



40 CFR 60, Subpart OOOO Performance Testing for Q250 Model

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40 CFR 60, Subpart OOOO Performance Test for Q250 Model

Rev: 1

1. Summary

Air Hygiene was contracted by Questor Technology Inc. to conduct a performance testing on Combustion Flare Q250 Model. The model was tested on February 25th through February 28th at Broken Arrow Rental Facility at Broken Arrow, Oklahoma. The flare model was tested to satisfy the specifications as described in United States Code of Federal Regulations Title 40, Part 60, Subpart OOOO (40 CFR 60, Subpart OOOO).

2. Test Method

The production flare model was tested according to EPA source emissions test method

- Method 1 – Sample and Velocity Traverse for Stationary Sources
- Method 2 – Determination of Stack Gas Velocity and Volumetric Flow Rate
- Method 2A – Direct Measurement of Gas Volume Through Pipes and Small Ducts
- Method 3C – Determination of Carbon Dioxide, Methane, Nitrogen and Oxygen from stationary Sources
- Method 4 – Determination of Moisture Content in Stack Gas
- Method 10 – Determination of Carbon Monoxide Emission from Stationary Sources
- Method 22 – Visual Determination of Fugitive Emissions from Material Sources and Smoke Emission from Flares
- Method 25A – Determination of Total Gaseous Organic Concentration Using Flame Ionization Analyzer
- ASTM D1945-03 – Standard Test Method for Analysis of Natural Gas by Gas Chromatography
- ASTM D3588-98 – Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels

3. Requirement Specification

In accordance to 40 CFR 60 Subpart OOOO, §60.5413(d)(12)(i) through (vi), this report contains the following information.

- A full schematic and dimensions of the flare model are presented in Appendix A
- The maximum net Heat Input Rating of the Q250 is 5.2 MMBtu/hr (Based on HHV)
- The inlet gas fuel range for 0% (min. rate) and 100% (max. rate) are 8 MSCFD and 55 MSCFD, respectively
- Air/Stream injection/assist is not applicable
- The test parameter ranges below, as applicable to this model
 - Fuel gas delivery pressure and temperature – See Air Hygiene report Appendix B
 - Fuel gas moisture range – >3ppm
 - Purge gas usage range – Not applicable
 - Condensate liquid fuel separation range – No liquid in the gas
 - Combustion temperature range – See Air Hygiene report Appendix B



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- Excess combustion air range – See Air Hygiene report Table 2.1 - 2.4
- Flame arrestor – See blue print of the production flare model on Appendix A
- Burner manifold pressure – 0.1-20 psig
- Pilot flame indicator – Ionization Flame Detection
- Pilot flame fuel usage – 0.5 MSCFD
- Tip velocity range – 1.5-10 m/s
- Momentum flux ratio – Not applicable
- Exit temperature range – See Air Hygiene report Appendix B
- Weather condition - See Air Hygiene report Appendix B

4. Specified Testing Conclusion for Q250 Model

- The device was tested with no visible emission
- The device was tested with less than 10 ppm average as propane corrected to 3 percent carbon dioxide
- The device was tested with less than 10 ppm average as carbon monoxide corrected to 3 percent carbon dioxide
- The device was tested with higher than 150 percent excess air
- The device was tested with higher than 95 percent destruction efficiency for VOC

