

IMPURITY	MAXIMUM CONCENTRATIONS
O2	1 PPM
N2	5 PPM
THC	0.5 PPM
CO	0.5 PPM
CO2	0.5 PPM

$42

ANALYST: _____

Shipped From: 9810 BAY AREA BLVD
PASADENA TX 77507
Phone: 281-474-5800 Fax: 281-474-5857

CERTIFICATE OF ANALYSIS

ENTECH ENGINEERING INC.
RICHARD ISHIKAWA
100 EAST NASA ROAD ONE
SUITE 407
WEBSTER TX 77598

PROJECT #: 04-43640-006
PO#: 51389
ITEM #: 0401811 A
DATE: 29Mar2006

CYLINDER #: XEL33144
FILL PRESSURE: 02200 PSIG

PURE MATERIAL: NITROGEN CAS# 7727-37-9

GRADE: U Z A M

PURITY: 99.999%

IMPURITY	MAXIMUM CONCENTRATIONS
THC	0.05 PPM
CO	0.10 PPM
O2	2 PPM
CO2	1 PPM
NOX	0.02 PPM
SF6	0.001 PPM
SO2	0.005 PPM
H2O	4 PPM

ANALYST: BHS

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section: 2.2 Procedure: G-1

Cyl. Number: CC58029

ustomer:	Entech Engineering	Shipping Order #:	17313139
.O. Number:	51047	Transfer #:	17313139
em Number:		LOT #:	LPX123737
otes:		Valve	CGA590
		Cyl. Pressure:*	1900psig
ssay Date:	8-Aug-05	Expiration Date: 7-Aug-08	

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Oxygen	14.5 %	14.5 ±0.2 %
Nitrogen	Balance	Balance

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS204	GMIS204	19.0	%	0.2	O2	N2	CC115413	5/12/2007	N.A.

alysis Information:

mponent 1:	Oxygen
nalyzer Information	
Manufacturer:	Servomex
Model Number:	4605C
Serial Number:	1101
Analytical Principle:	Paramag.
MPC Calibrated:	07/28/05

	First Triad Analysis On:		8/8/2005	
	Trial 1	Trial 2	Trial 3	Units
Zero	0.07	0.07	0.07	
Reference	18.73	18.73	18.73	
Candidate	14.31	14.31	14.31	
Result	14.50	14.50	14.50	%
		Mean Result:	14.50	%

	Second Triad Analysis On:			
	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference				
Candidate				
Result				
		Mean Result:		

Analyst Signature: Warren Pereira

Calculated by: Warren Pereira

B44

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

PORTAGAS

****
CERTIFICATE OF ANALYSIS
****

DATE : 14-Aug-2006
P.O.#: 51544

MANUFACTURED FOR: 1779.0000
Attn: Steven
Entech Engineering Inc.
408 East Main
League City , TX 77573

CYLINDER SIZE : 58DS
CYLINDER CONTENTS: 58 L (2 CU.FT.) @ 70 F & 1000 PSIG (6890Kpag)
CYLINDER LOT # : 912006
MANUFACTURE DATE : 14-Aug-2006
EXPIRATION DATE : 13-Aug-2009

COMPOSITION	CONCENTRATION
CARBON MONOXIDE	99.5% (vol)

PREPARATION METHOD : GRAVIMETRIC BALANCES CALIBRATED TO N.I.S.T. WEIGHTS.
N.I.S.T. TEST NUMBER 822/270236-04

DAVID SUN
QUALITY ASSURANCE MANAGER

(800) 548-2268
PORTAGAS 6717-B POLK STREET, HOUSTON, TX 77011

845

PORTAGAS

****
CERTIFICATE OF ANALYSIS
****

DATE : 14-Aug-2006
P.O.#: 51544

MANUFACTURED FOR: 1779.0000
Attn: Steven
Entech Engineering Inc.
408 East Main
League City , TX 77573

CYLINDER SIZE : 58DS
CYLINDER CONTENTS: 0.5 LB @ 830 PSIG (5719Kpag)
CYLINDER LOT # : 912007
MANUFACTURE DATE : 14-Aug-2006
EXPIRATION DATE : 13-Aug-2009

COMPOSITION	CONCENTRATION
CARBON DIOXIDE	99%

PREPARATION METHOD : GRAVIMETRIC BALANCES CALIBRATED TO N.I.S.T. WEIGHTS.
N.I.S.T. TEST NUMBER 822/270236-04

DAVID SUN
QUALITY ASSURANCE MANAGER

(800) 548-2268
PORTAGAS 6717-B POLK STREET, HOUSTON, TX 77011

B46

ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 TCD
Hydrogen Standards

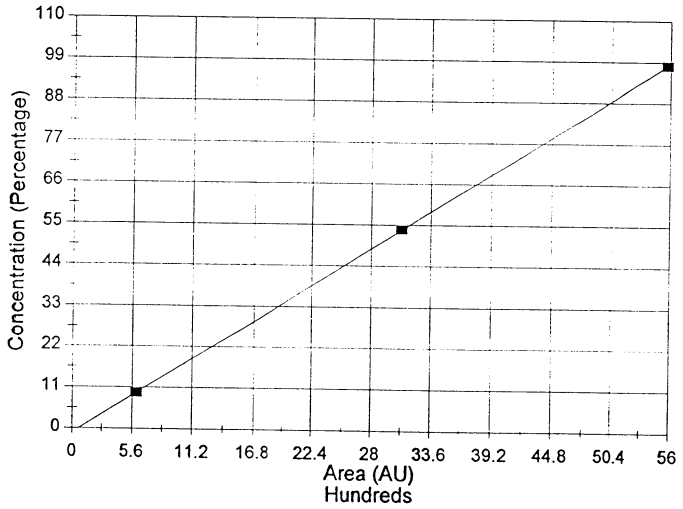
07/12/07

(Retention Time = 3.67 min)

Concentration (percent)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.00	0	0	0	0.0	NA
10.00	583	629	611	607.7	4.06%
50.00	3095	3083	3088	3088.7	0.21%
100.00	5617	5636	5477	5576.7	0.72%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	2.745
R Squared	0.996353
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	1.751295E-02
Std Err of Coef.	4.287131E-04



Operator _____ Date July 12 / 2007

B47

ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 TCD
Nitrogen Standards

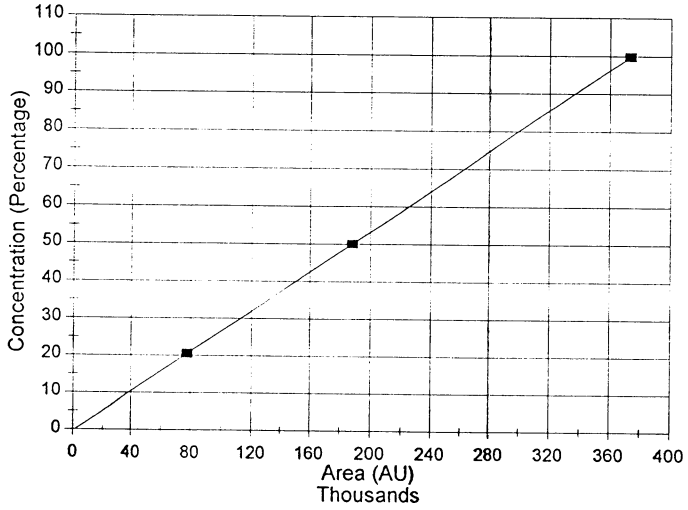
07/12/07

(Retention Time = 4.81 min)

Concentration (percent)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.0	0	0	0	0.0	NA
20.0	77683	78654	77755	78030.7	0.45%
50.0	189199	189568	186359	188375.3	0.44%
100.0	372779	377396	370548	373574.3	0.21%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.531
R Squared	0.999851
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	2.668598E-04
Std Err of Coef.	1.247316E-06



Operator pm Date July 12 2007

B48

ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 TCD
Oxygen Standards

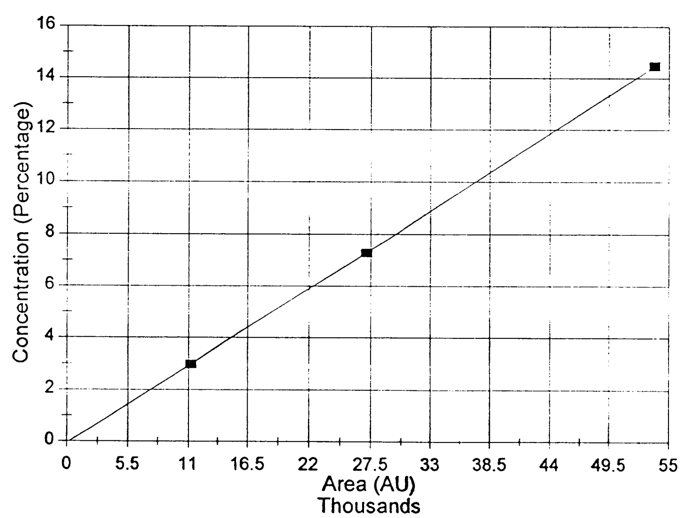
07/12/07

(Retention Time = 5.11min)

Concentration (percent)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.00	0	0	0	0.0	NA
2.90	11234	11176	11374	11261.3	0.24%
7.25	27242	27061	27160	27154.3	0.32%
14.50	53505	53811	53806	53707.3	0.38%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.087
R Squared	0.999812
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	2.689721E-04
Std Err of Coef.	1.413441E-06



Operator km Date July 15 /2007

B49

ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 TCD
Carbon Monoxide Standards

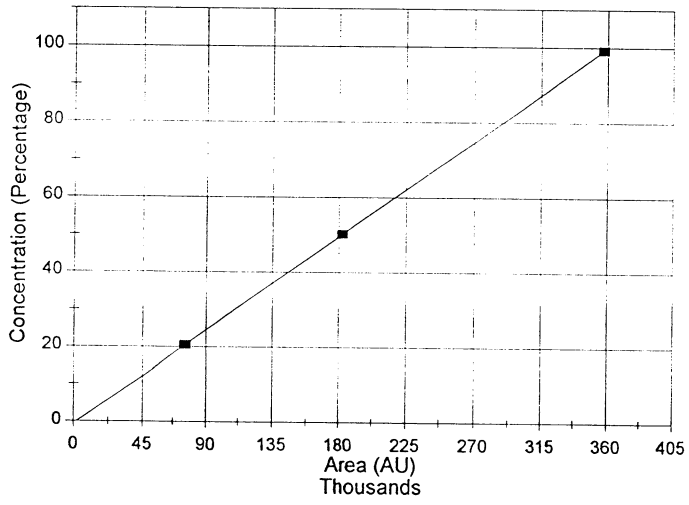
07/12/07

(Retention Time = 5.37 min)

Concentration (percent)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.0	0	0	0	0.0	NA
19.9	77323	76230	74371	75974.7	1.77%
49.8	184524	181219	182963	182902.0	0.89%
99.5	356932	356808	360608	358116.0	0.33%

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.839
R Squared	0.999624
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	2.761280E-04
Std Err of Coef.	2.049269E-06



Operator km Date July 15 2007

B50

ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #3 TCD
Carbon Dioxide Standards

07/12/07

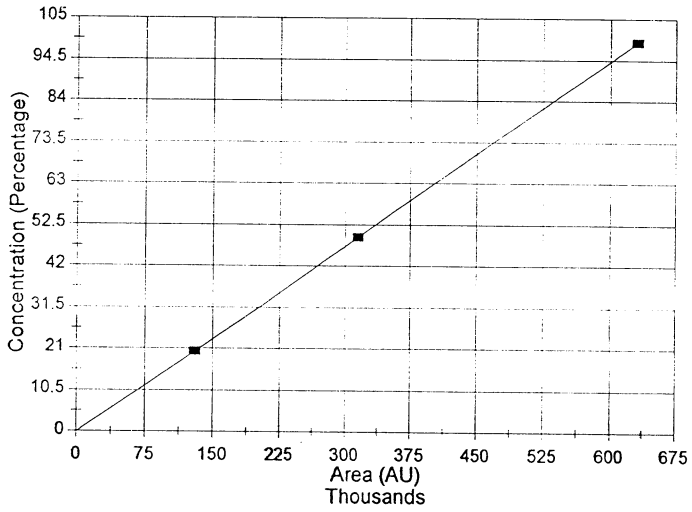
(Retention Time = 15.56 min)

Concentration (percent)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average Area (AU)	Precision Error (%)
0.0	0	0	0	0.0	NA
19.8	132565	134254	124958	130592.3	1.51%
49.5	311786	323421	311565	315590.7	1.21%
99.0	629298	634331	631621	631750.0	0.39%

PortaGas (Lot # 912007)

Regression Data (Zero-Forced)

Constant	0.0000
Std Err of Y Est	0.380
R Squared	0.999922
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	1.565665E-04
Std Err of Coef.	5.294251E-07

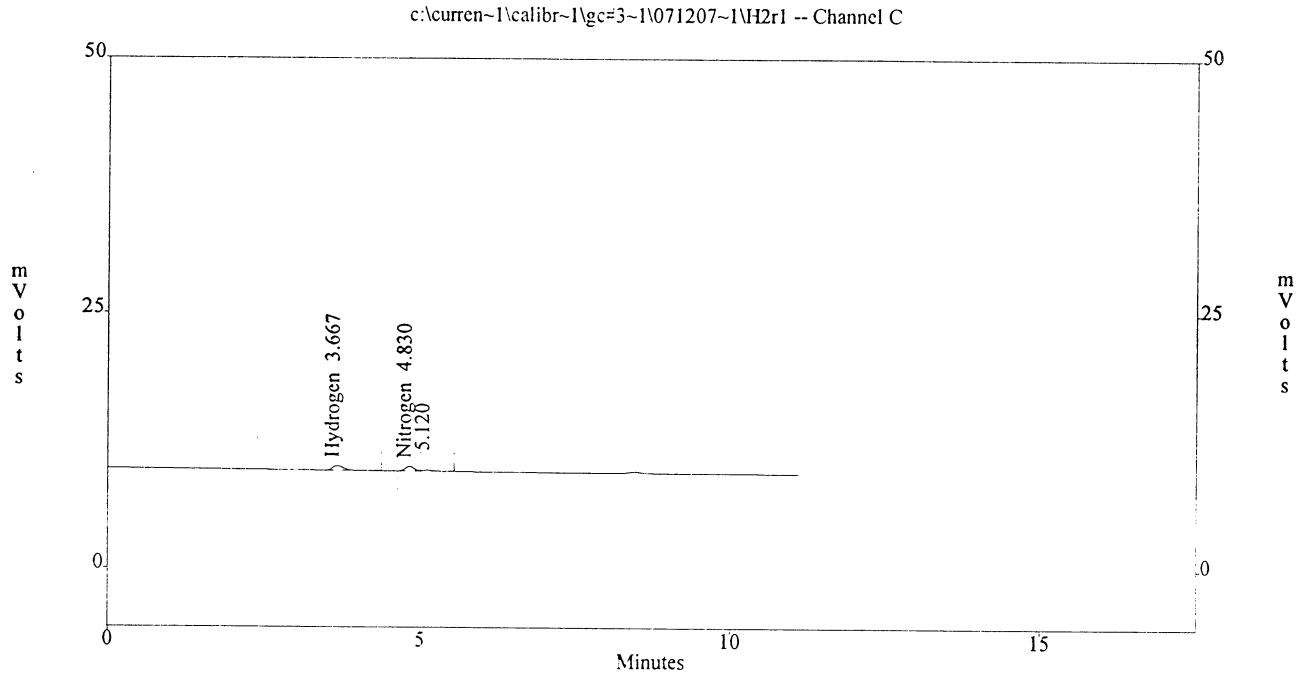


Operator km Date July 15/2007

B-51

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\H2r1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% H2
Acquired : Jul 12, 2007 14:15:22
Printed : Jul 12, 2007 14:26:37
User : System



Channel C Results

Peak	Retention Time	Area
Hydrogen	3.67	5617
Nitrogen	4.83	4469
	5.12	1164

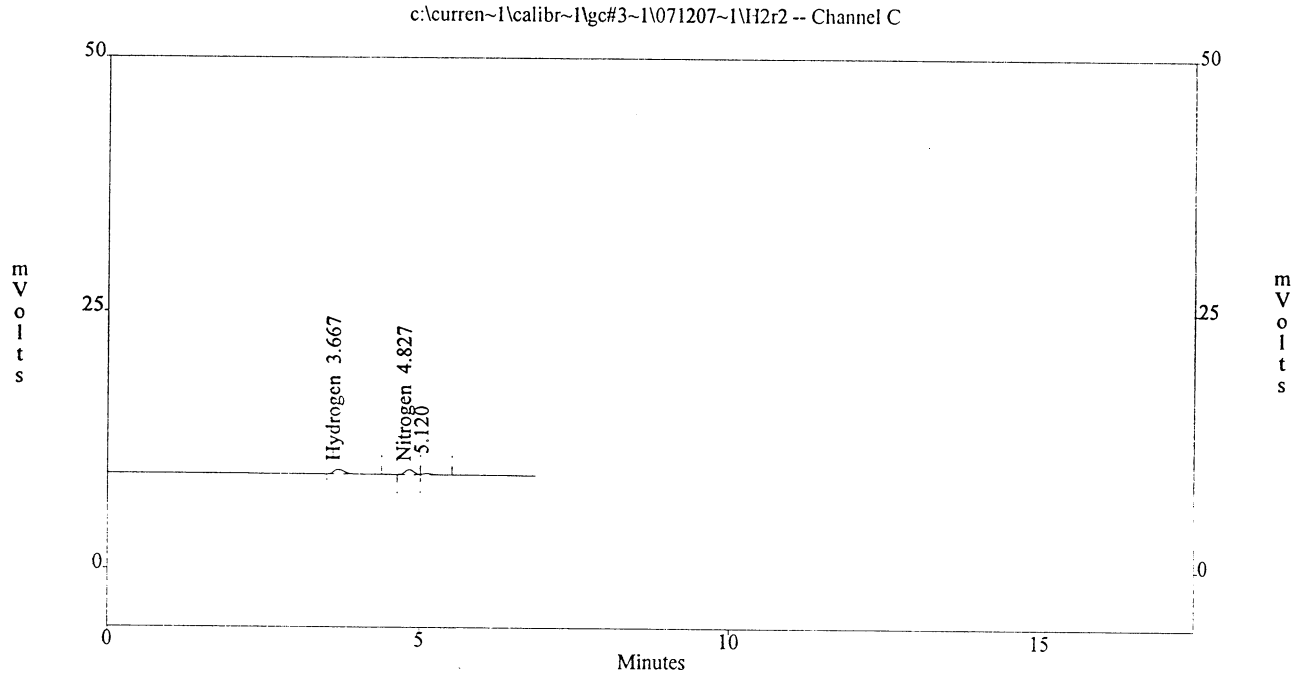
Totals :

11250

B52

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\H2r2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% h2
Acquired : Jul 12, 2007 14:33:17
Printed : Jul 12, 2007 14:40:08
User : System



Channel C Results

Peak	Retention Time	Area
Hydrogen	3.67	5636
Nitrogen	4.83	4892
	5.12	1295

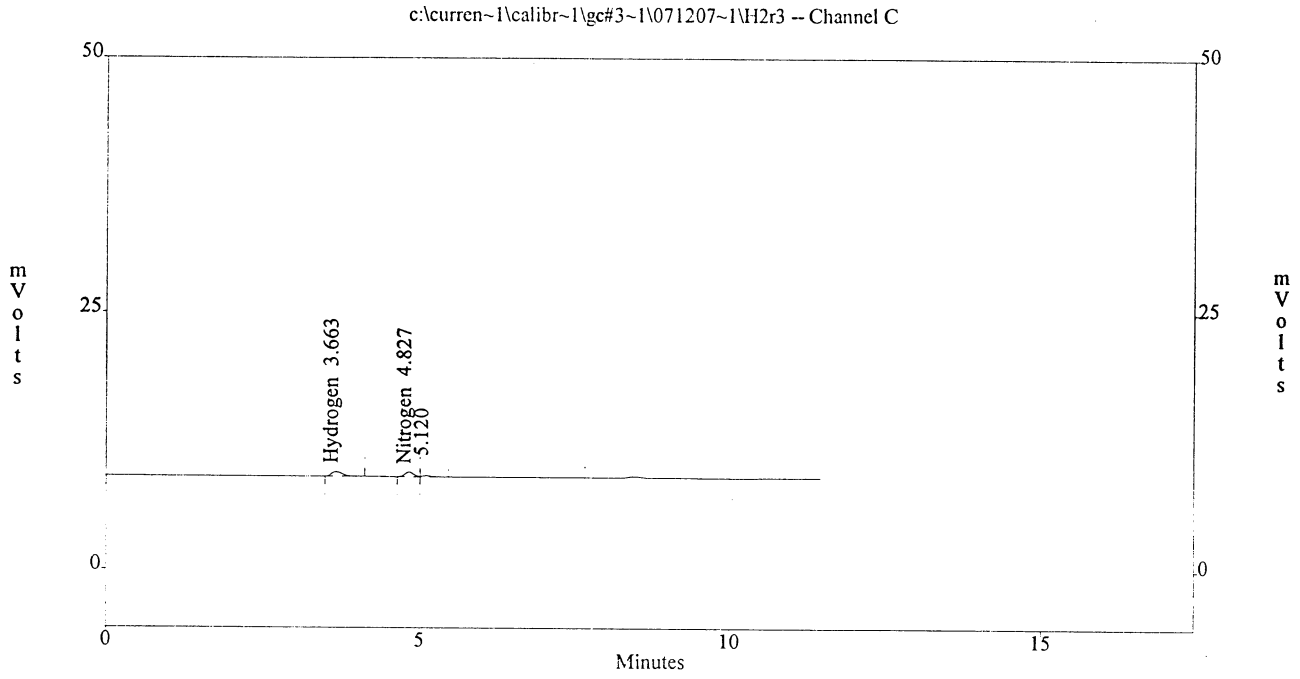
Totals :

11823

B-53

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\H2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% H2
Acquired : Jul 12, 2007 14:43:27
Printed : Jul 12, 2007 14:56:23
User : System



Channel C Results

Peak	Retention Time	Area
Hydrogen	3.66	5477
Nitrogen	4.83	4479
	5.12	1159

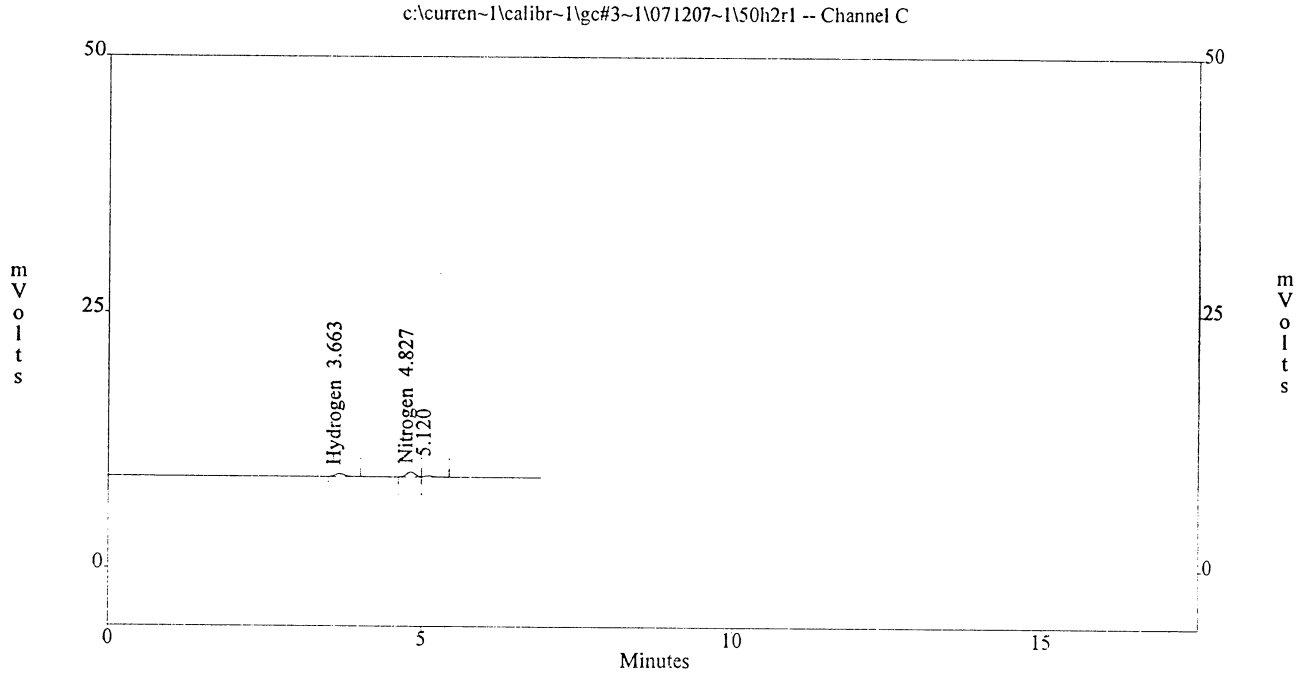
Totals :

11115

B54

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50h2r1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% H2
Acquired : Jul 12, 2007 16:05:54
Printed : Jul 12, 2007 16:12:53
User : System



Channel C Results

Peak	Retention Time	Area
Hydrogen	3.66	3095
Nitrogen	4.83	4585
	5. 2	2 5

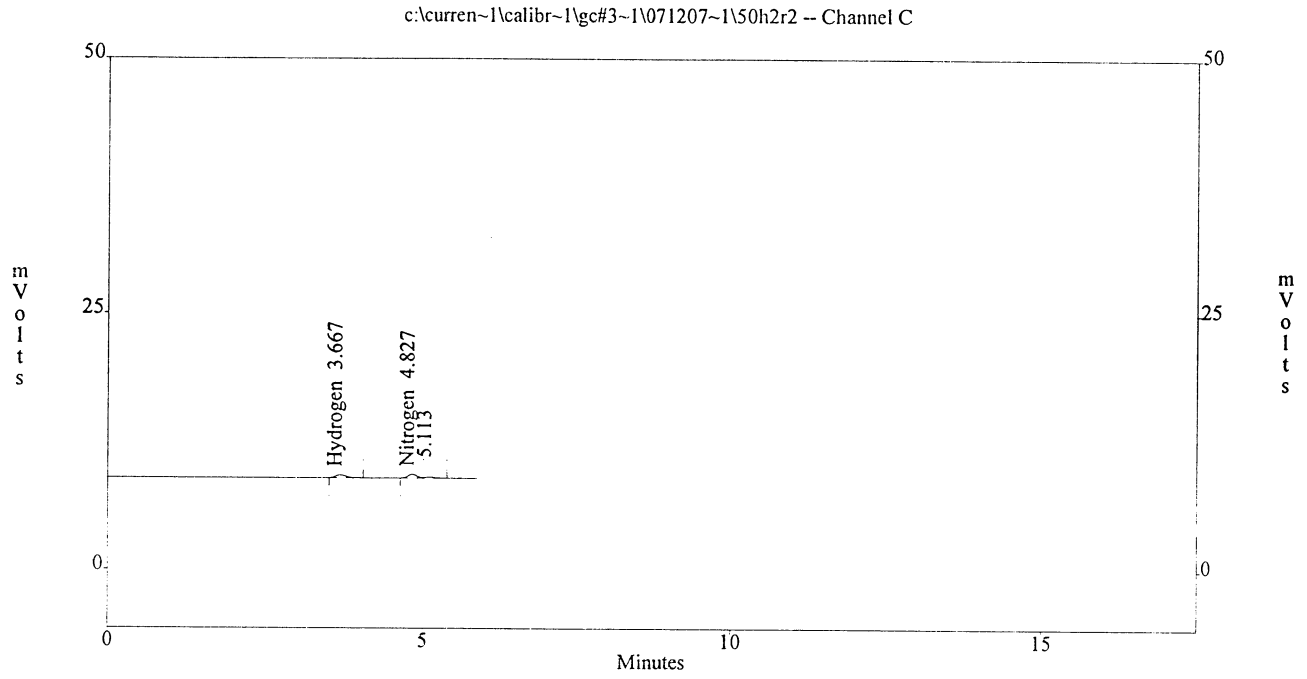
Totals :

8895

B55

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50h2r2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% H2
Acquired : Jul 12, 2007 16:15:28
Printed : Jul 12, 2007 16:21:31
User : System



Channel C Results

Peak	Retention Time	Area
Hydrogen	3.67	3083
Nitrogen	4.83	3604
	5.11	936

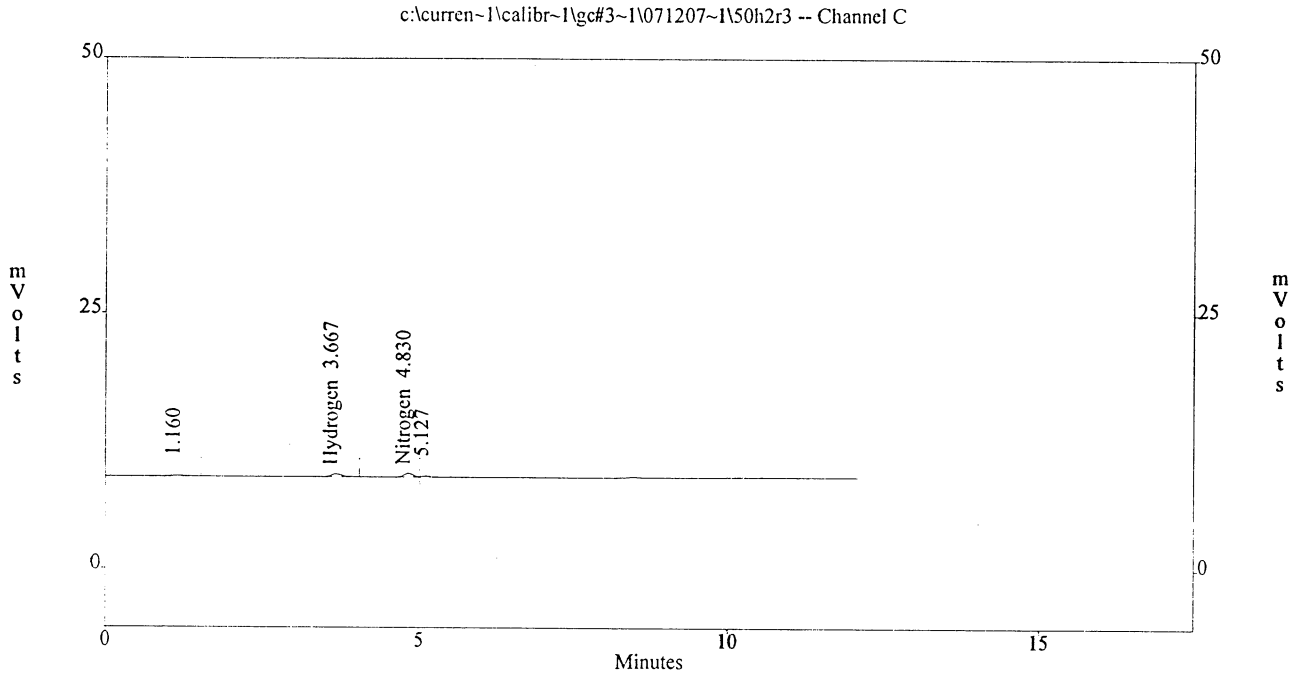
Totals :

7623

B56

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50h2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% H2
Acquired : Jul 12, 2007 16:23:05
Printed : Jul 12, 2007 16:35:19
User : System



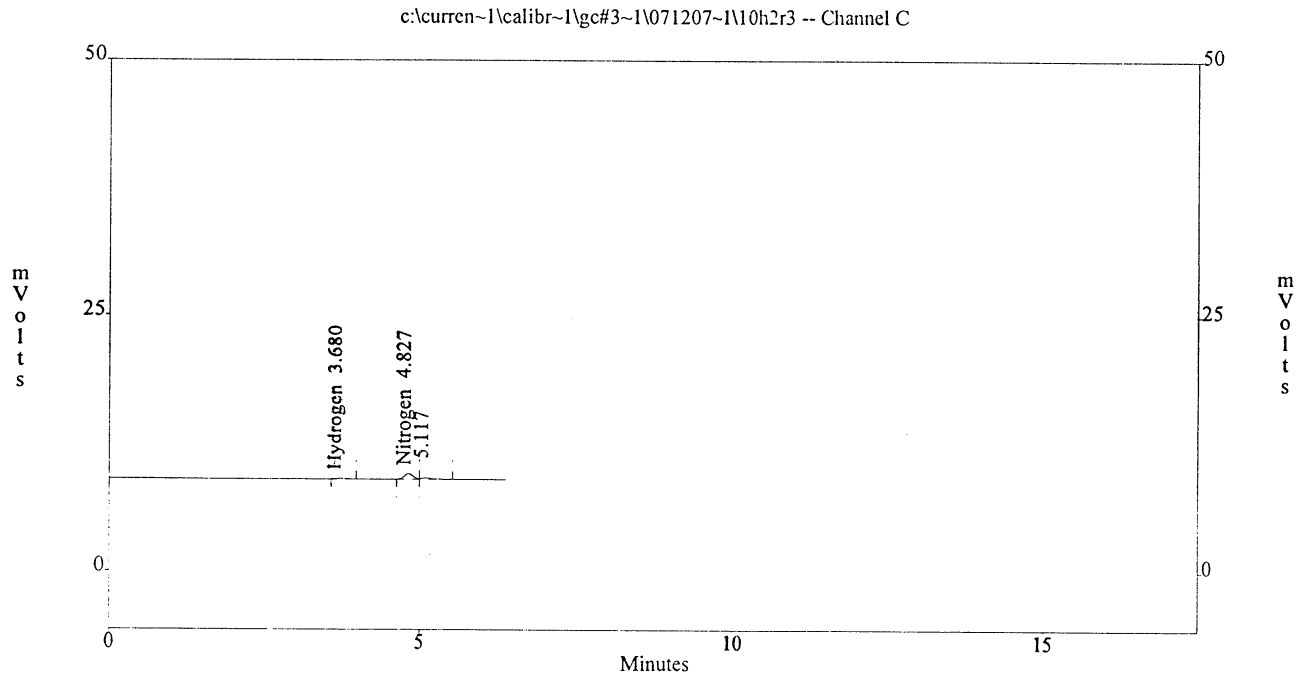
Channel C Results

Peak	Retention Time	Area
	1.16	772
Hydrogen	3.67	3088
Nitrogen	4.83	3432
	5.13	913
Totals :		8205

B57

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\10h2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 10% H2
Acquired : Jul 12, 2007 17:08:01
Printed : Jul 12, 2007 17:15:39
User : System



Channel C Results

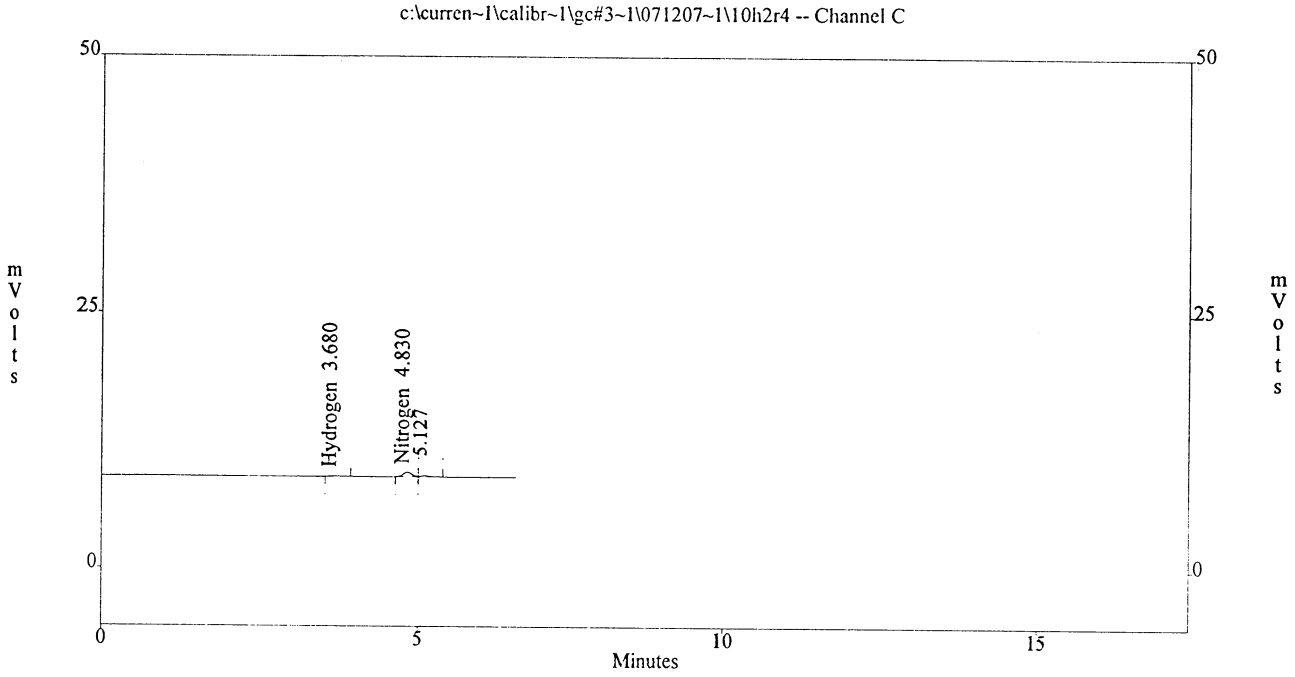
Peak	Retention Time	Area
Hydrogen	3.68	583
Nitrogen	4.83	5165
	5.12	1418

Totals : 7166

B 58

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\10h2r4
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 10% H2
Acquired : Jul 12, 2007 17:17:04
Printed : Jul 12, 2007 17:23:56
User : System



Channel C Results

Peak	Retention Time	Area
Hydrogen	3.68	629
Nitrogen	4.83	4309
	5.13	1125

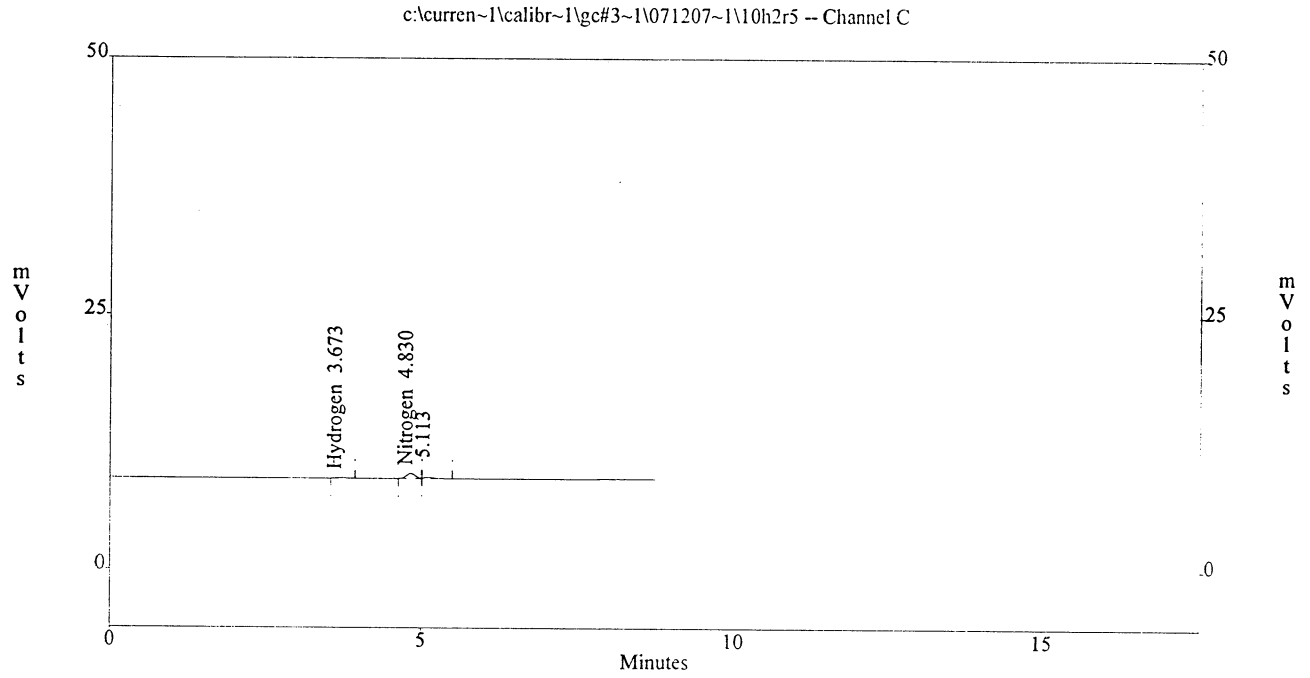
Totals :

6063

B-59

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\10h2r5
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 10% H2
Acquired : Jul 12, 2007 17:26:05
Printed : Jul 12, 2007 17:34:56
User : System



Channel C Results

Peak	Retention Time	Area
Hydrogen	3.67	611
Nitrogen	4.83	5059
	5.11	1353

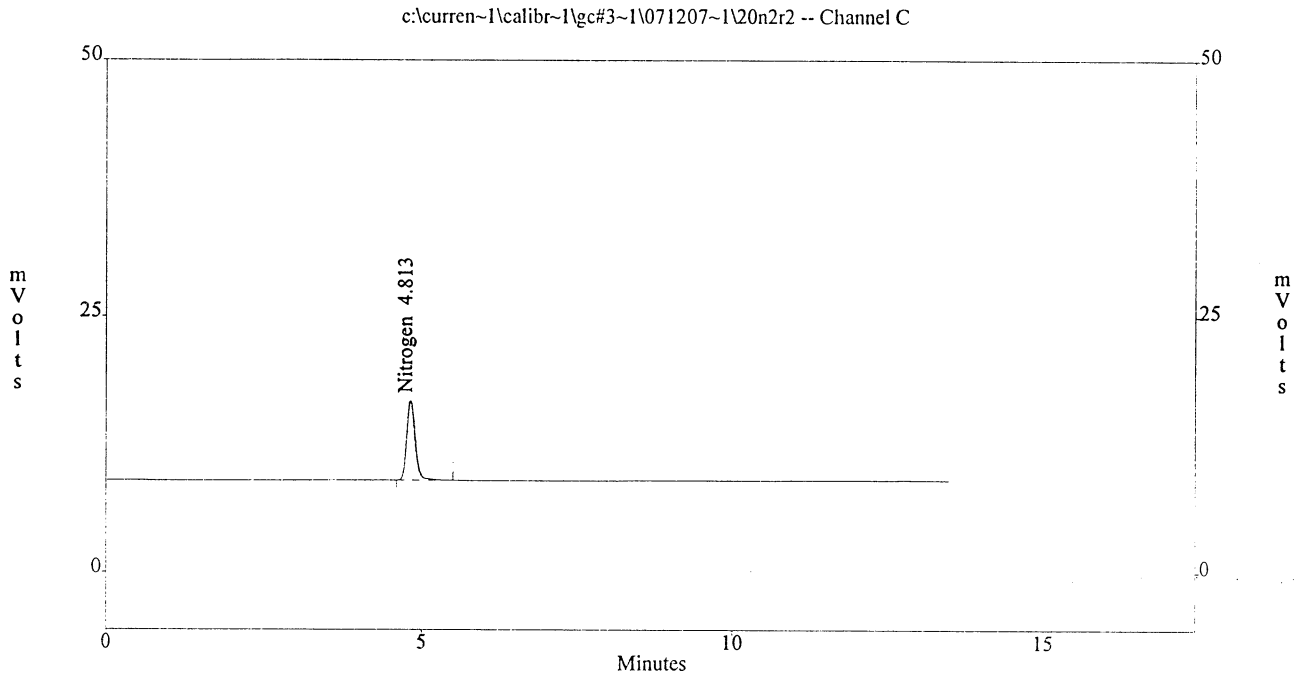
Totals :

7023

B60

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\20n2r2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 20% N2
Acquired : Jul 13, 2007 10:56:07
Printed : Jul 13, 2007 11:09:38
User : System



Channel C Results

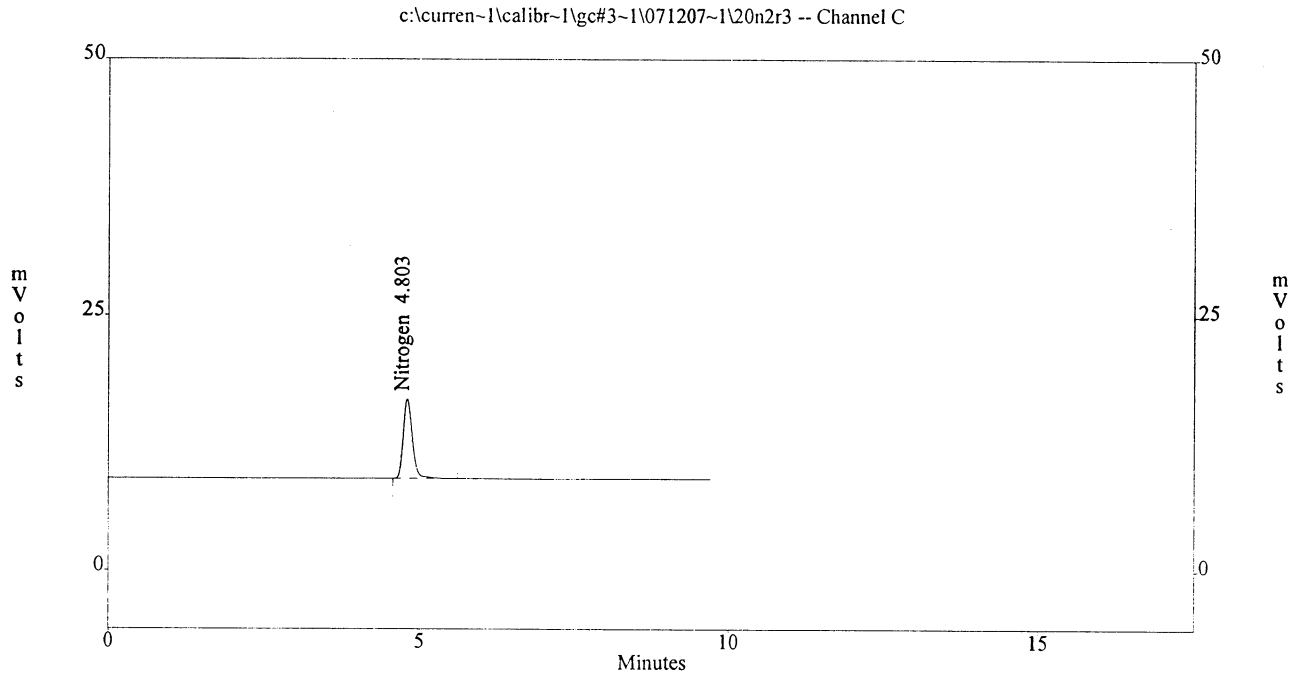
Peak	Retention Time	Area
Nitrogen	4.81	77683

Totals : 77683

B-61

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\20n2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 20% N2
Acquired : Jul 13, 2007 11:13:29
Printed : Jul 13, 2007 11:23:21
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.80	78654

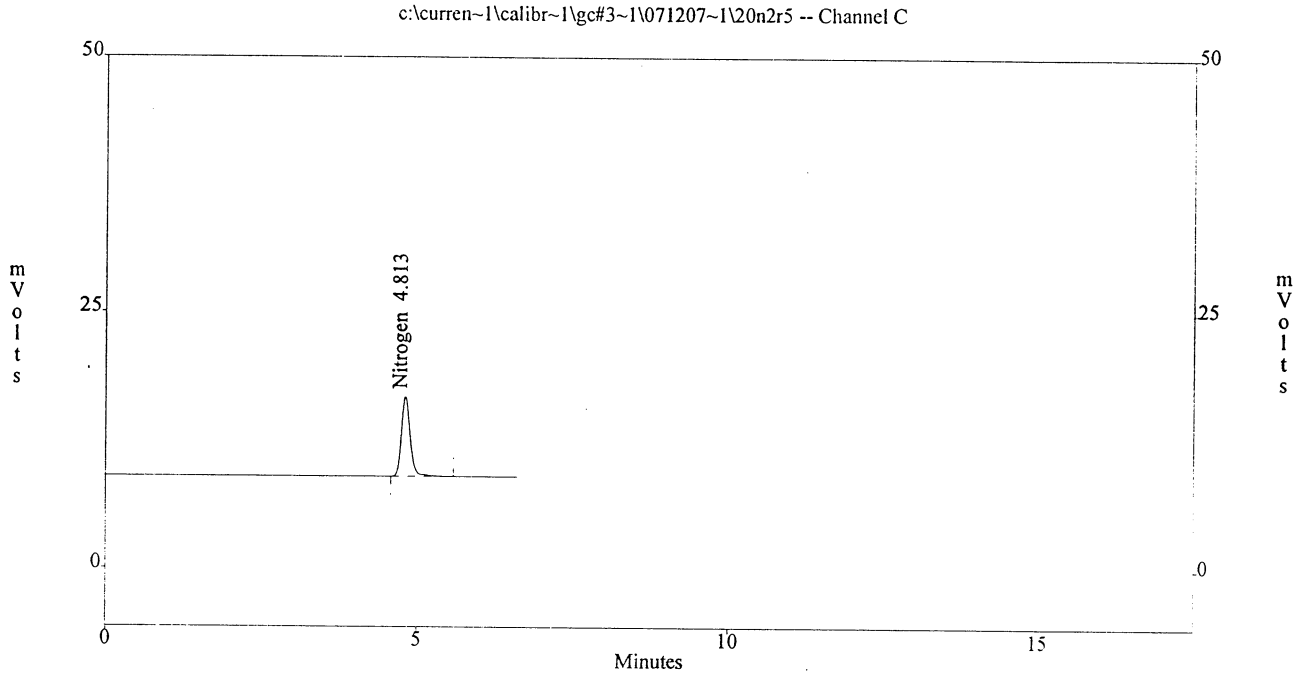
Totals :

78654

B62

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\20n2r5
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 20% N2
Acquired : Jul 13, 2007 12:01:15
Printed : Jul 13, 2007 12:08:00
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.81	77755

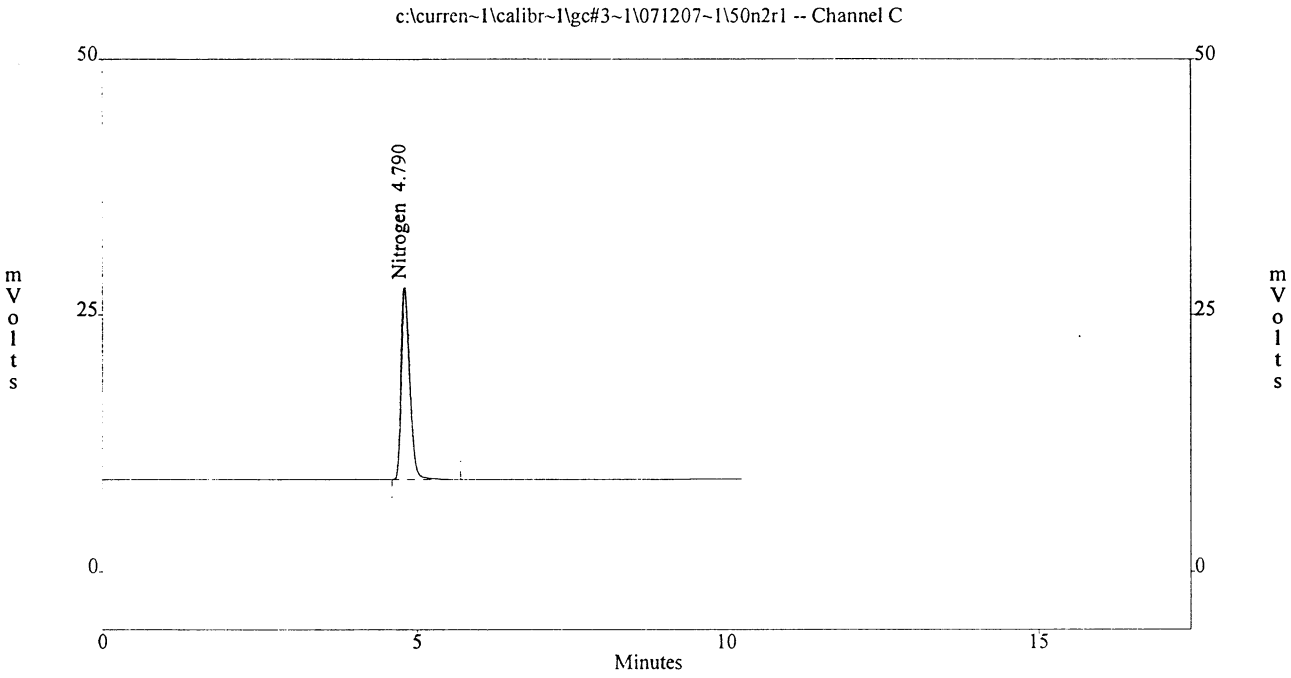
Totals :

77755

B63

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50n2r1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% N2
Acquired : Jul 13, 2007 12:10:53
Printed : Jul 13, 2007 12:22:04
User : System



Channel C Results

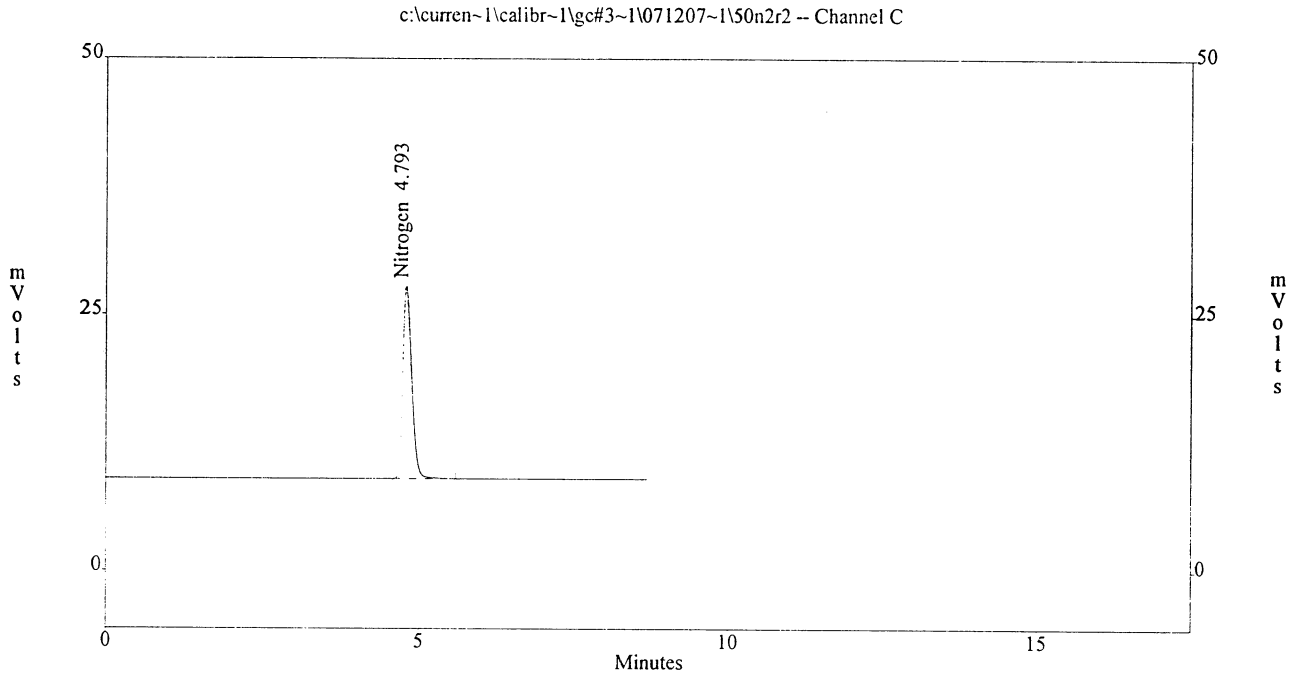
Peak	Retention Time	Area
Nitrogen	4.79	189199

Totals : 189199

B64

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50n2r2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% N2
Acquired : Jul 13, 2007 12:26:18
Printed : Jul 13, 2007 12:35:02
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.79	189568

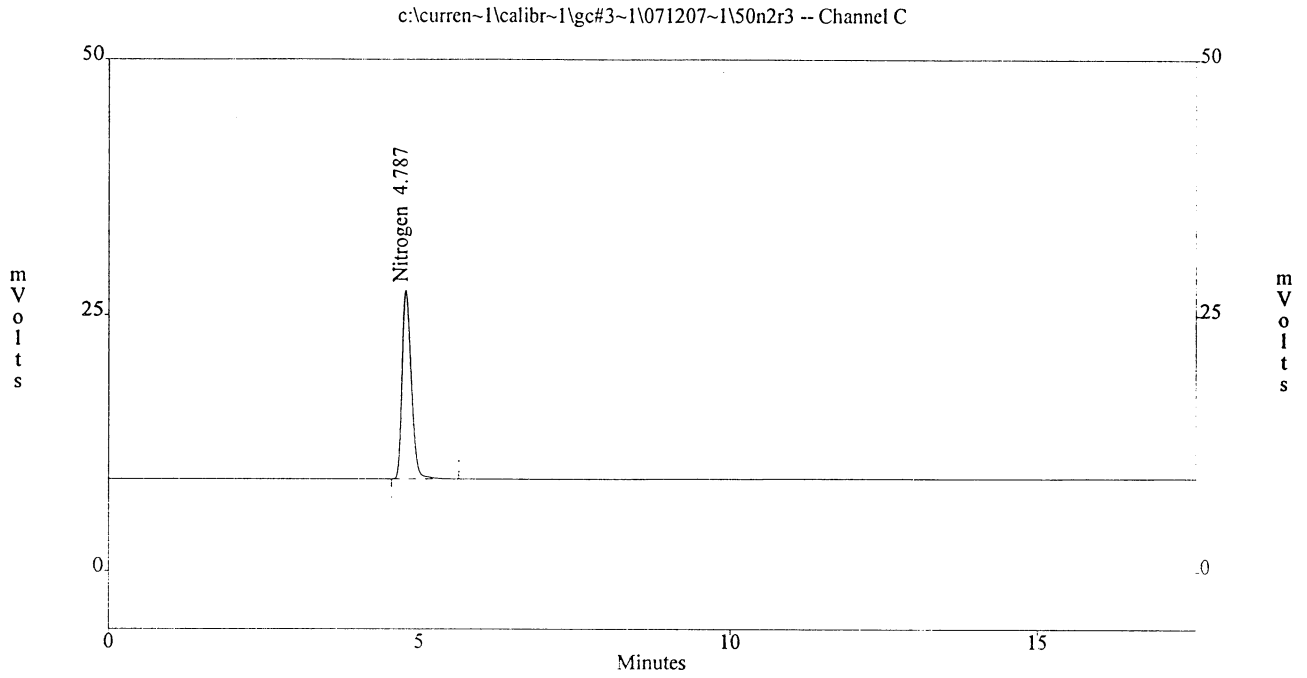
Totals :

189568

B65

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50n2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% N2
Acquired : Jul 13, 2007 12:49:46
Printed : Jul 13, 2007 13:09:53
User : System



Channel C Results

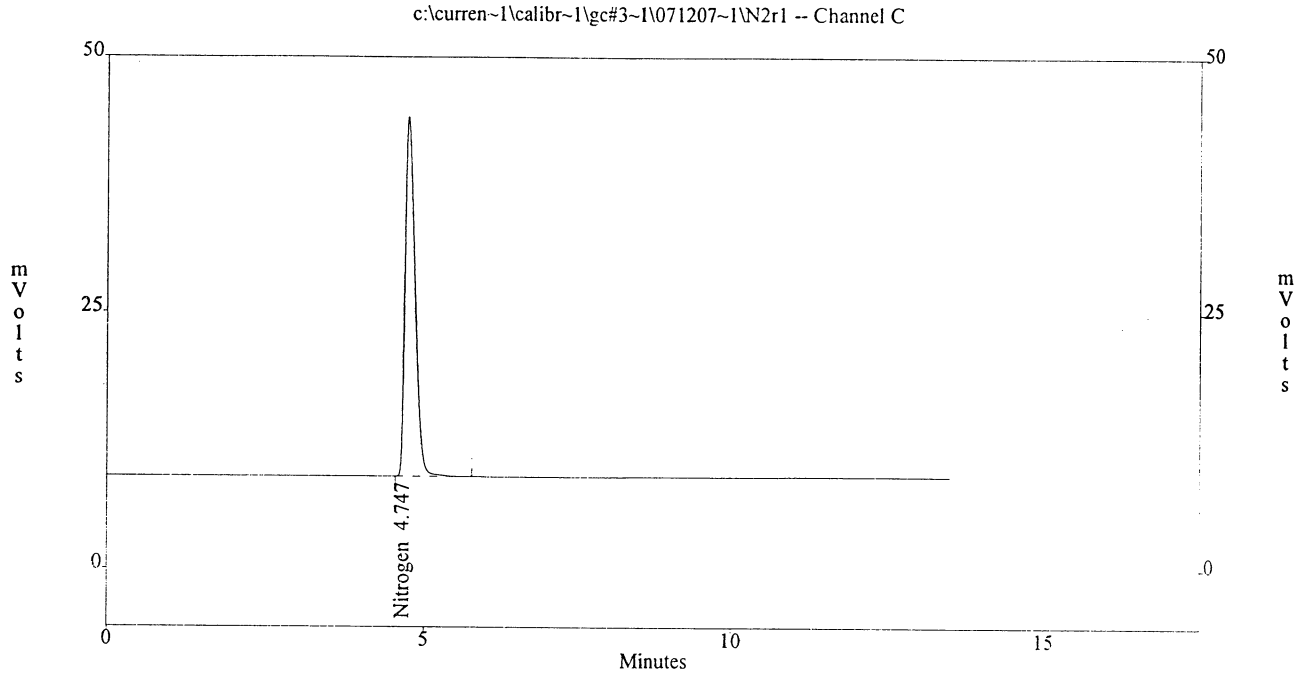
Peak	Retention Time	Area
Nitrogen	4.79	186359

Totals :

186359

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\N2r1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% N2
Acquired : Jul 13, 2007 13:13:23
Printed : Jul 13, 2007 13:26:54
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.75	372779

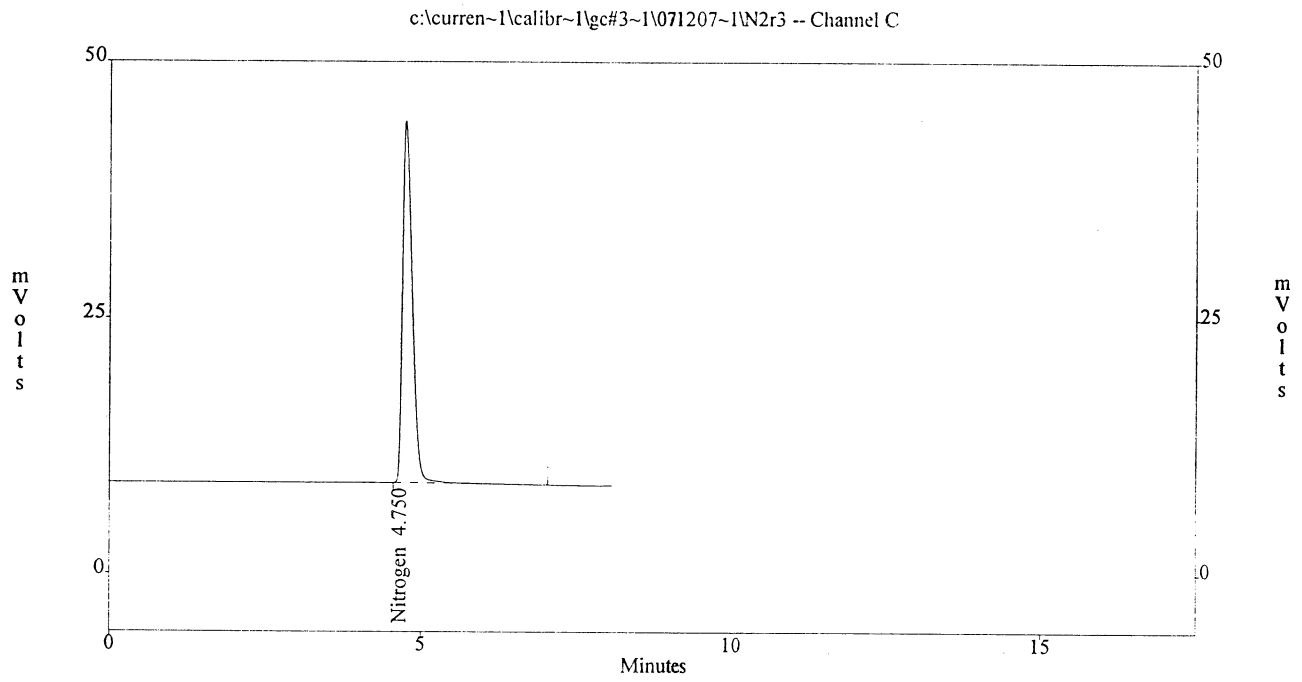
Totals :

372779

B67

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\N2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% N2
Acquired : Jul 13, 2007 13:45:55
Printed : Jul 13, 2007 13:54:00
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.75	377396

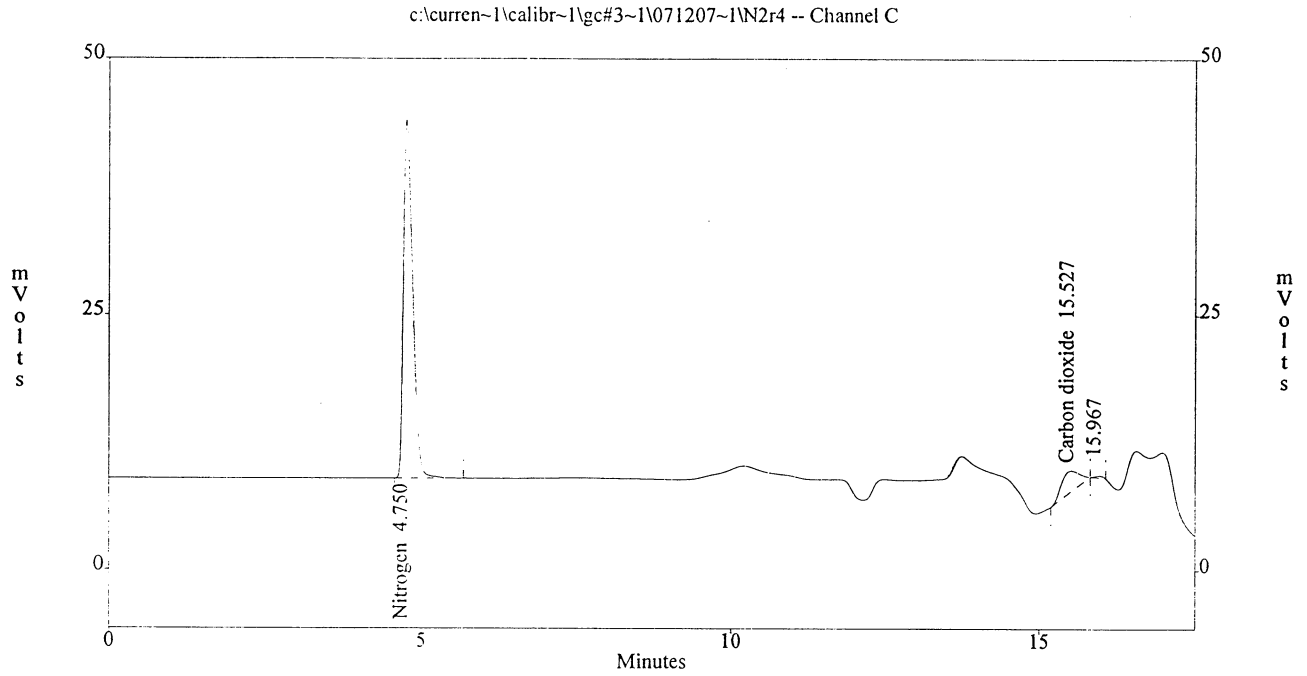
Totals :

377396

B68

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\N2r4
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% N2
Acquired : Jul 13, 2007 13:57:17
Printed : Jul 13, 2007 14:19:52
User : System



Channel C Results

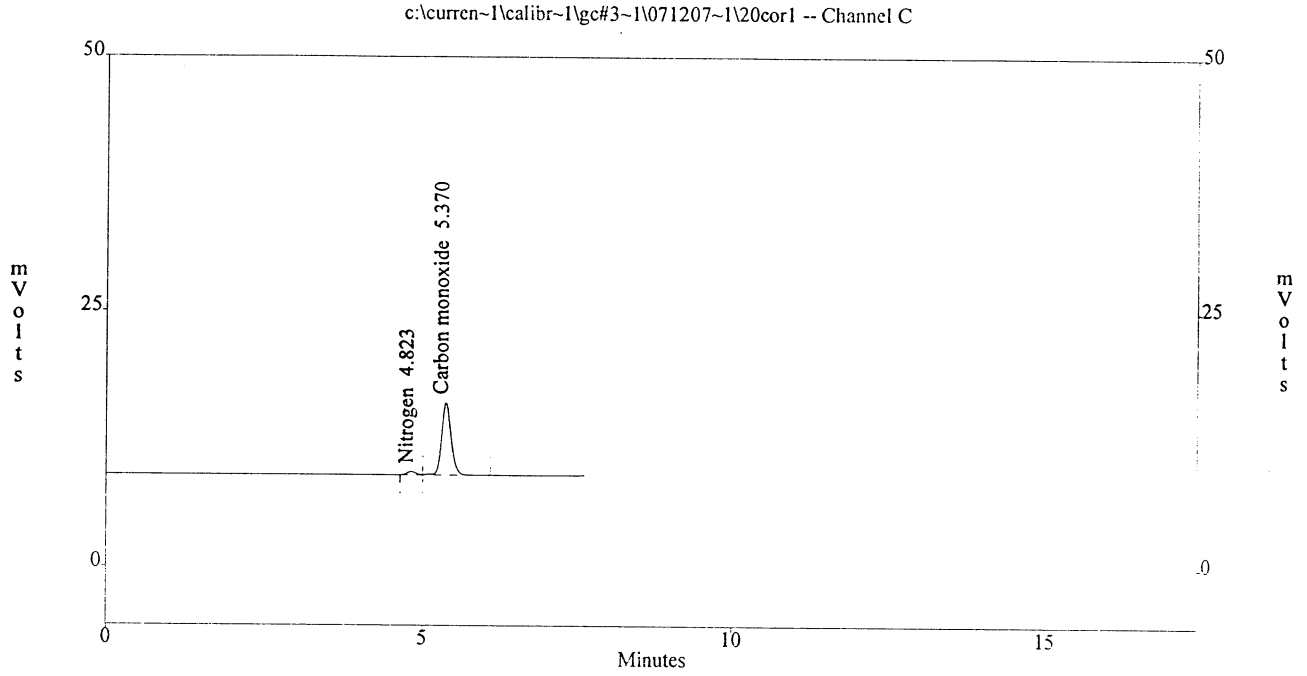
Peak	Retention Time	Area
Nitrogen	4.75	370548
Carbon dioxide	15.53	41871
	15.97	1912

Totals :

414331

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\20cor1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 20% co
Acquired : Jul 13, 2007 14:22:14
Printed : Jul 13, 2007 14:30:24
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.82	3068
Carbon monoxide	5.37	77323

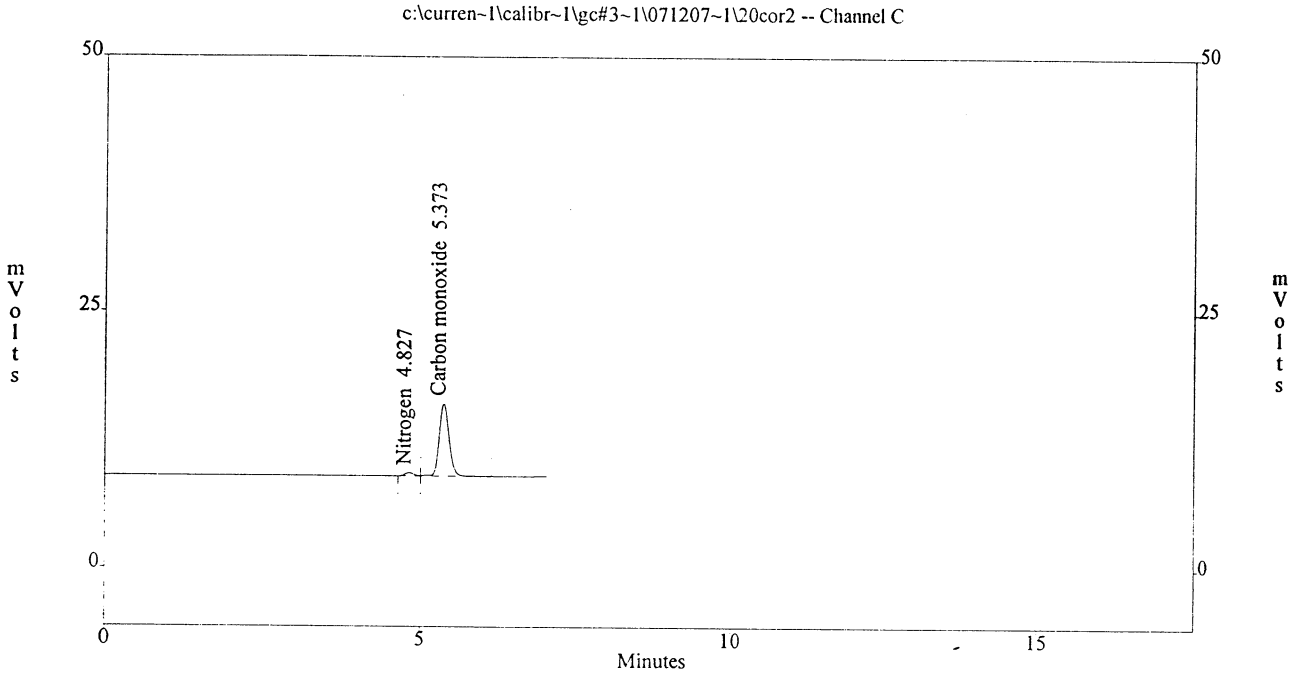
Totals :

80391

B70

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\20cor2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 20% co
Acquired : Jul 13, 2007 14:37:21
Printed : Jul 13, 2007 14:44:32
User : System



Channel C Results

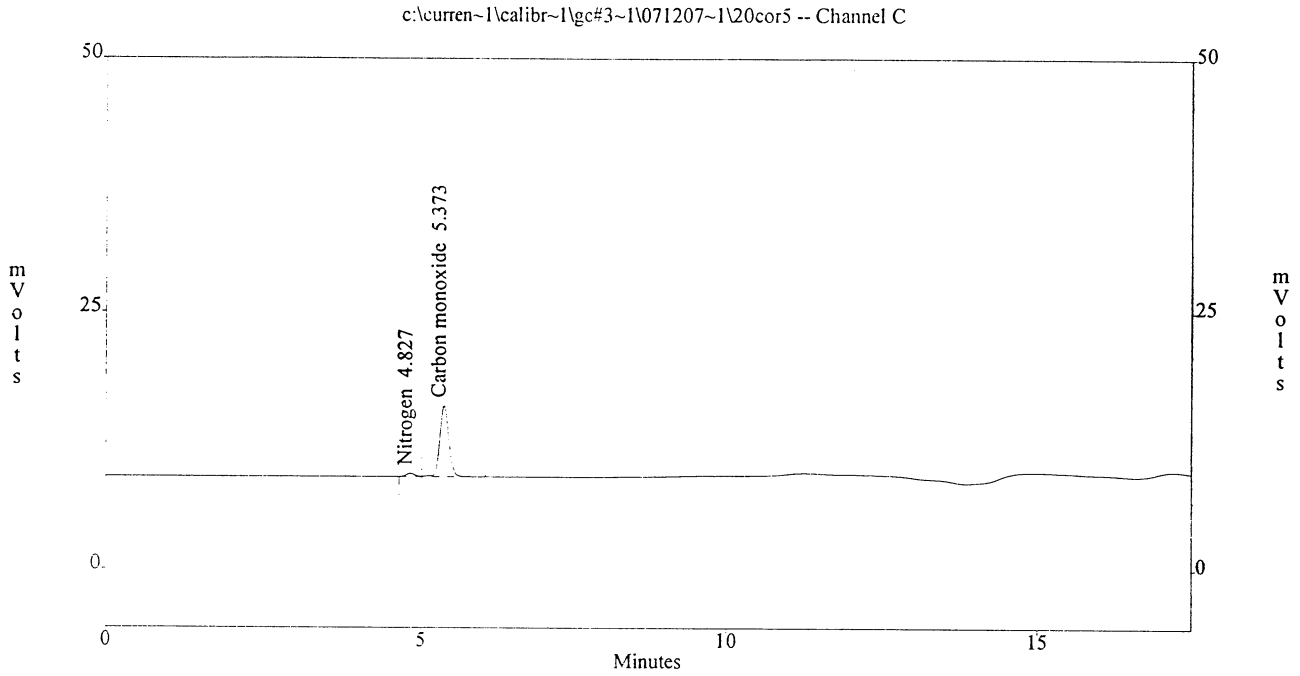
Peak	Retention Time	Area
Nitrogen	4.83	3016
Carbon monoxide	5.37	76230

Totals :

79246

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\20cor5
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 20% co
Acquired : Jul 13, 2007 15:56:33
Printed : Jul 13, 2007 16:19:12
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.83	3111
Carbon monoxide	5.37	74371

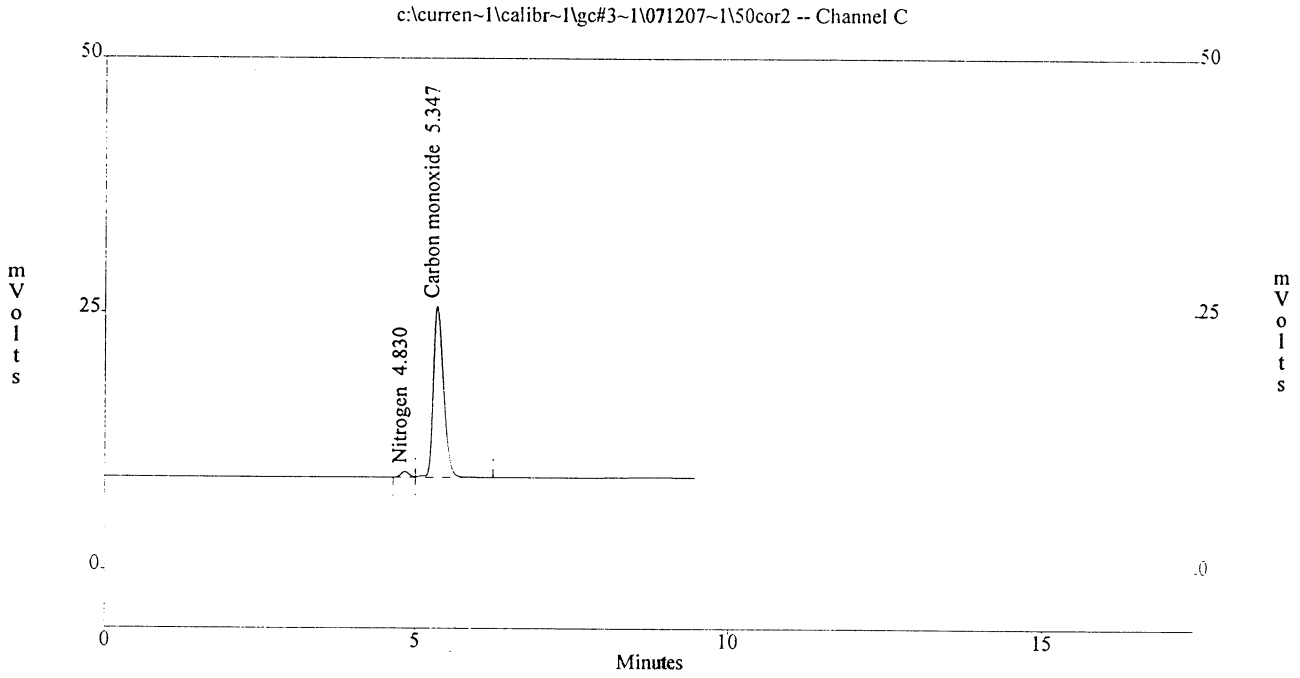
Totals :

77482

B12

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50cor2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% co
Acquired : Jul 13, 2007 16:51:13
Printed : Jul 13, 2007 17:30:32
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.83	5374
Carbon monoxide	5.35	184524

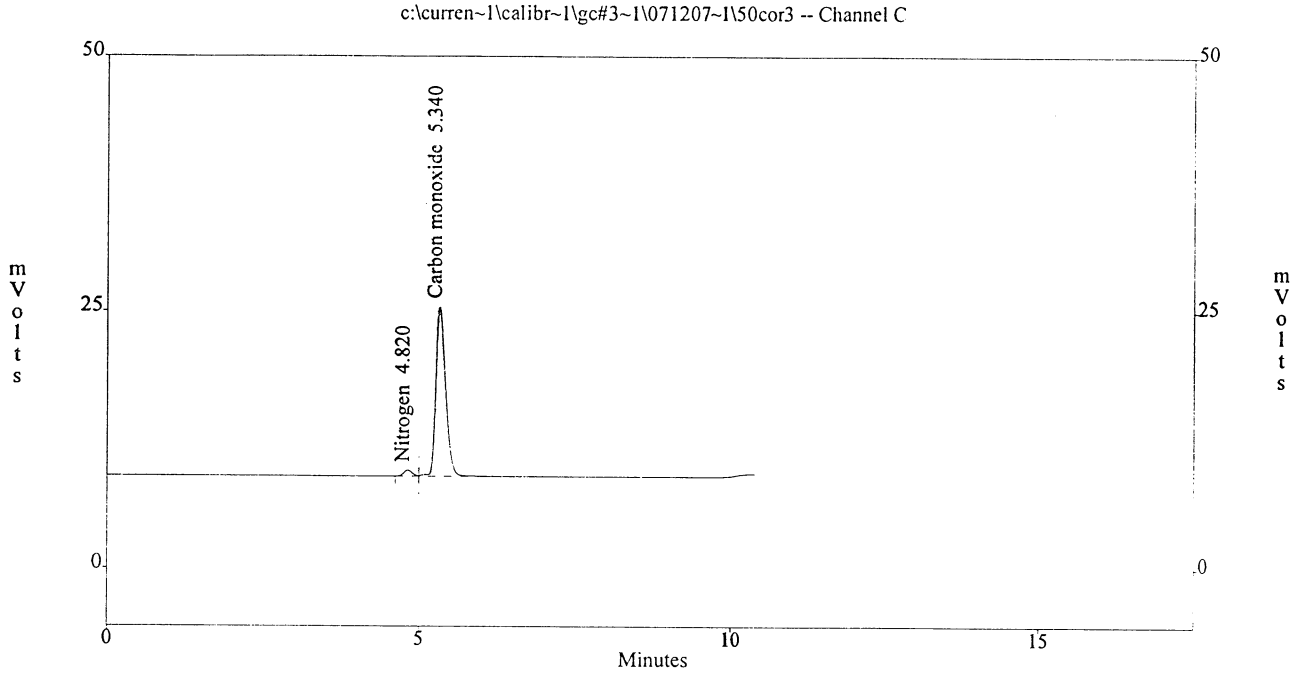
Totals :

189898

B 73

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50cor3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% co
Acquired : Jul 13, 2007 17:31:58
Printed : Jul 13, 2007 17:42:39
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.82	5560
Carbon monoxide	5.34	181219

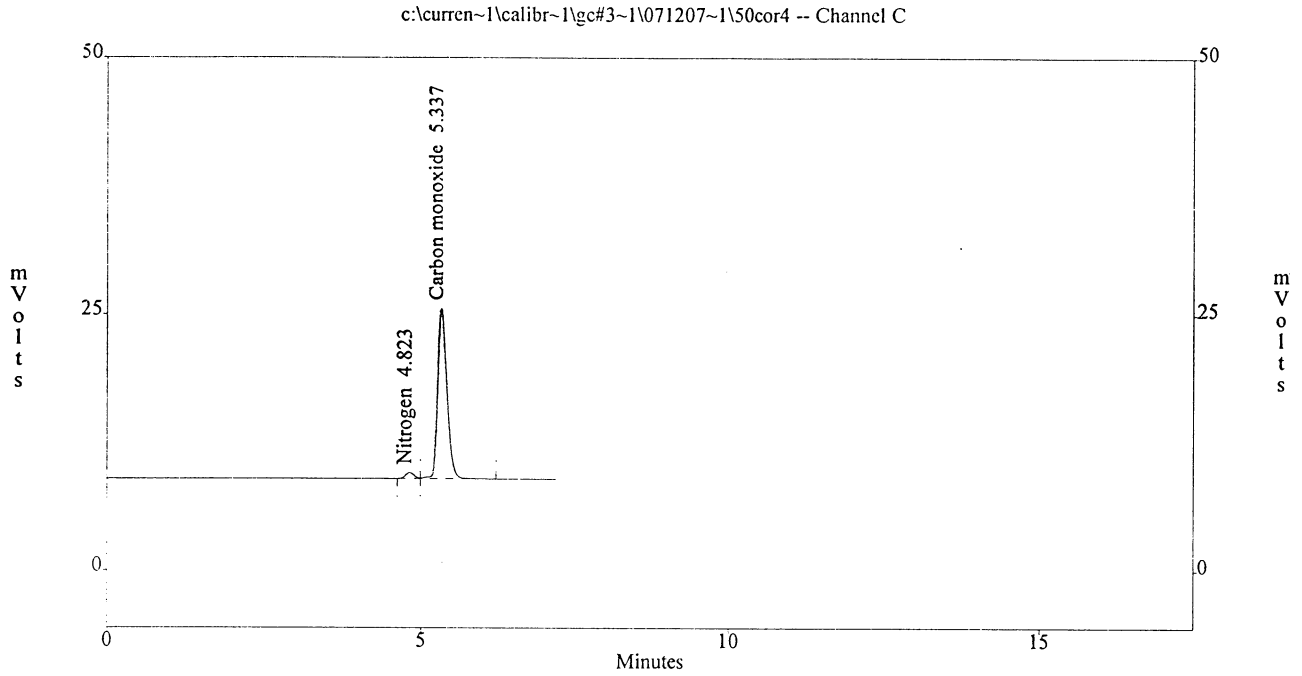
Totals :

186779

B74

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50cor4
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% co
Acquired : Jul 13, 2007 17:48:30
Printed : Jul 13, 2007 17:55:50
User : System



Channel C Results

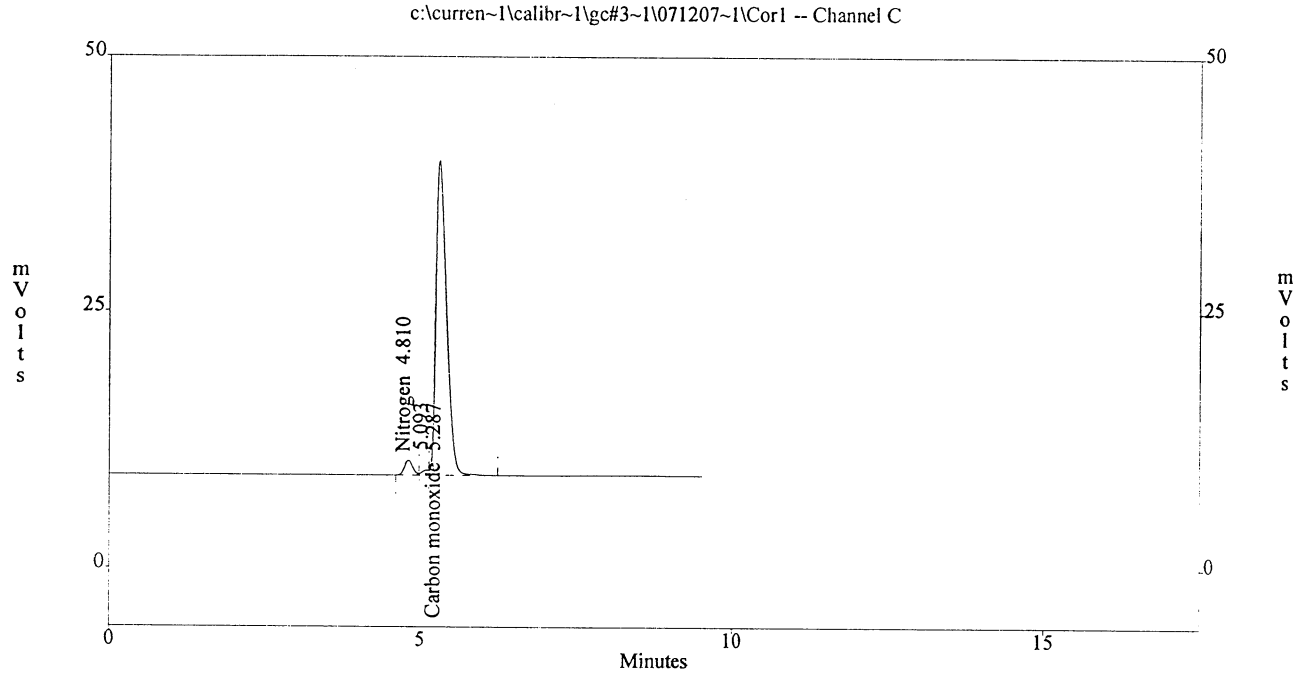
Peak	Retention Time	Area
Nitrogen	4.82	5551
Carbon monoxide	5.34	182963

Totals : 188514

B95

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Cor1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% co
Acquired : Jul 16, 2007 09:42:48
Printed : Jul 16, 2007 09:52:26
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.81	13020
	5.09	3356
Carbon monoxide	5.29	356932

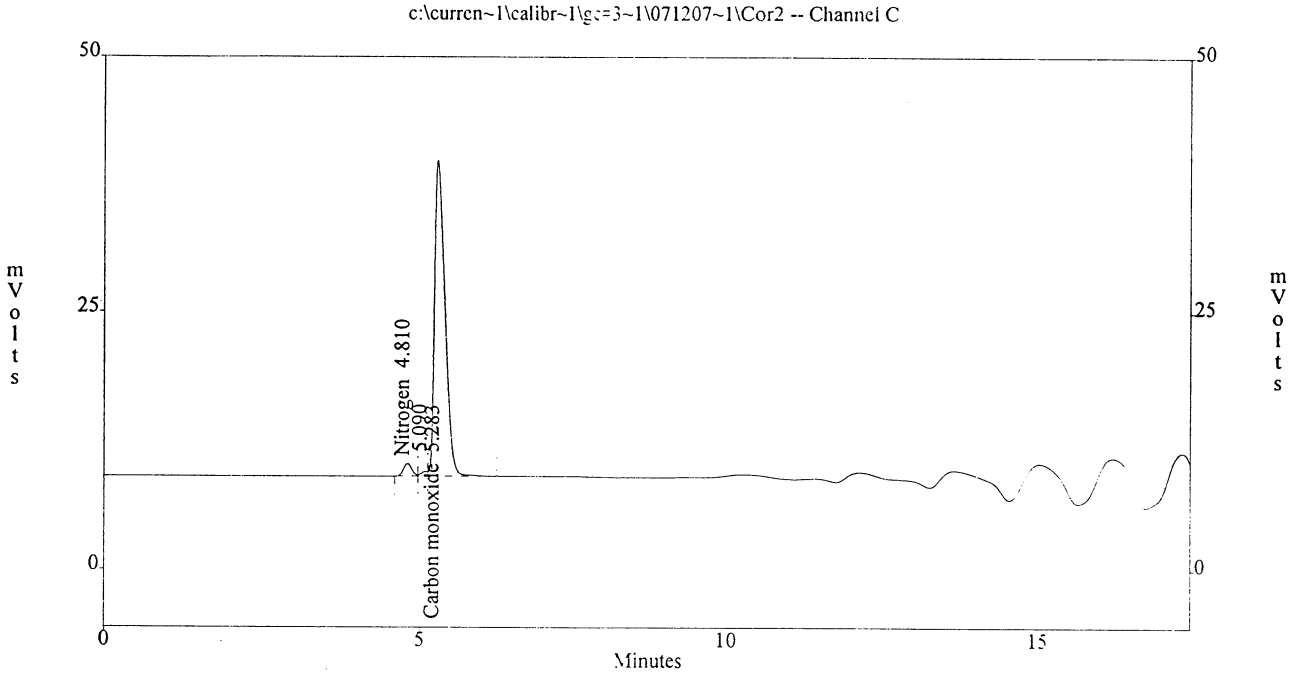
Totals :

373308

B96

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Cor2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% co
Acquired : Jul 16, 2007 09:56:36
Printed : Jul 16, 2007 10:14:34
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.81	10866
	5.09	2902
Carbon monoxide	5.28	356808

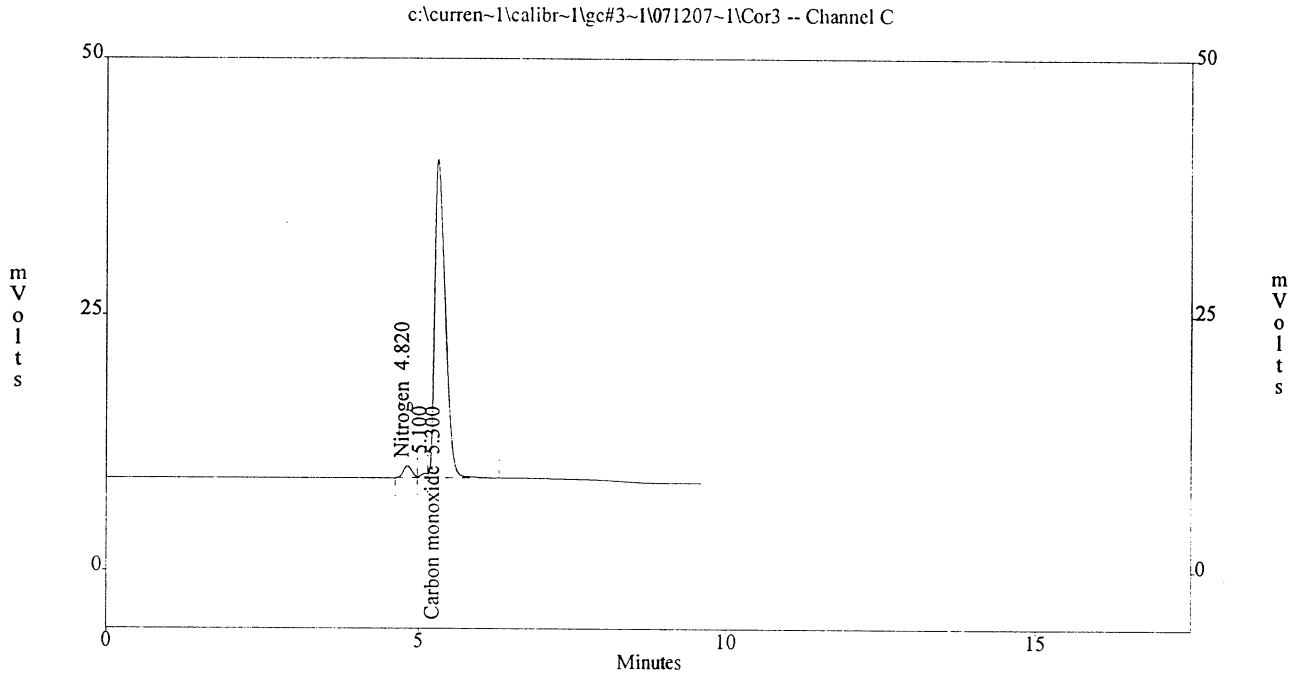
Totals :

370576

B79

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Cor3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% co
Acquired : Jul 16, 2007 10:21:57
Printed : Jul 16, 2007 10:31:35
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.82	10618
	5.10	2861
Carbon monoxide	5.30	360608

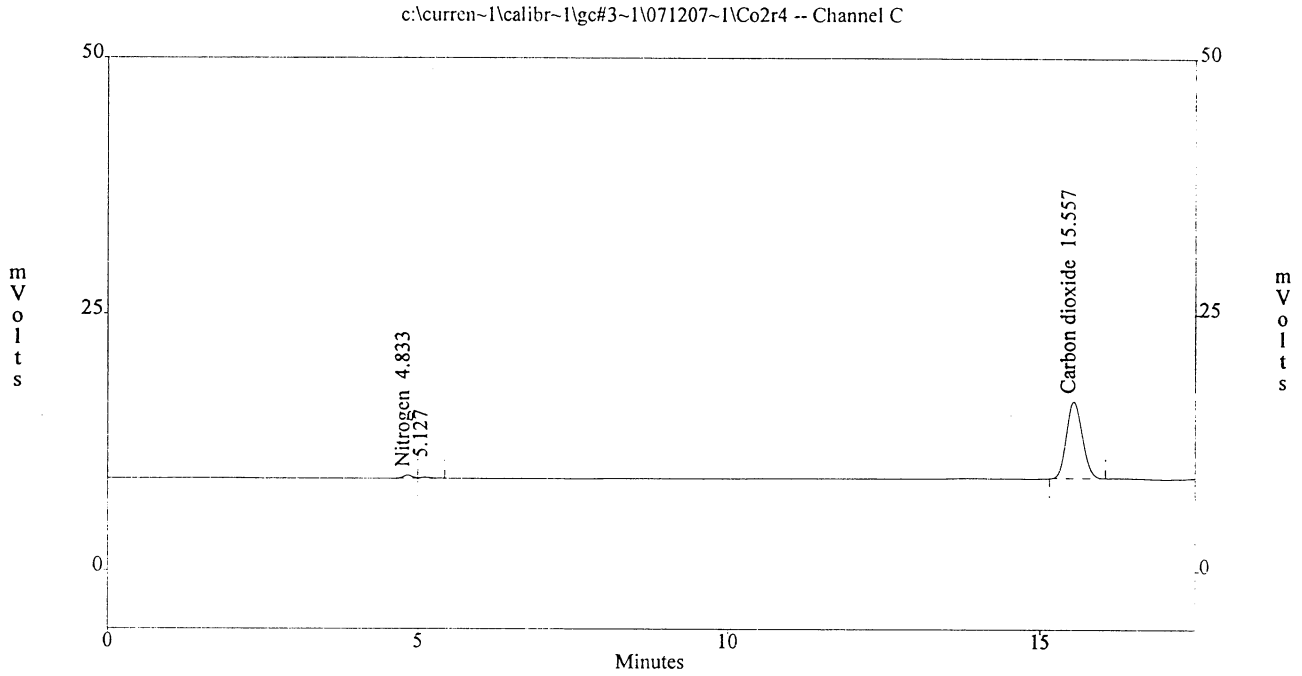
Totals :