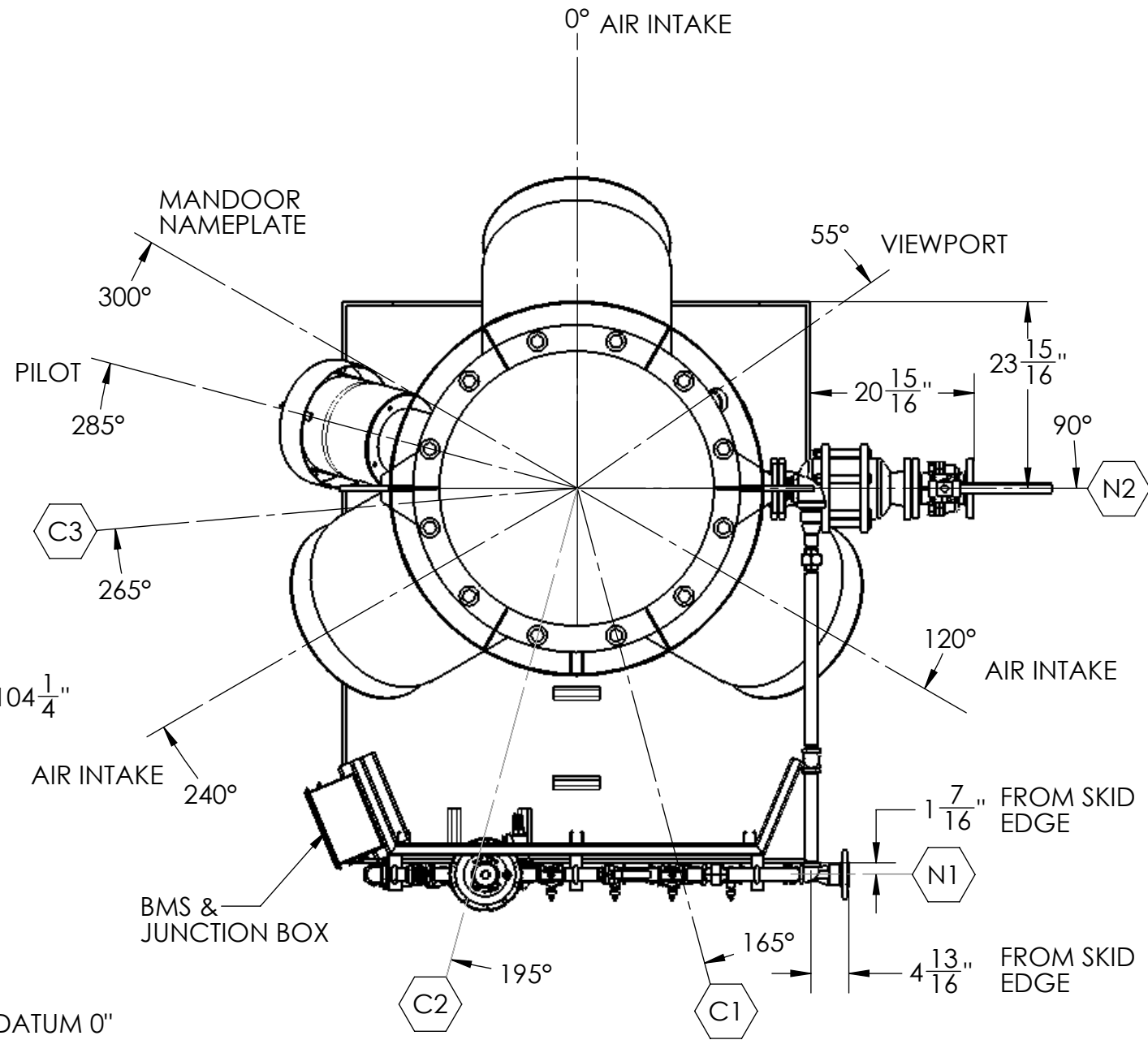
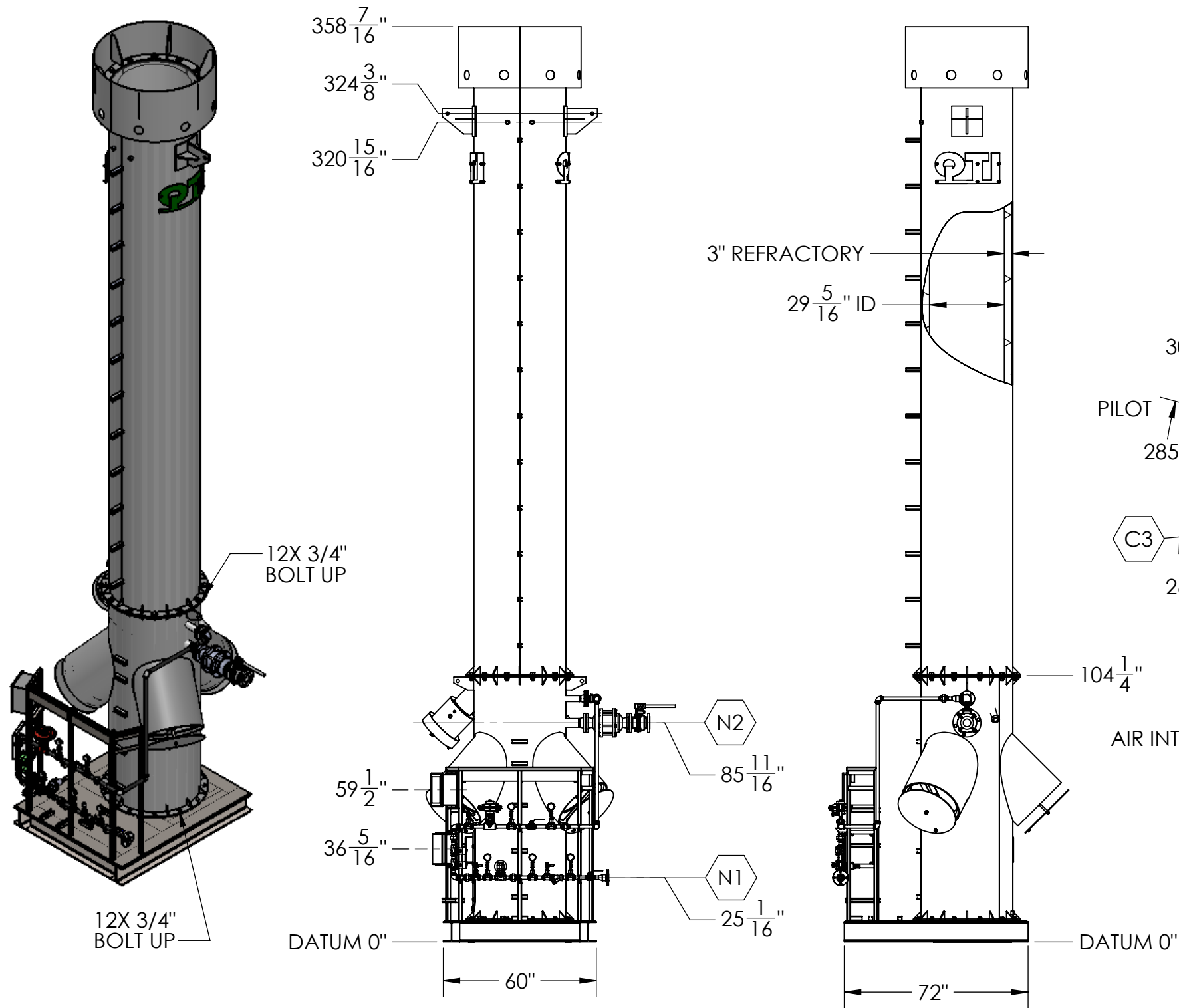
Appendix A

Q250 Blue Print and PI&D Schematic

F
E
D
C
B
A

13 12 11 10 9 8 7 6 5 4 3 2 1

NOZZLE SCHEDULE				
MARK	SIZE	GRADE	ELEV.	DESCRIPTION
N1	2"	150#	25-1/16"	FUEL GAS INLET
N2	3"	150#	85-11/16"	WASTE GAS INLET
C1	1"	3000#	320-15/16"	THERMOCOUPLE PORT
C2	1"	3000#	320-15/16"	SAMPLE PORT
C3	1"	3000#	10-7/8"	FLOOR DRAIN



GENERAL NOTES: A) UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.
B) TOLERANCES:
DECIMAL FRACTION ANGULAR
X = +/- .1 +/- .1/16 X = +/- .1°
XX = +/- .03 XXX = +/- .010 X = +/- .5°

C) ALL HOLES, SQUARES, SLOTS, CUTOUTS & EDGES TO BE BURR FREE.
D) ALL WELDS TO BE APPROPRIATE FOR FINAL ASSEMBLY AND PAINT.
E) SHEET TO BE PRINTED ON 11 x 17 PAPER ONLY

REV	DESCRIPTION	DATE	AUTHOR	SIGNATURE
0	ISSUED FOR CONSTRUCTION	12/08/2014	J. BOUCHARD	

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CUSTOMER: N/A	Q250 GA DRAWING	
WORK ORDER: N/A		
SCALE: 1:1	DWG NO.: ENG-D-M-17-Q250 GA and BOM	REV NO.: 0
		SHEET 1 of 2

13 12 11 10 9 8 7 6 5 4 3 2 1

13		12		11		10		9		8	
BILL OF MATERIALS											
ITEM #	PART #	QTY .	FUNCTIONAL DESCRIPTION	MATERIAL DESCRIPTION			LENGTH	MATERIAL GRADE	FAB. METHOD (CNC, FORMED, ROLLED)		
AIR CAN LIFT LUG											
6	1120856	2	AIR CAN LIFT LUG	PLA 7 7/8" x 5 1/8" x 1/2"			-	ASTM A-36	CNC		
NAME PLATE BRACKET											
12	1121608	1	NAMEPLATE BRACKET	C3x4.1			3 15/16"	50W	-		
SPIDER PIPING BRACKET											
14	1121341	1	SPIDER PIPING BRACKET	L 3" x 2" x 3/16"			19"	50W	-		
QTI LOGO PLATE											
17	-	12	-	BOLT 1/2" x 1 1/2" HEX			-	GRADE 5	-		
18	-	24	-	1/2" WASHER CARBON STEEL			-	GRADE 5	-		
19	-	24	-	HEX NUT 1/2"-13 UNC			-	GRADE 5	-		
20	-	1	LOGO PLATE	PLA, 1/4" x 27 5/16" x 12 5/16"			-	ASTM A-36	CNC, ROLLED		
SUPPORT BRACKET											
25	1121334	3	-	3/8"-16x1 1/4" - 2 1/2" OD			-	A193	-		
26	-	12	-	NUT HEX 0.375			-	A194	-		
27	1121451	3	-	L 2" x 2" x 1/4"			6"	50W	-		
WASTE MANIFOLD ASSEMBLY											
35	1109814	3		FLANGE 3" RFWN 150#			-	304L	-		
36	1118742	1		REDUCER 4 x 3" SCH40			-	304/304L	-		
37	1118792	1		WELD CAP SCH 40 - SPHERICAL			-	304/304L	-		
39	1118456	1		PIPE 3" SCH40			3"	304/304L	-		
40	1111950	1		3" WELDED LONG RADIUS SCH40 90° ELBOW			-	304L	-		
42	1150227	1		PIPE 3" SCH40			18 9/16"	304/304L	-		
43	-	4		HEX BOLT 5/8-11UNC x 3" LONG			-	A193			
44	-	4		HEX NUT 5/8-11 UNC			-	A194			
45	-	8		FLAT WASHER 5/8"			-	304 SS			
47	1141425	1		FLEXITALLIC SPIRAL WOUND GASKET 7 1/2"x3 1/2"			-	316 SS			
48	1121067-1	1	-	1" SCH 40 PIPE			11 9/16"	304/304L			
49	1121067-2	1	-	1" SCH 40 PIPE			4 7/16"	304/304L			
FUEL MANIFOLD ASSEMBLY											
71	1109748	1		FLANGE 2" RFWN 150#			-	304L	-		
79	1150226	1		PIPE 2" SCH40			5 13/16"	304/304L	-		
73	1120055	1		2" SCH40 WELD ON TEE			-	304/304L	-		
75	1122728	4		1" SCKT WLD x 1" NPT			-	304L	-		
76	1119744	4		1X1/2 SWAGE			-	304/304L	-		
77	1119742	4		FLAMECO NOZZLE			-	304/304L	-		
78	1120064	1		2" SCH 40 PIPE			92 7/16"	304/304L			
85	1120069-1	1	-	1" SCH 40 PIPE			13 3/4"	304/304L	-		
86	1120069-2	1	-	1" SCH 40 PIPE			2 1/8"	304/304L	-		
UNISTRUT LAYOUT											
89	1121129	17		P1000 UNISTRUT 1 5/8"			5 7/8"	MILD STEEL	-		
AIR ARRESTOR											
91	1120910	3		PIPE 24" SCH XS			-	ASTM A-36	-		
92	1120914	6		PLA 22 7/8"D x 1/4"			-	ASTM A-36	-		
93	1120921	3		PLA 24"D x 1/4"			-	ASTM A-36	-		
94	1120926	3		THREADED ROD 3/4" - 10 UNC			11.875	GRADE 5	-		
95	-	12		NUT HEX 3/4"			-	GRADE 5	-		
MANWAY											
101	1122665	1	-	PLA 3' 3/16" x 2'4 3/16" x 1/4"			-	ASTM A-36	CNC, ROLLED		
102	1122660	1	-	2 1/16" x 1/8" DURLON STRIP GASKET			-	DURLON	-		
103	1122653	2	-	ROUND 1/2" x 8 5/8"			8 5/8"	ASTM A-36	-		
104	1122656	2	-	SQ 3/4"			3"	ASTM A-36	-		
105	-	18	-	BOLT 1/2" x 1 3/4" HEX			-	GRADE 5	-		
106	-	18	-	1/2" WASHER CARBON STEEL			-	GRADE 5	-		
107	-	18	-	HEX NUT 1/2"-13UNC			-	GRADE 5	-		
IGNITOR											
111	1121108	1	IGNITOR BODY	HSS 4" x 3" x 3/16"			4 1/8"	50W	-		
112	1121115	1	IGNITOR BODY FLANGE	PLA 5" x 4" x 1/4"			-	ASTM A-36	CNC		
113	1121113	1	IGNITOR FACE	PLA 5" x 4" x 1/4"			-	ASTM A-36	CNC		
114	-	4	-	HEX BOLT 1/4"-20UNC x 1"			-	GRADE 5	-		
115	-	4	-	NUT HEX 1/4"			-	GRADE 5	-		