374087

B 78

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Co2r4
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 20% co2
Acquired : Jul 16, 2007 14:58:20
Printed : Jul 16, 2007 15:16:20
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.83	2789
	5.13	1048
Carbon dioxide	15.56	132565

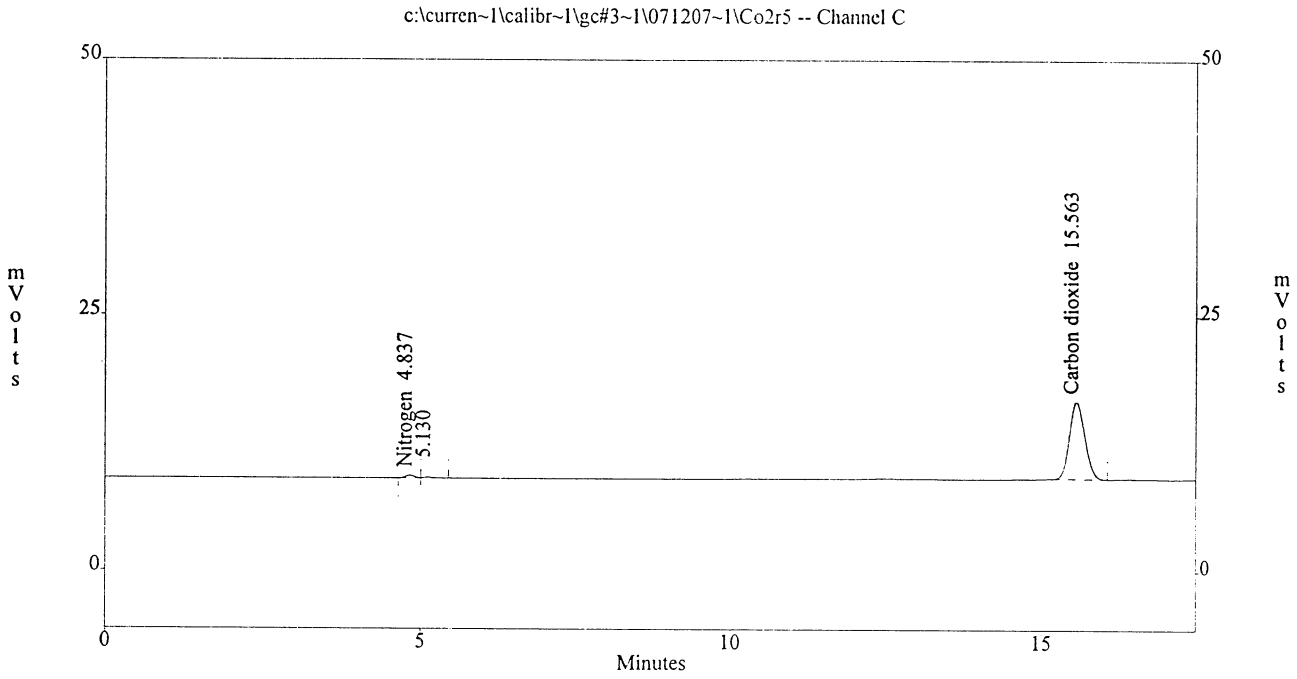
Totals :

136402

B79

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Co2r5
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 20% co2
Acquired : Jul 16, 2007 15:22:26
Printed : Jul 16, 2007 15:40:06
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.84	2659
	5.13	1011
Carbon dioxide	15.56	134254

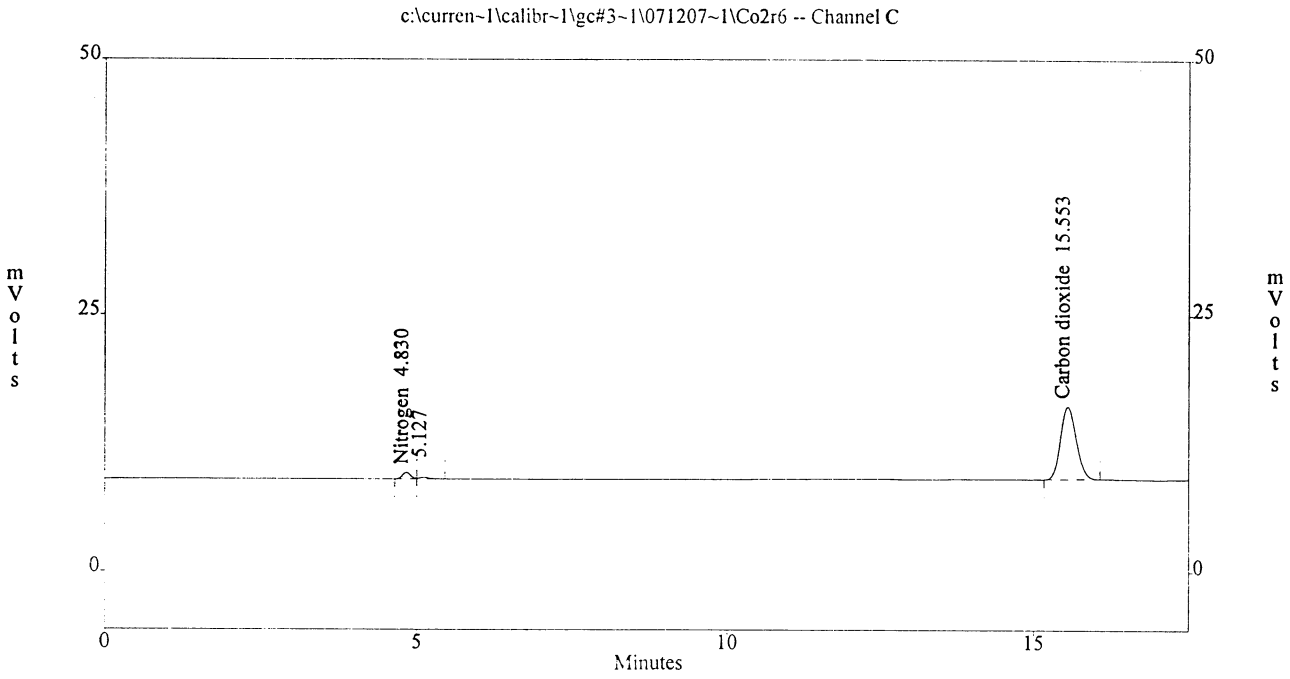
Totals :

37924

B80

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Co2r6
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 20% co2
Acquired : Jul 16, 2007 15:49:55
Printed : Jul 16, 2007 16:09:32
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.83	6027
	5.13	1879
Carbon dioxide	15.55	124958

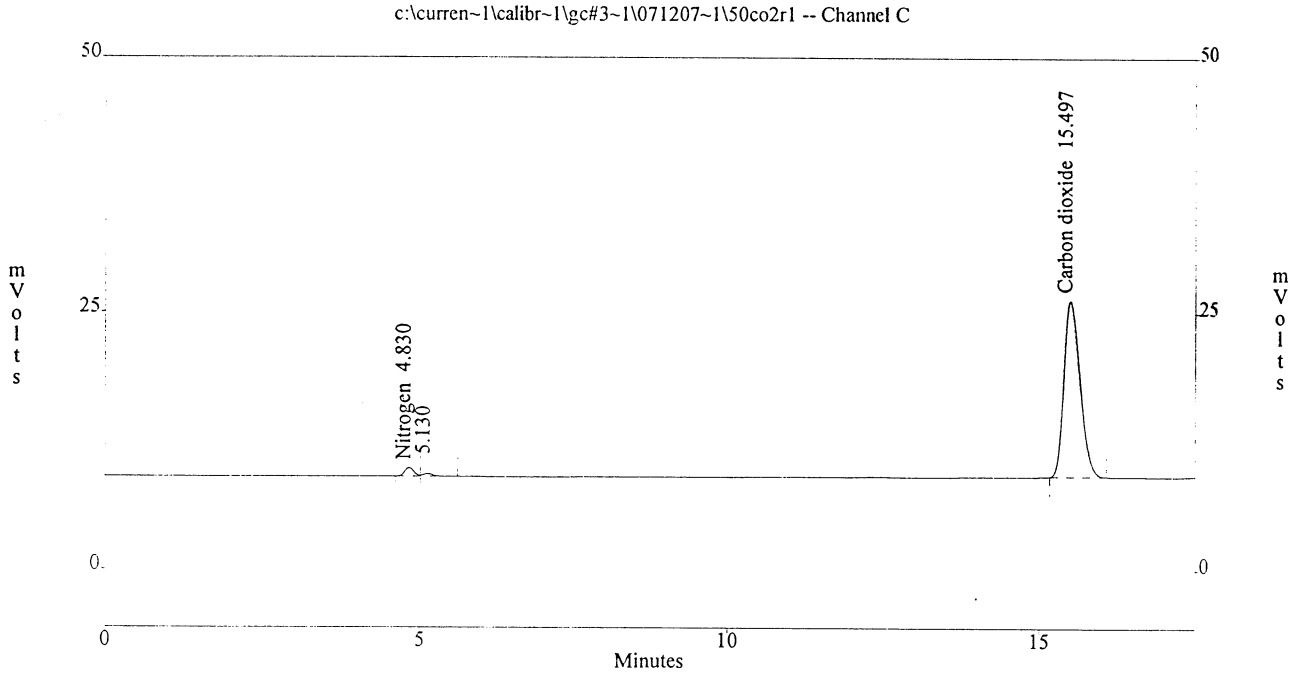
Totals :

132864

B81

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50co2r1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% co2
Acquired : Jul 16, 2007 16:17:40
Printed : Jul 16, 2007 16:39:44
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.83	8006
	5.13	2896
Carbon dioxide	15.50	311786

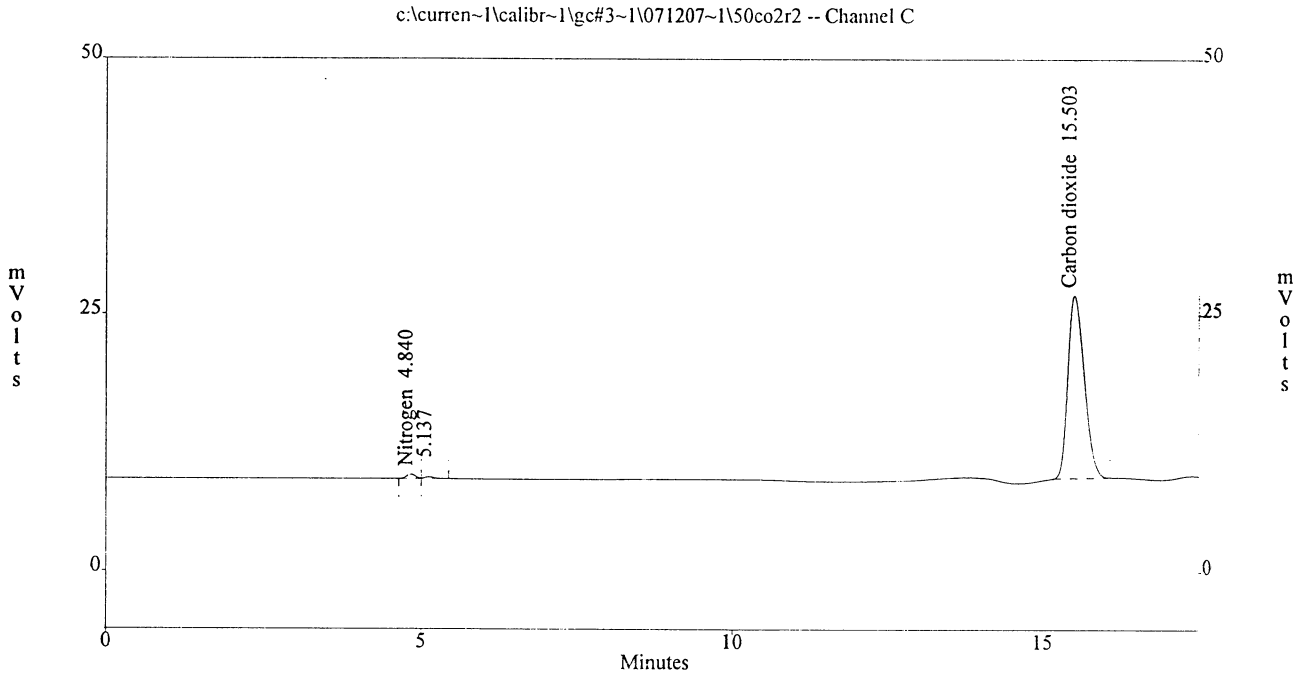
Totals :

322688

B82

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50co2r2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% co2
Acquired : Jul 16, 2007 16:43:45
Printed : Jul 16, 2007 17:03:20
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.84	4310
	5.14	1873
Carbon dioxide	15.50	323421

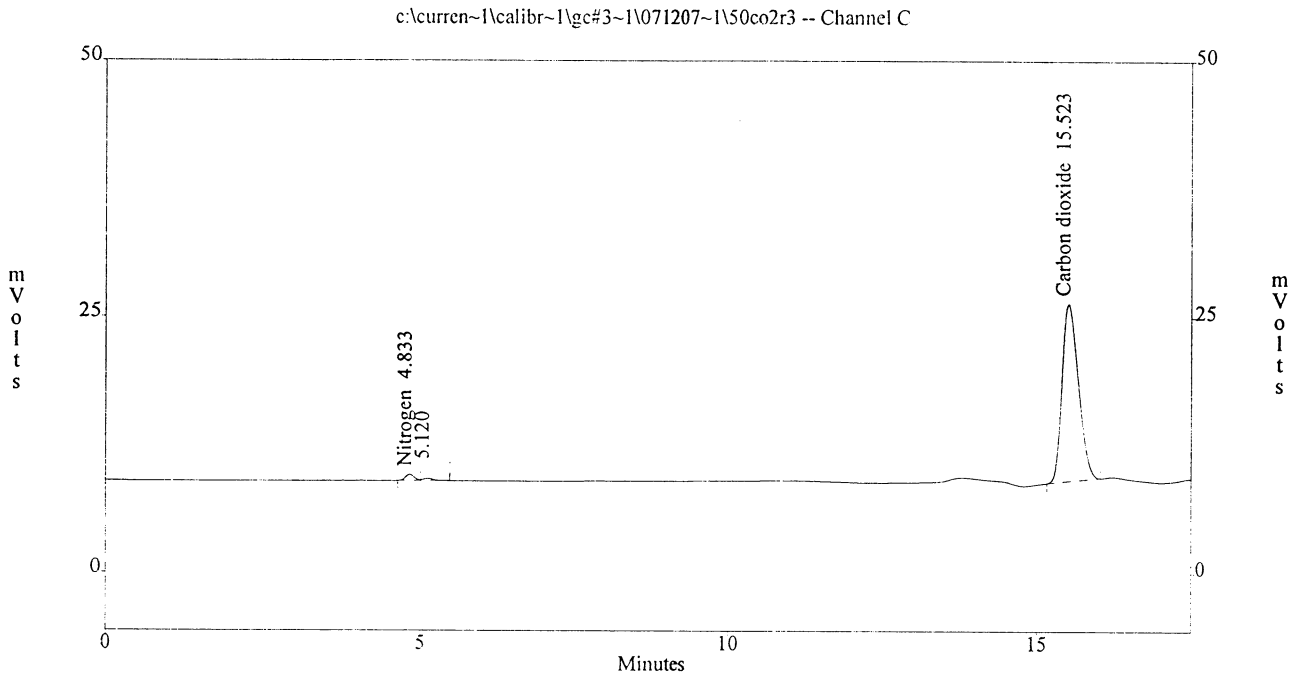
Totals :

329604

B83

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\50co2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 50% co2
Acquired : Jul 16, 2007 17:07:01
Printed : Jul 16, 2007 17:25:09
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.83	5742
	5.12	2225
Carbon dioxide	15.52	311565

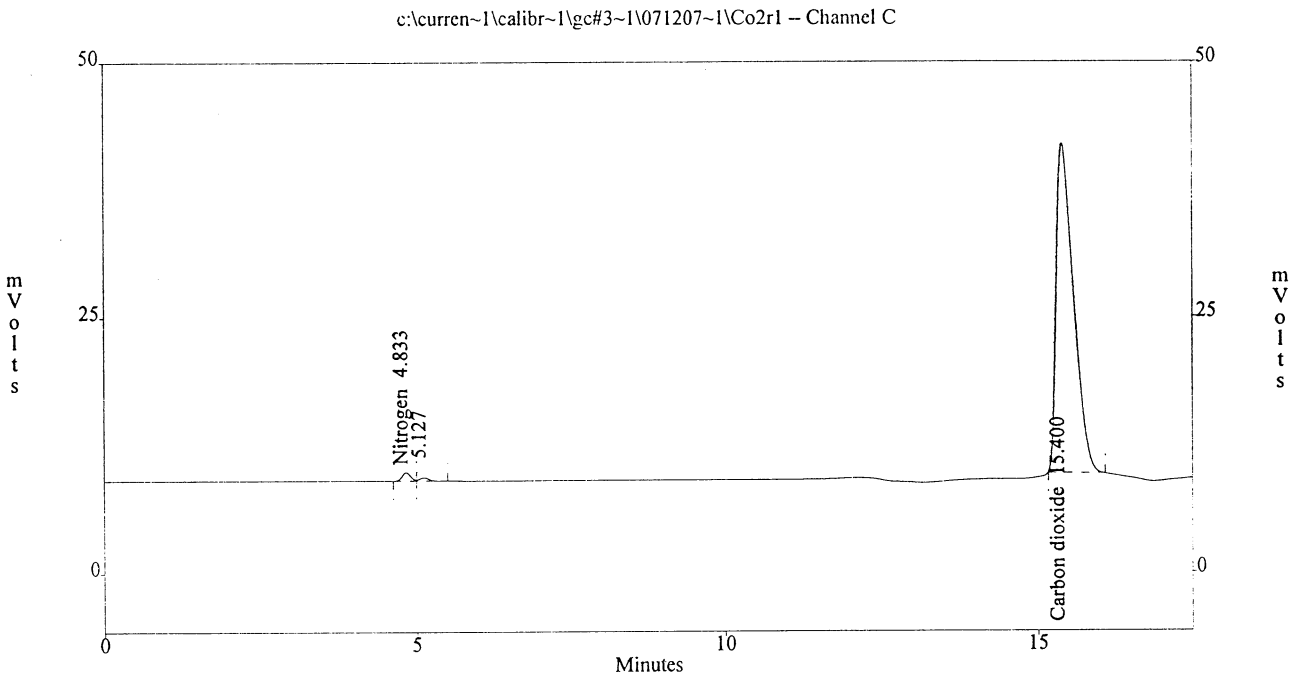
Totals :

319532

B84

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Co2r1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% co2
Acquired : Jul 16, 2007 17:56:49
Printed : Jul 16, 2007 18:18:18
User : System



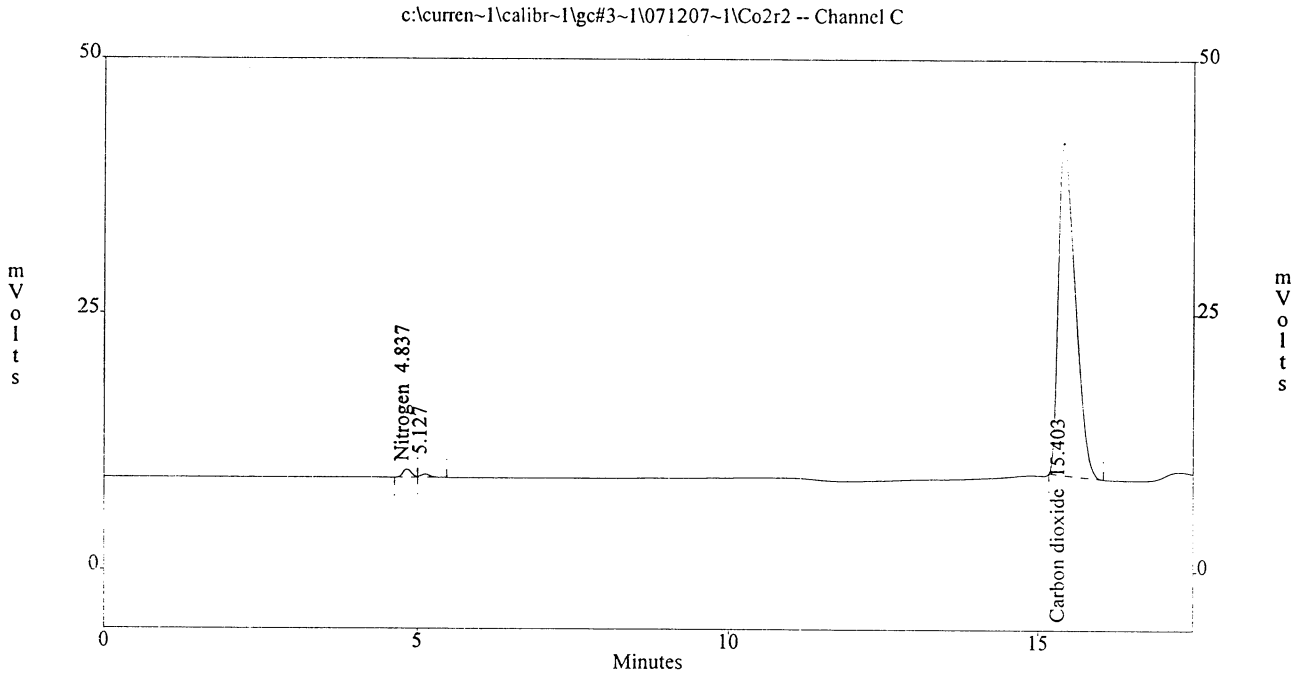
Channel C Results

Peak	Retention Time	Area
Nitrogen	4.83	8001
	5.13	3598
Carbon dioxide	15.40	629298
Totals :		640897

B85

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Co2r2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% co2
Acquired : Jul 16, 2007 18:23:30
Printed : Jul 16, 2007 18:41:05
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.84	7608
	5.13	3500
Carbon dioxide	15.40	634331

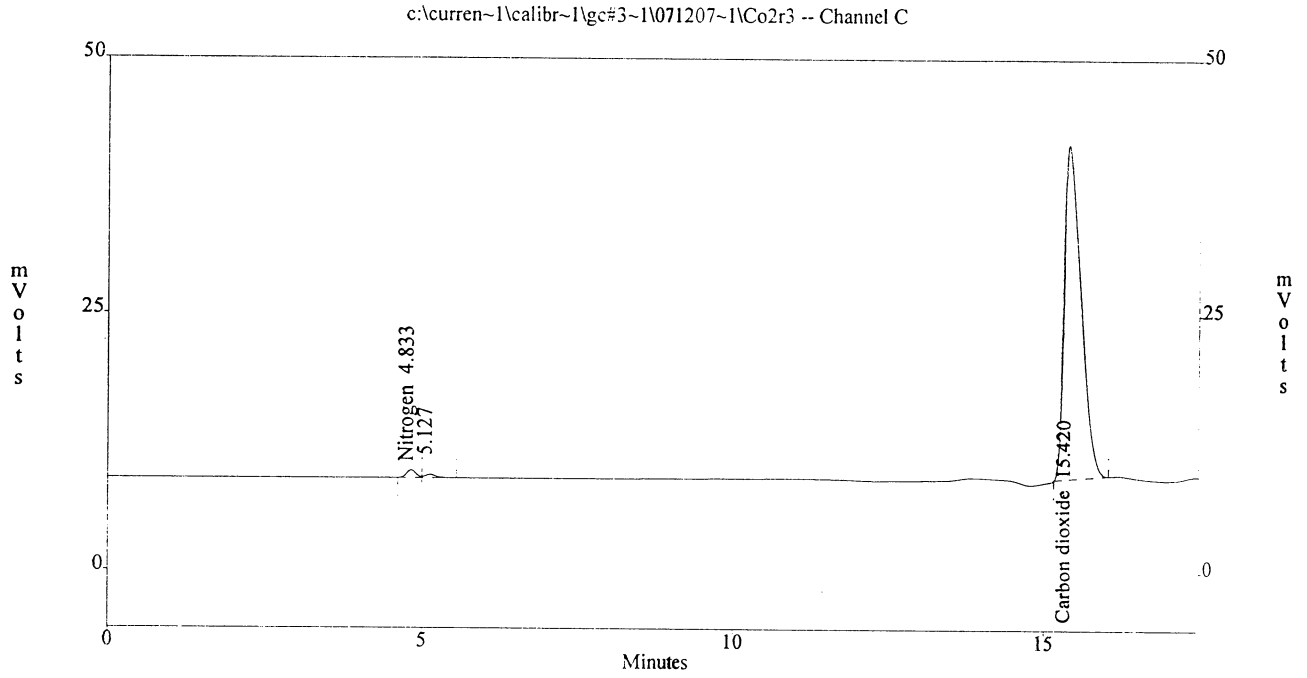
Totals :

645439

B86

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\Co2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 100% co2
Acquired : Jul 16, 2007 18:47:05
Printed : Jul 17, 2007 10:00:19
User : System



Channel C Results

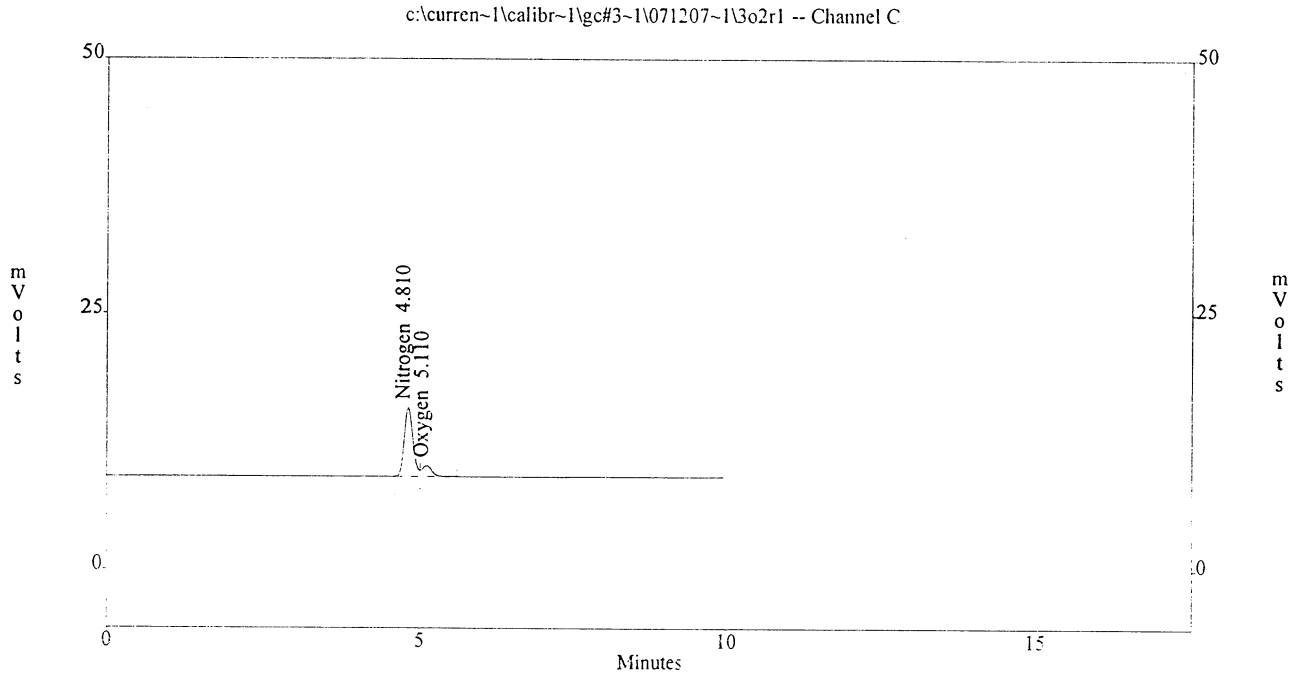
Peak	Retention Time	Area
Nitrogen	4.83	7404
	5.13	3480
Carbon dioxide	15.42	631621

Totals : 642505

B87

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\3o2r1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 2.9% O2
Acquired : Jul 17, 2007 10:07:04
Printed : Jul 17, 2007 10:36:02
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.81	65626
Oxygen	5.11	11234

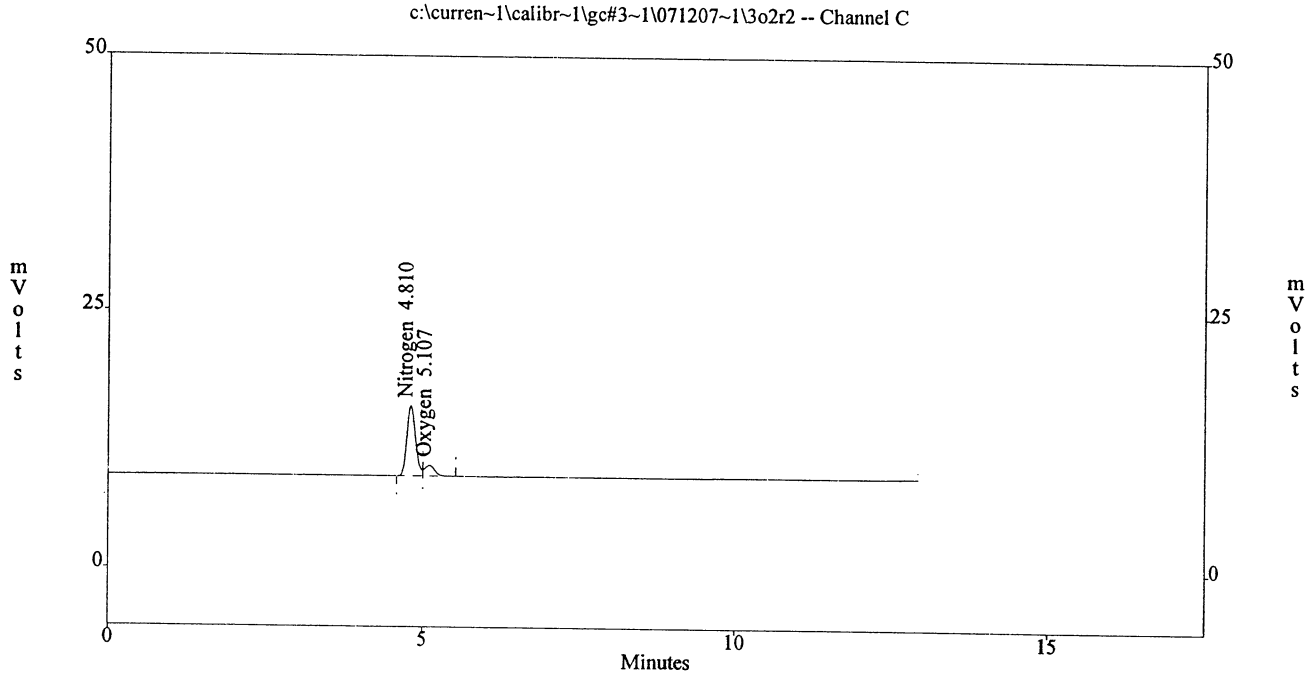
Totals :

76860

B88

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\3o2r2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 2.9% O2
Acquired : Jul 17, 2007 10:22:25
Printed : Jul 17, 2007 10:35:46
User : System



Channel C Results

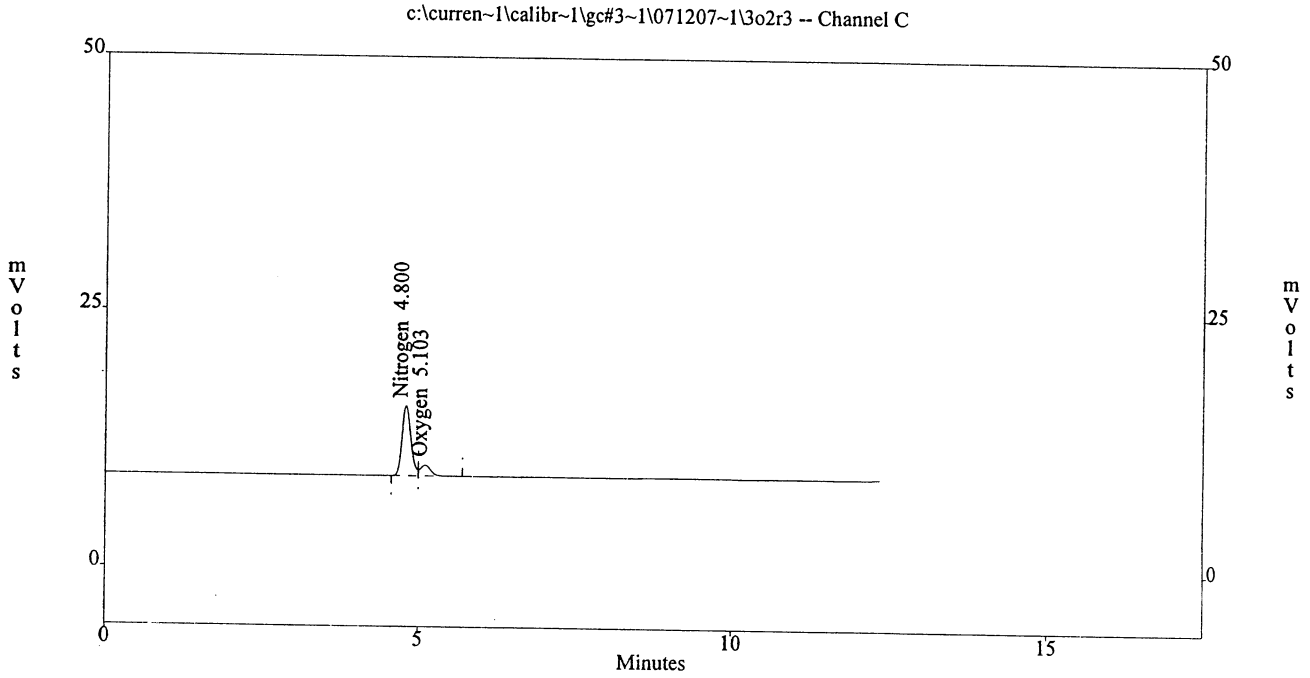
Peak	Retention Time	Area
Nitrogen	4.81	66153
Oxygen	5.11	11176

Totals : 77329

B89

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\3o2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 3% O2
Acquired : Jul 17, 2007 10:38:32
Printed : Jul 17, 2007 10:51:19
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.80	66338
Oxygen	5.10	11374

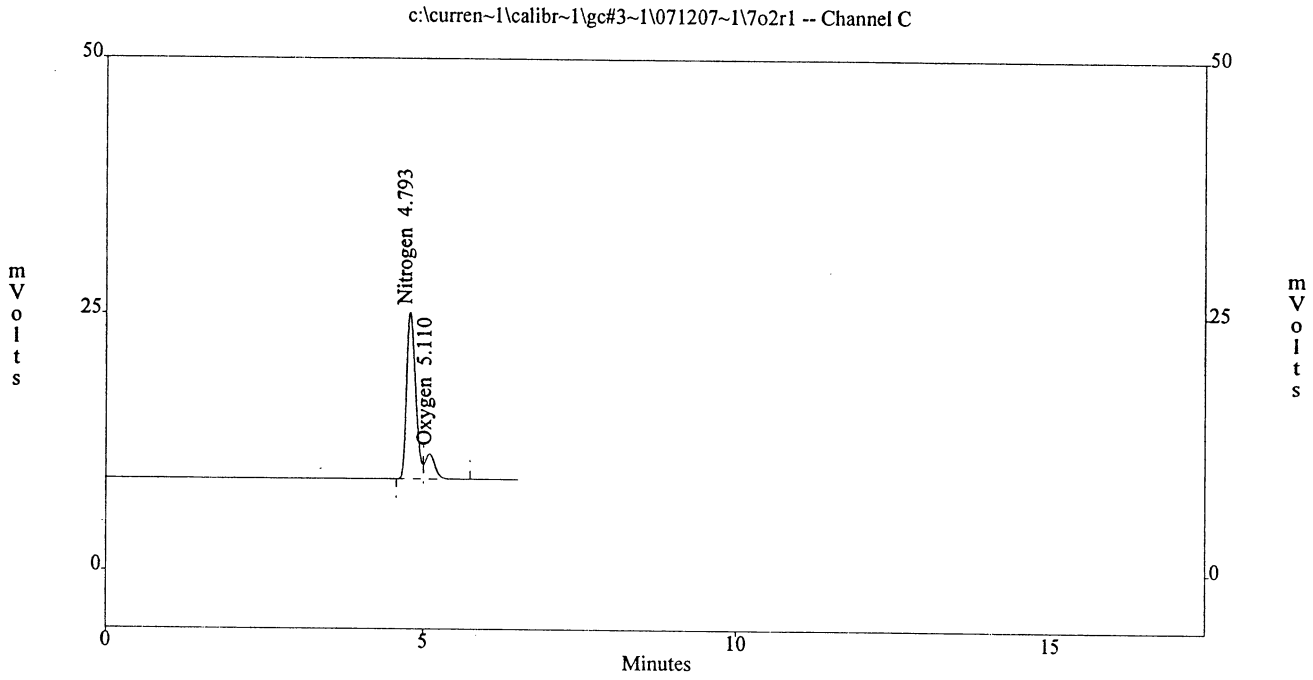
Totals :

77712

B90

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\7o2r1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 7% O2
Acquired : Jul 17, 2007 10:55:21
Printed : Jul 17, 2007 11:01:52
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.79	159306
Oxygen	5.11	27242

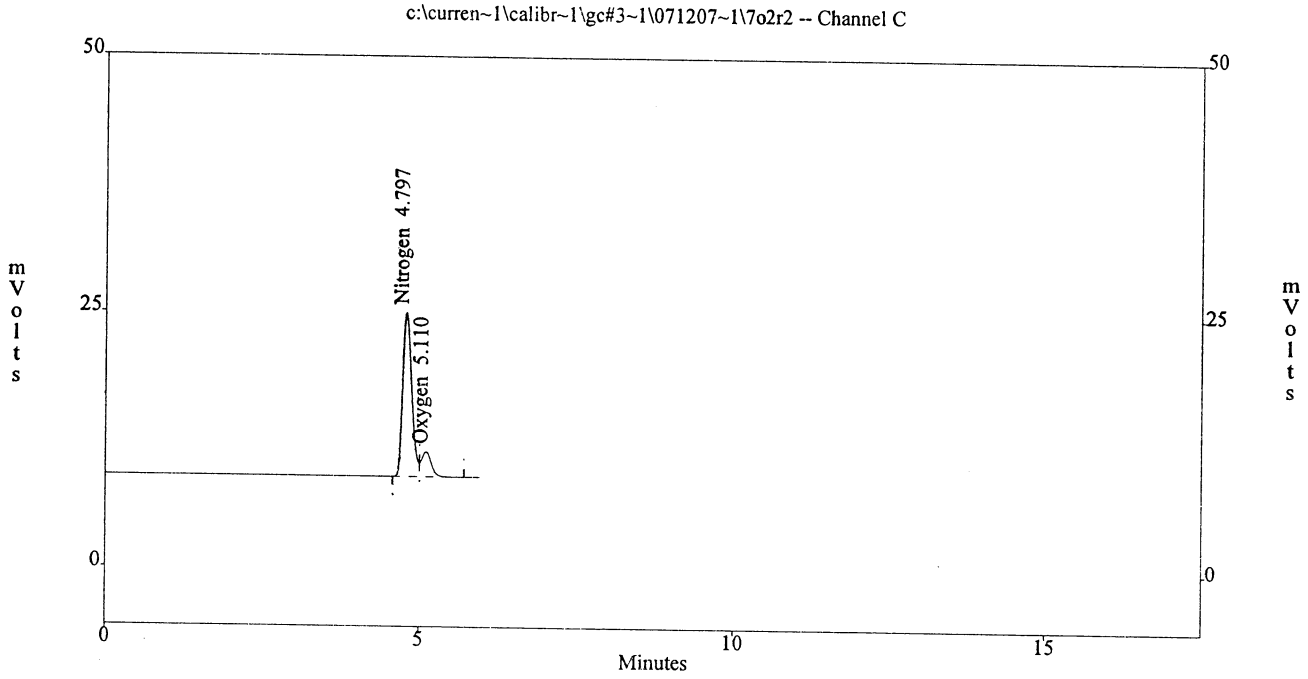
Totals :

186548

B91

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\7o2r2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 7% O2
Acquired : Jul 17, 2007 11:04:59
Printed : Jul 17, 2007 11:11:05
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.80	157215
Oxygen	5.11	27061

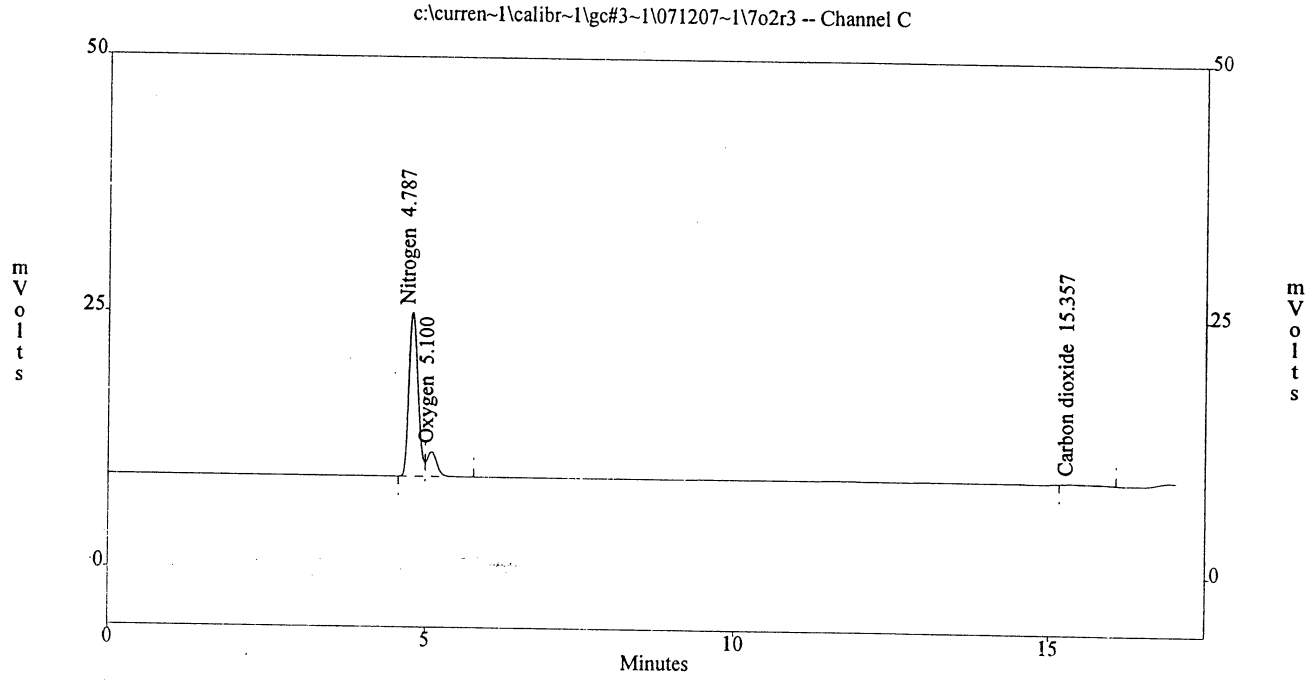
Totals :

184276

B92

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\7o2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 7% O2
Acquired : Jul 17, 2007 11:12:17
Printed : Jul 17, 2007 11:29:32
User : System



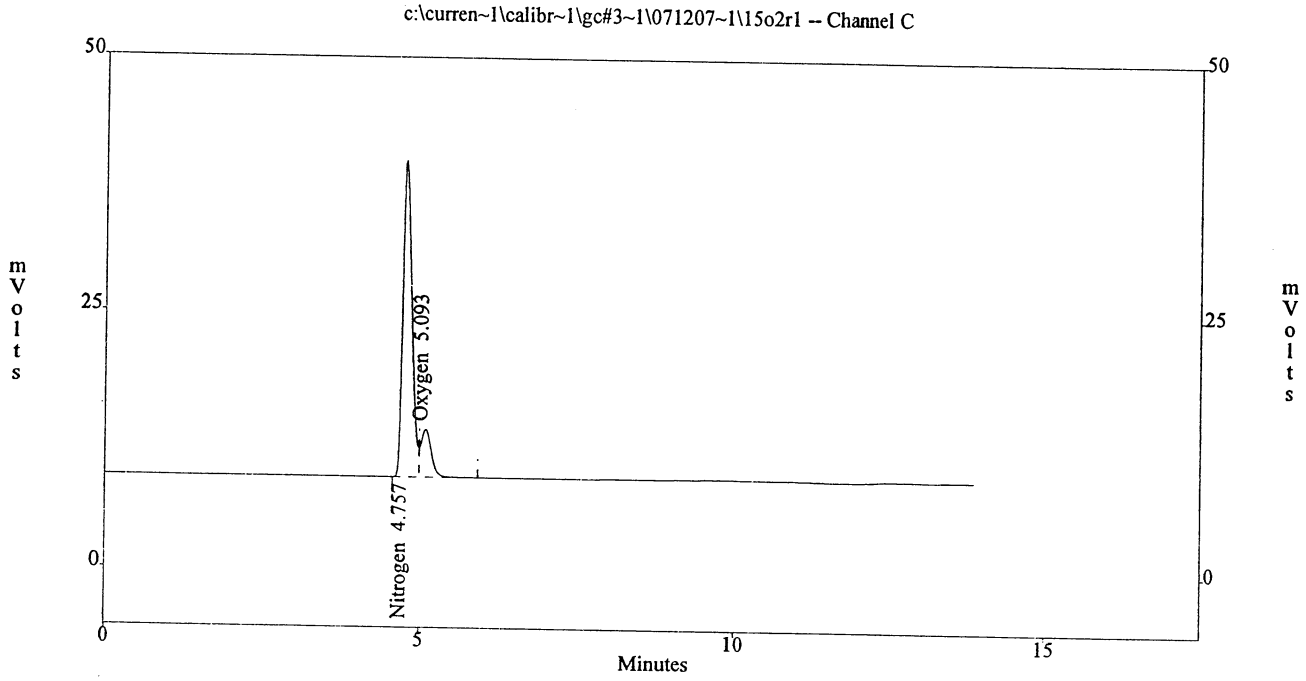
Channel C Results

Peak	Retention Time	Area
Nitrogen	4.79	157976
Oxygen	5.10	27160
Carbon dioxide	15.36	2533
Totals :		187669

B93

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\15o2r1
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 14.8% O2
Acquired : Jul 17, 2007 11:34:54
Printed : Jul 17, 2007 11:48:47
User : System



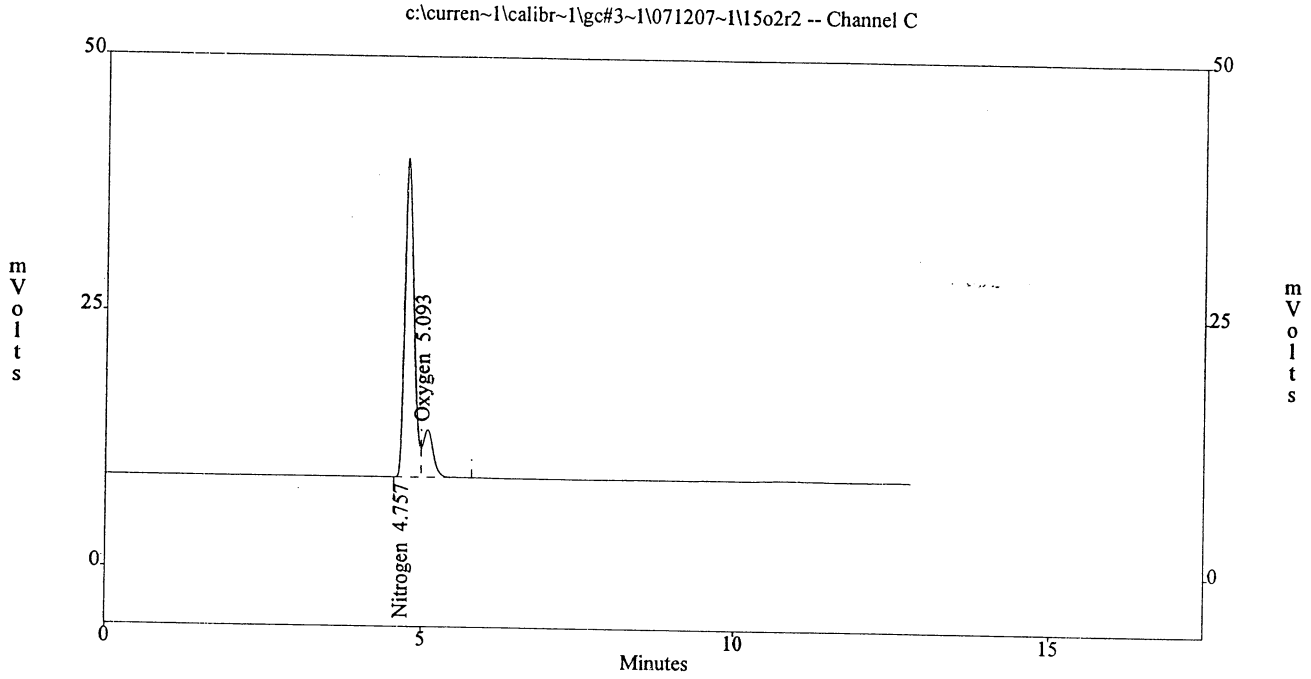
Channel C Results

Peak	Retention Time	Area
Nitrogen	4.76	314557
Oxygen	5.09	53505
Totals :		368062

B94

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\15o2r2
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 15% O2
Acquired : Jul 17, 2007 11:52:46
Printed : Jul 17, 2007 12:05:45
User : System



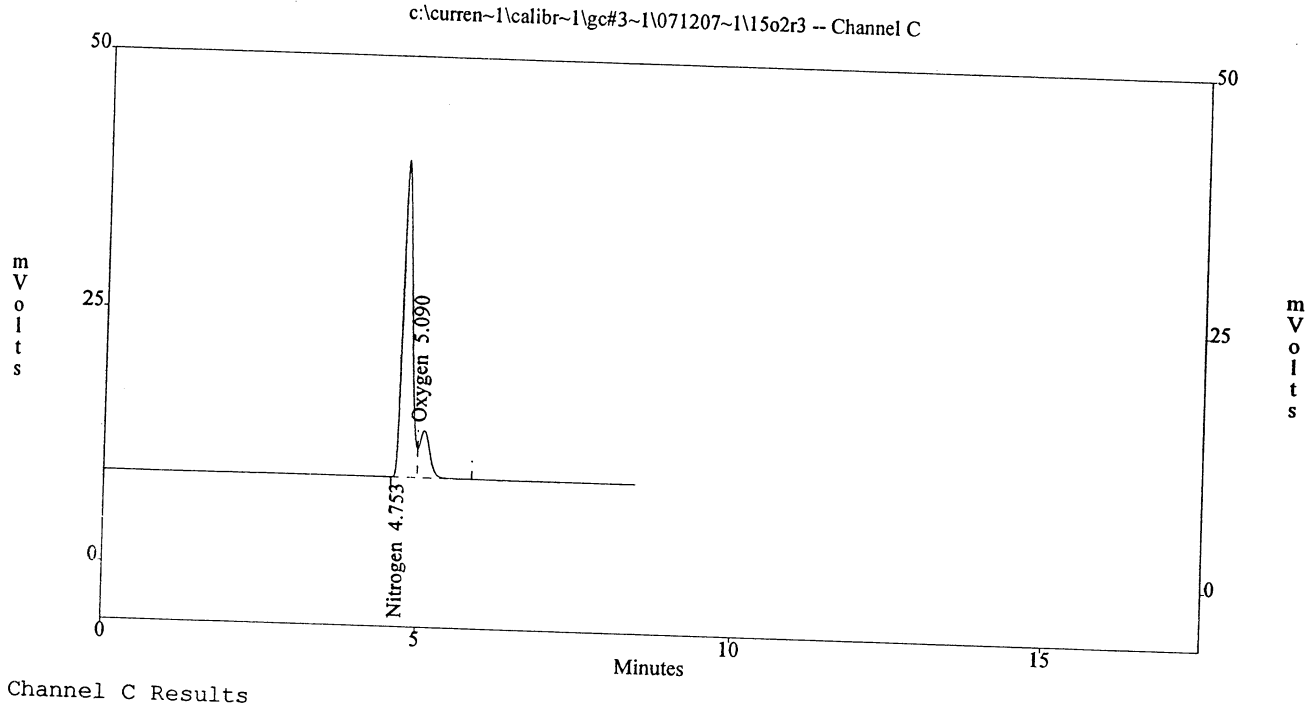
Channel C Results

Peak	Retention Time	Area
Nitrogen	4.76	315522
Oxygen	5.09	53811
Totals :		369333

B95

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\071207~1\15o2r3
Method : c:\curren~1\calibr~1\gc#3~1\Tcd.met
Sample ID : 15% O2
Acquired : Jul 17, 2007 12:11:19
Printed : Jul 17, 2007 12:19:58
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.75	313946
Oxygen	5.09	53806
Totals :		367752

$96

GC Natural Gas / Fuel Analysis

Gas Dilution Device Validation
(EPA Method 205)

B97

ENTECH ENGINEERING INC.

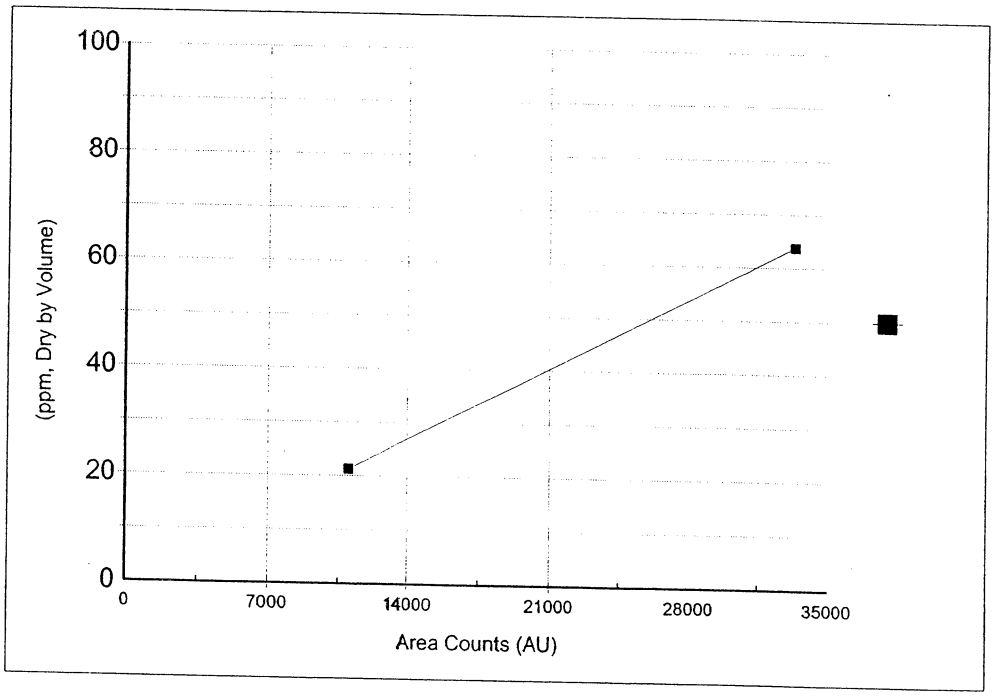
Gas Chromatograph Analysis Standard Curve Data
GC #3 FID (Channel A @ Range 1)
Propane Standard (Air Liquide CC115242, 85.0ppmv Propane certified)

05/15/2007

Dilution System : ENGASDL001

Dilution Factor	Predicted Concentration (ppmv)	Area Count				Precision Error			Calculated Concetration (ppmv)	% Difference (%)
		Run 1	Run 2	Run 3	Average	Run 1 (%)	Run 2 (%)	Run 3 (%)		
1:4	21.25	11303	10982	10737	11007.3	2.69	-0.23	-2.46	20.92	-1.55
3:4	63.75	33254	33488	33362	33368.0	-0.34	0.36	-0.02	63.42	-0.52

Constant	0.3288
R Squared	1.0000
No. of Observations	2
Degrees of Freedom	0
X Coefficient(s)	1.900659E-03

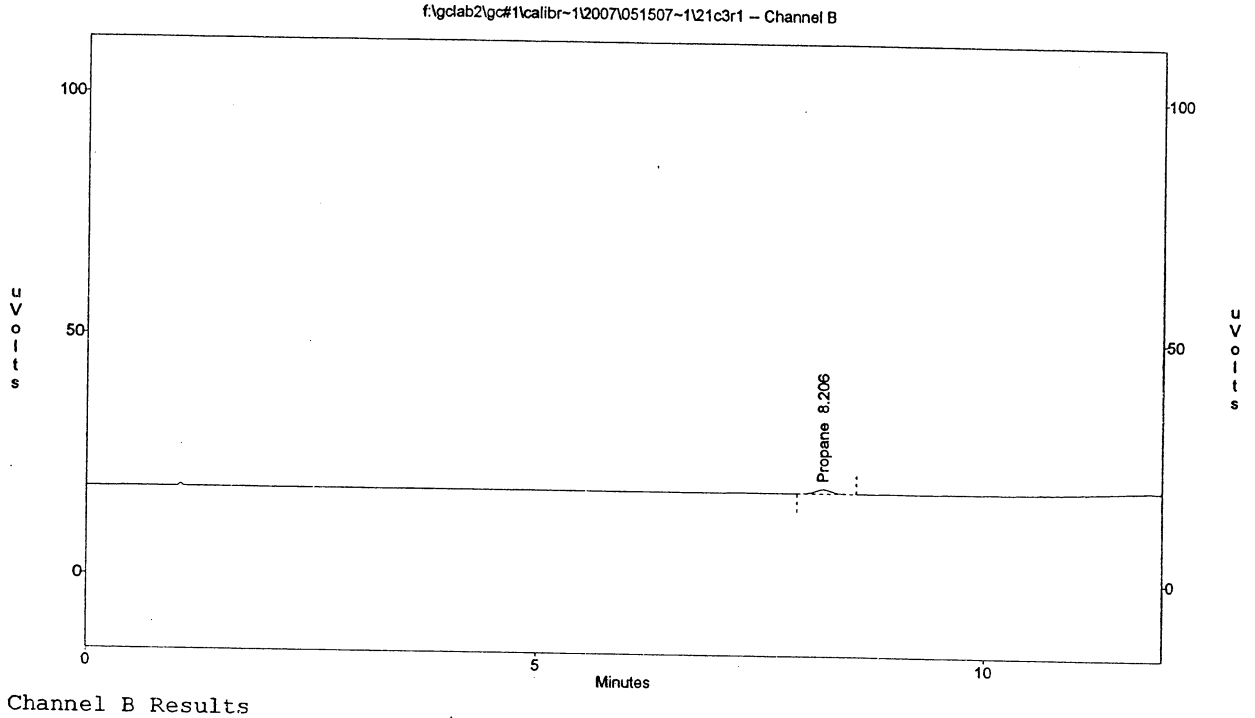


Operator _____ Date 5-16-07

B 98

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\21c3r1
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 21.25ppm propane
Acquired : May 15, 2007 17:58:09
Printed : May 15, 2007 18:16:18
User : System



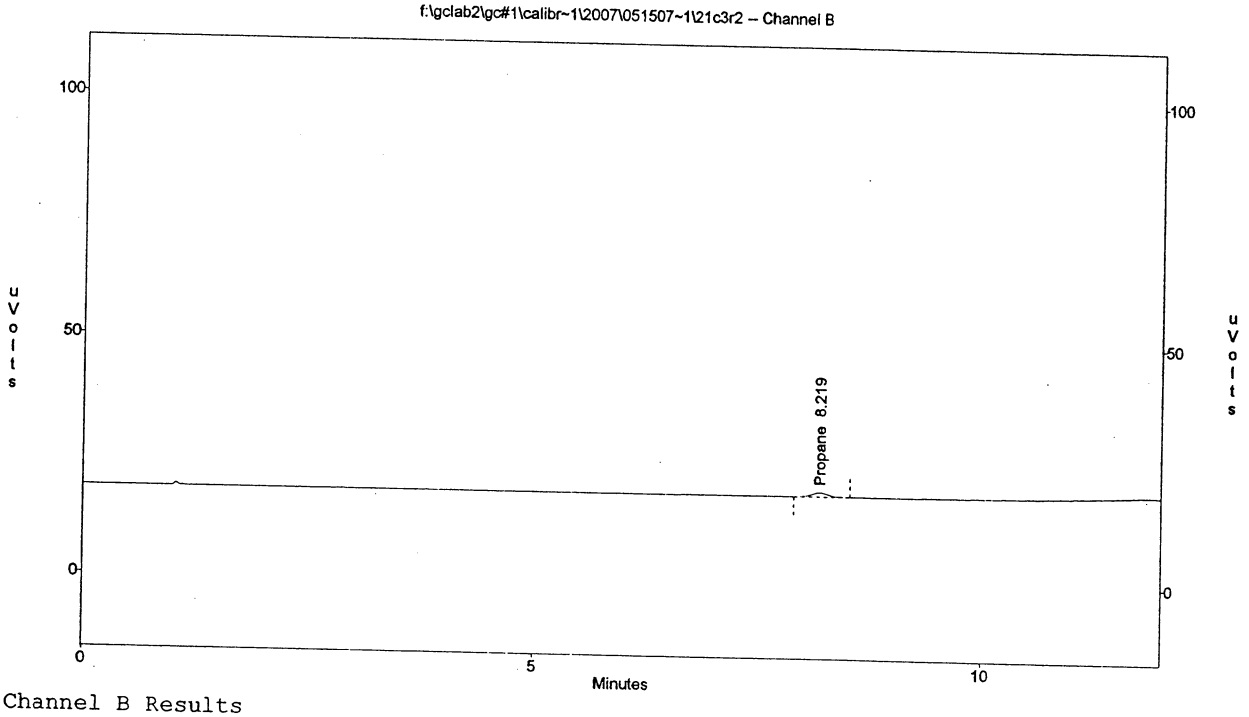
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	11303	18.9
Totals :		11303	18.9

B99

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\21c3r2
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 21.25ppm propane
Acquired : May 15, 2007 18:18:37
Printed : May 15, 2007 18:30:57
User : System



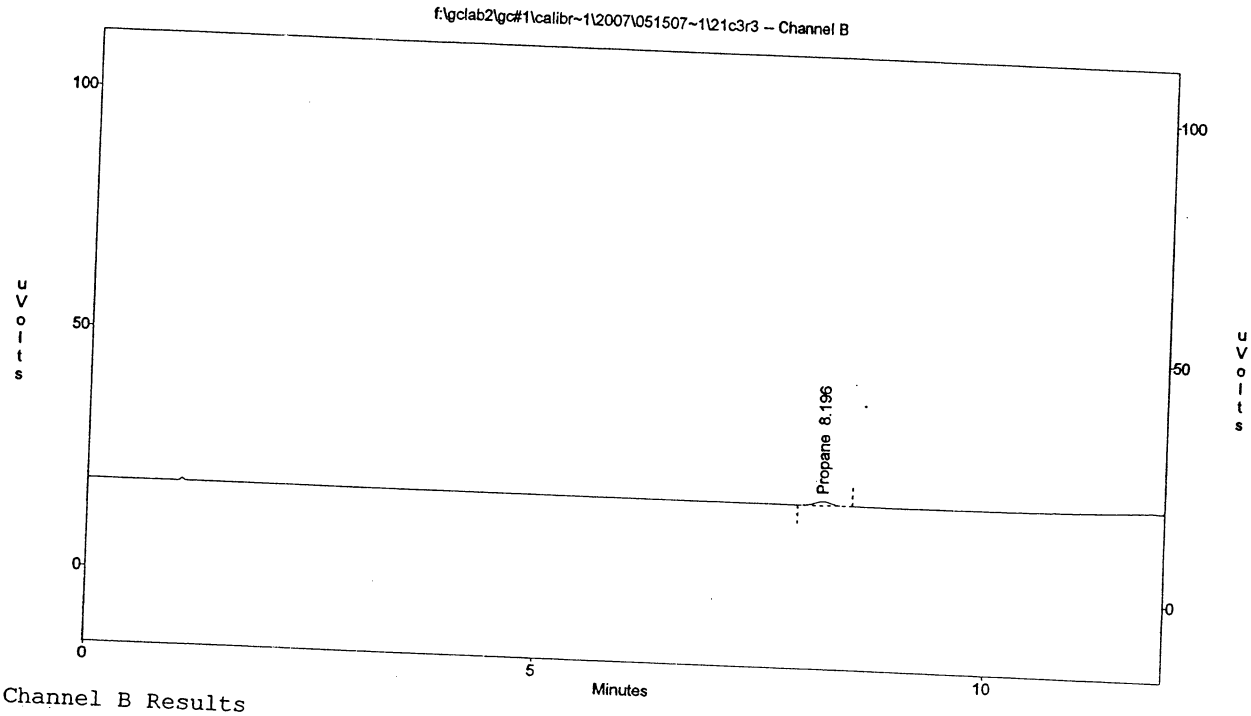
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.22	10982	18.4
Totals :		10982	18.4

B100

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\21c3r3
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 21.25ppm propane
Acquired : May 15, 2007 18:33:24
Printed : May 15, 2007 18:49:09
User : System



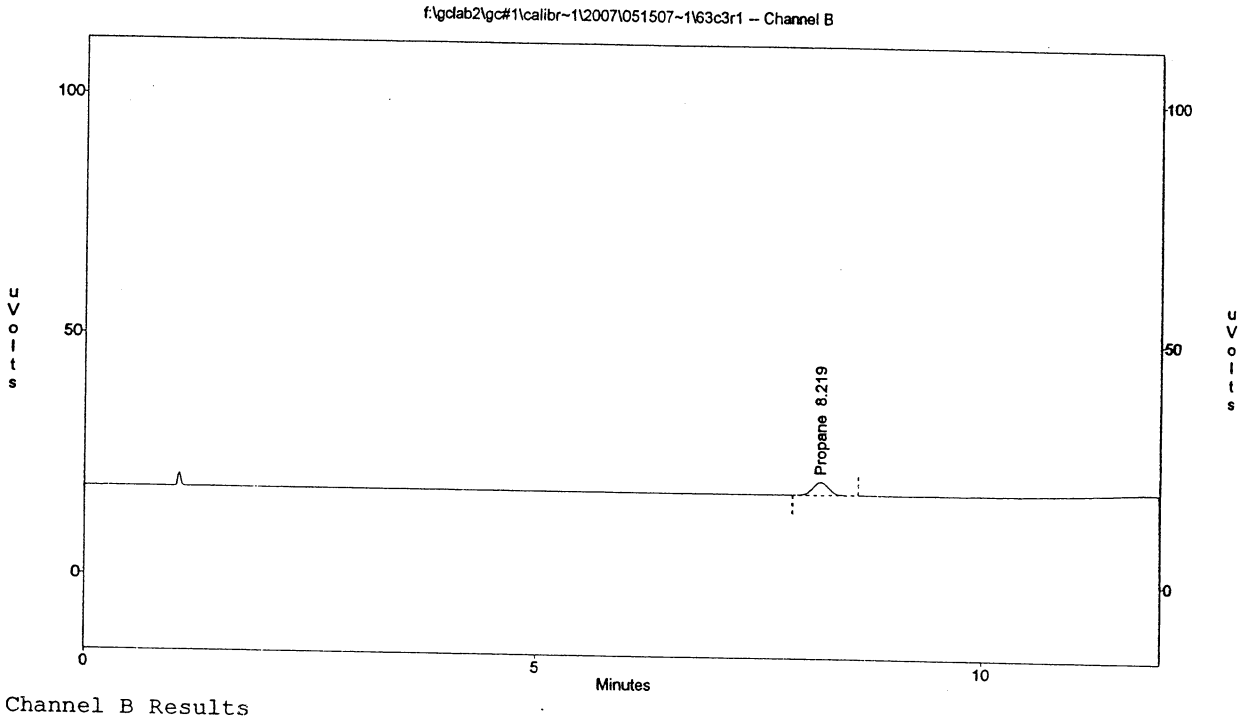
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.20	10737	18.0
Totals :		10737	18.0

B101

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\63c3r1
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 63.75ppm propane
Acquired : May 15, 2007 19:40:15
Printed : May 15, 2007 19:59:42
User : System



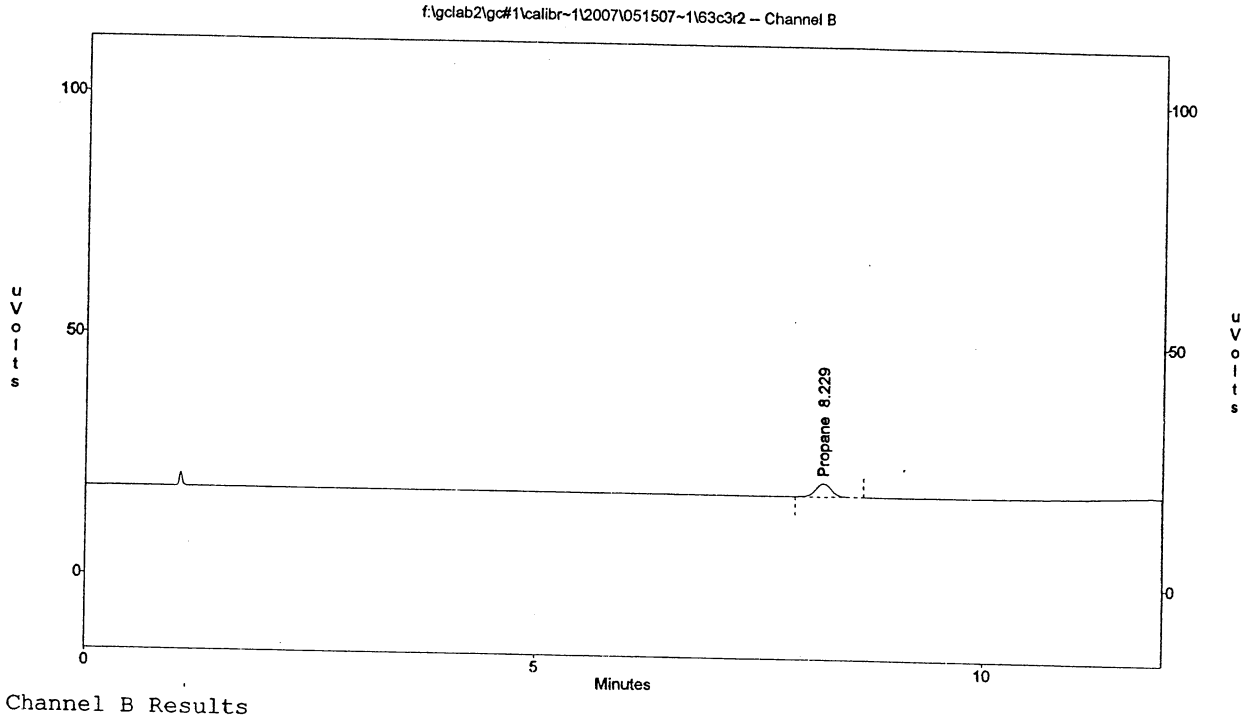
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.22	33254	55.7
Totals :		33254	55.7

B10Z

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\63c3r2
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 63.75ppm propane
Acquired : May 15, 2007 20:01:53
Printed : May 15, 2007 20:14:04
User : System



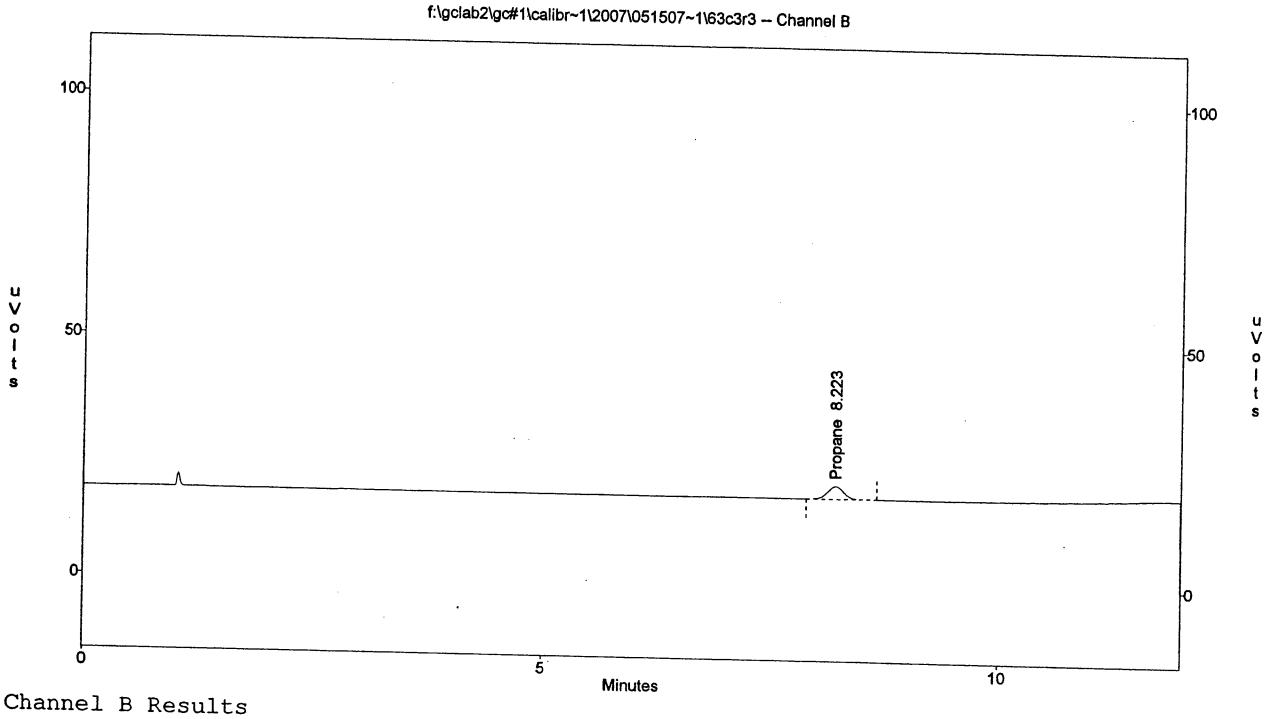
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.23	33488	56.1
Totals :		33488	56.1

B103

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\63c3r3
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 63.75ppm propane
Acquired : May 15, 2007 20:19:30
Printed : May 15, 2007 20:31:41
User : System



Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.22	33362	55.9
Totals :		33362	55.9

B104

ENTECH ENGINEERING INC.
P.O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Gas Dilution System Validation Study (EPA Method 205)

Gas Dilution System ID: ENGASDL001
Calibration Standard: AirLiquide CC115242
Calibration Date: May 15, 2007
Propane X Coefficent: 1.900659E-03

Validation Gas Standard: AirLiquide AL0400
Validation Date: May 15, 2007
Certified Concentration: 32.1 ppm

Instrument: GC#1 FID-2, Range 1 **Column:** 80/100 Haysep Q, 6 ft X 1/8 in, S.S. (316) **Sample Injection Loop:** 1000 ul

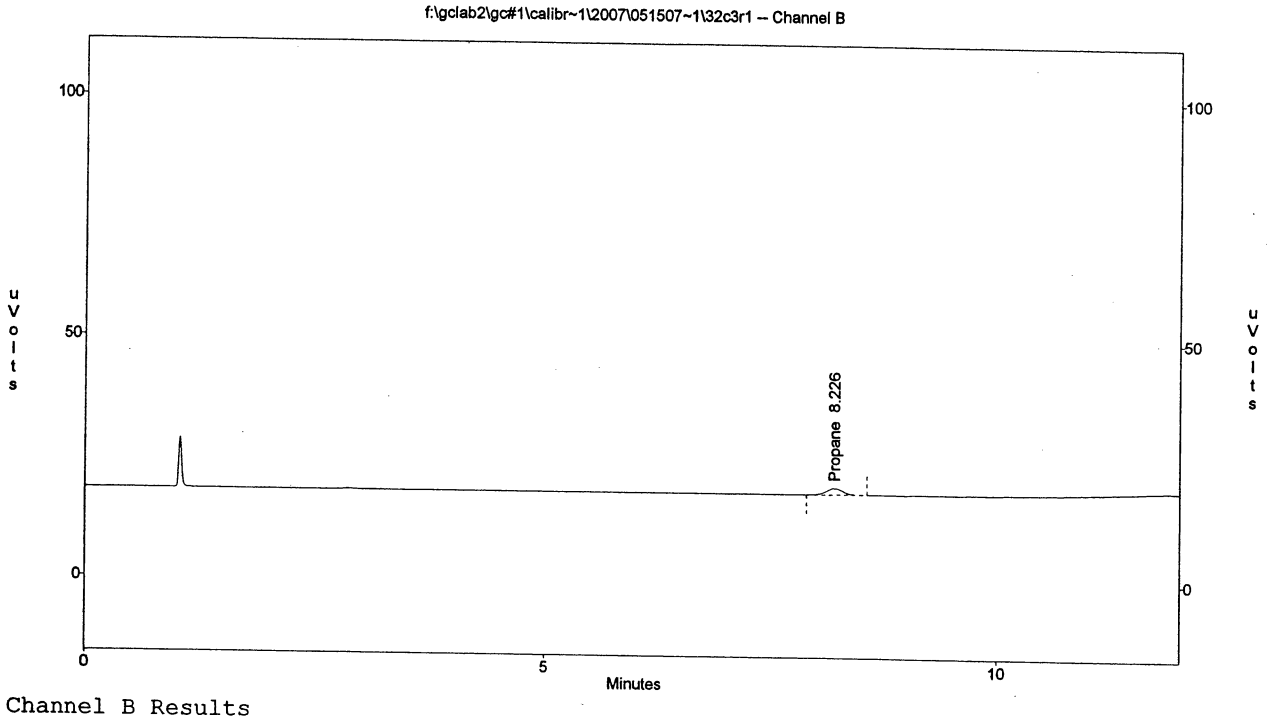
ID	Run 1 Area	Run 2 Area	Run 3 Area	Average Area	Precision Error (%) Run 1	Run 2	Run 3	Average Conc. (ppmv)	Certified Std. Conc. (ppmv)	Percent Difference	Control Limit (< 2)%
Propane	16978	16696	16797	16824	0.92%	0.76%	0.16%	31.98	32.10	0.39%	Pass

Oeprator _____ Date 5-16-07

B105

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\32c3r1
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 32.1ppm propane
Acquired : May 15, 2007 18:52:31
Printed : May 15, 2007 19:05:41
User : System



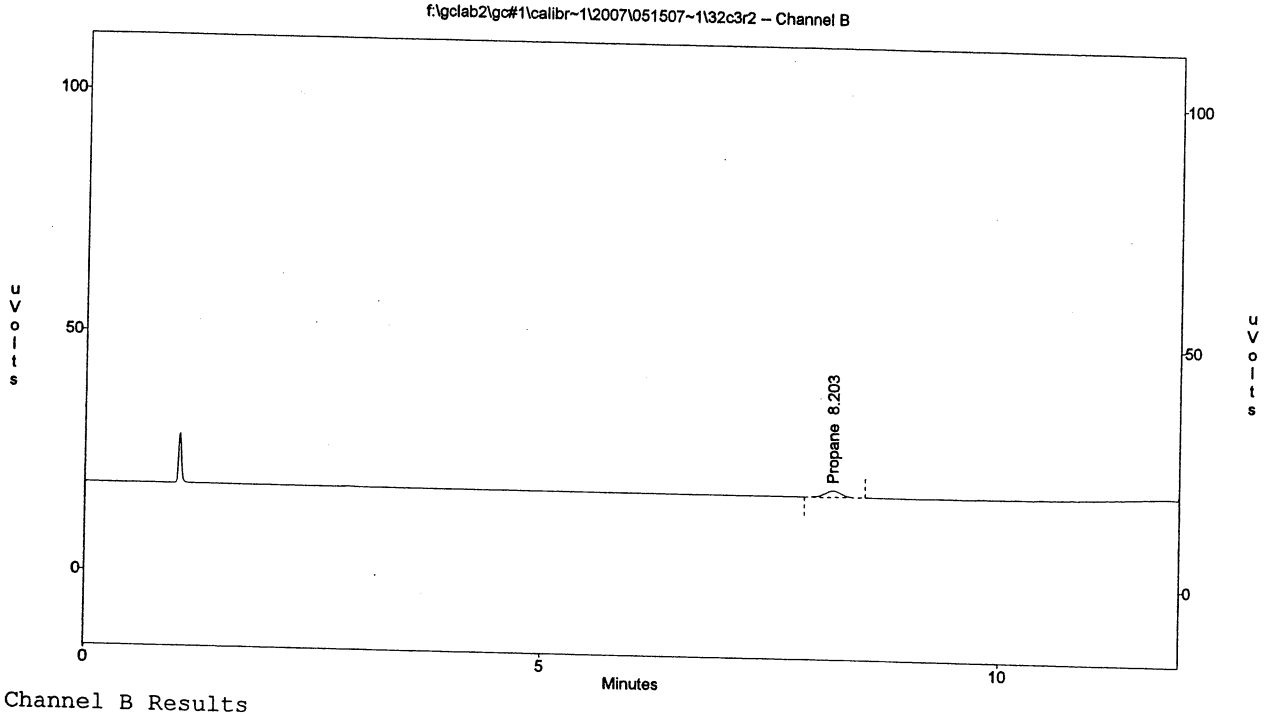
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.23	16978	28.5
Totals :		16978	28.5

B106

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\32c3r2
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 32.1ppm propane
Acquired : May 15, 2007 19:07:15
Printed : May 15, 2007 19:19:52
User : System



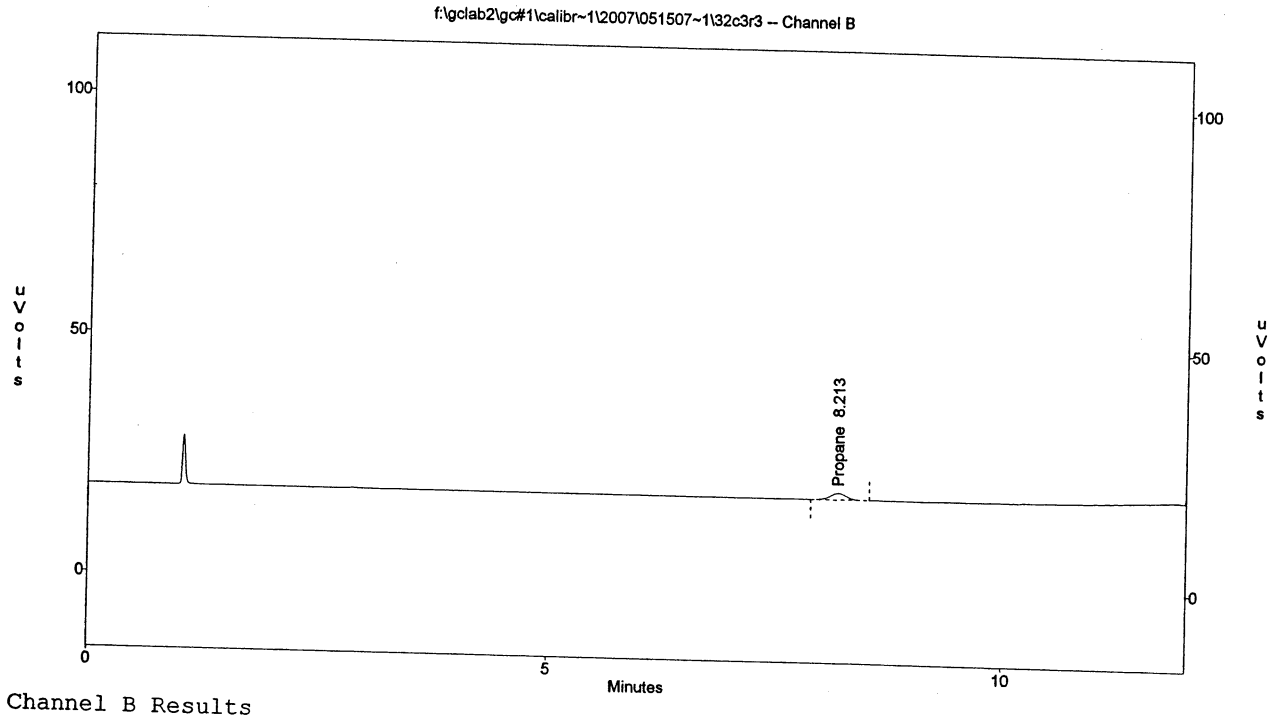
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.20	16696	28.0
Totals :		16696	28.0

B-107

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\32c3r3
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 32.1ppm propane
Acquired : May 15, 2007 19:22:49
Printed : May 15, 2007 19:36:35
User : System



Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	16797	28.1
Totals :		16797	28.1

B108

ENTECH ENGINEERING INC.