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	D) ALL WELDS TO BE APPROPRIATE FOR FINAL ASSEMBLY AND PAINT.	0	ISSUED FOR CONSTRUCTION	12/08/2014	J. BOUCHARD	
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BILL OF MATERIALS							
ITEM #	PART #	QTY .	FUNCTIONAL DESCRIPTION	MATERIAL DESCRIPTION	LENGTH	MATERIAL GRADE	FAB. METHOD (CNC, FORMED, ROLLED)
IGNITOR PIPE MOUNT							
115	1122549	1	-	PIPE 8" SCH40	11 9/16"	SA-234WPB	FLAME CUT
116	1122521	1	-	PLA 1' 1/4"D x 1/4"	-	ASTM A-36	CNC
LIFT LUG							
121	1120849-1	2	-	PLA 1' x 11 13/16" x 1/2"	-	ASTM A-36	CNC, ROLLED
122	1120849-2	2	-	PLA 11 7/8" x 10" x 3/4"	-	ASTM A-36	CNC
123	1120849-3	4	-	PLA 7 9/16" x 5 1/2" x 1/2"	-	ASTM A-36	CNC
Q250 CAN							
131	1120893	46	GENERAL GUSSET	PLA 3" x 3" x 1/2"		ASTM A-36	CNC
132	1119423	1	BASE PLATE - 250	PLA 42"D x 1/2"		ASTM A-36	CNC
133	1120887	1	AIR CAN FLANGE	PLA 42"D x 1/2"		ASTM A-36	CNC
134	1120880	2	STACK BASE FLANGE	PLA 42"D x 1/2"		ASTM A-36	CNC
135	1120978	1	AIR CAN SHELL	PIPE 36" SCH XS		ASTM A-36	-
136	1119393	1	STACK SHELL	PIPE 36" SCH STD		ASTM A-36	-
137	-	24	-	HEX BOLT 3/4"-10 UNC x 2.5" LONG		GRADE 8	-
138	-	48	-	3/4" WASHER CARBON STEEL		GRADE 5	-
139	-	24	-	NUT HEX 3/4"		GRADE 5	-
WIND SHROUD							
141	1120880	1	STACK BASE FLANGE	PLA 3'6"D x 1/2"	-	ASTM A-36	CNC
142	1120871	1	WIND SHROUD	PLA 15'7 7/8" x 2'0" x 3/16"	-	ASTM A-36	CNC, ROLLED
143	1120865	6	WIND SHROUD GUSSET	PLA 1' 3/8" x 5 7/8" x 1/4"	-	ASTM A-36	CNC
VIEW PORT							
145	1121598	1	-	PIPE 2" SHC40	6"	SA-106B	-
146	1121601	1	-	VIEW PORT GLASS 2in NPT	-	-	-
SKID AND FUEL TRAIN STAND							
150	-	2	SKID BEAM	W8X21 WIDE FLANGE	72"	ASTM A-572 GR. 50	-
151	-	3	SKID BEAM	W8X21 WIDE FLANGE	49 7/16"	ASTM A-572 GR. 50	-
152	-	2	SKID BEAM	W8X21 WIDE FLANGE	20 5/8"	ASTM A-572 GR. 50	-
153	-	1	TOP PLATE	PLA 71" x 59" x 1/2"	-	ASTM A-36	-
154	-	2	FUEL TRAIN STAND	1 1/2" x 3/16" SHS	60"	ASTM A-36	-
155	-	1	FUEL TRAIN STAND	1 1/2" x 3/16" SHS	13"	ASTM A-36	-
156	-	1	FUEL TRAIN STAND	1 1/2" x 3/16" SHS	48"	ASTM A-36	-
157	-	1	FUEL TRAIN STAND	1 1/2" x 3/16" SHS	13"	ASTM A-36	-
158	-	3	FUEL TRAIN STAND	1 1/2" x 3/16" SHS	58 1/2"	ASTM A-36	-
159	-	2	FUEL TRAIN STAND	4" x 1/4" FLAT BAR	21 3/4"	ASTM A-36	-
160	-	6	FUEL TRAIN STAND	1 1/2" x 1/4" FLAT BAR	10 7/8"	ASTM A-36	-
161	-	6	FUEL TRAIN STAND	1 1/2" x 1 1/2" x 1/4" ANGLE	-	ASTM A-36	-
162	-	7	CABLE ROUTING	UNISTRUT	6"	P1000 1 5/8"	-
163	-	3	CABLE ROUTING	UNISTRUT	12"	P1000 1 5/8"	-
164	-	1	CABLE ROUTING	UNISTRUT	13"	P1000 1 5/8"	-

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		SCALE: 1:1	DWG NO.: ENG-D-M-17-Q250 GA and BOM			REV NO.: 0	SHEET 2 of 2



AIR HYGIENE, INC.

Testing Solutions for a Better World

STACK EMISSIONS STUDY
EPA 40 CFR PART 60 SUBPART 0000
FOR THE
COMBUSTION FLARE Q250 MODEL
PREPARED FOR
QUESTOR TECHNOLOGY INC.
AT THE
BROKEN ARROW RENTAL FACILITY
BROKEN ARROW, OKLAHOMA
FEBRUARY 25-28, 2015



Corporate Headquarters

1600 W Tacoma Street
Broken Arrow, OK 74012



AIR HYGIENE, INC.

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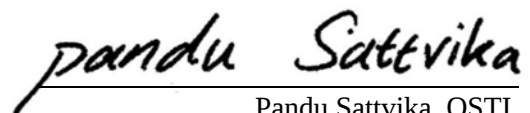
Las Vegas, NV 89156
Ft. Worth, TX 76028
Humble, TX 77338
Shreveport, LA 71115
Miami, FL 33101
Philadelphia, PA 19136

**STACK EMISSIONS STUDY
EPA 40 CFR PART 60 SUBPART OOOO
FOR THE
COMBUSTION FLARE Q250 MODEL
PREPARED FOR
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AT THE
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FEBRUARY 25-28, 2015**

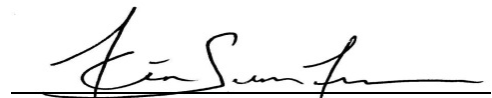
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Regional Manager-Austin, TX



Min Sum Lee, QSTI,
Project Manager

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**Stack Emissions Study
Combustion Flare Q250 Model
Questor Technology Inc.
Broken Arrow Rental Facility
Broken Arrow, Oklahoma
February 25-28, 2015**

1.0 INTRODUCTION

Air Hygiene International, Inc. (Air Hygiene) has completed the emissions testing study for carbon monoxide (CO), total hydrocarbons (THC), flow, visual emission (VE), moisture (H₂O), carbon dioxide (CO₂), and oxygen (O₂) from the exhaust of the Combustion Flare Q250 Model for Questor Technology Inc. at the Broken Arrow Rental Facility near Broken Arrow, Oklahoma. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on February 25-28, 2015.

1.1 TEST PURPOSE AND OBJECTIVES

The purpose of the test was to conduct compliance emission testing to document levels of selected pollutants at four ramp-up / ramp-down test loads (0-30-0%, 30-70-30%, 70-100-70%, and 90-100%). The information will be used to confirm compliance with United States Code of Federal Regulations (CFR), Title 40 (40 CFR), Part 60 (40 CFR 60), Subpart OOOO. The specific objective was to determine the emission concentration of CO, THC, flow, visual emission, H₂O, CO₂, and O₂ from the exhaust of Questor Technology Inc.'s Combustion Flare Q250 Model.