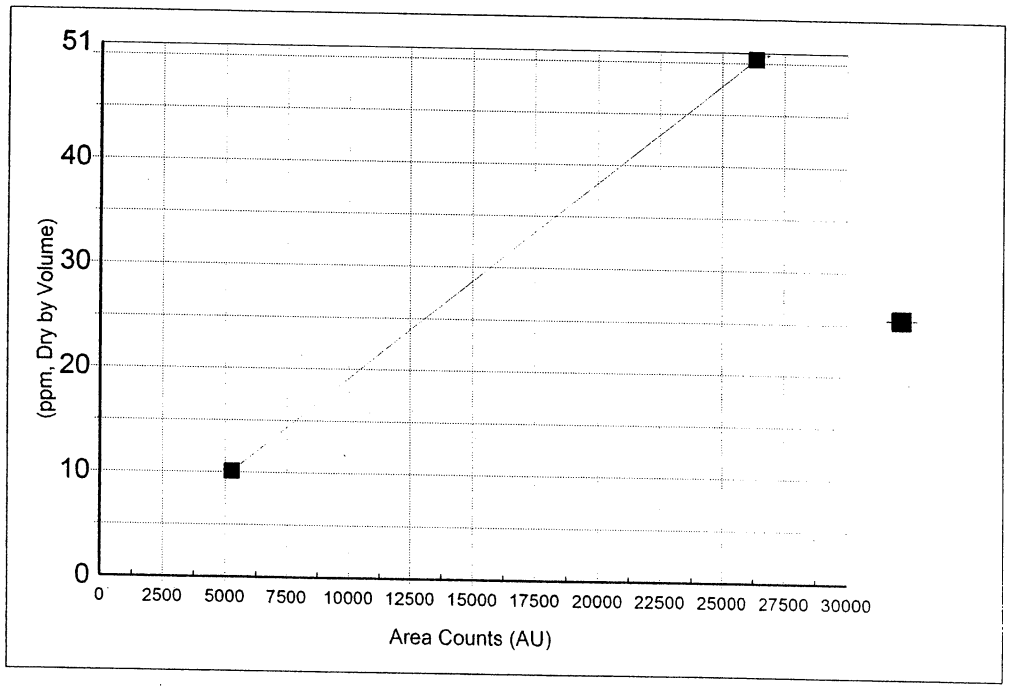
Gas Chromatograph Analysis Standard Curve Data
GC #1 FID (Channel B @ Range 1)
Propane Standard (Air Liquide CC217795, 504ppm Propane certified)

05/16-17/07

Dilution System : ENGASDL002

Dilution Factor	Predicted Concentration (ppmv)	Area Count				Precision Error			Calculated Concetration (ppmv)	% Difference (%)
		Run 1	Run 2	Run 3	Average	Run 1 (%)	Run 2 (%)	Run 3 (%)		
1:50	10.08	5268	5272	5273	5271.0	-0.06	0.02	0.04	10.07	-0.11
1:10	50.40	26317	26464	26354	26378.3	-0.23	0.32	-0.09	50.39	-0.02

Constant	0.0111
R Squared	1.0000
No. of Observations	2
Degrees of Freedom	0
X Coefficient(s)	1.910237E-03

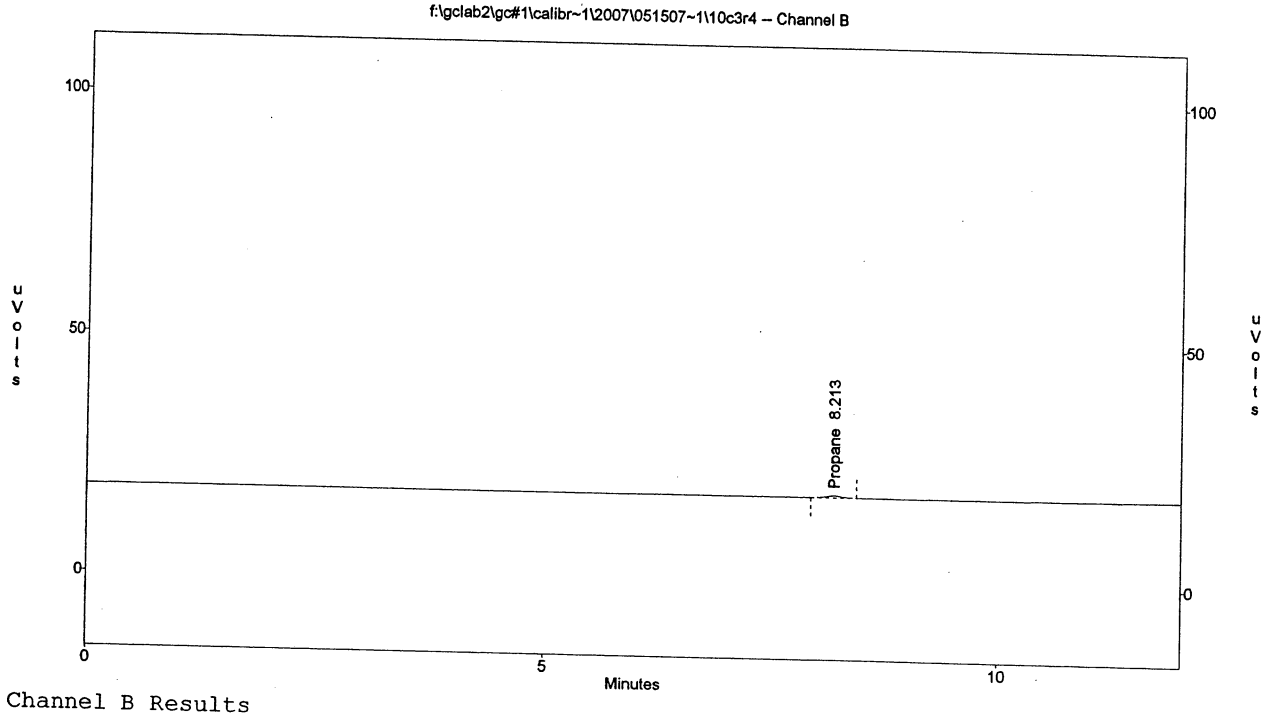


Operator _____ Date 5-17-07

B109

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\10c3r4
Method : f:\gclab2\gc#1\fid_b12.met
Sample ID : 10.08ppm propane
Acquired : May 17, 2007 09:47:44
Printed : May 17, 2007 11:00:30
User : System



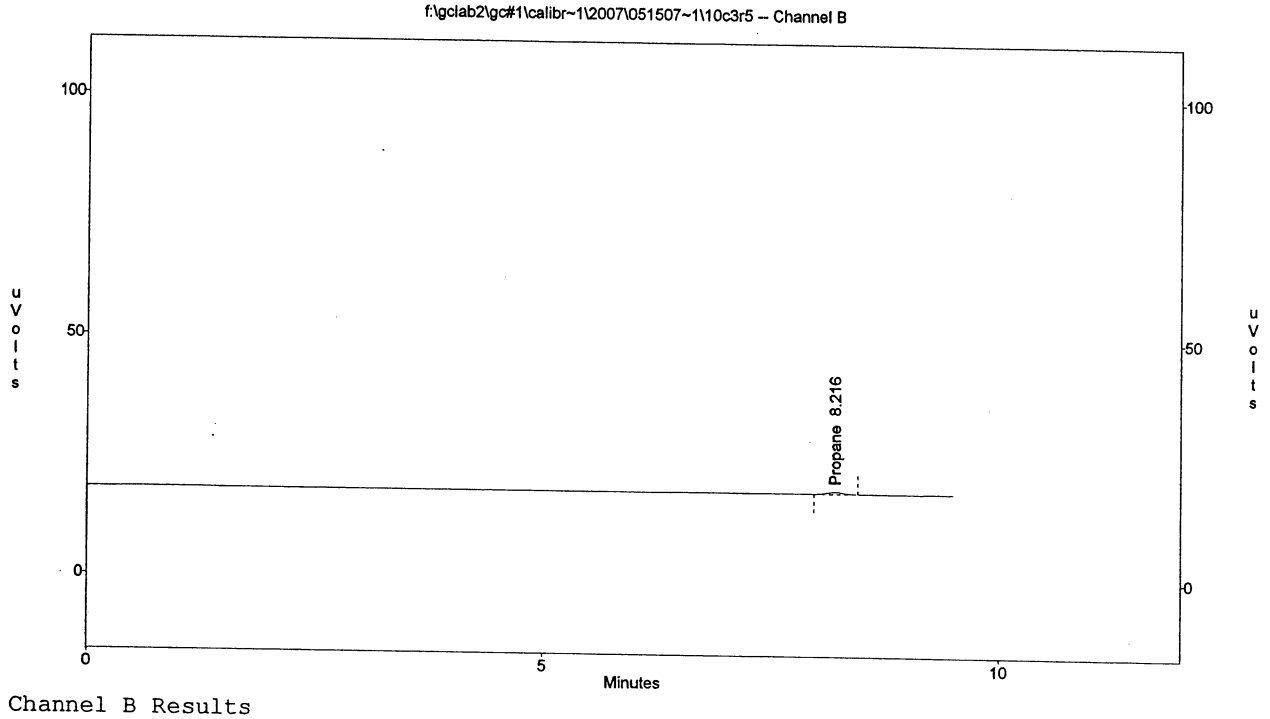
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	5268	8.8
Totals :		5268	8.8

B 110

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\10c3r5
Method : f:\gclab2\gc#1\fid_b12.met
Sample ID : 10.08ppm propane
Acquired : May 17, 2007 10:29:07
Printed : May 17, 2007 10:59:54
User : System



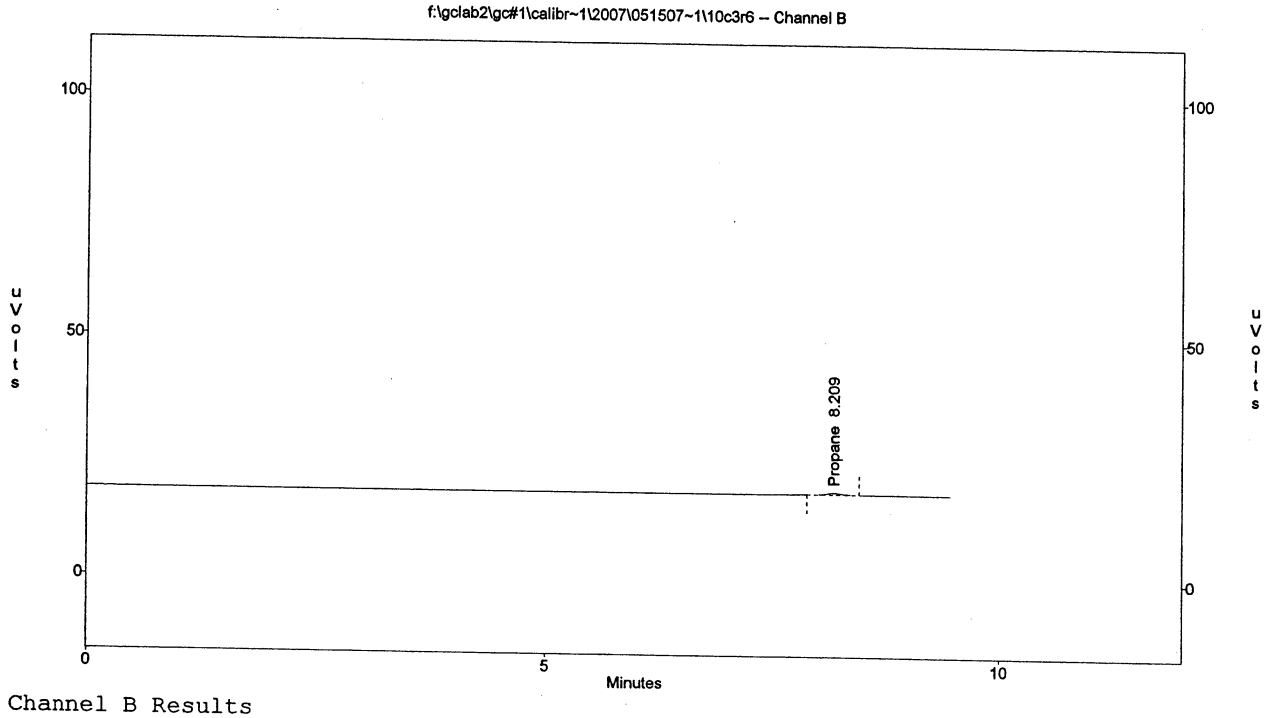
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.22	5272	8.8
Totals :		5272	8.8

B111

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\10c3r6
Method : f:\gclab2\gc#1\fid_b12.met
Sample ID : 10.08ppm propane
Acquired : May 17, 2007 10:41:18
Printed : May 17, 2007 10:59:36
User : System



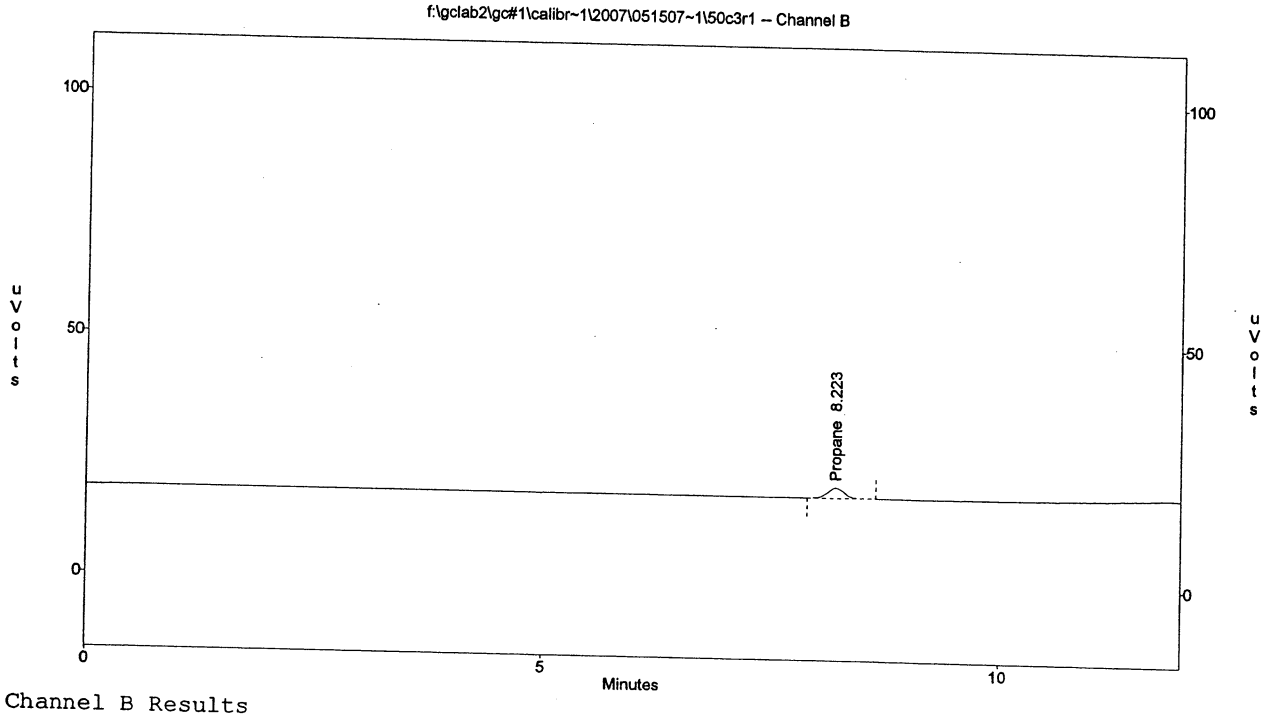
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	5273	8.8
Totals :		5273	8.8

B112

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\50c3r1
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 50.40ppm propane
Acquired : May 16, 2007 19:05:59
Printed : May 16, 2007 19:24:19
User : System



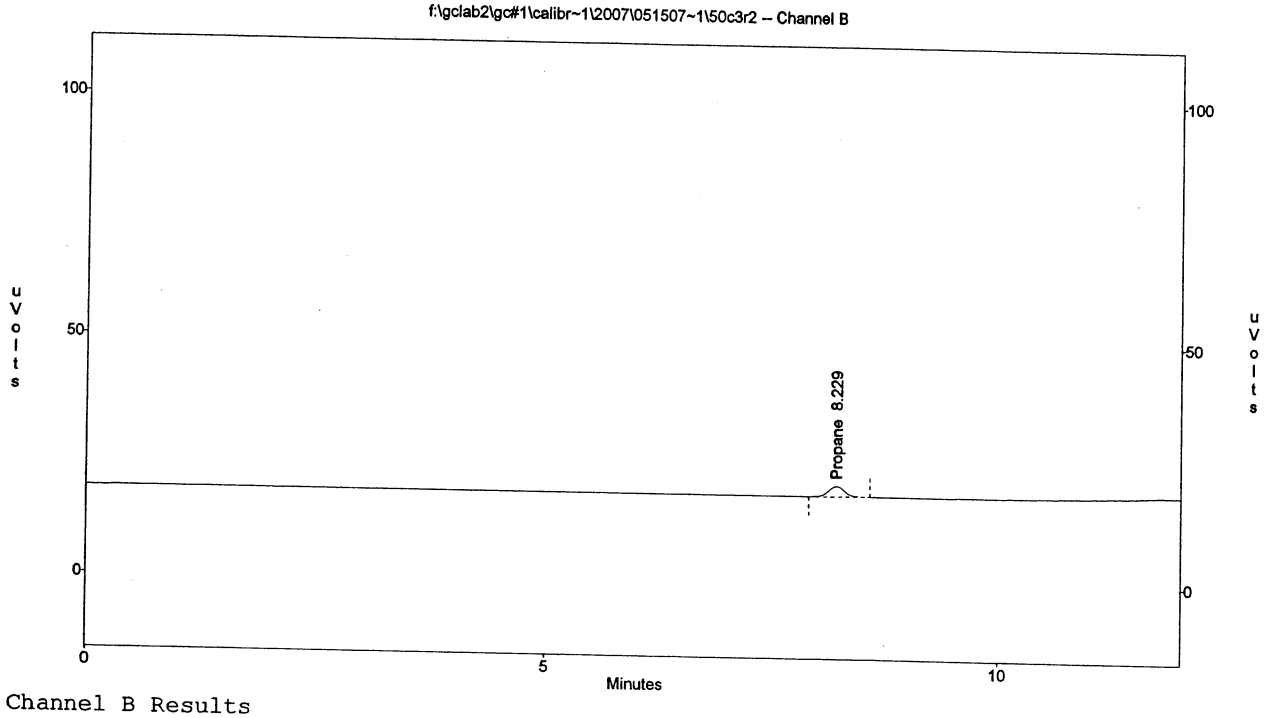
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.22	26317	44.1
Totals :		26317	44.1

B-113

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\50c3r2
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 50.40ppm propane
Acquired : May 16, 2007 19:26:08
Printed : May 16, 2007 19:40:02
User : System



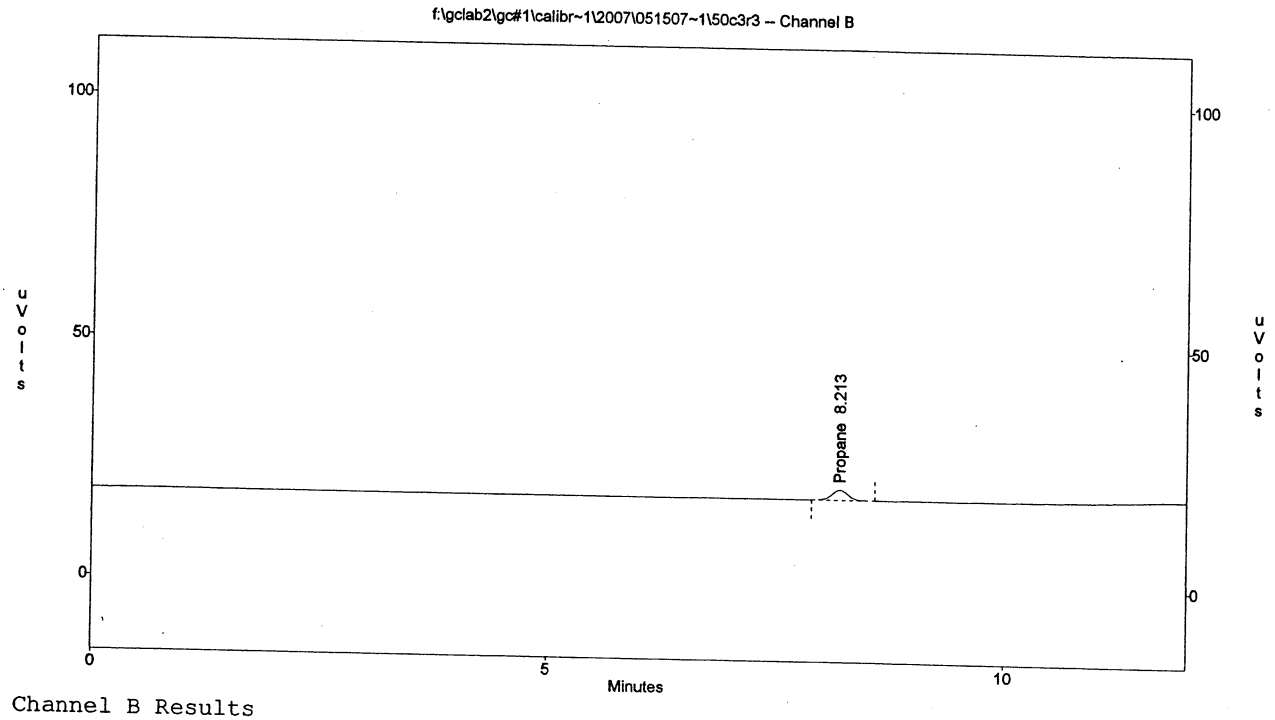
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.23	26464	44.3
Totals :		26464	44.3

B114

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\50c3r3
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 50.40ppm propane
Acquired : May 16, 2007 19:42:02
Printed : May 17, 2007 09:22:02
User : System



Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	26354	44.2
Totals :		26354	44.2

B115

ENTECH ENGINEERING INC.
P.O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Gas Dilution System Validation Study (EPA Method 205)

Gas Dilution System ID: ENGASDL002
Calibration Standard: Air Liquide CC115242
Calibration Date: May 16-17, 2007
Propane X Coefficent: 1.910237E-03

Validation Gas Standard: Air Liquide AL0400
Validation Date: May 15-16, 2007
Certified Concentration: 32.1 ppm

Instrument: GC#1 FID-2, Range 1 **Column:** 80/100 Haysep Q, 6 ft X 1/8 in, S.S. (316) **Sample Injection Loop:** 1000 ul

ID	Run 1 Area	Run 2 Area	Run 3 Area	Average Area	Precision Error (%) Run 1	Run 2	Run 3	Average Conc. (ppmv)	Certified Std. Conc. (ppmv)	Percent Difference	Control Limit (< 2)%
Propane	16978	16696	16797	16824	0.92%	0.76%	0.16%	32.14	32.10	0.12%	Pass

Operator _____ Date 5-17-07

B116

ENTECH ENGINEERING INC.
P.O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Gas Dilution System Validation Study (EPA Method 205)

Gas Dilution System ID: ENGASDL003
Calibration Standard: AirGas SG1014905
Calibration Date: May 16-17, 2007
Propane X Coefficent: 1.666122E-03

Validation Gas Standard: Air Liquide (CC217795)
Validation Date: May 17, 2007
Certified Concentration: 504 ppmv

Instrument: GC#1 FID-2, Range 1 **Column:** 80/100 Haysep Q, 6 ft X 1/8 in, S.S. (316) **Sample Injection Loop:** 1000 ul

ID	Run 1 Area	Run 2 Area	Run 3 Area	Average Area	Precision Error (%) Run 1	Run 2	Run 3	Average Conc. (ppmv)	Certified Std. Conc. (ppmv)	Percent Difference	Control Limit (< 2)%
Propane	297068	296312	298874	297418	0.12%	0.37%	0.49%	495.53	504.00	1.68%	Pass

Oeprator _____ Date 5-17-07

B117

AIR LIQUIDE™

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

Cyl. Number:	Cyl. Pressure:*	Document Number:
CC186874	1900psig	12948570
Assay Date:	**Expiration Date:**	**Item Number:**
5/24/2004	5/24/2007	
Customer:	**P.O. Number:**	**Notes:** CGA350
ENTECH	50616	
	LOT #: LPX100168	

COMPONENT Name	REQUESTED Concentration	ASSAY Concentration
Propane	500 ppm	503 ±5 ppm
Nitrogen	Balance	Balance

EPA-600/R-97/123, Section 2.2 Procedure G-2

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/123

*Cylinder should not be used when gas pressure is below 150 psig

REFERENCE STANDARD EMPLOYED FOR ANALYSIS

Std name	Std #	Conc.	Units	Std Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
SRM82	1669b	488.0	ppm	4.0	C3H8	Air	XF003985B	10/1/2006	81-H-04

Component 1: Propane Gas Analyzer Employed		Component 2: None Gas Analyzer Employed		Component 3: Gas Analyzer Employed	
Manufacturer:	HP	Manufacturer:		Manufacturer:	
Model Number:	6890	Model Number:		Model Number:	
Serial Number:	8295	Serial Number:		Serial Number:	
Analytical Principle:	GC-FID	Analytical Principle:		Analytical Principle:	
MPC Calibrated:	04/26/04	MPC Calibrated:		MPC Calibrated:	

5/24/2004	Trial 1	Trial 2	Trial 3	Units
Zero	0.00	0.00	0.00	
Reference 1	134.25	135.11	135.35	
Reference 2				
Candidate	135.30	136.00	135.60	
Result	140.41	141.13	140.73	ppm
	Mean Result:		140.76	ppm

Component 1

Propane

	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference 1				
Reference 2				
Candidate				
Result				
	Mean Result			

Note: Propane was analyzed by dilution. The dilution ratio was 500 / 140 to bring the analyte concentration into the range of the well-characterized multi-point curve. The reference standard was also diluted from 488 ppm to 140 ppm.

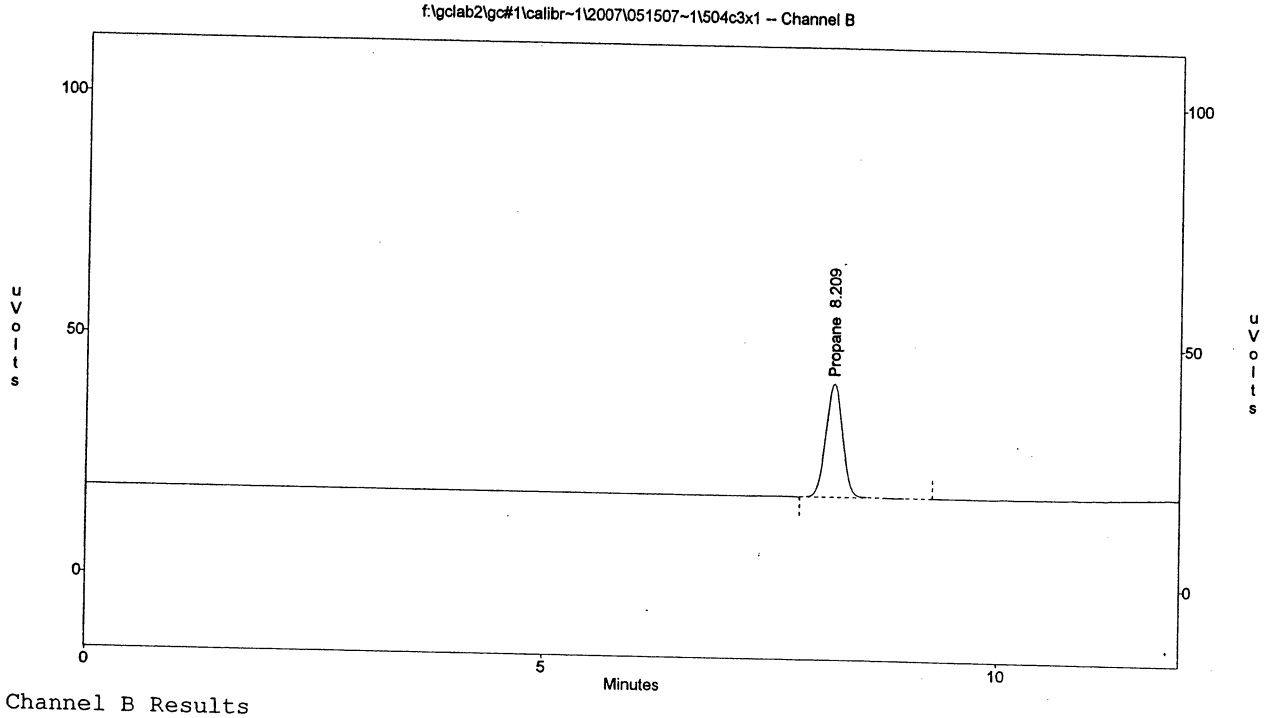
Analyst Signature: Yang Qin

Air Liquide America L.P.
11426 Fairmont Parkway, La Porte, Texas 77571-6000
Phone: (281) 474-8400 Fax: (281) 474-8419

B118

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\504c3x1
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 504ppm propane
Acquired : May 17, 2007 13:33:57
Printed : May 17, 2007 13:59:49
User : System



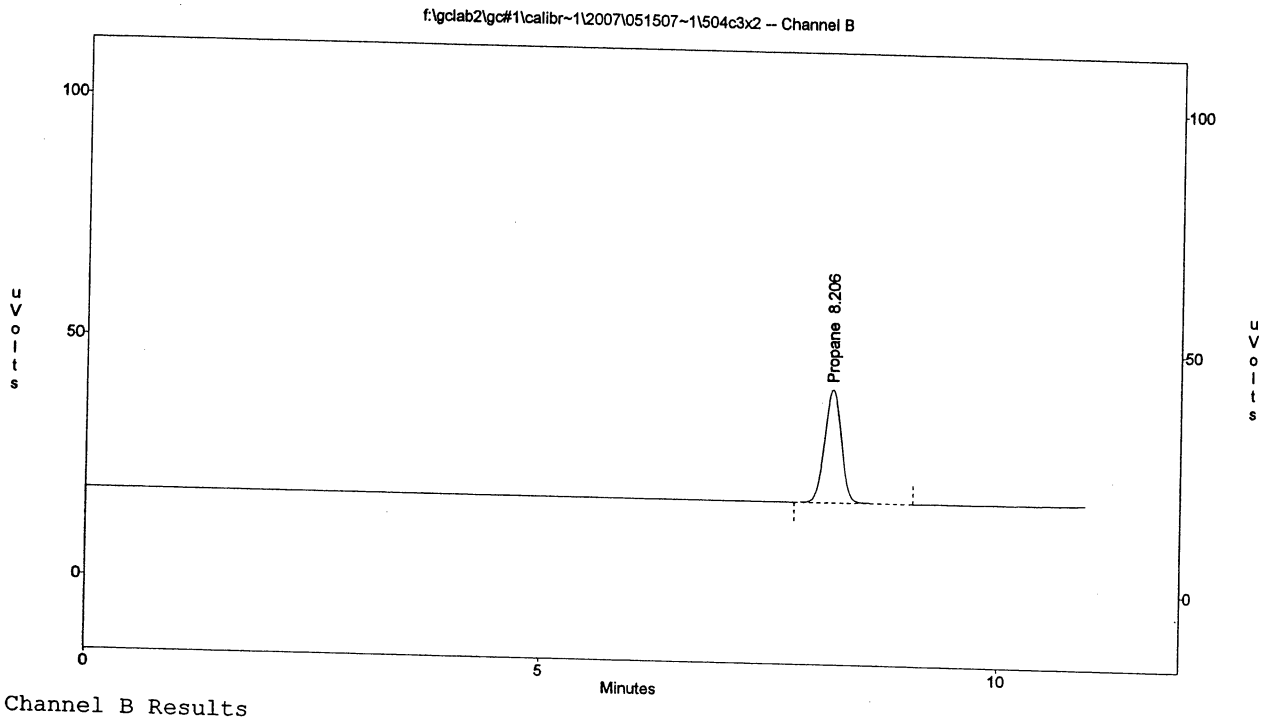
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	297068	497.8
Totals :		297068	497.8

B119

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\504c3x2
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 504ppm propane
Acquired : May 17, 2007 13:48:34
Printed : May 17, 2007 13:59:32
User : System



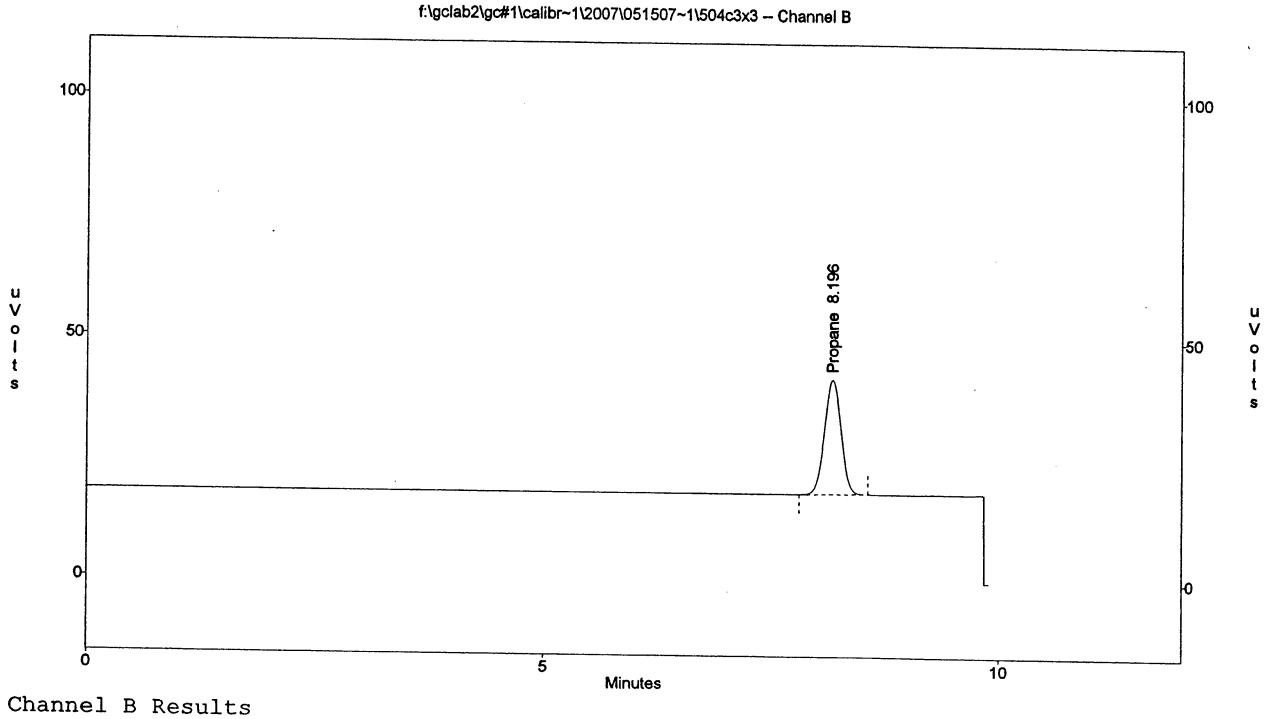
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	296312	496.6
Totals :		296312	496.6

B120

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\504c3x3
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 504ppm propane
Acquired : May 17, 2007 14:02:24
Printed : May 17, 2007 14:12:19
User : System



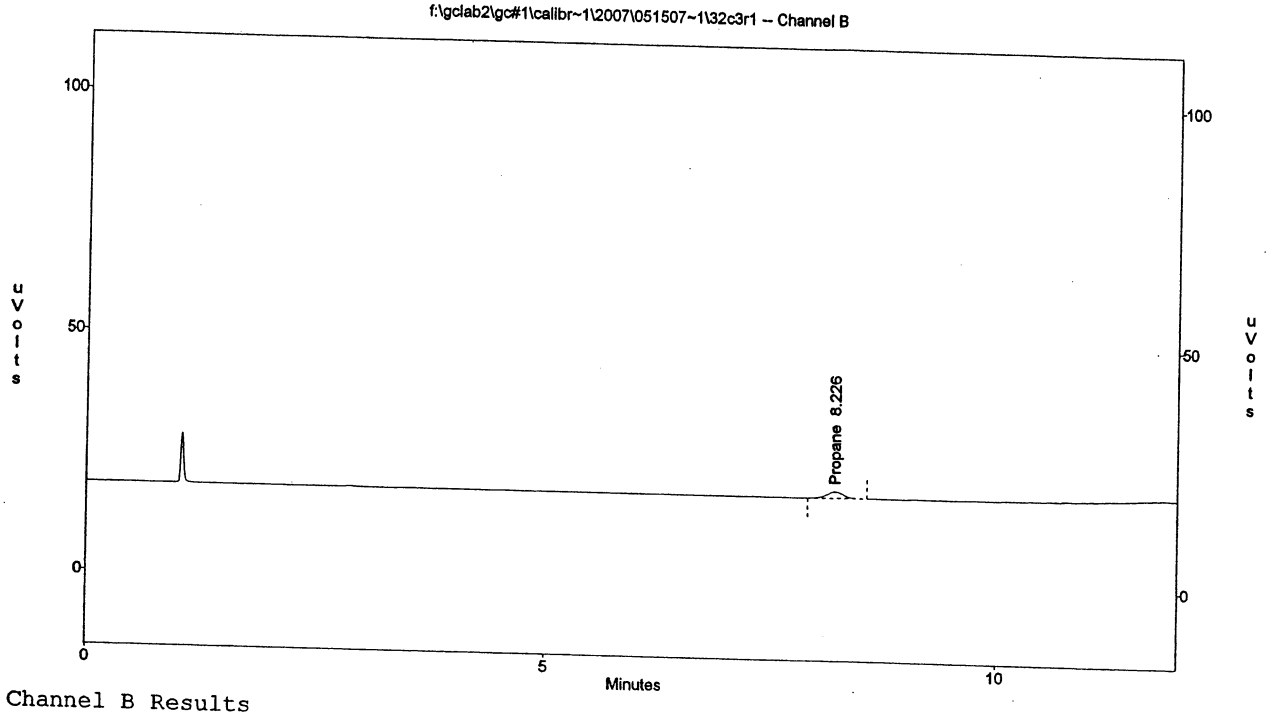
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.20	298874	500.8
Totals :		298874	500.8

B121

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\32c3r1
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 32.1ppm propane
Acquired : May 15, 2007 18:52:31
Printed : May 15, 2007 19:05:41
User : System



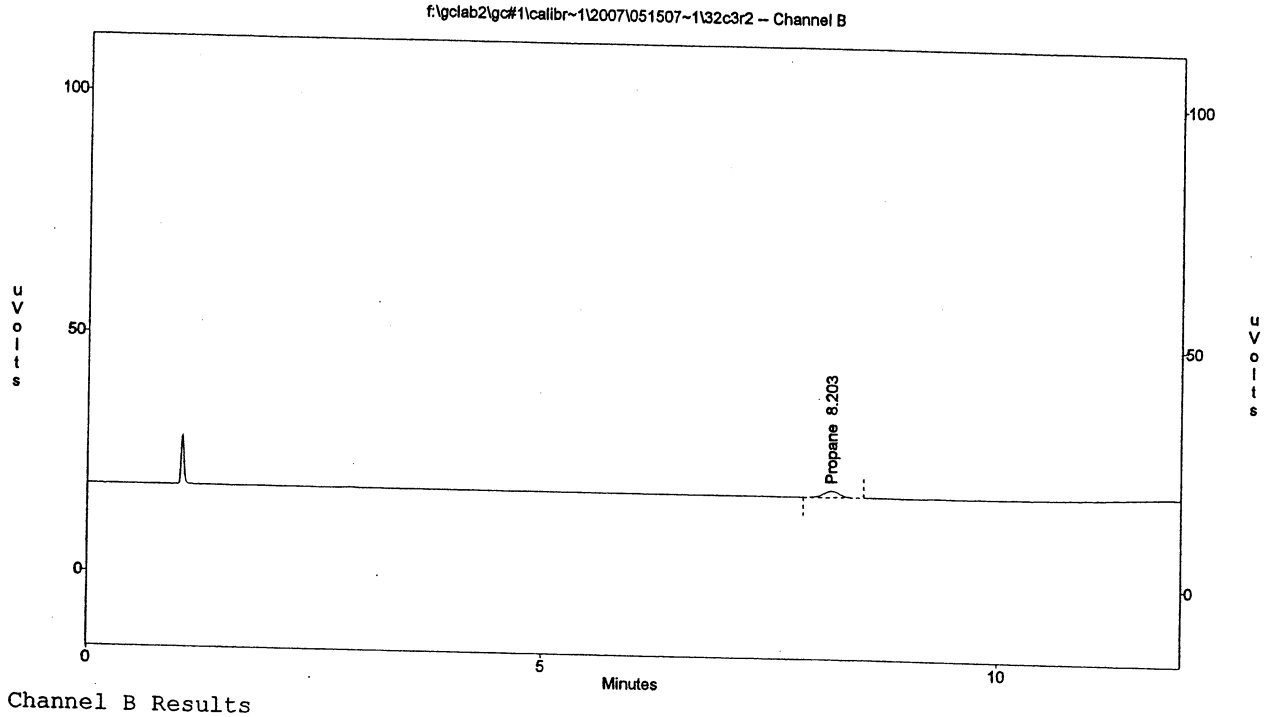
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.23	16978	28.5
Totals :		16978	28.5

B-122

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\32c3r2
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 32.1ppm propane
Acquired : May 15, 2007 19:07:15
Printed : May 15, 2007 19:19:52
User : System



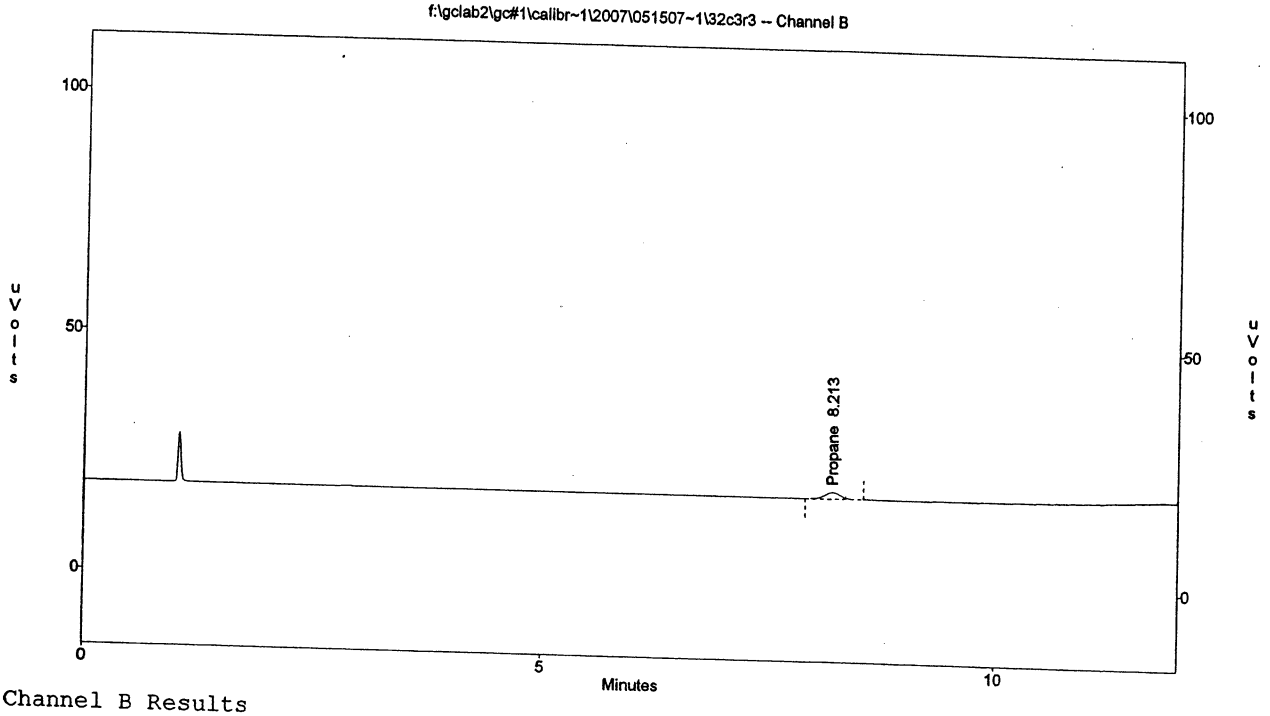
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.20	16696	28.0
Totals :		16696	28.0

15123

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\32c3r3
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 32.1ppm propane
Acquired : May 15, 2007 19:22:49
Printed : May 15, 2007 19:36:35
User : System



Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	16797	28.1
Totals :		16797	28.1

B 124

ENTECH ENGINEERING INC.

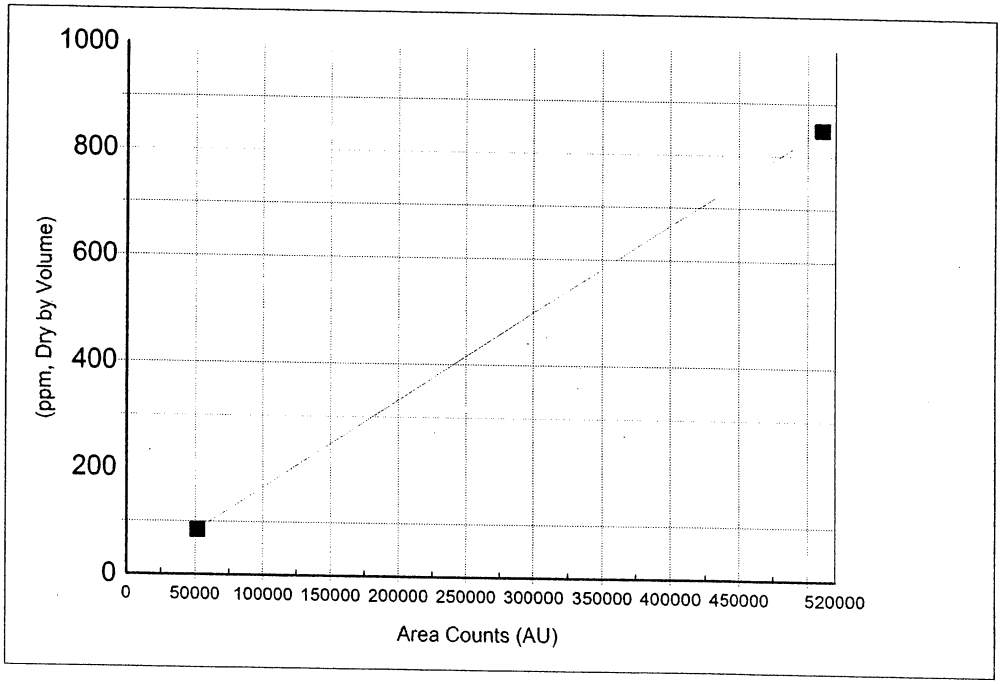
Gas Chromatograph Analysis Standard Curve Data
GC #1 FID (Channel B @ Range 1)
Propane Standard (AirGas SG1014905, 8.495% Propane certified)

05/16-17/07

Dilution System : ENGASDL003

Dilution Factor	Predicted Concentration (ppmv)	Area Count				Precision Error			Calculated Concetration (ppmv)	% Difference (%)
		Run 1	Run 2	Run 3	Average	Run 1 (%)	Run 2 (%)	Run 3 (%)		
1:1000	84.95	51728	51734	51784	51748.7	-0.04	-0.03	0.07	86.22	1.49
1:100	849.50	512557	512202	507127	510628.7	0.38	0.31	-0.69	850.77	0.15

Constant	-1.2696
R Squared	1.0000
No. of Observations	2
Degrees of Freedom	0
X Coefficient(s)	1.666122E-03



Operator _____ Date 5-17-07

B125

Airgas

Airgas Specialty Gases
12722 South Wentworth Avenue
Chicago, IL 60628
773.785.3000 Fax: 773.785.1928
www.airgas.com

Certificate of Analysis: E.P.A. Protocol Gas Mixture

Certification performed in accordance with "EPA Traceability Protocol (Sept.1997)" using assay procedures listed.

Cylinder No:	SG1014905	Reference Number:	012074-00
Certification Date:	6/22/2004	Expiration Date:	6/22/2007
Cylinder Pressure:	1000 psig	Part No:	Recertification
*Do not use cylinder below 150 psig.		Lab:	Chicago

Certified Concentrations

Component	Concentration	Accuracy	Procedure	Principle
PROPANE	8.495%	1%	G-2	TCD
NITROGEN	Balance			

Nox (Reference Value Only) ppm

Reference Standard Information

Type	Component	Concentration	Unit	Cylinder Number
NTRM	PROPANE	2.022	%	SG881565

Analytical Data

1st Analysis Date: 6/22/2004

R	20,456.0	S	85,692	Z	0
S	85,757	Z	0	R	20,417.0
Z	0	R	20,480.0	S	85,524

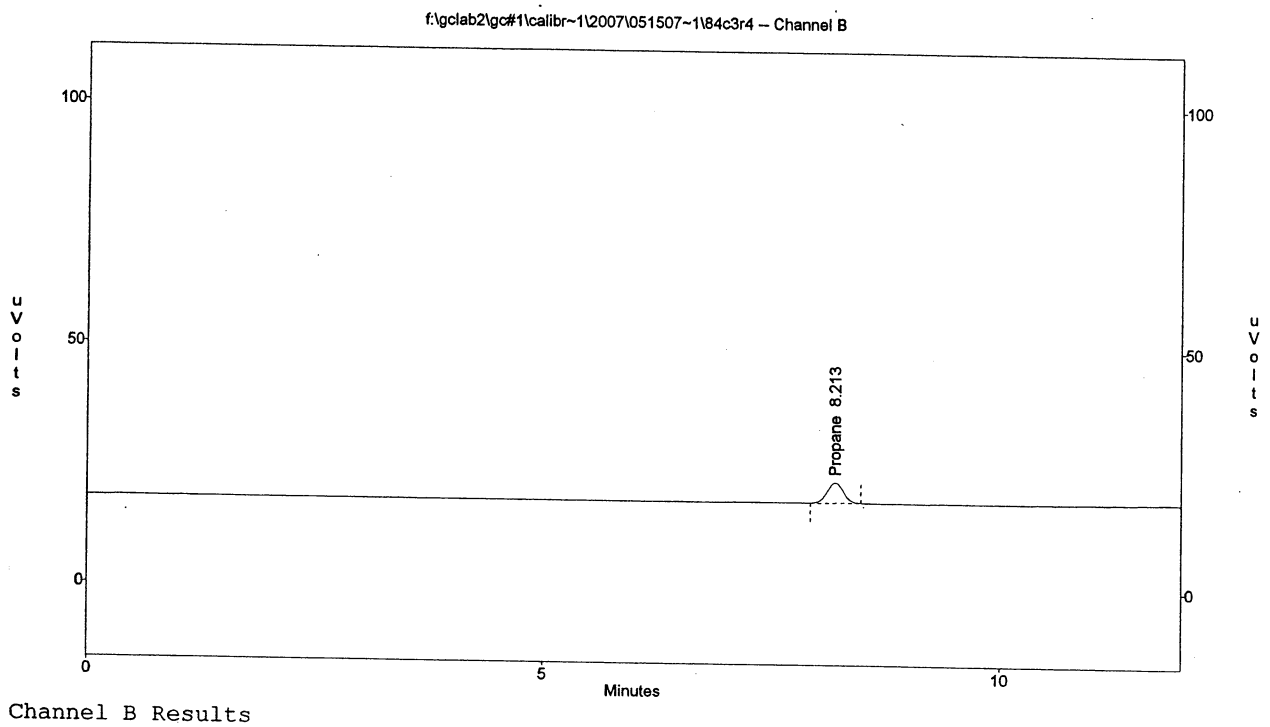
NOTE: Previous Certification
2/5/2000-2/5/2003
8.53%

Approved By:

B126

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\84c3r4
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 84.95ppm propane
Acquired : May 17, 2007 11:24:45
Printed : May 17, 2007 12:15:41
User : System



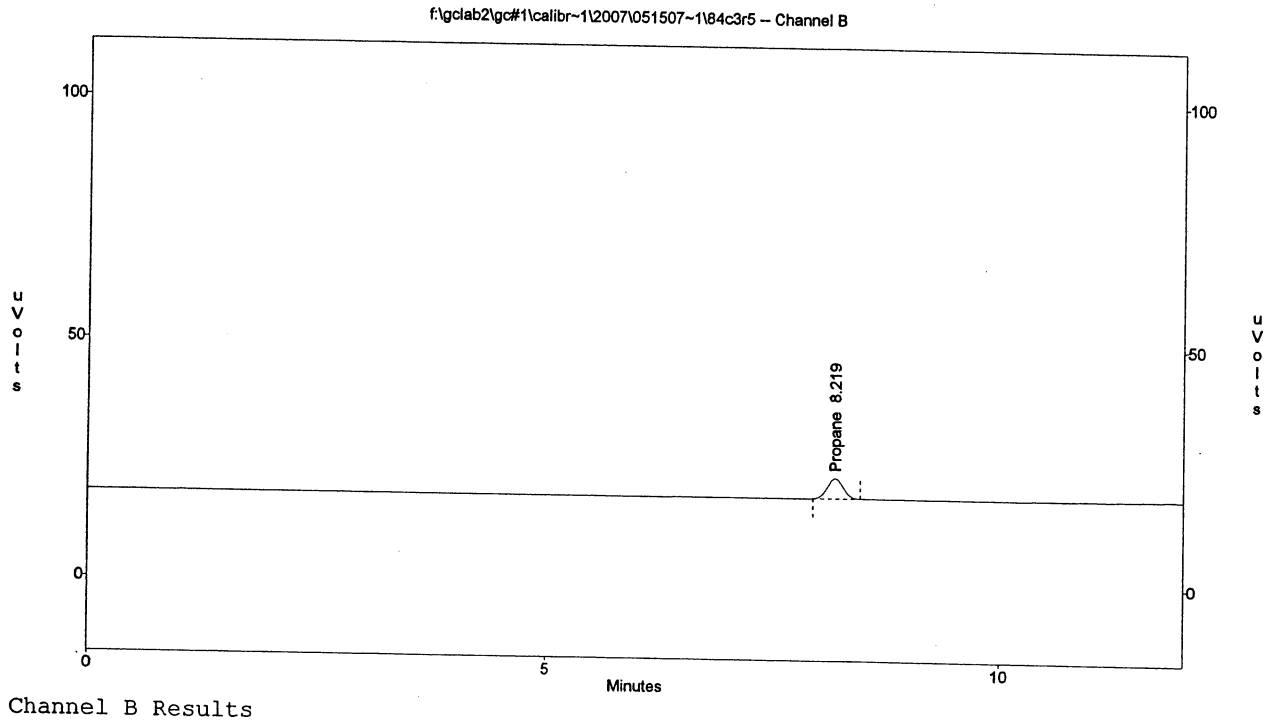
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	51728	86.7
Totals :		51728	86.7

B127

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\84c3r5
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 84.95ppm propane
Acquired : May 17, 2007 11:45:46
Printed : May 17, 2007 12:01:48
User : System



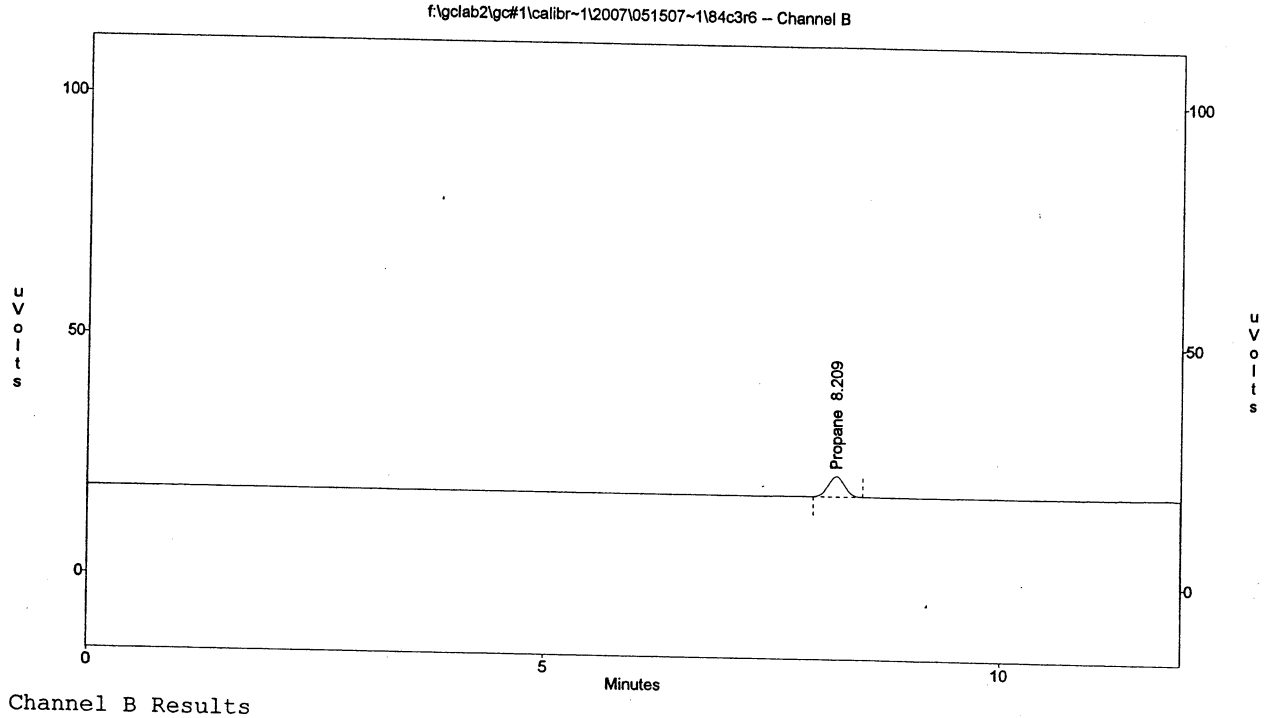
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.22	51734	86.7
Totals :		51734	86.7

B-128

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\84c3r6
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 84.95ppm propane
Acquired : May 17, 2007 12:02:17
Printed : May 17, 2007 12:15:20
User : System



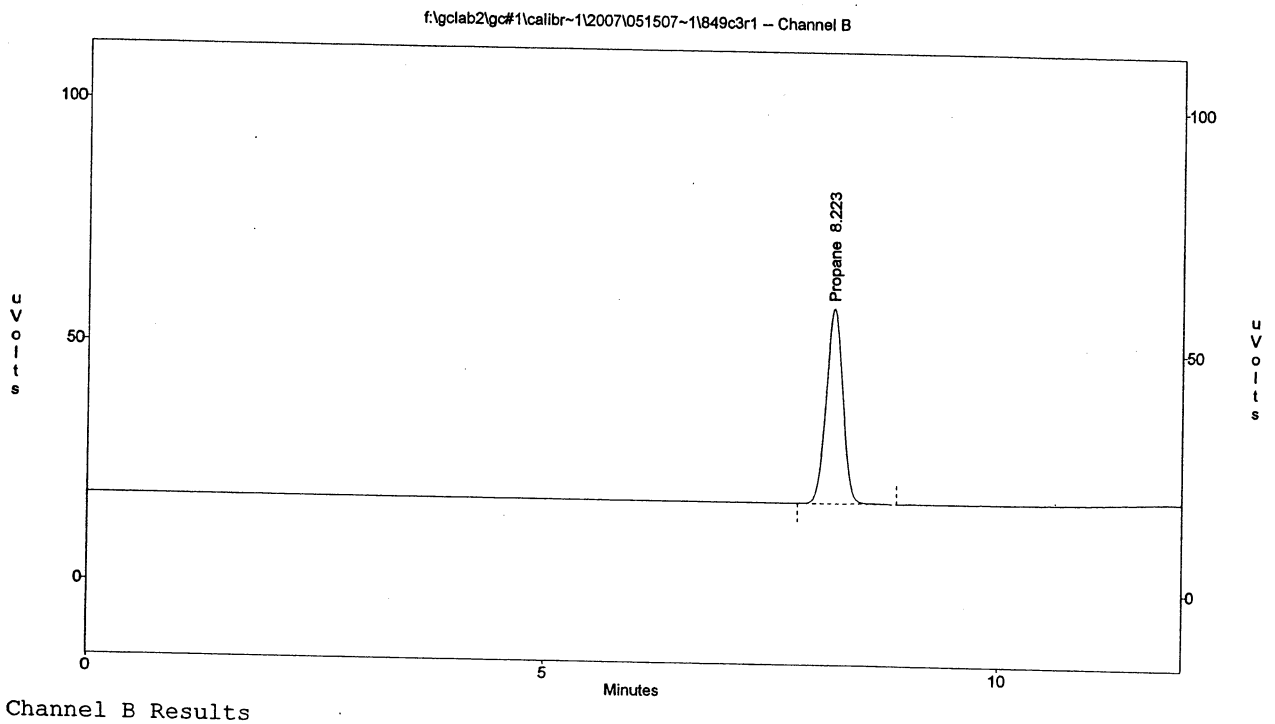
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	51784	86.8
Totals :		51784	86.8

B129

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\849c3r1
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 849.5ppm propane
Acquired : May 16, 2007 21:49:27
Printed : May 16, 2007 22:01:38
User : System



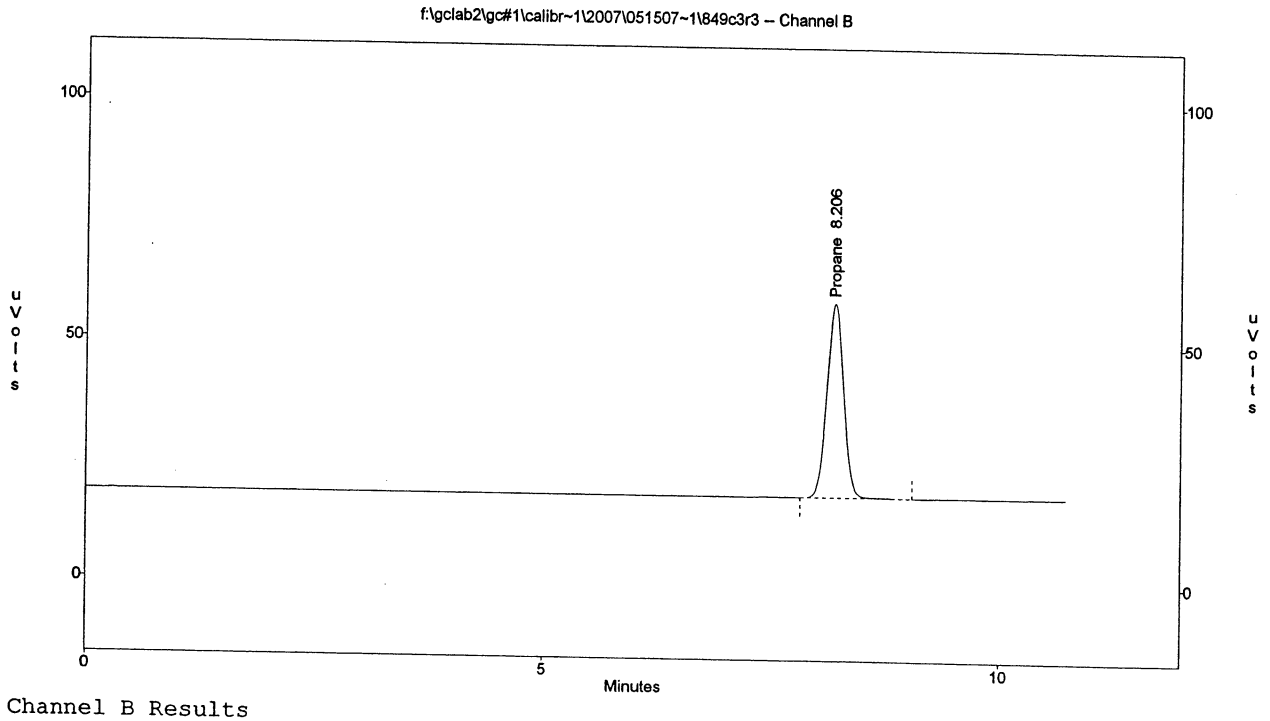
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.22	512557	858.9
Totals :		512557	858.9

B130

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\849c3r3
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 849.5ppm propane
Acquired : May 17, 2007 10:54:08
Printed : May 17, 2007 11:04:54
User : System



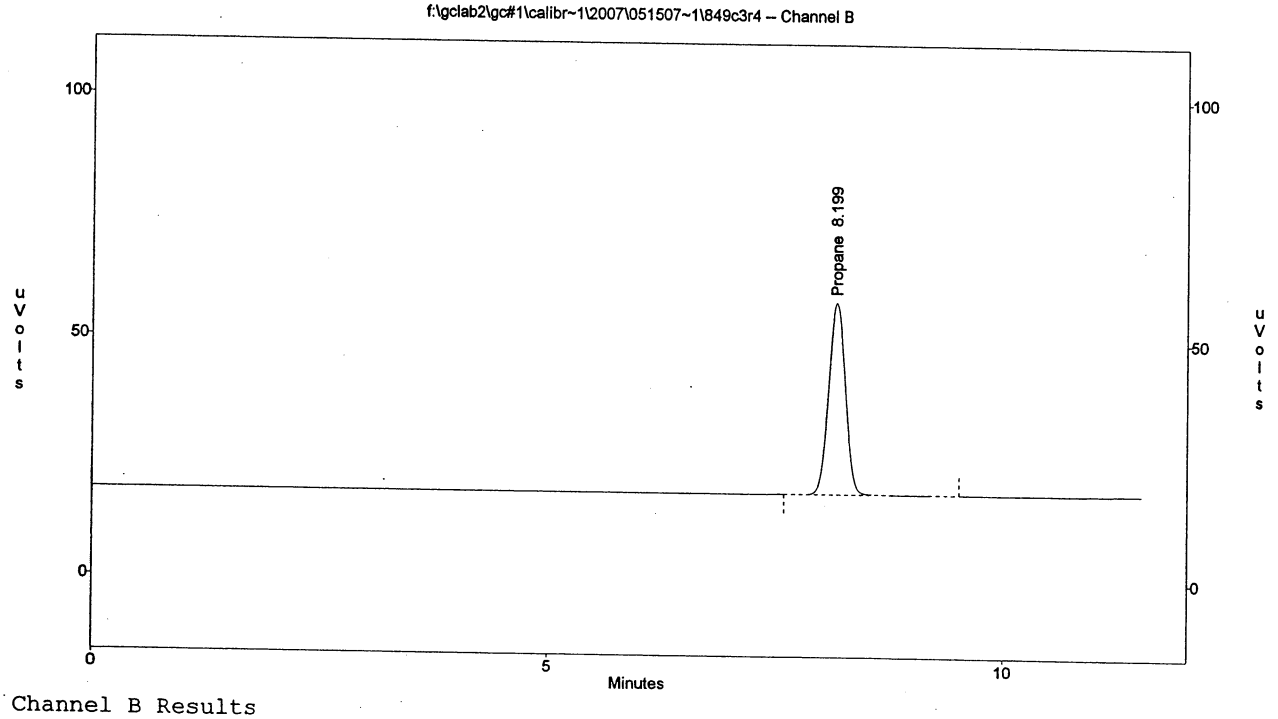
Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.21	512202	858.3
Totals :		512202	858.3

B131

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#1\calibr~1\2007\051507~1\849c3r4
Method : f:\gclab2\gc#1\Fid_b12.met
Sample ID : 849.5ppm propane
Acquired : May 17, 2007 12:17:09
Printed : May 17, 2007 12:28:41
User : System



Channel B Results

Peak	Retention Time	Area	Concentration, ppmv
Propane	8.20	507127	849.8
Totals :		507127	849.8

B132

GC Natural Gas / Fuel Analysis

Post-Calibration Standards
(EPA Method 18)

B-133

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

GC #3 FID Analysis - Initial Calibration: July. 17, 2007
Gasmix Standards Post Check Result - Aug 31, 2007

Sample ID No.	GC Run No.	Area Counts Methane area counts	Concentration Methane %	Area Counts Ethane area counts	Concentration Ethane %	Area Counts Propane area counts	Concentration Propane %	Area Counts Isobutane area counts	Concentration Isobutane %	Area Counts n-Butane area counts	Concentration n-Butane %
Initial Cal. Standard Avg.		857114.7	44.373	78005.7	1.760	32474.7	0.495	16365.0	0.199	16520.3	0.199
Calibration Post-Check Run	1	854595	45.5	75444	1.73	33452	0.52	16585	0.20	16541	0.20
	2	848708	45.2	74980	1.72	33230	0.51	16327	0.20	16322	0.20
	3	853973	45.5	75440	1.73	33423	0.51	16425	0.20	16420	0.20
		Average =	45.4		1.72		0.51		0.20		0.20
		Standard Response Factor =	19316.13		44321.42		65605.45		82236.18		83016.58
		QA Response Factor =	19210.45		42777.27		67410.77		82641.54		82551.09
		Mean Response Factor =	19263.29		43549.35		66508.11		82438.86		82783.84
		Percent Difference, % =	0.55		3.55		2.71		0.49		0.56
		Pass/Fail Criterion (<5%) =	Pass		Pass		Pass		Pass		Pass

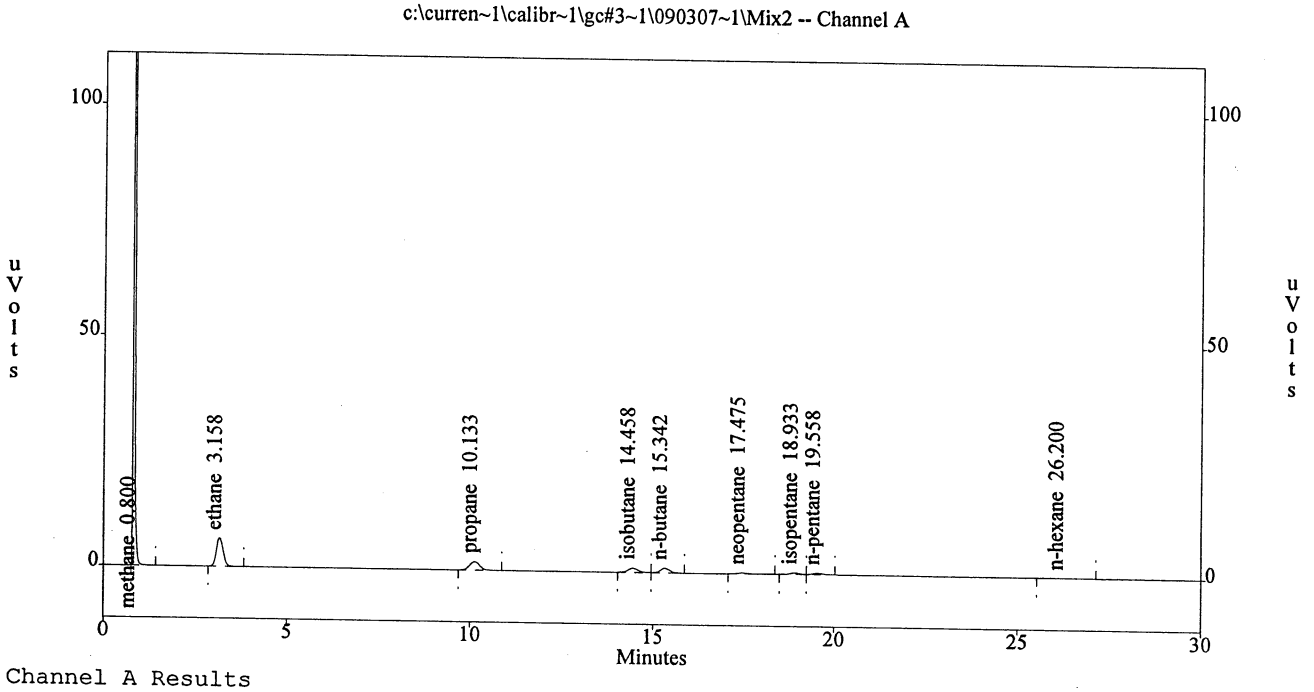
B134

Sample ID No.	GC Run No.	Area Counts Neopentane area counts	Concentration Neopentane %	Area Counts Isopentane area counts	Concentration Isopentane %	Area Counts n-Pentane area counts	Concentration n-Pentane %	Area Counts n-Hexane area counts	Concentration n-Hexane %
Initial Cal. Standard Avg.		4929.7	0.050	7335	0.075	7481.3	0.075	2481.7	0.025
Calibration Post-Check Run	1	5011	0.051	6732	0.069	6405	0.065	2701	0.025
	2	5062	0.051	7597	0.078	8301	0.084	2473	0.023
	3	5052	0.051	7586	0.078	7740	0.078	2158	0.020
		Average =	0.051		0.075		0.075		0.023
		Standard Response Factor =	98594.00		97800.00		99750.67		99666.67
		QA Response Factor =	100833.33		97400.00		99760.00		98152.61
		Mean Response Factor =	99713.67		97600.00		99755.33		98909.64
		Percent Difference, % =	2.25		0.41		0.01		1.53
		Pass/Fail Criterion (<5%) =	Pass		Pass		Pass		Pass

Operator Rm Date Sep04/2007

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\090307~1\Mix2
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 0.5xgasmix
Acquired : Sep 04, 2007 09:40:28
Printed : Sep 04, 2007 10:14:58
User : System



Channel A Results

Peak	Retention Time	Area
methane	0.80	854595
ethane	3.16	75444
propane	10.13	33452
isobutane	14.46	16585
n-butane	15.34	16541
neopentane	17.48	5011
isopentane	18.93	6732 → 7335
n-pentane	19.56	6405 → 7487.
n-hexane	26.20	2701

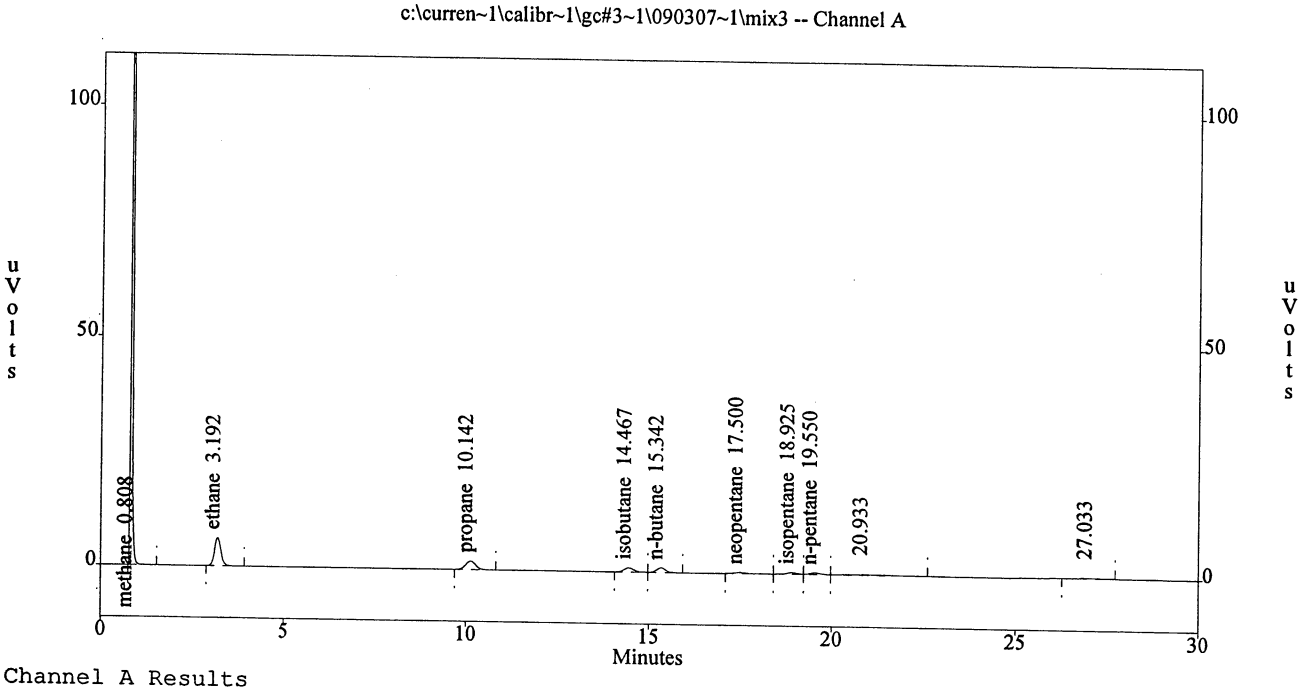
Totals :

1017466

$135

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\090307~1\mix3
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 0.5xgasmix
Acquired : Sep 04, 2007 10:17:52
Printed : Sep 04, 2007 10:55:42
User : System



Channel A Results

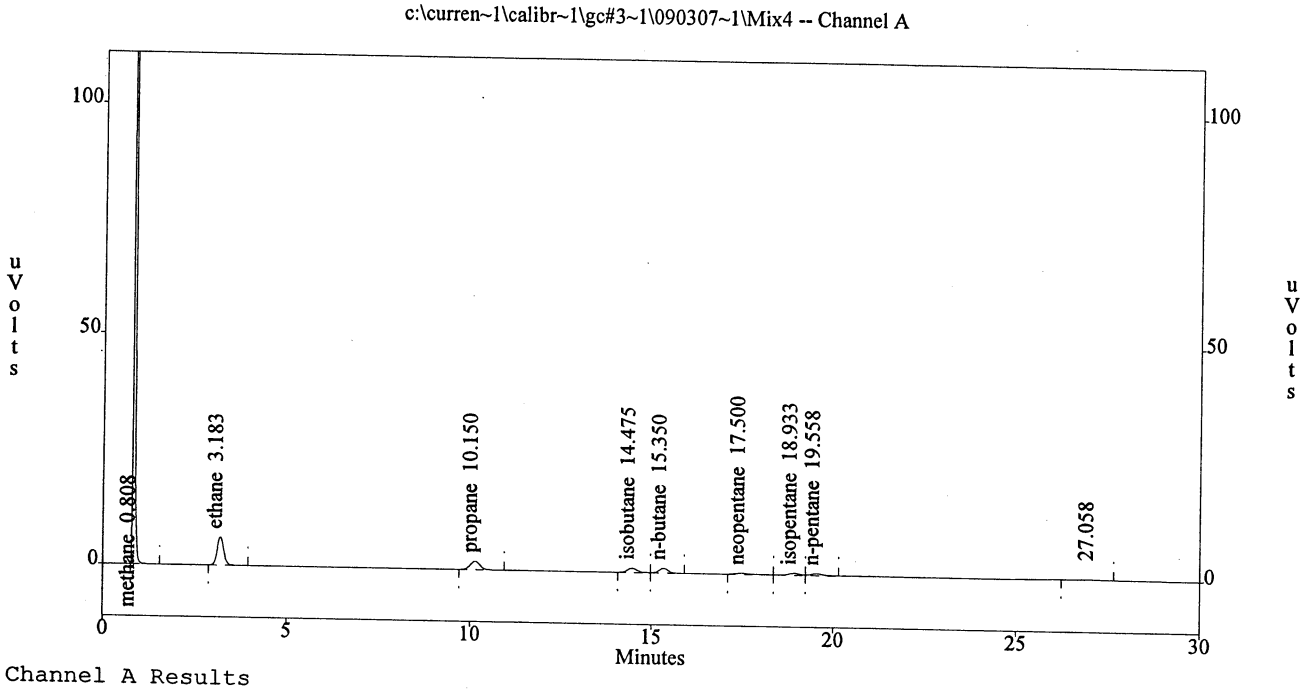
Peak	Retention Time	Area
methane	0.81	848708
ethane	3.19	74980
propane	10.14	33230
isobutane	14.47	16327
n-butane	15.34	16322
neopentane	17.50	5062
isopentane	18.92	7597
n-pentane	19.55	8301
	20.93	11478
	27.03	2473

Totals : 1024478

B136

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\calibr~1\gc#3~1\090307~1\Mix4
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 0.5xgasmix
Acquired : Sep 04, 2007 10:57:10
Printed : Sep 04, 2007 11:30:36
User : System



Channel A Results

Peak	Retention Time	Area
methane	0.81	853973
ethane	3.18	75440
propane	10.15	33423
isobutane	14.48	16425
n-butane	15.35	16420
neopentane	17.50	5052
isopentane	18.93	7586
n-pentane	19.56	7740
	27.06	2158

Totals : 1018217

B137

GC Natural Gas / Fuel Analysis

Sample Results and Raw Data
(EPA Method 18)

B 138

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Chain of Custody

Company Name: Delek
Plant Name: Delek Refining
Unit/EPN: SRU-2 / Boiler 9
Company Address:
City: Tyler State: TX Zip:
Entech Proposal No.:
Entech Supervisor Name: Ed. Pastermk
Entech Supervisor Signature:

Container Info. / Analysis Parameters: Fuel Analysis (C_1-C_6) (P/O : Wire . glass)

Remarks:
Turnaround Time:
Detection Limits Required Yes No
Circle one, if Yes, describe below or include separate sheet detailing requirements.

Entech Sample No.	Sample Description	Grab/Comp	Date	Time	Matrix	Number of Containers	Preservatives	Fuel Analysis (C_1-C_6) (P/O : Wire . glass)	Remarks
E507-08-14546	SRU-2 T1 B1	grab	8/22/07		g	1	—	X	
E507-08-14547	SRU-2 T1 B2	↓	8/22/07		↓	1	—		B/U
E507-08-14548	SRU-2 T2 B1	↓	8/22/07		↓	1	—	X	
E507-08-14549	SRU-2 T2 B2	↓	8/22/07		↓	1	—		B/U
E507-08-14550	SRU-2 T3 B1	↓	8/22/07		↓	1	—	X	
E507-08-14551	SRU-2 T3 B2	↓	8/22/07		↓	1	—		B/U
E507-08-14552	Boiler 9 T1 B1	↓	8/23/07		↓	1	—	X	
E507-08-14553	Boiler 9 T1 B2	↓	8/23/07		↓	1	—		B/U
E507-08-14554	Boiler 9 T2 B1	↓	8/23/07		↓	1	—	X	
E507-08-14555	Boiler 9 T2 B2	↓	8/23/07		↓	1	—		B/U
E507-08-14556	Boiler 9 T3 B1	↓	8/23/07		↓	1	—	X	
E507-08-14557	Boiler 9 T3 B2	↓	8/23/07		↓	1	—		B/U

Person Taking Sample (a.-Print Name & b.-Signature)
See above for date and time
a. Tim Rios b. T-R

Received By (Signature): | Date: | Time: | QAQC FIELD acceptance checks. Place a Y or N after text | Container Type and volume OK? | Holding time OK? | Temperature OK? | Sample deficiencies - list on reverse. If none, write "none" in this box.

Received By (Signature): [signature] | Date: 8-27-07 | Time: 1420 | QAQC LAB acceptance checks. Place a Y or N after text: Y | Container Type and volume OK? ✓ | Holding time OK? ✓ | Temperature OK? ✓ | Sample deficiencies - list on reverse. If none, write "none" in this box. none

Sample Remainder Disposal | I Requested Lab To Dispose Of All Sample Remainders

Return Sample remainder to Entech Via: | (Signature) | (Date)

TO MAKE CORRECTION, USE SINGLE LINE MARK THROUGH THE INCORRECT DATA, INITIAL, DATE. DO NOT USE PEN OR LIQUID PAPER TO COMPLETELY COVER THE INCORRECT DATA.

f\templates\datasheets\field\chain of custody datasheets\chain of custody sheet.rev6 QAQC BACKUP.qpw 08/06

COC Lab Doc Number | COC unfilled form controlled document number: COCRev6c

Original

8139

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Chain of Custody

Company Name: Delek
Plant Name: Tyler Refining
Unit/EPN: Boiler 9
Company Address:
City: Tyler | State: TX | Zip:

Entech Proposal No.:

Entech Supervisor Name: E.J.P.
Entech Supervisor Signature: [signature]

Container Info. | Analysis Parameters

Remarks:

Turnaround Time:

Detection Limits Required Yes No
Circle one, if Yes, describe below or include separate sheet detailing requirements.

Entech Sample No.	Sample Description	Grab/Comp	Date	Time	Matrix	Number of Containers	Preservatives	Fuel Analysis (C_1-C_6)	(P/O : wise. gases)						Remarks
E507-08-14553	Boiler 9 TY B1	grab	8/27/07		g	1	–	X							
E507-08-14552	Boiler 9 TY B2	grab	8/27/07		g	1	–								B/U

Person Taking Sample (a.-Print Name & b.-Signature) See above for date and time	Received By (Signature):	Date:	Time:	QAQC FIELD acceptance checks. Place a Y or N after text	Container Type and volume OK?	Holding time OK?	Temperature OK?	Sample deficiencies - list on reverse. If none, write "none" in this box.
a. Tim Ruis b. [signature]								
Received By (Signature): [signature]	Date: 8-27-07	Time: 1420	QAQC LAB acceptance checks. Place a Y or N after text: Y		Container Type and volume OK? ✓	Holding time OK? ✓	Temperature OK? ✓	Sample deficiencies - list on reverse. If none, write "none" in this box. none

Sample Remainder Disposal | I Requested Lab To Dispose Of All Sample Remainders

Return Sample remainder to Entech Via: | (Signature) | (Date)

TO MAKE CORRECTION, USE SINGLE LINE MARK THROUGH THE INCORRECT DATA, INITIAL, DATE. DO NOT USE PEN OR LIQUID PAPER TO COMPLETELY COVER THE INCORRECT DATA.

f\templates\datasheets\field\chain of custody datasheets\chain of custody sheet.rev6 QAQC BACKUP.qpw 08/06

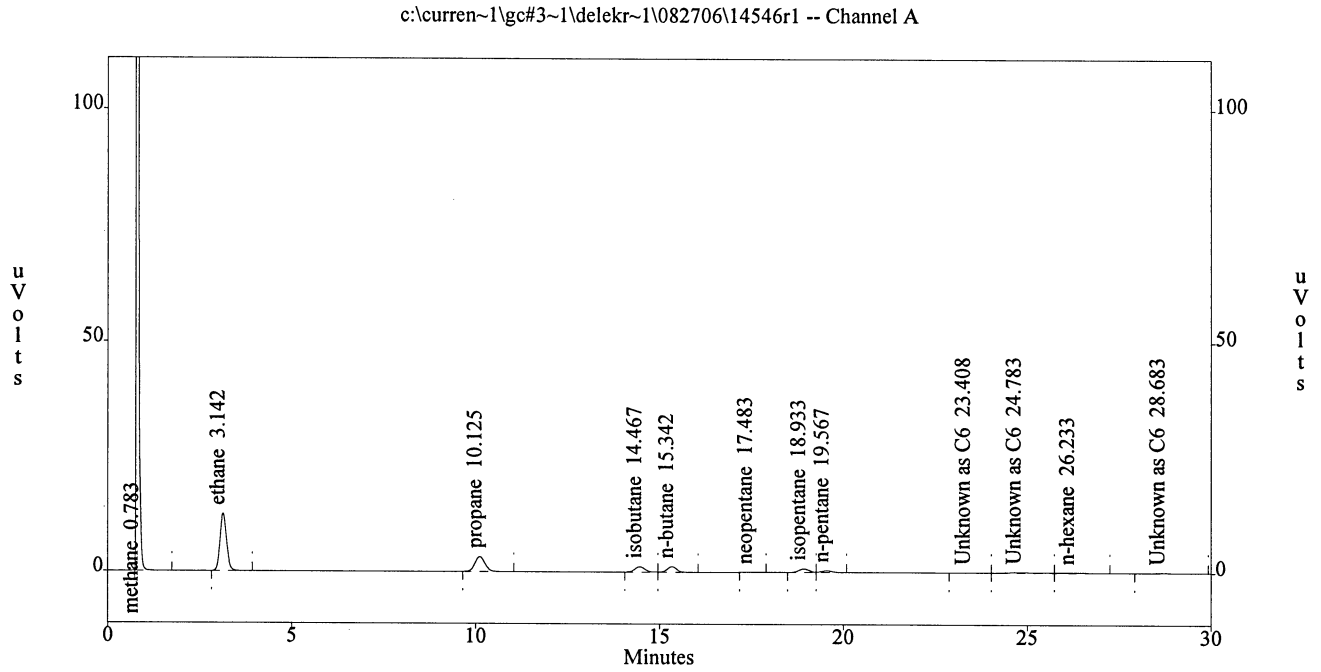
COC Lab Doc Number | COC unfilled form controlled document number: COCRev6c

B140

original

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14546r1
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : SRU-2 T1
Acquired : Aug 30, 2007 16:04:13
Printed : Aug 30, 2007 16:40:07
User : System



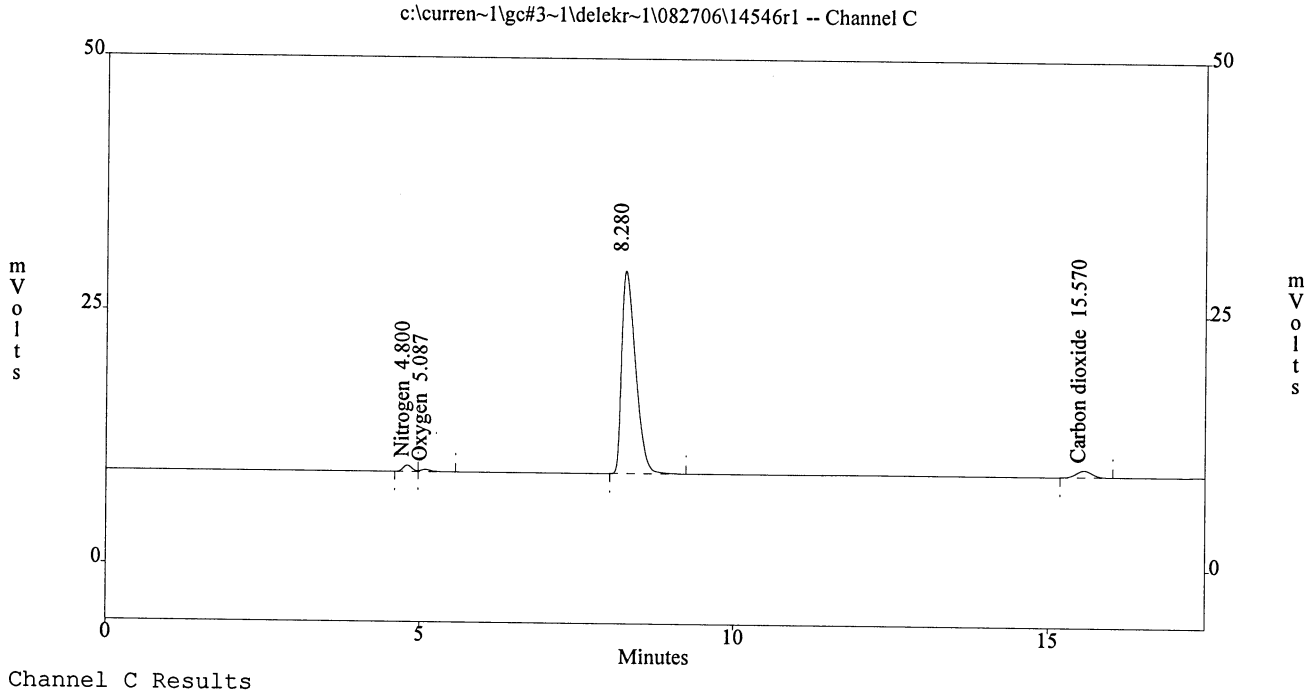
Channel A Results

Peak	Retention Time	Area
methane	0.78	1666040
ethane	3.14	156244
propane	10.13	60078
isobutane	14.47	21540
n-butane	15.34	20596
neopentane	17.48	615
isopentane	18.93	15779
n-pentane	19.57	8619
Unknown as C6	23.41	1289
Unknown as C6	24.78	9656
n-hexane	26.23	5915
Unknown as C6	28.68	3606
Totals :		1969977

B141

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14546r1
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : SRU-2 T1
Acquired : Aug 30, 2007 16:04:13
Printed : Aug 30, 2007 16:40:12
User : System



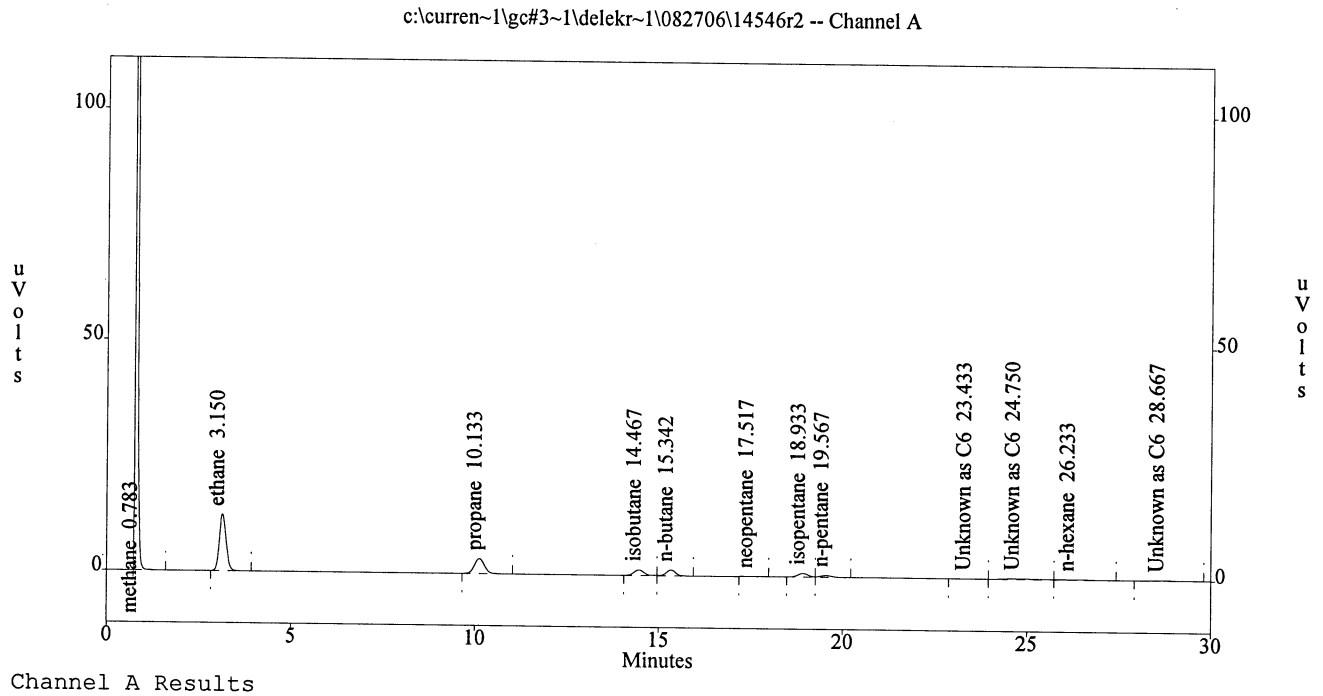
Channel C Results

Peak	Retention Time	Area
Nitrogen	4.80	5948
Oxygen	5.09	2390
	8.28	307065
Carbon dioxide	15.57	11972
Totals :		327375

B142

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14546r2
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : SRU-2 T1
Acquired : Aug 30, 2007 16:44:48
Printed : Aug 30, 2007 18:08:25
User : System



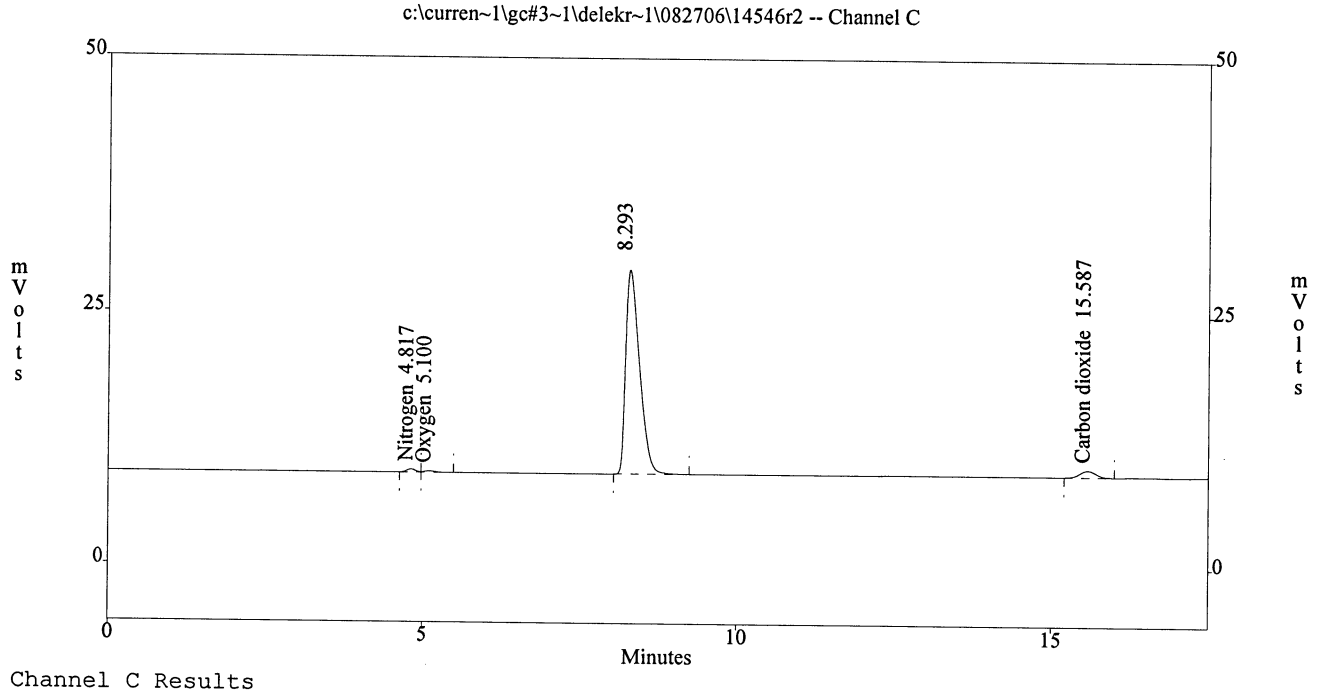
Channel A Results

Peak	Retention Time	Area
methane	0.78	1641044
ethane	3.15	153729
propane	10.13	59289
isobutane	14.47	21354
n-butane	15.34	20388
neopentane	17.52	597
isopentane	18.93	15814
n-pentane	19.57	8695
Unknown as C6	23.43	1644
Unknown as C6	24.75	10534
n-hexane	26.23	5455
Unknown as C6	28.67	3605
Totals :		1942148

B 143

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14546r2
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : SRU-2 T1
Acquired : Aug 30, 2007 16:44:48
Printed : Aug 30, 2007 18:08:25
User : System



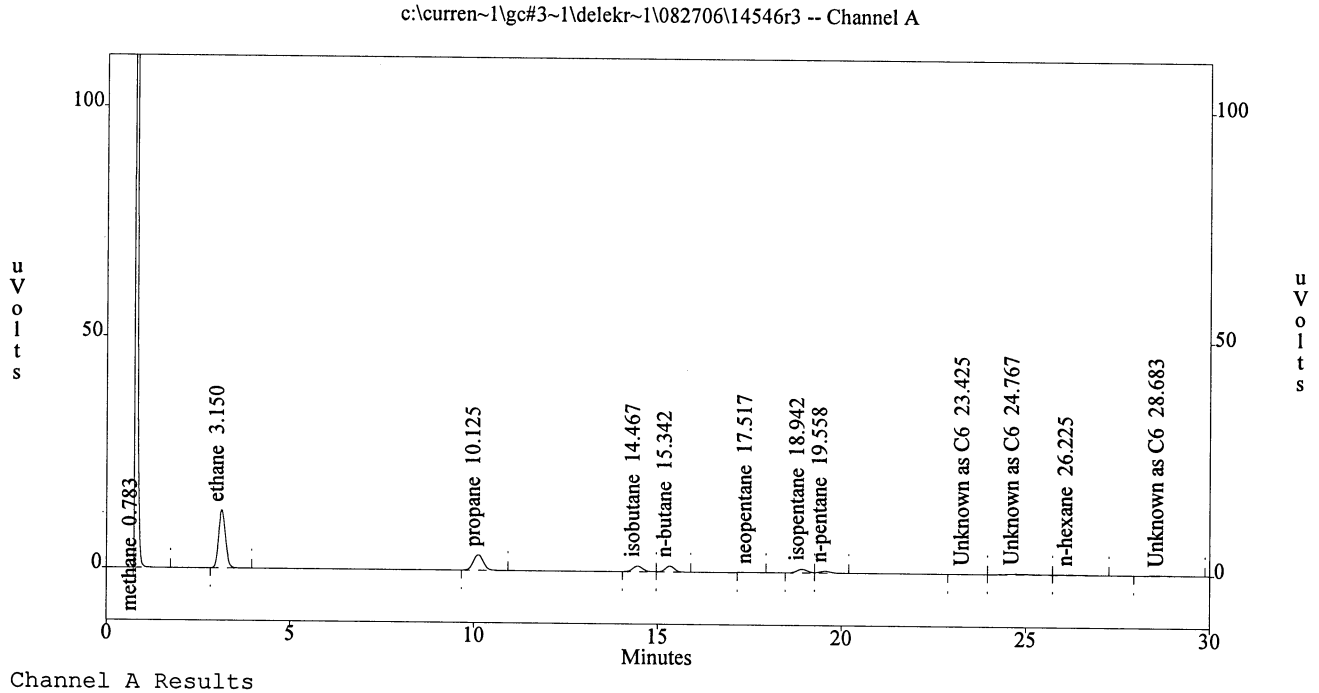
Channel C Results

Peak	Retention Time	Area
Nitrogen	4.82	2793
Oxygen	5.10	1455
	8.29	309576
Carbon dioxide	15.59	11960
Totals :		325784

B144

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14546r3
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : SRU-2 T1
Acquired : Aug 30, 2007 17:30:32
Printed : Aug 30, 2007 18:07:21
User : System



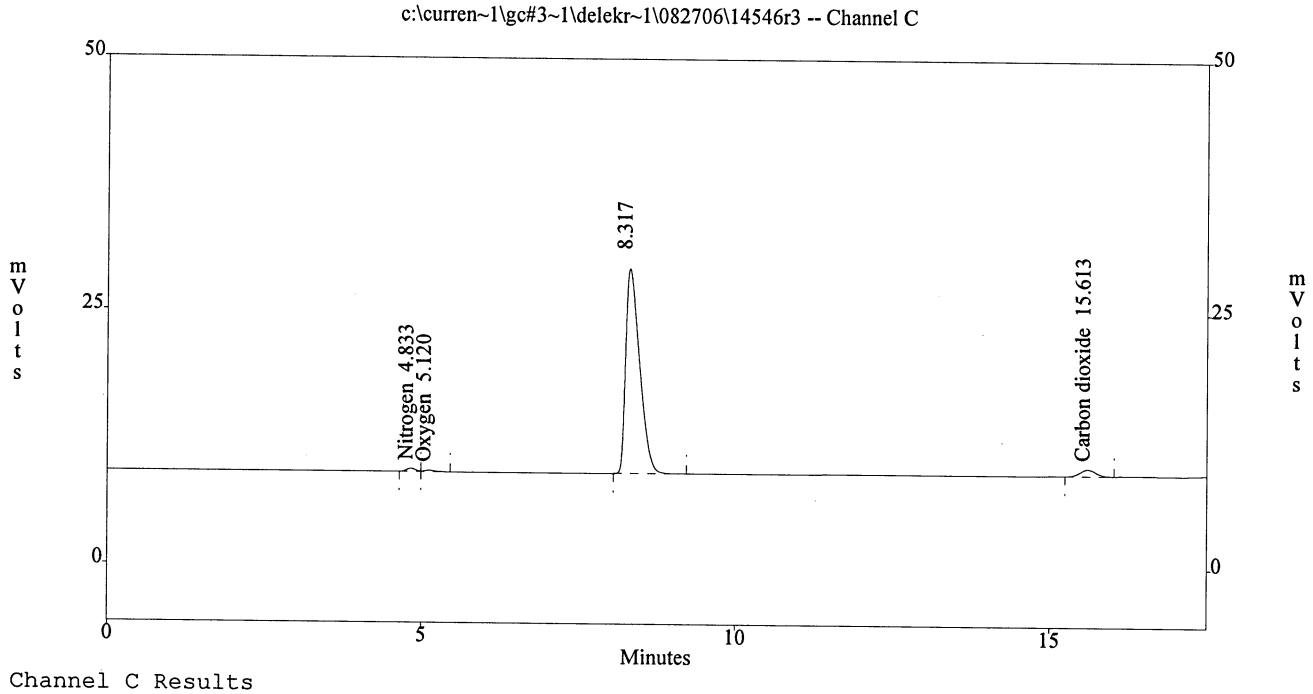
Channel A Results

Peak	Retention Time	Area
methane	0.78	1654785
ethane	3.15	155438
propane	10.13	59919
isobutane	14.47	21594
n-butane	15.34	20618
neopentane	17.52	589
isopentane	18.94	15995
n-pentane	19.56	8728
Unknown as C6	23.42	1637
Unknown as C6	24.77	10478
n-hexane	26.23	5426
Unknown as C6	28.68	3662
Totals :		1958869

B145

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14546r3
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : SRU-2 T1
Acquired : Aug 30, 2007 17:30:32
Printed : Aug 30, 2007 18:07:27
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.83	3010
Oxygen	5.12	1512
	8.32	309692
Carbon dioxide	15.61	11697

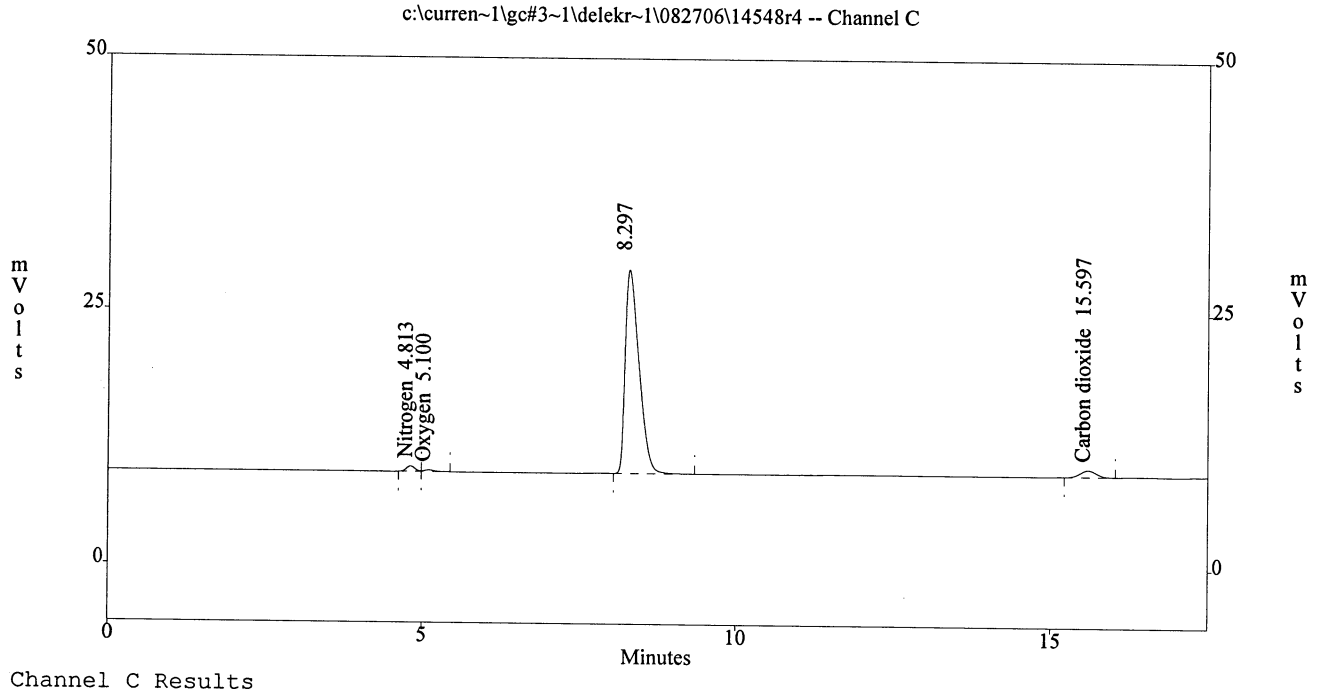
Totals :

325911

B146

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14548r4
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 14548 SRU2 T1B1
Acquired : Aug 30, 2007 18:14:20
Printed : Aug 30, 2007 18:48:24
User : System



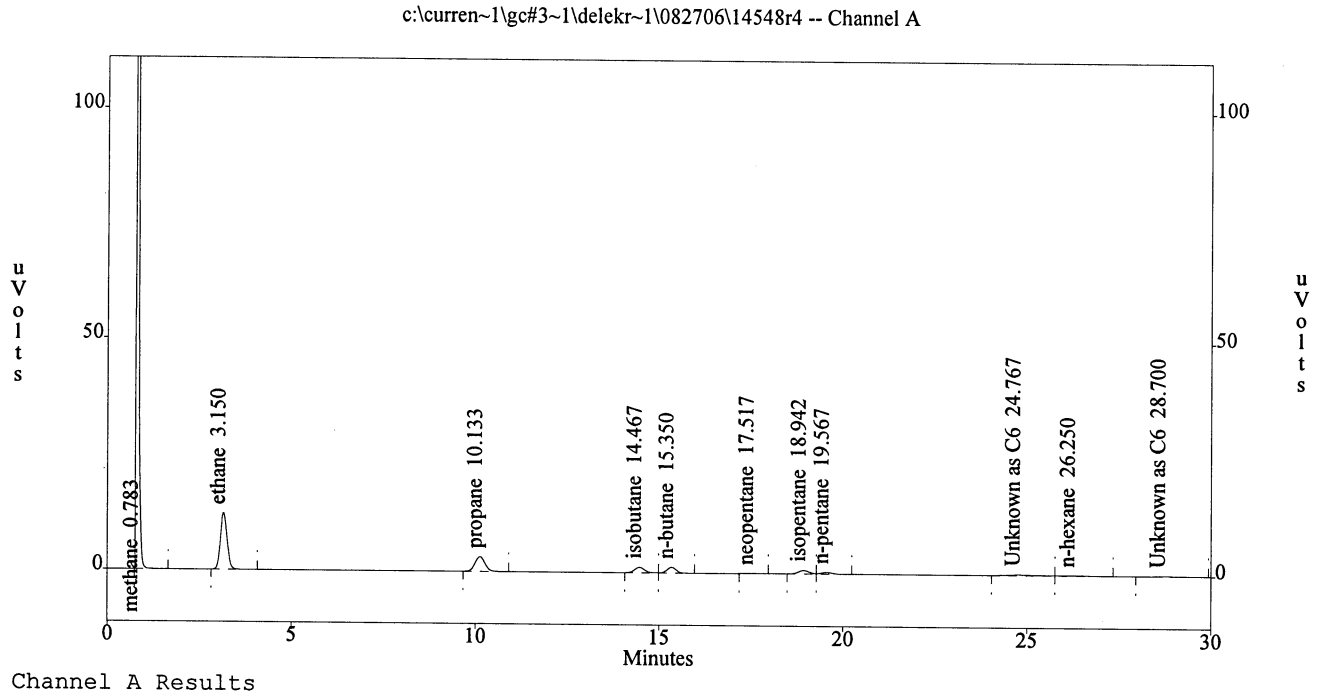
Channel C Results

Peak	Retention Time	Area
Nitrogen	4.81	5131
Oxygen	5.10	1837
	8.30	306306
Carbon dioxide	15.60	11942
Totals :		325216

B147

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14548r4
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 14548 SRU2 T1B1
Acquired : Aug 30, 2007 18:14:20
Printed : Aug 30, 2007 18:48:23
User : System



Channel A Results

Peak	Retention Time	Area
methane	0.78	1632328
ethane	3.15	151983
propane	10.13	57741
isobutane	14.47	21090
n-butane	15.35	20247
neopentane	17.52	601
isopentane	18.94	15259
n-pentane	19.57	7869
Unknown as C6	24.77	8695
n-hexane	26.25	4830
Unknown as C6	28.70	3353

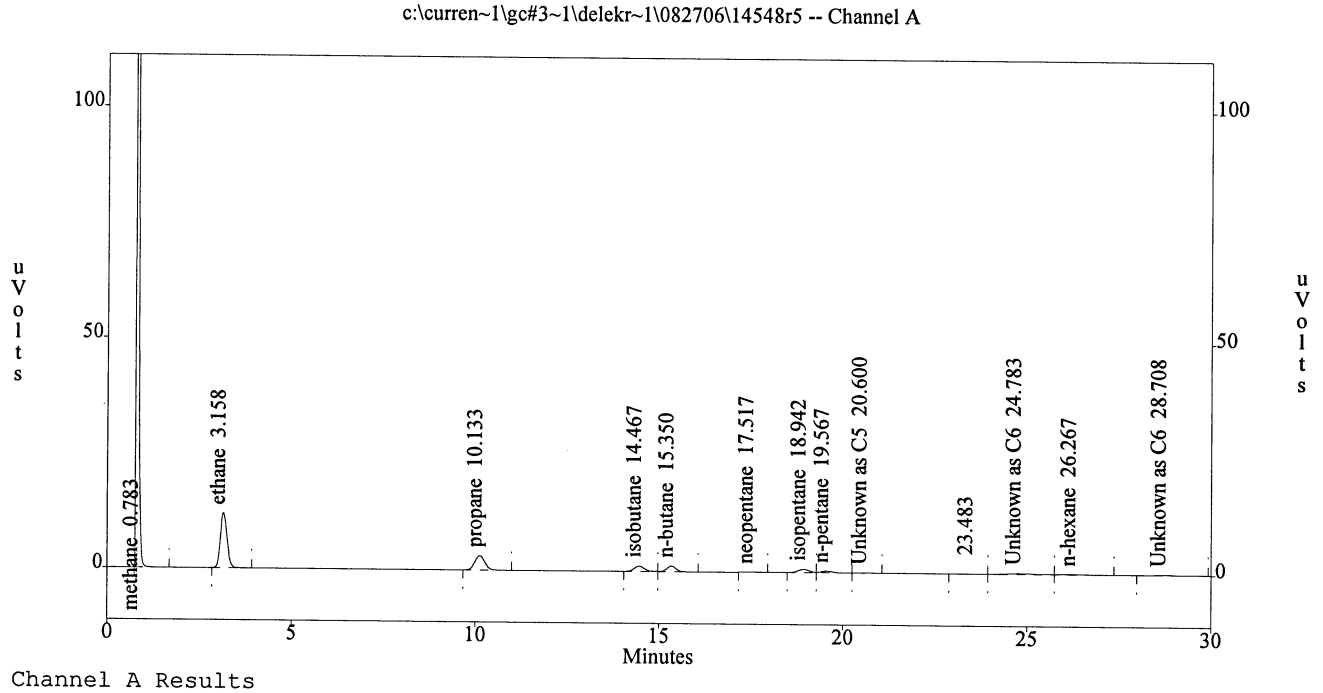
Totals :

1923996

B 148

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14548r5
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 14548 SRU2 T1B1
Acquired : Aug 30, 2007 18:53:52
Printed : Aug 30, 2007 19:48:21
User : System



Channel A Results

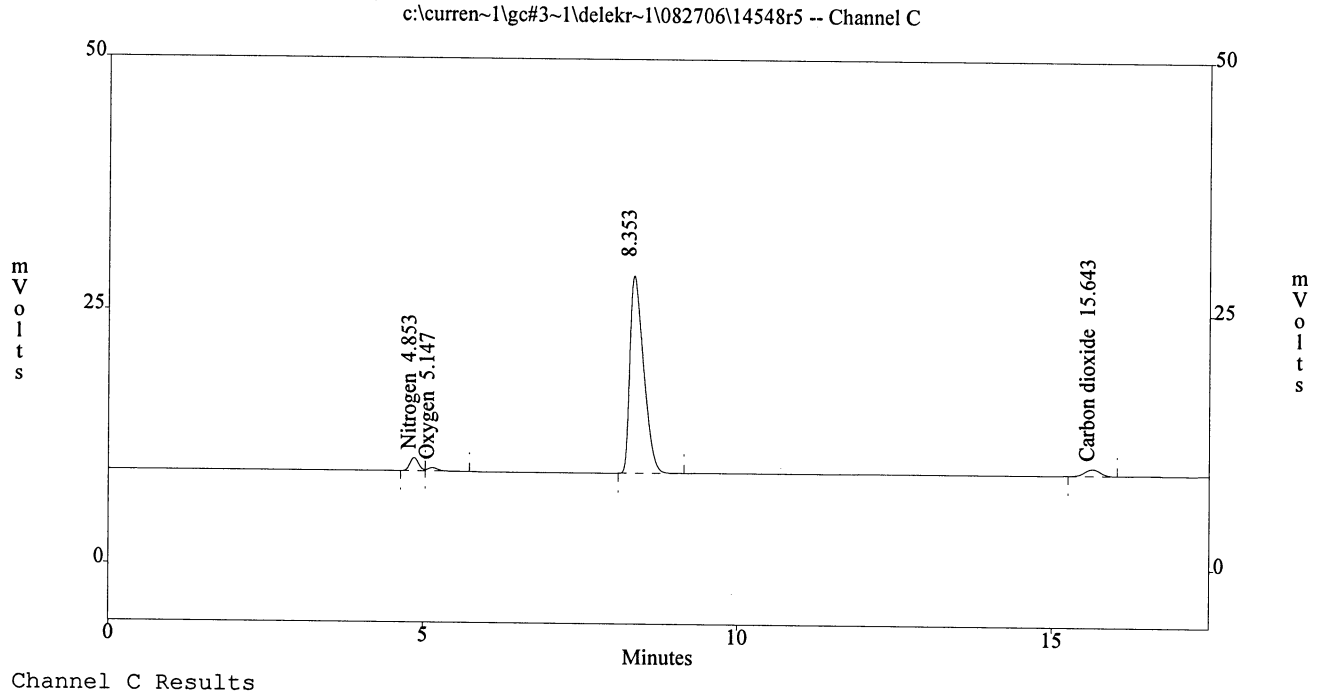
Peak	Retention Time	Area
methane	0.78	1607928
ethane	3.16	149747
propane	10.13	57174
isobutane	14.47	20941
n-butane	15.35	20140
neopentane	17.52	600
isopentane	18.94	15198
n-pentane	19.57	8023
Unknown as C5	20.60	341
	23.48	1713
Unknown as C6	24.78	11067
n-hexane	26.27	5675
Unknown as C6	28.71	3500

Totals : 1902047

B149

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14548r5
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 14548 SRU2 T1B1
Acquired : Aug 30, 2007 18:53:52
Printed : Aug 30, 2007 19:48:21
User : System



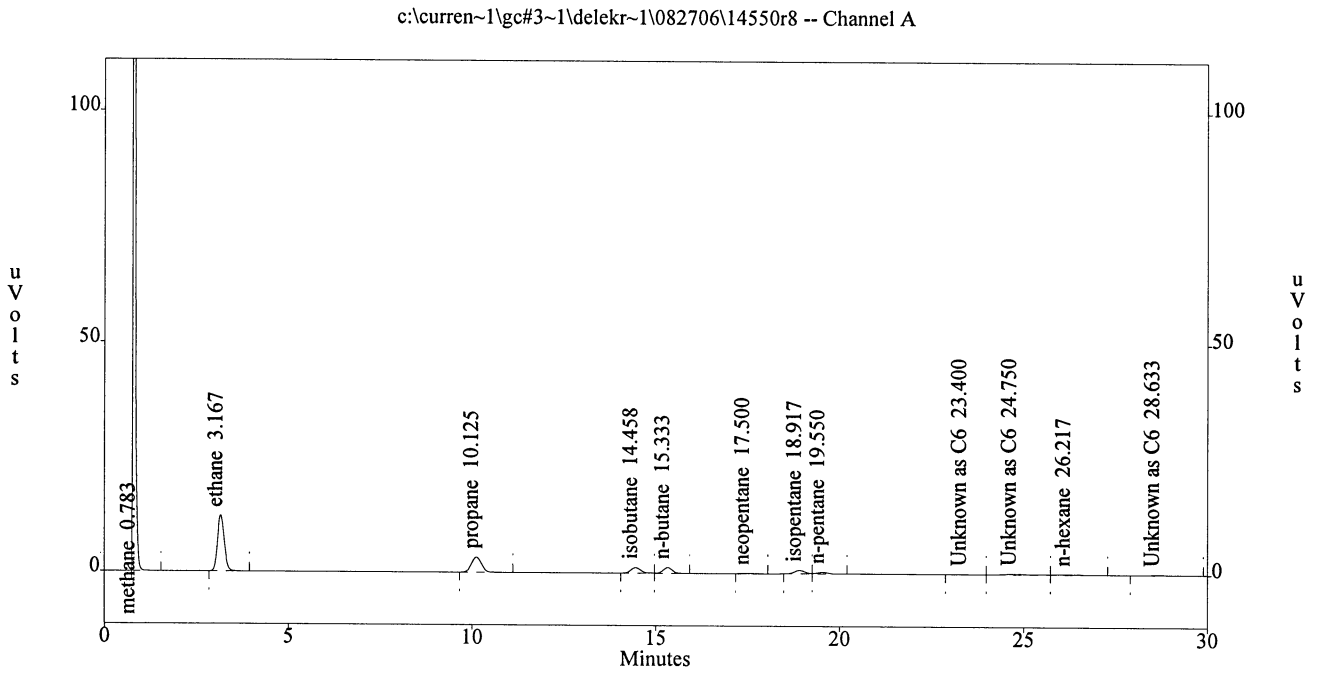
Channel C Results

Peak	Retention Time	Area
Nitrogen	4.85	12636
Oxygen	5.15	3993
	8.35	298302
Carbon dioxide	15.64	11899
Totals :		326830

B150

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14550r8
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : SRU2 T3B1
Acquired : Aug 31, 2007 10:51:50
Printed : Aug 31, 2007 11:22:17
User : System



Channel A Results

Peak	Retention Time	Area
methane	0.78	1614891
ethane	3.17	151485
propane	10.13	58982
isobutane	14.46	20551
n-butane	15.33	19562
neopentane	17.50	617
isopentane	18.92	14620
n-pentane	19.55	7531
Unknown as C6	23.40	1337
Unknown as C6	24.75	9325
n-hexane	26.22	5556
Unknown as C6	28.63	3605

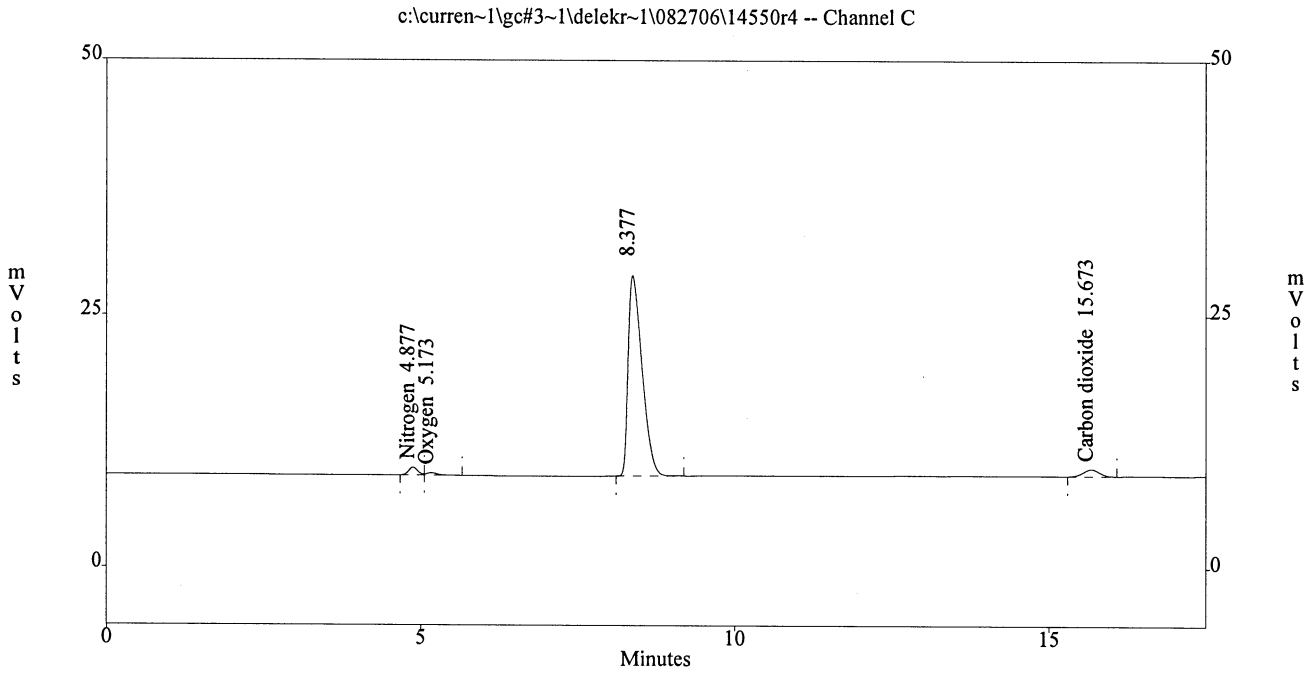
Totals :

1908062

B153

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14550r4
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 14550 SRU2 T3B1
Acquired : Aug 30, 2007 20:29:50
Printed : Aug 30, 2007 21:00:05
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.88	7408
Oxygen	5.17	2645
	8.38	304532
Carbon dioxide	15.67	11977

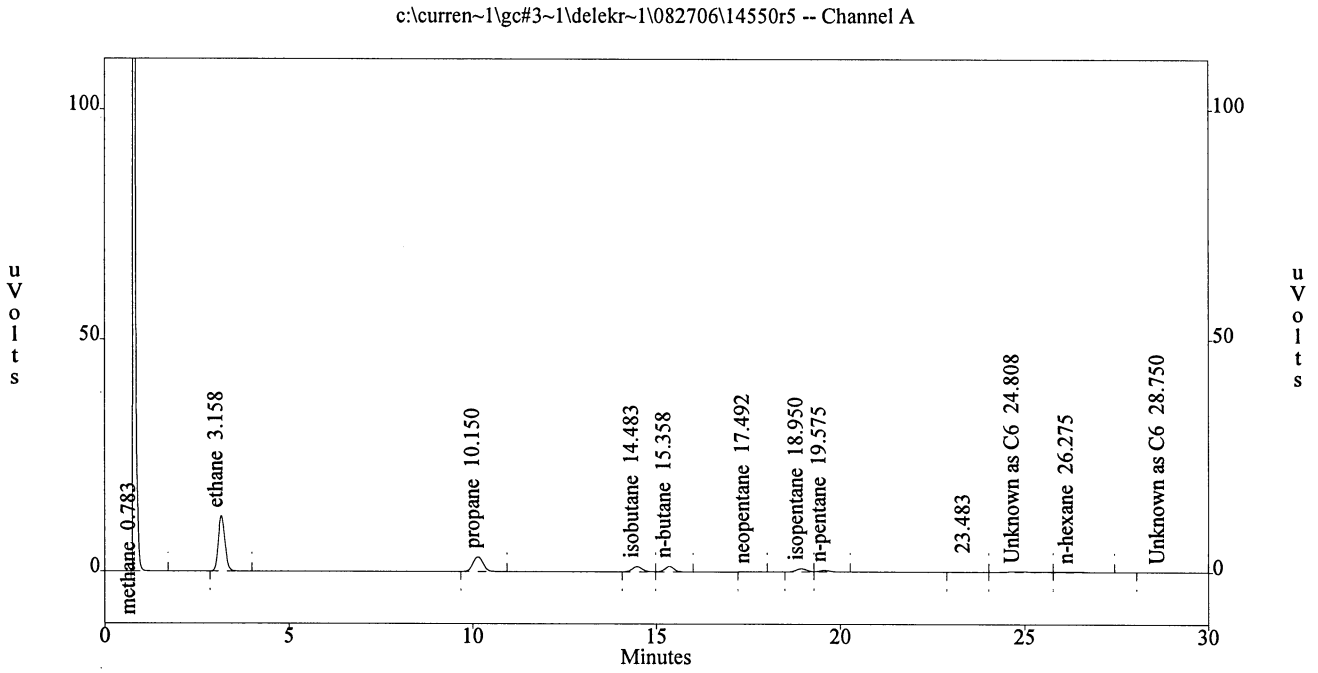
Totals :

326562

B154

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14550r5
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 14550 SRU2 T3B1
Acquired : Aug 30, 2007 21:15:17
Printed : Aug 30, 2007 21:51:25
User : System



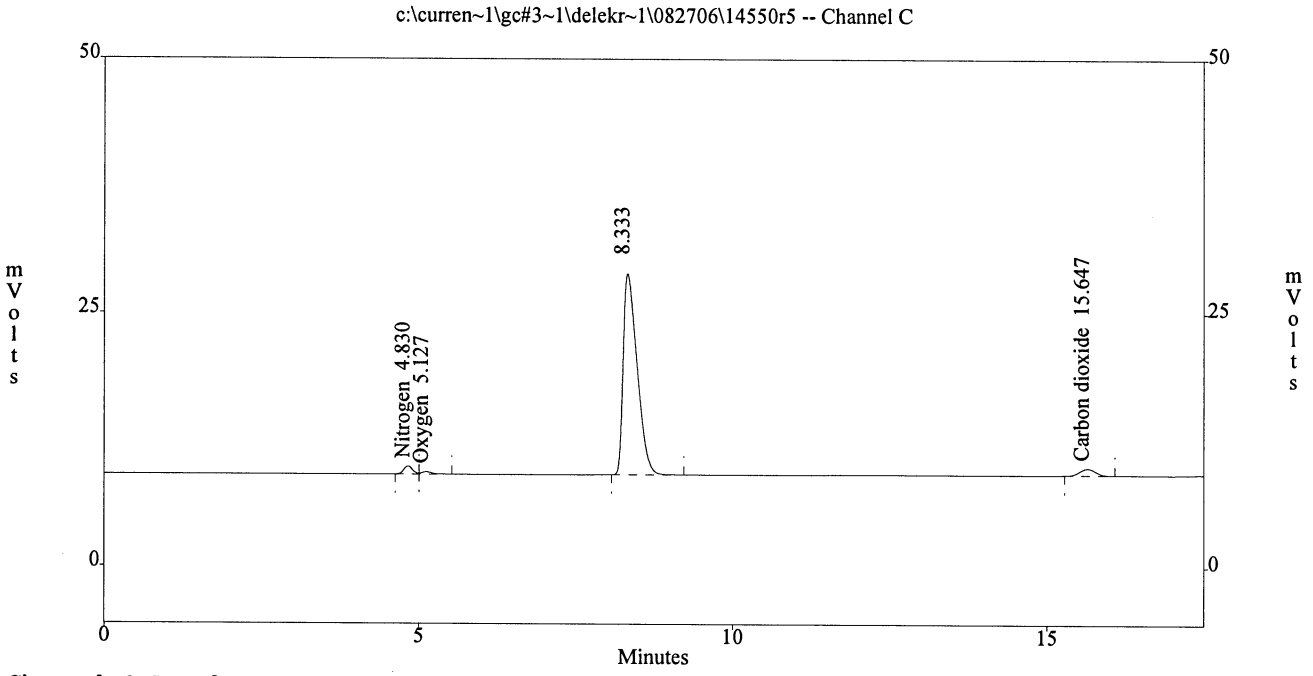
Channel A Results

Peak	Retention Time	Area
methane	0.78	1602546
ethane	3.16	150291
propane	10.15	58833
isobutane	14.48	20654
n-butane	15.36	19607
neopentane	17.49	574
isopentane	18.95	14635
n-pentane	19.58	7604
	23.48	1683
Unknown as C6	24.81	10123
n-hexane	26.27	5397
Unknown as C6	28.75	2827
Totals :		1894774

B155

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14550r5
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : 14550 SRU2 T3B1
Acquired : Aug 30, 2007 21:15:17
Printed : Aug 30, 2007 21:51:26
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.83	7428
Oxygen	5.13	2526
	8.33	302649
Carbon dioxide	15.65	11883

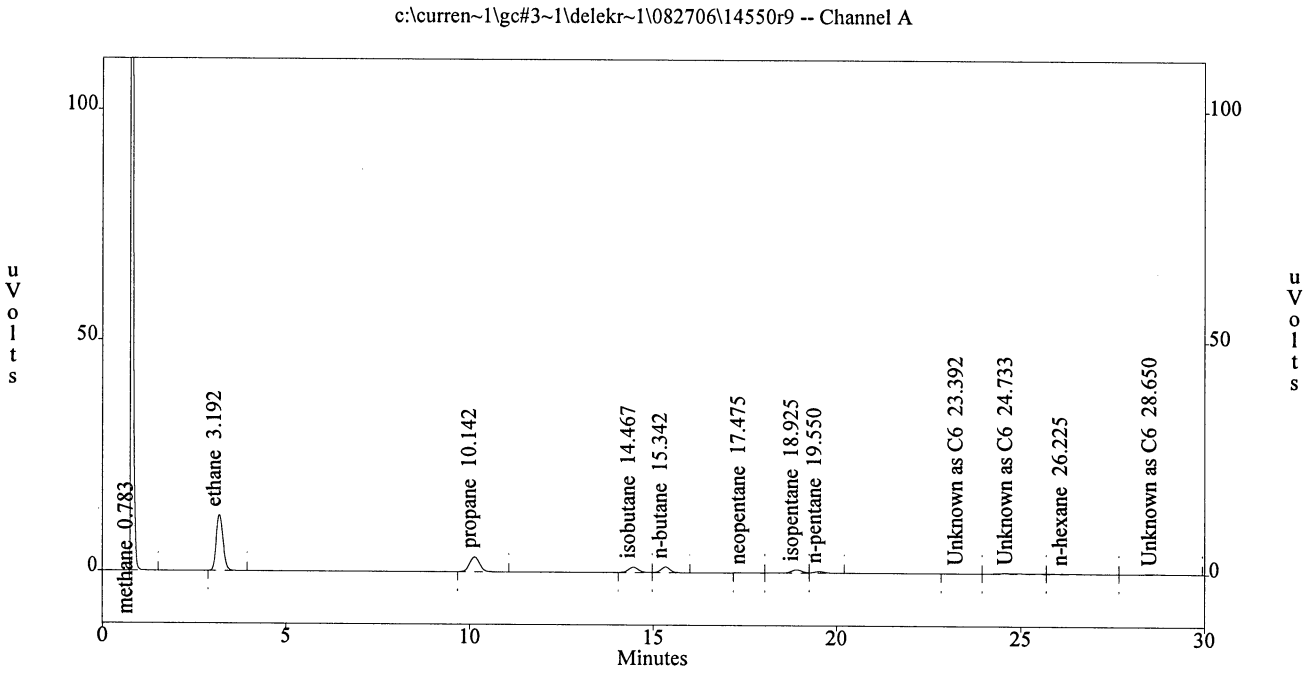
Totals :

324486

B-156

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14550r9
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : SRU2 T3B1
Acquired : Aug 31, 2007 11:29:46
Printed : Aug 31, 2007 12:08:23
User : System



Channel A Results

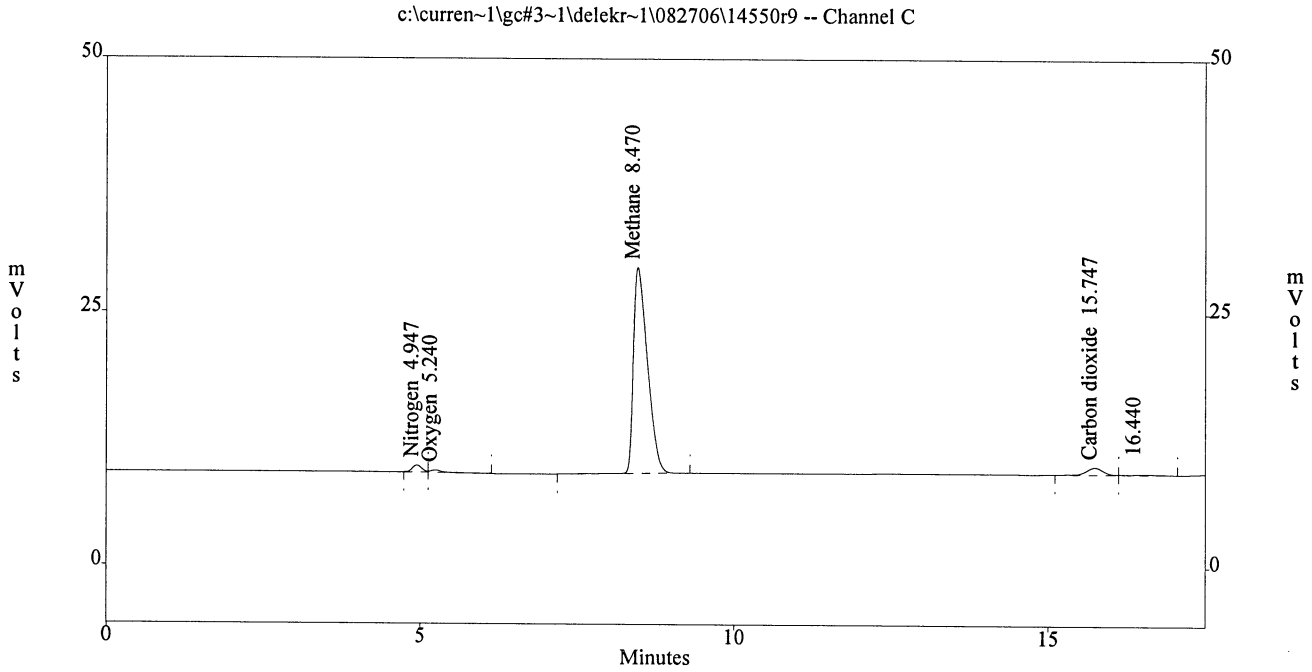
Peak	Retention Time	Area
methane	0.78	1615408
ethane	3.19	151042
propane	10.14	58741
isobutane	14.47	20565
n-butane	15.34	19557
neopentane	17.48	602
isopentane	18.92	14915
n-pentane	19.55	7745
Unknown as C6	23.39	1690
Unknown as C6	24.73	10340
n-hexane	26.23	6890
Unknown as C6	28.65	4999

Totals : 1912494

B-157

Entech Engineering Inc.
Webster, Texas

File : c:\curren~1\gc#3~1\delekr~1\082706\14550r9
Method : c:\curren~1\calibr~1\gc#3~1\Fid_gas.met
Sample ID : SRU2 T3B1
Acquired : Aug 31, 2007 11:29:46
Printed : Aug 31, 2007 12:08:28
User : System



Channel C Results

Peak	Retention Time	Area
Nitrogen	4.95	7211
Oxygen	5.24	2910
Methane	8.47	317569
Carbon dioxide	15.75	13135
	16.44	2085

Totals : 342910

B 158

Sulfur Analysis - GC / FPD

Pre-Test Calibration

(EPA method 15)

B 159

ENTECH ENGINEERING INC.
P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Gas Chromatography Data Sheet

Gas Chromatograph Information

GC Type:	Shimadzu GC-14A		
Detector:	Photo Ionization Detector (FPD).	Channel:	A
GC ID #:	6	DAS:	Shimadzu EZChrom
GC Serial #:	C10552911593		
Column Type:	Chromosil 310 Column, 8'x1/8" OD Teflon.		

Gas Chromatograph Operating Parameters

GC Oven Temperature Parameters:			
Isothermal Column Temperature (C):	35	Injector Temperature (C):	220
Initial Column Temperature (C):	35	Detector Temperature (C):	220
Duration of initial temperature (min):	na	TCD Oven Temperature (C):	na
Program Rate (C/min):	na	Methanizer Temperature (C):	na
Final Temperature (C):	na		
Final Time (min):	na		
Carrier Gas Mass Flow Setting (Kpa):	100	Carrier Gas Type:	Nitrogen
Air Flow (Kpa):	50	Hydrogen Flow (Kpa)	50
Detector Range:	2	Back-flush Time (min):	NA
Sample Size (ul):	250	TCD Bridge Current (mA):	NA

Calibration Data

ID	Retent Time (min)	ID Time Band (+/- min)	Range	Regression Data: y = mx + b Where: x = Area & y = molar ppm m	b	r
		* See Data Calculations Section				

B160

CERTIFICATE

The permeation rate of the DYNACAL® PERMEATION DEVICE listed below is certified traceable to N.I.S.T. standards.

Chemical Fill	: Carbon Disulfide
Device Type	: High Emission
Part Number	: 101-111-6300-C30
Length /Geometry	: 11.1 cm
Method of Certification	: Gravimetric
Certification Number	: 89-24835
Rate	: 7800 ng/min +/- 2 % at 30 degrees C
Note	
Date : March 21, 2007	By
Customer : Entech Engineering Inc	
Order No. : M037042	

VICI

VICI Metronics, Inc.
26272 Twelve Trees Lane NW
Poulsbo, WA 98370
(360) 697-9199 Fax: (360) 697-6682

B161

CERTIFICATE

The permeation rate of the DYNACAL® PERMEATION DEVICE listed below is certified traceable to N.I.S.T. standards.

Chemical Fill	: Hydrogen Sulfide
Device Type	: Low Emission #2
Part Number	: 121-102-0110-F56-C30
Length /Geometry	: 10.2 cm
Method of Certification	: Gravimetric
Certification Number	: 56-27687
Rate	: 3314 ng/min +/- 2 % at 30 degrees C
Note	
Date : March 23, 2007	By D. H.
Customer : Entech Engineering Inc.	
Order No. : M037042	

VICI

VICI Metronics, Inc.
26272 Twelve Trees Lane NW
Poulsbo, WA 98370
(360) 697-9199 Fax: (360) 697-6682

B152

CERTIFICATE

The permeation rate of the DYNACAL® PERMEATION DEVICE listed below is certified traceable to N.I.S.T. standards.

Chemical Fill	: Carbonyl Sulfide
Device Type	: Extended Life #3
Part Number	: 181-020-7600-F59-C30
Length /Geometry	: 2.0 cm
Method of Certification	: Gravimetric
Certification Number	: 59-27692
Rate	: 4808 ng/min +/- 2 % at 30 degrees C
Note	
Date	: March 23, 2007 By
Customer	: Entech Engineering Inc.
Order No.	: M037042

VICI

VICI Metronics, Inc.
26272 Twelve Trees Lane NW
Poulsbo, WA 98370
(360) 697-9199 Fax: (360) 697-6682

B163

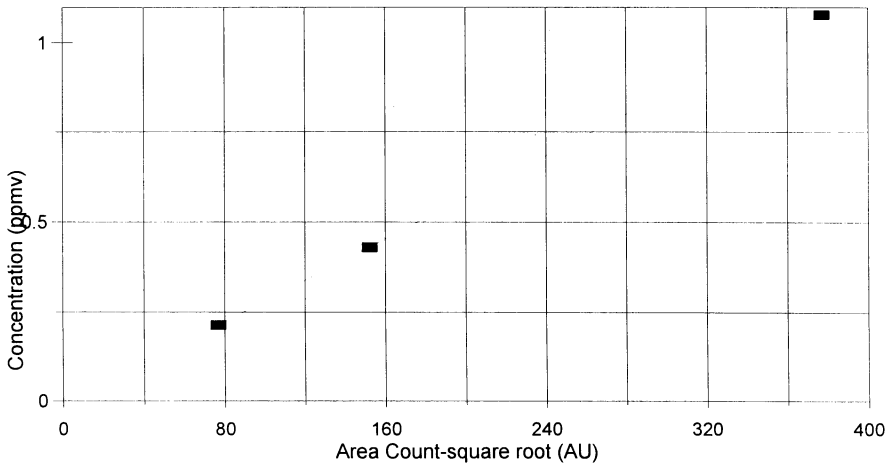
ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #6 FPD-1 (Range 2)
Carbonyl Sulfide Standards (Dynacalibrator)
08/22/07
(Retention Time = 1.87 min)

Concentration (ppmv)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average (square root) (AU)	Precision Error (%)
0.00	0	0	0	0.0	NA
0.20	5746	6028	5983	76.94	-2.92%
0.44	22168	23099	24208	152.18	-4.28%
1.08	143261	138090	145742	377.31	0.63%

Regression Data (Zero-Forced)

Constant	0.000
Std Err of Y Est	0.012
R Squared	0.999
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	2.857197E-03
Std Err of Coef.	2.869697E-05



Operator _____ Date 8-23-07

B164

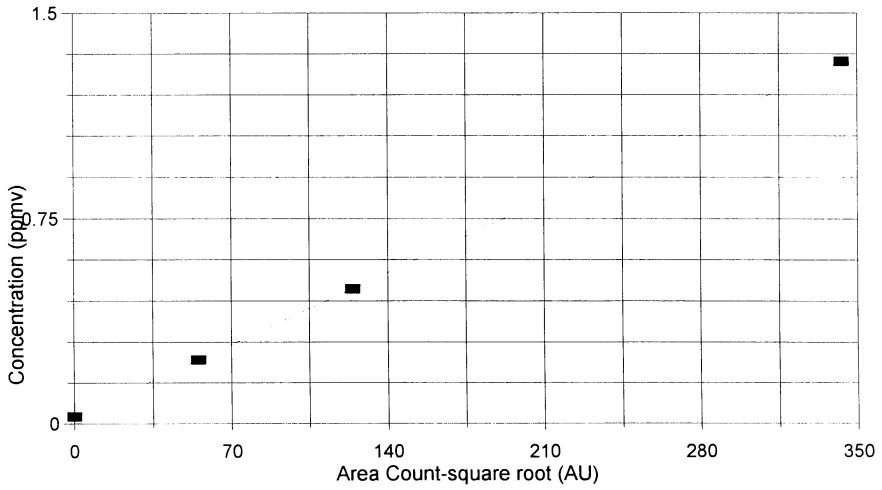
ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #6 FID-1 (Range 2)
Hydrogen Sulfide Standards (Dynacalibrator)
08/22/07
(Retention Time = 2.19 min)

Concentration (ppmv)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average (square root) (AU)	Precision Error (%)
0.00	0	0	0	0.0	NA
0.24	3086	3111	3013	55.41	0.52%
0.53	15641	15496	15390	124.54	0.85%
1.31	117723	115458	119931	343.08	0.02%

Regression Data (Zero-Forced)

Constant	0.000
Std Err of Y Est	0.033
R Squared	0.997
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	3.879695E-03
Std Err of Coef.	8.934799E-05



Operator SG Date 8-23-07

B165

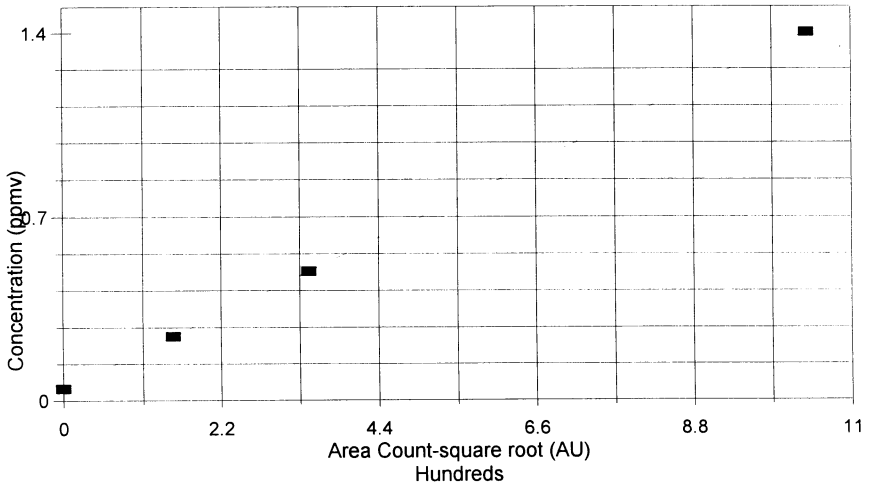
ENTECH ENGINEERING INC.

Gas Chromatograph Analysis Standard Curve Data
Gas Chromatograph #6 FID-1 (Range 2)
Carbon Disulfide Standards (Dynacalibrator)
08/22/07
(Retention Time = 3.83 min)

Concentration (ppmv)	Area 1 (AU)	Area 2 (AU)	Area 3 (AU)	Average (square root) (AU)	Precision Error (%)
0.00	0	0	0	0.0	NA
0.25	23328	23581	23480	153.18	-0.58%
0.56	116600	118654	118263	343.28	-1.05%
1.38	1113047	1071060	1052156	1038.63	3.18%

Regression Data (Zero-Forced)

Constant	0.000
Std Err of Y Est	0.062
R Squared	0.989
No. of Observations	4
Degrees of Freedom	3
X Coefficient(s)	1.363740E-03
Std Err of Coef.	5.594219E-05

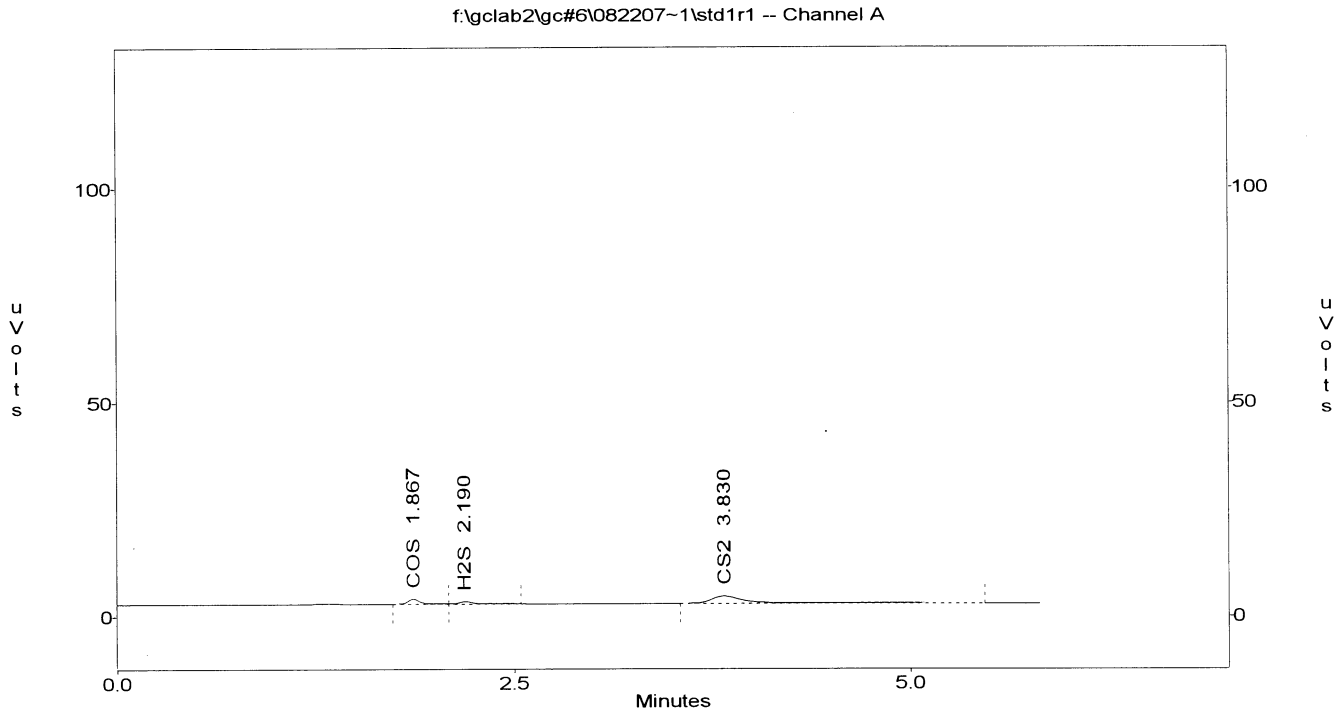


Operator _____ Date 8-23-07

B166

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\std1r1
Method : f:\gclab2\gc#6\Fpd_07.met
Sample ID : std1 span1 set8
Inj. Vial : 000
Acquired : Aug 22, 2007 09:48:21
Printed : Aug 22, 2007 10:13:41
User : System



Channel A Results

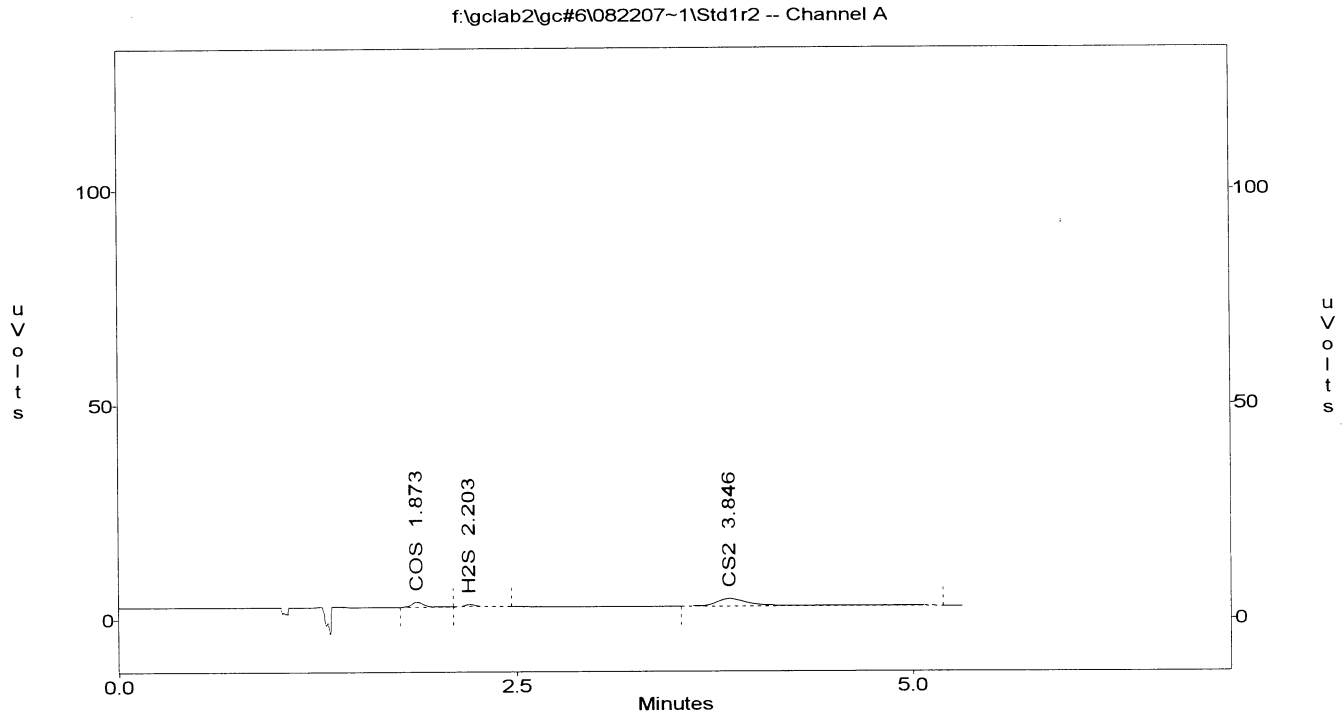
Peak	Retention Time	Area
COS	1.87	5746
H2S	2.19	3086
CS2	3.83	23328

Totals : 32160

B167

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\Std1r2
Method : f:\gclab2\gc#6\Fpd_07.met
Sample ID : std1 span1 set8
Inj. Vial : 000
Acquired : Aug 22, 2007 09:54:29
Printed : Aug 22, 2007 10:00:20
User : System



Channel A Results

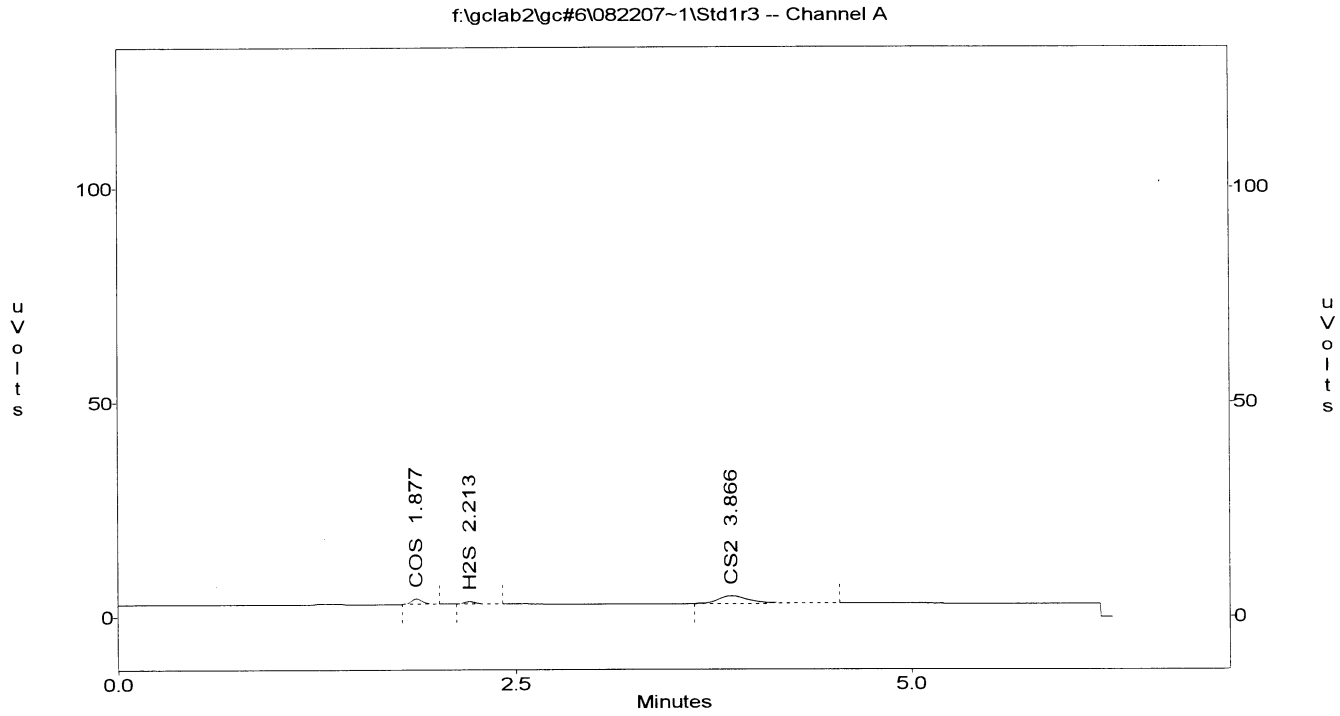
Peak	Retention Time	Area
COS	1.87	6028
H2S	2.20	3111
CS2	3.85	23581

Totals : 32720

B168

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\Std1r3
Method : f:\gclab2\gc#6\Fpd_07.met
Sample ID : std1 span1 set8
Inj. Vial : 000
Acquired : Aug 22, 2007 10:00:40
Printed : Aug 22, 2007 10:06:57
User : System



Channel A Results

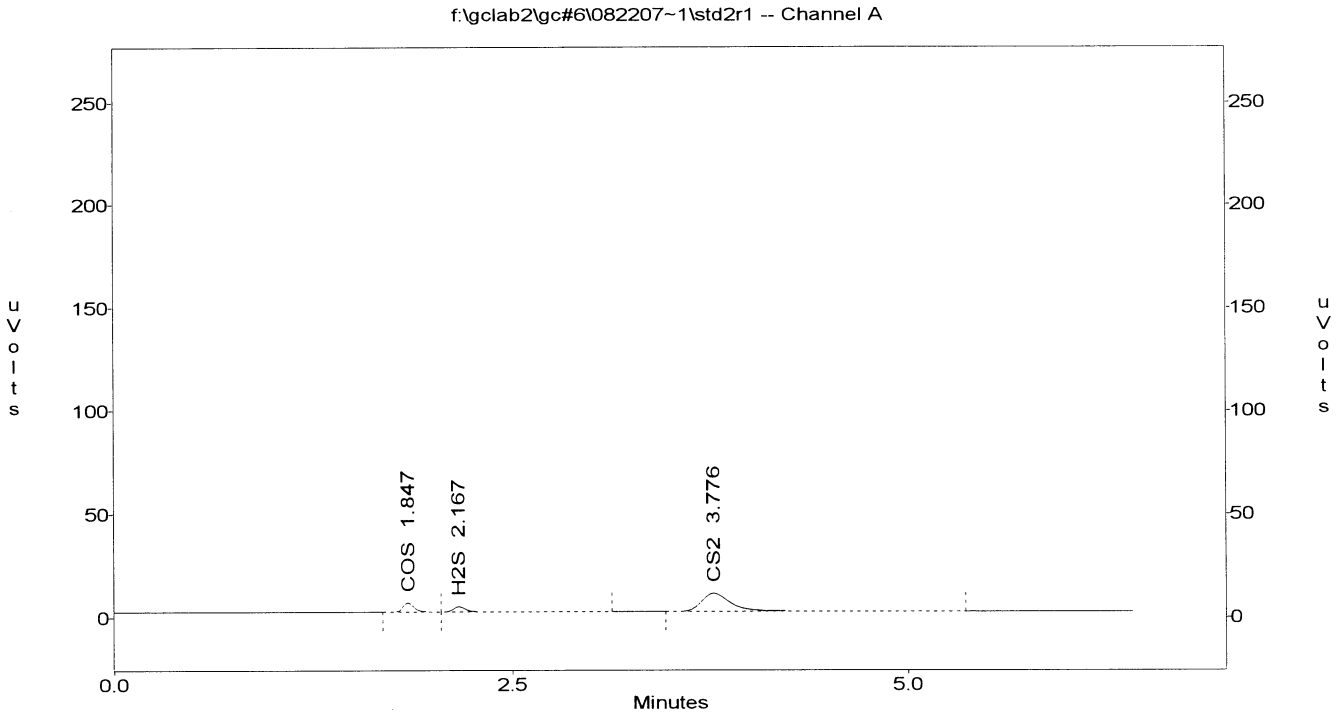
Peak	Retention Time	Area
COS	1.88	5983
H2S	2.21	3013
CS2	3.87	23480

Totals :
32476

B169

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\std2r1
Method : f:\gclab2\gc#6\fpd_07.met
Sample ID : std2 span1 set4
Inj. Vial : 000
Acquired : Aug 22, 2007 08:50:27
Printed : Aug 22, 2007 09:19:26
User : System



Channel A Results

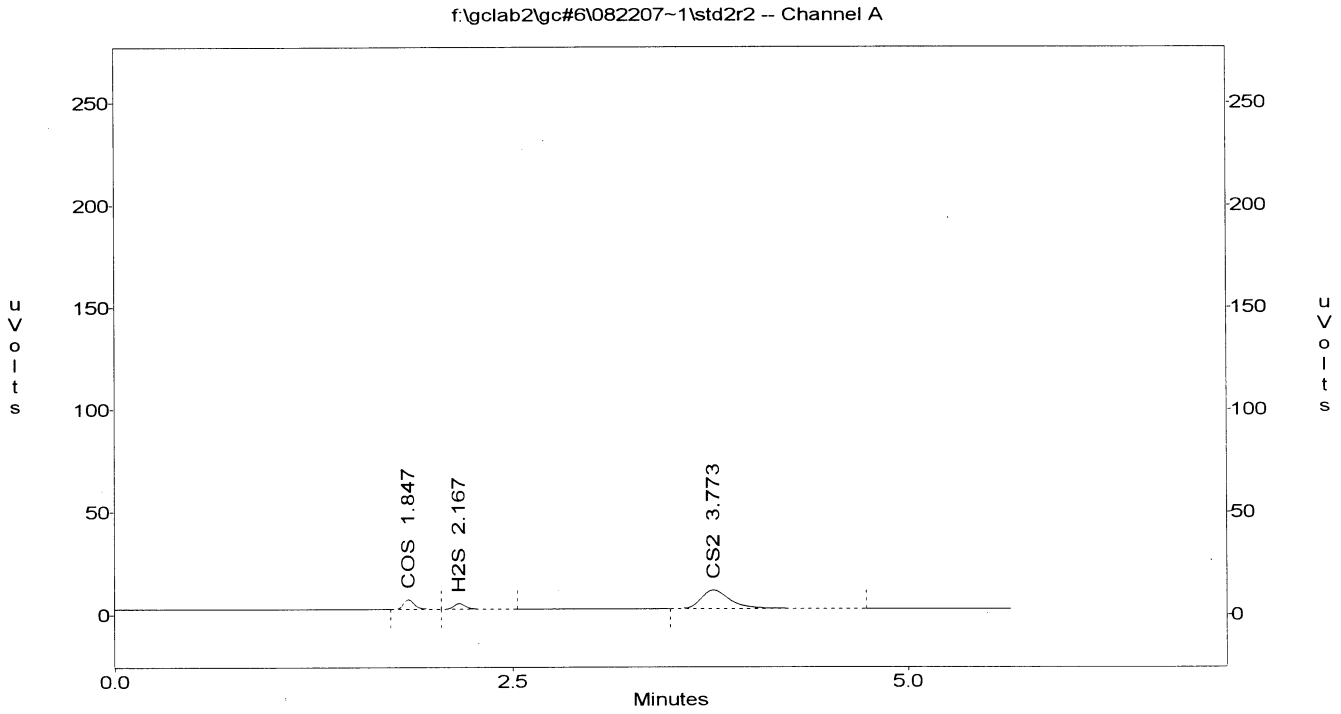
Peak	Retention Time	Area
COS	1.85	22168
H2S	2.17	15641
CS2	3.78	116600

Totals : 154409

B170

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\std2r2
Method : f:\gclab2\gc#6\fpd_07.met
Sample ID : std2 span1 set4
Inj. Vial : 000
Acquired : Aug 22, 2007 08:57:10
Printed : Aug 22, 2007 09:19:34
User : System



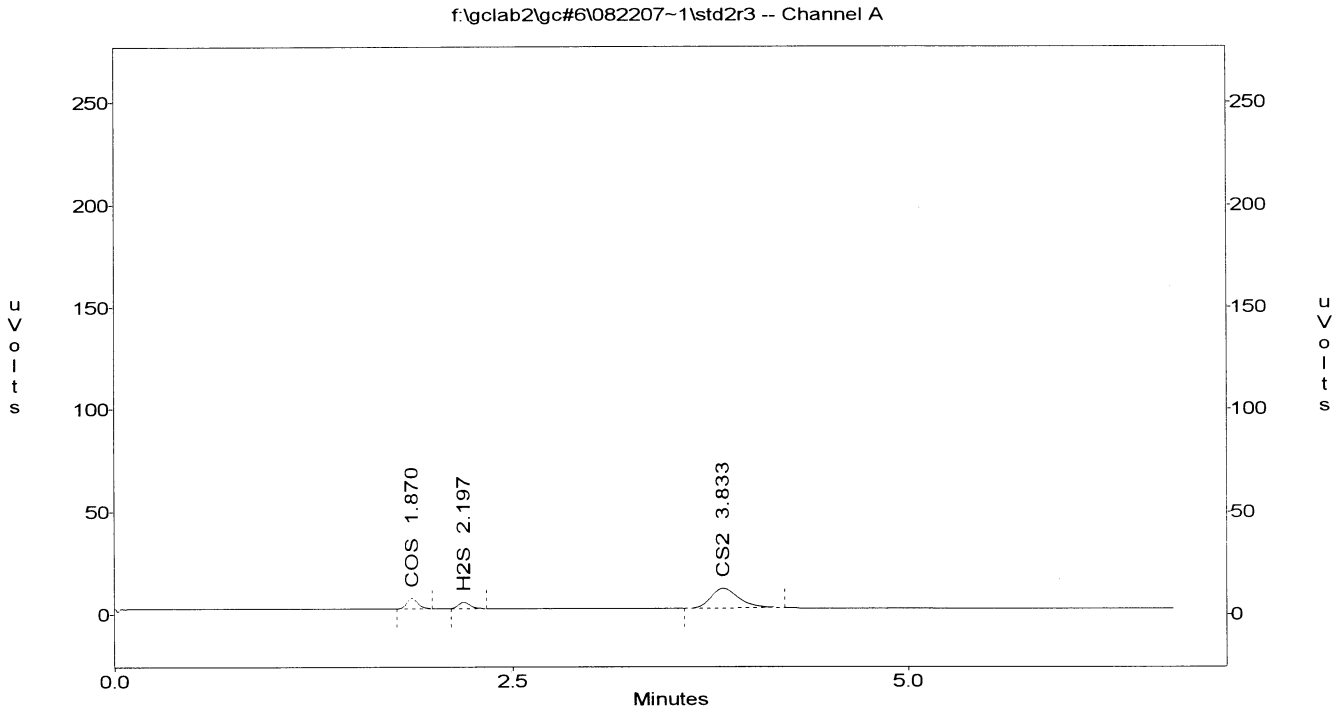
Channel A Results

Peak	Retention Time	Area
COS	1.85	23099
H2S	2.17	15496
CS2	3.77	118654
Totals :		157249

$171

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\std2r3
Method : f:\gclab2\gc#6\fpd_07.met
Sample ID : std2 span1 set4
Inj. Vial : 000
Acquired : Aug 22, 2007 09:03:08
Printed : Aug 22, 2007 09:19:42
User : System



Channel A Results

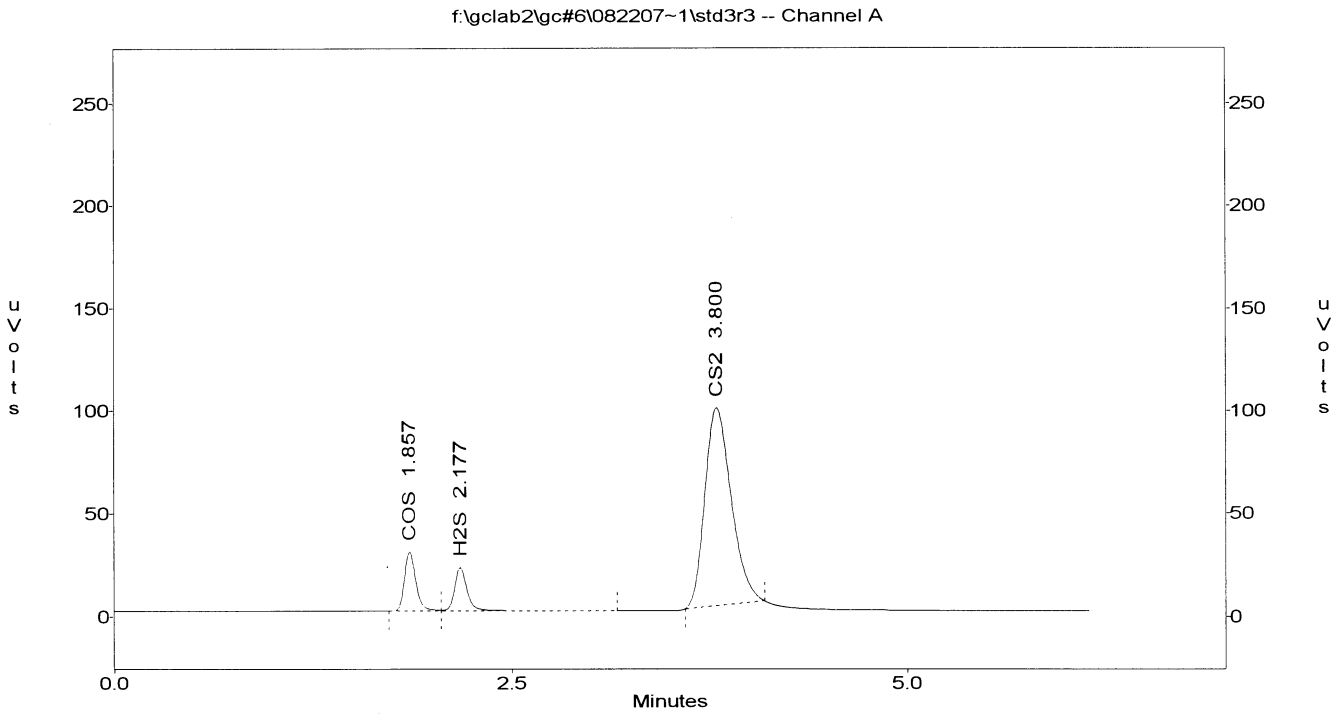
Peak	Retention Time	Area
COS	1.87	24208
H2S	2.20	15390
CS2	3.83	118263

Totals : 157861

B172

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\std3r3
Method : f:\gclab2\gc#6\fpd_07.met
Sample ID : std3 span1 set2
Inj. Vial : 000
Acquired : Aug 22, 2007 08:08:37
Printed : Aug 22, 2007 09:18:56
User : System



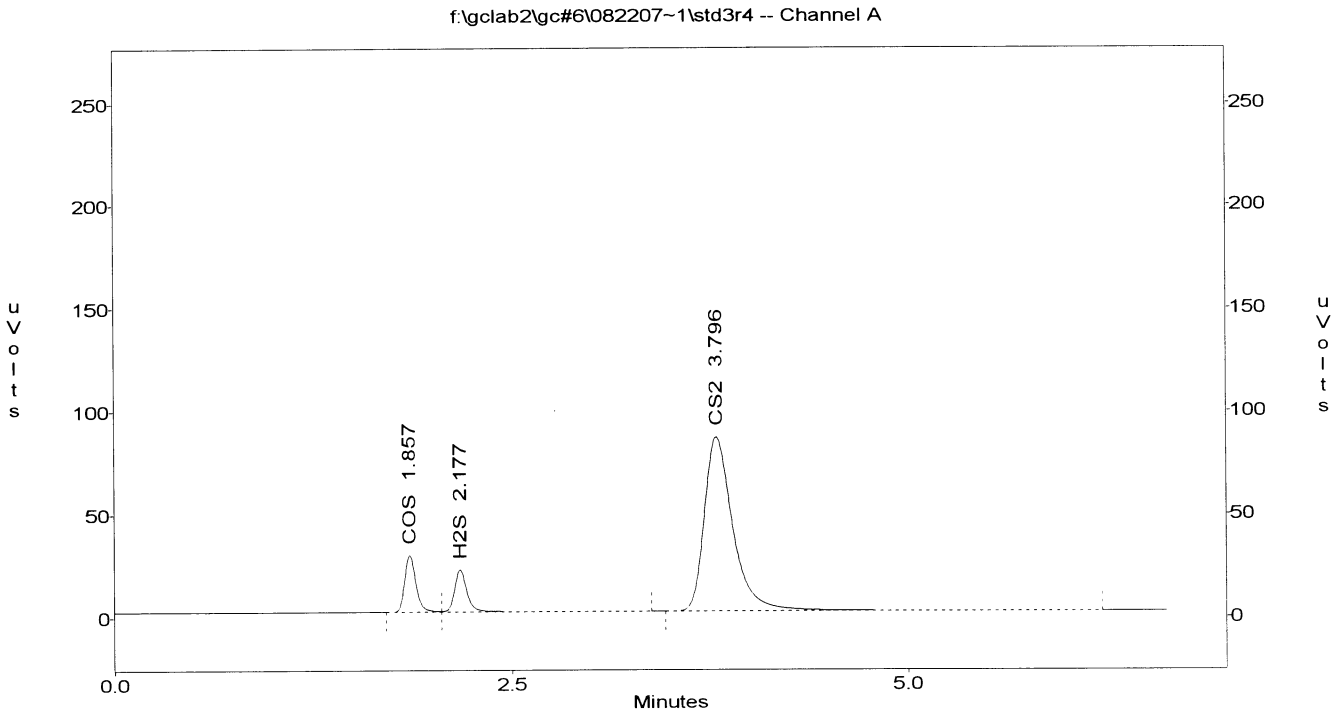
Channel A Results

Peak	Retention Time	Area
COS	1.86	143261
H2S	2.18	117723
CS2	3.80	1113047

Totals : 1374031

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\std3r4
Method : f:\gclab2\gc#6\fpd_07.met
Sample ID : std3 span1 set2
Inj. Vial : 000
Acquired : Aug 22, 2007 08:15:01
Printed : Aug 22, 2007 09:19:04
User : System



Channel A Results

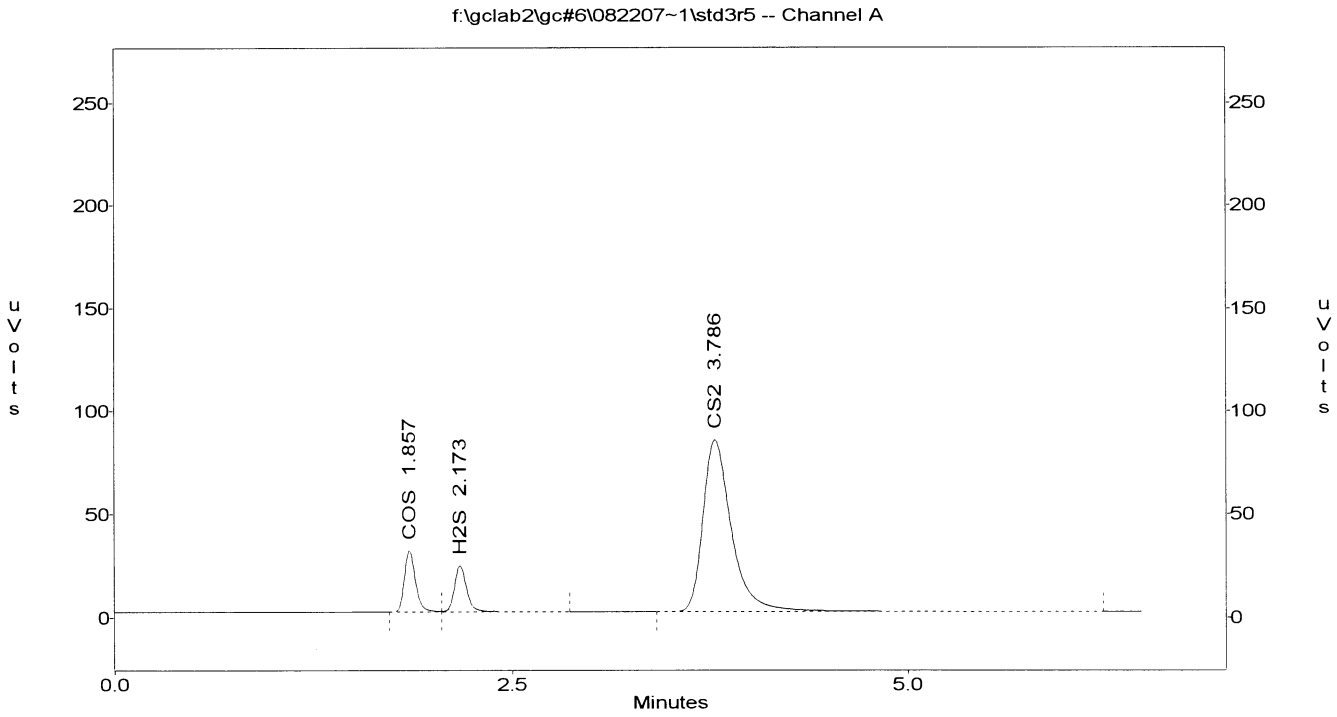
Peak	Retention Time	Area
COS	1.86	138090
H2S	2.18	115458
CS2	3.80	1071060

Totals : 1324608

B174

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\std3r5
Method : f:\gclab2\gc#6\fpd_07.met
Sample ID : std3 span1 set2
Inj. Vial : 000
Acquired : Aug 22, 2007 08:22:59
Printed : Aug 22, 2007 09:19:13
User : System



Channel A Results

Peak	Retention Time	Area
COS	1.86	145742
H2S	2.17	119931
CS2	3.79	1052156

Totals : 1317829

B175

Sulfur Analysis - GC / FPD

Post-Test Calibration

(EPA method 15)

B176

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

GC #6 FPD Analysis - Initial Calibration: August 22, 2007

H_2S Standards Post Test Check Result - August 23, 2007

(FPD@Range 2)

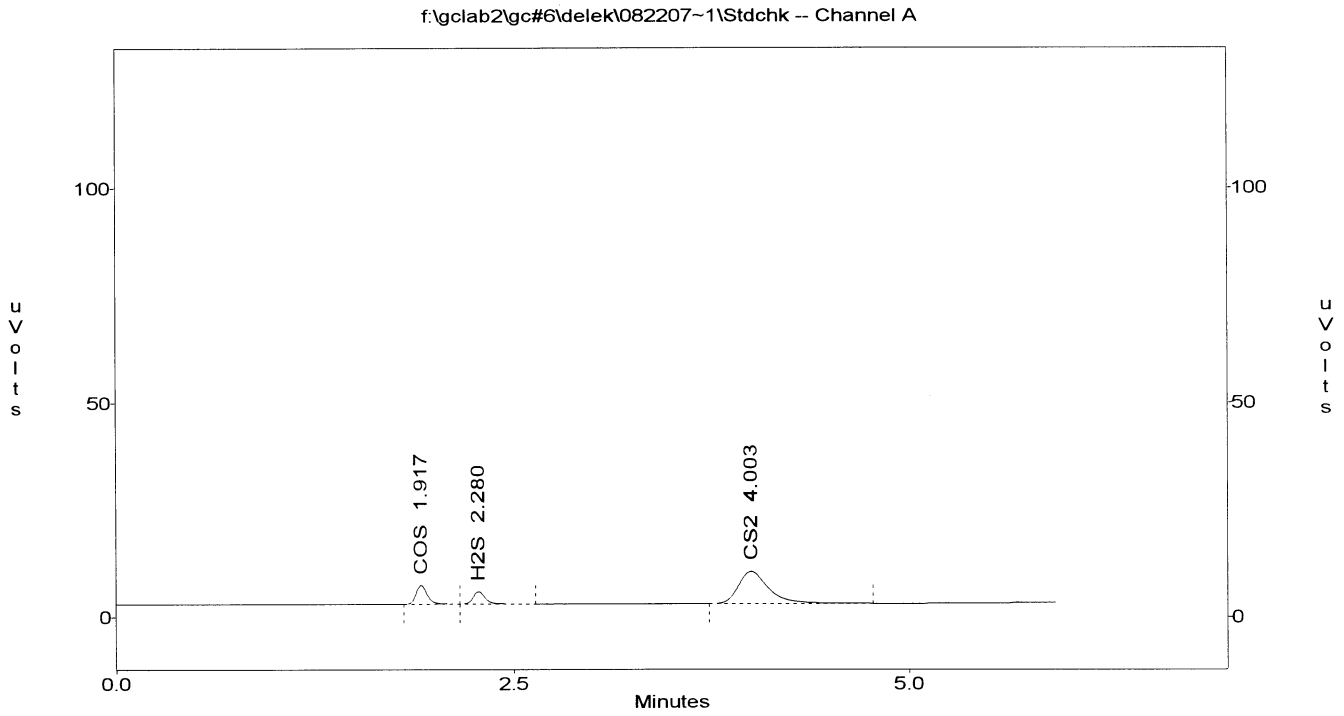
		Area Counts	Concentration
Sample ID No.	GC Run No.	Hydrogen Sulfide	H2S
		area counts (square root)	0.53
Initial Cal. Standard Avg.		124.54	ppmv
Calibration Post-Check Run	1	124	0.53
	2	126	0.54
	3	124	0.53
		Average =	0.53
		Standard Response Factor =	234.98
		QA Response Factor =	235.54
		Mean Response Factor =	235.26
		Percent Difference, % =	0.24
		Pass/Fail Criterion (<5%) =	Pass

Operator SLy Date 8-23-07

B177

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\Stdchk
Method : f:\gclab2\gc#6\Fpd_07.met
Sample ID : STD CHK
Inj. Vial : 000
Acquired : Aug 23, 2007 11:27:16
Printed : Aug 23, 2007 11:33:13
User : System



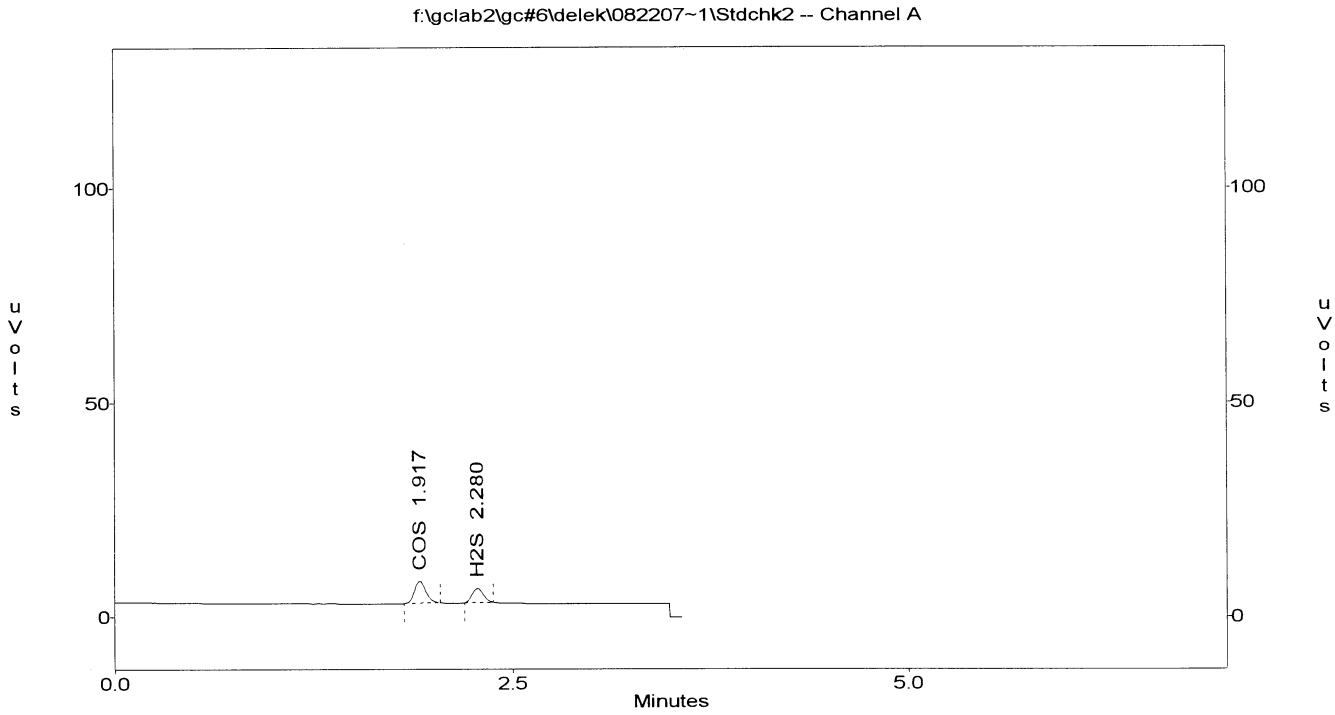
Channel A Results

Peak	Retention Time	Area
COS	1.92	21769
H2S	2.28	15352
CS2	4.00	98641

Totals : 135762

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\Stdchk2
Method : f:\gclab2\gc#6\Fpd_07.met
Sample ID : STD CHK
Inj. Vial : 000
Acquired : Aug 23, 2007 11:33:35
Printed : Aug 23, 2007 11:37:10
User : System



Channel A Results

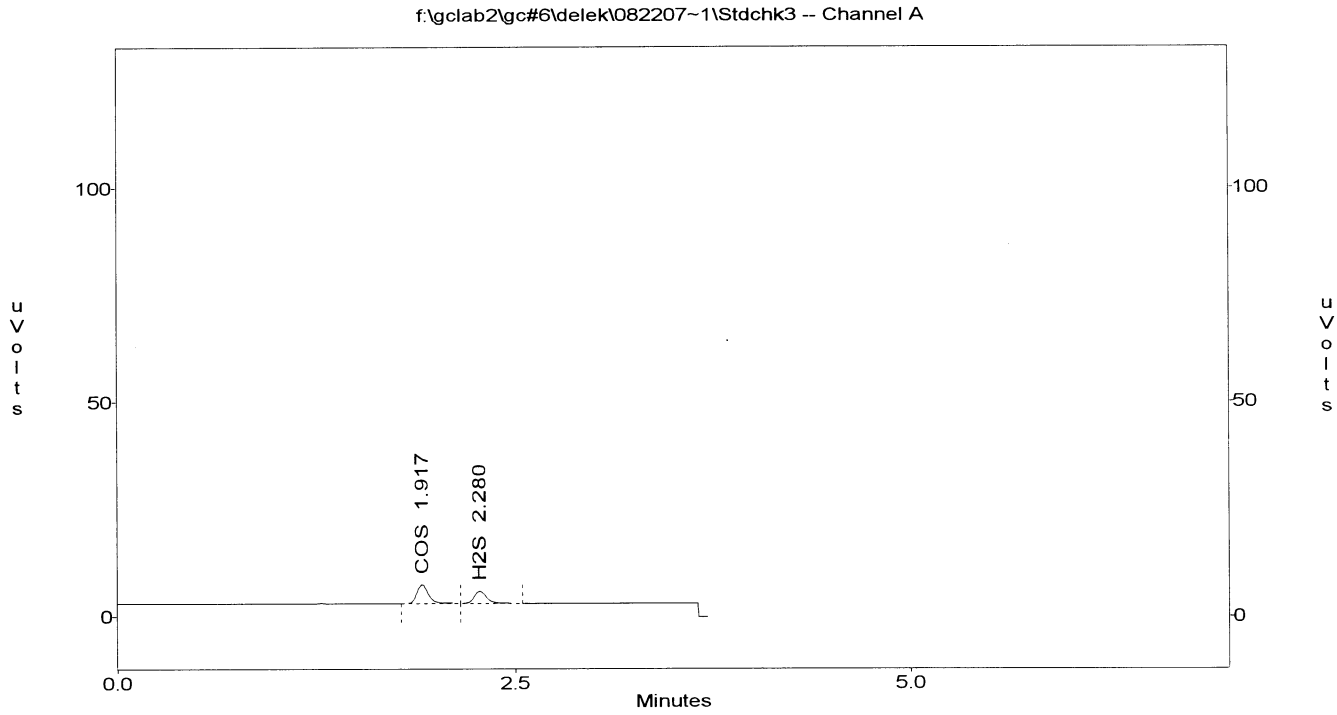
Peak	Retention Time	Area
COS	1.92	25437
H2S	2.28	15954

Totals : 41391

B179

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\Stdchk3
Method : f:\gclab2\gc#6\Fpd_07.met
Sample ID : STD CHK
Inj. Vial : 000
Acquired : Aug 23, 2007 11:38:36
Printed : Aug 23, 2007 11:42:20
User : System



Channel A Results

Peak	Retention Time	Area
COS	1.92	22486
H2S	2.28	15449

Totals : 37935

B180

Sulfur Analysis - GC / FPD

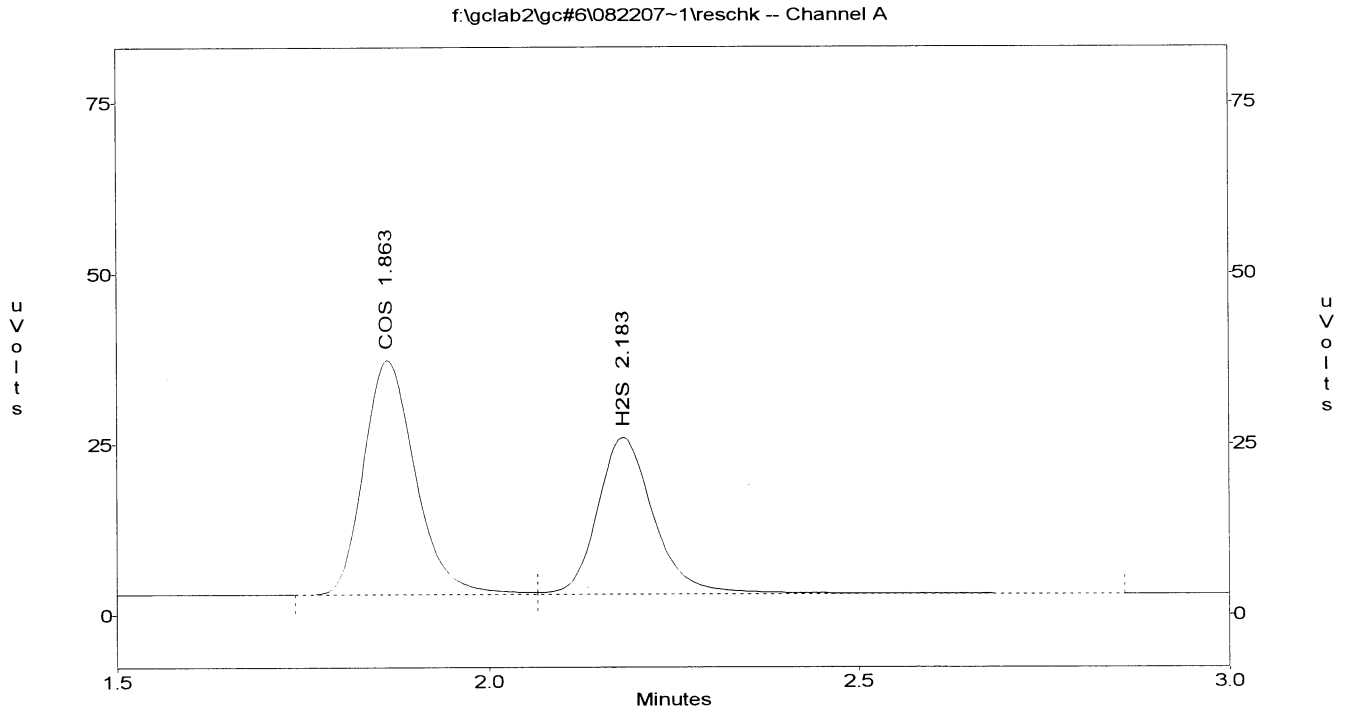
Column Resolution Check

(EPA method 15)

B181

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\reschk
Method : f:\gclab2\gc#6\fpd_07.met
Sample ID : resolution check
Inj. Vial : 000
Acquired : Aug 22, 2007 07:43:05
Printed : Aug 22, 2007 09:20:35
User : System



Channel A Results

Peak	Retention Time	Area
COS	1.86	166602
H2S	2.18	122615
CS2	3.81	3071358
Totals :		3360575

B182

Sulfur Analysis - GC / FPD
Sample Line Loss Check
(EPA method 15)

B183

ENTECH ENGINEERING INC.

P.O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Sample Line Loss Check (EPA Method 15) - August 23, 2007

Initial Calibration Date: Aug 22, 2007 - GC#6 FPD (Range2), Chromosil-310 Column

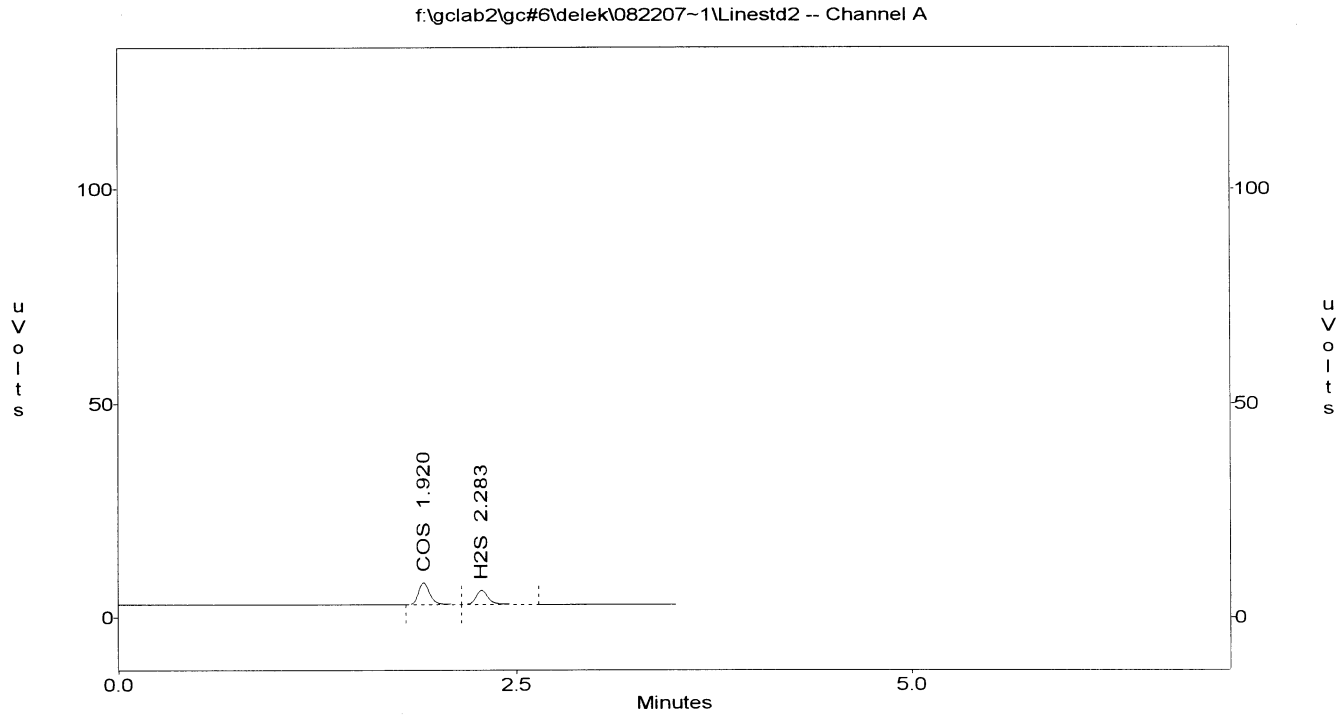
		Standard		Sample Line Feed		Sample Line Loss Recovery	QC Limit
ID	X-Coefficient	Area	Conc. (ppmv)	Area	Conc. (ppmv)	(%)	(< 20%)
H_2S	3.88E-03	17771	0.52	15185	0.48	-7.56	Pass

Operator SCy Date 8-23-07

$184

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\Linestd2
Method : f:\gclab2\gc#6\Fpd_07.met
Sample ID : LINE CHK STD
Inj. Vial : 000
Acquired : Aug 23, 2007 11:53:23
Printed : Aug 23, 2007 11:56:58
User : System



Channel A Results

Peak	Retention Time	Area
COS	1.92	25241
H2S	2.28	17771

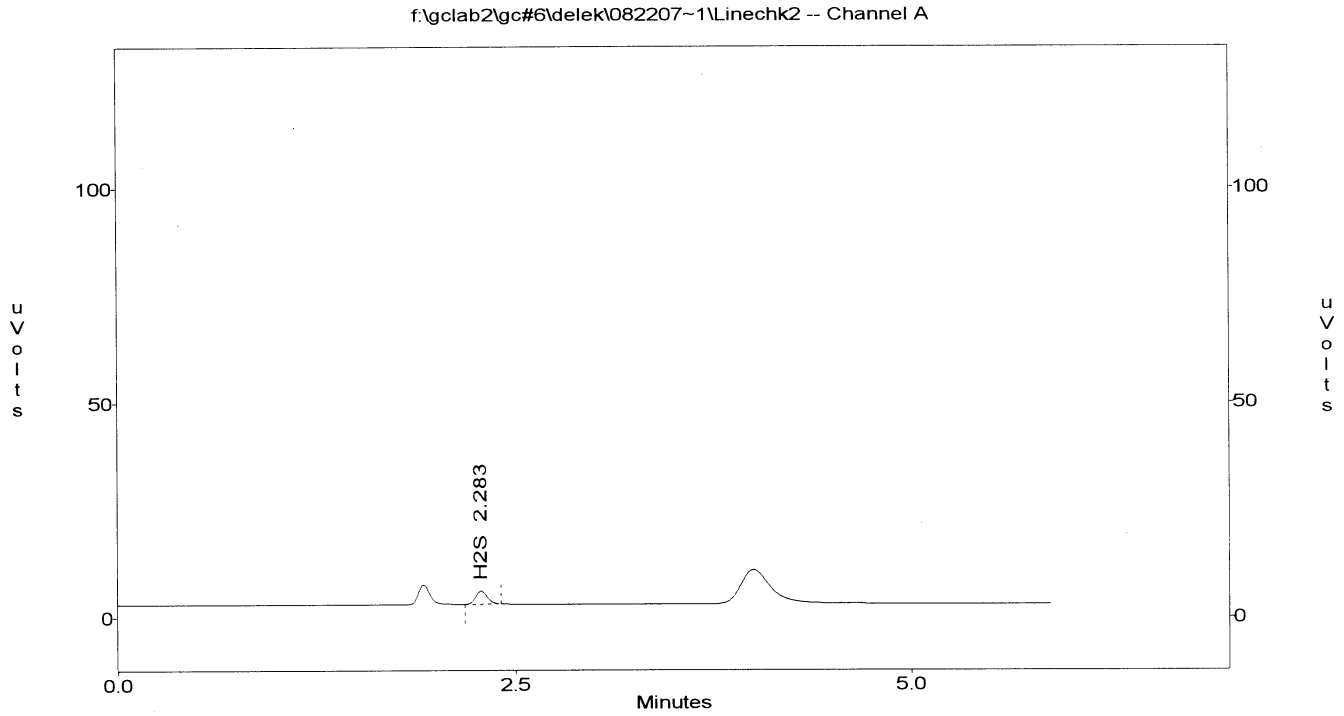
Totals :

43012

B185

Entech Engineering Inc.
Webster, Texas

File	:	f:\gclab2\gc#6\delek\082207~1\Linechk2
Method	:	f:\gclab2\gc#6\Fpd_07.met
Sample ID	:	LINE LOSS CHK
Inj. Vial	:	000
Acquired	:	Aug 23, 2007 11:20:01
Printed	:	Aug 23, 2007 11:25:55
User	:	System



Channel A Results

Peak	Retention Time	Area
H2S	2.28	15185
Totals :		15185

B186

Sulfur Analysis - GC / FPD

Sample Results & Raw Data

(EPA method 15)

B187

ENTECH ENGINEERING INC.

Delek Refining - SRU2. Tyler, Texas. August 22, 2007

Determination of Hydrogen Sulfide, Carbony Sulfide, and Carbon Dissulfide Emission From Stationary Source - EPA method 15 - TEST No. 1

H_2S			
X Coefficient = 3.879695E-03. MDL = 0.24 PPMV			
TEST RUN	Peak Area	Area Sq Root	Concentration (ppmv)
Run1	423111	650.470	**2.52**
Run2	808975	899.430	**3.49**
Run3	228886	478.420	**1.86**
Run4	83482	288.933	**1.12**
Run5	53994	232.366	**0.90**
Run6	35093	187.331	**0.73**
Run7	23602	153.629	**0.60**
Run8	12829	113.265	**0.44**
Run9	7058	84.012	**0.33**
Run10	4268	65.330	**0.25**
Run11	3138	56.018	**0.24**
Run12	1820	0.000	**0.24**
Run13	1288	0.000	**0.24**
Run14	0	0.000	**0.24**
Run15	0	0.000	**0.24**
Run16	0	0.000	**0.24**
Run17	0	0.000	**0.24**
Run18	0	0.000	**0.24**
Run19	0	0.000	**0.24**
Run20	0	0.000	**0.24**
	Total:		**5.64**
	Average:		**0.35**

CS_2			
X Coefficient = 1.363740E-03. MDL = 0.25 PPMV			
TEST RUN	Peak Area	Area Sq Root	Concentration (ppmv)
Run1	0	0.000	**0.25**
Run2	0	0.000	**0.25**
Run3	0	0.000	**0.25**
Run4	0	0.000	**0.25**
Run5	0	0.000	**0.25**
Run6	0	0.000	**0.25**
Run7	0	0.000	**0.25**
Run8	0	0.000	**0.25**
Run9	0	0.000	**0.25**
Run10	0	0.000	**0.25**
Run11	0	0.000	**0.25**
Run12	0	0.000	**0.25**
Run13	0	0.000	**0.25**
Run14	0	0.000	**0.25**
Run15	0	0.000	**0.25**
Run16	0	0.000	**0.25**
Run17	0	0.000	**0.25**
Run18	0	0.000	**0.25**
Run19	0	0.000	**0.25**
Run20	0	0.000	**0.25**
	Total:		**4.00**
	Average:		**0.25**

COS			
X Coefficient = 2.857197E-03. MDL = 0.20 PPMV			
TEST RUN	Peak Area	Area Sq Root	Concentration (ppmv)
Run1	0	0.000	**0.20**
Run2	0	0.000	**0.20**
Run3	0	0.000	**0.20**
Run4	0	0.000	**0.20**
Run5	0	0.000	**0.20**
Run6	0	0.000	**0.20**
Run7	0	0.000	**0.20**
Run8	0	0.000	**0.20**
Run9	0	0.000	**0.20**
Run10	0	0.000	**0.20**
Run11	0	0.000	**0.20**
Run12	0	0.000	**0.20**
Run13	0	0.000	**0.20**
Run14	0	0.000	**0.20**
Run15	0	0.000	**0.20**
Run16	0	0.000	**0.20**
Run17	0	0.000	**0.20**
Run18	0	0.000	**0.20**
Run19	0	0.000	**0.20**
Run20	0	0.000	**0.20**
	Total:		**3.20**
	Average:		**0.20**

Note: The data of Run 1-4 was not used due to the instability of unit.

ENTECH ENGINEERING INC.

Delek Refining - SRU2. Tyler, Texas. August 22, 2007

Determination of Hydrogen Sulfide, Carbony Sulfide, and Carbon Dissulfide Emission From Stationary Source - EPA method 15 - TEST No. 2

H_2S

X Coefficient = 3.879695E-03. MDL = 0.24 PPMV

TEST RUN	Peak Area	Area Sq Root	Concentration (ppmv)
Run1	0	0.000	**0.24**
Run2	0	0.000	**0.24**
Run3	0	0.000	**0.24**
Run4	0	0.000	**0.24**
Run5	0	0.000	**0.24**
Run6	0	0.000	**0.24**
Run7	0	0.000	**0.24**
Run8	0	0.000	**0.24**
Run9	0	0.000	**0.24**
Run10	0	0.000	**0.24**
Run11	0	0.000	**0.24**
Run12	0	0.000	**0.24**
Run13	0	0.000	**0.24**
Run14	0	0.000	**0.24**
Run15	0	0.000	**0.24**
Run16	0	0.000	**0.24**

Total: **3.84**

Average: **0.24**

CS_2

X Coefficient = 1.363740E-03. MDL = 0.25 PPMV

TEST RUN	Peak Area	Area Sq Root	Concentration (ppmv)
Run1	0	0.000	**0.25**
Run2	0	0.000	**0.25**
Run3	0	0.000	**0.25**
Run4	0	0.000	**0.25**
Run5	0	0.000	**0.25**
Run6	0	0.000	**0.25**
Run7	0	0.000	**0.25**
Run8	0	0.000	**0.25**
Run9	0	0.000	**0.25**
Run10	0	0.000	**0.25**
Run11	0	0.000	**0.25**
Run12	0	0.000	**0.25**
Run13	0	0.000	**0.25**
Run14	0	0.000	**0.25**
Run15	0	0.000	**0.25**
Run16	0	0.000	**0.25**

Total: **4.00**

Average: **0.25**

COS

X Coefficient = 2.857197E-03. MDL = 0.20 PPMV

TEST RUN	Peak Area	Area Sq Root	Concentration (ppmv)
Run1	0	0.000	**0.20**
Run2	0	0.000	**0.20**
Run3	0	0.000	**0.20**
Run4	0	0.000	**0.20**
Run5	0	0.000	**0.20**
Run6	0	0.000	**0.20**
Run7	0	0.000	**0.20**
Run8	0	0.000	**0.20**
Run9	0	0.000	**0.20**
Run10	0	0.000	**0.20**
Run11	0	0.000	**0.20**
Run12	0	0.000	**0.20**
Run13	0	0.000	**0.20**
Run14	0	0.000	**0.20**
Run15	0	0.000	**0.20**
Run16	0	0.000	**0.20**

Total: **3.20**

Average: **0.20**

6189

ENTECH ENGINEERING INC.