1.2 SUMMARY OF TEST PROGRAM

The following list details pertinent information related to this specific project:

- 1.2.1 Participating Organizations
 - Environment Protection Agency (EPA)
 - Questor Technology Inc.
 - Air Hygiene
- 1.2.2 Industry
 - Oil and Natural Gas Storage Transport and Processing
- 1.2.3 Air Permit and Federal Requirements
 - 40 CFR 60, Subpart OOOO
- 1.2.4 Plant Location
 - Broken Arrow Rental Facility near Broken Arrow, Oklahoma
 - 1600 West Tacoma Street, Broken Arrow, OK 74012
- 1.2.5 Equipment Tested
 - Combustion Flare Q250 Model
- 1.2.6 Emission Points
 - For all gases, three sample points in the exhaust duct from the Combustion Flare Q250 Model, determined according 40 CFR 60 Subpart OOOO
 - For all moisture, flow and fixed gas testing, 24 sampling points in the exhaust duct from the Combustion Flare Q250 Model
 - For visual emission, one sample visual observation point from the exit of the exhaust duct to the atmosphere from the Combustion Flare Q250 Model

- 1.2.7 Pollutants Measured
 - CO
 - THC
 - Flow
 - Visual Emission
 - H₂O
 - CO₂
 - O₂
- 1.2.8 Dates of Emission Test
 - February 25-28, 2015

1.3 KEY PERSONNEL

Questor Technology Inc.:	Jeff Nelson	587-390-0965
Air Hygiene	Min Sum Lee	918-307-8865
Air Hygiene:	Colby Gniech	918-307-8865
Air Hygiene:	Mike Schroeder	918-307-8865

2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on Questor Technology Inc.'s Combustion Flare Q250 Model located at the Broken Arrow Rental Facility on February 25-28, 2015 are summarized in the following table and relate only to the items tested.

TABLE 2.1
Q250 0-30-0 LOAD DATA SUMMARY

Parameter	0-30-0 Load, Run - Q250-R1	0-30-0 Load, Run - Q250-R2	0-30-0 Load, Run - Q250-R3	Average
Date (mm/dd/yy)	02/25/15	02/26/15	02/27/15	--
Start Time (hh:mm:ss)	16:50:08	15:55:08	8:42:08	--
End Time (hh:mm:ss)	18:00:38	17:05:38	9:52:38	--
Run Duration (min / run)	71	71	71	71
Bar. Pressure (in. Hg)	29.79	30.42	30.61	30.27
Amb. Temp. (°F)	55	40	29	41
Rel. Humidity (%)	31	31	40	34
Spec. Humidity (lb water / lb air)	0.002798	0.001549	0.001287	0.001878
Wind Speed (mph)	5.0	10.0	5.0	6.7
Wind Direction (--)	N	N	N	--
Inlet Gas Canister Pressure Start (inHg)	-29.02	-19.70	-10.30	-19.67
Inlet Gas Canister Pressure Stop (inHg)	-19.70	-10.30	-3.97	-11.32
Gross Fuel Heating Value (Btu/ft3)	2,533	2,533	2,533	2,533
Stack Flow (M2) (dscfh)	42,560	37,124	39,355	39,680
Stack Moisture (Method 4) (%)	3.7	3.6	3.6	3.6
Average Inlet Fuel Flowrate (SCFH)	572.5	577.3	572.5	574.08
Average Inlet Mass Fuel Flowrate (lb/hr)	66.5	67.1	66.5	66.68
% Excess Air	205.2	219.9	195.9	207.00
CO ₂ (%) - Modified method 3C	5.78	5.63	5.96	5.79
O ₂ (%) - Modified Method 3C	14.20	14.50	14.00	14.23
N ₂ (%) - Modified Method 3C	80.00	79.90	80.10	80.00
Visual Emission (mm:ss)	0:00	0:00	0:00	0:00
CO (ppmvd)	0.76	0.22	0.61	0.53
CO (ppm@3%CO ₂)	0.39	0.12	0.31	0.27
THC (ppmvw)	1.16	0.64	0.58	0.79
THC (ppm@3%CO ₂)	0.60	0.34	0.29	0.41
THC (lb/hr)	0.006	0.003	0.003	0.004
VOC Destruction Efficiency (%)	99.992	99.996	99.996	99.994

TABLE 2.2
Q250 30-70-30 LOAD DATA SUMMARY

Parameter	30-70-30 Load, Run - Q250-R4	30-70-30 Load, Run - Q250-R5	30-70-30 Load, Run - Q250-R6	Average
Date (mm/dd/yy)	02/27/15	02/27/15	02/27/15	--
Start Time (hh:mm:ss)	10:47:08	12:20:08	13:49:08	--
End Time (hh:mm:ss)	11:57:38	13:30:38	14:59:38	--
Run Duration (min / run)	71	71	71	71
Bar. Pressure (in. Hg)	30.62	30.59	30.55	30.59
Amb. Temp. (°F)	26	21	25	24
Rel. Humidity (%)	44	51	43	46
Spec. Humidity (lb water / lb air)	0.001218	0.001129	0.001133	0.001160
Wind Speed (mph)	5.0	10.0	10.0	8.3
Wind Direction (--)	N	N	N	--
Inlet Gas Canister Pressure Start (inHg)	-29.79	-18.23	-9.95	--
Inlet Gas Canister Pressure Stop (inHg)	-18.23	-9.95	-4.12	--
Gross Fuel Heating Value (Btu/ft3)	2,509	2,509	2,509	2,509
Stack Flow (M2) (dscfh)	68,668	68,903	76,873	71,481
Stack Moisture (Method 4) (%)	3.6	3.6	4.3	3.8
Average Inlet Fuel Flowrate (SCFH)	1,200.7	1,210.7	1,180.3	1,197.23
Average Inlet Mass Fuel Flowrate (lb/hr)	138.8	140.6	125.4	134.95
% Excess Air	236.2	273.0	320.0	276.40
CO ₂ (%) - Modified method 3C	5.39	4.95	4.50	4.95
O ₂ (%) - Modified Method 3C	14.80	15.40	16.00	15.40
N ₂ (%) - Modified Method 3C	79.80	79.70	79.50	79.67
Visual Emission (mm:ss)	0:00	0:00	0:00	0:00
CO (ppmvd)	2.09	1.30	2.49	1.96
CO (ppm@3%CO ₂)	1.17	0.79	1.66	1.21
THC (ppmvw)	0.61	0.85	0.78	0.75
THC (ppm@3%CO ₂)	0.34	0.52	0.52	0.46
THC (lb/hr)	0.005	0.007	0.007	0.006
VOC Destruction Efficiency (%)	99.996	99.995	99.994	99.995