Delek Refining - SRU2. Tyler, Texas. August 22, 2007

Determination of Hydrogen Sulfide, Carbony Sulfide, and Carbon Dissulfide Emission From Stationary Source - EPA method 15 - TEST No. 3

H_2S

X Coefficient = 3.879695E-03. MDL = 0.24 PPMV

TEST RUN	Peak Area	Area Sq Root	Concentration (ppmv)
Run1	0	0.000	**0.24**
Run2	0	0.000	**0.24**
Run3	0	0.000	**0.24**
Run4	0	0.000	**0.24**
Run5	0	0.000	**0.24**
Run6	126519	355.695	**1.38**
Run7	96860	311.223	**1.21**
Run8	1719	41.461	**0.24**
Run9	0	0.000	**0.24**
Run10	0	0.000	**0.24**
Run11	0	0.000	**0.24**
Run12	0	0.000	**0.24**
Run13	0	0.000	**0.24**
Run14	0	0.000	**0.24**
Run15	0	0.000	**0.24**
Run16	0	0.000	**0.24**
		Total:	**5.95**
		Average:	**0.37**

CS_2

X Coefficient = 1.363740E-03. MDL = 0.25 PPMV

TEST RUN	Peak Area	Area Sq Root	Concentration (ppmv)
Run1	0	0.000	**0.25**
Run2	0	0.000	**0.25**
Run3	0	0.000	**0.25**
Run4	0	0.000	**0.25**
Run5	0	0.000	**0.25**
Run6	0	0.000	**0.25**
Run7	0	0.000	**0.25**
Run8	0	0.000	**0.25**
Run9	0	0.000	**0.25**
Run10	0	0.000	**0.25**
Run11	0	0.000	**0.25**
Run12	0	0.000	**0.25**
Run13	0	0.000	**0.25**
Run14	0	0.000	**0.25**
Run15	0	0.000	**0.25**
Run16	0	0.000	**0.25**
		Total:	**4.00**
		Average:	**0.25**

COS

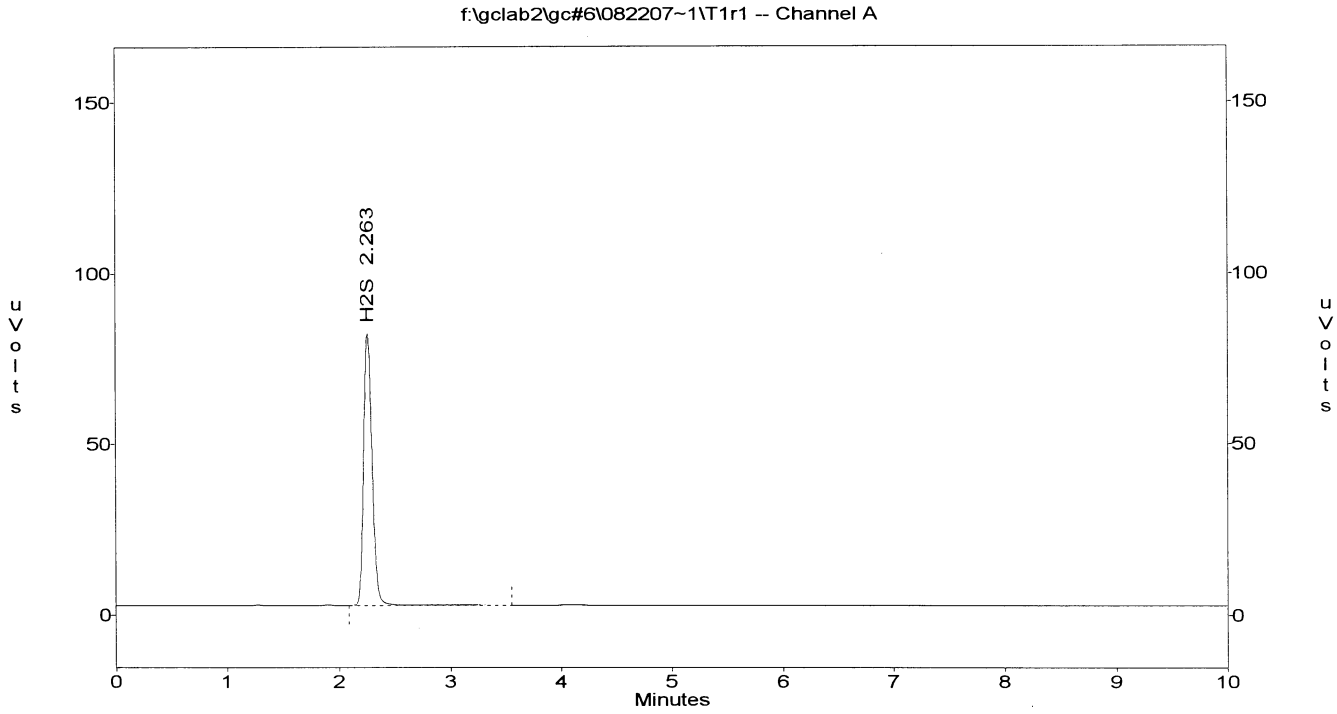
X Coefficient = 2.857197E-03. MDL = 0.20 PPMV

TEST RUN	Peak Area	Area Sq Root	Concentration (ppmv)
Run1	0	0.000	**0.20**
Run2	0	0.000	**0.20**
Run3	0	0.000	**0.20**
Run4	0	0.000	**0.20**
Run5	0	0.000	**0.20**
Run6	0	0.000	**0.20**
Run7	0	0.000	**0.20**
Run8	0	0.000	**0.20**
Run9	0	0.000	**0.20**
Run10	0	0.000	**0.20**
Run11	0	0.000	**0.20**
Run12	0	0.000	**0.20**
Run13	0	0.000	**0.20**
Run14	0	0.000	**0.20**
Run15	0	0.000	**0.20**
Run16	0	0.000	**0.20**
		Total:	**3.20**
		Average:	**0.20**

Entech Engineering Inc.
Webster, Texas

Unit unstable.
Data was not included

File : f:\gclab2\gc#6\082207~1\T1r1
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 11:54:05
Printed : Aug 22, 2007 12:06:12
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.26	423111

Totals :

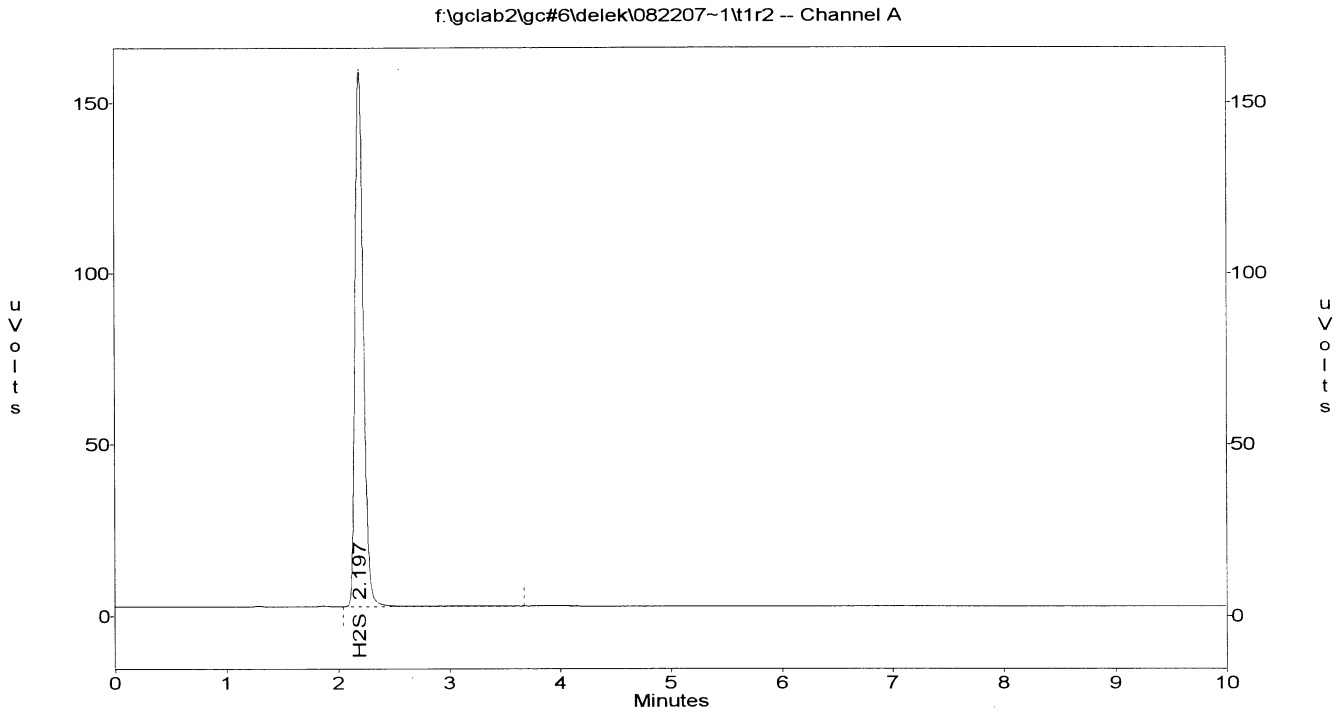
423111

B191

Entech Engineering Inc.
Webster, Texas

Unit was unstable test data was not included.

File : f:\gclab2\gc#6\delek\082207~1\t1r2
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 12:06:37
Printed : Aug 22, 2007 12:32:57
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.20	808975

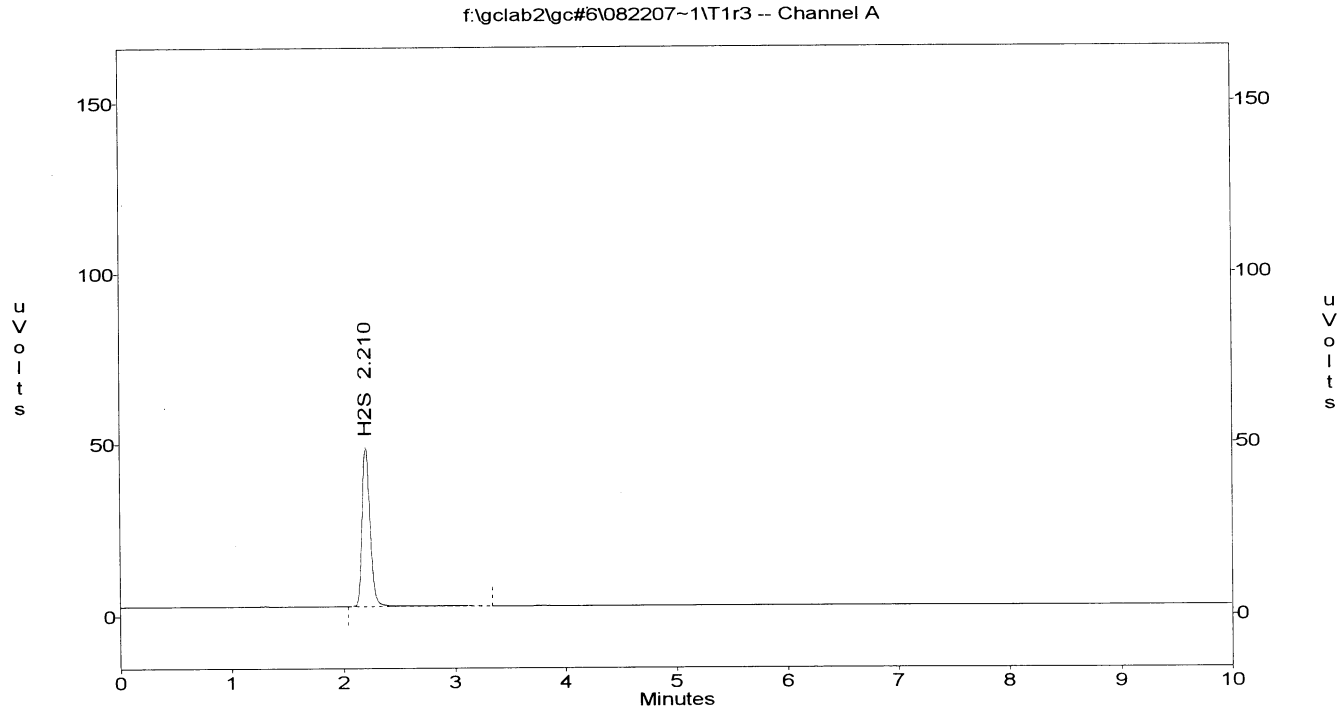
Totals :

808975

B192

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\082207~1\T1r3
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 12:18:57
Printed : Aug 22, 2007 12:31:05
User : System



Channel A Results

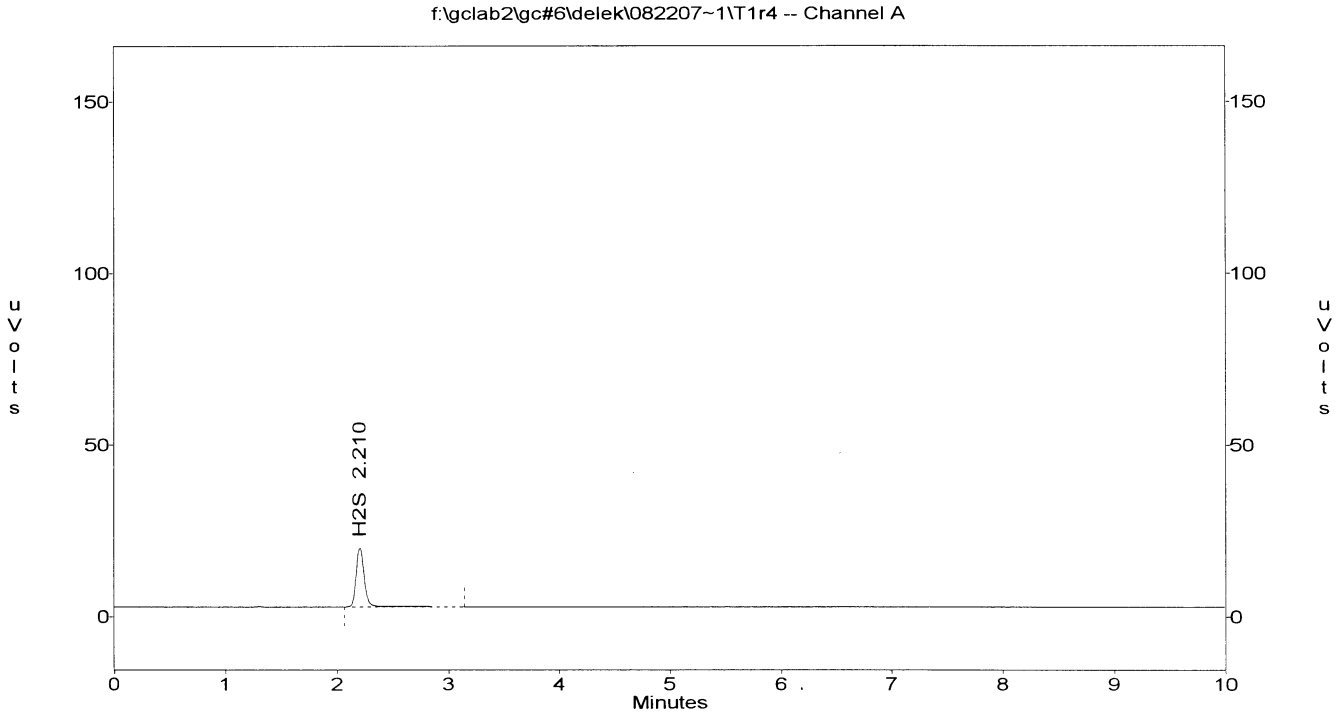
Peak	Retention Time	Area
H2S	2.21	228886
Totals :		228886

B 193

Entech Engineering Inc.
Webster, Texas

Unit was unstable
Test data is not used.

File : f:\gclab2\gc#6\delek\082207~1\T1r4
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 12:33:28
Printed : Aug 22, 2007 12:45:32
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.21	83482

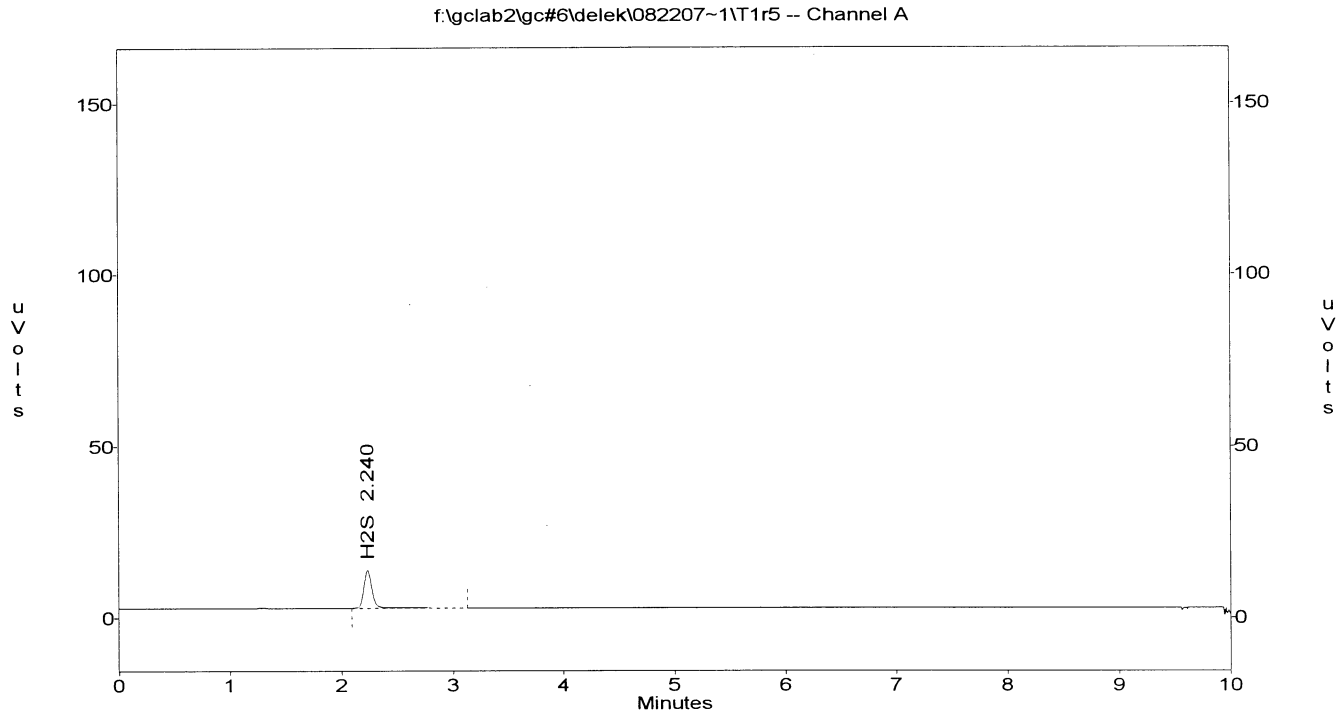
Totals :

83482

B194

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r5
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 12:45:43
Printed : Aug 22, 2007 12:57:56
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.24	53994

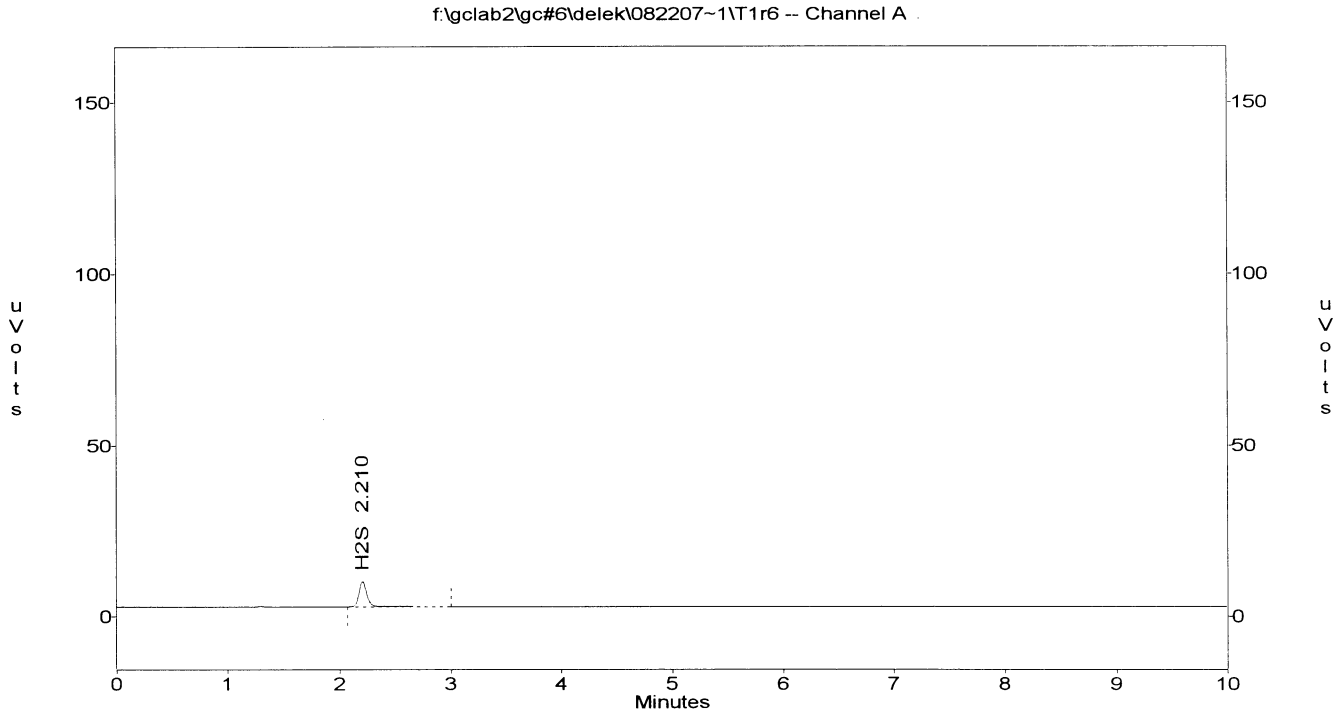
Totals :

53994

B-195

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r6
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 12:58:08
Printed : Aug 22, 2007 13:10:14
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.21	35093

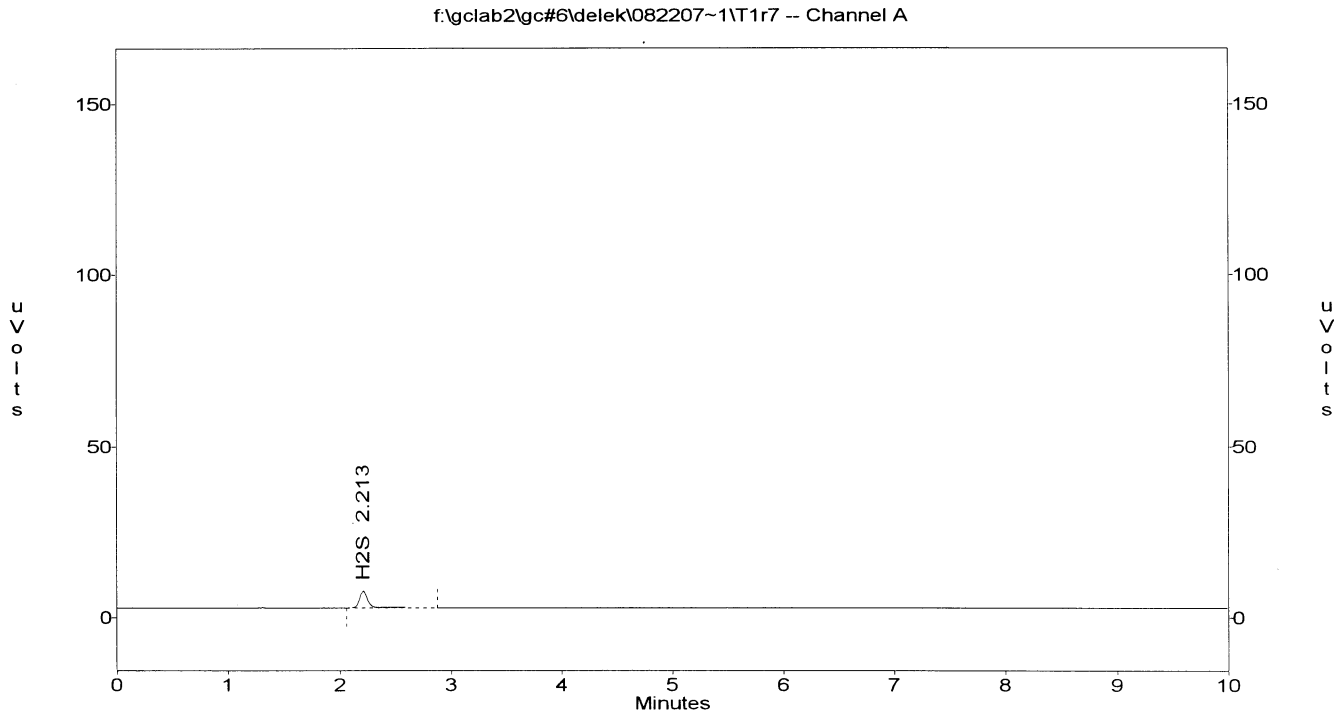
Totals :

35093

$196

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r7
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 13:12:07
Printed : Aug 22, 2007 13:25:06
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.21	23602

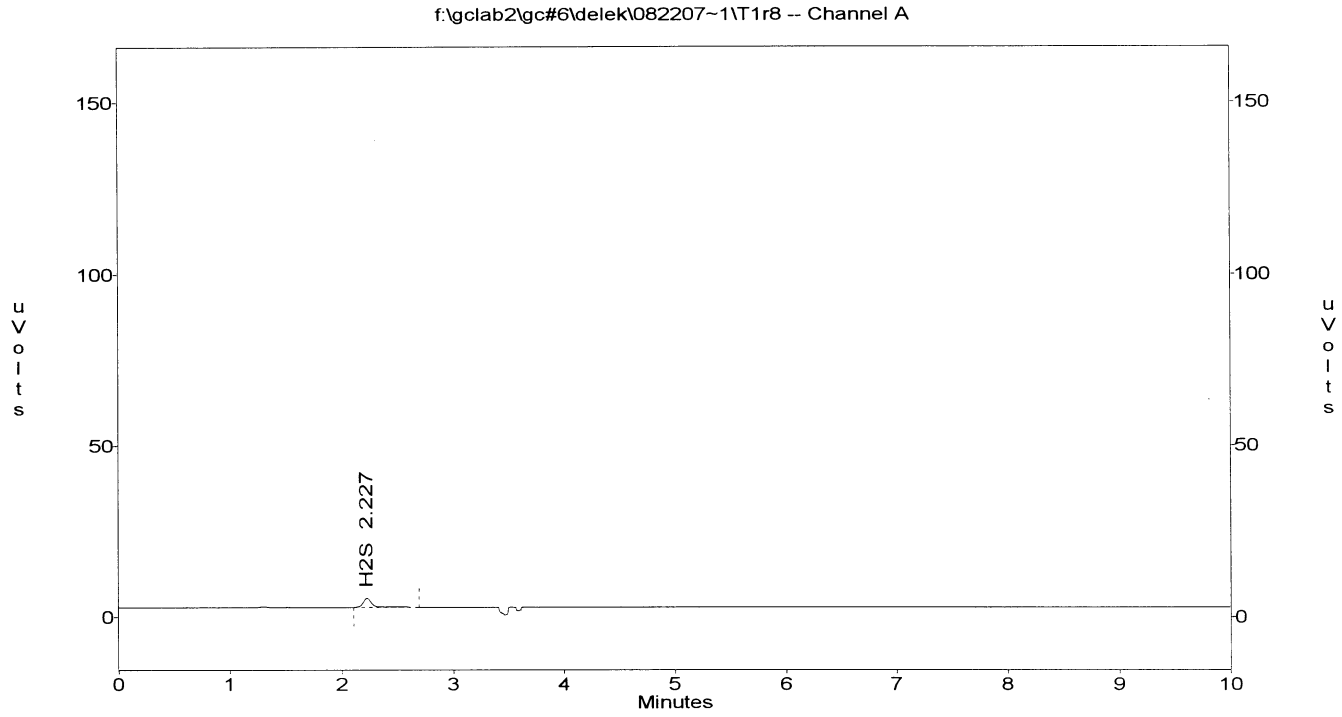
Totals :

23602

B197

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r8
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 13:25:17
Printed : Aug 22, 2007 13:37:22
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.23	12829

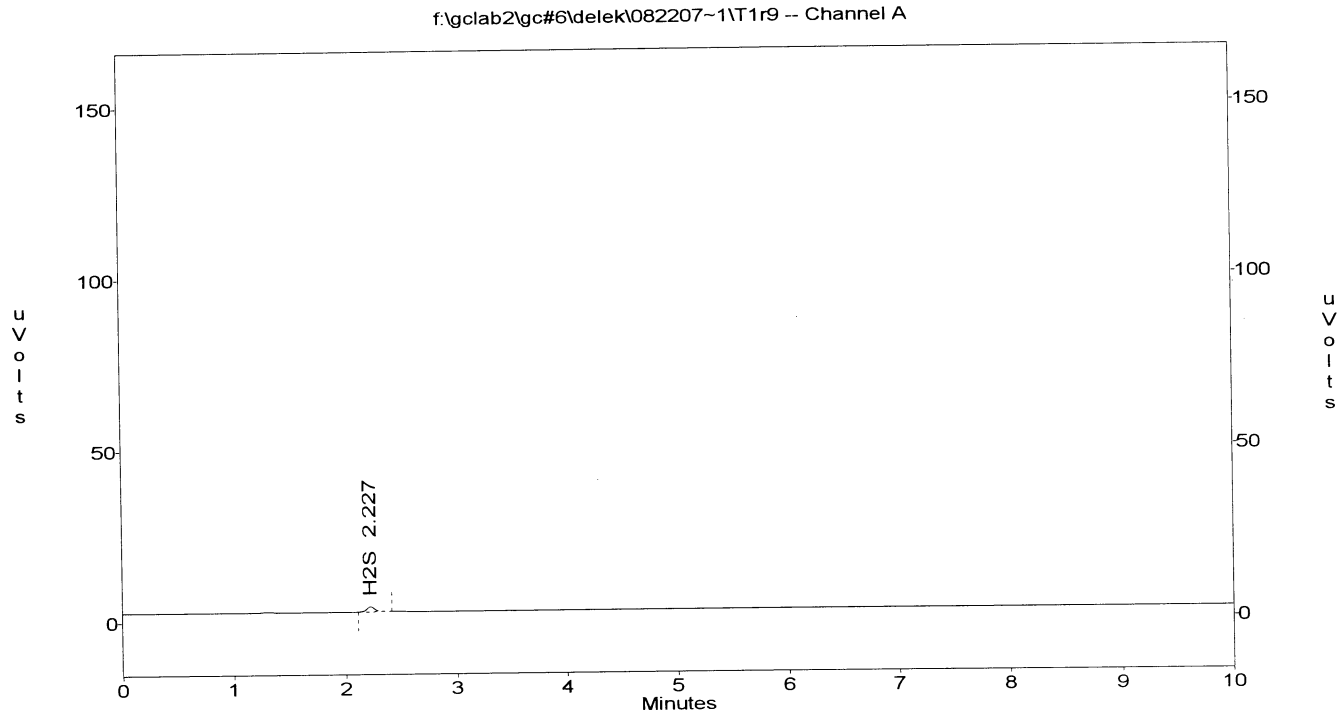
Totals :

12829

B198

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r9
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 13:37:34
Printed : Aug 22, 2007 13:49:40
User : System



Channel A Results

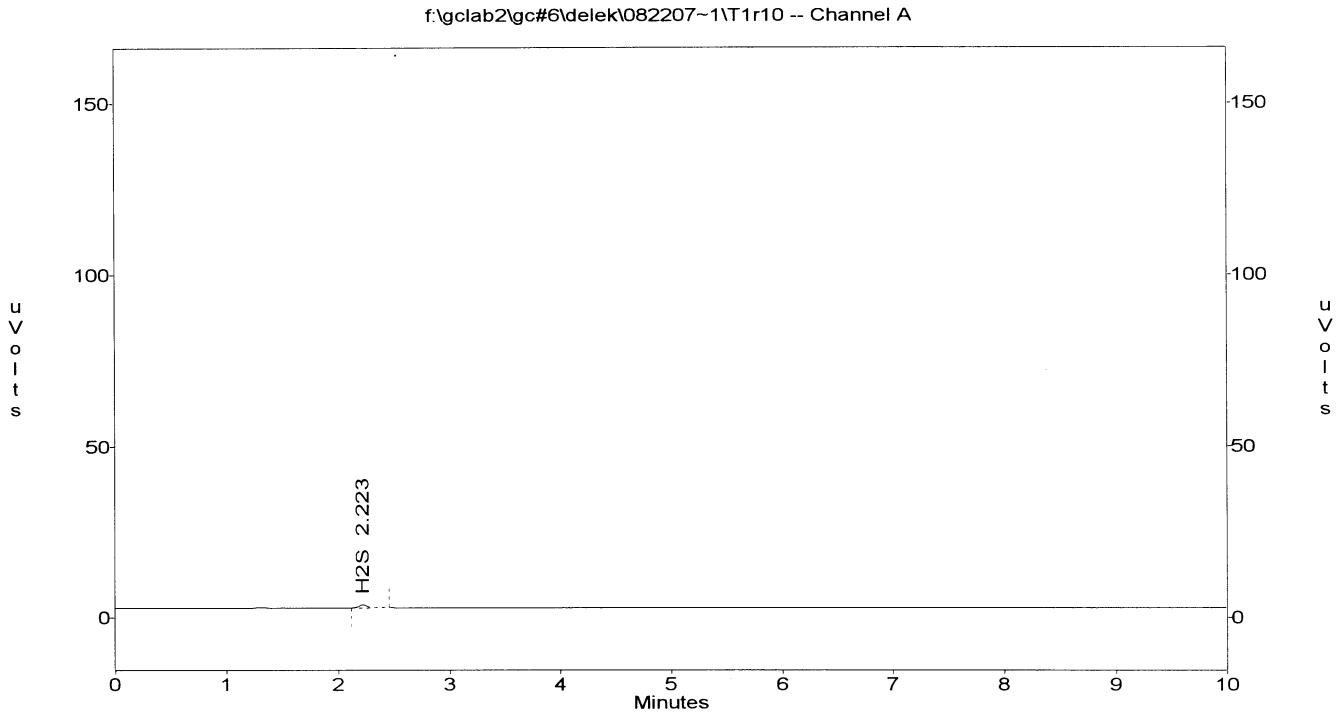
Peak	Retention Time	Area
H2S	2.23	7058

Totals : 7058

$199

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r10
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 13:49:49
Printed : Aug 22, 2007 14:01:54
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.22	4268

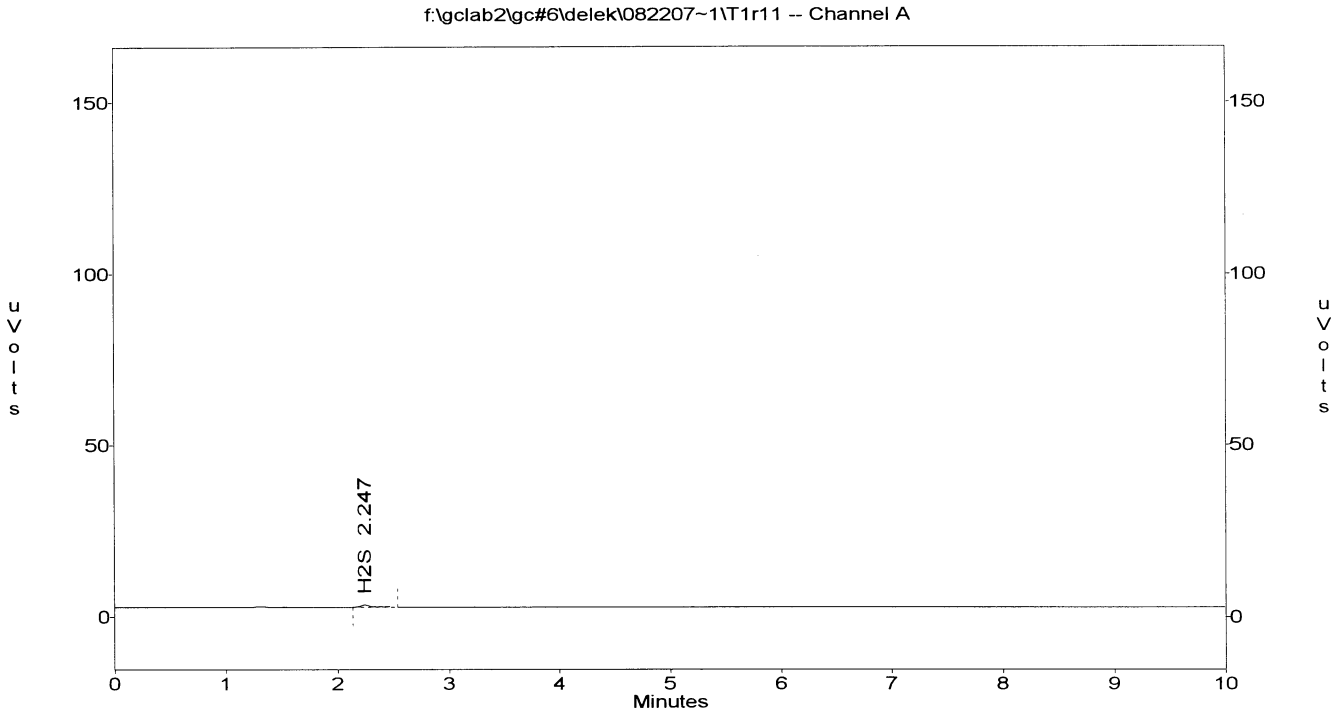
Totals :

4268

$200

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r11
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 14:02:38
Printed : Aug 22, 2007 14:14:38
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.25	3138

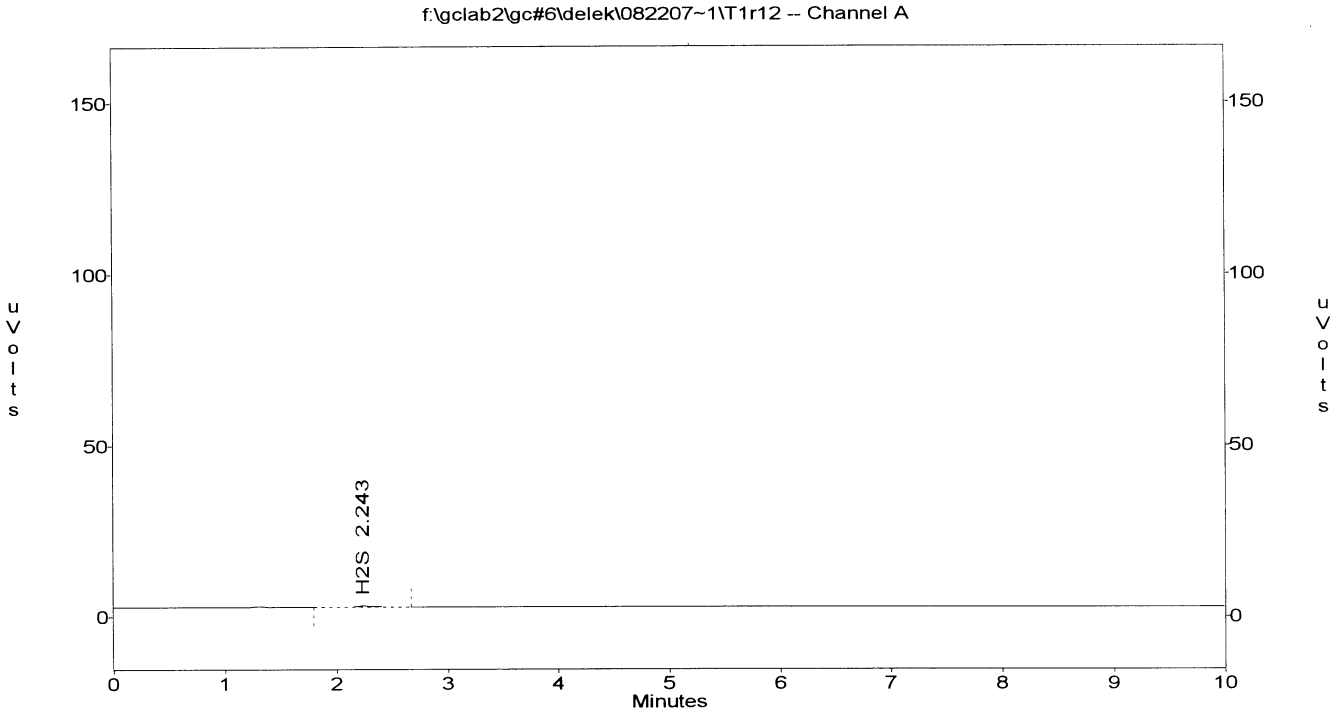
Totals :

3138

201

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r12
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 14:14:51
Printed : Aug 22, 2007 14:26:50
User : System



Channel A Results

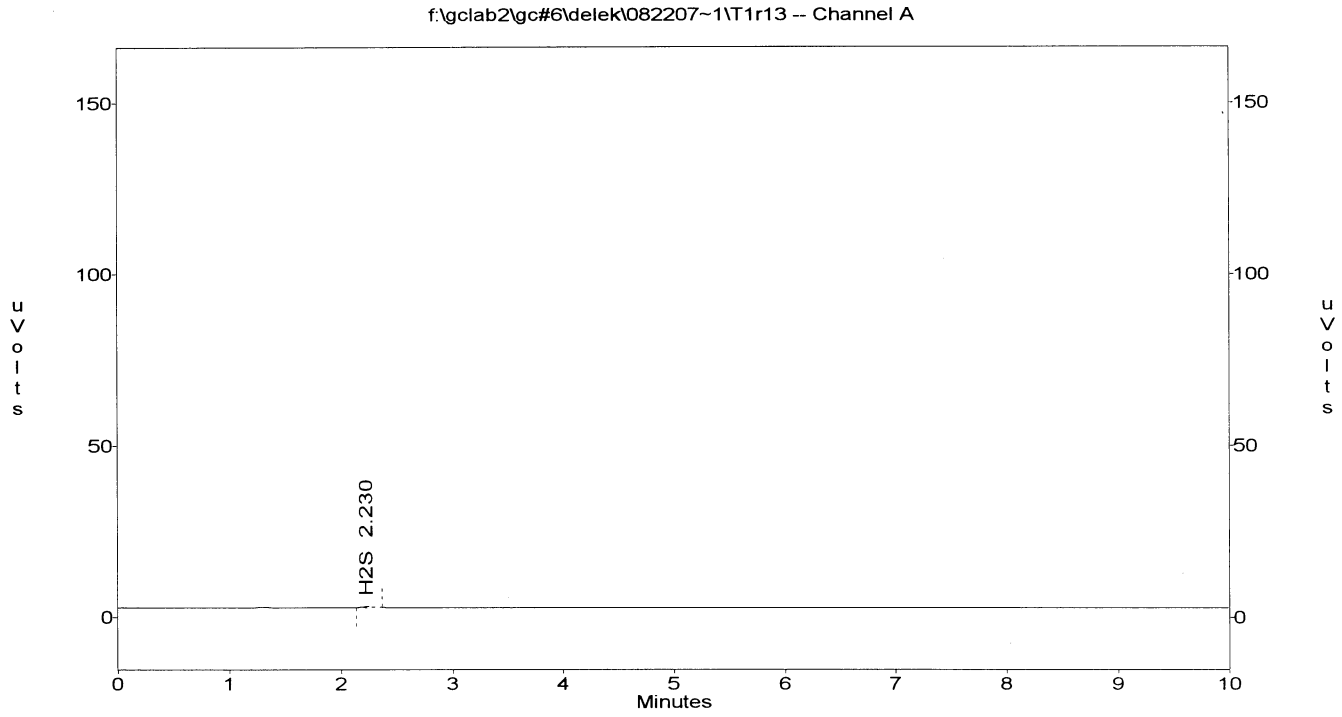
Peak	Retention Time	Area
H2S	2.24	1820

Totals :
1820

B202

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r13
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 14:27:05
Printed : Aug 22, 2007 14:39:11
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.23	1288

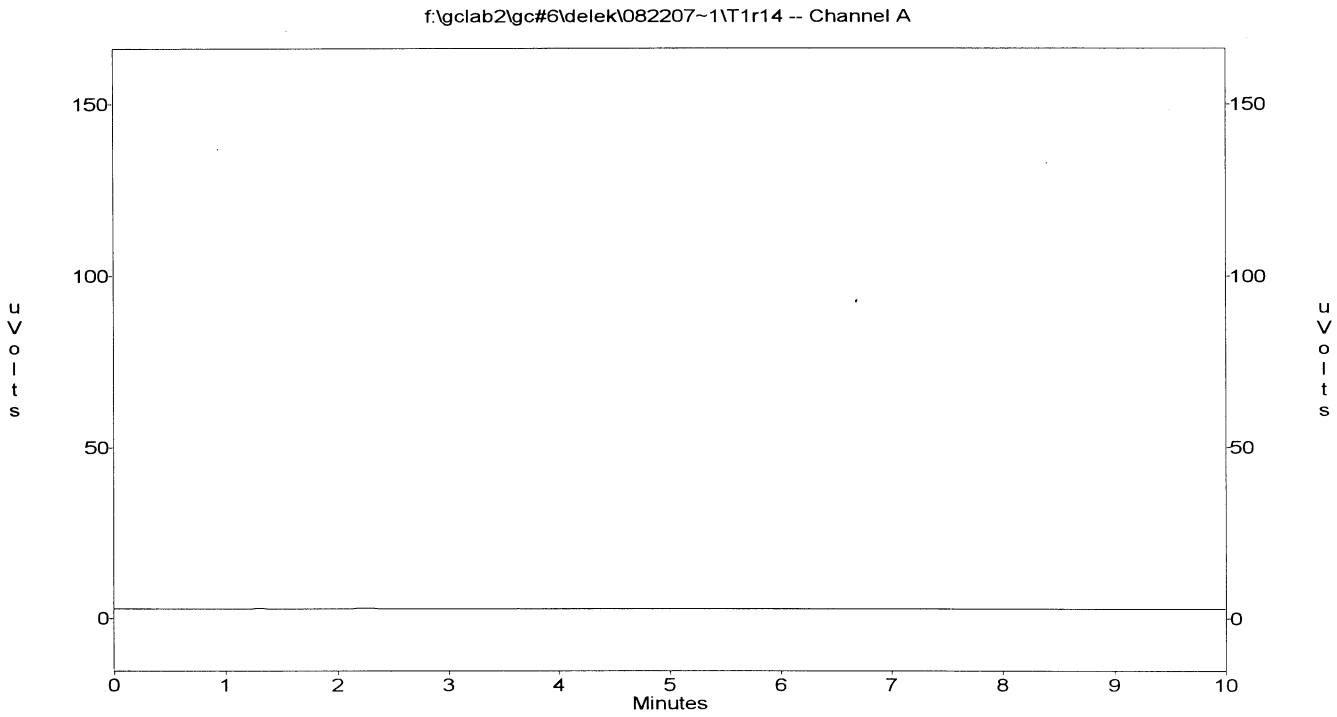
Totals :

1288

B 203

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r14
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 14:39:26
Printed : Aug 22, 2007 14:51:31
User : System



Channel A Results

Peak	Retention Time	Area

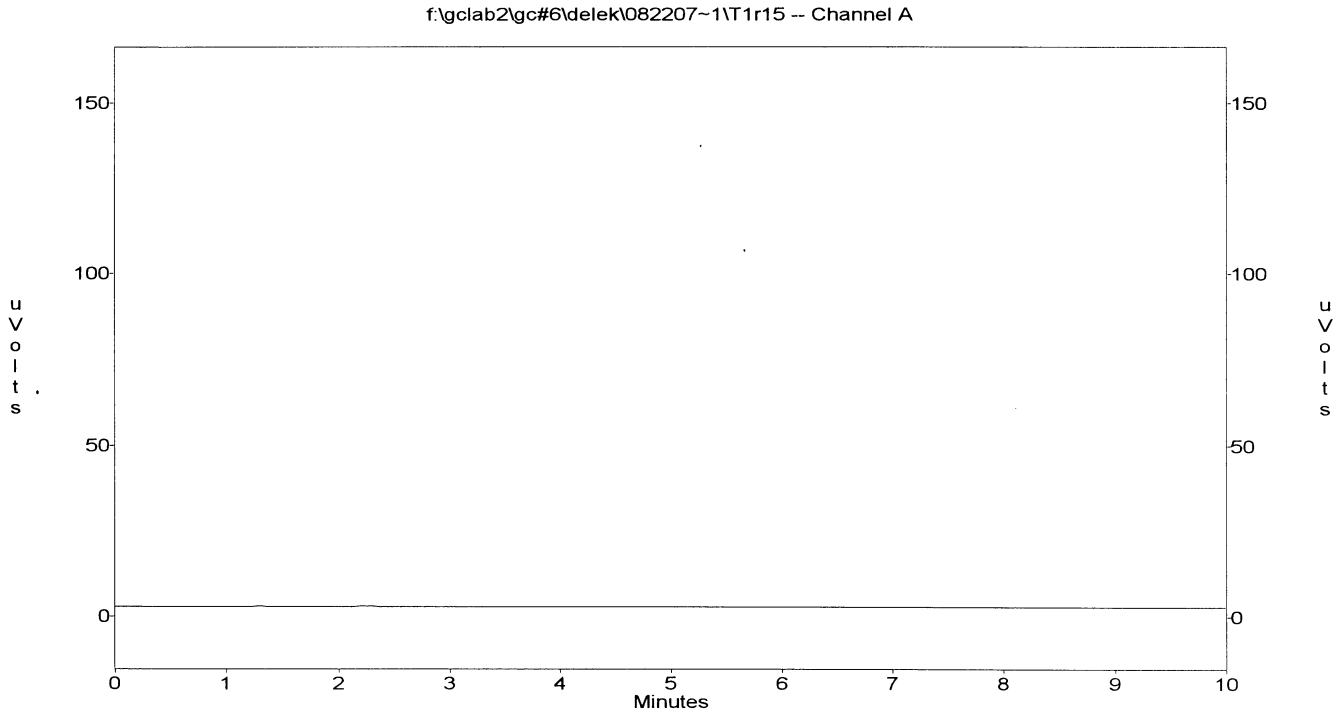
Totals :

0

B204

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r15
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 14:51:48
Printed : Aug 22, 2007 15:03:52
User : System



Channel A Results

Peak	Retention Time	Area

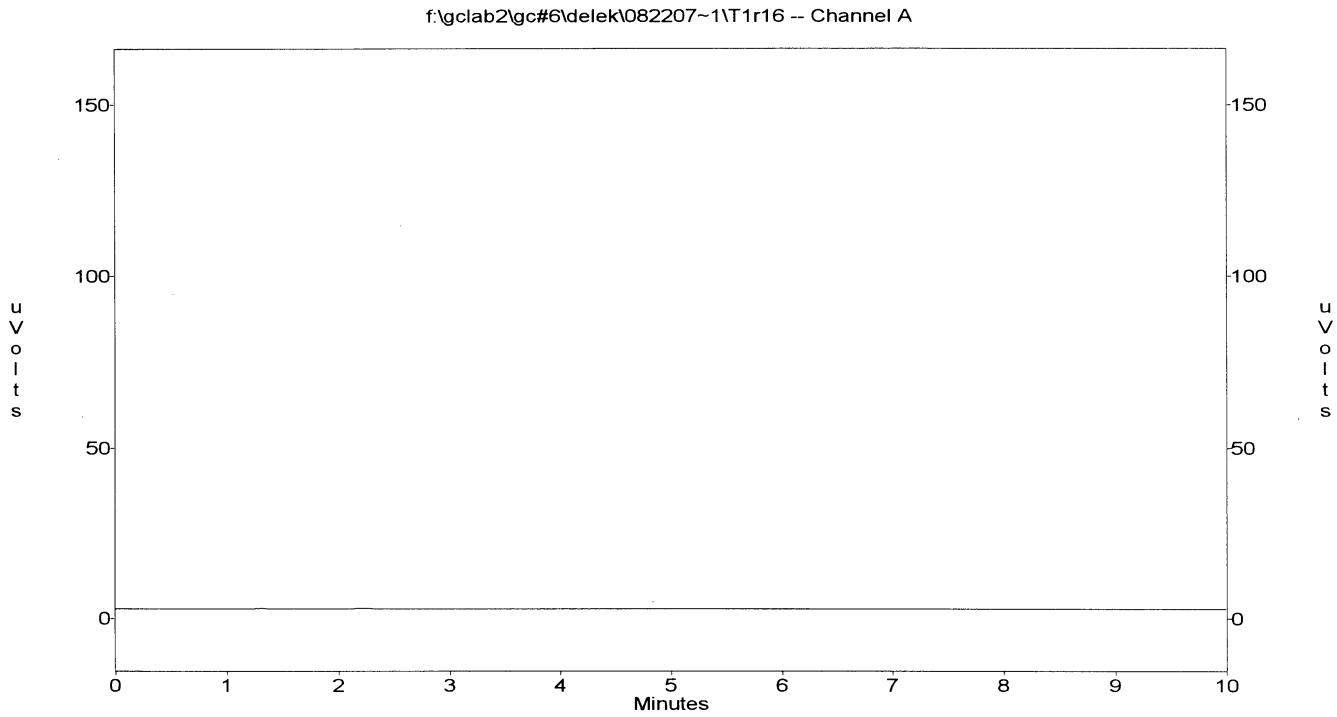
Totals :

0

B205

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r16
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 15:04:05
Printed : Aug 22, 2007 15:14:08
User : System



Channel A Results

Peak	Retention Time	Area

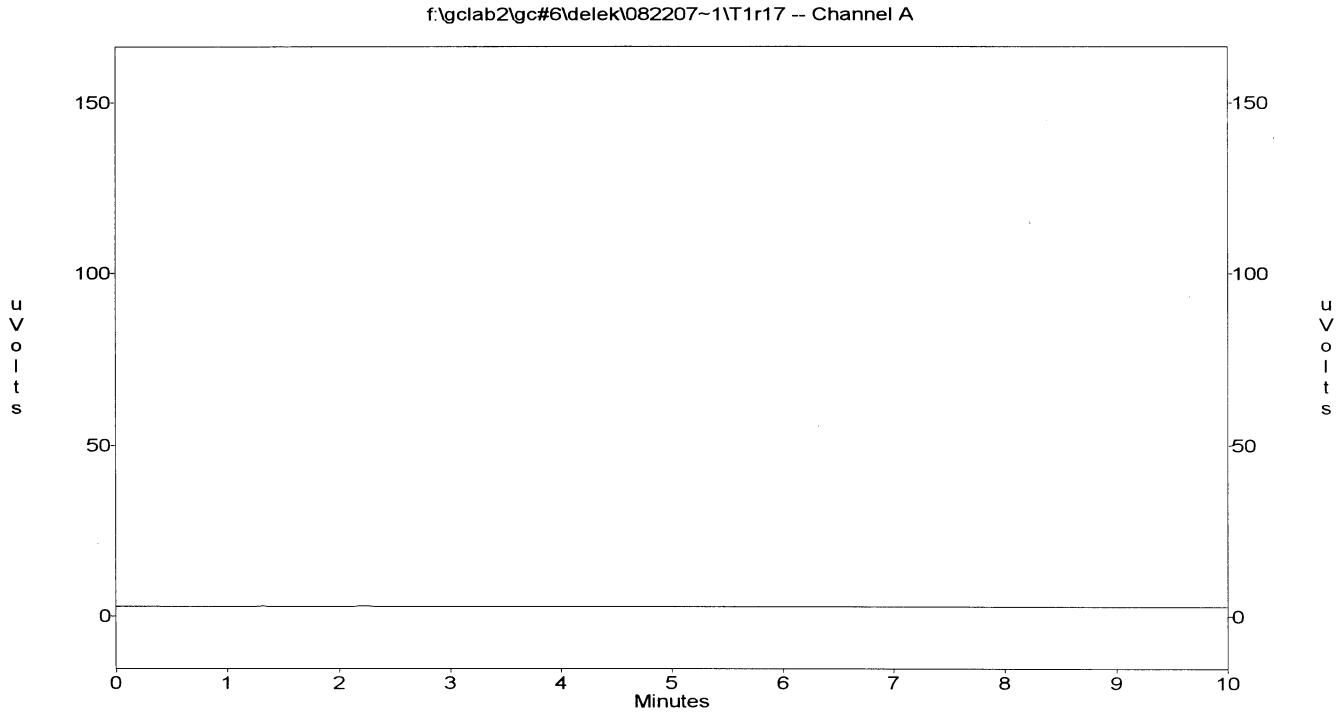
Totals :

0

B706

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r17
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 15:14:27
Printed : Aug 22, 2007 15:26:41
User : System



Channel A Results

Peak	Retention Time	Area

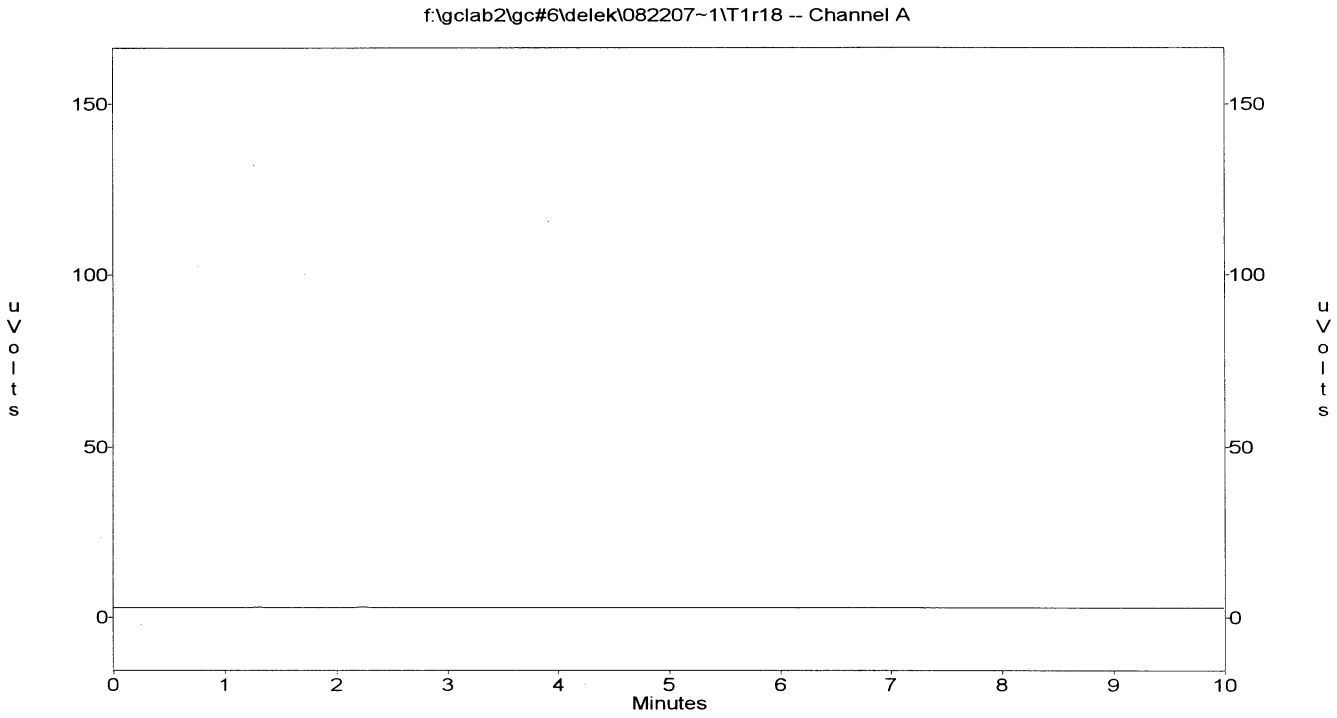
Totals :

0

B 207

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r18
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 15:26:51
Printed : Aug 22, 2007 15:37:08
User : System



Channel A Results

Peak	Retention Time	Area

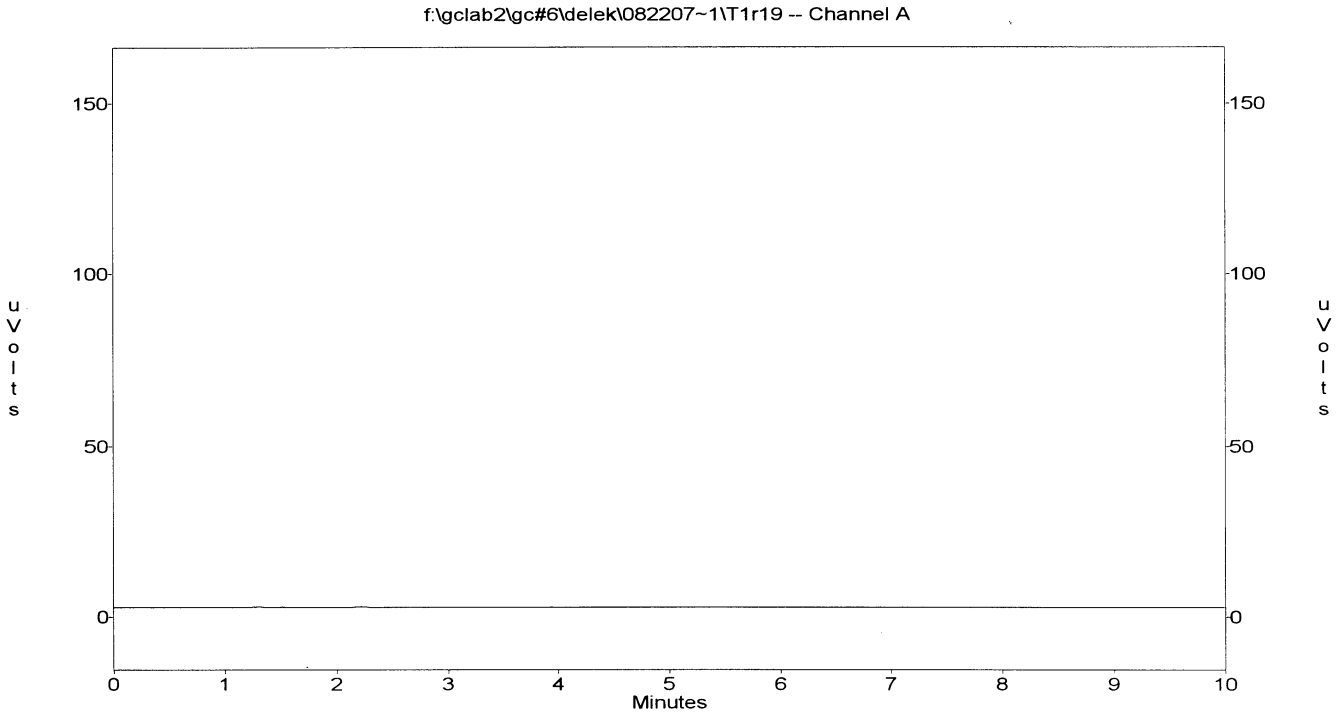
Totals :

0

B208

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r19
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 15:37:27
Printed : Aug 22, 2007 15:48:19
User : System



Channel A Results

Peak	Retention Time	Area

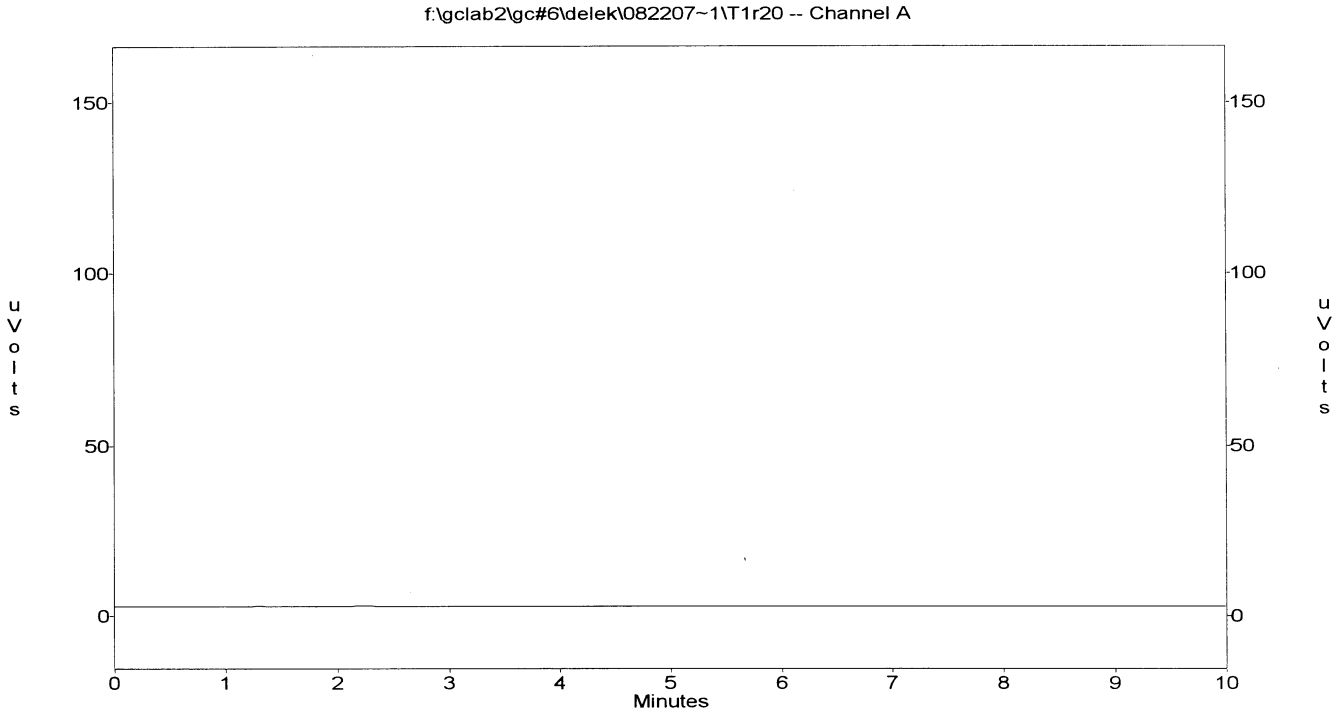
Totals :

0

B209

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T1r20
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-1
Inj. Vial : 000
Acquired : Aug 22, 2007 15:48:35
Printed : Aug 22, 2007 15:58:56
User : System



Channel A Results

Peak	Retention Time	Area

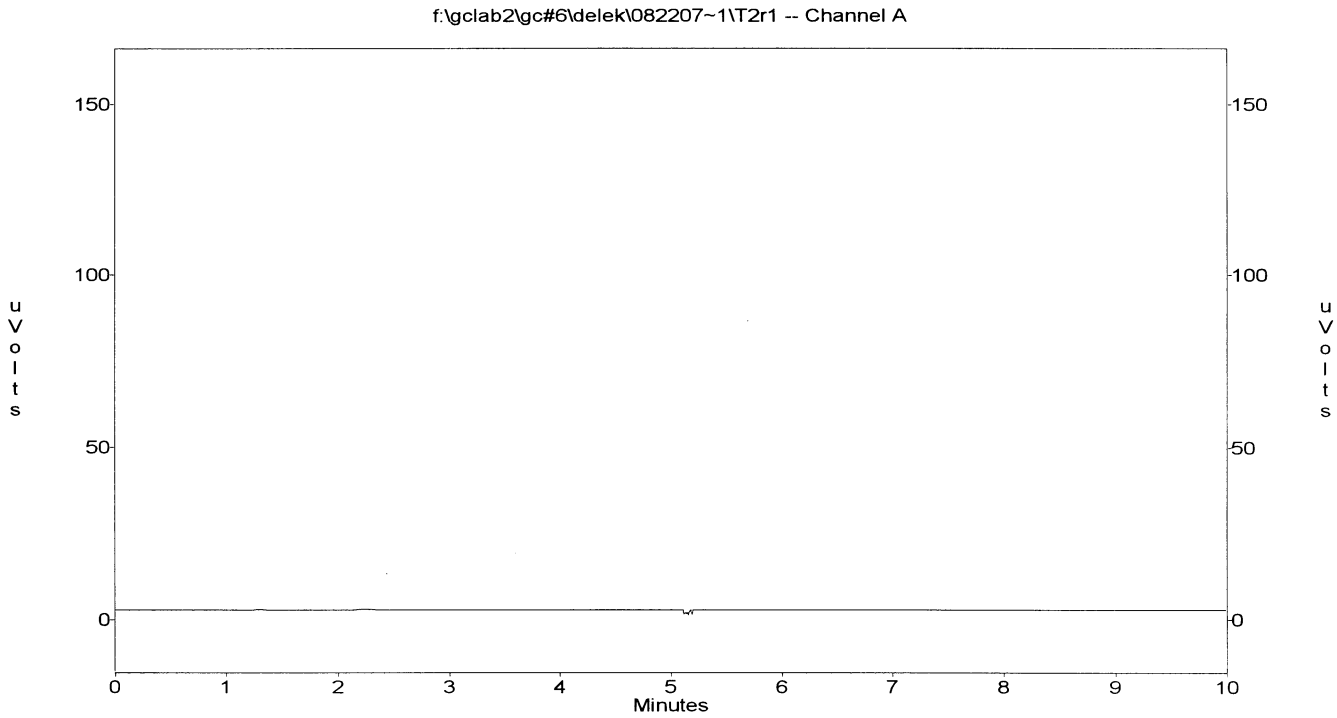
Totals :

0

B210

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r1
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 16:00:46
Printed : Aug 22, 2007 16:12:53
User : System



Channel A Results

Peak	Retention Time	Area

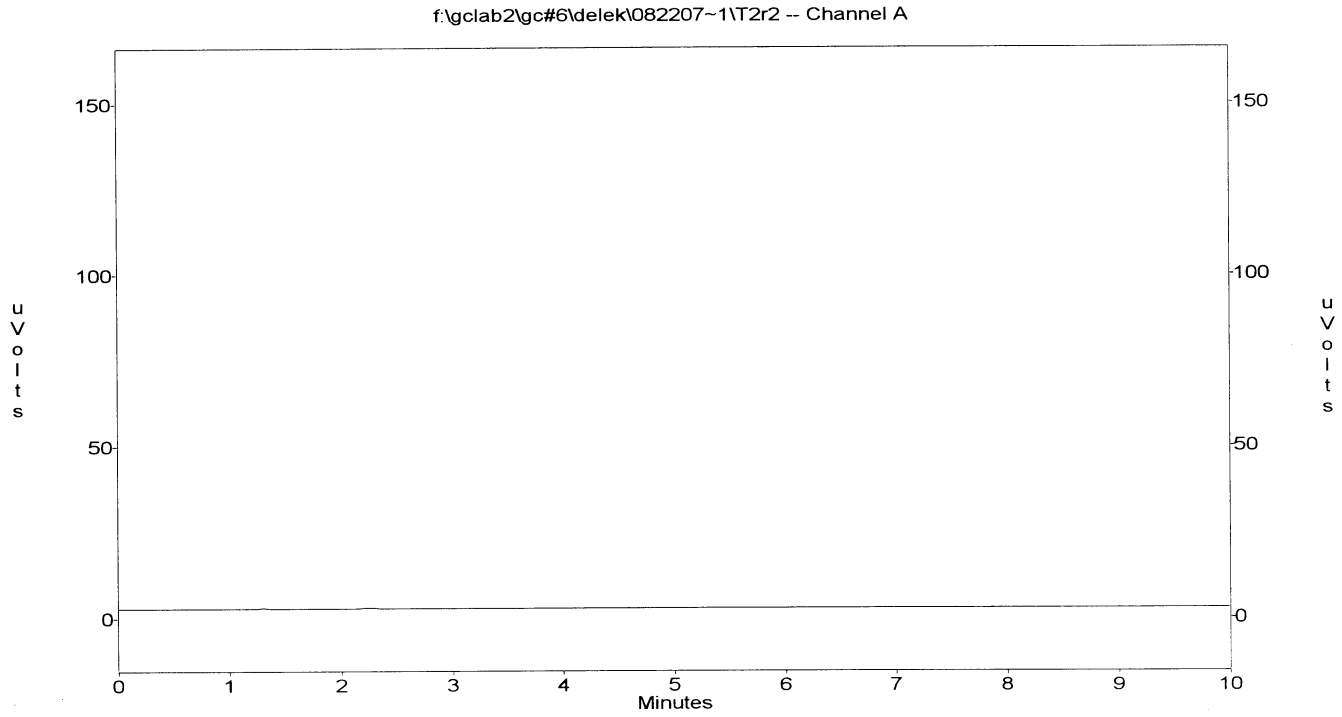
Totals :

0

B-211

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r2
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 16:13:02
Printed : Aug 22, 2007 16:25:07
User : System



Channel A Results

Peak	Retention Time	Area

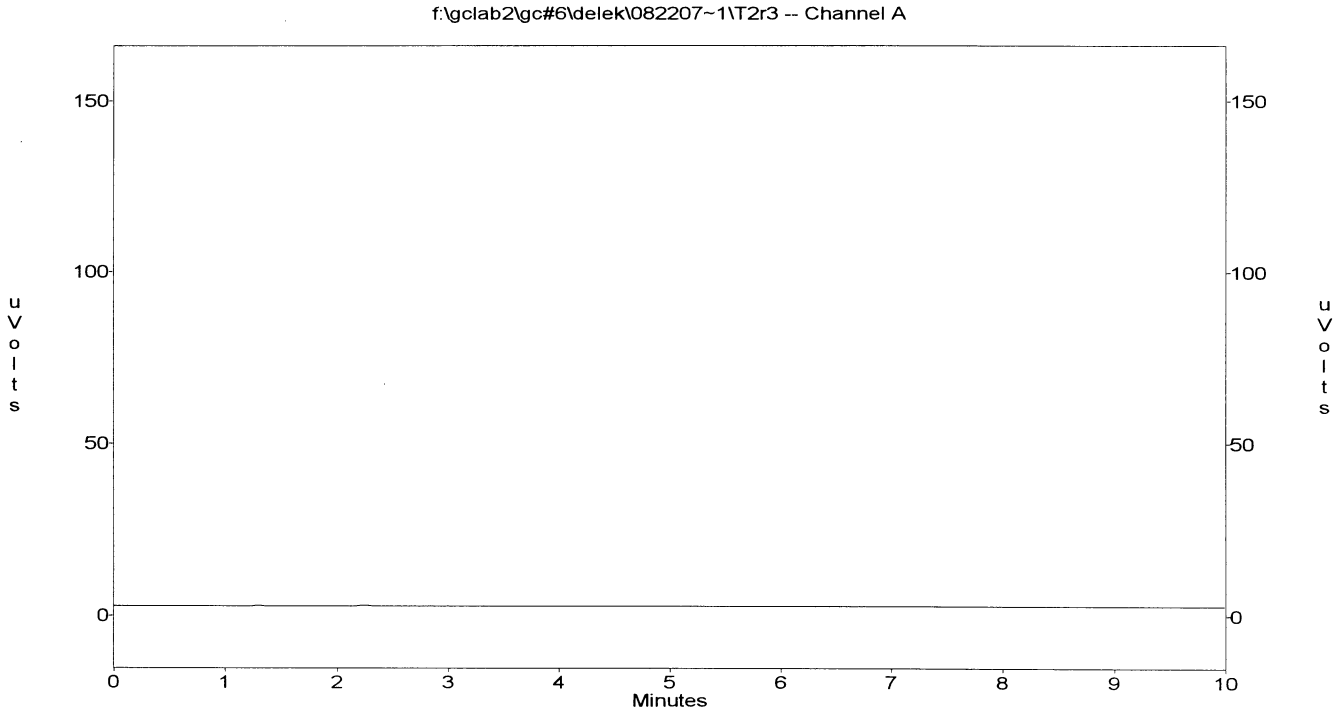
Totals :

0

B212

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r3
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 16:25:18
Printed : Aug 22, 2007 16:37:22
User : System



Channel A Results

Peak	Retention Time	Area

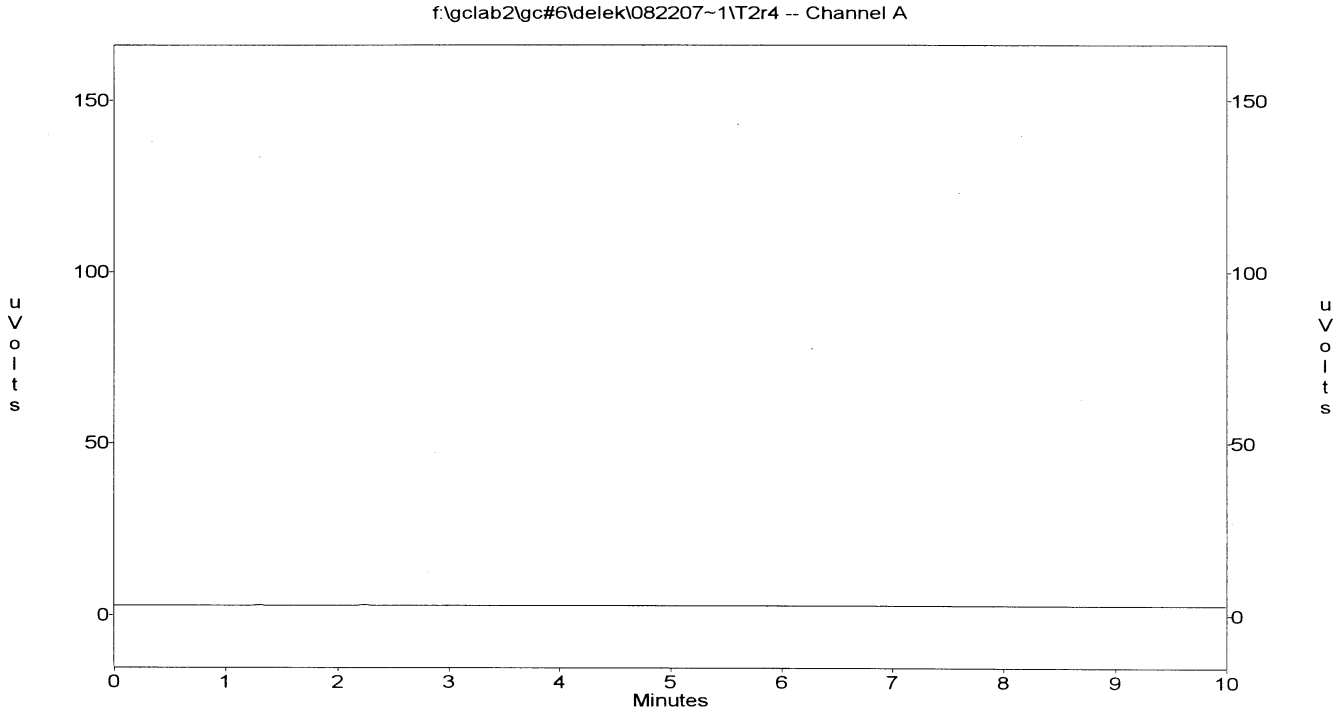
Totals :

0

B213

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r4
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 16:37:32
Printed : Aug 22, 2007 16:49:36
User : System



Channel A Results

Peak	Retention Time	Area

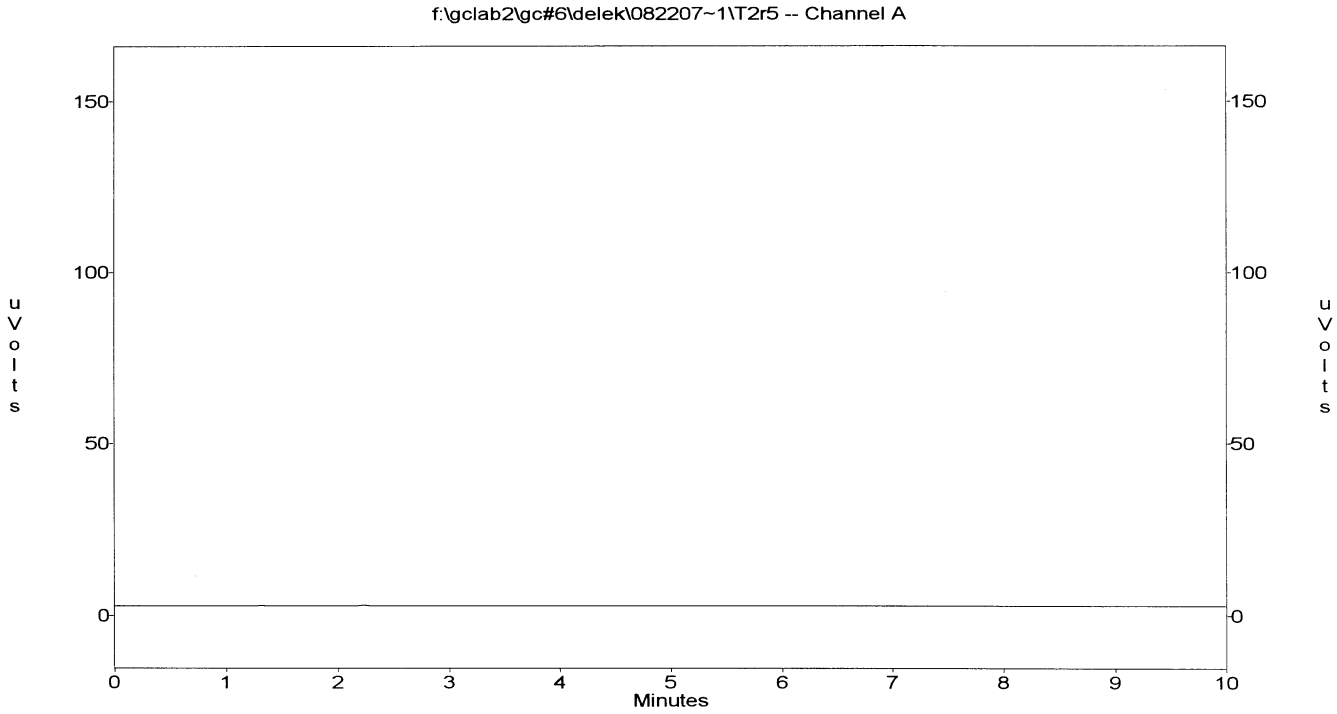
Totals :

0

B214

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r5
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 16:49:47
Printed : Aug 22, 2007 17:05:15
User : System



Channel A Results

Peak	Retention Time	Area

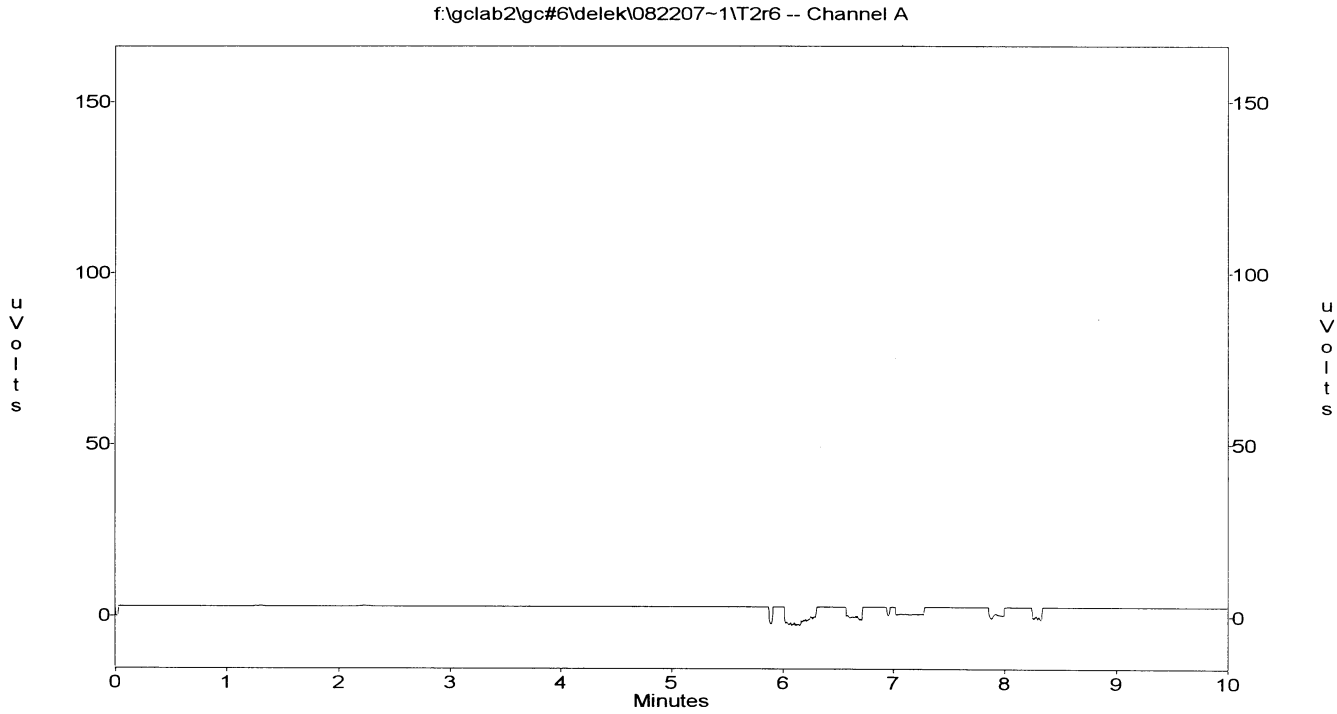
Totals :

0

D 215

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r6
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 17:05:27
Printed : Aug 22, 2007 17:17:03
User : System



Channel A Results

Peak	Retention Time	Area

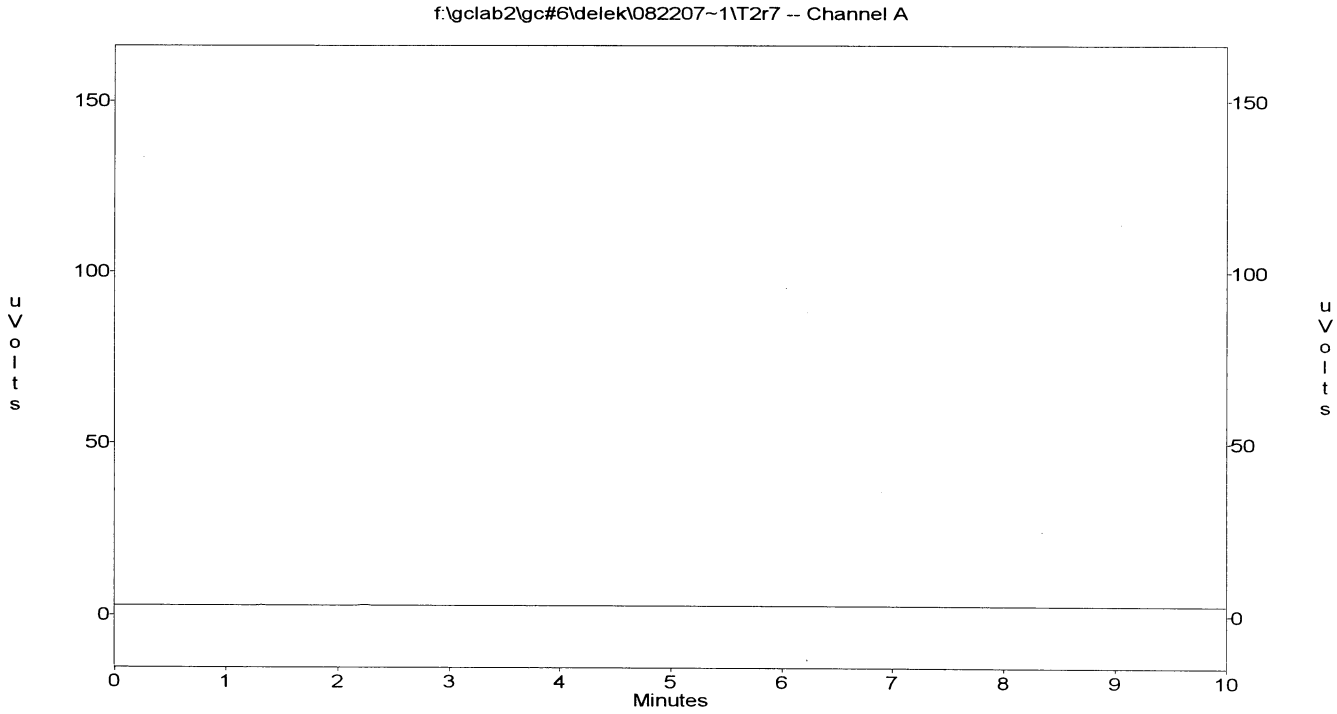
Totals :

0

$216

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r7
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 17:17:34
Printed : Aug 22, 2007 17:29:38
User : System



Channel A Results

Peak	Retention Time	Area

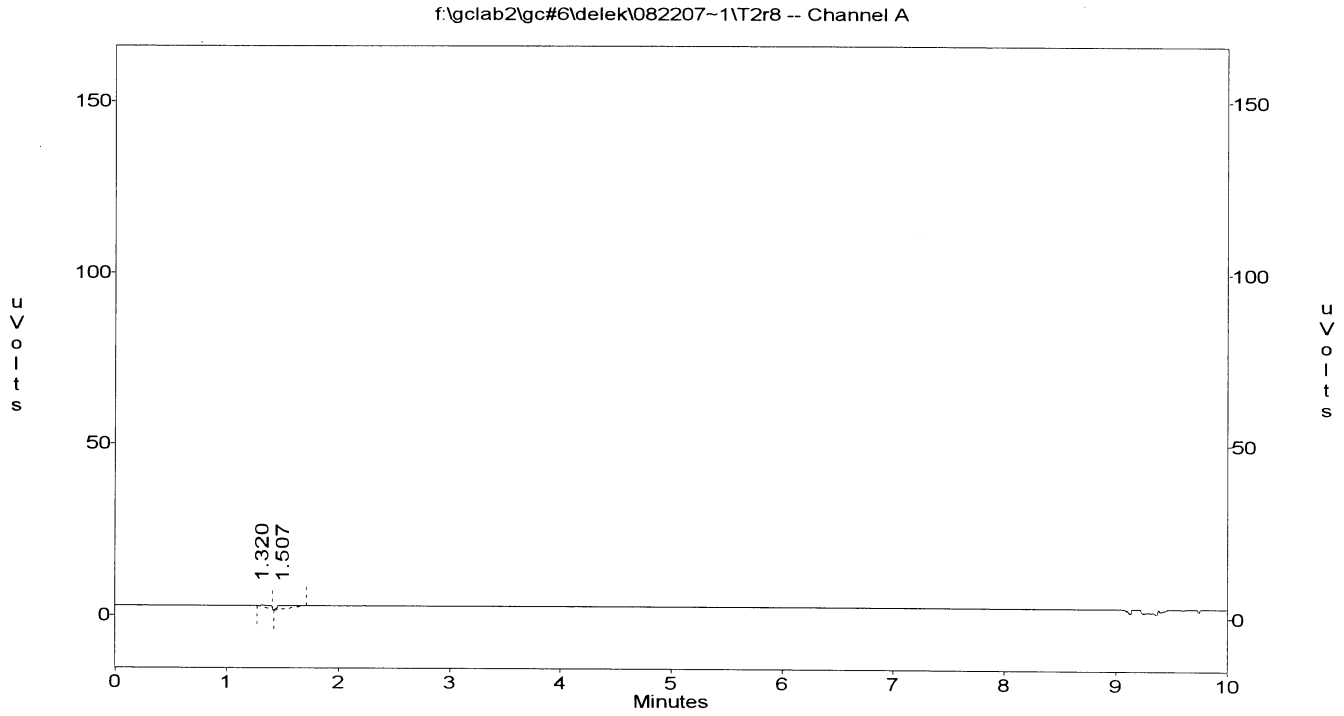
Totals :

0

B217

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r8
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 17:29:52
Printed : Aug 22, 2007 17:42:06
User : System



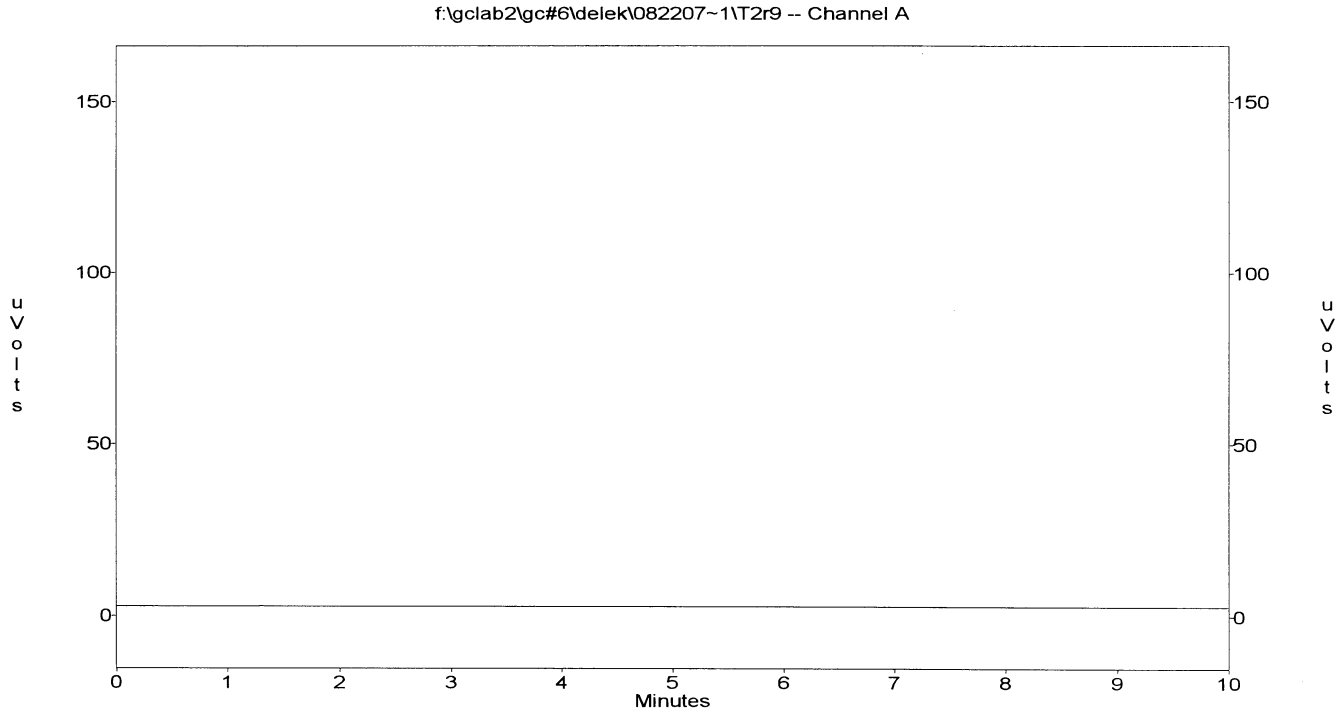
Channel A Results

Peak	Retention Time	Area
	1.32	5384
	1.51	10151
Totals :		15535

B-218

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r9
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 17:44:02
Printed : Aug 22, 2007 17:56:06
User : System



Channel A Results

Peak	Retention Time	Area

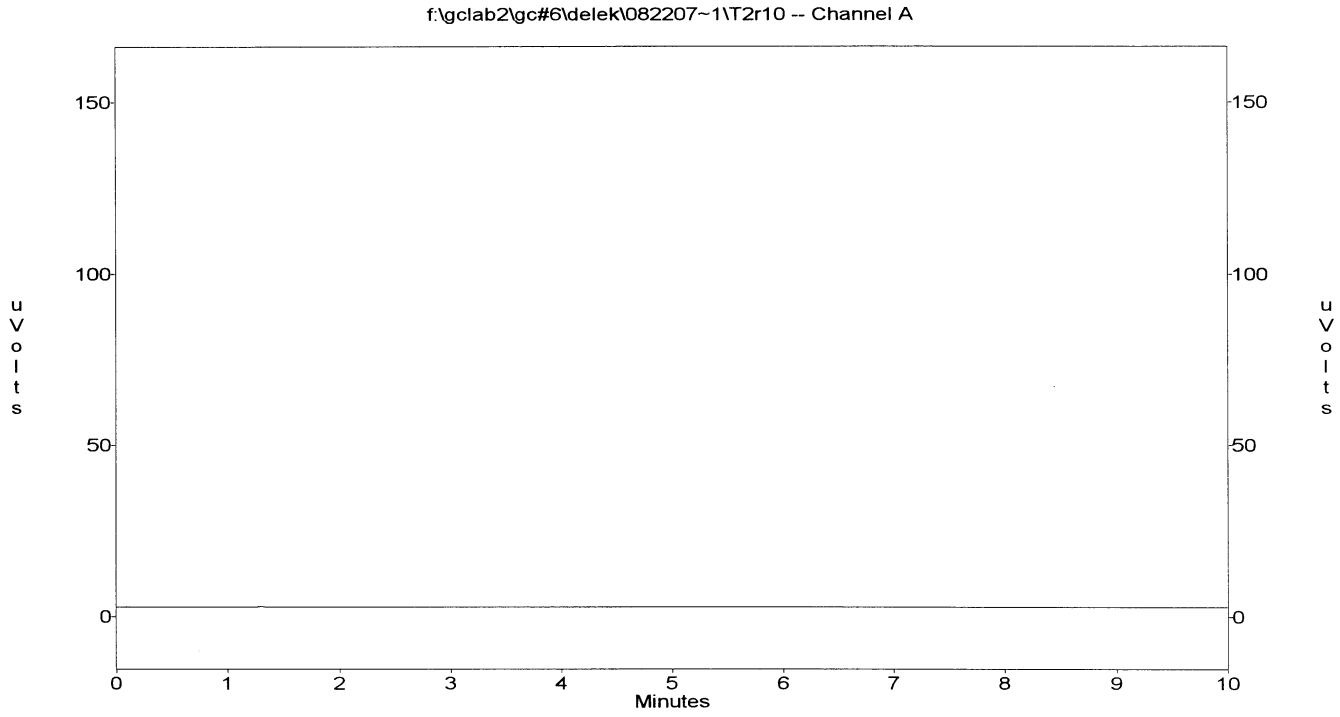
Totals :

0

L219

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r10
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 17:56:19
Printed : Aug 22, 2007 18:08:24
User : System



Channel A Results

Peak	Retention Time	Area

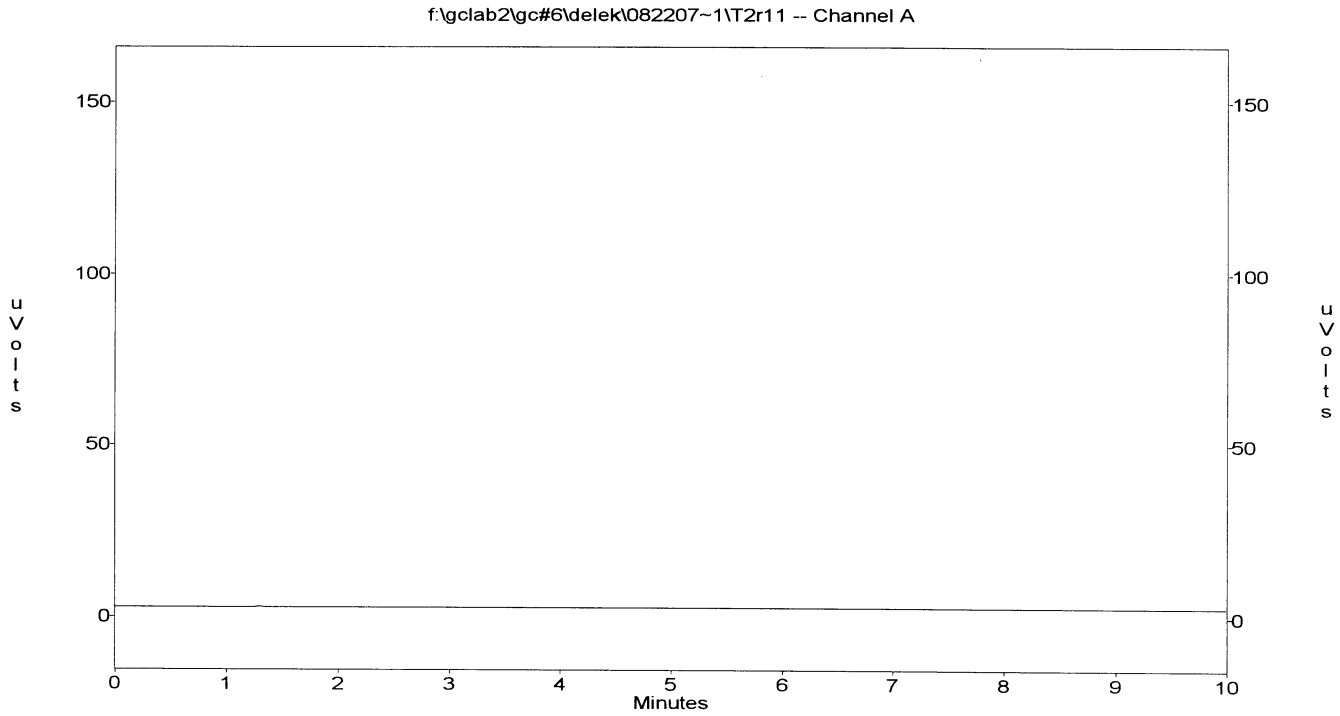
Totals :

0

B220

Entech Engineering Inc.
Webster, Texas

File	:	f:\gclab2\gc#6\delek\082207~1\T2r11
Method	:	f:\gclab2\gc#6\Fpd_12.met
Sample ID	:	TEST-2
Inj. Vial	:	000
Acquired	:	Aug 22, 2007 18:08:37
Printed	:	Aug 22, 2007 18:20:48
User	:	System



Channel A Results

Peak	Retention Time	Area

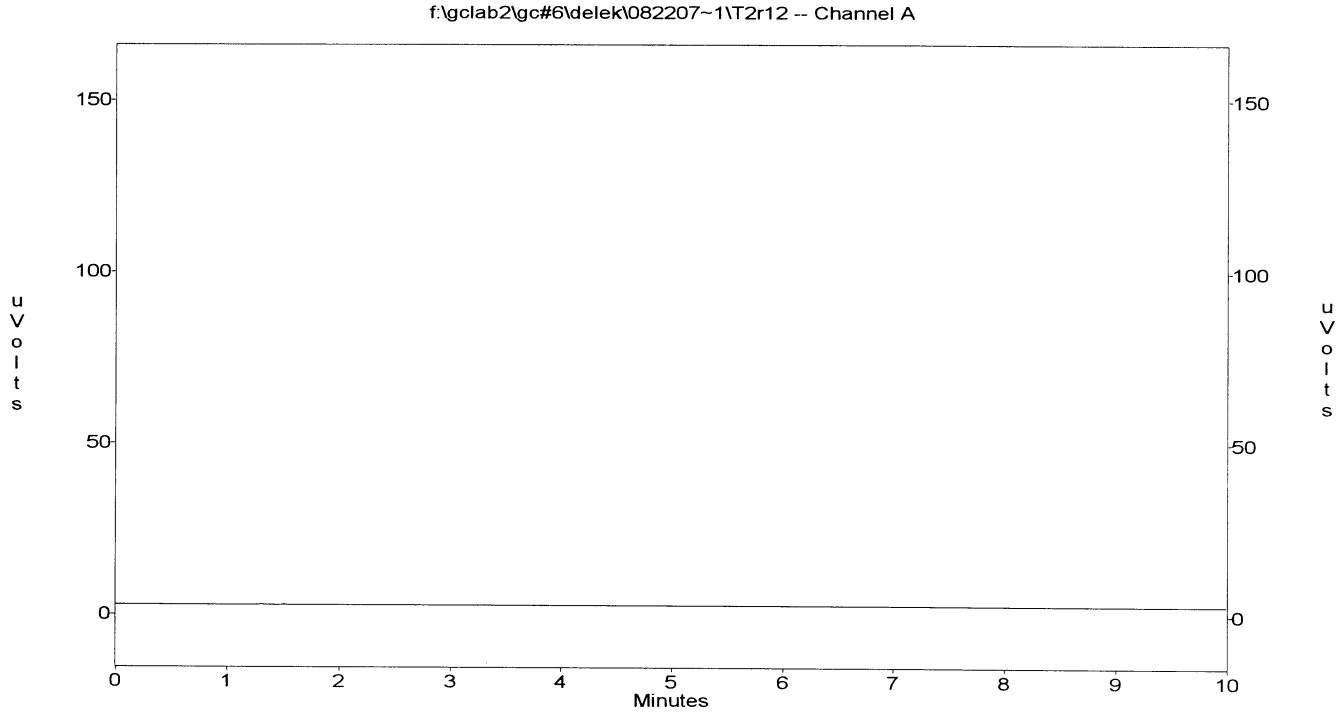
Totals :

0

B221

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r12
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 18:21:08
Printed : Aug 22, 2007 18:33:14
User : System



Channel A Results

Peak	Retention Time	Area

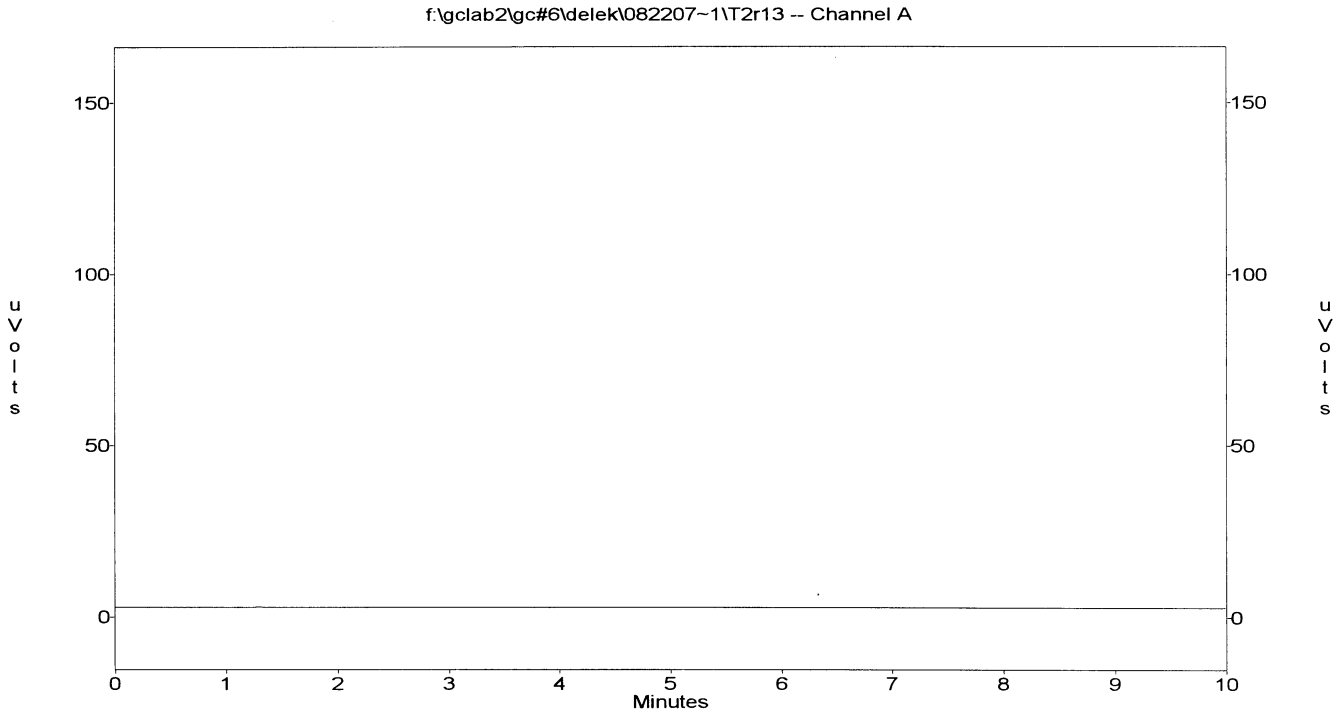
Totals :

0

B222

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r13
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 18:34:02
Printed : Aug 22, 2007 18:46:09
User : System



Channel A Results

Peak	Retention Time	Area

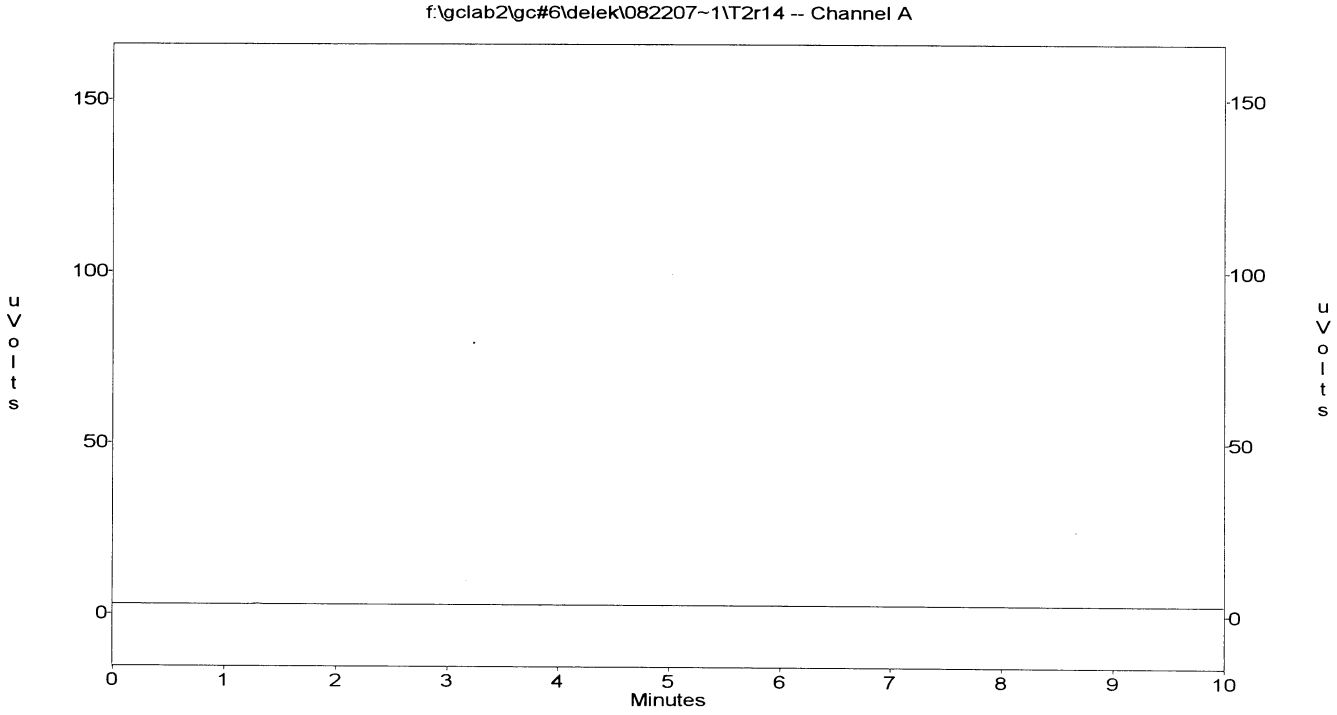
Totals :

0

B-223

Entech Engineering Inc.
Webster, Texas

File	:	f:\gclab2\gc#6\delek\082207~1\T2r14
Method	:	f:\gclab2\gc#6\Fpd_12.met
Sample ID	:	TEST-2
Inj. Vial	:	000
Acquired	:	Aug 22, 2007 18:46:19
Printed	:	Aug 22, 2007 18:58:23
User	:	System



Channel A Results

Peak	Retention Time	Area

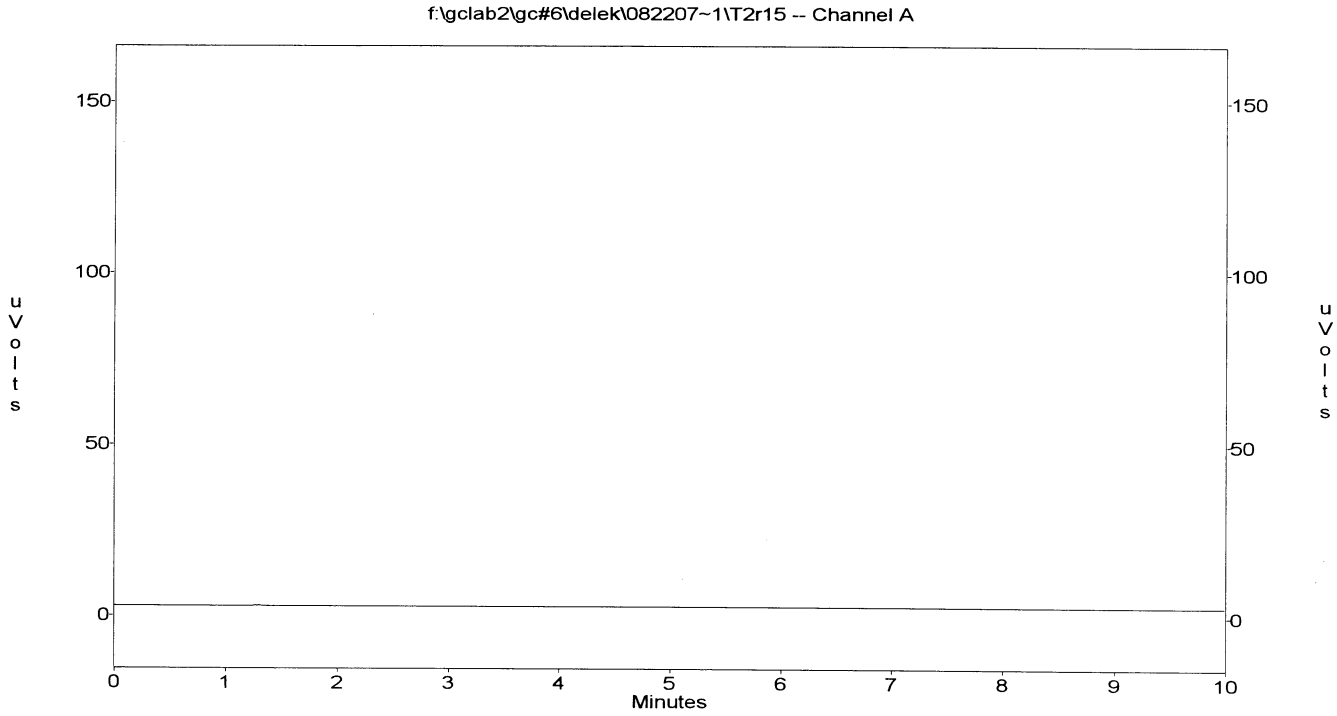
Totals :

0

B 224

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r15
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 18:58:32
Printed : Aug 22, 2007 19:10:21
User : System



Channel A Results

Peak	Retention Time	Area

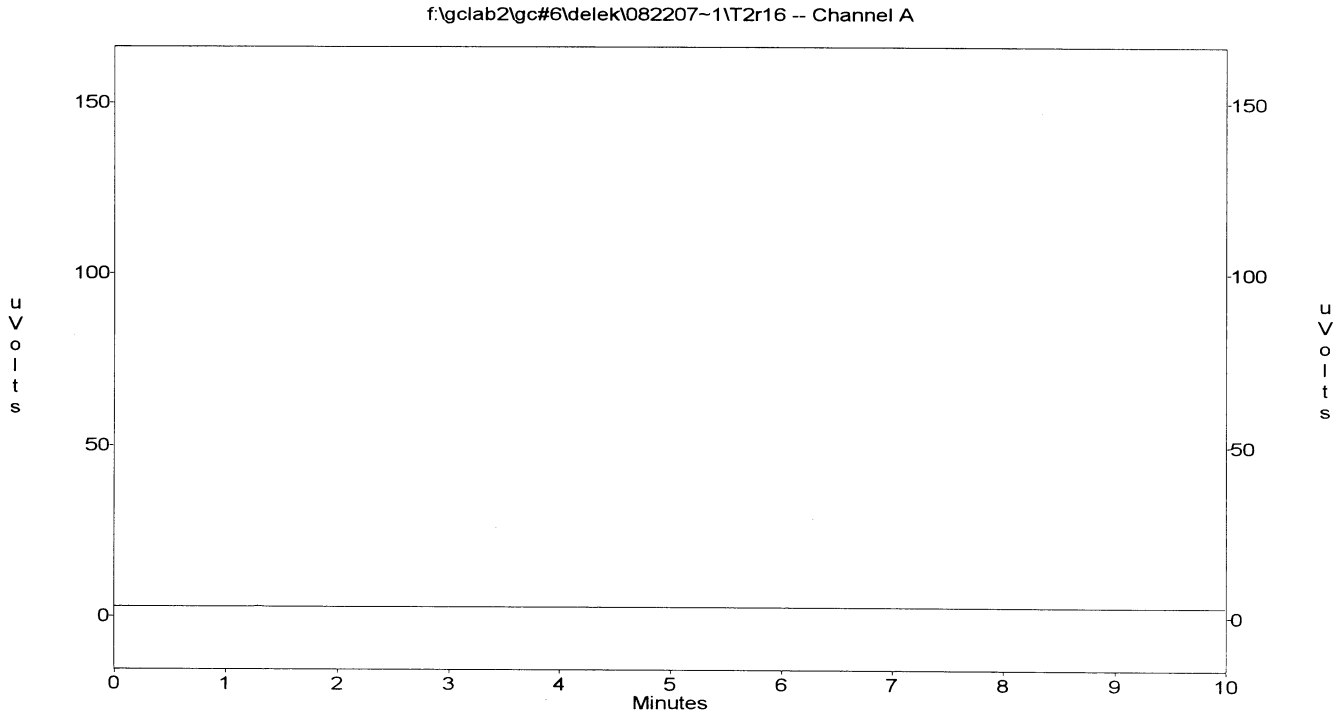
Totals :

0

B225

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T2r16
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-2
Inj. Vial : 000
Acquired : Aug 22, 2007 19:10:37
Printed : Aug 22, 2007 19:21:00
User : System



Channel A Results

Peak	Retention Time	Area

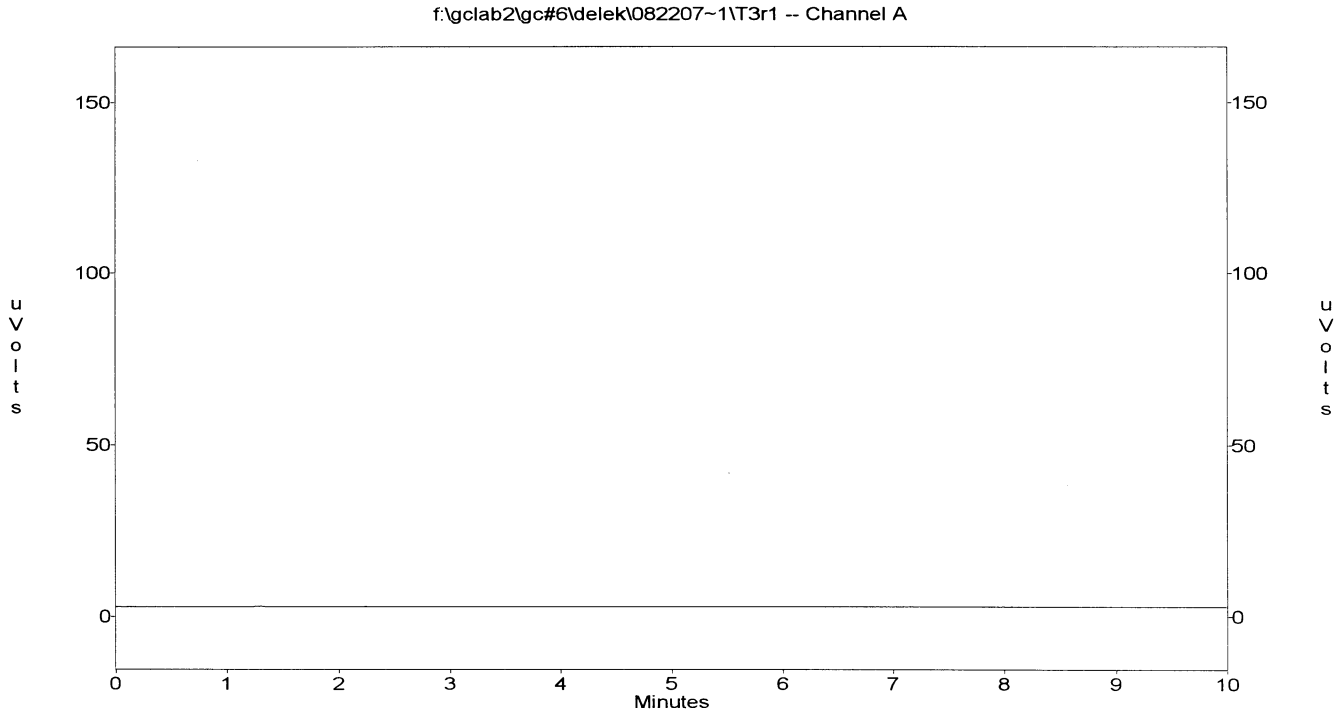
Totals :

0

226

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r1
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 19:23:06
Printed : Aug 22, 2007 19:35:13
User : System



Channel A Results

Peak	Retention Time	Area

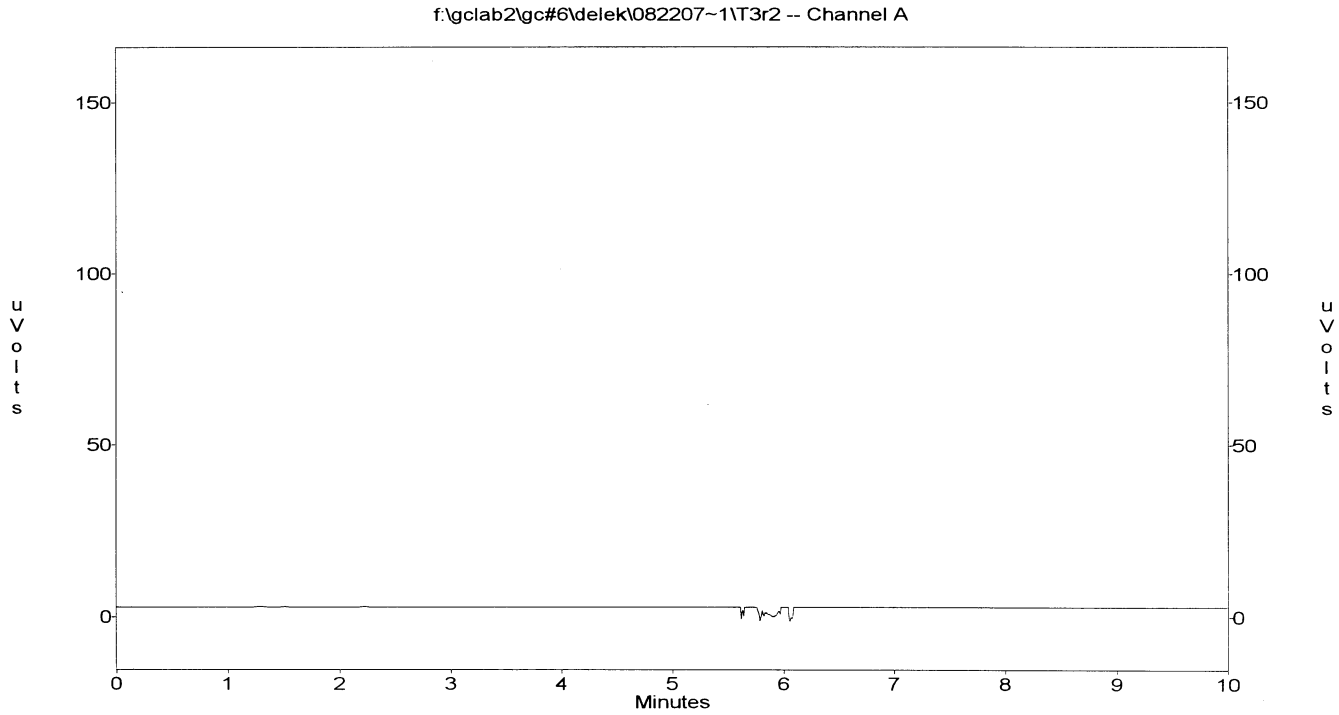
Totals :

0

B-227

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r2
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 19:35:28
Printed : Aug 22, 2007 19:50:19
User : System



Channel A Results

Peak	Retention Time	Area

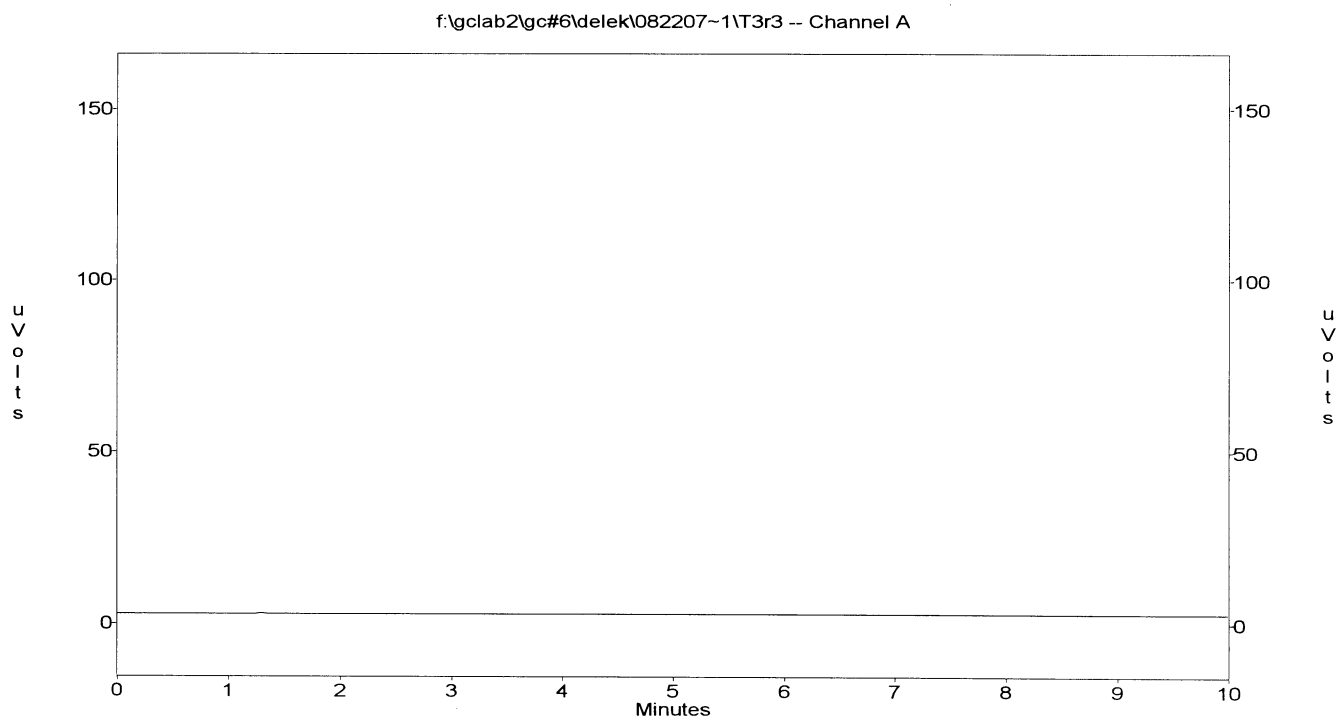
Totals :

0

B228

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r3
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 19:50:29
Printed : Aug 22, 2007 20:02:33
User : System



Channel A Results

Peak	Retention Time	Area

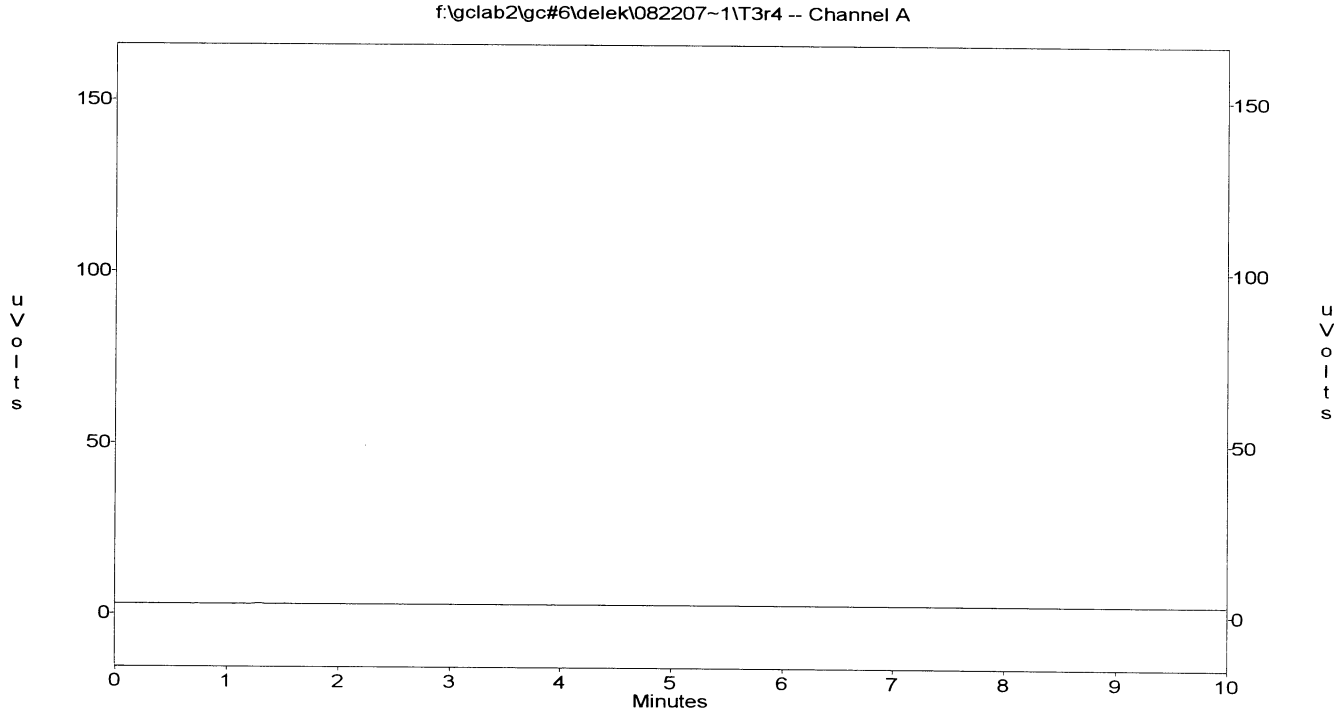
Totals :

0

B229

Entech Engineering Inc.
Webster, Texas

File	:	f:\gclab2\gc#6\delek\082207~1\T3r4
Method	:	f:\gclab2\gc#6\Fpd_12.met
Sample ID	:	TEST-3
Inj. Vial	:	000
Acquired	:	Aug 22, 2007 20:02:43
Printed	:	Aug 22, 2007 20:15:03
User	:	System



Channel A Results

Peak	Retention Time	Area

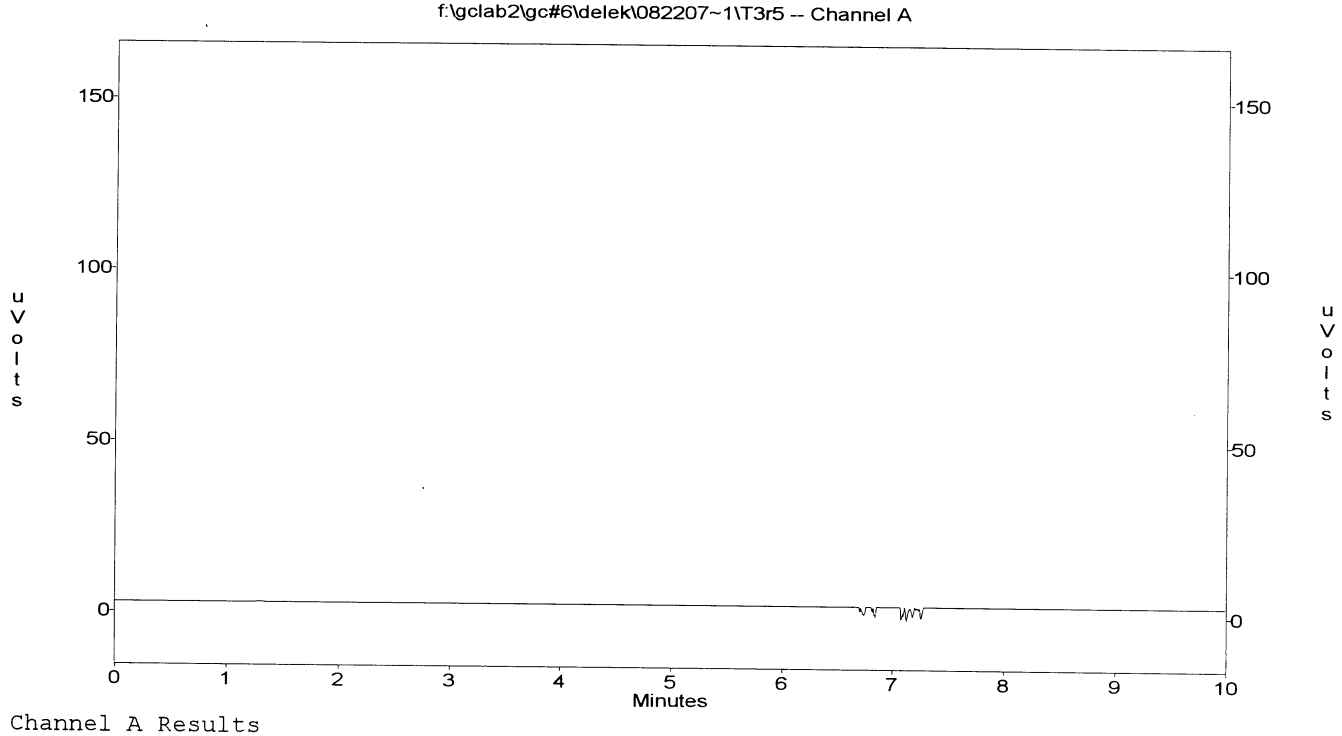
Totals :

0

B230

Entech Engineering Inc.
Webster, Texas

File	:	f:\gclab2\gc#6\delek\082207~1\T3r5
Method	:	f:\gclab2\gc#6\Fpd_12.met
Sample ID	:	TEST-3
Inj. Vial	:	000
Acquired	:	Aug 22, 2007 20:15:18
Printed	:	Aug 22, 2007 20:26:51
User	:	System



Channel A Results

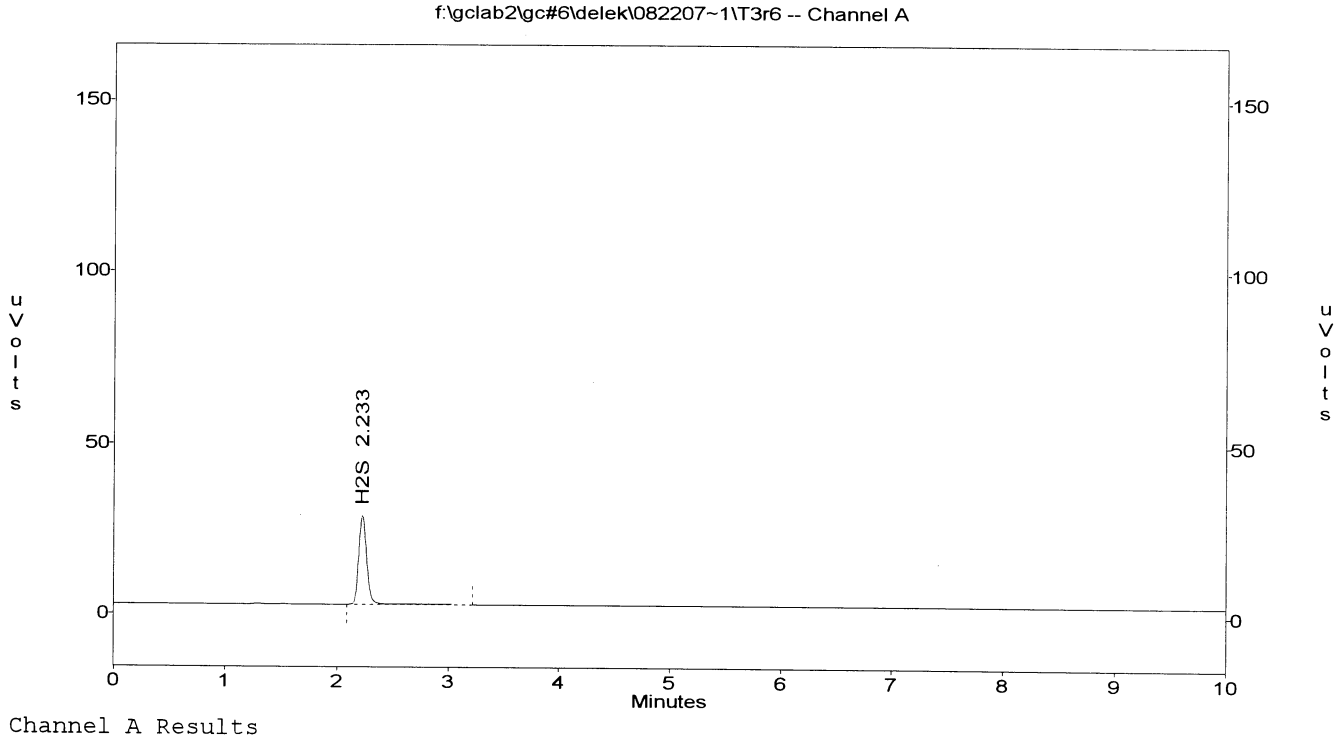
Peak	Retention Time	Area

Totals :

0

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r6
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 20:27:21
Printed : Aug 22, 2007 20:38:11
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.23	126519

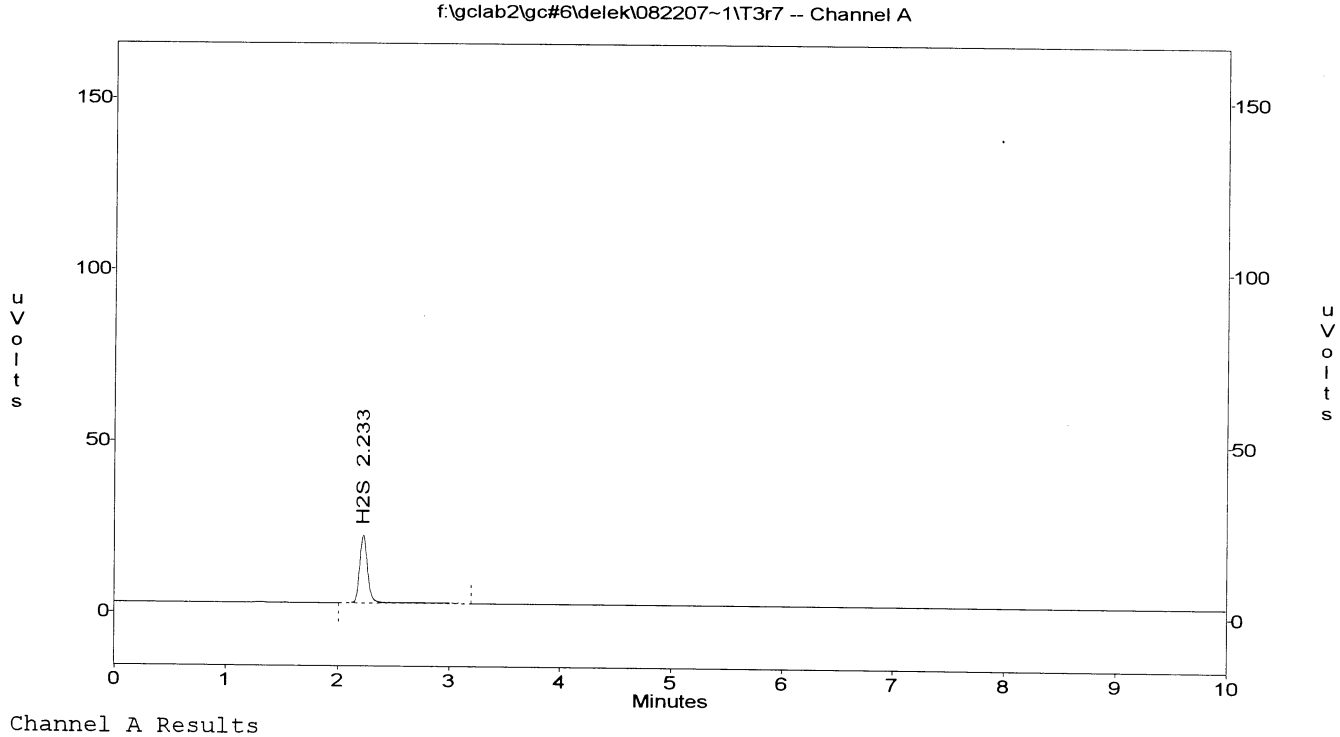
Totals :

126519

B232

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r7
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 20:38:42
Printed : Aug 22, 2007 20:48:46
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.23	96860

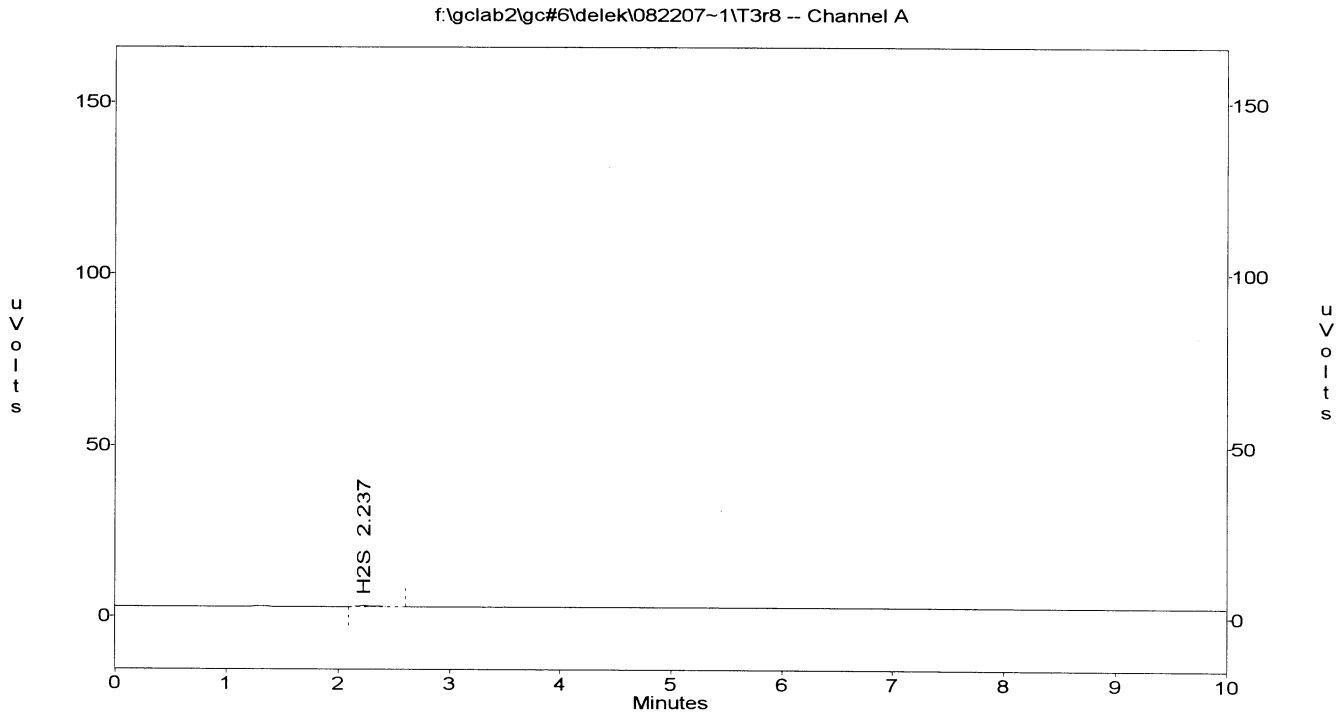
Totals :

96860

B-233

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r8
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 20:49:09
Printed : Aug 22, 2007 21:00:42
User : System



Channel A Results

Peak	Retention Time	Area
H2S	2.24	1719

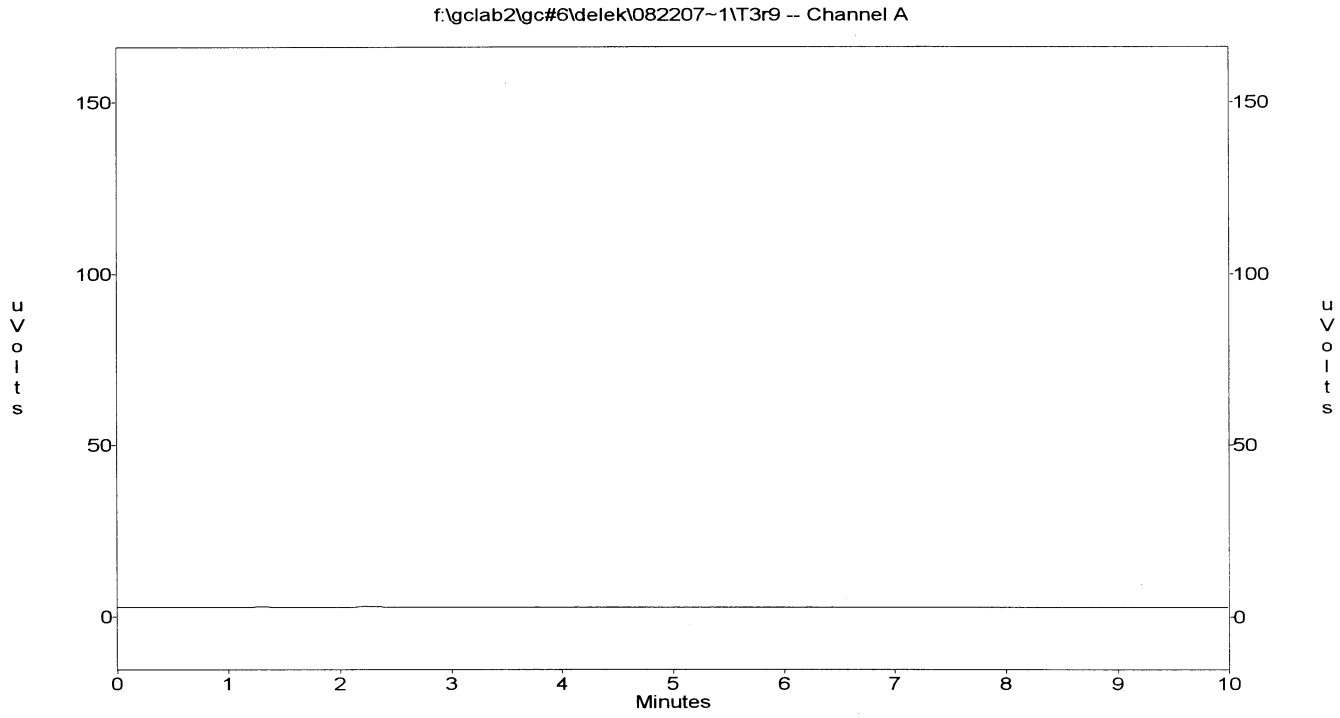
Totals :

1719

B234

Entech Engineering Inc.
Webster, Texas

File	:	f:\gclab2\gc#6\delek\082207~1\T3r9
Method	:	f:\gclab2\gc#6\Fpd_12.met
Sample ID	:	TEST-3
Inj. Vial	:	000
Acquired	:	Aug 22, 2007 21:00:57
Printed	:	Aug 22, 2007 21:11:37
User	:	System



Channel A Results

Peak	Retention Time	Area

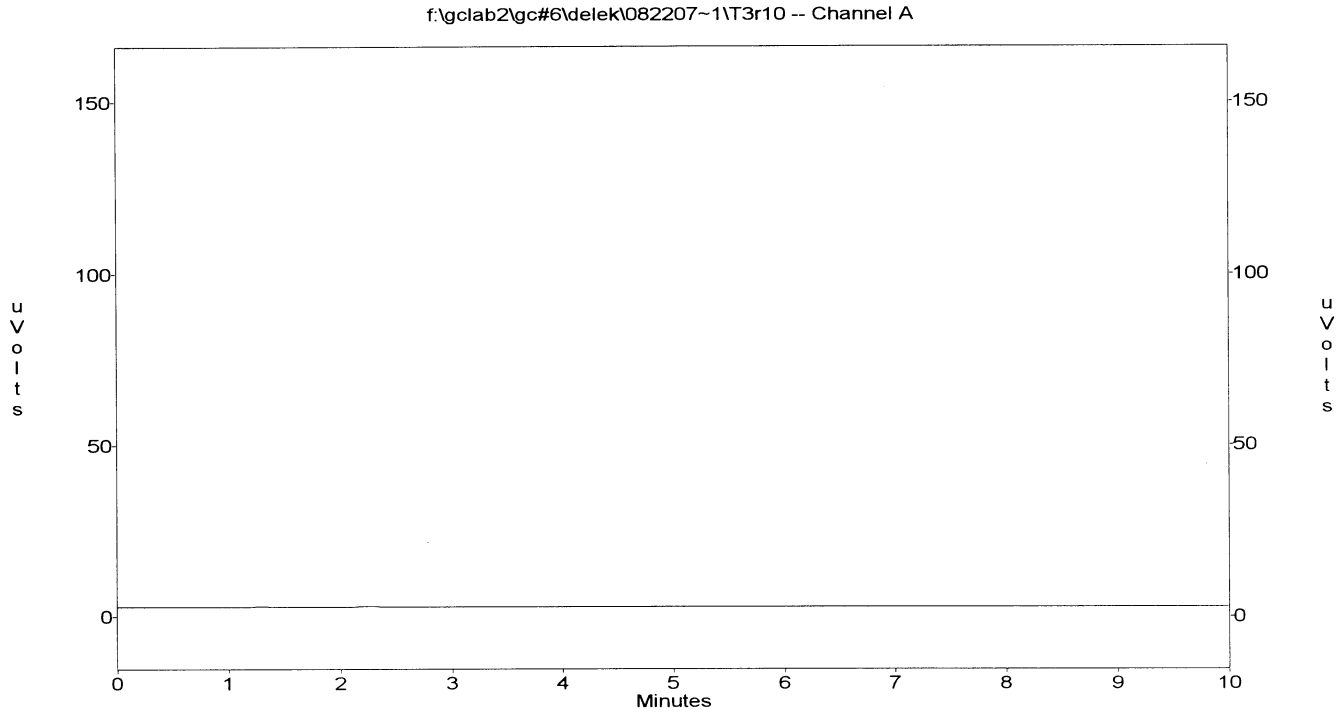
Totals :

0

235

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r10
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 21:12:59
Printed : Aug 22, 2007 21:24:58
User : System



Channel A Results

Peak	Retention Time	Area

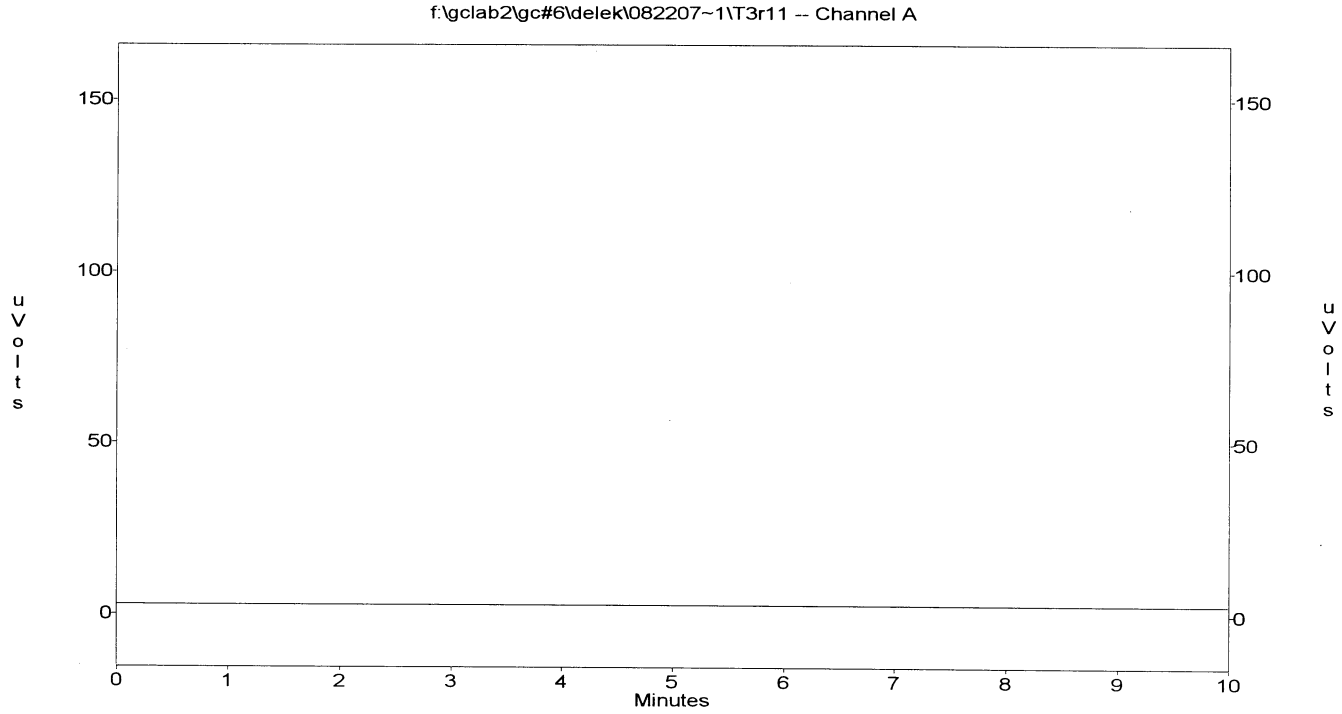
Totals :

0

B236

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r11
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 21:25:42
Printed : Aug 22, 2007 21:36:46
User : System



Channel A Results

Peak	Retention Time	Area

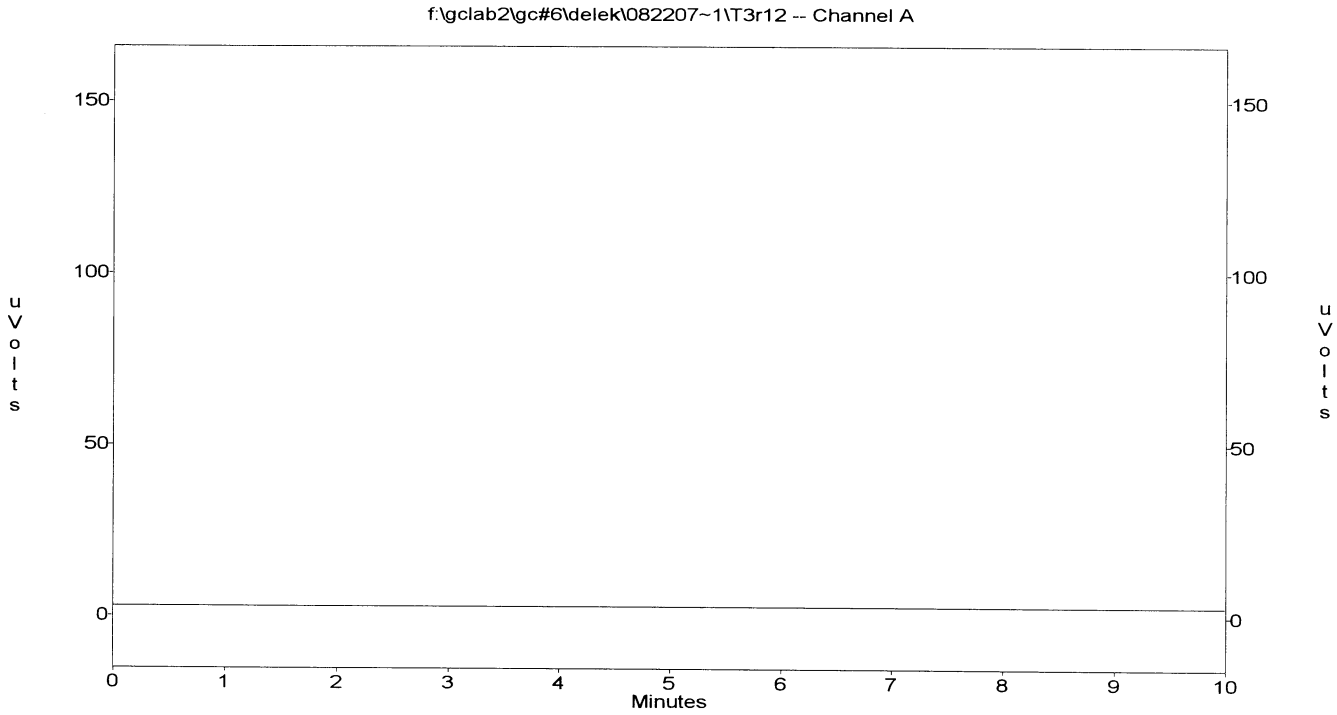
Totals :

0

B-237

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r12
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 21:37:54
Printed : Aug 22, 2007 21:48:47
User : System



Channel A Results

Peak	Retention Time	Area

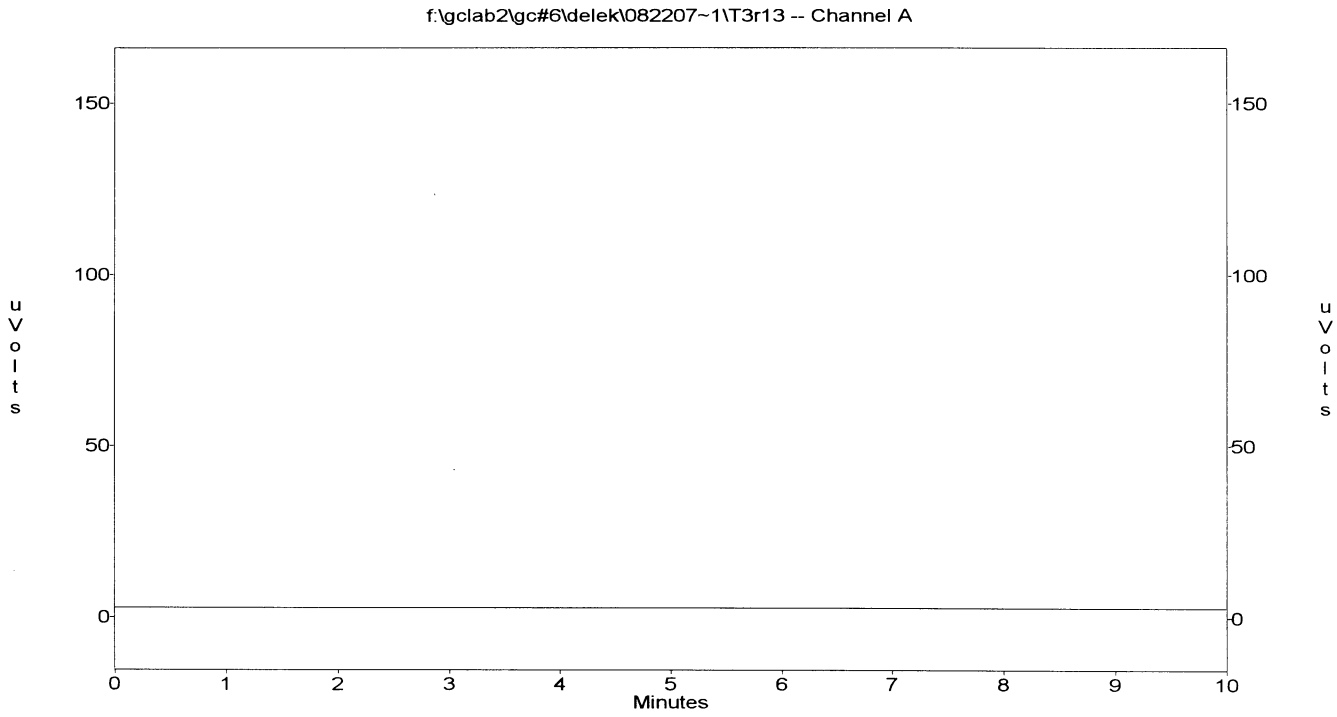
Totals :

0

238

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r13
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 21:51:12
Printed : Aug 22, 2007 22:04:49
User : System



Channel A Results

Peak	Retention Time	Area

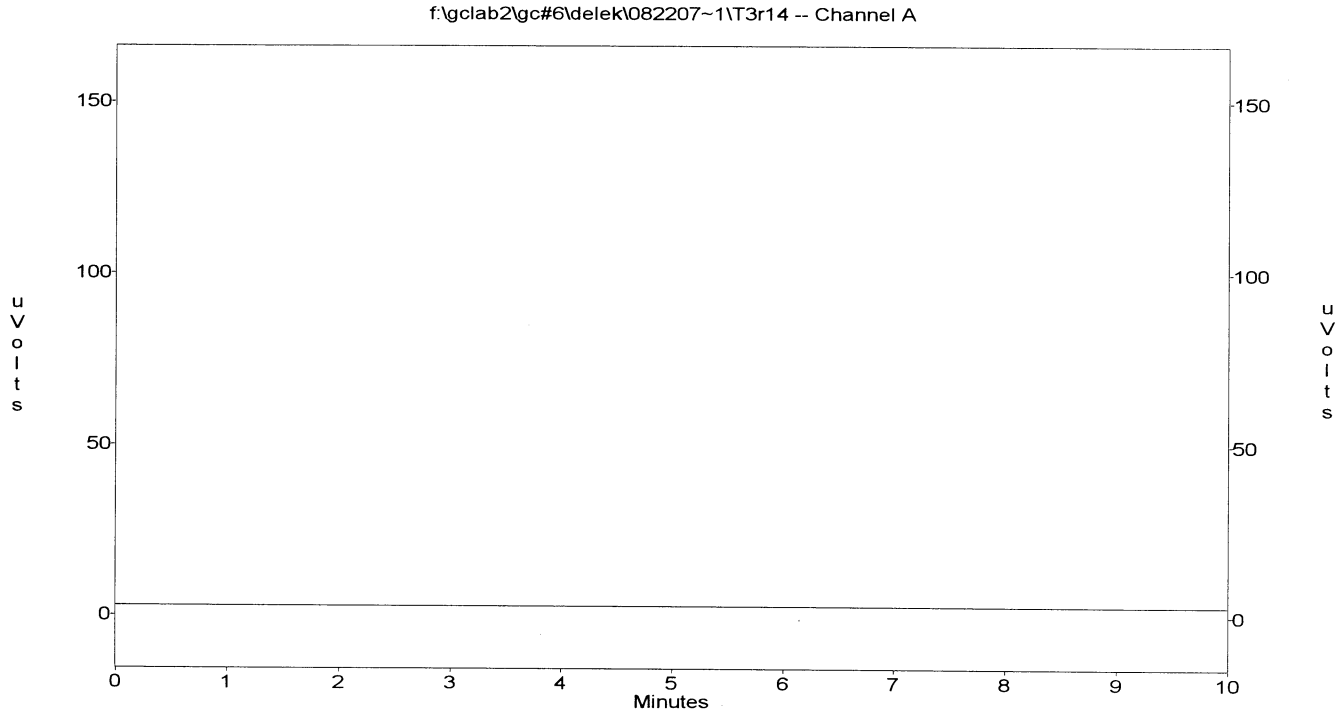
Totals :

0

6239

Entech Engineering Inc.
Webster, Texas

File	:	f:\gclab2\gc#6\delek\082207~1\T3r14
Method	:	f:\gclab2\gc#6\Fpd_12.met
Sample ID	:	TEST-3
Inj. Vial	:	000
Acquired	:	Aug 22, 2007 22:05:18
Printed	:	Aug 22, 2007 22:17:23
User	:	System



Channel A Results

Peak	Retention Time	Area

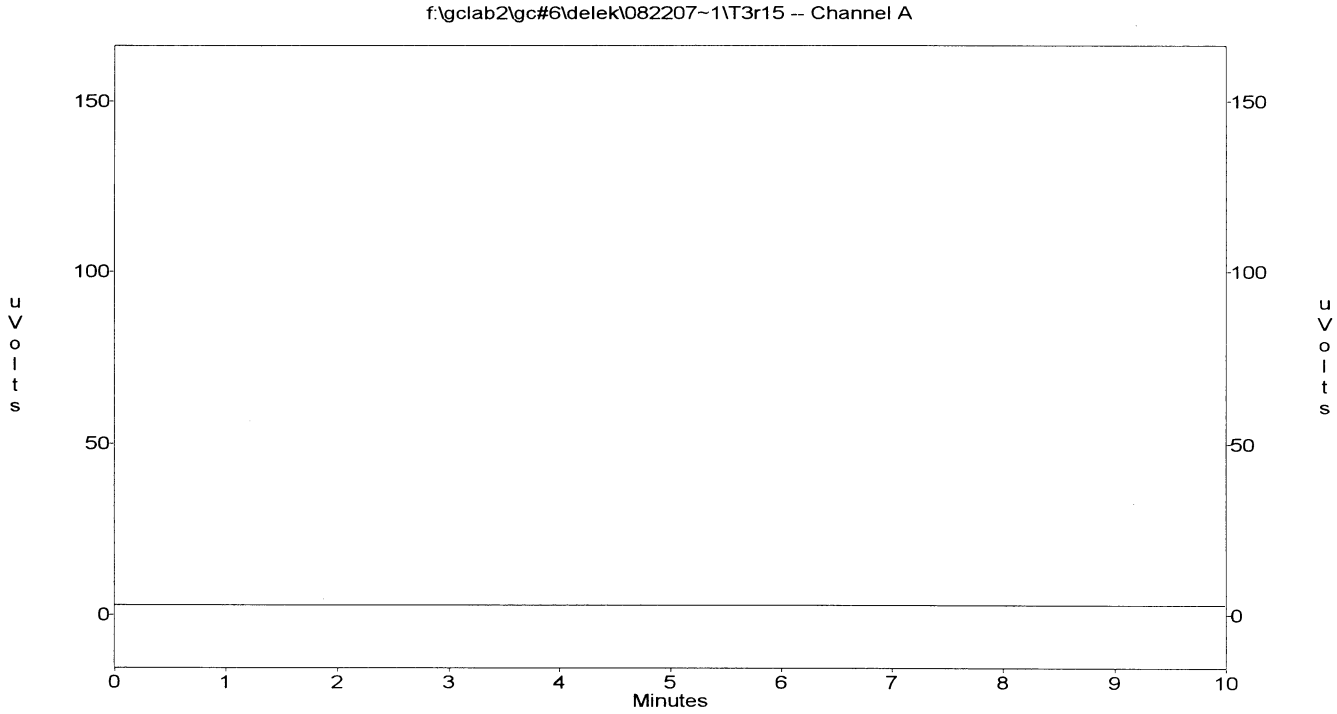
Totals :

0

$240

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r15
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 22:17:39
Printed : Aug 22, 2007 22:29:44
User : System



Channel A Results

Peak	Retention Time	Area

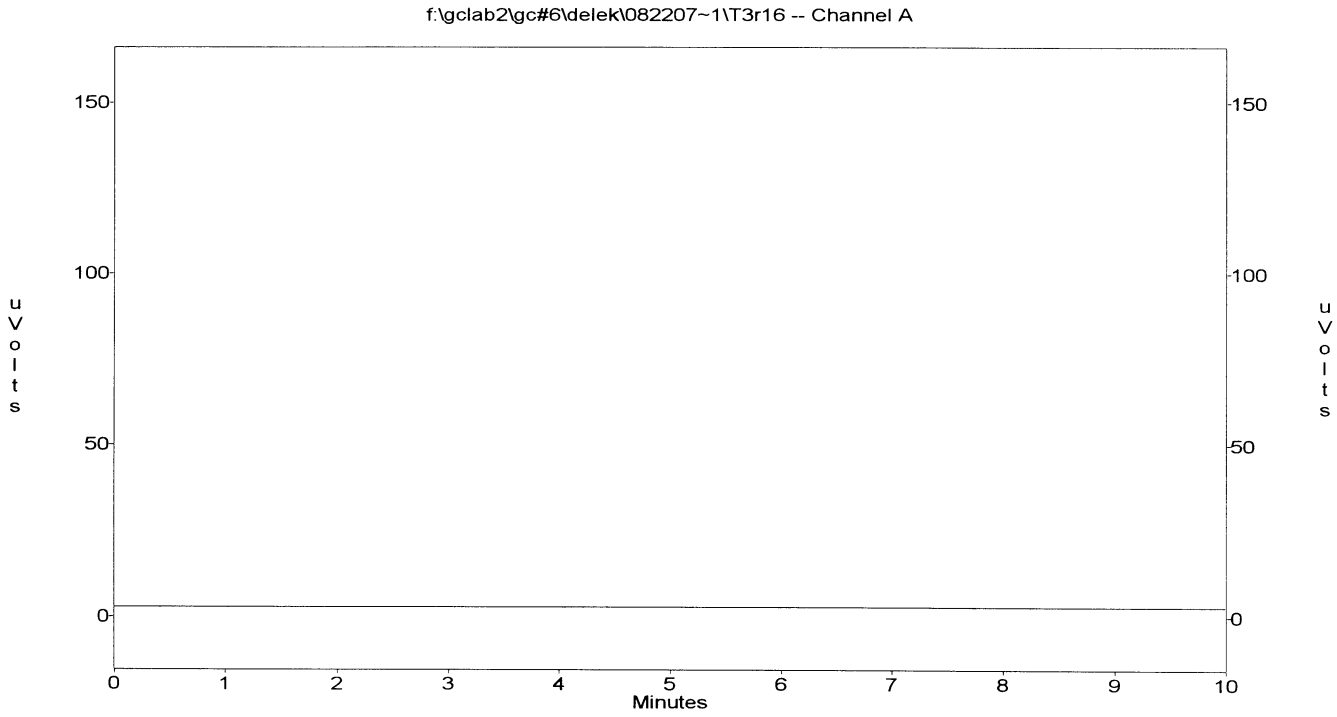
Totals :

0

B241

Entech Engineering Inc.
Webster, Texas

File : f:\gclab2\gc#6\delek\082207~1\T3r16
Method : f:\gclab2\gc#6\Fpd_12.met
Sample ID : TEST-3
Inj. Vial : 000
Acquired : Aug 22, 2007 22:29:55
Printed : Aug 22, 2007 22:40:38
User : System



Channel A Results

Peak	Retention Time	Area

Totals :

0

B 242

APPENDIX C.

EXAMPLE CALCULATIONS AND QA/QC DATA

ENTECH ENGINEERING INC.

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EPA METHOD 2 & 4
FLOW AND MOISTURE DETERMINATION

Company	Delek Refining, Ltd.
Location	Tyler, TX
Test Date	08/22/07
Test Number	1
Unit Tested	SRU -2 (SRUTGUINC)
Source	Outlet
Test Conditions	
Unit Load	Full
Sampling Elevation (feet)	35
Barometric Pressure, Uncorrected (inches Hg)	29.00
Barometric Pressure, Corrected (inches Hg)	28.96
Stack Internal Diameter (inches)	48
Stack Area at Sampling Plane (ft^2)	12.56637
Sampling Results	
Pitot Tube Coefficient (C_p)	0.84
Control Box Delta H Standard (ΔH)	1.85
Dry Gas Meter Correction Factor (DGMCF)	1.012
Average Delta H (inches H_2O)	0.600
Average Square Root Delta P (inches $H_2O^{1/2}$)	0.1227
Average Meter Temperature (°F)	104.1
Sampling Time (minutes)	64
Meter Volume, Uncorrected (ft^3)	26.990
Meter Volume, Corrected (ft^3)	24.753
Meter Volume at Standard Conditions (DSCF)	24.791
Moisture Measured by Weight (g)	85.1
Vent Gas Parameters	
Excess Oxygen (vol%, dry)	1.84
Carbon Dioxide (vol%, dry)	10.00
Temperature (°F)	1214.6
Molecular Weight, (g/gmol, dry)	29.67
Molecular Weight, (g/gmol, wet)	28.05
Moisture Content (vol%)	13.93
Static Head (inches H_2O)	-0.20
Stack Pressure (inches Hg)	28.95
Average Velocity (ft/sec)	12.65
Volumetric Flow Rate (DSCFM)	2504.76

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EPA METHOD 2 & 4
FLOW AND MOISTURE DETERMINATION

Company	Delek Refining, Ltd.
Location	Tyler, TX
Test Date	08/22/07
Test Number	2
Unit Tested	SRU -2 (SRUTGUINC)
Source	Outlet
Test Conditions	
Unit Load	Full
Sampling Elevation (feet)	35
Barometric Pressure, Uncorrected (inches Hg)	29.00
Barometric Pressure, Corrected (inches Hg)	28.96
Stack Internal Diameter (inches)	48
Stack Area at Sampling Plane (ft^2)	12.56637
Sampling Results	
Pitot Tube Coefficient (C_p)	0.84
Control Box Delta H Standard (ΔH)	1.85
Dry Gas Meter Correction Factor (DGMCF)	1.012
Average Delta H (inches H_2O)	0.600
Average Square Root Delta P (inches $H_2O^{1/2}$)	0.1199
Average Meter Temperature (°F)	108.6
Sampling Time (minutes)	64
Meter Volume, Uncorrected (ft^3)	27.121
Meter Volume, Corrected (ft^3)	24.679
Meter Volume at Standard Conditions (DSCF)	24.716
Moisture Measured by Weight (g)	84.4
Vent Gas Parameters	
Excess Oxygen (vol%, dry)	1.88
Carbon Dioxide (vol%, dry)	11.00
Temperature (°F)	1210.4
Molecular Weight, (g/gmol, dry)	29.84
Molecular Weight, (g/gmol, wet)	28.19
Moisture Content (vol%)	13.87
Static Head (inches H_2O)	-0.20
Stack Pressure (inches Hg)	28.95
Average Velocity (ft/sec)	12.32
Volumetric Flow Rate (DSCFM)	2447.62

C2

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EPA METHOD 2 & 4
FLOW AND MOISTURE DETERMINATION

Company	Delek Refining, Ltd.
Location	Tyler, TX
Test Date	08/22/07
Test Number	3
Unit Tested	Outlet
Source	SRU -2 (SRUTGUINC)
Test Conditions	
Unit Load	Full
Sampling Elevation (feet)	35
Barometric Pressure, Uncorrected (inches Hg)	29.00
Barometric Pressure, Corrected (inches Hg)	28.96
Stack Internal Diameter (inches)	48
Stack Area at Sampling Plane (ft^2)	12.56637
Sampling Results	
Pitot Tube Coefficient (C_p)	0.84
Control Box Delta H Standard (ΔH)	1.85
Dry Gas Meter Correction Factor (DGMCF)	1.012
Average Delta H (inches H_2O)	0.600
Average Square Root Delta P (inches $H_2O^{1/2}$)	0.1217
Average Meter Temperature (°F)	102.1
Sampling Time (minutes)	64
Meter Volume, Uncorrected (ft^3)	28.014
Meter Volume, Corrected (ft^3)	25.783
Meter Volume at Standard Conditions (DSCF)	25.823
Moisture Measured by Weight (g)	82.7
Vent Gas Parameters	
Excess Oxygen (vol%, dry)	2.15
Carbon Dioxide (vol%, dry)	10.90
Temperature (°F)	1218.6
Molecular Weight, (g/gmol, dry)	29.83
Molecular Weight, (g/gmol, wet)	28.28
Moisture Content (vol%)	13.12
Static Head (inches H_2O)	-0.20
Stack Pressure (inches Hg)	28.95
Average Velocity (ft/sec)	12.52
Volumetric Flow Rate (DSCFM)	2496.14

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CALIBRATION ERROR AND SYSTEM BIAS CORRECTIONS

O2 - METHOD 3A

(%)

Client: Delek Refining, Ltd.
Unit: SRU 2
Location: Tyler,TX
Date: 08/22/07
Test: 1-3
Span: 0 - 10 %

	Cylinder Value (%)	Analyzer Calibration Response (%)	Absolute Difference (%)	Difference (% of span)
Zero gas	0.00	0.01	0.01	0.08
Mid-range gas	5.00	5.03	0.03	0.27
High-range gas	10.00	10.04	0.04	0.41

	Zero gas					Upscale gas				
	Initial Values		Final Values			Initial Values		Final Values		
Run No.	System Calibration Response	System Cal. Bias (% of span)	System Calibration Response	System Cal. Bias (% of span)	Drift (% of span)	System Calibration Response	System Cal. Bias (% of span)	System Calibration Response	System Cal. Bias (% of span)	Drift (% of span)
1	0.03	0.25	0.03	0.18	-0.07	4.97	-0.57	4.97	-0.54	0.03
2	0.03	0.18	0.01	0.04	-0.14	4.97	-0.54	4.95	-0.75	-0.21
3	0.01	0.04	0.00	-0.07	-0.11	4.95	-0.75	4.94	-0.85	-0.10

Run No.	C (%)	Co	Cm	Cma	Cgas (%)
1	1.85	0.03	4.97	5.00	1.84
2	1.88	0.02	4.96	5.00	1.88
3	2.14	0.01	4.95	5.00	2.15

Cgas = (C - Co) * Cma/(Cm - Co)

Where: Cgas = Effluent gas concentration, dry basis, %
C = Average gas concentration indicated by gas analyzer, dry basis, %
Co = Average of initial and final system calibration bias check responses for the zero gas, %
Cm = Average of initial and final system calibration responses for the upscale calibration gas, %
Cma = Actual concentration of the upscale calibration gas, %

C4

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CALIBRATION ERROR AND SYSTEM BIAS CORRECTIONS

CO - METHOD 3A

(%)

Client: Delek Refining, Ltd.
Unit: SRU 2
Location: Tyler,TX
Date: 08/22/07
Test: 1-3
Span: 0 - 295 ppm

	Cylinder Value (%)	Analyzer Calibration Response (%)	Absolute Difference (%)	Difference (% of span)
Zero gas	0.00	0.16	0.16	0.05
Mid-range gas	120.00	119.75	0.25	0.08
High-range gas	295.00	296.42	1.42	0.48

	Zero gas					Upscale gas				
	Initial Values		Final Values			Initial Values		Final Values		
Run No.	System Calibration Response	System Cal. Bias (% of span)	System Calibration Response	System Cal. Bias (% of span)	Drift (% of span)	System Calibration Response	System Cal. Bias (% of span)	System Calibration Response	System Cal. Bias (% of span)	Drift (% of span)
1	-2.83	-1.01	-2.18	-0.79	0.22	116.09	-1.24	117.16	-0.88	0.36
2	-2.18	-0.79	-1.77	-0.65	0.14	117.16	-0.88	116.15	-1.22	-0.34
3	-1.77	-0.65	-1.87	-0.69	-0.03	116.15	-1.22	114.00	-1.95	-0.73

Run No.	C (%)	Co	Cm	Cma	Cgas (%)
1	42.65	-2.51	116.63	120.00	45.48
2	41.83	-1.98	116.66	120.00	44.31
3	37.10	-1.82	115.08	120.00	39.95

Cgas = (C - Co) * Cma/(Cm - Co)

Where: Cgas = Effluent gas concentration, dry basis, %
C = Average gas concentration indicated by gas analyzer, dry basis, %
Co = Average of initial and final system calibration bias check responses for the zero gas, %
Cm = Average of initial and final system calibration responses for the upscale calibration gas, %
Cma = Actual concentration of the upscale calibration gas, %

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CALIBRATION ERROR AND SYSTEM BIAS CORRECTIONS
SO2 - METHOD 6C
(ppmv)

Client: Delek Refining, Ltd.
Unit: SRU 2
Location: Tyler,TX
Date: 08/22/07
Test: 1-3
Span: 0 - 227 ppmv

	Cylinder Value (ppmv)	Analyzer Calibration Response (ppmv)	Absolute Difference (ppmv)	Difference (% of span)
Zero gas	0.0	-0.2	0.2	0.07
Mid-range gas	94.7	98.3	3.6	1.59
High-range gas	227.0	227.0	0.0	0.01

	Zero gas					Upscale gas				
	Initial Values		Final Values			Initial Values		Final Values		
Run No.	System Calibration Response	System Cal. Bias (% of span)	System Calibration Response	System Cal. Bias (% of span)	Drift (% of span)	System Calibration Response	System Cal. Bias (% of span)	System Calibration Response	System Cal. Bias (% of span)	Drift (% of span)
1	3.4	1.58	4.6	2.11	0.53	88.6	-4.26	89.1	-4.04	0.22
2	4.6	2.11	5.7	2.57	0.46	89.1	-4.04	91.0	-3.22	0.82
3	5.7	2.57	3.9	1.81	-0.76	91.0	-3.22	91.1	-3.17	0.04

Run No.	C (ppmv)	Co	Cm	Cma	Cgas (ppmv)
1	137.42	4.0	88.9	94.7	148.9
2	142.38	5.2	90.1	94.7	153.0
3	129.79	4.8	91.1	94.7	137.2

Cgas = (C - Co) * Cma/(Cm - Co)

Where: Cgas = Effluent gas concentration, dry basis, ppmv
C = Average gas concentration indicated by gas analyzer, dry basis, ppmv
Co = Average of initial and final system calibration bias check responses for the zero gas, ppmv
Cm = Average of initial and final system calibration responses for the upscale calibration gas, ppmv
Cma = Actual concentration of the upscale calibration gas, ppmv

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CALIBRATION ERROR AND SYSTEM BIAS CORRECTIONS
NOx - METHOD 7E
(ppmv)

Client: Delek Refining, Ltd.
Unit: SRU 2
Location: Tyler, TX
Date: 08/22/07
Test: 1-3
Span: 0 - 95.6 ppmv

	Cylinder Value (ppmv)	Analyzer Calibration Response (ppmv)	Absolute Difference (ppmv)	Difference (% of span)
Zero gas	0.0	0.4	0.4	0.43
Mid-range gas	24.7	26.3	1.6	1.64
High-range gas	95.6	95.8	0.2	0.20

	Zero gas					Upscale gas				
	Initial Values		Final Values			Initial Values		Final Values		
Run No.	System Calibration Response	System Cal. Bias (% of span)	System Calibration Response	System Cal. Bias (% of span)	Drift (% of span)	System Calibration Response	System Cal. Bias (% of span)	System Calibration Response	System Cal. Bias (% of span)	Drift (% of span)
1	-0.1	-0.50	0.2	-0.19	0.31	23.7	-2.70	24.6	-1.80	0.90
2	0.2	-0.19	0.2	-0.23	-0.04	24.6	-1.80	24.2	-2.16	-0.36
3	0.2	-0.23	0.0	-0.41	-0.17	24.2	-2.16	24.0	-2.42	-0.27

Run No.	C (ppmv)	Co	Cm	Cma	Cgas (ppmv)
1	18.99	0.1	24.1	24.70	19.4
2	19.14	0.2	24.4	24.70	19.3
3	18.89	0.1	24.1	24.70	19.4

Cgas = (C - Co) * Cma/(Cm - Co)

Where: Cgas = Effluent gas concentration, dry basis, ppmv
C = Average gas concentration indicated by gas analyzer, dry basis, ppmv
Co = Average of initial and final system calibration bias check responses for the zero gas, ppmv
Cm = Average of initial and final system calibration responses for the upscale calibration gas, ppmv
Cma = Actual concentration of the upscale calibration gas, ppmv

FLUE GAS MOISTURE CONTENT
(EPA Reference Method 4)
SRU -2 (Test 1)

Nomenclature:

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

M_w = Molecular weight of water, 18.0 lb/lb mole.

P_{bar} = Barometric pressure at dry gas meter, in Hg.

ΔH = Average pressure differential in dry gas meter, in H2O.

P_m = P_{bar} + (H/13.6)

13.6 = Specific gravity of Hg.

P_{std} = Standard absolute pressure, 29.92 in Hg.

T_{mf} = Temperature at meter, F.

T_m = Absolute temperature at meter, R.

Vm = Dry gas volume measure by dry gas meter, dcf (dry cubic feet).

Vm_{std} = Dry gas volume measured by dry gas meter corrected to standard conditions, dscf.

Vwc_{std} = Volume of water vapor collected, volumetrically measured, corrected to standard conditions, scf.

Vwg_{std} = Volume of water vapor collected, gravimetrically measured, corrected to standard conditions, scf.

V_w = Volume of water collected, ml.

W_g = Weight of water collected, g.

Y = Dry gas meter calibration factor.

K1 = Constant, 0.04707 cubic feet/ml.

K2 = Constant, 0.04715 cubic feet/g.

K3 = Constant, 17.64 R/in Hg.

Variables:

$\Delta H := 0.60 \cdot in\_H2O$

$P_{bar} := 29.00 \cdot in\_Hg$

$T_{mf} := 104.1 \cdot F$

$Vm := 26.990 \cdot ft^3$

$V_w := 0 \cdot ml$

$W_g := 85.1 \cdot g$

$Y := 1.012$

Constants:

$M_w := 18.0 \cdot \frac{lb}{lb \cdot mole}$

$P_{std} := 29.92 \cdot in\_Hg$

$K1 := 0.04707 \cdot \frac{ft^3}{ml}$

$K2 := 0.04715 \cdot \frac{ft^3}{g}$

$K3 := 17.64 \cdot \frac{R}{in\_Hg}$

Calculations:

$P_m := P_{bar} + \left(\frac{\Delta H}{13.6} \cdot \frac{in\_Hg}{in\_H2O} \right)$ $P_m = 29.044 \cdot in\_Hg$

$T_m := T_{mf} + 460$ $T_m = 564.1 \cdot R$

$Vwc_{std} := K1 \cdot V_w$ (Equation 4.1) $Vwc_{std} = 0.000 \cdot ft^3$

$Vwg_{std} := K2 \cdot W_g$ (Equation 4.2) $Vwg_{std} = 4.012 \cdot ft^3$

$Vm_{std} := K3 \cdot Y \cdot \left(\frac{Vm \cdot P_m}{T_m} \right)$ (Equation 4.3) $Vm_{std} = 24.808 \cdot ft^3$

$B_{ws} := \frac{Vwc_{std} + Vwg_{std}}{Vwc_{std} + Vwg_{std} + Vm_{std}}$ (Equation 4.4)

$B_{ws} = 0.1392$

$Moisture := B_{ws} \cdot 100 \cdot \%$

$Moisture = 13.92 \cdot \%$

MOLECULAR WEIGHT OF FLUE GAS
(EPA Reference Method 3)

Nomenclature:
M_d = Dry molecular weight, lb/lb-mole.
M_s = Wet molecular weight, lb/lb-mole.
CO_2 = Percent CO_2 by volume, dry basis.
O_2 = Percent O_2 by volume, dry basis.
CO = Percent CO by volume, dry basis.
N_2 = Percent N_2 by volume, dry basis.
Balance = N_2 + CO.
B_{ws} = Flue gas moisture fraction, by volume.

Variables:

$CO_2 := 10.0 \cdot \%$

$O_2 := 1.84 \cdot \%$

$Balance := 100 \cdot \% - CO_2 - O_2$

$Balance = 88.16 \cdot \%$

$B_{ws} = 0.1392$

Constants:

$44.0 \cdot \frac{lb}{lb \cdot mole}$ Molecular Weight of CO_2.

$32.0 \cdot \frac{lb}{lb \cdot mole}$ Molecular Weight of O_2.

$28.0 \cdot \frac{lb}{lb \cdot mole}$ Molecular Weight of N_2.

Calculations:

$$M_d := \left(44.0 \cdot \frac{lb}{lb \cdot mole} \cdot CO_2\right) + \left(32.0 \cdot \frac{lb}{lb \cdot mole} \cdot O_2\right) + \left(28.0 \cdot \frac{lb}{lb \cdot mole} \cdot Balance\right) \quad \text{(Equation 3-1)}$$

$$M_d = 29.67 \cdot \frac{lb}{lb \cdot mole}$$

$$M_s := M_d \cdot (1.0 - B_{ws}) + \left(18.0 \cdot \frac{lb}{lb \cdot mole} \cdot B_{ws}\right) \quad \text{(EPA Reference Method 2, Equation 2-5)}$$

$$M_s = 28.05 \cdot \frac{lb}{lb \cdot mole}$$

VELOCITY & VOLUMETRIC FLOW RATE OF FLUE GAS
(EPA Reference Method 2)

Nomenclature:
Diameter = Diameter of stack, in.
Area = Cross-sectional area of stack, ft^2.
B_{ws} = Flue gas moisture fraction.
C_p = Pitot tube coefficient.
K_p = Pitot tube Constant.
M_s = Molecular weight of stack gas, wet basis, lb/lb-mole.
P_{bar} = Barometric pressure at measurement site, in_Hg.
P_g = Stack static pressure, in_H2O.
P_s = Absolute stack pressure, in_Hg.
P_{std} = Standard pressure, 29.92 in_Hg.
Q_{std} = Dry volumetric stack gas flow rate, corrected to standard conditions, dscf/min.
T_{sf} = Stack temperature, F.
T_s = Absolute stack temperature, R.
T_{std} = Standard absolute temperature, 528 R.
V = Average stack gas velocity, ft/sec.
Δp = Average square root of delta p, $in\_H2O^{0.5}$.

Variables:

$Area := 12.56637 \cdot ft^2$

$C_p := 0.84$

$M_s = 28.05 \bullet \frac{lb}{lb \cdot mole}$

$P_{bar} = 29 \bullet in\_Hg$

$P_g := -0.20 \cdot in\_H2O$

$T_{sf} := 1214.6 \cdot F$

$\Delta p := 0.1227 \cdot in\_H2O^{0.5}$

$B_{ws} = 0.1392$

Constants:

$$K_p := 85.49 \cdot \frac{ft}{sec} \cdot \left(\frac{\frac{lb}{lb \cdot mole} \cdot in\_Hg}{R \cdot in\_H2O} \right)^{0.5}$$

$T_{std} := 528 \cdot R$

$P_{std} := 29.92 \cdot in\_Hg$

Calculations:

$T_s := T_{sf} + 460 \cdot R$ $\qquad T_s = 1.675 \cdot 10^3 \cdot R$

$P_s := P_{bar} + \left(\frac{P_g}{13.6} \cdot \frac{in\_Hg}{in\_H2O} \right)$ $\qquad P_s = 28.985 \cdot in\_Hg$

$V := K_p \cdot C_p \cdot \Delta p \cdot \sqrt{\frac{T_s}{P_s \cdot M_s}}$ (Equation 2-9)

$V = 12.65 \cdot \frac{ft}{sec}$

$Q_{std} := 60 \cdot \frac{sec}{min} \cdot \left(1.0 - B_{ws}\right) \cdot V \cdot Area \cdot \left(\frac{T_{std}}{T_s} \right) \cdot \left(\frac{P_s}{P_{std}} \right)$ (Equation 2-10)

$Q_{std} = 2506.93 \cdot \frac{dscf}{min}$

ISOKINETIC SAMPLING RATE
(EPA Reference Method 5)

Nomenclature:
A_n = Cross-sectional area of nozzle tip, ft^2.
B_{ws} = Flue gas moisture content.
I = Percent of isokinetic sampling, %.
K4 = Constant
N_d = Diameter of nozzle tip, in.
N_r = Radius of nozzle tip, ft.
P_s = Absolute stack pressure
P_{std} = Standard pressure, 29.92 in_Hg
T_{sf} = Stack temperature, F
T_s = Absolute stack temperature, R
Vm_{std} = Dry gas meter volume at standard conditions, dscf.
V = Velocity of flue gas, ft/sec.
Time = Total test time, min.

Variables:

$Nd := 0.217 \cdot in$

$B_{ws} = 0.1392$

$P_s = 28.99 \cdot in\_Hg$

$T_{sf} = 1.215 \cdot 10^3 \cdot F$

$T_s = 1.675 \cdot 10^3 \cdot R$

$Vm_{std} = 24.81 \cdot dscf$

$V = 12.65 \cdot \frac{ft}{sec}$

$Time := 60 \cdot min$

Constants:

$K4 := 0.09450 \cdot \frac{in\_Hg \cdot \% \cdot min}{sec \cdot R}$

$P_{std} = 29.92 \cdot in\_Hg$

$T_{std} = 528 \cdot R$

Delek Refining Ltd.
SRU -2 Compliance Test
CO Mass Emission Example Calculations
Test 1

Nomenclature:

CO	= Concentration of CO measured dry, ppmvd.
$CO_{emission}$	= CO mass emission rate, lb/MMBtu, lb/hr, ng/J.
CO_{MW}	= Molecular weight of CO.
O_2	= Excess oxygen concentration, vol%.
F_d	= Fuel factor, dscf/MMBtu.
Q_{std}	= Volumetric flow rate, dscfm.

Variables:

$CO := 45.48 \cdot ppmv$

$O_2 := 1.84 \cdot vol\%$

$Q_{std} := 2502.98 \cdot \frac{dscf}{min}$

Constants:

$F_d := 8662.89 \cdot \frac{dscf}{MMBtu}$

$CO_{MW} := 28 \cdot \frac{lb}{lb \cdot mol}$

$Btu := 1055 \cdot J$

Calculation:

$$CO_{emission} := CO \cdot \left(\frac{CO_{MW}}{385.33 \cdot \frac{dscf}{lb \cdot mol} \cdot 10^6 \cdot ppmv} \right) \cdot Q_{std} \cdot \left(\frac{60 \cdot min}{hr} \right)$$

$$CO_{emission} = 0.5 \cdot \frac{lb}{hr}$$

Delek Refining Ltd.
SRU -2 Compliance Test
SO_2 Mass Emission Example Calculations
Test 1

Nomenclature:

SO_2 = Concentration of SO_2 measured dry, ppmvd.

$SO_{2emission}$ = SO_2 mass emission rate, lb/MMBtu, lb/hr, ng/J.

$SO_{2\,MW}$ = Molecular weight of SO_2.

O_2 = Excess oxygen concentration, vol%.

F_d = Fuel factor, dscf/MMBtu.

Q_{std} = Volumetric flow rate, dscfm.

Variables:

$SO2 := 148.0 \cdot ppmv$

$O_2 := 1.84 \cdot vol\%$

$Q_{std} := 2502.98 \cdot \frac{dscf}{min}$

Constants:

$F_d := 8662.89 \cdot \frac{dscf}{MMBtu}$

$SO2_{MW} := 64 \cdot \frac{lb}{lb \cdot mol}$

$Btu := 1055 \cdot J$

Calculation:

$$SO2_{emission} := SO2 \cdot \left(\frac{SO2_{MW}}{385.33 \cdot \frac{dscf}{lb \cdot mol} \cdot 10^6 \cdot ppmv} \right) \cdot Q_{std} \cdot \left(\frac{60 \cdot min}{hr} \right)$$

$$SO2_{emission} = 3.69 \cdot \frac{lb}{hr}$$

Delek Refining Ltd.
SRU -2 Compliance Test
NOx Mass Emission Example Calculations
Test 1

Nomenclature:

NOx	= Concentration of NOx measured dry, ppmvd.
$NOx_{emission}$	= NOx mass emission rate, lb/MMBtu, lb/hr, ng/J.
NOx_{MW}	= Molecular weight of NOx.
O_2	= Excess oxygen concentration, vol%.
F_d	= Fuel factor, dscf/MMBtu.
Q_{std}	= Volumetric flow rate, dscfm.