TABLE 2.3
Q250 70-100-70 LOAD DATA SUMMARY

Parameter	70-100-70 Load, Run - Q250-R7	70-100-70 Load, Run - Q250-R8	70-100-70 Load, Run - Q250-R9	Average
Date (mm/dd/yy)	02/28/15	02/28/15	02/28/15	--
Start Time (hh:mm:ss)	9:01:17	10:31:17	12:27:04	--
End Time (hh:mm:ss)	10:11:47	11:41:47	13:37:34	--
Run Duration (min / run)	71	71	71	71
Bar. Pressure (in. Hg)	30.48	30.47	30.43	30.46
Amb. Temp. (°F)	26	25	27	26
Rel. Humidity (%)	82	83	88	84
Spec. Humidity (lb water / lb air)	0.002296	0.002217	0.002587	0.002367
Wind Speed (mph)	3.2	2.0	1.7	2.3
Wind Direction (--)	NE	NE	NE	--
Inlet Gas Canister Pressure Start (inHg)	-29.70	-18.00	-9.33	--
Inlet Gas Canister Pressure Stop (inHg)	-18.00	-9.33	-2.10	--
Gross Fuel Heating Value (Btu/ft3)	2,527	2,527	2,527	2,527
Stack Flow (M2) (dscfh)	75,725	81,549	76,880	78,051
Stack Moisture (Method 4) (%)	5.7	5.1	5.5	5.4
Average Inlet Fuel Flowrate (SCFH)	1,965.0	1,962.3	1,825.9	1,917.77
Average Inlet Mass Fuel Flowrate (lb/hr)	228.2	226.6	212.1	222.30
% Excess Air	229.9	209.7	209.7	216.43
CO ₂ (%) - Modified method 3C	5.43	5.65	5.70	5.59
O ₂ (%) - Modified Method 3C	14.70	14.30	14.30	14.43
N ₂ (%) - Modified Method 3C	79.90	80.00	80.00	79.97
Visual Emission (mm:ss)	0:00	0:00	0:00	0:00
CO (ppmvd)	2.36	1.89	1.39	1.88
CO (ppm@3%CO ₂)	1.30	1.00	0.73	1.01
THC (ppmvw)	0.68	0.25	0.76	0.56
THC (ppm@3%CO ₂)	0.37	0.13	0.40	0.30
THC (lb/hr)	0.006	0.002	0.007	0.005
VOC Destruction Efficiency (%)	99.997	99.999	99.997	99.998

TABLE 2.4
Q250 90-100 LOAD DATA SUMMARY

Parameter	90-100 Load, Run - Q250-R10	90-100 Load, Run - Q250-R11	90-100 Load, Run - Q250-R12	Average
Date (mm/dd/yy)	02/25/15	02/25/15	02/25/15	--
Start Time (hh:mm:ss)	8:44:25	10:19:25	13:38:25	--
End Time (hh:mm:ss)	9:54:55	11:29:55	14:48:55	--
Run Duration (min / run)	71	71	71	71
Bar. Pressure (in. Hg)	29.94	29.91	29.80	29.88
Amb. Temp. (°F)	35	39	54	43
Rel. Humidity (%)	56	46	37	46
Spec. Humidity (lb water / lb air)	0.002369	0.002308	0.003236	0.002638
Wind Speed (mph)	2.0	2.0	5.0	3.0
Wind Direction (--)	N	N	N	--
Inlet Gas Canister Pressure Start (inHg)	-29.89	-20.13	-11.12	--
Inlet Gas Canister Pressure Stop (inHg)	-20.13	-11.12	-5.79	--
Gross Fuel Heating Value (Btu/ft3)	2,503	2,503	2,503	2,503
Stack Flow (M2) (dscfh)	139,014	143,525	138,517	140,352
Stack Moisture (Method 4) (%)	6.4	4.3	5.2	5.3
Average Inlet Fuel Flowrate (SCFH)	2,236.3	2,147.1	2,196.9	2,193.41
Average Inlet Mass Fuel Flowrate (lb/hr)	259.7	249.4	255.2	254.75
% Excess Air	235.3	241.6	295.4	257.43
CO ₂ (%) - Modified method 3C	5.33	5.24	4.70	5.09
O ₂ (%) - Modified Method 3C	14.80	14.90	15.70	15.13
N ₂ (%) - Modified Method 3C	79.80	79.80	79.60	79.73
Visual Emission (mm:ss)	0:00	0:00	0:00	0.00
CO (ppmvd)	3.52	4.39	3.52	3.81
CO (ppm@3%CO ₂)	1.98	2.52	2.24	2.25
THC (ppmvw)	0.06	1.05	0.31	0.47
THC (ppm@3%CO ₂)	0.03	0.60	0.20	0.28
THC (lb/hr)	0.001	0.017	0.002	0.007
VOC Destruction Efficiency (%)	99.999	99.993	99.999	99.997

All testing was conducted according to the requirement of 40 CFR 60.5413 and 40 CFR 60.5412

3.0 SOURCE OPERATION

3.1 PROCESS DESCRIPTION

Questor Technology Inc. (Questor) is an international environmental oilfield service company headquartered in Calgary, Alberta. Questor manufactures and services high efficiency waste gas incinerator systems, provides combustion and burner-related oilfield services as well as power generation systems. The interest of this certification testing is a Questor designed combustion flare, designated as Q250. This combustion flare was tested in Broken Arrow, Oklahoma.

3.2 SAMPLING LOCATION

The sample ports were located approximately 27 feet above grade level on the exhaust system. The stack had a 29.3 inch inner diameter and was equipped with two, 3 inch ports oriented at 90 degrees. The ports were 6 duct diameters downstream from the flare tip and 1 duct diameters upstream from the stack exit to the atmosphere. THC and CO samples for gaseous emissions were continuously drawn from the exhaust system at one sample port with three sampling points located at 16.7 percent, 50 percent, and 83.3 percent of the stack diameter. All visual emission observation was made by viewing the point where the exhaust system exited to the atmosphere at the top of the exhaust stack. All fuel sampling was continuously drawn from the fuel supply system with silonite-coated stainless steel evacuated canister from a tap located at 24 pipe diameter, 48 inches upstream of the fuel monitoring system. All flow, fixed gases and moisture sampling was continuously drawn from the exhaust system at two ports with 24 points across the stack according to Method 1.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

The emission test on the Combustion Flare Q250 Model at the Broken Arrow Rental Facility was performed following United States Environmental Protection Agency (EPA) methods described by the Code of Federal Regulations (CFR). Table 4.1 outlines the specific methods performed on February 25-28, 2015.