Variables:

$NOx := 19.40 \cdot ppmv$

$O_2 := 1.84 \cdot vol\%$

$Q_{std} := 2502.98 \cdot \frac{dscf}{min}$

Constants:

$F_d := 8662.89 \cdot \frac{dscf}{MMBtu}$

$NOx_{MW} := 46 \cdot \frac{lb}{lb \cdot mol}$

$Btu := 1055 \cdot J$

Calculation:

$$NOx_{emission} := NOx \cdot \left(\frac{NOx_{MW}}{385.33 \cdot \frac{dscf}{lb \cdot mol} \cdot 10^6 \cdot ppmv} \right) \cdot Q_{std} \cdot \left(\frac{60 \cdot min}{hr} \right)$$

$$NOx_{emission} = 0.35 \cdot \frac{lb}{hr}$$

Delek Refining, LTD Tyler TX August 22, 2007 SRU-2 Emission Compliance Test

Moisture Calculations QAQC

Note: In the vectors, rows 1 through 3 are for tests 1 -3

$in\_H2O := \frac{in\_Hg}{13.6}$ ORIGIN := 1 Diameter := 48.00·in

mol := 1 ml := 0.001·l Y := 1.012

$K1 := 0.04707 \cdot \frac{ft^3}{ml}$

$K2 := 0.04715 \cdot \frac{ft^3}{g}$ $Tm := \begin{pmatrix} 564.1 \\ 568.6 \\ 562.1 \end{pmatrix} \cdot R$ $Pbaro := \begin{pmatrix} 28.96 \\ 28.96 \\ 28.96 \end{pmatrix} \cdot in\_Hg$ $Wg := \begin{pmatrix} 85.1 \\ 84.4 \\ 82.7 \end{pmatrix} \cdot g$

$K3 := 17.64 \cdot \frac{R}{in\_Hg}$

$O2 := \begin{pmatrix} 1.84 \\ 1.88 \\ 2.15 \end{pmatrix} \cdot \%$ $CO2 := \begin{pmatrix} 10.00 \\ 11.00 \\ 10.90 \end{pmatrix} \cdot \%$ $Vm := \begin{pmatrix} 26.99 \\ 27.121 \\ 28.014 \end{pmatrix} \cdot ft^3$ $DeltaH := \begin{pmatrix} 0.6 \\ 0.6 \\ 0.6 \end{pmatrix} \cdot in\_H2O$

$Vwg := K2 \cdot Wg$ $Vwg = \begin{pmatrix} 4.012 \\ 3.979 \\ 3.899 \end{pmatrix} \cdot ft^3$ $Pm := Pbaro + \frac{DeltaH}{13.6} \cdot \frac{in\_Hg}{in\_H2O}$ $Pm = \begin{pmatrix} 29.004 \\ 29.004 \\ 29.004 \end{pmatrix} \cdot in\_Hg$

$\overrightarrow{Vmstd := \left[K3 \cdot Y \cdot \left(\frac{Vm \cdot Pm}{Tm} \right) \right]}$ $Vmstd = \begin{pmatrix} 24.773 \\ 24.697 \\ 25.805 \end{pmatrix} \cdot ft^3$

$\overrightarrow{Bws := \frac{Vwg}{(Vwg + Vmstd)}}$ $Bws = \begin{pmatrix} 13.939 \\ 13.877 \\ 13.127 \end{pmatrix} \cdot \%$ Bws is % moisture

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Delek Refining, LTD Tyler TX August 22, 2007 SRU-2 Emission Compliance Test

Wet and Dry Molecular Weight QAQC

Note: In the vectors, rows 1 through 3 are for tests 1 through 3

$$Balance := 100 \cdot \% - CO2 - O2 \qquad Balance = \begin{pmatrix} 88.16 \\ 87.12 \\ 86.95 \end{pmatrix} \cdot \%$$

$$Md := 44 \cdot \frac{lb}{lb \cdot mol} \cdot CO2 + 32 \cdot \frac{lb}{lb \cdot mol} \cdot O2 + 28 \cdot \frac{lb}{lb \cdot mol} \cdot Balance \qquad Md = \begin{pmatrix} 29.674 \\ 29.835 \\ 29.83 \end{pmatrix} \cdot \frac{lb}{lb \cdot mol}$$

$$Ms := \overrightarrow{\left[(Md \cdot (1.0 - Bws)) + 18.0 \cdot \frac{lb}{lb \cdot mol} \cdot Bws \right]} \qquad Ms = \begin{pmatrix} 28.046 \\ 28.193 \\ 28.277 \end{pmatrix} \cdot \frac{lb}{lb \cdot mol}$$

Delek Refining, LTD Tyler August 22, 2007 SRU-2 Emission Compliance Test
Velocity and Volumetric Flow QAQC
Note: In the vectors, rows 1 - 3 are for tests 1 - 3

Pg = stack static pressure, in. H2O
Ps = Absolute stack pressure, in. Hg
Ts = absolute temperature of stack, R
Diam = diameter of stack, inches
A = cross sectional area of stack, sq. ft
V = Velocity(fps)
Kp = Pitot tube constant
Cp = Pitot tube coefficient
Δp = average square root of Δp
Qstd = dry volumetric stack gas flow rate, corrected to standard conditions
Tstd = standard absolute temperature (68 F= 528 R)
Pstd = standard pressure (29.92 in Hg)

Units, Constants

$in\_H2O := \frac{in\_Hg}{13.6}$ $\pi := 3.14159$

$Pstd := 29.92 \cdot in\_Hg$

$Tstd := 528 \cdot R$

$Kp := 85.49 \cdot \frac{ft}{sec} \cdot \left(\frac{lb}{lb \cdot mole} \cdot \frac{in\_Hg}{R \cdot in\_H2O} \right)^{0.5}$

Variables

$Cp := 0.84$ $Diam := 48.0 \cdot in$

$A := \frac{\pi \cdot \left(\frac{Diam}{12 \cdot \frac{in}{ft}} \right)^2}{4}$ $A = 12.566 \cdot ft^2$

$\Delta p := \begin{pmatrix} 0.1227 \\ 0.1199 \\ 0.1217 \end{pmatrix} \cdot in\_H2O^{0.5}$ $Ts := \begin{pmatrix} 1674.6 \\ 1670.4 \\ 1678.6 \end{pmatrix} \cdot R$ $Pg := \begin{pmatrix} -0.2 \\ -0.2 \\ -0.2 \end{pmatrix} \cdot in\_H2O$

Calculations

$Ps := Pbaro + \frac{Pg}{13.6} \cdot \frac{in\_Hg}{in\_H2O}$ $Ps = \begin{pmatrix} 28.945 \\ 28.945 \\ 28.945 \end{pmatrix} \cdot in\_Hg$ $V := \overrightarrow{\left(Kp \cdot \Delta p \cdot Cp \cdot \sqrt{\frac{Ts}{Ps \cdot Ms}}^2 \right)}$ $V = \begin{pmatrix} 12.655 \\ 12.319 \\ 12.516 \end{pmatrix} \cdot \frac{ft}{sec}$

$Qstd := \overrightarrow{\left[60 \cdot \frac{sec}{min} \cdot (1.0 - Bws) \cdot V \cdot A \cdot \left(\frac{Tstd}{Ts} \right) \cdot \left(\frac{Ps}{Pstd} \right) \right]}$ $Qstd = \begin{bmatrix} 2.505 \cdot 10^3 \\ 2.446 \cdot 10^3 \\ 2.495 \cdot 10^3 \end{bmatrix} \cdot \frac{ft^3}{min}$

Delek Refining, LTD Tyler TX April August 22, 2007 SRU-2 Emission Compliance Test
Emissions Calculations QAQC
Note: In the vectors, rows 1 - 3 are for tests 1 - 3

$$MMBTU := 10^6 \cdot BTU$$

$$NOXppm := \begin{pmatrix} 19.4 \\ 19.3 \\ 19.4 \end{pmatrix} \cdot ppm \quad COppm := \begin{pmatrix} 45.48 \\ 44.31 \\ 39.95 \end{pmatrix} \cdot ppm \quad SO2ppm := \begin{pmatrix} 148.9 \\ 153.0 \\ 137.2 \end{pmatrix} \cdot ppm$$

$$MolecWtCO := 28.0 \cdot \frac{lb}{lb \cdot mol} \quad MolecWtNOX := 46.0 \cdot \frac{lb}{lb \cdot mol} \quad MolecWtSO2 := 64 \cdot \frac{lb}{lb \cdot mol}$$

$$NOxLBperHR := \overrightarrow{\left[NOXppm \cdot 60 \cdot \frac{min}{hr} \cdot Qstd \cdot \left[\frac{MolecWtNOX}{\left(\frac{385.33 \cdot ft^3}{lb \cdot mol} \right) \cdot 10^6 \cdot ppm} \right] \right]} \quad NOxLBperHR = \begin{pmatrix} 0.348 \\ 0.338 \\ 0.347 \end{pmatrix} \cdot \frac{lb}{hr}$$

$$CO\_LBperHR := \overrightarrow{\left[COppm \cdot 60 \cdot \frac{min}{hr} \cdot Qstd \cdot \left[\frac{MolecWtCO}{\left(\frac{385.33 \cdot ft^3}{lb \cdot mol} \right) \cdot 10^6 \cdot ppm} \right] \right]} \quad CO\_LBperHR = \begin{pmatrix} 0.497 \\ 0.473 \\ 0.435 \end{pmatrix} \cdot \frac{lb}{hr}$$

$$SO2\_LBperHR := \overrightarrow{\left[SO2ppm \cdot 60 \cdot \frac{min}{hr} \cdot Qstd \cdot \left[\frac{MolecWtSO2}{\left(\frac{385.33 \cdot ft^3}{lb \cdot mol} \right) \cdot 10^6 \cdot ppm} \right] \right]} \quad SO2\_LBperHR = \begin{pmatrix} 3.717 \\ 3.73 \\ 3.411 \end{pmatrix} \cdot \frac{lb}{hr}$$

$$Fd := \begin{pmatrix} 8662.89 \\ 8671.19 \\ 8662.42 \end{pmatrix} \cdot \frac{ft^3}{MMBTU}$$

$$COconversion := 7.266 \cdot 10^{-8} \cdot \frac{lb}{(ppm \cdot ft^3)} \quad NOXconversion := 1.194 \cdot 10^{-7} \cdot \frac{lb}{(ppm \cdot ft^3)}$$

$$SO2conversion := 1.6609 \cdot 10^{-7} \cdot \frac{lb}{(ppm \cdot ft^3)}$$

$$\overrightarrow{NOXlbPERmmbtu := \left[Fd \cdot NOXconversion \cdot NOXppm \cdot \left(\frac{20.9 \cdot \%}{20.9 \cdot \% - O2} \right) \right]}$$

$$NOXlbPERmmbtu = \begin{pmatrix} 0.022 \\ 0.02196 \\ 0.02237 \end{pmatrix} \cdot \frac{lb}{MMBTU}$$

$$\overrightarrow{COlbPERmmbtu := \left[Fd \cdot COconversion \cdot COppm \cdot \left(\frac{20.9 \cdot \%}{20.9 \cdot \% - O2} \right) \right]}$$

$$COlbPERmmbtu = \begin{pmatrix} 0.03139 \\ 0.03068 \\ 0.02803 \end{pmatrix} \cdot \frac{lb}{MMBTU}$$

APPENDIX D.

INSTRUMENT SPECIFICATIONS

SPECIFICATIONS

SPECIFICATION	NONDISPERSIVE INFRARED (NDIR)	OXYGEN	
	CO / CO_2 / CH_4 / SO_2	O_2	O_2
DETECTOR	Microflow	Paramagnetic	Galvanic Fuel Cell
SAMPLE CONTACT MATERIAL	Stainless steel and Tygon† disposable gold plated cell liner. Window material CaF_2	Platinum, Glass, Stainless Steel, Viton and Tygon†	Stainless Steel and Tygon†
RANGES	See Table, Page 3	See Table, Page 3	See Table, Page 3
LINEARITY	Better than 1% Full Scale	Better than 1% Full Scale	Better than 1% Full Scale
REPEATABILITY	Better than 1% Full Scale	Better than 1% Full Scale	Better than 1% Full Scale
RESPONSE TIME	90% of Full Scale in less than 1 second*	90% of Full Scale in 2 seconds	90% of Full Scale in 5 seconds
SAMPLE FLOW RATE	0.5 to 2 liters/minute	1 liter/minute	1 liter/minute
NOISE	Less than 1% Full Scale	Less than 1% Full Scale	Less than 1% Full Scale
ZERO & SPAN DRIFT	Less than 1% of Full Scale in 24 hours	Less than 1% of Full Scale in 24 hours	Less than 1% of Full Scale in 24 hours
ZERO & SPAN, ADJUSTMENT	Ten turn potentiometer	Ten turn potentiometer	Ten turn potentiometer
DISPLAY	Individual 4½ digit panel meter	3½ digit panel meter	3½ digit panel meter
OUTPUTS	Select: 0-10VDC or 4-20 or 0-20mA (RS-232 optional)	Select: 0-10VDC and 4-20 or 0-20mA (RS-232 optional)	Select: 0-10VDC and 4-20 or 0-20mA (RS-232 optional)
ALARMS (optional)	2 each Form C-10A SPDT and Form A-5A SPST (Dry Relay Contacts)	Single or Dual SPDT-5A (Dry Relay Contacts)	Single or Dual SPDT-5A (Dry Relay Contacts)
AMBIENT TEMPERATURE	–5 to 45°C	–5 to 45°C	–5 to 45°C
SAMPLE TEMPERATURE	0 to 50°C	0 to 50°C	0 to 50°C
SAMPLE CONDITION	Clean, non-condensing gas	Clean, non-condensing gas	Clean, non-condensing gas
FITTINGS	1/4" tube	1/4" tube	1/4" tube
POWER REQUIREMENTS	115/220/240 VAC, 50/60 Hz, 70 watts/channel	115/220/240 VAC, 50/60 Hz, 70 watts/channel	115/220/240 VAC, 50/60 Hz, 70 watts/channel
DIMENSIONS	5¼"H x 19"W x 23"D 133mm x 483mm x 508mm	5¼"H x 19"W x 15"D 133mm x 483mm x 381mm	5¼"H x 19"W x 15"D 133mm x 483mm x 381mm
RELATIVE HUMIDITY	Less than 90% R.H.**	Less than 90% R.H.**	Less than 90% R.H.**
WEIGHT (single unit)	24 lbs. (approximate) 10.8 Kg	15 lbs. (approximate) 6.8 Kg	10 lbs. (approximate) 4.8 Kg

*Depending on cell length and flow rate **Non-condensing

Specifications are subject to change without notice

California Analytical Instruments, Inc.

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Web site: www.gasanalyzers.com

†Tygon is a registered trademark of the Norton Performance Plastics Corporation

SM709SDL

SPECIFICATIONS

Preset ranges	0-10, 20, 50, 100, 200, 500, 1,000, 2,000, 5000 ppm 0-20, 50, 100, 200, 500, 1,000, 2,000, 5,000, 10,000 mg/m^3
Custom ranges	0-10 to 5,000 ppm 0-20 to 10,000 mg/m^3
Zero noise	0.025 ppm
Lower detectable limit	0.050 ppm
Zero drift (24 hour)	0.050 ppm
Span drift (24 hour)	± 1% fullscale
Response time (in manual mode)	2.5 seconds NO 5.0 seconds NO_x
Vacuum	28.5" Hg
Linearity	± 1% fullscale
Sample flow rate	25 cc/min.
Bypass flow rate	250 to 1100 cc/min.
Operating temperature	15°-35°C (may be safely operated over the range of 5°-40°C)
Power requirements	90 -110 VAC @ 50/60 Hz 105-125 VAC @ 50/60 Hz 210-250 VAC @ 50/60 Hz 500 Watts
Physical dimensions	16.75" (W) X 8.62" (H) X 23" (D)
Weight	70 lbs. (including external pump)
Outputs	NO, NO_2, and NO_x, selectable voltage, 4-20 mA, RS-232, RS-485

NO. 6 - SN - 42CHL - 77923 - 387

NO. 5 - SN - 42CHL - 77922 - 387

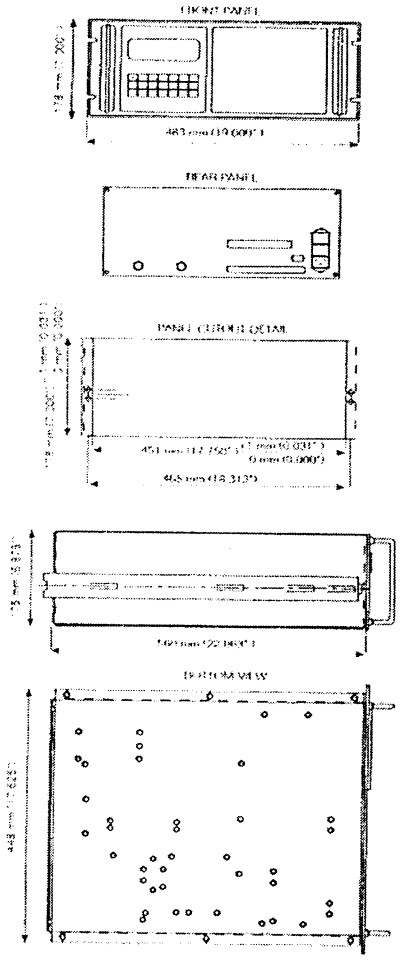
D2

MODEL 721M

SO_2, O_2 Analyzer

APPLICATIONS

- ✔ Sulfur recovery incinerators
- ✔ Coal fired power plant stack sources
- ✔ Cement kilns
- ✔ Mineral smelters
- ✔ Pulp and paper



SPECIFICATIONS	
Methodology:	Non-dispersive ultraviolet
Speed of response:	90% in less than 30 seconds
Accuracy:	±0.5% of full-scale (typically)
Zero drift:	±0.5% of full-scale (24 hours)
Calibration:	SO_2 calibration gas in nitrogen
Sensitivity:	±0.5% of full-scale
Outputs:	100 mVDC, 1 VDC, 10 VDC field selectable as standard. Optional 4 to 20 mA (isolated). Self-powered standard, loop-power available upon request.
Electrical requirement:	50 W; 120 VAC/50 to 60 Hz or 220 VAC/50 to 60 Hz
Electrical classification:	General Purpose
Typical flow:	1 to 2 L/min. (2 to 5 SCF/H)
Ambient temperature:	10 to 35°C (50 to 95°F)
Temperature stability:	0.25 ppm per Celsius degree
Electrical classification:	General purpose (non-hazardous)
Physical dimensions:	HxWxD 180x480x600 mm (7x19x23.5 in.) Weight: 12.3 kg (27 lb.)

STANDARD FEATURES

Outputs
- 4 voltage outputs any combination of 0 to 100 mVDC, 0 to 1 VDC, 0 to 10 VDC

Electrical requirements
- 120 VAC/50 to 60 Hz

Measurement ranges: SO_2
- 0 to 100 ppm minimum up to 0 to 5000 ppm maximum (see note 1)
- Sample must be dry, i.e. dewpoint of the sample must be below the lowest ambient temperature at which the analyzer will be used.

Note 1: Standard cell configuration – others available

OPTIONS

Outputs
- 4 to 20 mA self-powered
- 4 current outputs (maximum 4)
- 4 to 20 mA loop-powered (available on request in place of self-powered)

Electrical requirements:
- 240 VAC/50 to 60 Hz

Optional configurations
- Low range concentration cell for full-scale ranges less than 100 ppm
- Mid range concentration cell for applications requiring full-scale ranges between 5000 ppm and 5%
- High concentration cell for applications requiring full-scale ranges between 5% and 10%
- O_2 sensor installed in the Model 721M enclosure
- O_2 compensation
- Mass flow calculations

BOVAR
Western Research

CANADA • 8 Manning Close N.E., Calgary, Alberta T2E 7N5 Phone: (403) 235-8300 Fax: (403) 248-3550
UNITED STATES • Suite 150, 10200 Richmond Avenue, Houston, Texas, USA 77042 Phone: (713) 789-1084 Fax: (713) 784-1015
EUROPE • Voltastrasse 7, D-65795 Hattersheim 1, Germany Phone: (49) 6190-8591 Fax: (49) 6190-73660
ASIA / PACIFIC • Level 28, Menara Haw Par, Jalan Sultan Ismail, 50250 Kuala Lumpur, Malaysia Phone: 60-3-233-6121 Fax: 60-3-233-6222

Shimadzu
Model 14A
Gas Chromatograph
Specifications

2. Specifications

GC1-C10893500574

■ Column oven

Dimensions of column compartment:	230 (W) X 140 (D) X 360 (H) mm		
Length of columns to be accommodated:	Stainless steel column	10m X 2	
	Glass column	3m X 2	
	Capillary column	100m X 1	
Range of temperature setting:	Temperature;	-80~+399	1°C step
	Rate of temperature rise;	0~40°C/min	0.1°C step
	Constant temperature hold time;	0~655 min	0.1°C step
	Program stages	5 stages max.	

Range of temperature control (with power voltage of 100V)

Range of linear temperature increase:	30°C/min	150°C or less
	20°C/min	250°C or less
	10°C/min	330°C or less
	5°C/min	399°C or less

Lower-limit temperature: When INJ and DET temperature is 300°C, room temperature + 15°C
When INJ and DET temperature is 150°C, room temperature + 10°C
Additional cryogenic equipment is required for controlling at lower temperatures than those above.

Cooling speed: Approx. 9 min to reduce from 399°C to 100°C with room temperature of 25°C.
Approx. 14 min for reducing from 399°C to 50°C with room temperature of 25°C

■ Detector oven

Range of temperature setting: Room temperature ~ 399°C (in 1°C steps)

■ TCD oven

Range of temperature setting: Room temperature ~ 399°C (in 1°C steps)

■ Sample injection port unit

Range of temperature setting: Room temperature ~ 399°C

Sample injection port unit (Either one of the following units is provided)

Single injection port unit:	For packed glass column, combination type of glass insert and on-column injection, 1 flow line
Dual injection port unit:	For packed glass column, combination of glass insert and on-column injection, 2 flow lines
Injection port unit for for capillary columns:	Exclusive injection port for capillary analysis

- Overheat protection circuit 3 circuits
  1. 450°C-fixed independent protection circuit.
  2. Protection circuit for which the upper-limit temperature can be set via key operation.
  3. Overheat protection circuit by CPU abnormality detection
- Combination of Detectors
  1. Four detectors at maximum from among TCD, FID, ECD, FPD, and FTD can be simultaneously installed to the detector oven of the GC main body. Two TCD detectors cannot be set simultaneously.
  2. Only two types of detector controllers (except FTD) can be installed simultaneously to the control section of the GC. Another unit should be applied for installing three or more detector controllers, or FTD.

APPENDIX E.

EQUIPMENT CALIBRATIONS

CERTIFICATE OF CALIBRATION

This certifies that your American AL-19 Wet Test Meter
Serial No. P-2968
Has been calibrated with a American Bell Prover
Serial No. 277
It is traceable to the N.I.S.T., Reference No. 12169734

Rate of Flow	% of Proof
32 CFH	100.0 %

Calibrated by Carl Poe Co., Inc.
4600 Allen Street Houston, Texas 77007
(713) 861-3816 * Fax: (713) 861-8299

November 6, 2006
Date

Charles Cook
Signature

E1

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

METER BOX CALIBRATION
WET TEST METER (SN# P2968)

Date: **07/09/07**

Barometric Pressure: 30.09

Meter box number: **11**

Sample Line Vacuum Hg		Orifice manometer setting ΔH in. H2O	Spirometer (wet meter) gas volume Vw (ft3)	Dry gas meter volume Vm (ft3)	Temperatures: Spirometer (wet meter) tw °F	Dry Gas Meter Inlet ti °F	Dry Gas Meter Outlet to °F	Dry Gas Meter Average tm °F	Time θ min	Spirometer (wet meter) Vacuum Pw in. H2O
5.0	Start	0.5	1370.000	915.252	81		87	87.0	12.80	0.4
	End		1375.000	920.280	81		87			
	Volume		**5.000**	**5.028**	81					
5.0	Start	1.0	1375.000	920.280	81		87	87.5	11.05	0.6
	End		1381.000	926.280	81		88			
	Volume		**6.000**	**6.000**	81					
6.0	Start	2.0	1381.000	926.280	81		84	84.0	7.60	0.9
	End		1387.000	932.158	81		84			
	Volume		**6.000**	**5.878**	81					
5.0	Start	3.0	1387.000	932.158	81		84	84.5	13.50	1.2
	End		1400.000	944.915	81		85			
	Volume		**13.000**	**12.757**	81					
4.0	Start	4.0	1400.000	944.915	81		85	85.5	8.10	1.4
	End		1409.000	953.740	81		86			
	Volume		**9.000**	**8.825**	81					

Calculations

$$\gamma = \frac{(Vw)\,(Pb-(Pw/13.6))(tm+460)}{(Vm)\,(Pb + (H/13.6))\,(tw + 460)}$$

$$\Delta H@ = \frac{(0.0317)\,(\text{Delta H})}{(Pb)\,(to + 460)} \times \left[\frac{(tw + 460)\,(\theta)}{(Vw)}\right]^2$$

ΔH	Δ	ΔH@	Condition
0.5	1.003	1.85	OK
1	1.008	1.91	OK
2	1.019	1.82	OK
3	1.015	1.83	OK
4	1.015	1.83	OK
Average	**1.012**	**1.85**	

$$\text{K-factor} = \frac{(\text{Volume (ft)3}) \times (\gamma) \times (\text{Meter Temp (F)}+460)}{(\text{B.P.}) \times (\text{Time})}$$

Thermocouple Readout Calibration

NIST Tracable Simulator Make: Omega Model: CL540K S.N. 100570

Type-K Simulator	Stack **	Probe **	Filter **	Last Imp.**	Aux **	Meter In **	Meter Out **
0	-1	-1	-1	-1	-1	-1	-1
50	49	49	49	49	49	49	49
100	99	99	99	99	99	99	99
200	201	201	201	201	201	199	199
500	502	502	502				
1000	1001						
1900	1900						

**Note: all temperatures are in °F

Sign: _____ Date: 7-9-7

An OMEGA Technologies Company

MOST RECENT AS OF 2-13-06
TOSS OUT OLD SHEET
2265A

Certificate of Calibration
for
ENTECH ENGINEERING

Customer PO: 51271
Report #: 601965808

Model #: CL540K
Serial #: 100570

Cal-3

OMEGA Engineering, Inc. certifies the above instrumentation has been calibrated to meet or exceed the published specifications. This calibration was performed using instrumentation and Standards that are traceable to the United States National Institute of Standards and Technology and is in compliance with ISO-10012-1 and ANSI/NCSL Z540-1-1994. This Certificate/Report shall not be reproduced, except in full, without the written consent of OMEGA Engineering, Inc.

Accuracy of UUT: ± 0.8°F or ± 0.5°C

* Indicates Out Of Tolerance Condition

Range	Standard	As Found	As Left
KF	32	32.5	32.5
	625	625.6	625.6
	1250	1250.7	1250.7
	1875	1875.8	1875.8
	2400	2399.9	2399.9

Max calibration System Uncertainty : 8 ppm (DC), ± 0.01%(ohms), ± 0.19°F
NIST Traceable Test No: 775585-5985303:1073509367

Calibration Standards	Control #	Cal Due:
Fluke 5700A Calibrator	STD-098-04	4/7/06
Ice Point Reference	CL-098-19	7/25/06

Test Conditions : Temp 24°C, ± 2°C RH 35%, ± 20%

Accepted By: _____ Lab Representative
Certified by: _____ Technician
Date: 1/27/06
Due Date: 1/27/07

OMEGA Engineering, Inc., One Omega Circle, P.O. Box 336, Bridgeport, NJ 08014-0336 Telephone: (856) 467-4200 • FAX: (856) 467-1212
www.omega.com e-mail: info@omega.com

WCS - 0638A

ENTECH ENGINEERING INC.
P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Temperature Measurement Device Calibration

Device ID:	G7A	Calibration Date:	07/31/07
Device Type:	Type-K thermocouple		
Person Performing Calibration:	TR		
Reference Standard Type:	Mercury thermometer	Reference Standard Calibration Date:	08/21/06
NIST Traceble Standard Manufacturer:	Brooklyn P-M Thermo Co.		
NIST Traceble Standard Serial No.	1726		

Calibration Point	Measurement Range	Thermocouple		Reference Standard		Percent Deviation	Pass / Fail Specification
		(°F)	(°R)	(°F)	(°R)		
1	Cool Point	48.0	508.0	49.0	509.0	-0.20	Pass
2	Ambient	80.0	540.0	80.0	540.0	0.00	Pass
3	Hot Point	180.0	640.0	181.0	641.0	-0.16	Pass

Specification: Percent deviation ≤1.5% of reference temperature.

I hereby certify the temperature measurement device as being accurate to within the acceptable specification:

Signature: T-R

E4

ENTECH ENGINEERING INC.
P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Temperature Measurement Device Calibration

Device ID:	G7A	Calibration Date:	09/20/07
Device Type:	Type-K thermocouple		
Person Performing Calibration:	TR		
Reference Standard Type:	Mercury thermometer	Reference Standard Calibration Date:	08/21/06
NIST Traceble Standard Manufacturer:	Brooklyn P-M Thermo Co.		
NIST Traceble Standard Serial No.	1726		

Calibration Point	Measurement Range	Thermocouple		Reference Standard		Percent Deviation	Pass / Fail Specification
		(°F)	(°R)	(°F)	(°R)		
1	Cool Point	48.0	508.0	48.0	508.0	0.00	Pass
2	Ambient	80.0	540.0	80.0	540.0	0.00	Pass
3	Hot Point	180.0	640.0	179.0	639.0	0.16	Pass

Specification: Percent deviation ≤ 1.5% of reference temperature.

I hereby certify the temperature measurement device as being accurate to within the acceptable specification:

Signature:

ICL CALIBRATION LABORATORIES, INC.

ACCREDITED
Certificate 526.01

ISO/IEC 17025 and ANSI/NCSL Z540-1 accredited
The specialists in ASTM and laboratory thermometers & hydrometers
Members: ASTM API NCSLI ASQ NCWM

Setting new standards in calibration excellence!

1501 Decker Avenue Suite 118 Stuart, FL 34994 USA
Tel: 772 286 7710 1-800-713-6647
Fax: 772 286 8737 E-mail: sales@iclllabs.com
Internet: www.iclllabs.com

Field office: Cagues, PR Tel: 787 266 7445

CALIBRATION REPORT FOR THERMOMETER

THIS REPORT OF CALIBRATION SHALL DOCUMENT THAT THE INSTRUMENT DESCRIBED HEREIN WAS EXAMINED AND TESTED IN ICL'S ISO/IEC 17025 ACCREDITED CALIBRATION LABORATORY, AGAINST NIST TRACEABLE REFERENCE STANDARDS, IN ACCORDANCE WITH ICL'S ISO/IEC 17025 CALIBRATION PROCEDURE REFERENCED BELOW. THIS CALIBRATION MEETS THE REQUIREMENTS OF ISO/IEC 17025, ANSI/NCSL Z540-1-1994, (WHICH SUPERCEDED AND REPLACED MIL-STD 45662A), AND THE ISO-9000 AND QS-9000 SERIES OF QUALITY STANDARDS.

CUSTOMER INFORMATION:

ENTECH ENGINEERING, INC.
408 EAST MAIN STREET
LEAGUE CITY, TX 77573

PURCHASE ORDER NUMBER: 51545

SUBMITTED BY: ENTECH ENGINEERING, INC.

INSTRUMENT INFORMATION:

DATE CALIBRATED: 08-21-2006

THERMOMETER ASTM 3F-99 MODEL NUMBER: 10003F-C

SERIAL NUMBER: 1726 INSCRIPTION: ERTCO

SCALE: Fahrenheit SCALE RANGE: 20/760F SCALE DIVISIONS: 2

IMMERSION: 76MM

MAXIMUM SCALE ERROR PERMITTED BY ASTM E-1: +/- 2.0F TO 574F, +/- ... ABOVE 574F

RESULTS OF PHYSICAL EXAMINATION:

THIS INSTRUMENT WAS EXAMINED UNDER A POLARIZED LENS AND STRAINS IN THE GLASS, IF ANY, WERE JUDGED TO BE MINIMAL AND OF NO DETRIMENT TO THE FUNCTION OF THE INSTRUMENT.

THE CAPILLARY OF THIS THERMOMETER WAS EXAMINED UNDER MAGNIFICATION WITH RESULTS AS FOLLOWS: NO FOREIGN MATERIAL, MOISTURE, OR OTHER EVIDENCE OF CONTAMINATION WERE DISCOVERED. NO DISCERNABLE CAPILLARY IRREGULARITIES WERE NOTED.

IT WAS DETERMINED THAT THIS INSTRUMENT IS IN GOOD WORKING ORDER AND IS THEREFORE SUITABLE FOR CALIBRATION.

CALIBRATION PROCEDURE USED:

ICL Procedure 01, which is based upon ASTM E-77-98, NBS Monograph 150 & NIST SP 250-23

RESULTS OF CALIBRATION:

NOTE: The indications of this instrument cannot be adjusted or modified by ordinary means; accordingly, the readings given in the table below should be considered, in effect, to be both 'As Found' and 'As Left' readings.

The values and corrections presented herein are derived, or calculated, data as required by ASTM method E-77-98 for the calibration of this ASTM partial immersion thermometer. Raw data (actual observations) obtained in the performance of this calibration and an explanation of the calculations are presented on Page 3 of this report.

TEST TEMP	READING	CORRECTION	TOLERANCE	IN TOL?	ASTM SPECIFIED STEM TEMP	UNCERTAINTY
32.00°F	31.8°F	+0.2°F	2.00°F	YES	70°F	0.69°F
200.00°F	199.9°F	+0.1°F	2.00°F	YES	90°F	0.69°F
370.00°F	370.6°F	-0.6°F	2.00°F	YES	101°F	0.69°F
540.00°F	541.9°F	-1.9°F	2.00°F	YES*	110°F	0.70°F
700.00°F	702.2°F	-2.2°F	3.00°F	YES	129°F	0.70°F

THE TEST POINTS LISTED IN THE ABOVE TABLE ARE THOSE SPECIFIED IN ASTM E-1 (CURRENT REVISION).

THIS INSTRUMENT MEETS THE ACCURACY TOLERANCE AT THE POINTS TESTED.

**DECISION RULE: Unless otherwise instructed, ICL uses the following decision rule: if indications are perceived to reside within the tolerance limits, the indications are considered as 'In-Tolerance'; any indications perceived to reside outside the tolerance limits are considered to be 'Out-of-Tolerance'. The measurement uncertainty is not considered in this declaration.*

An asterik (*) alongside the 'Yes' or 'No' in the 'IN TOLERANCE?' column in the table of corrections above should alert the user that the amount by which the device is either In-Tolerance or Out-of-Tolerance is smaller than the measurement uncertainty attributable to that calibration result.

Our best measurement capabilities are: at Liquid Nitrogen (approximately -196C), +/- 0.017C; from -80 to 0C, +/- 0.015C; at 0C, +/- 0.006C; at 0.01C (TPW), +/-0.003C; from 0.01 to 105C, +/- 0.015C; from 105 to 200C, +/- 0.024C; from 200 to 300C, +/- 0.037C; from 300 to 420C, +/- 0.039C; from 420 to 1000C, +/- 1.2C. These uncertainties have been calculated utilizing the methods elaborated in NIST Technical Note 1297 and the ANSI-NCSL document Z-540-2 entitled 'Guide to the Expression of Uncertainty in Measurement', commonly referred to as the 'GUM'. A coverage factor of 2 sigma (k = 2) has been applied to the standard uncertainty in order to express

the expanded uncertainty at approximately a 95% confidence level.

THE UNCERTAINTIES PRESENTED ABOVE IN THE 'RESULTS' TABLE MAY BE LARGER THAN OUR SYSTEM UNCERTAINTIES, AS THE RESOLUTION OF THIS INSTRUMENT, ESTIMATED TO BE 0.2°F, HAS BEEN FACTORED INTO THE CALCULATION. MOREOVER, BECAUSE THIS IS A PARTIAL IMMERSION THERMOMETER, AN ADDITIONAL 0.4°F HAS BEEN FACTORED INTO THE CALCULATION AS SUGGESTED BY NIST IR 5341.

THE EXPANDED UNCERTAINTIES (K = 2) REPORTED HERE DO NOT CONTAIN ESTIMATES FOR (1) ANY EFFECTS THAT MAY BE INTRODUCED BY TRANSPORTATION OF THE INSTRUMENT BETWEEN ICL AND THE USER'S LABORATORY, (2) DRIFT OF THE INSTRUMENT, (3) HYSTERESIS OF THE INSTRUMENT, OR (4) ANY MEASUREMENT UNCERTAINTIES INTRODUCED BY THE USER.

FOR A DISCUSSION OF ACCURACIES ATTAINABLE WITH THERMOMETERS SUCH AS THIS INSTRUMENT SEE NIST SPECIAL PUBLICATION 250-23, NIST PUBLICATION IR-5341, ASTM E-1 AND ASTM E-77.

LABORATORY ENVIRONMENTAL CONDITIONS: TEMPERATURE: 23°C +/- 2°C RELATIVE HUMIDITY: BETWEEN 40% AND 60%

ALL TEMPERATURES GIVEN IN THIS REPORT ARE THOSE DEFINED BY THE INTERNATIONAL TEMPERATURE SCALE OF 1990 (ITS-90)

** IMPORTANT NOTE: THE READINGS AND CORRECTIONS NOTED ABOVE APPLY FOR THE CONDITION OF IMMERSION INDICATED PROVIDED THE ICE POINT READING, TAKEN AFTER EXPOSURE FOR NOT FEWER THAN THREE DAYS TO A TEMPERATURE OF ABOUT 23 DEGREES CELSIUS (73F), IS 31.8°F. IF THE ICE POINT READING IS FOUND TO BE HIGHER (OR LOWER) THAN STATED, ALL OTHER READINGS WILL BE HIGHER (OR LOWER) BY THE SAME AMOUNT.

THIS CALIBRATION WAS PERFORMED BY: DEBORAH M. WEBER

THE CALIBRATION PERFORMED AND DOCUMENTED BY THIS REPORT OF TEST IS A FULL SCALE CALIBRATION AND NO LIMITATIONS OF USE ARE IMPOSED ON THIS INSTRUMENT.

TRACEABILITY INFORMATION

This calibration is traceable to NIST through an unbroken chain of comparisons. The reference standard is used to calibrate the transfer standard, which in turn is used to calibrate the client's instrument. Each step in the chain is fully documented, and measurement uncertainty at each step has been calculated.

Our NIST primary reference thermometer from -196 to 420C is a Rosemount model 162CE 25.5 Ohm SPRT, serial no. 5058, calibrated by NIST on May 15, 2006. NIST GMP-11 recommends a 36 month calibration cycle for SPRTs. Transfer standards PRTs are calibrated against this reference standard semi-annually; ASTM liquid-in-glass transfer standards are calibrated annually.

Our primary reference thermometer for temperatures from 500 to 1000C is a Hart Scientific model 5624 PRT sensor, serial no. 0105, MTE-243, calibrated by Hart Scientific.

Test Point	Comparator	MTE#	Manufacturer	Transfer Standard	MTE#	Manufacturer	Next Due
32.00°F	Ice point bath	000	Lab Glass	Intrinsic	222	Lab Glass	10/03/06
200.00°F	7310 oil bath	005	PolyScience	5614 PRT 524116	126	Hart Scientific	01/06/07
370.00°F	6022 oil bath	021	Hart Scientific	5628 PRT 0523	228	Hart Scientific	12/25/06
540.00°F	6045 salt bath	004	Hart Scientific	5628 PRT 0481	27	Hart Scientific	12/25/06
700.00°F	6050H salt bath	016	Hart Scientific	5628 PRT 0483	227	Hart Scientific	12/25/06

ICL CALIBRATION LABORATORIES, INC.

An ISO/IEC 17025 & ANSI/NCSL Z-540-1 accredited laboratory - American Association for Laboratory Accreditation Certificate #526.01

J. JEFF KELLY, TECHNICAL DIRECTOR
DEBORAH M. WEBER, A.S.C.P. ACCREDITED TECHNOLOGIST
BRUCE MARKEY, V.P. TECHNICAL SERVICES

Karen Allebon

This document prepared by MICHAEL KELLY and reviewed by KAREN ALLEBON

DATE CALIBRATED: 08-21-2006 RECALIBRATION DATE SPECIFIED BY CLIENT: August 21, ~~2007~~ 2008 Next 4-02-07

NIST GMP-11 (Mar '03), 'Good Measurement Practice for Assignment and Adjustment of Calibration Intervals for Standards' states that 'Temperature standards are dynamic with use. Shock, contamination and other factors can cause drift from accepted values'. Table 4 of GMP-11 recommends recalibration of liquid-in-glass thermometers, standard thermistors and PRTs at 12 month intervals. Liquid-in-glass thermometers used for 'Temperature Critical Parameters' should be recalibrated at 6 month intervals. NIST GMP-11 is available for download in Adobe .pdf format on our website at www.icllabs.com Follow the link for 'Downloads'.

The API 'Manual of Petroleum Measurement Standards', Chapter 7, June, 2001, specifies a 12 month recalibration interval for liquid-in-glass thermometers (see section 8.3) and for portable electronic thermometers (PETs). See section 8.2

The user should be aware that any number of factors may cause this instrument to drift out of calibration before the specified calibration interval has expired.

This report applies only to the item calibrated.

RAW DATA

The actual raw data obtained during testing of this instrument is as follows:

Test temperature	Reading	Emergent column temp (To)	degs of emergent stem (n)
32.00°F	31.8°F	70°F	86
200.00°F	199.8°F	84°F	254
370.00°F	370.0°F	86°F	424
540.00°F	541.0°F	94°F	594
700.00°F	700.2°F	99°F	754

THE ABOVE READINGS WERE MADE UNDER MAGNIFICATION AND RESOLVED TO ONE TENTH OF ONE SCALE DIVISION.

Because the temperature of the emergent stem (the portion of the mercury column above the bath, exposed to room temperatures) realized during testing differs from the ASTM E-1 specified emergent stem temperatures (assumed to be the conditions of actual or intended use of the instrument), the method requires that an emergent stem temperature correction be calculated and applied. This is explained fully in ASTM E-77-98, section 7, Treatment of Data.

The calculation utilized is:

Emergent stem correction = $kn(Ts - To)$

where:

k = differential expansion coefficient of the liquid and the glass of which the themometer is made; for Celsius mercury-in-glass thermometers the value of k is 0.00016, for Fahrenheit mercury-in-glass thermometers $k = 0.00009$ For Celsius organic liquid-in-glass thermometers $k = 0.001$, and for Fahrenheit organic liquid-in-glass thermometers $k = 0.0006$

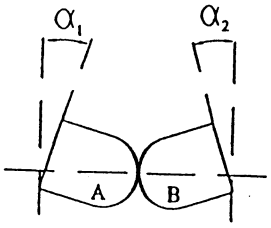
n = number of (scale) degrees of liquid column emergent from the bath, as measured from the immersion mark to the top of the mercury column. The ungraduated portion of the stem between the immersion mark and the beginning of the scale is evaluated and included into the value of n.

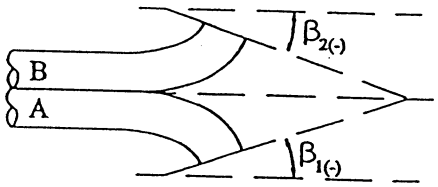
Ts = the emergent stem temperature specified in ASTM E-1, table 4

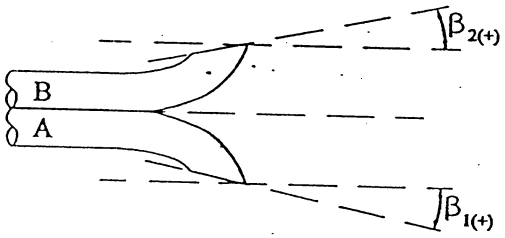
To = observed average temperature of the emergent liquid column of n degrees

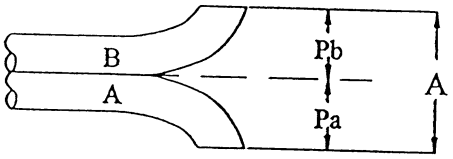
This calculation has been performed for each temperature tested, and, as required by ASTM E-77-98, the results have been incorporated into the readings and corrections which appear under RESULTS OF CALIBRATION on page 1 of this report.

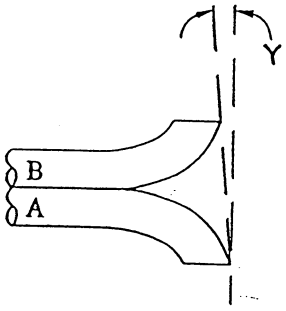
Type S Pitot Tube Inspection

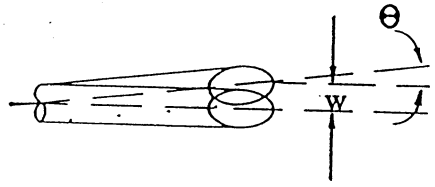


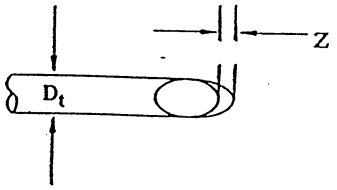












	Pre-sample Date 8/13/07	Post-sample Date 8/24/07
Level and Perpendicular?	✓	✓
Obstruction?	NO	NO
Damaged?	NO	NO
α_1 ($-10° \le \alpha_1 \le +10°$)	ϕ	ϕ
α_2 ($-10° \le \alpha_2 \le +10°$)	ϕ	ϕ
β_1 ($-5° \le \beta_1 \le +5°$)	ϕ	ϕ
β_2 ($-5° \le \beta_2 \le +5°$)	ϕ	ϕ
γ	ϕ	ϕ
θ	ϕ	ϕ
$z = A \tan \gamma$ (≤ 0.125")	ϕ	ϕ
$w = A \tan \theta$ (≤ 0.03125")	ϕ	ϕ
D_t ($3/16" \le D_t \le 3/8"$)	0.375	0.375
A	1.0"	1.0"
$A/2D_t$ ($1.05 \le Pa \le 1.5$)	1.29	1.29
$Pa = Pb \pm 0.063$"	✓	✓

QA/QC Check ✓

Completeness ✓ Legibility ✓ Accuracy ✓ Specifications ✓ Reasonableness ✓

Certification

I certify that the Type S pitot tube/probe ID# 67A meets all specifications, criteria and/or applicable design features and is hearby assigned a pitot tube calibration factor C_p of 0.84.

Certified by: [signature] 8/15/07
Personnel (Signature/Date)

[signature] 8/24/07
Team Leader (Signature/Date)

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

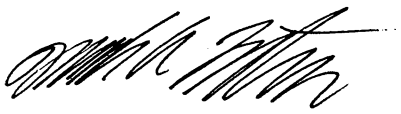
Caliper Calibration

Entech Caliper #1

04/10/06

NIST Gauge Block Size	NIST Gauge Block Iden. No. / Tracable Number	Caliiper Reading
0.400	011133 (NIST No. 821/263174-00)	0.400
0.200	010690 (NIST No. 821/263174-00)	0.200
0.000	N.A.	0.000

Technican MAL

Sign. 

Date 4/10/06

Mitutoyo

Certificate number T1D05172

CERTIFICATE OF INSPECTION

Instrument: Gauge Block

Grade: 2 (FS)

Date of inspection: 02nd Apr. 2001

Unit : μinch

Nominal Length inch	Ident. No.	Central Deviation	Maximum Deviation	Minimum Deviation	Variation
0.2	010690	0	0	-1	1

ENVIRONMENT: Air temperature (68 ± 1.8)F [(20 ± 1.0) ℃]

BASIS OF TEST: FS GGG-G-15C

MATERIAL: Steel

INSPECTION METHOD: by comparator

COEFFICIENT OF THERMAL EXPANSION: (6.1±0.6)×1E-6/F [(10.9±1.0)×1E-6/K]

EXPANDED UNCERTAINTY (For Central Deviation) (k=2): Less than 4" 2.4 μinch
Up to20" (1.2 + L / 2.3) μinch
(L=Nominal length) L:inch

QUALITY SYSTEM: ISO 9002 Registered Firm : JQA JMI0189

TRACEABILTY: Traceable to NIST No.821/263174-00
(NIST=National Institute of Standard and Technology)

Date 02nd Apr. 2001

Signature QC Manager S. Shutoh

S. Shutoh

F-691

This certificate is issued by MITUTOYO MIYAZAKI PLANT:
Postal code: 889-1701
Kou10652-1 Tano-cho, Miyazaki-gun, Miyazaki-pref. Japan
Tel: 0985(86)2591 Fax: 0985(86)0827

MITUTOYO HEADQUARTERS:
Postal code: 213-0012
20-1 Sakado 1-chome, Takatsu-ku, Kawasaki-shi, Japan
Tel: 044(813)8201 Fax: 044(813)8210

Mitutoyo

Certificate number T2E06393
page 1 of 1

CERTIFICATE OF INSPECTION

Instrument: Gauge Block

Grade: 2 (FS)

Date of inspection: 13th May. 2002

Unit : μinch

Nominal Length inch	Ident. No.	Central Deviation	Maximum Deviation	Minimum Deviation	Variation
0.4	011133	+4	+4	+2	2

ENVIRONMENT: Air temperature (68 ± 1.8)F [(20 ± 1.0) ℃]

BASIS OF TEST: FS GGG-G-15C

MATERIAL: Steel

INSPECTION METHOD: by comparator

COEFFICIENT OF THERMAL EXPANSION: (6.1±0.6)×1E-6/F [(10.9±1.0)×1E-6/K]

EXPANDED UNCERTAINTY (For Central Deviation) (k=2): Less than 4" 2.4 μinch; Up to20" (1.2 + L / 2.3) μinch (L=Nominal length) L:inch

QUALITY SYSTEM: ISO 9002 Registered Firm : JQA JMI0189

TRACEABILTY: Traceable to NIST No.821/263174-00
(NIST=National Institute of Standard and Technology)

Date 13th May. 2002

Signature QC Manager S. Shutoh

S. Shutoh

F-691

This certificate is issued by MITUTOYO MIYAZAKI PLANT:
Postal code: 889-1701
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Tel: 044(813)8201 Fax: 044(813)8210

E 12

ENTECH ENGINEERING INC.

P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Toploader Balance Calibration

Manufacturer: OHAUS

Model No: SP601

Serial No: 7125510035

Entech ID:

NIST Traceble Standard Manufacturer: TROEMNER

NIST Traceble Standard Serial No. 25143, 25144 & 82048

Calibration Temperature (°F): 78

Calibration Date: 06/08/07

Personnel: Gang Zhang

Standard ID	NIST Traceable Standard (grams)	Measured Value (grams)	Difference (grams)	Percent Error (%)
1	100.0	99.9	-0.1	-0.10%
2	200.0	199.9	-0.1	-0.05%
3	300.0	299.8	-0.2	-0.07%

Standard is +/- .5 grams in weight

Average Percentage Error = -0.07%

ENTECH ENGINEERING INC.

P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Toploader Balance Calibration

Manufacturer: OHAUS

Model No: SP601

Serial No: 7125510035

Entech ID:

NIST Traceble Standard Manufacturer: TROEMNER

NIST Traceble Standard Serial No. 25143, 25144 & 82048

Calibration Temperature (°F): 80

Calibration Date: 09/20/07

Personnel: T. Rios

Standard ID	NIST Traceable Standard (grams)	Measured Value (grams)	Difference (grams)	Percent Error (%)
1	100.0	100.0	0.0	0.00%
2	200.0	199.9	-0.1	-0.05%
3	300.0	300.0	0.0	0.00%

Standard is +/- .5 grams in weight

Average Percentage Error = -0.02%

ALLOMETRICS, INC.
specialty laboratory services

SALES • SERVICE
P.O. Box 15825 • Baton Rouge, LA 70895 • (225) 303-0419 • Fax (225) 303-0867
2500 Bayport Blvd. • Seabrook, TX 77586 • (281) 474-3329 • Fax (281) 474-5482

Entech Engineering
100 E. Nasa Rd 1 Suite 407
Webster, TX 77598

Date of Test: September 25, 2006
Test Frequency: Annually

Next Test Due: September, 2007

TRACEABLE REPORT

This is to certify that the weights listed below have been tested by Allometrics, Inc. with traceability to the National Institute of Standards and Technology.

Weight ID Number	Nominal Mass Value	Value of Cust. Weights	Reported Error
25143	100 mg	0.09999 g	-0.01 mg
	200	0.20001	0.01
	500	0.49999	-0.01
	100 g	99.9998	-0.2
25144	200 g	200.0001	0.1

WEIGHT TRACEABILITY

Analytical Weight Set No. 019 **NIST Test No.** 822/270236-04 **Exp. Date** 5-19-07
Top Load Weight Set No. 019 **NIST Test No.** 822/270236-04 **Exp. Date** 5-19-07

Tested By: Juan Martinez Jr

Approved By: P. Reyes

AL-032-65

ALLOMETRICS, INC.
specialty laboratory services

SALES • SERVICE

P.O. Box 15825 • Baton Rouge, LA 70895 • (225) 303-0419 • Fax (225) 303-0867
2500 Bayport Blvd. • Seabrook, TX 77586 • (281) 474-3329 • Fax (281) 474-5482

Entech Engineering Inc
408 East Main
League City, Texas 77573
Attn: Lisa Stallsworth

Date of Test: September 20, 2006
Test Frequency: Annually

Next Test Due: September, 2007

TRACEABLE REPORT

This is to certify that the weights listed below have been tested by Allometrics, Inc. with traceability to the National Institute of Standards and Technology.

Weight ID Number	Nominal Mass Value	Value of Cust. Weights	Reported Error
82048	300 g	300.000 g	0.000 g
83731	300 g	300.000 g	0.000 g
61705	300 g	300.000 g	0.000 g
Brass Wt **	300 g	300.004 g	0.004 g
Ohaus 295 g*	295 g	295.204 g	0.204 g
Ohaus 295	295 g	295.214 g	0.214 g
Ohaus 147.5	147.5 g	147.5577	0.0577 g

WEIGHT TRACEABILITY

Analytical Weight Set No. 019 NIST Test No. 822/270236-04 Exp. Date 5-19-07
Top Load Weight Set No. 019 NIST Test No. 822/270236-04 Exp. Date 5-19-07

Tested By: J. Martinez

Approved By: P. Rupp

AL-032-65

ENTECH ENGINEERING INC.

P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Portable Barometer Calibration

Barometer ID: Barometer #5

Presample Calibration

Date:	06/08/07	
Time:	03:15 PM	
Entech Laboratory Mercury Barometer Standard (Actual)	30.12	in Hg
Portable Barometer (Actual)	30.12	in Hg
Temperature at Barometer Reading Site	78	°F
Portable Barometer Reading Error	0.00	in Hg
Portable Barometer Reading Acceptable? (Yes/No)	Yes	

* (Tolerance +/- 0.10 in Hg)

I certify that I have check the portable barometer indentified above and that it agrees with the laboratory barometer standard within +/- 0.10 in Hg.

(GZ) _____

Signature

06/08/07 _____

Date

If Unacceptable, Input Correction	in Hg
Corrected Portable Barometer Reading	in Hg

I certify that I have adjusted the portable barometer indentified above to the laboratory barometer standard.

_____

Signature

_____

Date

Postsample Calibration Check

Date:		
Time:		
Entech Laboratory Mercury Barometer Standard (Actual)		in Hg
Portable Barometer (Actual)		in Hg
Temperature at Barometer Reading Site		°F
Portable Barometer Reading Error	0.00	in Hg
Portable Barometer Reading Acceptable? (Yes/No)	Yes	

* (Tolerance +/- 0.10 in Hg)

I certify that I have check the portable barometer indentified above and that it agrees with the laboratory barometer standard within +/- 0.10 in Hg.

_____

Signature

_____

Date

ENTECH ENGINEERING INC.
P. O. Box 890746, Houston, Texas 77289-0746, (281) 332-3118

Portable Barometer Calibration

Barometer ID: Barometer #5

Presample Calibration

Date: 09/20/07
Time: 11:00 AM

Entech Laboratory Mercury Barometer Standard (Actual)	30.1 in Hg
Portable Barometer (Actual)	30.10 in Hg
Temperature at Barometer Reading Site	80 °F
Portable Barometer Reading Error	0.00 in Hg
Portable Barometer Reading Acceptable? (Yes/No)	Yes

* (Tolerance +/- 0.10 in Hg)

I certify that I have check the portable barometer indentified above and that it agrees with the laboratory barometer standard within +/- 0.10 in Hg.

(TR) _____

Signature

09/20/07
Date

If Unacceptable, Input Correction in Hg
Corrected Portable Barometer Reading in Hg

I certify that I have adjusted the portable barometer indentified above to the laboratory barometer standard.

_____

Signature

_____

Date

Postsample Calibration Check

Date:
Time:

Entech Laboratory Mercury Barometer Standard (Actual)	in Hg
Portable Barometer (Actual)	in Hg
Temperature at Barometer Reading Site	°F
Portable Barometer Reading Error	0.00 in Hg
Portable Barometer Reading Acceptable? (Yes/No)	Yes

* (Tolerance +/- 0.10 in Hg)

I certify that I have check the portable barometer indentified above and that it agrees with the laboratory barometer standard within +/- 0.10 in Hg.

_____

Signature

_____

Date

APPENDIX F.

CALIBRATION GAS CERTIFICATIONS

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC177858

Customer:	Entech Engineering	**Shipping Order #:**	24329584
P.O. Number:	51753	**Transfer #:**	24329584
Item Number:		**LOT #:**	LPX217605
Notes:		**Valve**	CGA580
		Cyl. Pressure:*	1900psig

*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 9-Mar-07 **Expiration Date: 8-Mar-10**

Component	Requested Concentration	Assay Concentration
Oxygen	**5 %**	**5.02 ±0.03 %**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS338	GMIS338	9.98	%	0.05	O2	N2	CC66218	7/27/2008	N.A.

Analysis Information:

Component 1: Oxygen

Analyzer Information	
Manufacturer:	Servomex
Model Number:	4605C
Serial Number:	1101
Analytical Principle:	Paramag.
MPC Calibrated:	02/13/07

	First Triad Analysis On: 3/9/2007			
	Trial 1	Trial 2	Trial 3	Units
Zero	-0.01	-0.01	-0.01	
Reference	9.80	9.80	9.80	
Candidate	4.93	4.93	4.92	
Result	5.03	5.03	5.02	%
		Mean Result:	5.02	%

	Second Triad Analysis On:			
	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference				
Candidate				
Result				
		Mean Result:		

Analyst Signature: Warren Pereira **Calculated by:** Warren Pereira

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC66212

Customer:	Entech	**Shipping Order #:**	20082782
P.O. Number:	51368	**Transfer #:**	20082782
Item Number:		**LOT #:**	LPX138441
Notes:		**Valve**	CGA590
		Cyl. Pressure:*	1900psig

*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 24-Mar-06 **Expiration Date: 23-Mar-09**

Component	Requested Concentration	Assay Concentration
Oxygen	**10 %**	**10.0 ±0.1 %**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS203	GMIS203	19.0	%	0.2	O2	N2	CC57985	5/12/2007	N.A.

Analysis Information:

Component 1:	Oxygen
Analyzer Information	
Manufacturer:	Servomex
Model Number:	4605C
Serial Number:	1101
Analytical Principle:	Paramag.
MPC Calibrated:	03/16/06

	First Triad Analysis On:		3/24/2006	
	Trial 1	Trial 2	Trial 3	Units
Zero	**0.07**	0.07	0.07	
Reference	**19.00**	19.01	19.00	
Candidate	**10.08**	10.07	10.07	
Result	**10.05**	10.04	10.04	%
		Mean Result:	10.04	%

	Second Triad Analysis On:			
	Trial 1	Trial 2	Trial 3	Units
Zero				
Reference				
Candidate				
Result				
		Mean Result:		

Analyst Signature: _____ Warren Pereira **Calculated by:** _____ Warren Pereira

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC204696

Customer:	ENTECH ENGINEERING, INC.	**Shipping Order #:**	24299093
P.O. Number:	51753	**Transfer #:**	24299093
Item Number:		**LOT #:**	LPX217485
Notes:		**Valve**	CGA350
		Cyl. Pressure:*	1900psig

Assay Date: 6-Mar-07 **Expiration Date: 5-Mar-10**

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Carbon Monoxide	**115 ppm**	**120 ±1 ppm**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS339	GMIS339	99.44	ppm	0.48	CO	N2	CC82421	11/14/2008	N.A.

Analysis Information:

Component 1:	Carbon Monoxide
Analyzer Information	
Manufacturer:	KVB/Analect
Model Number:	EN3024
Serial Number:	3024
Analytical Principle:	FTIR
MPC Calibrated:	02/15/07

	First Triad Analysis On: 2/27/2007			
	Trial 1	Trial 2	Trial 3	Units
Zero	-0.03	-0.20	-0.31	
Reference	93.80	93.57	94.14	
Candidate	113.42	113.53	112.84	
Result	120.16	120.27	119.53	ppm
		Mean Result:	119.99	ppm

	Second Triad Analysis On: 3/6/2007			
	Trial 1	Trial 2	Trial 3	Units
Zero	-0.46	-0.59	-0.83	
Reference	92.71	92.46	92.79	
Candidate	112.63	112.65	112.16	
Result	120.74	120.76	120.24	ppm
		Mean Result:	120.58	ppm

Analyst Signature: Bryan Leger **Calculated by:** M. Adnane

Mix Assayed At: Air Liquide America **11426 Fairmont Pkwy, La Porte, TX, 77571** **Phone:(281)474-8400 Fax:(281)474-8419**

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC237112

Customer:	Entech Engineering	**Shipping Order #:**	20650831
P.O. Number:	51432	**Transfer #:**	20650831
Item Number:		**LOT #:**	LPX140765
Notes:		**Valve**	CGA350
		Cyl. Pressure:*	1900psig
Assay Date:	15-May-06	**Expiration Date: 14-May-09**	*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Carbon Monoxide	**300 ppm**	**295 ±2 ppm**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS248	GMIS248	497.0	ppm	3.0	CO	N2	CC92229	7/27/2007	N.A.

Analysis Information:

Component 1:	Carbon Monoxide
Analyzer Information	
Manufacturer:	KVB/Analect
Model Number:	EN3024
Serial Number:	3024
Analytical Principle:	FTIR
	04/13/06 &
MPC Calibrated:	05/11/06

	First Triad Analysis On: 5/8/2006			
	Trial 1	Trial 2	Trial 3	Units
Zero	-0.11	-0.06	-0.17	
Reference	460.74	461.39	462.92	
Candidate	274.33	274.53	273.83	
Result	295.37	295.59	294.83	ppm
		Mean Result:	295.26	ppm

	Second Triad Analysis On: 5/15/2006			
	Trial 1	Trial 2	Trial 3	Units
Zero	-0.64	-0.49	-0.14	
Reference	460.22	459.94	459.76	
Candidate	271.77	272.84	272.74	
Result	293.84	294.99	294.88	ppm
		Mean Result:	294.57	ppm

Analyst Signature: _____ Bryan Leger **Calculated by:** _____ Warren Pereira

Mix Assayed At: Air Liquide America **11426 Fairmont Pkwy, La Porte, TX, 77571** **Phone:(281)474-8400 Fax:(281)474-8419**

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC55329

Customer:	ENTECH ENGINEERING	**Shipping Order #:**	19874790
P.O. Number:	51347	**Transfer #:**	19874790
Item Number:		**LOT #:**	LPX137578
Notes:		**Valve**	CGA660
		Cyl. Pressure:*	1900psig
Assay Date:	14-Mar-06	**Expiration Date: 13-Mar-08**	*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Nitric Oxide	**23 ppm**	**24.4 ±0.4 ppm**
Total NOX		**24.7 ppm**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS310	GMIS310	99.4	ppm	0.7	NO	N2	CC124388	11/10/2007	N.A.

Analysis Information:

Component 1:	Nitric Oxide
Analyzer Information	
Manufacturer:	KVB/Analect
Model Number:	EN3024
Serial Number:	3024
Analytical Principle:	FTIR
MPC Calibrated:	02/09/06 & 03/09/06

	First Triad Analysis On:	3/6/2006		
	Trial 1	Trial 2	Trial 3	Units
Zero	**-0.58**	**-0.27**	**-0.22**	
Reference	**96.97**	**97.33**	**97.38**	
Candidate	**23.47**	**23.09**	**23.46**	
Result	**24.27**	**23.88**	**24.26**	ppm
		Mean Result:	24.14	ppm

	Second Triad Analysis On:	3/14/2006		
	Trial 1	Trial 2	Trial 3	Units
Zero	**0.30**	**-0.23**	**0.27**	
Reference	**95.86**	**95.43**	**95.34**	
Candidate	**23.82**	**23.71**	**23.79**	
Result	**24.69**	**24.58**	**24.66**	ppm
		Mean Result:	24.64	ppm

Analyst Signature: Bryan Leger **Calculated by:** M. Adnane

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC115776

Customer:	ENTECH ENGINEERING	**Shipping Order #:**	22085802
P.O. Number:	51570	**Transfer #:**	22085802
Item Number:		**LOT #:**	LPX110348
Notes:		**Valve**	CGA660
		Cyl. Pressure:*	1900psig
Assay Date:	14-Sep-06	**Expiration Date: 13-Sep-08**	

*Cylinder should not be used when gas pressure is below 150 psig

Component	Requested Concentration	Assay Concentration
Nitric Oxide	**90 ppm**	**95.4 ±0.7 ppm**
Total NOX		**95.6 ppm**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS323	GMIS323	103.5	ppm	0.64	NO	N2	CC55572	1/19/2008	N.A.

Analysis Information:

Component 1:	Nitric Oxide
Analyzer Information	
Manufacturer:	KVB/Analect
Model Number:	EN3024
Serial Number:	3024
Analytical Principle:	FTIR
MPC Calibrated:	08/24/06

	First Triad Analysis On:	9/6/2006		
	Trial 1	Trial 2	Trial 3	Units
Zero	-0.09	-0.62	0.20	
Reference	99.84	100.40	100.09	
Candidate	91.84	91.51	92.77	
Result	94.96	94.62	95.92	ppm
		Mean Result:	95.17	ppm

	Second Triad Analysis On:	9/14/2006		
	Trial 1	Trial 2	Trial 3	Units
Zero	0.07	-0.23	-0.02	
Reference	98.57	99.15	99.86	
Candidate	91.29	91.43	92.07	
Result	95.26	95.40	96.07	ppm
		Mean Result:	95.58	ppm

Analyst Signature: Bryan Leger **Calculated by:** M. Adnane

Mix Assayed At: Air Liquide America 11426 Fairmont Pkwy, La Porte, TX, 77571 Phone:(281)474-8400 Fax:(281)474-8419

AIR LIQUIDE

CERTIFICATE of ANALYSIS

Interference-Free Multi-Component EPA Protocol Gases

NOTE: Analytical uncertainty and NIST traceability are in compliance with EPA-600/R-97/121

Section 2.2 Procedure: G-1

Cyl. Number: CC66290

Customer:	ENTECH ENGINEERING, INC.	**Shipping Order #:**	19420416
P.O. Number:	51274	**Transfer #:**	19420416
Item Number:		**LOT #:**	LPX135756
Notes:		**Valve**	CGA660
		Cyl. Pressure:*	1900psig

*Cylinder should not be used when gas pressure is below 150 psig

Assay Date: 8-Feb-06 **Expiration Date: 8-Feb-08**

Component	Requested Concentration	Assay Concentration
Sulfur Dioxide	**96 ppm**	**94.7 ±0.6 ppm**
Nitrogen	**Balance**	**Balance**

Reference Standard(s) Employed For Analysis:

Std name	Std #	Conc.	Units	Std. Error	Comp.	Balance	Cyl. No.	Exp. Date	Sample No.
GMIS118	GMIS118	99.9	ppm	0.6	SO2	N2	CC66144	9/30/2007	N.A.

Analysis Information:

Component 1:	Sulfur Dioxide
Analyzer Information	
Manufacturer:	KVB/Analect
Model Number:	EN3024
Serial Number:	3024
Analytical Principle:	FTIR
MPC Calibrated:	01/26/06

	First Triad Analysis On:		2/1/2006	
	Trial 1	Trial 2	Trial 3	Units
Zero	**0.01**	**-0.15**	**0.06**	
Reference	**97.94**	**98.14**	**98.47**	
Candidate	**93.10**	**93.11**	**93.51**	
Result	**94.73**	**94.74**	**95.15**	ppm
		Mean Result:	94.87	ppm

	Second Triad Analysis On:		2/8/2006	
	Trial 1	Trial 2	Trial 3	Units
Zero	**0.39**	**0.09**	**0.21**	
Reference	**97.92**	**98.50**	**97.81**	
Candidate	**92.30**	**92.97**	**93.05**	
Result	**94.00**	**94.68**	**94.76**	ppm
		Mean Result:	94.48	ppm

Analyst Signature: Bryan Leger **Calculated by:** M. Adnane

Mix Assayed At: Air Liquide America **11426 Fairmont Pkwy, La Porte, TX, 77571** **Phone:(281)474-8400 Fax:(281)474-8419**

APPENDIX G.

PROCESS DATA

THIS PAGE HAS BEEN REMOVED BECAUSE IT CONTAINED CONFIDENTIAL BUSINESS INFORMATION.

THIS PAGE HAS BEEN REMOVED BECAUSE IT CONTAINED CONFIDENTIAL BUSINESS INFORMATION.

THIS PAGE HAS BEEN REMOVED BECAUSE IT CONTAINED CONFIDENTIAL BUSINESS INFORMATION.

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THIS PAGE HAS BEEN REMOVED BECAUSE IT CONTAINED CONFIDENTIAL BUSINESS INFORMATION.

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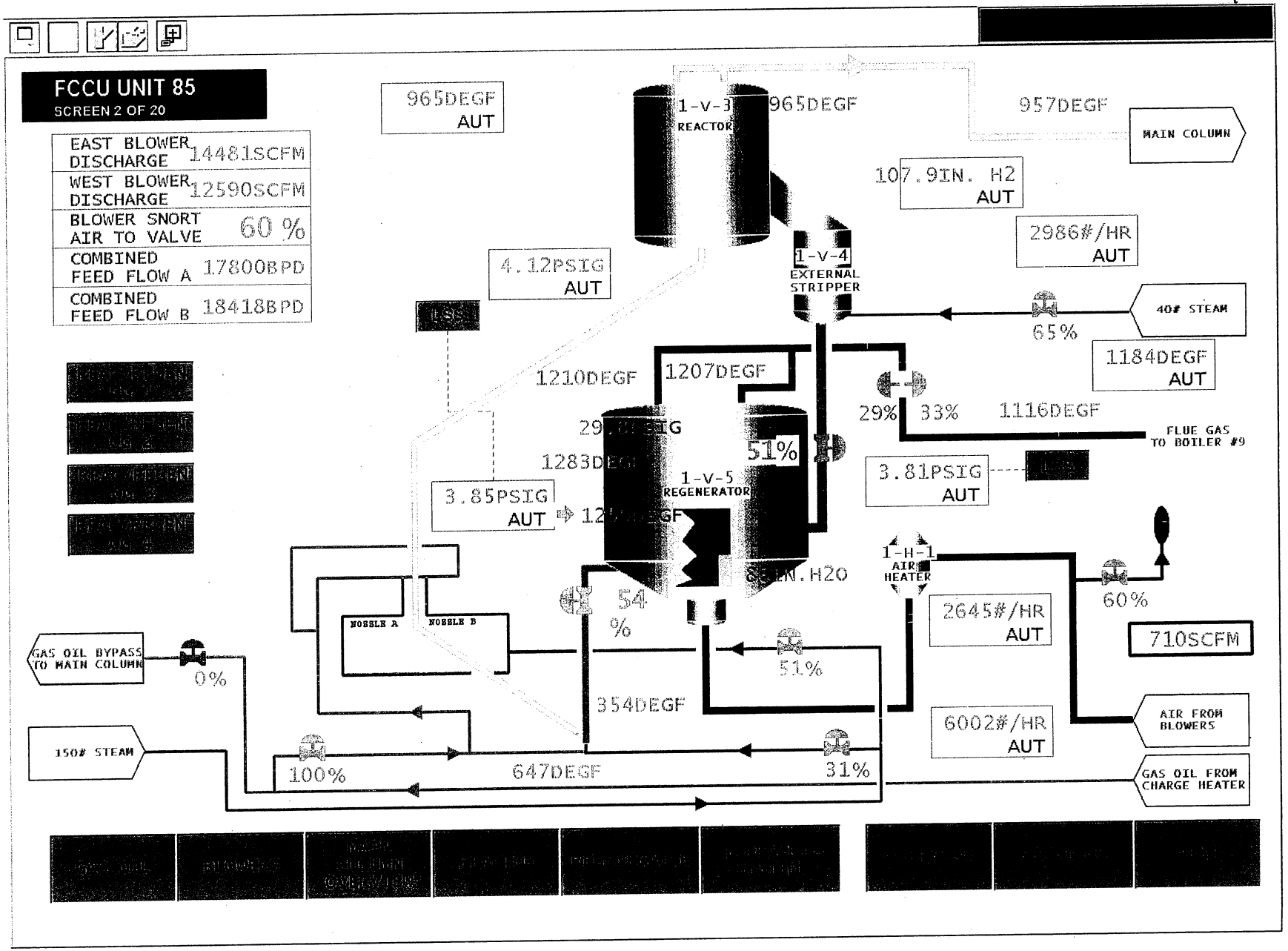
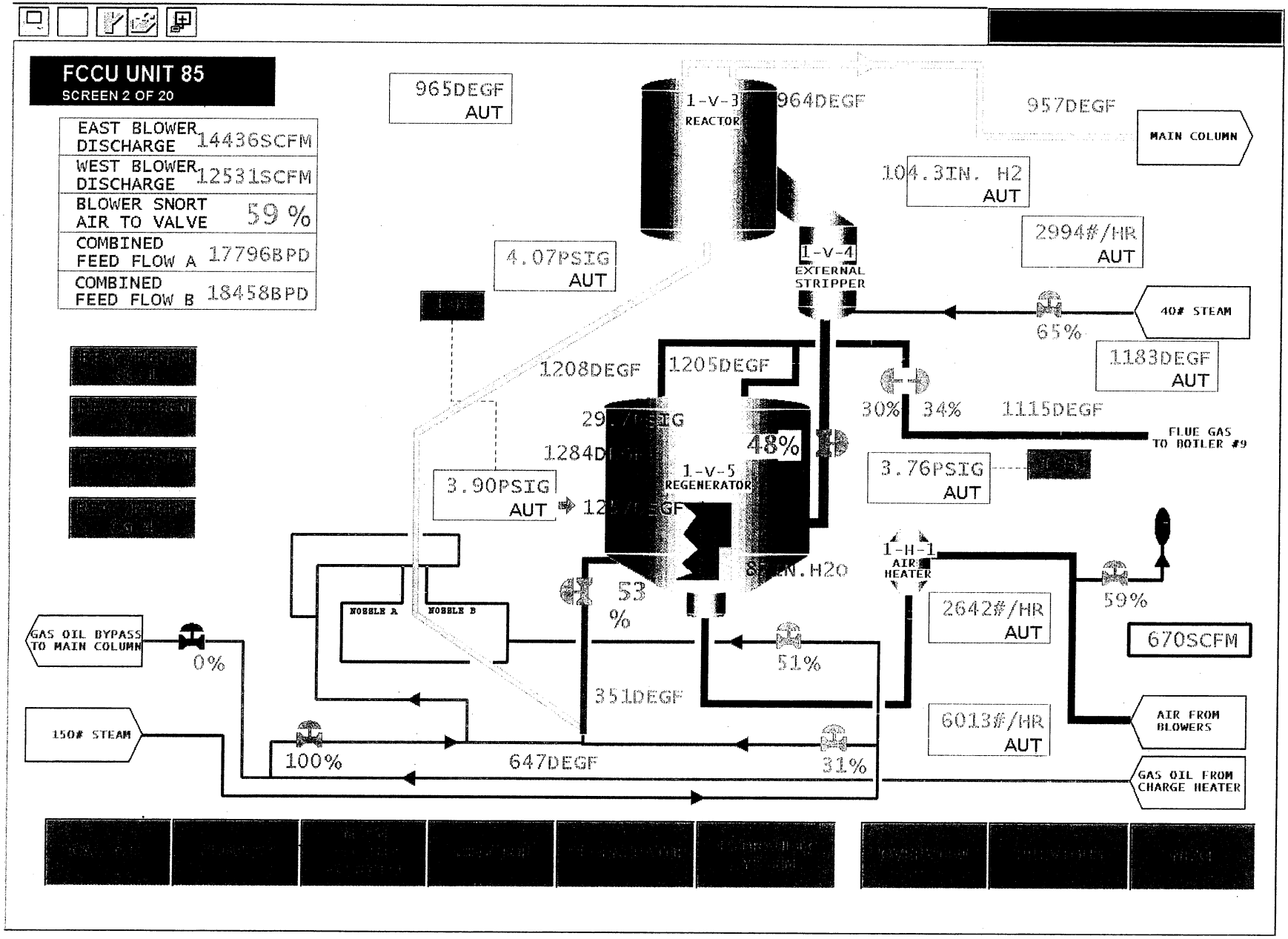
08-23-07
Delek Refinery
FCCU/B&R Test #1

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COMBINED FEED FLOW A 17796BPD
COMBINED FEED FLOW B 18458BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
957DEGF
MAIN COLUMN
104.3IN. H2 AUT
2994#/HR AUT
4.07PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
65%
1208DEGF
1205DEGF
1183DEGF AUT
30%
34%
1115DEGF
FLUE GAS TO BOILER #9
48%
1-V-5 REGENERATOR
3.90PSIG AUT
3.76PSIG AUT
1-H-1 AIR HEATER
53 %
NOZZLE A
NOZZLE B
2642#/HR AUT
59%
670SCFM
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
351DEGF
6013#/HR AUT
AIR FROM BLOWERS
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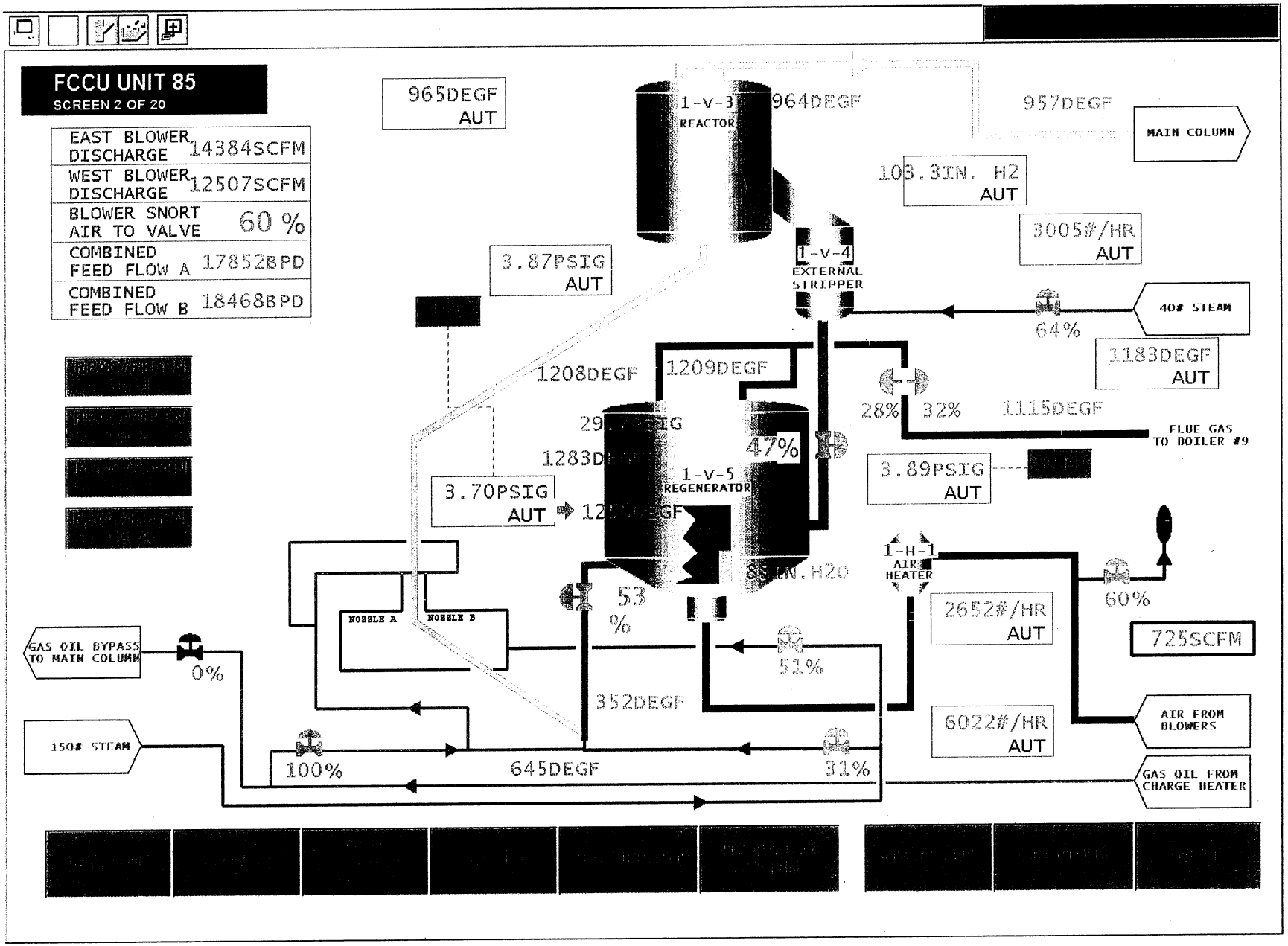
100%
647DEGF
31%
GAS OIL FROM CHARGE HEATER

11:10 AM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COMBINED FEED FLOW B 18468BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
957DEGF
MAIN COLUMN
103.3IN. H2 AUT
3005#/HR AUT
3.87PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
64%
1183DEGF AUT
1208DEGF
1209DEGF
28%
32%
1115DEGF
FLUE GAS TO BOILER #9
47%
1-V-5 REGENERATOR
3.89PSIG AUT
3.70PSIG AUT
1-H-1 AIR HEATER
60%
725SCFM
2652#/HR AUT
NOZZLE A
NOZZLE B
53 %
51%
GAS OIL BYPASS TO MAIN COLUMN
0%
352DEGF
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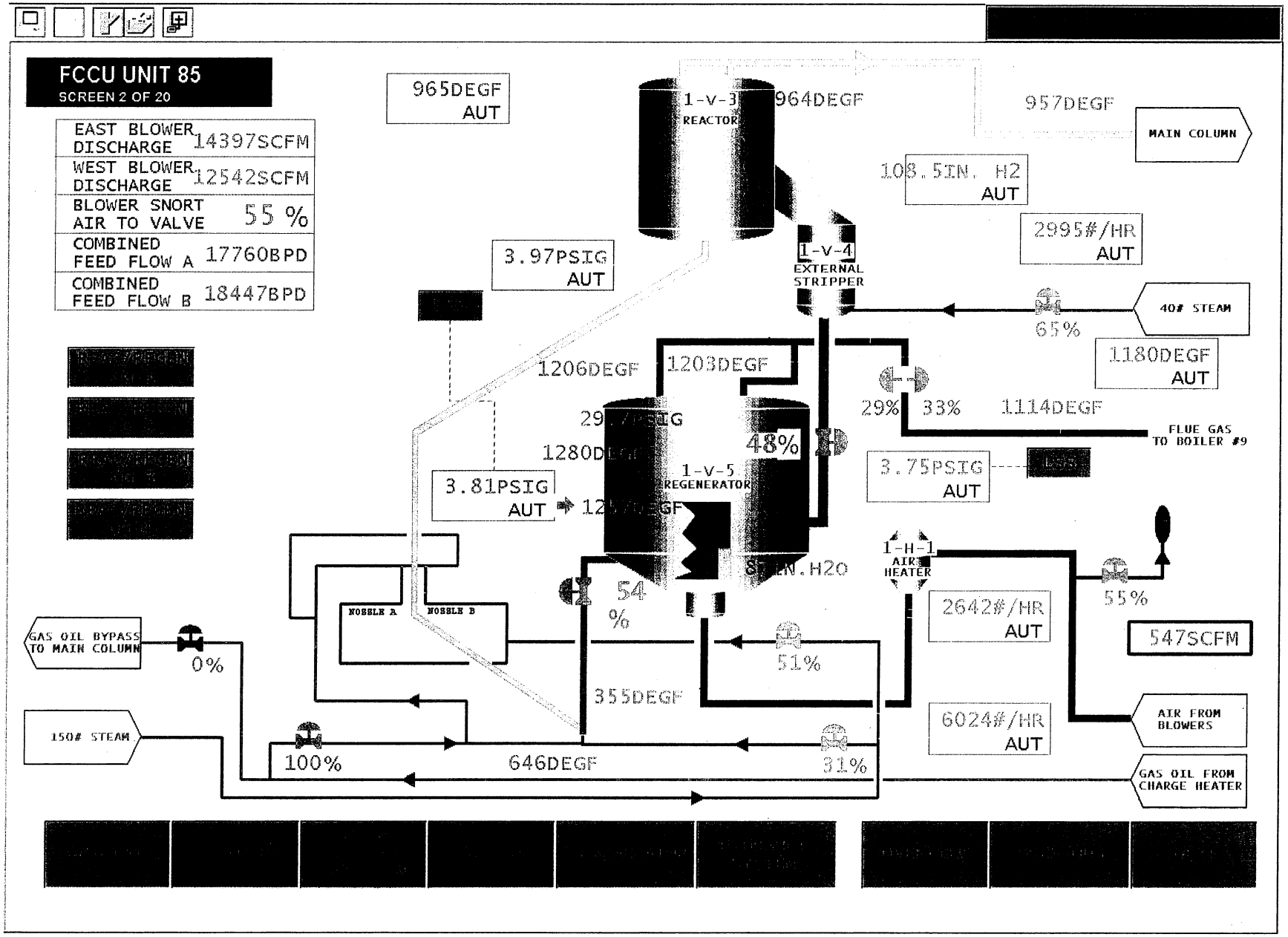
31%
GAS OIL FROM CHARGE HEATER

C10

11:25 AM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SCREEN 2 OF 20
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COMBINED FEED FLOW B 18447BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
957DEGF
MAIN COLUMN
108.5IN. H2 AUT
2995#/HR AUT
3.97PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
65%
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1203DEGF
29%
33%
1114DEGF
FLUE GAS TO BOILER #9
48%
1-V-5 REGENERATOR
3.75PSIG AUT
3.81PSIG AUT
1-H-1 AIR HEATER
55%
2642#/HR AUT
547SCFM
54 %
NOZZLE A
NOZZLE B
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
355DEGF
AIR FROM BLOWERS
6024#/HR AUT
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31%
GAS OIL FROM CHARGE HEATER

C11

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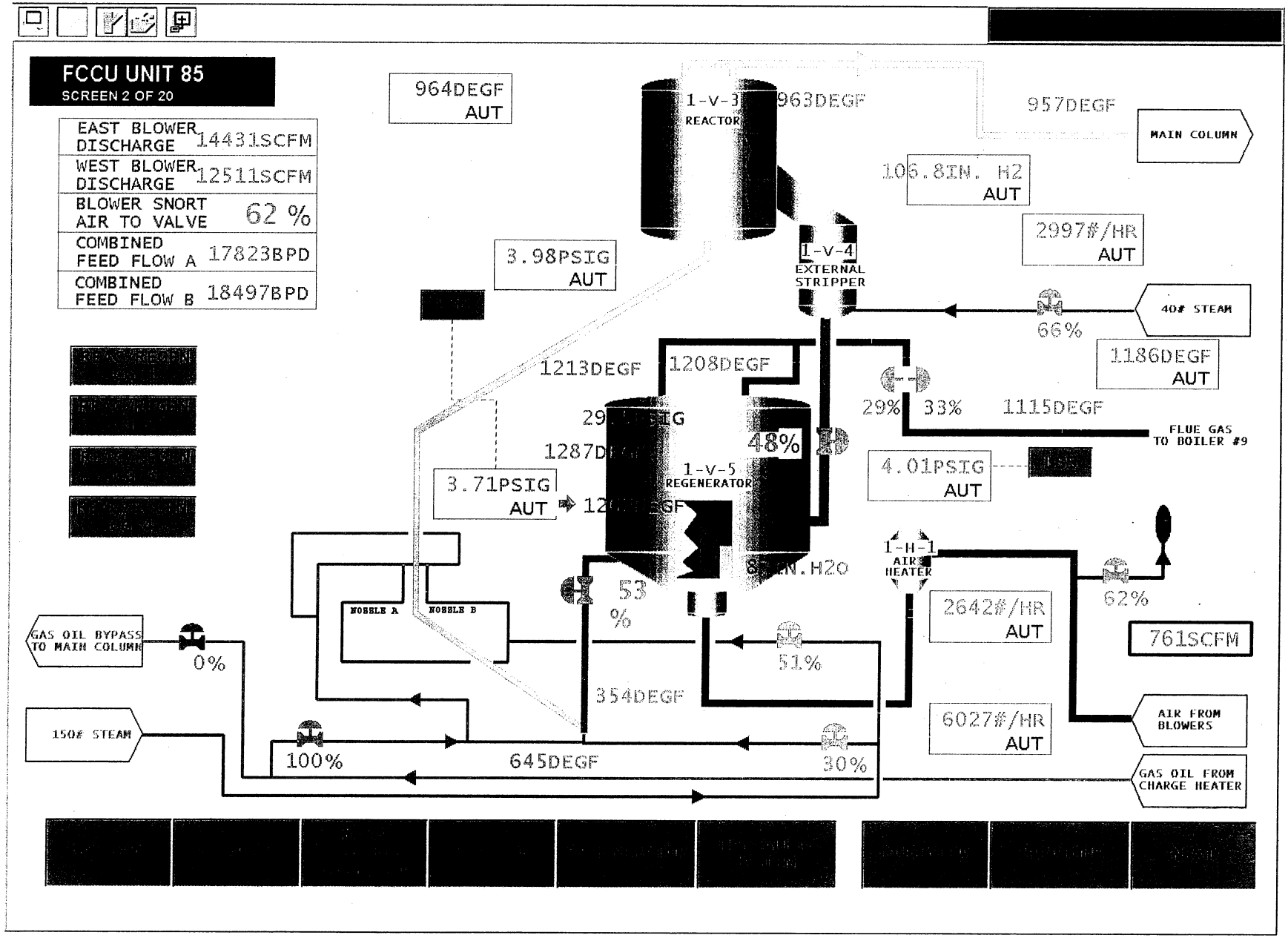
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SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14431SCFM
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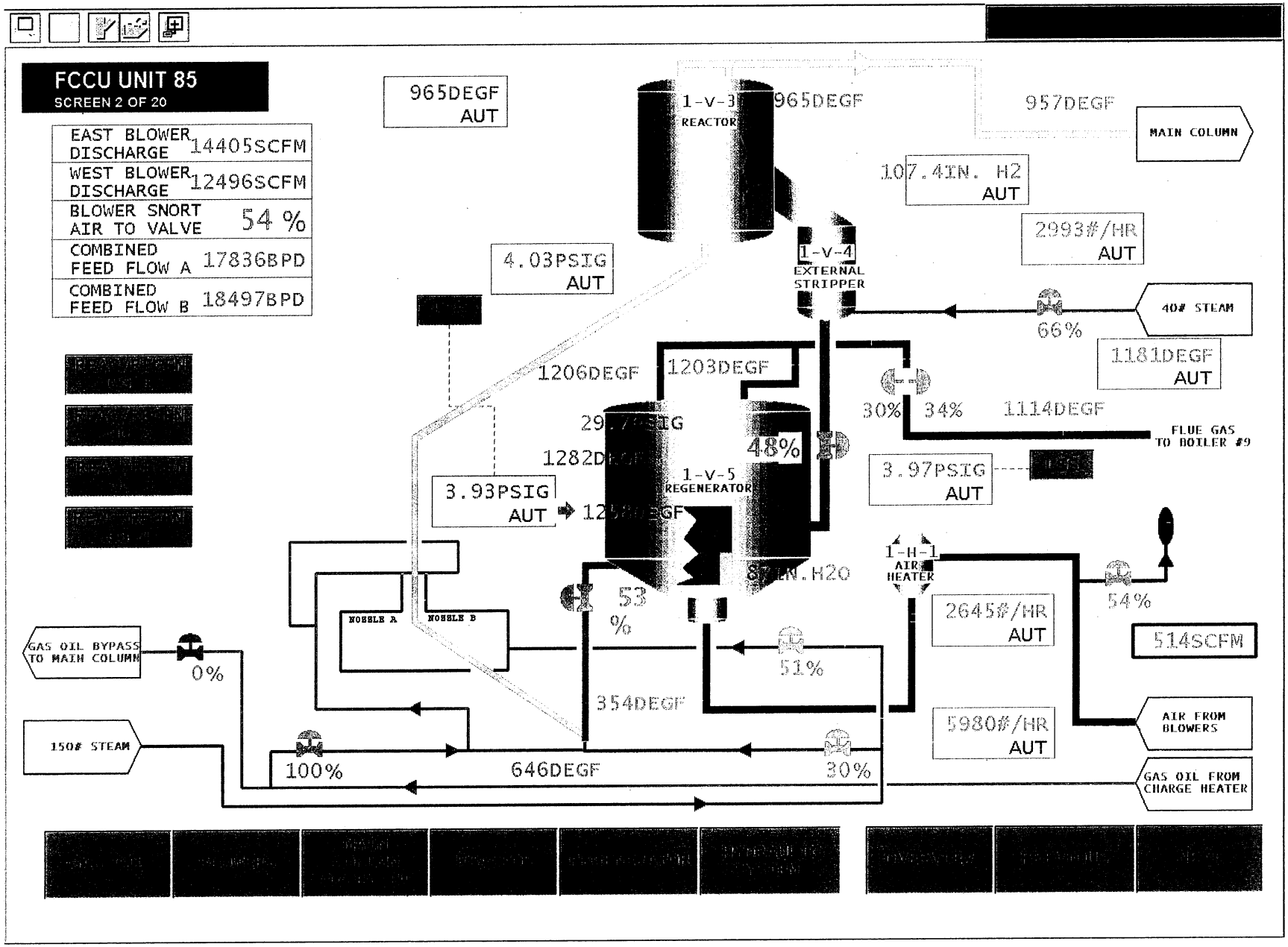
BLOWER SNORT AIR TO VALVE 62 %
COMBINED FEED FLOW A 17823BPD
COMBINED FEED FLOW B 18497BPD
964DEGF AUT
1-V-3 REACTOR
963DEGF
957DEGF
MAIN COLUMN
106.8IN. H2 AUT
2997#/HR AUT
3.98PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
66%
1213DEGF
1208DEGF
1186DEGF AUT
29%
33%
1115DEGF
FLUE GAS TO BOILER #9
48%
1-V-5 REGENERATOR
4.01PSIG AUT
3.71PSIG AUT
1-H-1 AIR HEATER
62%
761SCFM
53 %
NOZZLE A
NOZZLE B
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
2642#/HR AUT
354DEGF
6027#/HR AUT
AIR FROM BLOWERS
150# STEAM
100%
645DEGF
30%
GAS OIL FROM CHARGE HEATER

612

11:55AM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SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14405SCFM
WEST BLOWER DISCHARGE 12496SCFM
BLOWER SNORT AIR TO VALVE 54 %
COMBINED FEED FLOW A 17836BPD
COMBINED FEED FLOW B 18497BPD
965DEGF AUT
1-V-3 REACTOR
965DEGF
957DEGF
MAIN COLUMN
107.4IN. H2 AUT
2993#/HR AUT
4.03PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
66%
1181DEGF AUT
1206DEGF
1203DEGF
30%
34%
1114DEGF
FLUE GAS TO BOILER #9
48%
1-V-5 REGENERATOR
3.97PSIG AUT
3.93PSIG AUT
1-H-1 AIR HEATER
54%
53 %
NOZZLE A
NOZZLE B
2645#/HR AUT
514SCFM
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
354DEGF
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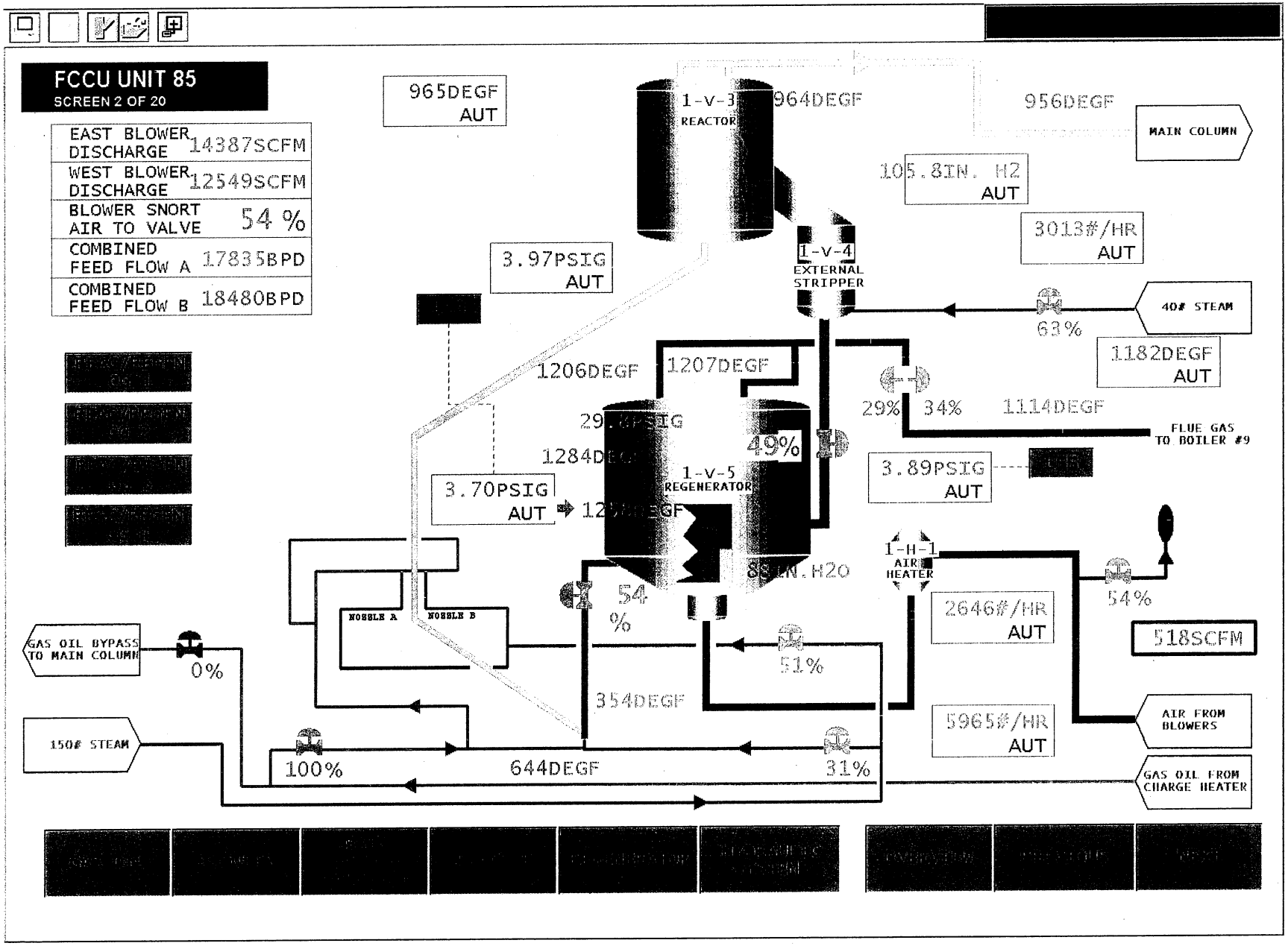
30%
GAS OIL FROM CHARGE HEATER

G13

12:18 PM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SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14387SCFM
WEST BLOWER DISCHARGE 12549SCFM
BLOWER SNORT AIR TO VALVE 54 %
COMBINED FEED FLOW A 17835BPD
COMBINED FEED FLOW B 18480BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
956DEGF
MAIN COLUMN
105.8IN. H2 AUT
3013#/HR AUT
3.97PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
63%
1182DEGF AUT
1206DEGF
1207DEGF
29%
34%
1114DEGF
FLUE GAS TO BOILER #9
49%
1284DEGF
1-V-5 REGENERATOR
3.89PSIG AUT
3.70PSIG AUT
1-H-1 AIR HEATER
54%
NOZZLE A
NOZZLE B
54 %
51%
2646#/HR AUT
518SCFM
GAS OIL BYPASS TO MAIN COLUMN
0%
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AIR FROM BLOWERS
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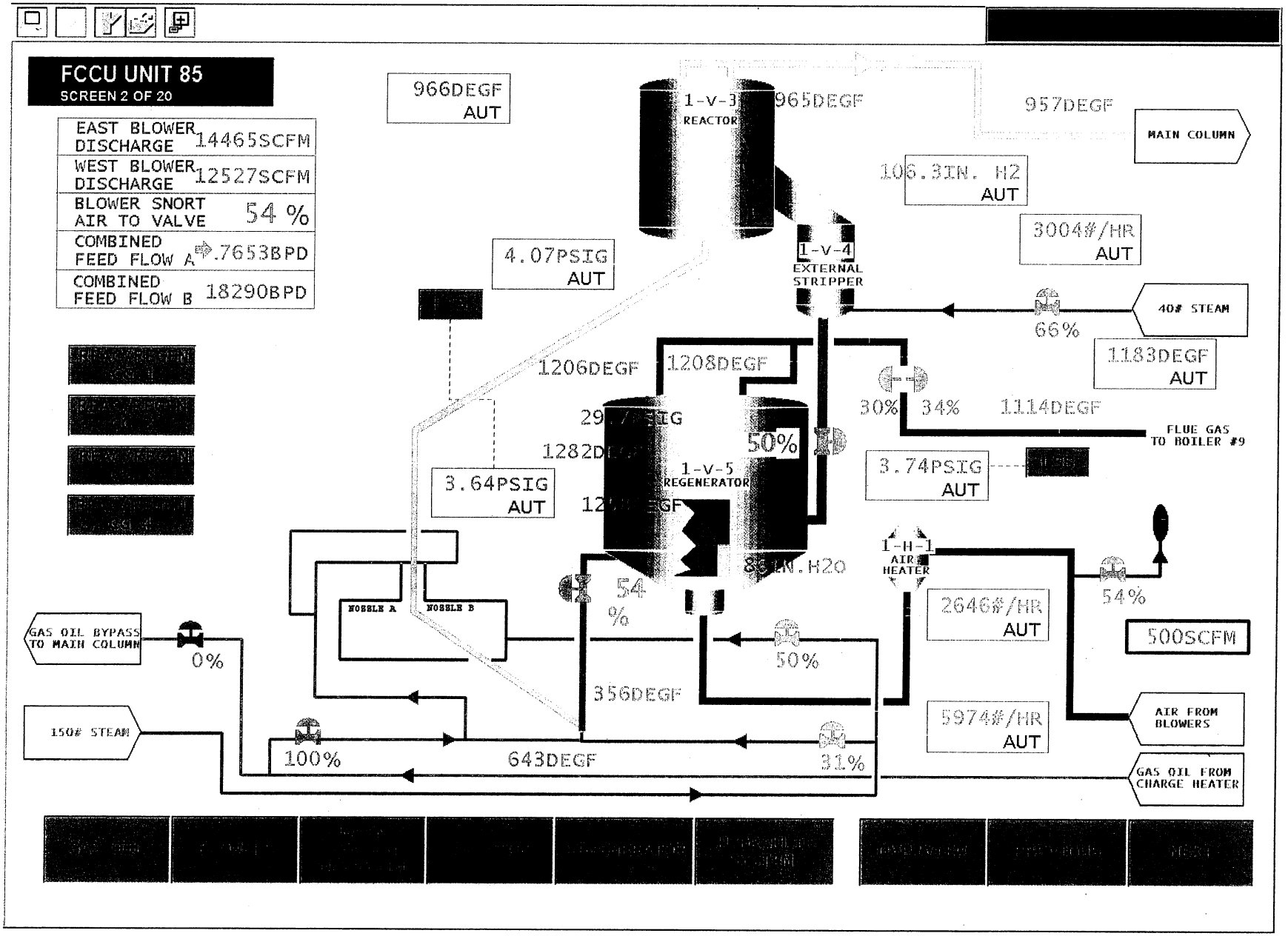
31%
GAS OIL FROM CHARGE HEATER

C14

12:25 PM


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14465SCFM
WEST BLOWER DISCHARGE 12527SCFM
BLOWER SNORT AIR TO VALVE 54 %
COMBINED FEED FLOW A .7653BPD
COMBINED FEED FLOW B 18290BPD
966DEGF AUT
1-V-3 REACTOR
965DEGF
957DEGF
MAIN COLUMN
106.3IN. H2 AUT
3004#/HR AUT
4.07PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
66%
1206DEGF
1208DEGF
1183DEGF AUT
30%
34%
1114DEGF
FLUE GAS TO BOILER #9
50%
1-V-5 REGENERATOR
3.64PSIG AUT
3.74PSIG AUT
1-H-1 AIR HEATER
54 %
NOZZLE A
NOZZLE B
2646#/HR AUT
54%
500SCFM
GAS OIL BYPASS TO MAIN COLUMN
0%
50%
356DEGF
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643DEGF
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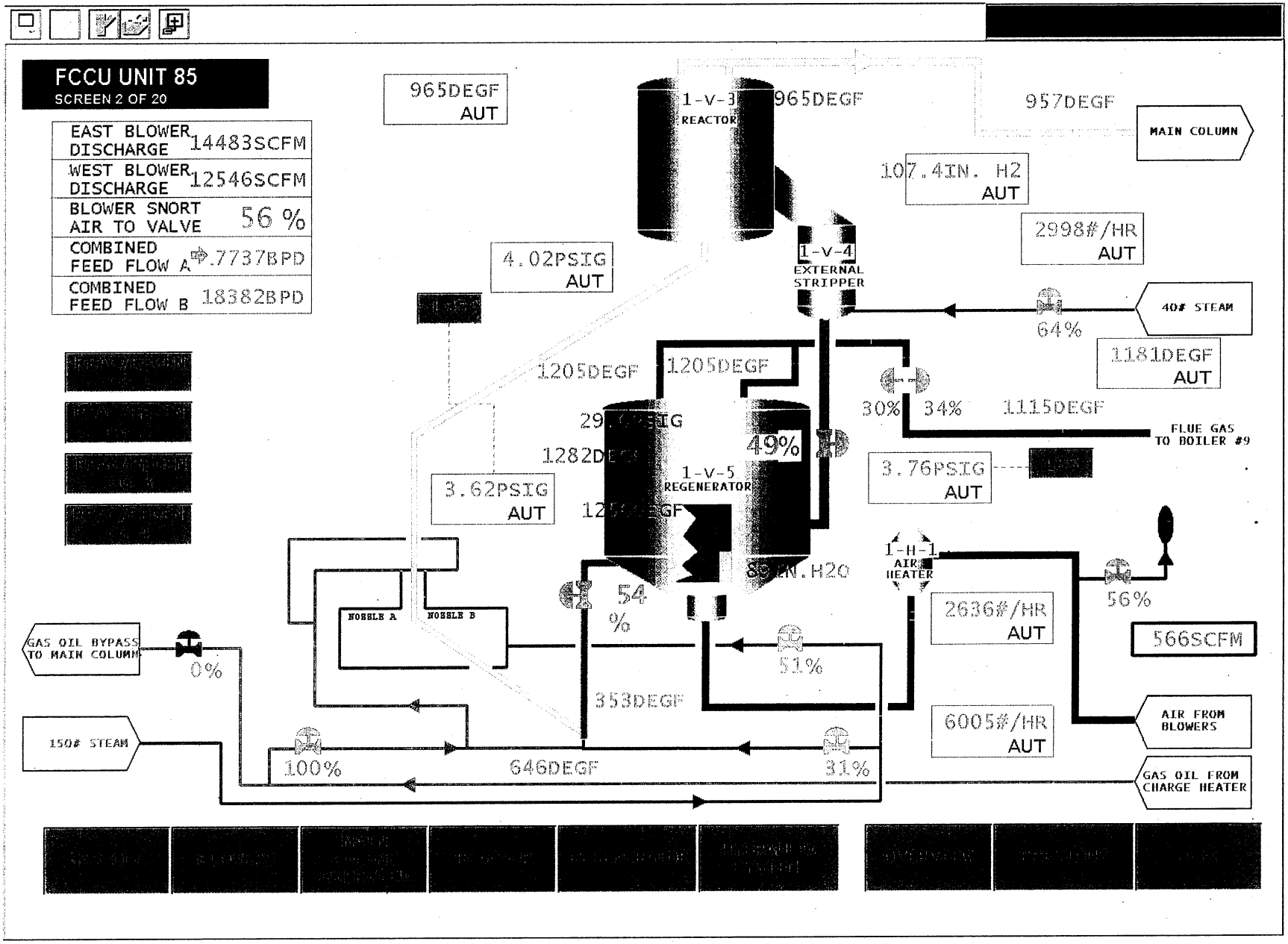
AIR FROM BLOWERS
GAS OIL FROM CHARGE HEATER

G15

12:53 PM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SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14483SCFM
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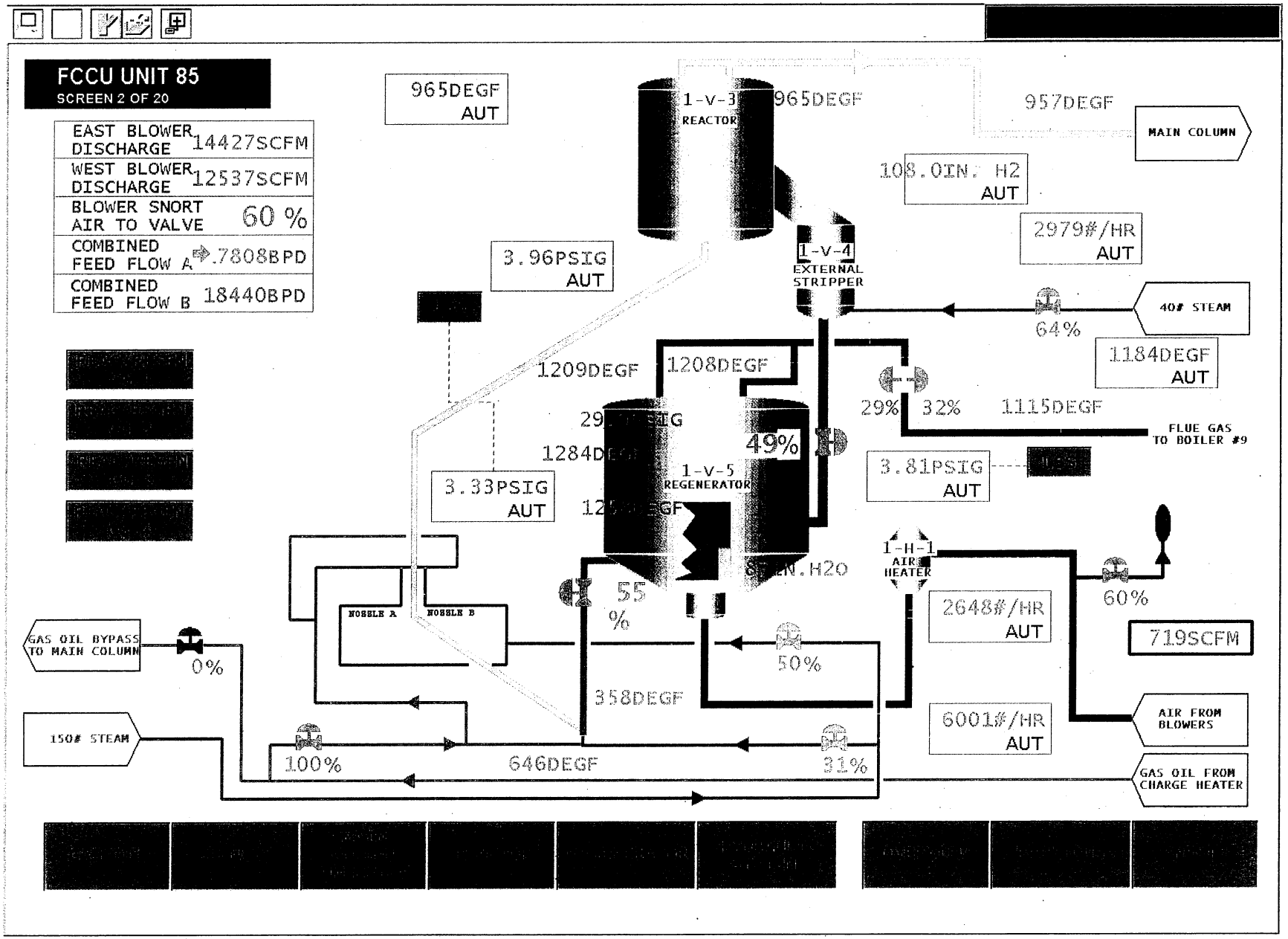
COMBINED FEED FLOW B 18382BPD
965DEGF AUT
1-V-3 REACTOR
965DEGF
957DEGF
MAIN COLUMN
107.4IN. H2 AUT
2998#/HR AUT
4.02PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
64%
1181DEGF AUT
1205DEGF
1205DEGF
30%
34%
1115DEGF
FLUE GAS TO BOILER #9
49%
1-V-5 REGENERATOR
3.76PSIG AUT
3.62PSIG AUT
1-H-1 AIR HEATER
56%
566SCFM
2636#/HR AUT
NOZZLE A
NOZZLE B
54 %
51%
GAS OIL BYPASS TO MAIN COLUMN
0%
353DEGF
AIR FROM BLOWERS
6005#/HR AUT
150# STEAM
100%
646DEGF
31%
GAS OIL FROM CHARGE HEATER

G16

1:10 PM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SCREEN 2 OF 20
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WEST BLOWER DISCHARGE 12537SCFM
BLOWER SNORT AIR TO VALVE 60 %
COMBINED FEED FLOW A .7808BPD
COMBINED FEED FLOW B 18440BPD
965DEGF AUT
1-V-3 REACTOR
965DEGF
957DEGF
MAIN COLUMN
108.0IN. H2 AUT
2979#/HR AUT
3.96PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
64%
1184DEGF AUT
1209DEGF
1208DEGF
29% 32% 1115DEGF
FLUE GAS TO BOILER #9
49%
1-V-5 REGENERATOR
3.81PSIG AUT
3.33PSIG AUT
1-H-1 AIR HEATER
55 %
NOZZLE A
NOZZLE B
60%
719SCFM
2648#/HR AUT
GAS OIL BYPASS TO MAIN COLUMN
0%
50%
358DEGF
AIR FROM BLOWERS
6001#/HR AUT
150# STEAM
100%
646DEGF
31%
GAS OIL FROM CHARGE HEATER

G17

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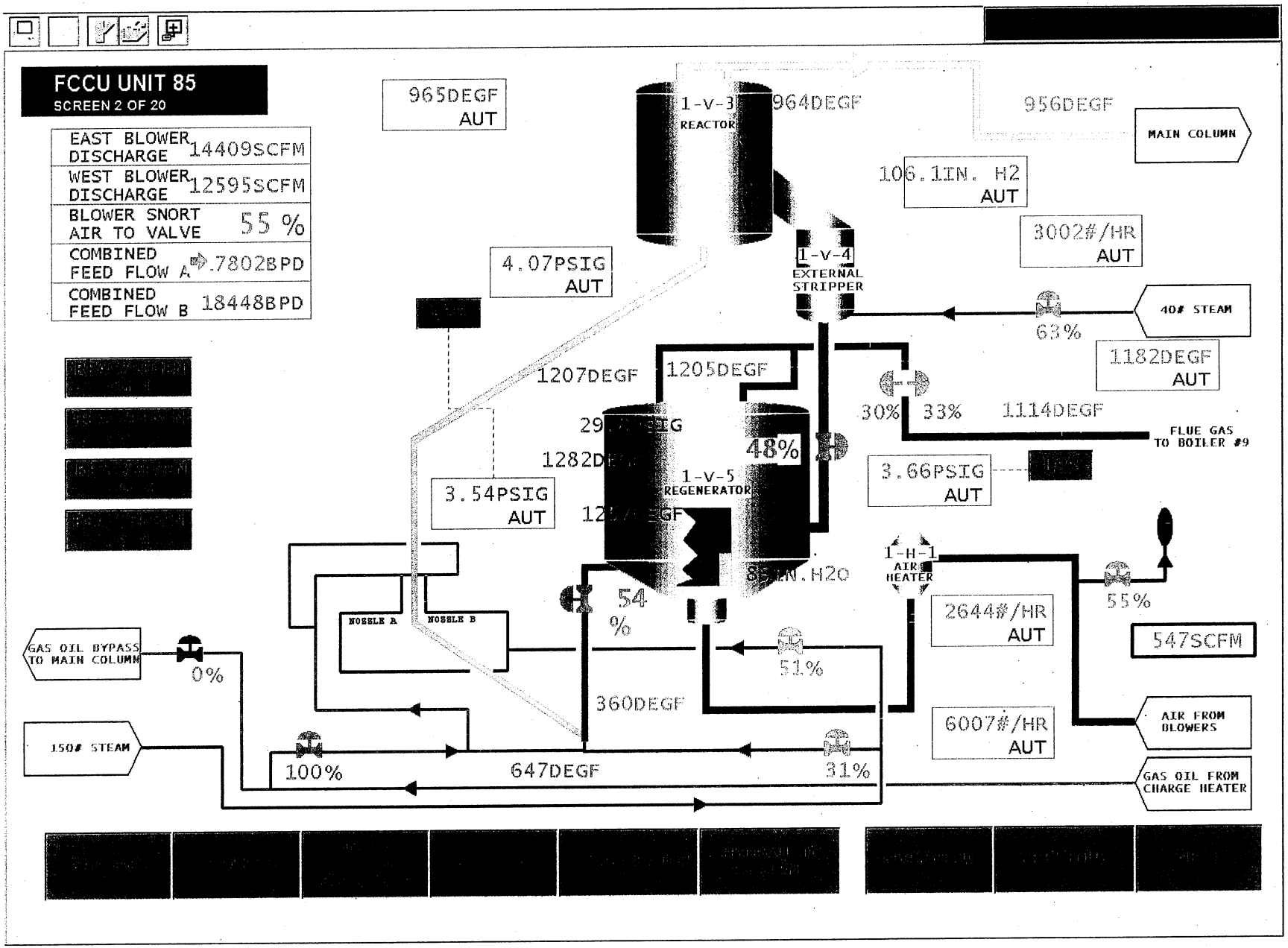
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SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14409SCFM
WEST BLOWER DISCHARGE 12595SCFM
BLOWER SNORT AIR TO VALVE 55 %
COMBINED FEED FLOW A .7802BPD
COMBINED FEED FLOW B 18448BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
956DEGF
MAIN COLUMN
106.1IN. H2 AUT
3002#/HR AUT
4.07PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
63%
1182DEGF AUT
1207DEGF
1205DEGF
30%
33%
1114DEGF
FLUE GAS TO BOILER #9
48%
1-V-5 REGENERATOR
3.66PSIG AUT
3.54PSIG AUT
1-H-1 AIR HEATER
54 %
NOZZLE A
NOZZLE B
55%
2644#/HR AUT
547SCFM
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
360DEGF
AIR FROM BLOWERS
6007#/HR AUT
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31%
GAS OIL FROM CHARGE HEATER

C18

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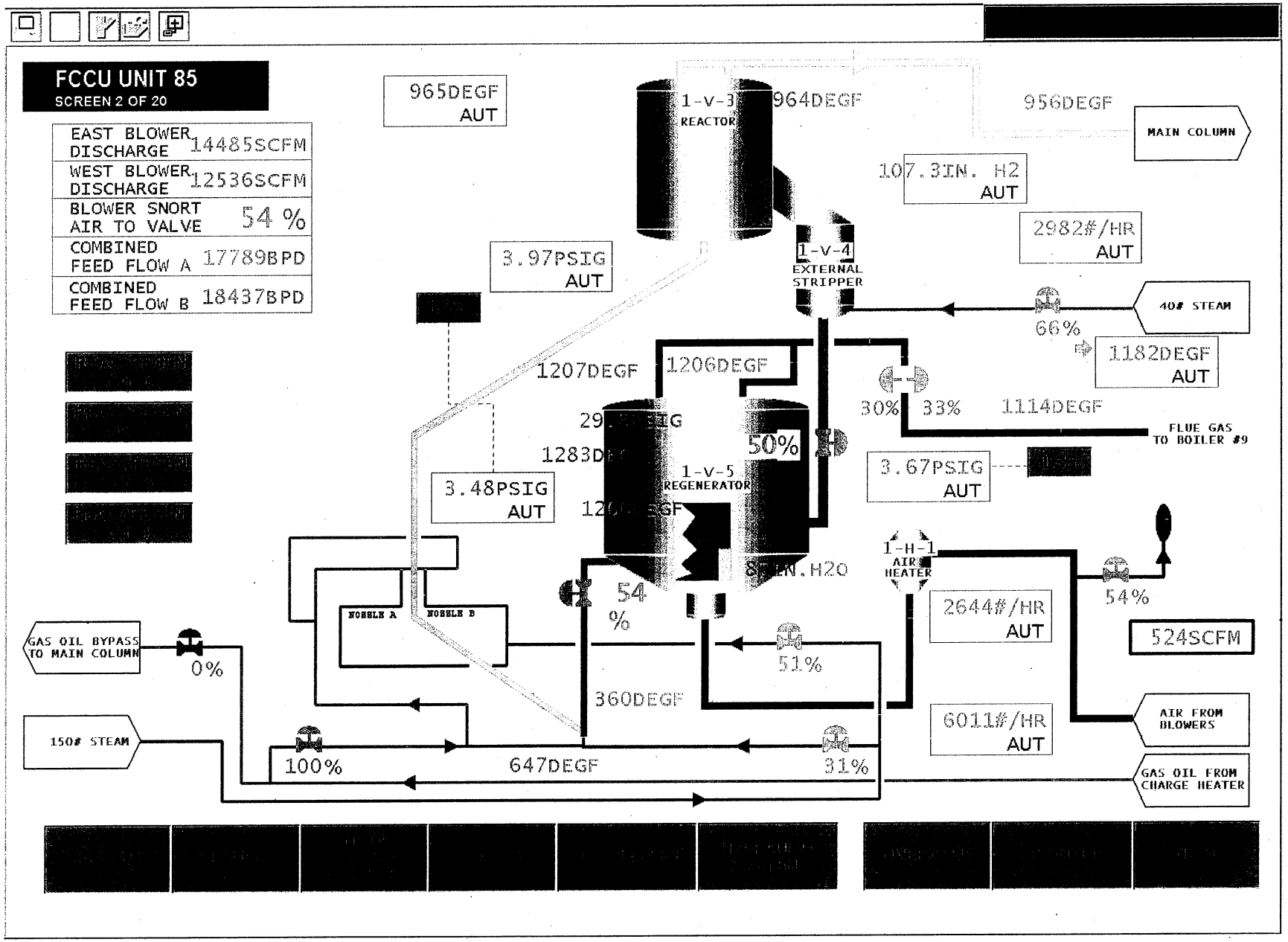
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SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14485SCFM
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COMBINED FEED FLOW A 17789BPD
COMBINED FEED FLOW B 18437BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
956DEGF
MAIN COLUMN
107.3IN. H2 AUT
2982#/HR AUT
3.97PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
66%
1182DEGF AUT
1207DEGF
1206DEGF
30%
33%
1114DEGF
FLUE GAS TO BOILER #9
50%
1-V-5 REGENERATOR
3.67PSIG AUT
3.48PSIG AUT
1-H-1 AIR HEATER
54%
2644#/HR AUT
524SCFM
NOZZLE A
NOZZLE B
54 %
51%
GAS OIL BYPASS TO MAIN COLUMN
0%
360DEGF
6011#/HR AUT
AIR FROM BLOWERS
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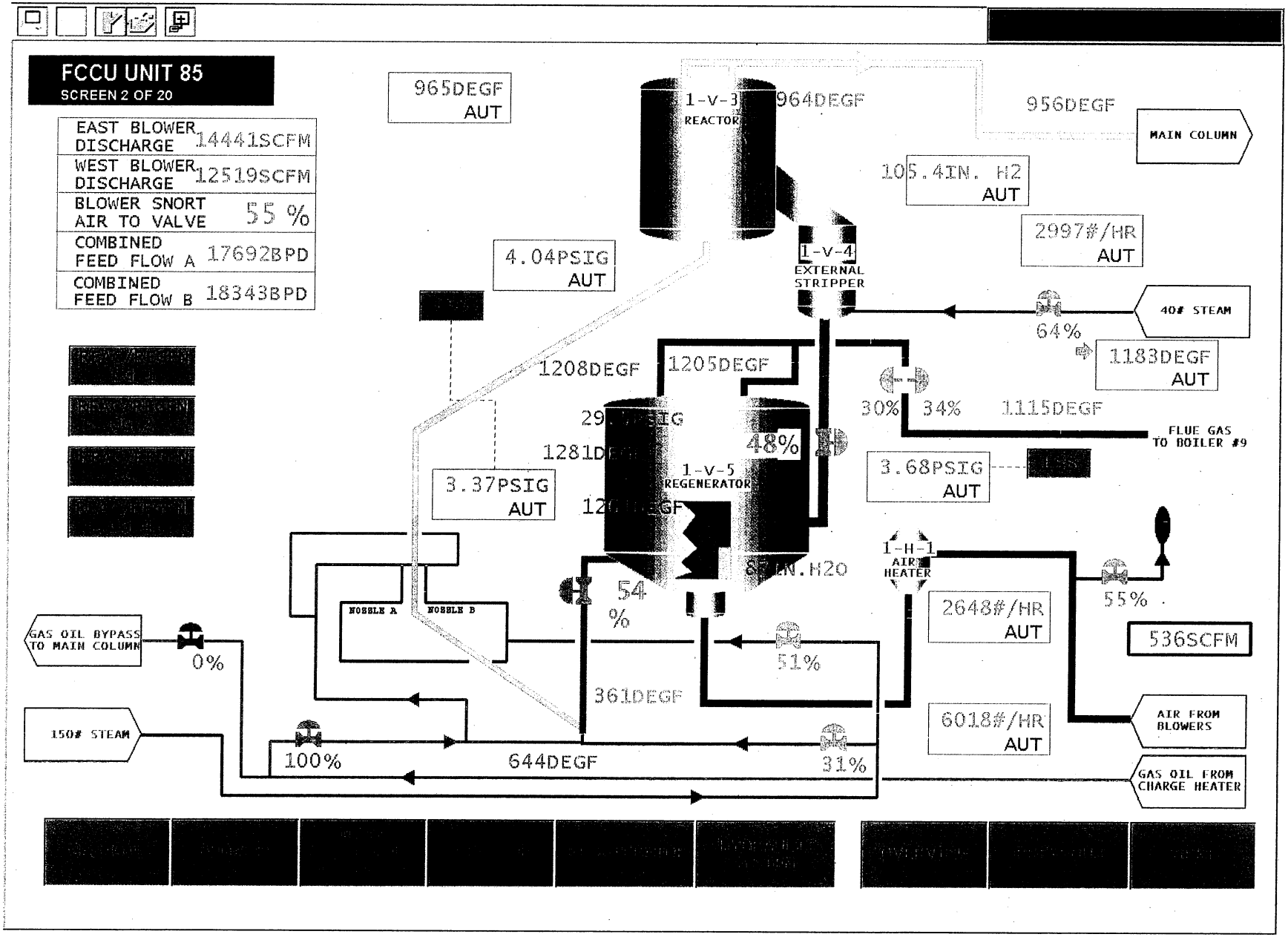
647DEGF
31%
GAS OIL FROM CHARGE HEATER

Cg

1:55 PM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SCREEN 2 OF 20
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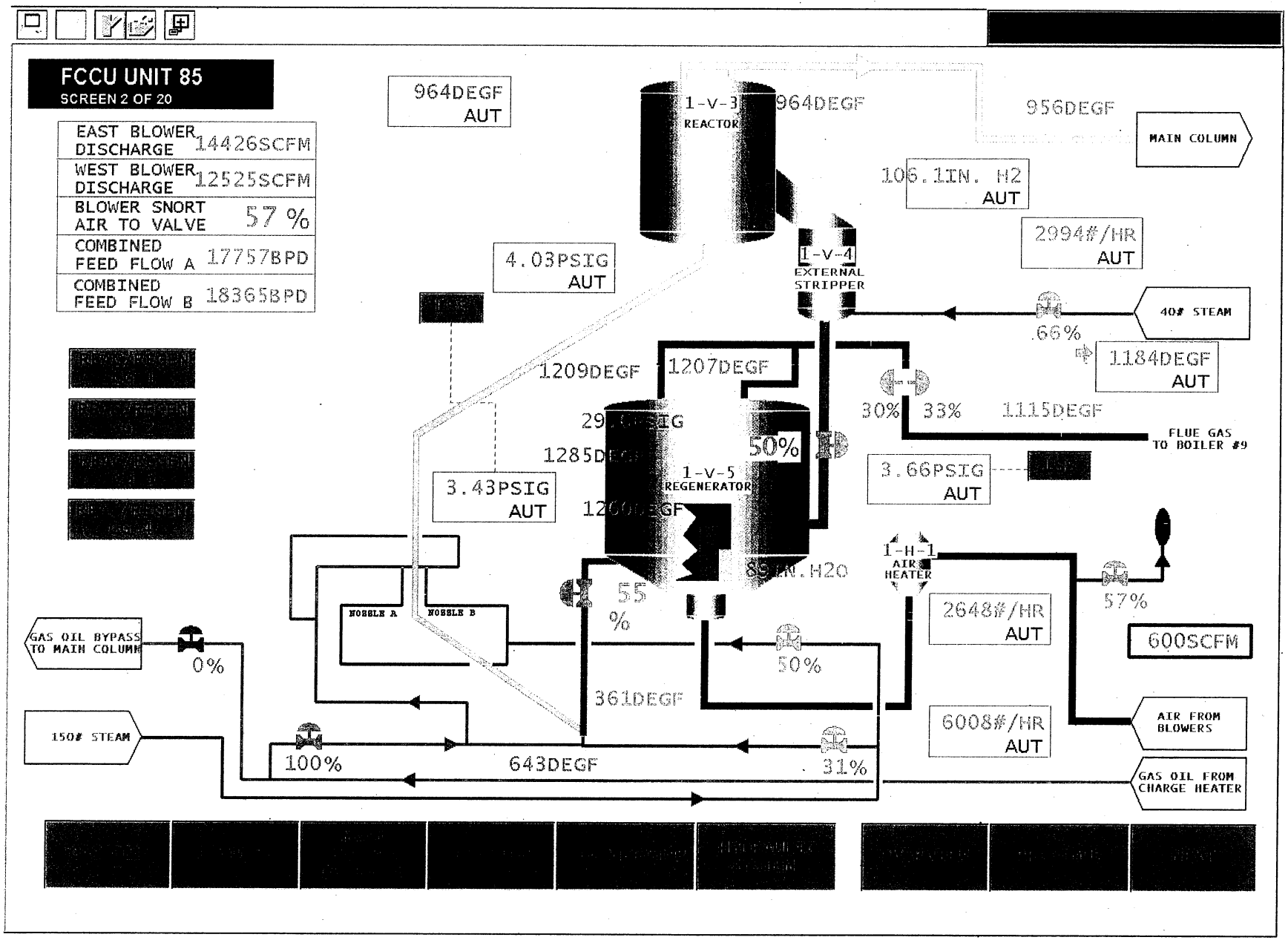
WEST BLOWER DISCHARGE 12519SCFM
BLOWER SNORT AIR TO VALVE 55 %
COMBINED FEED FLOW A 17692BPD
COMBINED FEED FLOW B 18343BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
956DEGF
MAIN COLUMN
105.4IN. H2 AUT
2997#/HR AUT
4.04PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
64%
1183DEGF AUT
1208DEGF
1205DEGF
30%
34%
1115DEGF
FLUE GAS TO BOILER #9
48%
1-V-5 REGENERATOR
3.68PSIG AUT
3.37PSIG AUT
1-H-1 AIR HEATER
54 %
NOZZLE A
NOZZLE B
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
2648#/HR AUT
55%
536SCFM
361DEGF
6018#/HR AUT
AIR FROM BLOWERS
150# STEAM
100%
644DEGF
31%
GAS OIL FROM CHARGE HEATER

G20

2:10PM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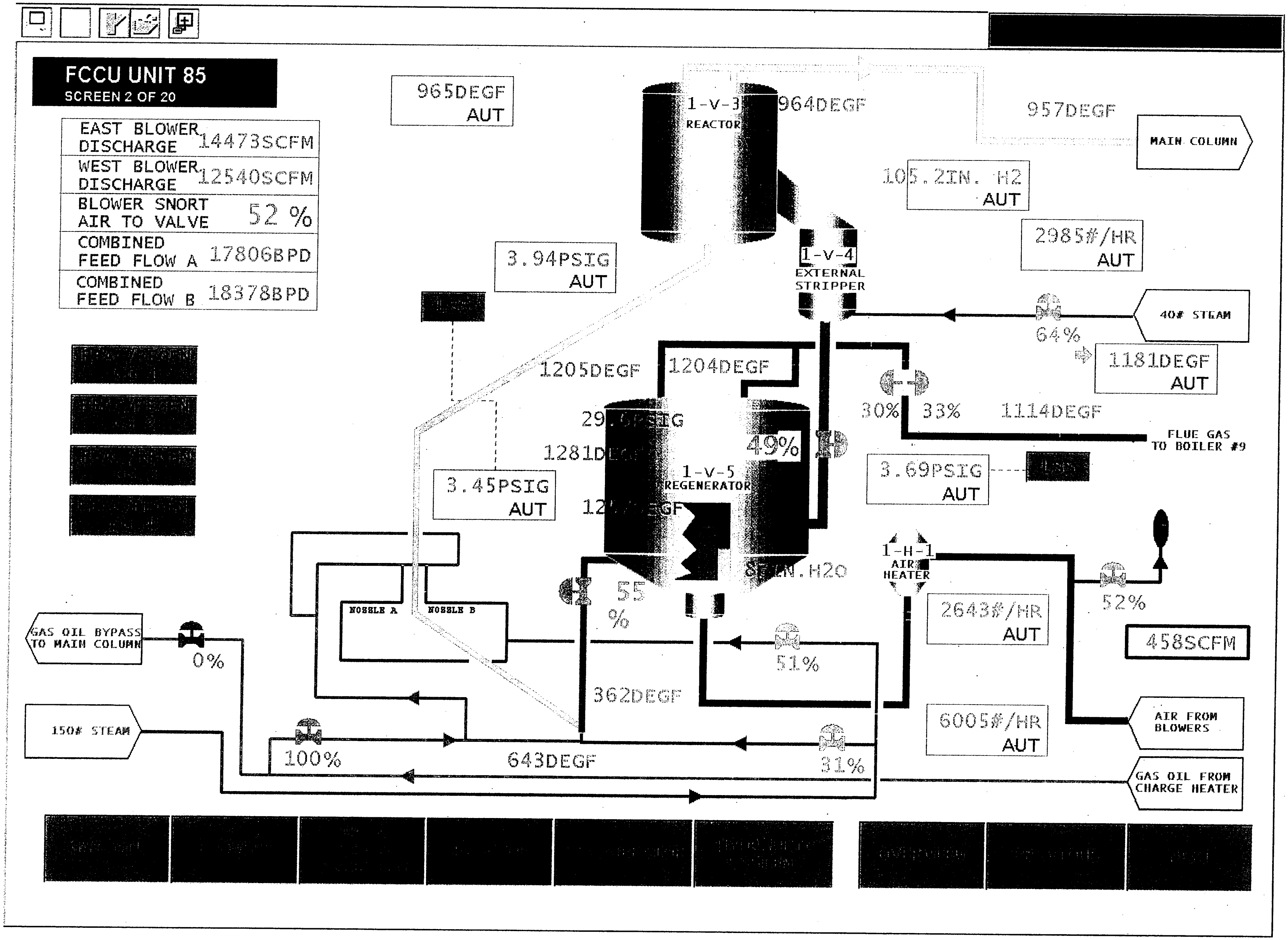
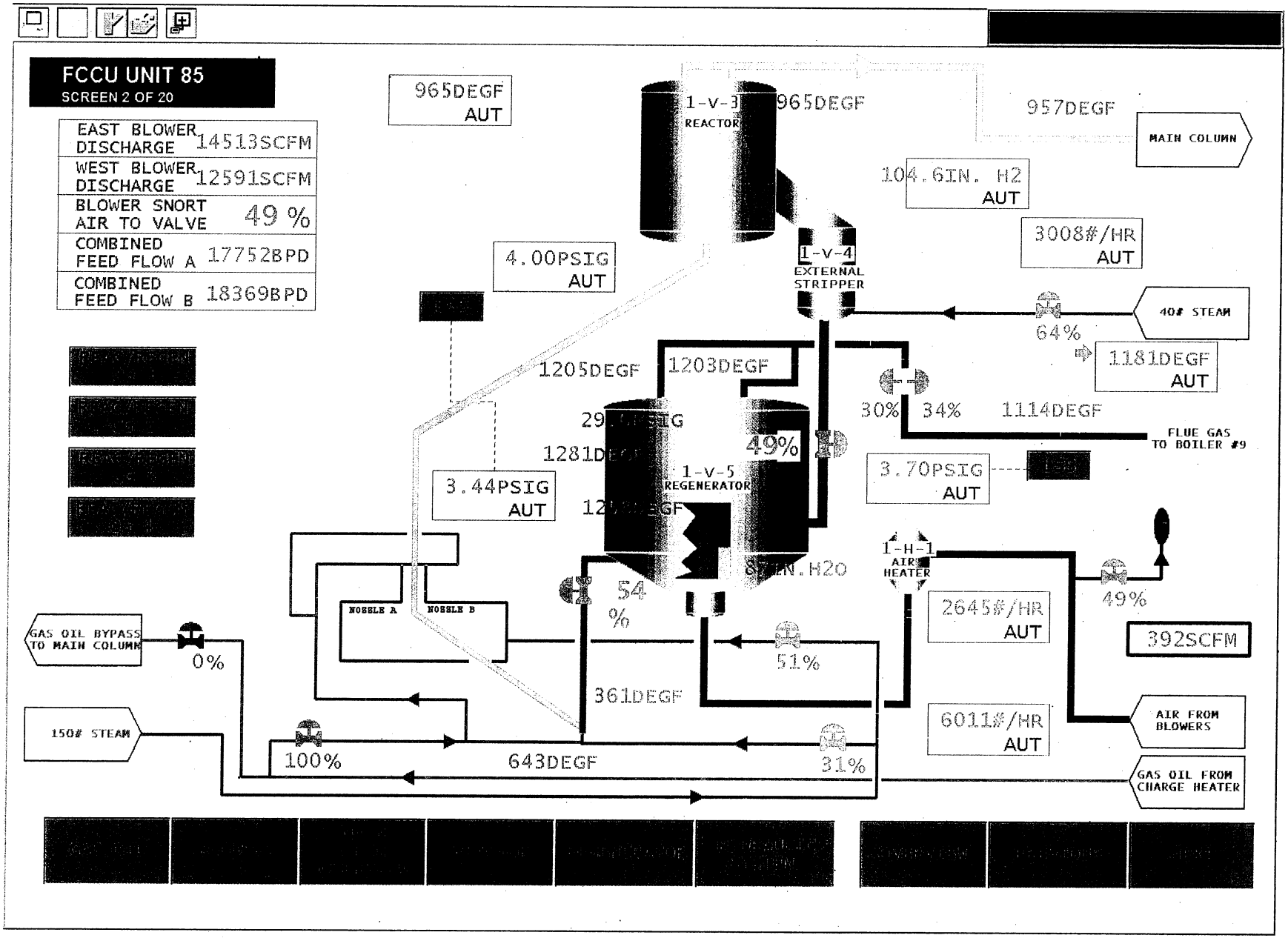
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14426SCFM
WEST BLOWER DISCHARGE 12525SCFM
BLOWER SNORT AIR TO VALVE 57 %
COMBINED FEED FLOW A 17757BPD
COMBINED FEED FLOW B 18365BPD
964DEGF AUT
1-V-3 REACTOR
964DEGF
956DEGF
MAIN COLUMN
106.1IN. H2 AUT
2994#/HR AUT
4.03PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
66%
1184DEGF AUT
1209DEGF
1207DEGF
30%
33%
1115DEGF
FLUE GAS TO BOILER #9
50%
1-V-5 REGENERATOR
3.66PSIG AUT
3.43PSIG AUT
1-H-1 AIR HEATER
57%
55 %
NOZZLE A
NOZZLE B
GAS OIL BYPASS TO MAIN COLUMN
0%
50%
2648#/HR AUT
600SCFM
361DEGF
6008#/HR AUT
AIR FROM BLOWERS
150# STEAM
100%
643DEGF
31%
GAS OIL FROM CHARGE HEATER

621

2:00 P.M.

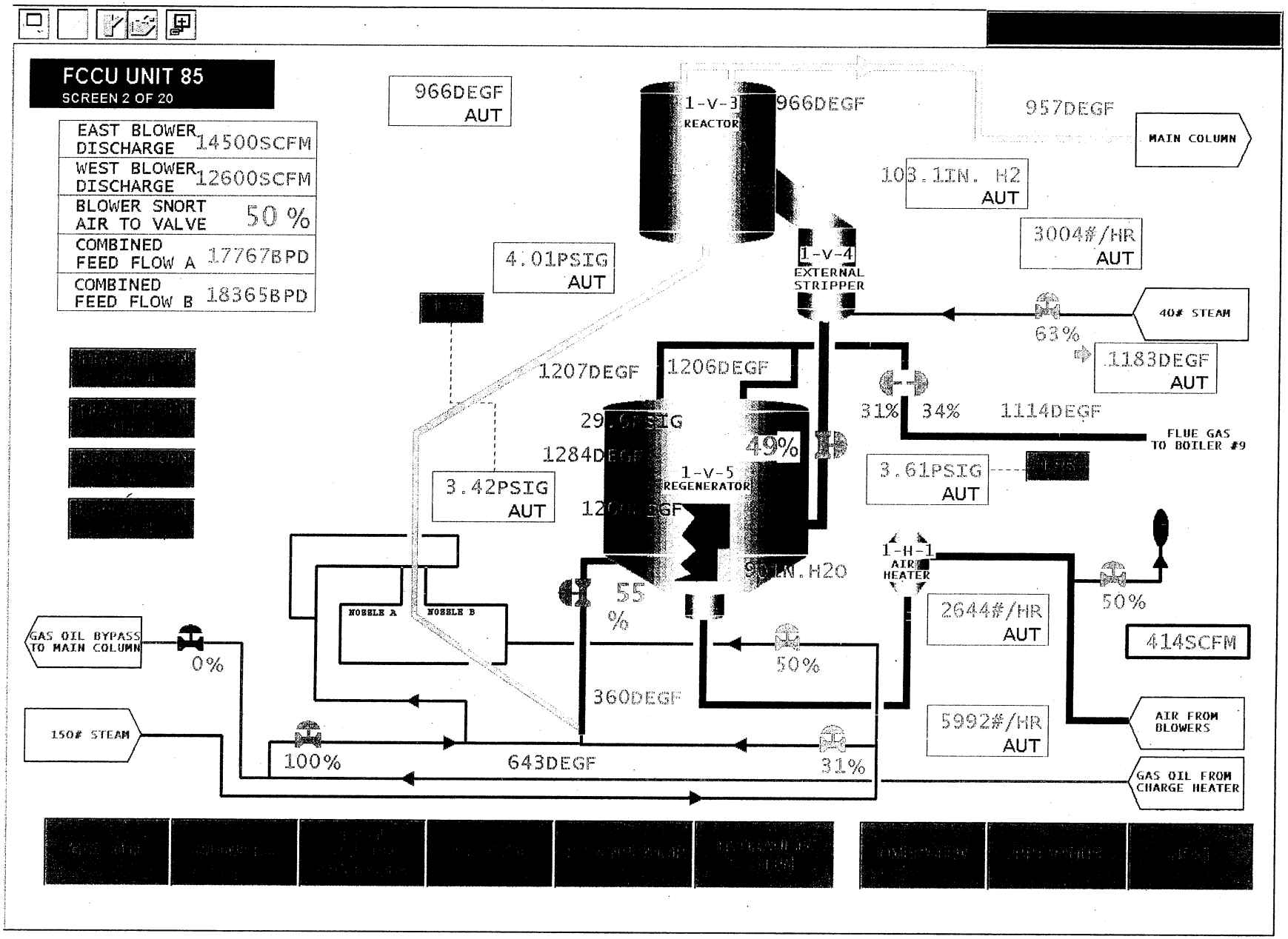

FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14473SCFM
WEST BLOWER DISCHARGE 12540SCFM
BLOWER SNORT AIR TO VALVE 52 %
COMBINED FEED FLOW A 17806BPD
COMBINED FEED FLOW B 18378BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
957DEGF
MAIN COLUMN
105.2IN. H2 AUT
2985#/HR AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
64%
1181DEGF AUT
3.94PSIG AUT
1205DEGF
1204DEGF
30%
33%
1114DEGF
FLUE GAS TO BOILER #9
49%
1281DEGF
1-V-5 REGENERATOR
3.69PSIG AUT
3.45PSIG AUT
1-H-1 AIR HEATER
52%
55 %
2643#/HR AUT
458SCFM
NOSSLE A
NOSSLE B
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
362DEGF
AIR FROM BLOWERS
6005#/HR AUT
150# STEAM
100%
643DEGF
31%
GAS OIL FROM CHARGE HEATER

2:40 P.M.


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14513SCFM
WEST BLOWER DISCHARGE 12591SCFM
BLOWER SNORT AIR TO VALVE 49 %
COMBINED FEED FLOW A 17752BPD
COMBINED FEED FLOW B 18369BPD
965DEGF AUT
1-V-3 REACTOR
965DEGF
957DEGF
MAIN COLUMN
104.6IN. H2 AUT
3008#/HR AUT
4.00PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
64%
1181DEGF AUT
1205DEGF
1203DEGF
30%
34%
1114DEGF
FLUE GAS TO BOILER #9
49%
1-V-5 REGENERATOR
3.44PSIG AUT
3.70PSIG AUT
1-H-1 AIR HEATER
54 %
NOZZLE A
NOZZLE B
2645#/HR AUT
49%
392SCFM
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
361DEGF
150# STEAM
100%
643DEGF
31%
6011#/HR AUT
AIR FROM BLOWERS
GAS OIL FROM CHARGE HEATER

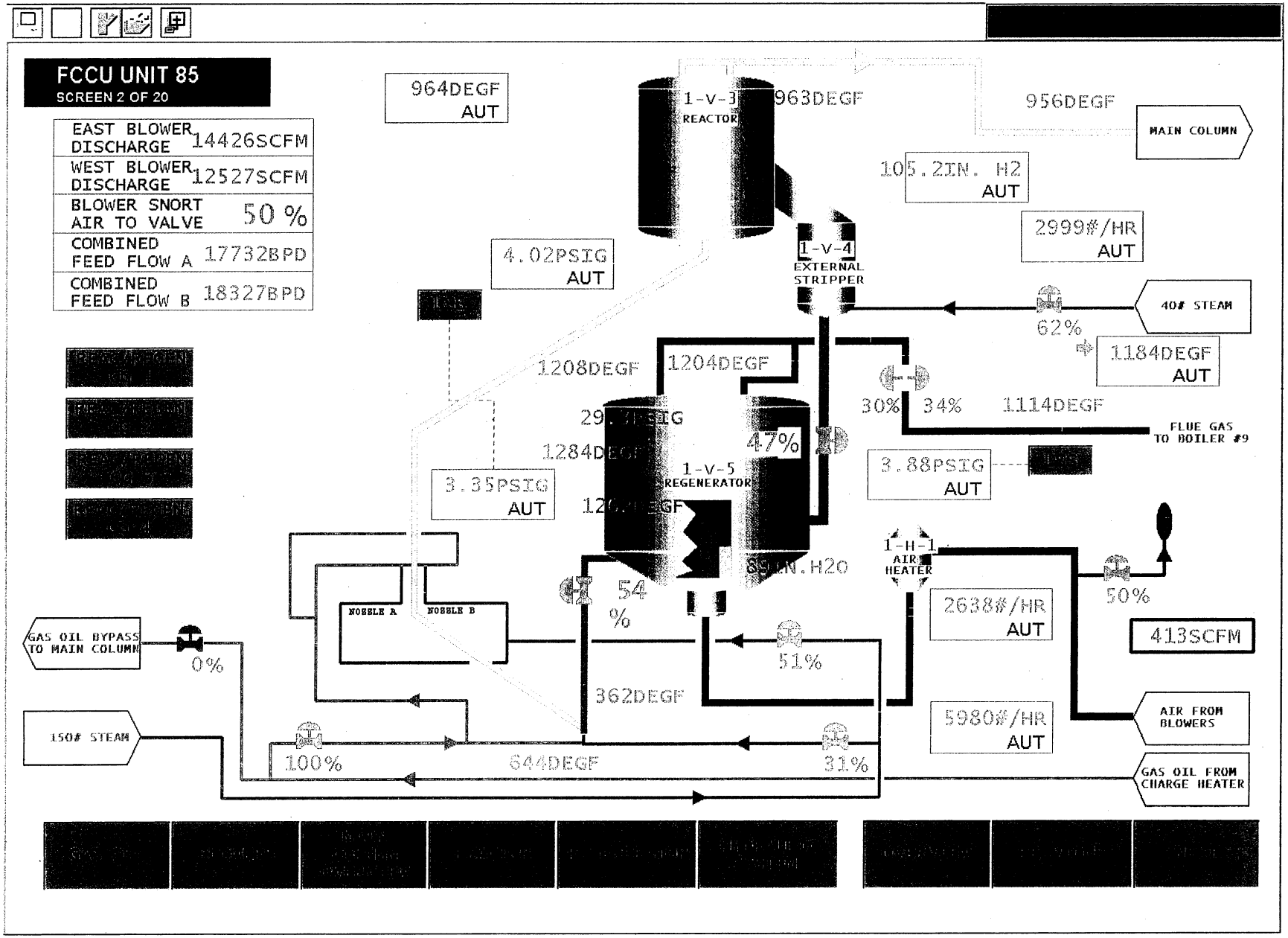
C23

2:40 PM


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14500SCFM
WEST BLOWER DISCHARGE 12600SCFM
BLOWER SNORT AIR TO VALVE 50 %
COMBINED FEED FLOW A 17767BPD
COMBINED FEED FLOW B 18365BPD
966DEGF AUT
1-V-3 REACTOR
966DEGF
957DEGF
MAIN COLUMN
103.1IN. H2 AUT
3004#/HR AUT
4.01PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
63%
1183DEGF AUT
1207DEGF
1206DEGF
31%
34%
1114DEGF
FLUE GAS TO BOILER #9
49%
1284DEGF
1-V-5 REGENERATOR
3.42PSIG AUT
3.61PSIG AUT
1-H-1 AIR HEATER
55 %
50%
2644#/HR AUT
414SCFM
NOZZLE A
NOZZLE B
GAS OIL BYPASS TO MAIN COLUMN
0%
50%
360DEGF
150# STEAM
100%
643DEGF
31%
5992#/HR AUT
AIR FROM BLOWERS
GAS OIL FROM CHARGE HEATER

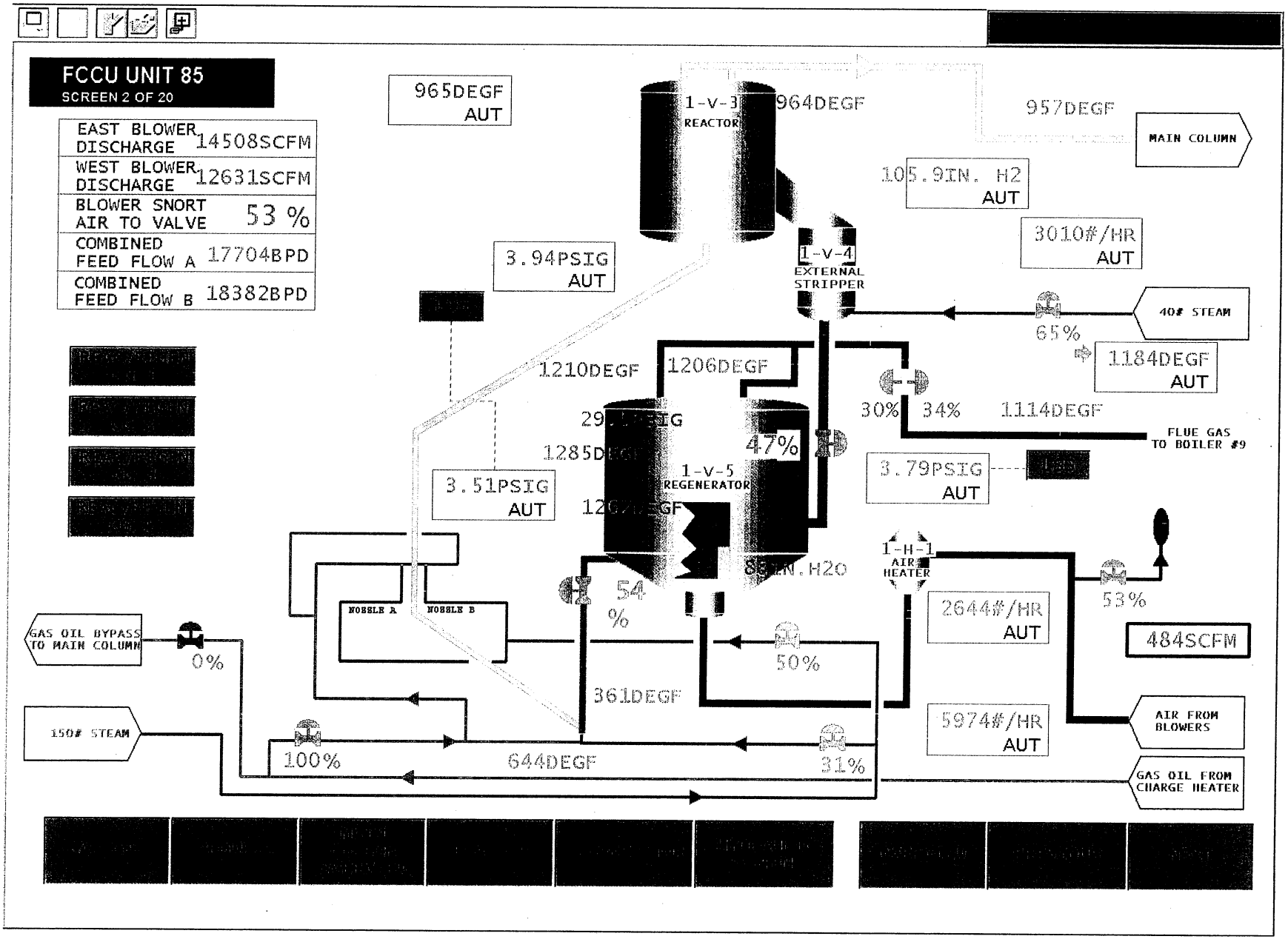
C 24

3:10 P.M.


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14426SCFM
WEST BLOWER DISCHARGE 12527SCFM
BLOWER SNORT AIR TO VALVE 50 %
COMBINED FEED FLOW A 17732BPD
COMBINED FEED FLOW B 18327BPD
964DEGF AUT
1-V-3 REACTOR
963DEGF
956DEGF
MAIN COLUMN
105.2IN. H2 AUT
2999#/HR AUT
4.02PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
62%
1184DEGF AUT
1208DEGF
1204DEGF
30%
34%
1114DEGF
FLUE GAS TO BOILER #9
47%
1284DEGF
1-V-5 REGENERATOR
3.88PSIG AUT
3.35PSIG AUT
1-H-1 AIR HEATER
50%
54 %
NOZZLE A
NOZZLE B
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
2638#/HR AUT
413SCFM
362DEGF
5980#/HR AUT
AIR FROM BLOWERS
150# STEAM
100%
644DEGF
31%
GAS OIL FROM CHARGE HEATER

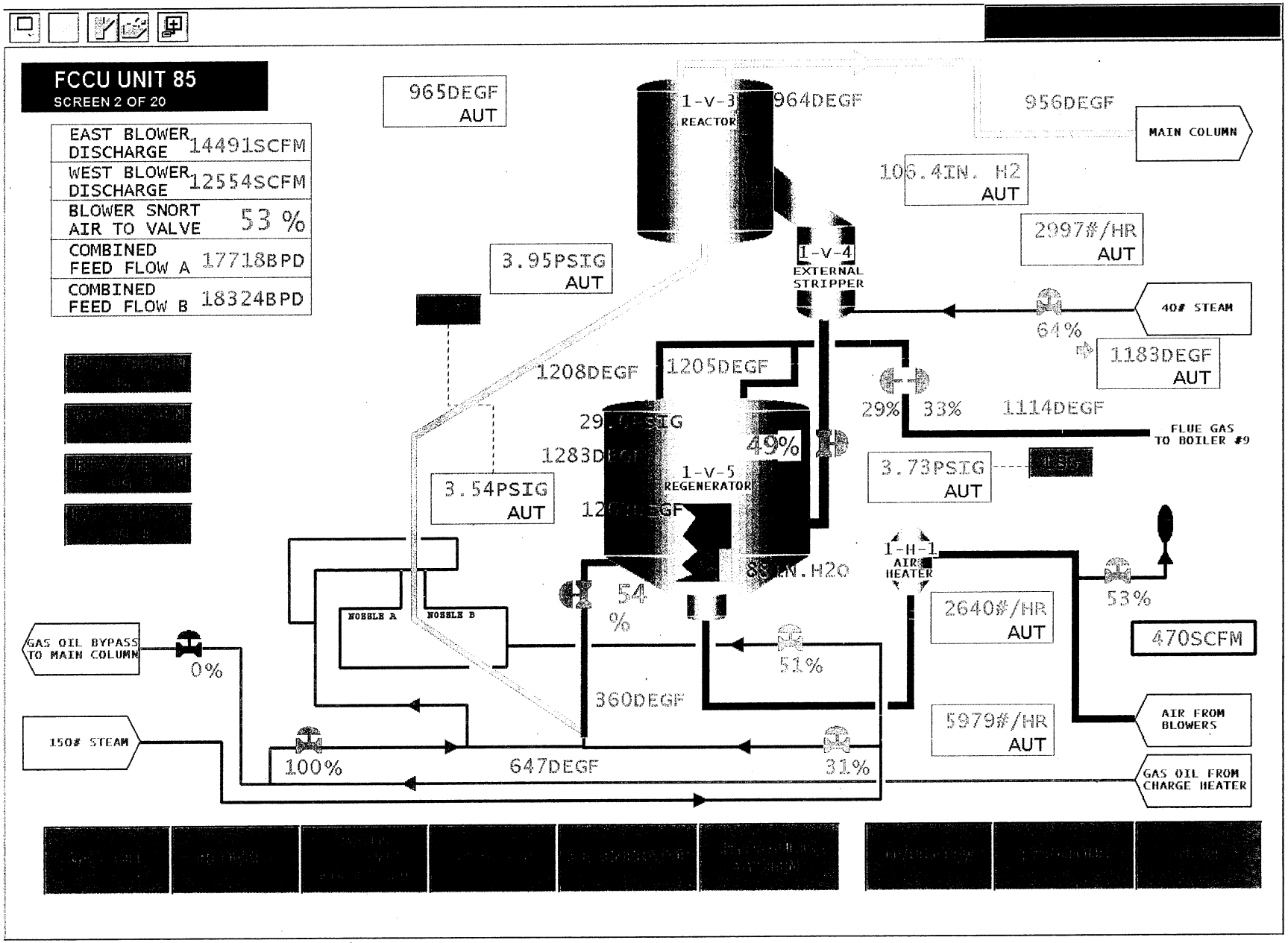
C.25

5:25 P.M


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14508SCFM
WEST BLOWER DISCHARGE 12631SCFM
BLOWER SNORT AIR TO VALVE 53 %
COMBINED FEED FLOW A 17704BPD
COMBINED FEED FLOW B 18382BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
957DEGF
MAIN COLUMN
105.9IN. H2 AUT
3010#/HR AUT
3.94PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
65%
1184DEGF AUT
1210DEGF
1206DEGF
30%
34%
1114DEGF
FLUE GAS TO BOILER #9
47%
1-V-5 REGENERATOR
3.79PSIG AUT
3.51PSIG AUT
1-H-1 AIR HEATER
53%
2644#/HR AUT
484SCFM
NOZZLE A
NOZZLE B
54 %
50%
GAS OIL BYPASS TO MAIN COLUMN
0%
361DEGF
150# STEAM
100%
644DEGF
31%
5974#/HR AUT
AIR FROM BLOWERS
GAS OIL FROM CHARGE HEATER

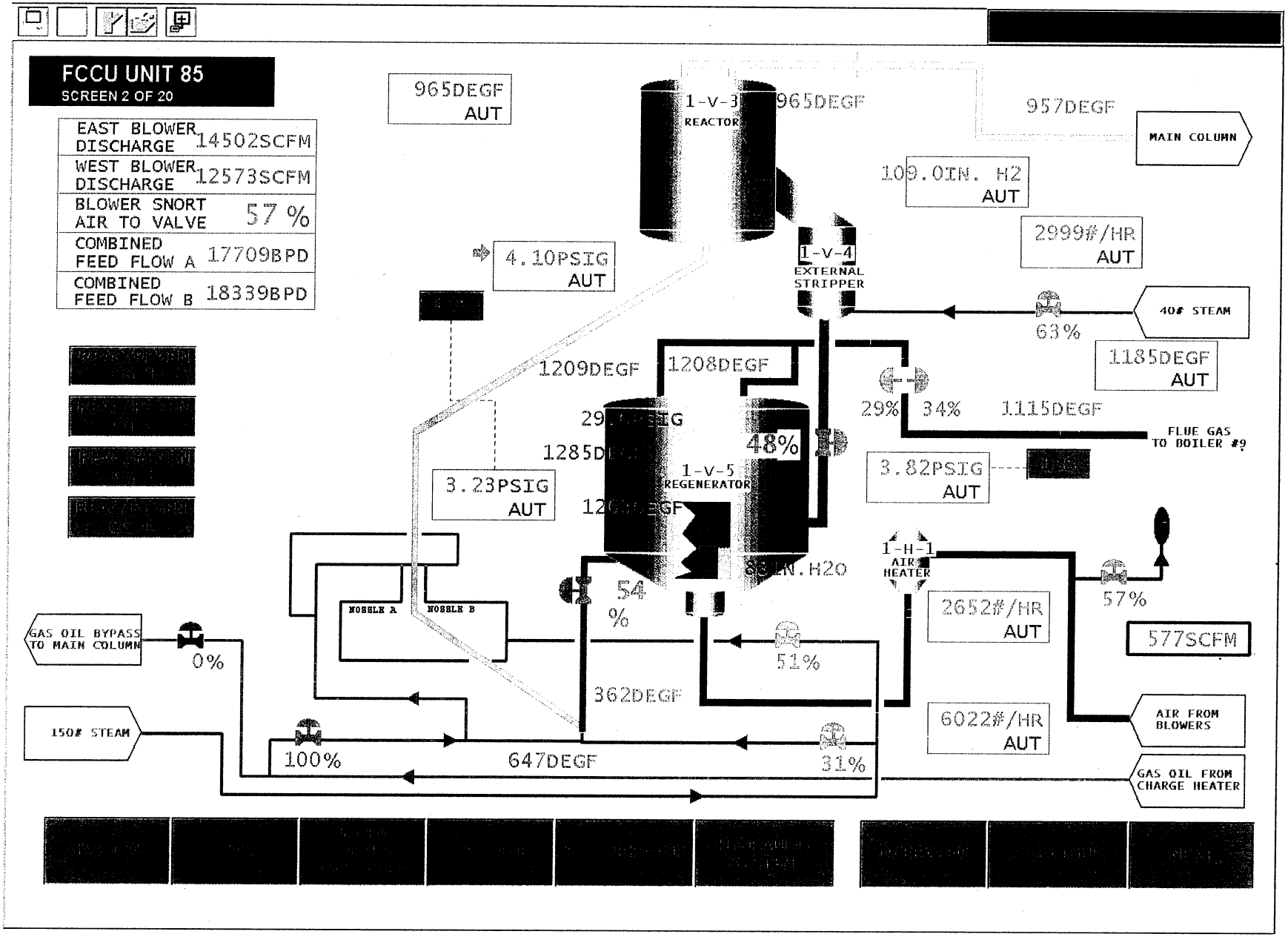
G26

3:40 P.M.


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14491SCFM
WEST BLOWER DISCHARGE 12554SCFM
BLOWER SNORT AIR TO VALVE 53 %
COMBINED FEED FLOW A 17718BPD
COMBINED FEED FLOW B 18324BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
956DEGF
MAIN COLUMN
106.4IN. H2 AUT
2997#/HR AUT
3.95PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
64%
1183DEGF AUT
1208DEGF
1205DEGF
29% 33%
1114DEGF
FLUE GAS TO BOILER #9
49%
1-V-5 REGENERATOR
3.73PSIG AUT
3.54PSIG AUT
1-H-1 AIR HEATER
53%
2640#/HR AUT
470SCFM
NOZZLE A
NOZZLE B
54 %
51%
GAS OIL BYPASS TO MAIN COLUMN
0%
360DEGF
5979#/HR AUT
AIR FROM BLOWERS
150# STEAM
100%
647DEGF
31%
GAS OIL FROM CHARGE HEATER

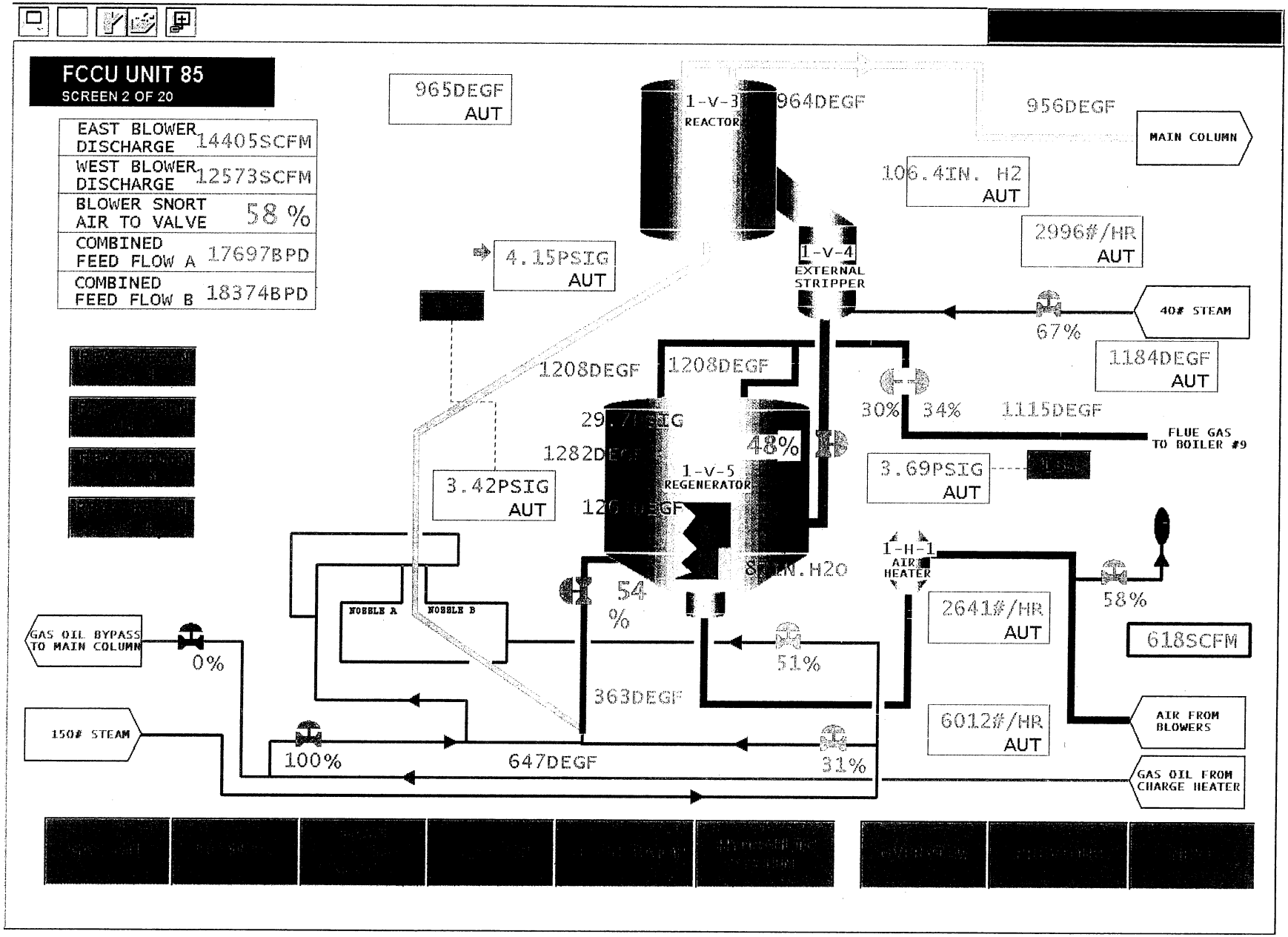
LPG

3:55 P.M.


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14502SCFM
WEST BLOWER DISCHARGE 12573SCFM
BLOWER SNORT AIR TO VALVE 57 %
COMBINED FEED FLOW A 17709BPD
COMBINED FEED FLOW B 18339BPD
965DEGF AUT
1-V-3 REACTOR
965DEGF
957DEGF
MAIN COLUMN
109.0IN. H2 AUT
2999#/HR AUT
4.10PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
63%
1185DEGF AUT
1209DEGF
1208DEGF
29% 34% 1115DEGF
FLUE GAS TO BOILER #9
48%
1285DEGF
1-V-5 REGENERATOR
3.23PSIG AUT
3.82PSIG AUT
1-H-1 AIR HEATER
54 %
NOZZLE A
NOZZLE B
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
2652#/HR AUT
57%
577SCFM
362DEGF
150# STEAM
100%
647DEGF
31%
6022#/HR AUT
AIR FROM BLOWERS
GAS OIL FROM CHARGE HEATER

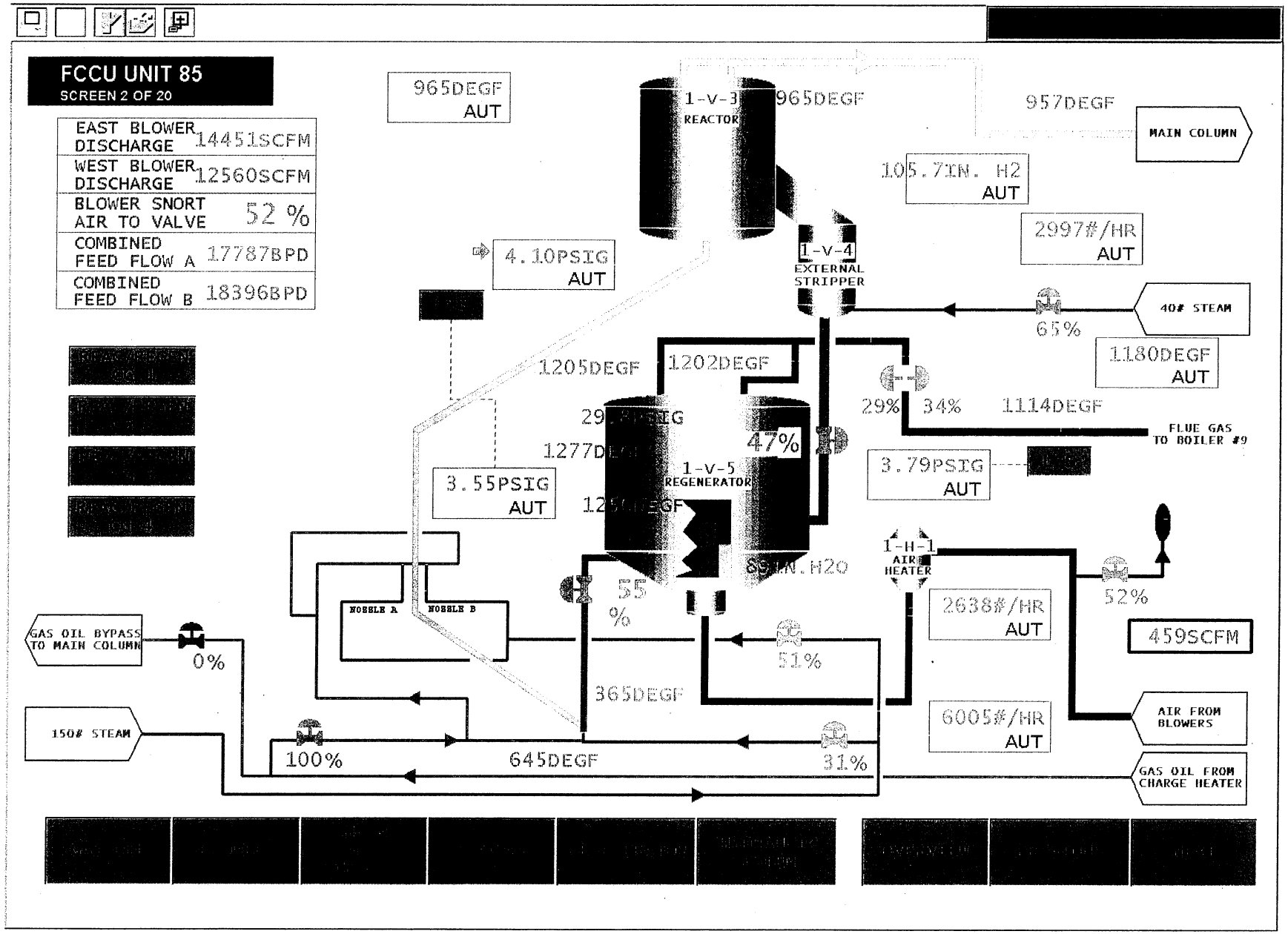
C28

4:10 P.M.


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14405SCFM
WEST BLOWER DISCHARGE 12573SCFM
BLOWER SNORT AIR TO VALVE 58 %
COMBINED FEED FLOW A 17697BPD
COMBINED FEED FLOW B 18374BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
956DEGF
MAIN COLUMN
106.4IN. H2 AUT
2996#/HR AUT
4.15PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
67%
1208DEGF
1208DEGF
1184DEGF AUT
30%
34%
1115DEGF
FLUE GAS TO BOILER #9
48%
1-V-5 REGENERATOR
3.69PSIG AUT
3.42PSIG AUT
1-H-1 AIR HEATER
54 %
NOBBLE A
NOBBLE B
58%
2641#/HR AUT
618SCFM
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
363DEGF
6012#/HR AUT
AIR FROM BLOWERS
150# STEAM
100%
647DEGF
31%
GAS OIL FROM CHARGE HEATER

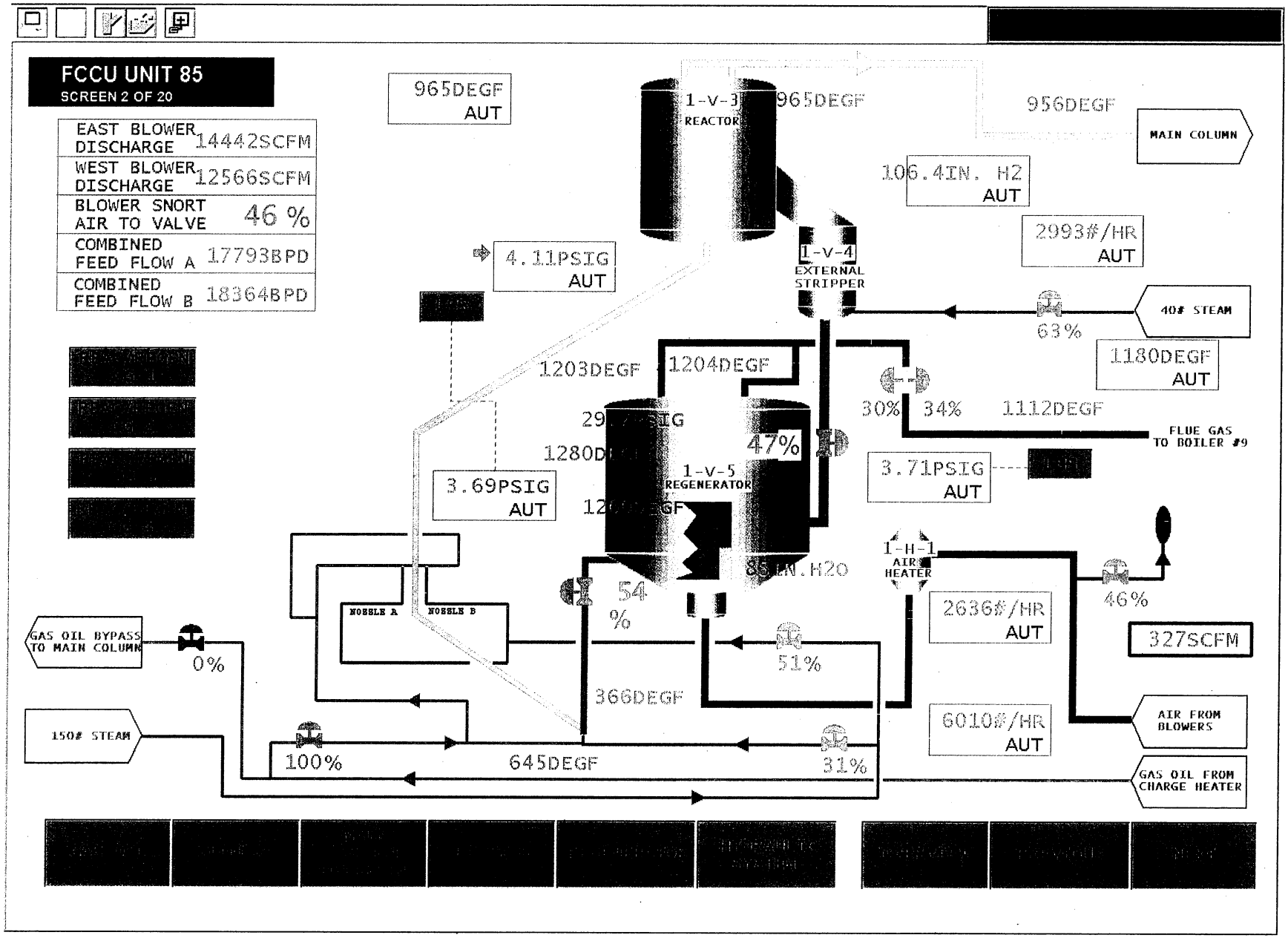
629

4:25 P.M.


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14451SCFM
WEST BLOWER DISCHARGE 12560SCFM
BLOWER SNORT AIR TO VALVE 52 %
COMBINED FEED FLOW A 17787BPD
COMBINED FEED FLOW B 18396BPD
965DEGF AUT
1-V-3 REACTOR
965DEGF
957DEGF
MAIN COLUMN
105.7IN. H2 AUT
2997#/HR AUT
4.10PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
65%
1180DEGF AUT
1205DEGF
1202DEGF
29% 34%
1114DEGF
FLUE GAS TO BOILER #9
47%
1277DEGF
1-V-5 REGENERATOR
3.79PSIG AUT
3.55PSIG AUT
1-H-1 AIR HEATER
52%
55 %
NOZZLE A
NOZZLE B
GAS OIL BYPASS TO MAIN COLUMN
0%
51%
2638#/HR AUT
459SCFM
365DEGF
150# STEAM
100%
645DEGF
31%
6005#/HR AUT
AIR FROM BLOWERS
GAS OIL FROM CHARGE HEATER

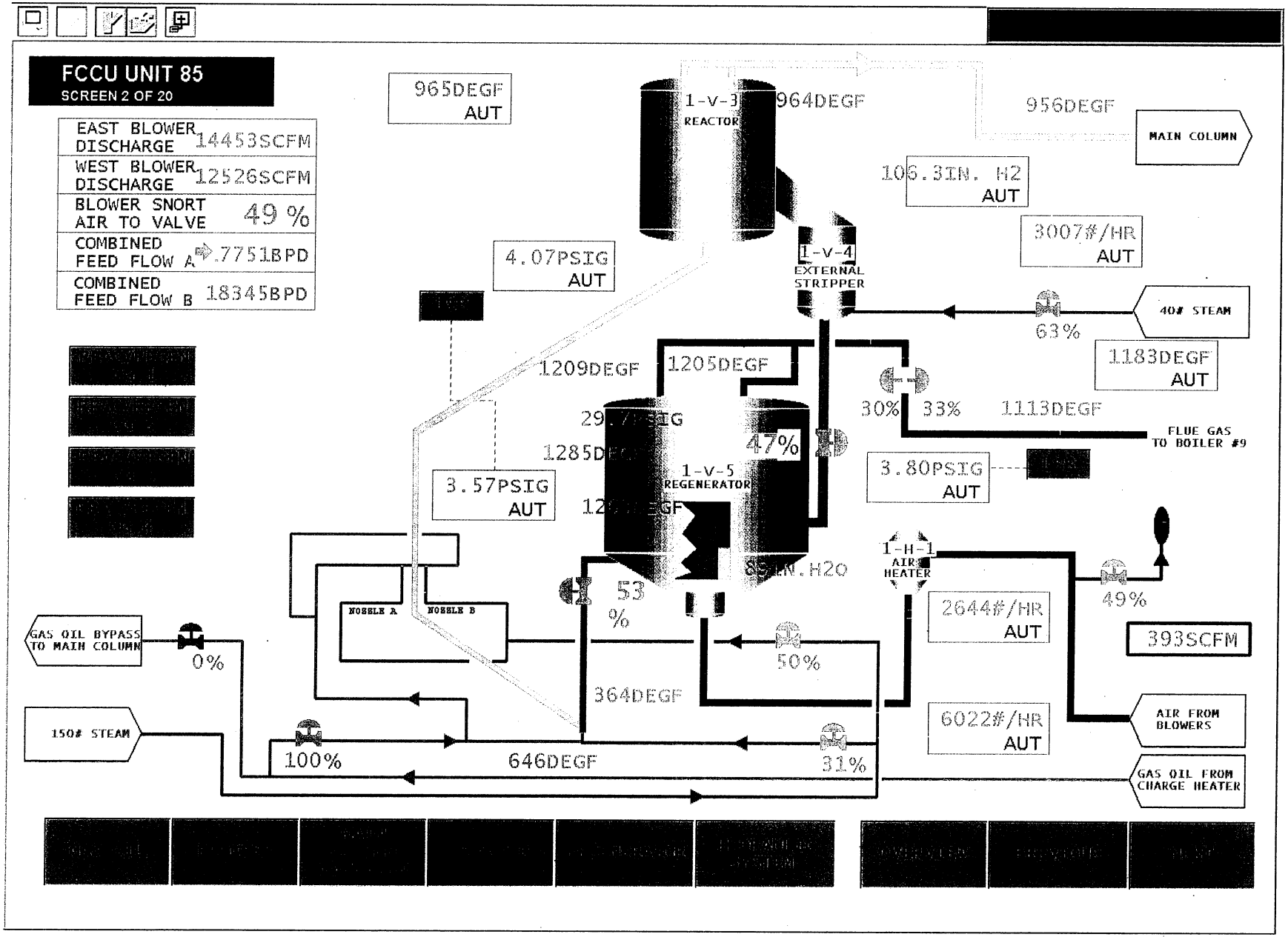
C30

4:40 P.M.


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14442SCFM
WEST BLOWER DISCHARGE 12566SCFM
BLOWER SNORT AIR TO VALVE 46 %
COMBINED FEED FLOW A 17793BPD
COMBINED FEED FLOW B 18364BPD
965DEGF AUT
1-V-3 REACTOR
965DEGF
956DEGF
MAIN COLUMN
106.4IN. H2 AUT
2993#/HR AUT
4.11PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
63%
1180DEGF AUT
1203DEGF
1204DEGF
30%
34%
1112DEGF
FLUE GAS TO BOILER #9
47%
1-V-5 REGENERATOR
3.69PSIG AUT
3.71PSIG AUT
1-H-1 AIR HEATER
46%
2636#/HR AUT
327SCFM
NOZZLE A
NOZZLE B
54 %
51%
GAS OIL BYPASS TO MAIN COLUMN
0%
366DEGF
150# STEAM
100%
645DEGF
31%
6010#/HR AUT
AIR FROM BLOWERS
GAS OIL FROM CHARGE HEATER

C 31

4:55 P.M.


FCCU UNIT 85
SCREEN 2 OF 20
EAST BLOWER DISCHARGE 14453SCFM
WEST BLOWER DISCHARGE 12526SCFM
BLOWER SNORT AIR TO VALVE 49 %
COMBINED FEED FLOW A .7751BPD
COMBINED FEED FLOW B 18345BPD
965DEGF AUT
1-V-3 REACTOR
964DEGF
956DEGF
MAIN COLUMN
106.3IN. H2 AUT
3007#/HR AUT
4.07PSIG AUT
1-V-4 EXTERNAL STRIPPER
40# STEAM
63%
1209DEGF
1205DEGF
1183DEGF AUT
30%
33%
1113DEGF
FLUE GAS TO BOILER #9
47%
1-V-5 REGENERATOR
3.80PSIG AUT
3.57PSIG AUT
1-H-1 AIR HEATER
53 %
NOZZLE A
NOZZLE B
GAS OIL BYPASS TO MAIN COLUMN
0%
50%
2644#/HR AUT
49%
393SCFM
364DEGF
150# STEAM
100%
646DEGF
31%
6022#/HR AUT
AIR FROM BLOWERS
GAS OIL FROM CHARGE HEATER

G 32

Delek Refining

SRU 1/2 Incinerator Compliance Stack Test

August 22, 2007

Test Start Time 11:55

Time (hour)	Sulfur Make (Tons/day)	Stack Flow Rate (mscfh)	Inc. Liq. Gas (mscfh)
0	28.26		1.69
1	27.67		1.72
2	27.19	112 (clean)	1.79
3	27.05	97	1.70
4	27.61	106	1.72
5	28.19	109	1.73
6	27.54	104	1.679
7	26.63	104	1.798
8	26.32	105	1.681
9	26.50	99	2.048
10	27.73	91	2.014
11	28.56	93	2.043
12			
13			
14			

APPENDIX H.

RESUMES

Steven L. Yin

2002-present	*Laboratory Manager* Entech Engineering Inc. - Laboratory Analysis - Instrument maintenance - Method development - Analytical QA/QC assurance
1990-2002	*Supervisor/Senior Environmental Chemist* Pace Analytical Services, Inc.
1998-1990	*Technical Support Chemist* Analytical Sensors, Inc.
1985-1998	*M.S. Chemist* Texas Southern University Houston, Texas
1978-1982	*B.S. Material Science* Shanghai University of Science and Technology Shanghai, China

ENTECH ENGINEERING INC.
P.O. Box 890746 • Houston, Texas 77289-0746 • (281) 332-3118

Tim Rios

2001-present	*Senior Environmental Scientist* Entech Engineering Inc. - Source Compliance Testing - Emissions Abatement - CEMS Certification - Laboratory Analysis
1999-2001	*Project Manager* E& S Construction - Millwork Designer - Project Estimation - Quality Assurance - Safety Director
1992-1999	B.S. Biology University of Houston
1997-1999	*Substitute Teacher* Pasadena Independent School District - all grades - math, science, English, music, P.E., Spanish
1989-1997	*Safety Manager* I. M. Pena Inc. - OSHA/EPA Compliance - Employee Safety & Health - Materials purchasing

Certified Visible Emission Observer in Texas

ENTECH ENGINEERING INC.
P.O. Box 890746 • Houston, Texas 77289-0746 • (281) 332-3118

Humberto A. Saenz III

2004-present	Entech Engineering Inc. *Environmental Scientist*
2000-2004	U.S. Army -Maintenance Officer -Battalion Environmental Officer
1996-2000	*B.S. Chemical Engineering* Texas A&M University-Kingsville Kingsville, Texas

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Mark A Lester

2002-present	*Principal Environmental Technician* Entech Engineering Inc. - Source Compliance Testing - Equipment calibration and maintenance - Source Compliance Testing - Emissions Abatement - CEMS Certification - Laboratory Analysis
1983-2001	*Senior Environmental Tech.- Field Supervisor* Tetra tech NUS formally Haliburton NUS - Source Compliance Testing - Emissions Abatement - CEMS Certification - Laboratory Analysis - Fugitive emission sampling - Ambient air sampling - Under ground storage tank removal - Soil Analysis - Soil remediation - Heavy equipment operator - Ground water sampling - Ground water remediation - Ground water analysis - Hazardous waste clean up (Super Fund Sites)
1978-1983	*Environmental Technician* Energy Impact Associates - Ambient air sampling - Meteorological equipment set-up and calibration - Ambient air station maintenance and calibration

APPENDIX I.

CHAIN OF CUSTODY

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Chain of Custody

Company Name:	Delek
Plant Name:	Delek Refining
Unit/EPN:	SRU-2 / Boiler 9
Company Address:	
City:	Tyler
State:	TX
Zip:	
Entech Proposal No.:	
Entech Supervisor Name:	Ed. Pastrank
Entech Supervisor Signature:	[signature]

Entech Sample No.	Sample Description	Grab/Comp	Date	Time	Matrix	Number of Containers	Preservatives	Full Analysis (C1-C6)	(P/O: wax. gass)	Remarks
E507-08-14546	SRU-2 T1 B1	grab	8/22/07		g	1	–	X		
E507-08-14547	SRU-2 T1 B2	↓	8/22/07		↓	1	–			B/U
E507-08-14548	SRU-2 T2 B1	↓	8/22/07		↓	1	–	X		
E507-08-14549	SRU-2 T2 B2	↓	8/22/07		↓	1	–			B/U
E507-08-14550	SRU-2 T3 B1	↓	8/22/07		↓	1	–	X		
E507-08-14551	SRU-2 T3 B2	↓	8/22/07		↓	1	–			B/U
E507-08-14552	Boiler 9 T1 B1	↓	8/23/07		↓	1	–	X		
E507-08-14553	Boiler 9 T1 B2	↓	8/23/07		↓	1	–			B/U
E507-08-14554	Boiler 9 T2 B1	↓	8/23/07		↓	1	–	X		
E507-08-14555	Boiler 9 T2 B2	↓	8/23/07		↓	1	–			B/U
E507-08-14556	Boiler 9 T3 B1	↓	8/23/07		↓	1	–	X		
E507-08-14557	Boiler 9 T3 B2	↓	8/23/07		↓	1	–			B/U

Remarks:

Turnaround Time:

Detection Limits Required Yes No
Circle one, if Yes, describe below or include separate sheet detailing requirements.

Person Taking Sample (a.-Print Name & b.-Signature) See above for date and time
a. Tim Rios b. T-R

Received By (Signature): | Date: | Time: | QAQC FIELD acceptance checks. Place a Y or N after text | Container Type and volume OK? | Holding time OK? | Temperature OK? | Sample deficiencies - list on reverse. If none, write "none" in this box.

Received By (Signature): [signature] | Date: 8-27-07 | Time: 14:20 | QAQC LAB acceptance checks. Place a Y or N after text: Y | Container Type and volume OK? ✓ | Holding time OK? ✓ | Temperature OK? ✓ | Sample deficiencies - list on reverse. If none, write "none" in this box. None

Sample Remainder Disposal | I Requested Lab To Dispose Of All Sample Remainders

Return Sample remainder to Entech Via: | (Signature) | (Date)

TO MAKE CORRECTION, USE SINGLE LINE MARK THROUGH THE INCORRECT DATA, INITIAL, DATE. DO NOT USE PEN OR LIQUID PAPER TO COMPLETELY COVER THE INCORRECT DATA.

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COC Lab Doc Number | COC unfilled form controlled document number: COCRev6c

original

I 1

ENTECH ENGINEERING INC.

P. O. Box 890746 . Houston, Texas 77289-0746 . (281)332-3118

Chain of Custody

Company Name: Delek

Plant Name: Tyler Refining

Unit/EPN: Boiler 9

Company Address:

City: Tyler State: TX Zip:

Entech Proposal No.:

Entech Supervisor Name: E.J.P.

Entech Supervisor Signature: [signature]

Remarks:

Turnaround Time:

Detection Limits Required Yes No
Circle one, if Yes, describe below or include separate sheet detailing requirements.

Entech Sample No.	Sample Description	Grab/Comp	Date	Time	Matrix	Number of Containers	Preservatives	Fuel Analysis (C_1-C_6)	(P/O: wire. grass)						Remarks
E507-08-14553	Boiler 9 TY B1	g.mb	8/27/07		g	1	–	X							
E507-08-14554	Boiler 9 TY B2	g.mb	8/27/07		g	1	–								B/U

Person Taking Sample (a.-Print Name & b.-Signature) See above for date and time	Received By (Signature):	Date:	Time:	QAQC FIELD acceptance checks. Place a Y or N after text	Container Type and volume OK?	Holding time OK?	Temperature OK?	Sample deficiencies - list on reverse. If none, write "none" in this box.
a. Tim Rios b. [signature]								

Received By (Signature):	Date:	Time:	QAQC LAB acceptance checks. Place a Y or N after text	Container Type and volume OK?	Holding time OK?	Temperature OK?	Sample deficiencies - list on reverse. If none, write "none" in this box.
[signature]	8-27-07	1420	Y	✓	✓	✓	none

Sample Remainder Disposal

I Requested Lab To Dispose Of All Sample Remainders

Return Sample remainder to Entech Via:

(Signature) (Date)

TO MAKE CORRECTION, USE SINGLE LINE MARK THROUGH THE INCORRECT DATA, INITIAL, DATE. DO NOT USE PEN OR LIQUID PAPER TO COMPLETELY COVER THE INCORRECT DATA.

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COC Lab Doc Number

COC unfilled form controlled document number: COCRev6c

original

I2

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CHAIN OF CUSTODY

Mr. Humberto A. Saenz III, Environmental Scientist of Entech Engineering Inc., was in charge of obtaining the emission samples and transporting them from Delek Refining, Ltd's. Tyler Refinery in Tyler, Texas to Entech Engineering Inc. in League City, Texas. The emission samples were delivered to and analyzed at the Entech Engineering office in League City, Texas.

APPENDIX J.

PERSONNEL INFORMATION

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The Delek Refining, Ltd. contact for additional information is Mr. Alan Dover. The testing organization is Entech Engineering Inc. and the contacts at Entech Engineering are Mr. Billy T.Y. Lee and Mr. Edward J. Pasternak. The names and addresses of these contacts are as follows:

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