TABLE 4.1
SUMMARY OF SAMPLING METHODS

Pollutant or Parameter	Sampling Method	Analysis Method
Sample Point Location	EPA Method 1	Equal Area Method
Stack Flow Rate	EPA Method 2	S-Type Pitot Tube
Fuel Flow Rate	EPA Method 2a	Volume Displacement
CO ₂ , O ₂ , Methane	EPA Method 3C	Gas Chromatograph-TCD
Stack Moisture Content	EPA Method 4	Gravimetric Analysis
Carbon Monoxide	EPA Method 10	Nondispersive Infrared Analyzer

Pollutant or Parameter	Sampling Method	Analysis Method
Visual Emission	EPA Method 22	Visual Observation
Total Hydrocarbons	EPA Method 25a	Flame Ionization Detector
Fuel Content Analysis	ASTM D 1945-03, ASTM D 3588-98	Gas Chromatograph

4.2 INSTRUMENT CONFIGURATION AND OPERATIONS FOR GAS ANALYSIS

The sampling and analysis procedures used during these tests conform with the methods outlined in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A, Methods 1, 2, 2a, 3c, 4, 10, 22, 25a; American Society for Testing and Materials (ASTM) Standard D1945-03, and D3588-98 .

Figure 4.1 depicts the sample system used for the real-time gas analyzer tests. The gas sample was continuously pulled through the probe and transported, via heat-traced Teflon® tubing, to a stainless steel minimum-contact condenser designed to dry the sample. Transportation of the sample, through Teflon® tubing, continued into the sample manifold within the mobile laboratory via a stainless steel/Teflon® diaphragm pump. From the manifold, the sample was partitioned to the real-time analyzers through rotameters that controlled the flow rate of the sample. Exhaust samples were routed to the wet based analyzer prior to gas conditioning.

Figure 4.1 shows that the sample system was also equipped with a separate path through which a calibration gas could be delivered to the probe and back through the entire sampling system. This allowed for convenient performance of system bias checks as required by the testing methods.

All instruments were housed in an air-conditioned, controlled environment. Gaseous calibration standards were provided in aluminum cylinders with the concentrations certified by the vendor. EPA Protocol No. 1 was used to determine the cylinder concentrations where applicable (i.e. CO calibration gases).

Table 4.2 provides a description of the analyzers used for the instrument portion of the tests. All data from the continuous monitoring instruments were recorded on a Logic Beach Portable Data Logging System Hyperlogger which retrieves calibrated electronic data from each instrument every one second and reports an average of the collected data every 30 seconds. Data records can be found in Appendix A and B of this report.

Figure 4.2 represents the sample system used for moisture O₂,CO₂ and flow testing. A hastelloy probe with an inconel 3/8 inches tubing, pitot tubes and thermocouple were inserted into the sample ports of the stack to extract gas measurements from the emission stream through a glass impinger train. Flow rates were monitored with oil filled manometers (low flow) and total sample volumes were measured with a dry gas meter. Tedlar bags were collected at the exit of this train for 3c analysis.

Three test runs for each of the firing rates at 0-30-0 percent, 30-70-30 percent, 70-100-70 percent, and 90-100 percent (ramp up, ramp down) of approximately 61 minutes each were conducted on the Combustion Flare Q250 Model for CO, THC, CO₂, and O₂.

Figure 4.3 represents the inlet sampling system in accordance with Method 2A, 40 CFR part 60 to measure inlet gas flow rate, pressure and temperature. Fuel sample was collected at 48 inches upstream from gas flow meter.

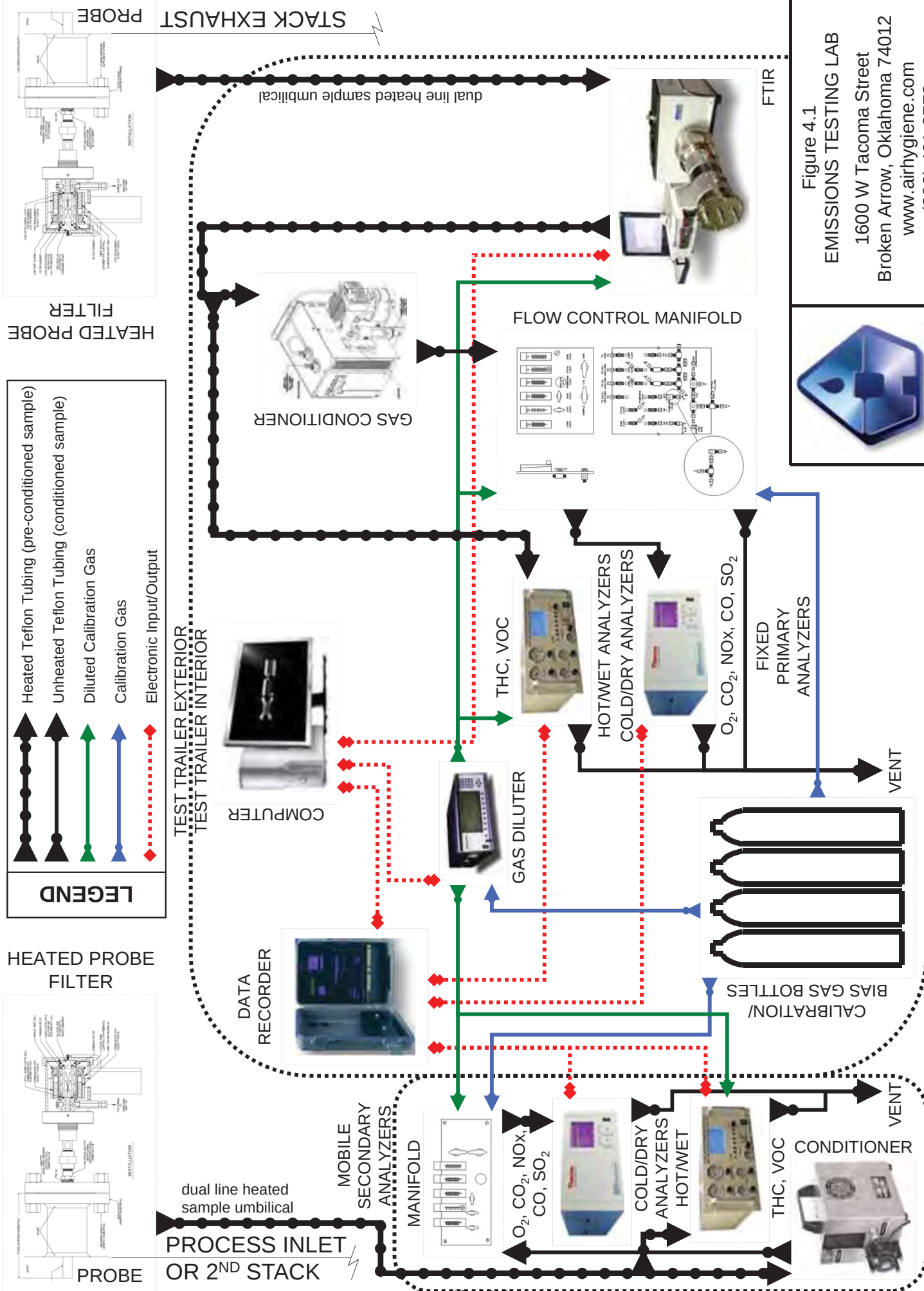
The stack gas analysis for O₂ and CO₂ concentrations was performed in accordance with procedures set forth in EPA Method 3C. The sample were collected in a tedlar bag and analyzed by GC-TCD at an offsite laboratory.

CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous nondispersive infrared (NDIR) analyzer was used for this purpose.

THC emission concentrations were quantified in accordance with procedures set forth in EPA Method 25a. A continuous flame ionization (FID) analyzer was used for this purpose.

TABLE 4.2
ANALYTICAL INSTRUMENTATION

Parameter	Manufacturer and Model	Range	Sensitivity	Detection Principle
CO	Thermo 48C	User may select up to 10,000 ppm	0.1 ppm	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
THC	Thermo 51C-HT	User may select up to 10,000 ppm	0.1 ppm	Flame Ionization Detector



AIR HYGIENE

EMISSIONS TESTING LAB

1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
www.airhygiene.com
(888) 461-8778

Figure 4.1

Shown fully equipped. Some labs may not contain these features and others may contain additional features specific to certain scopes.

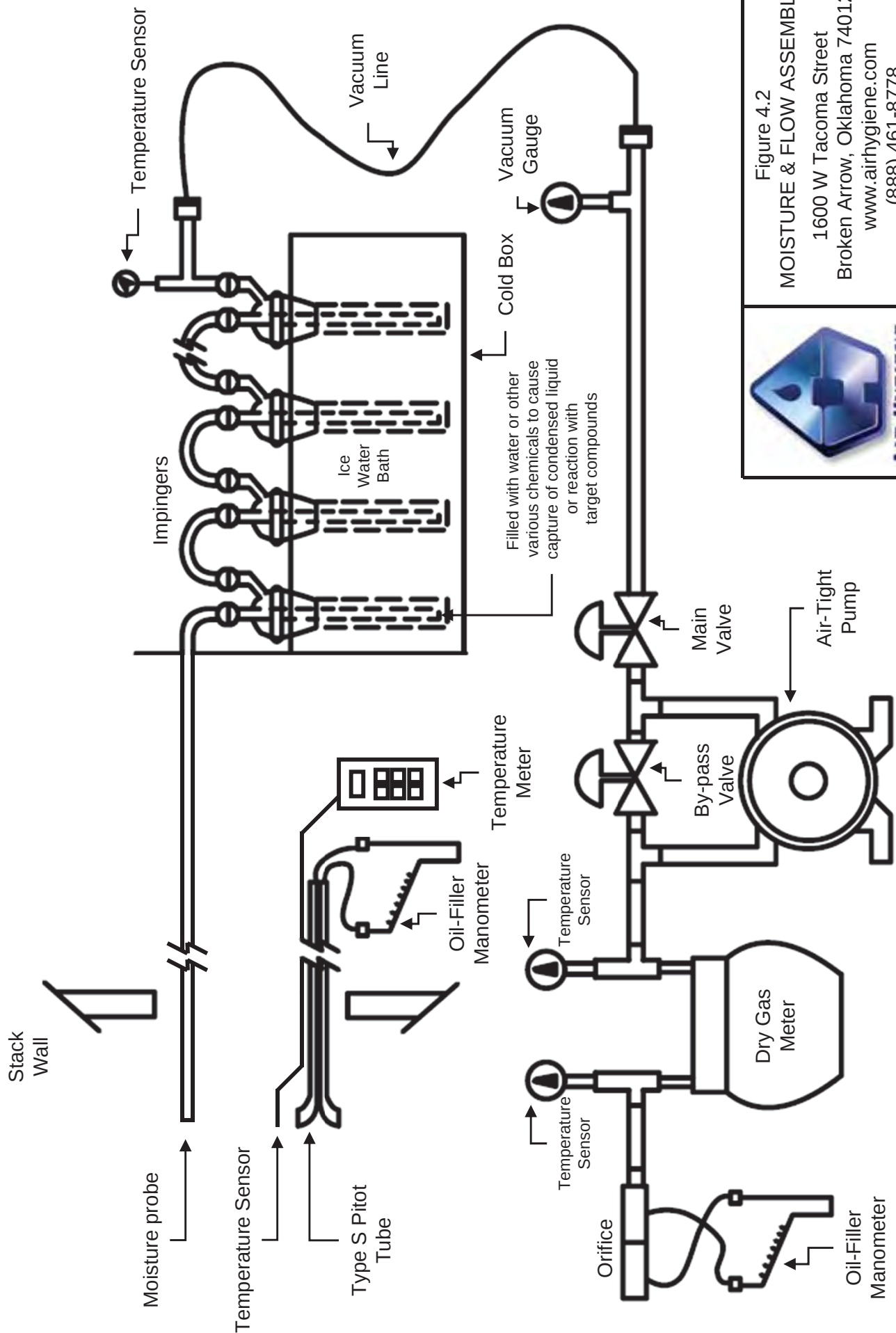


Figure 4.2
MOISTURE & FLOW ASSEMBLY
 1600 W Tacoma Street
 Broken Arrow, Oklahoma 74012
www.airhygiene.com
 (888) 461-8778

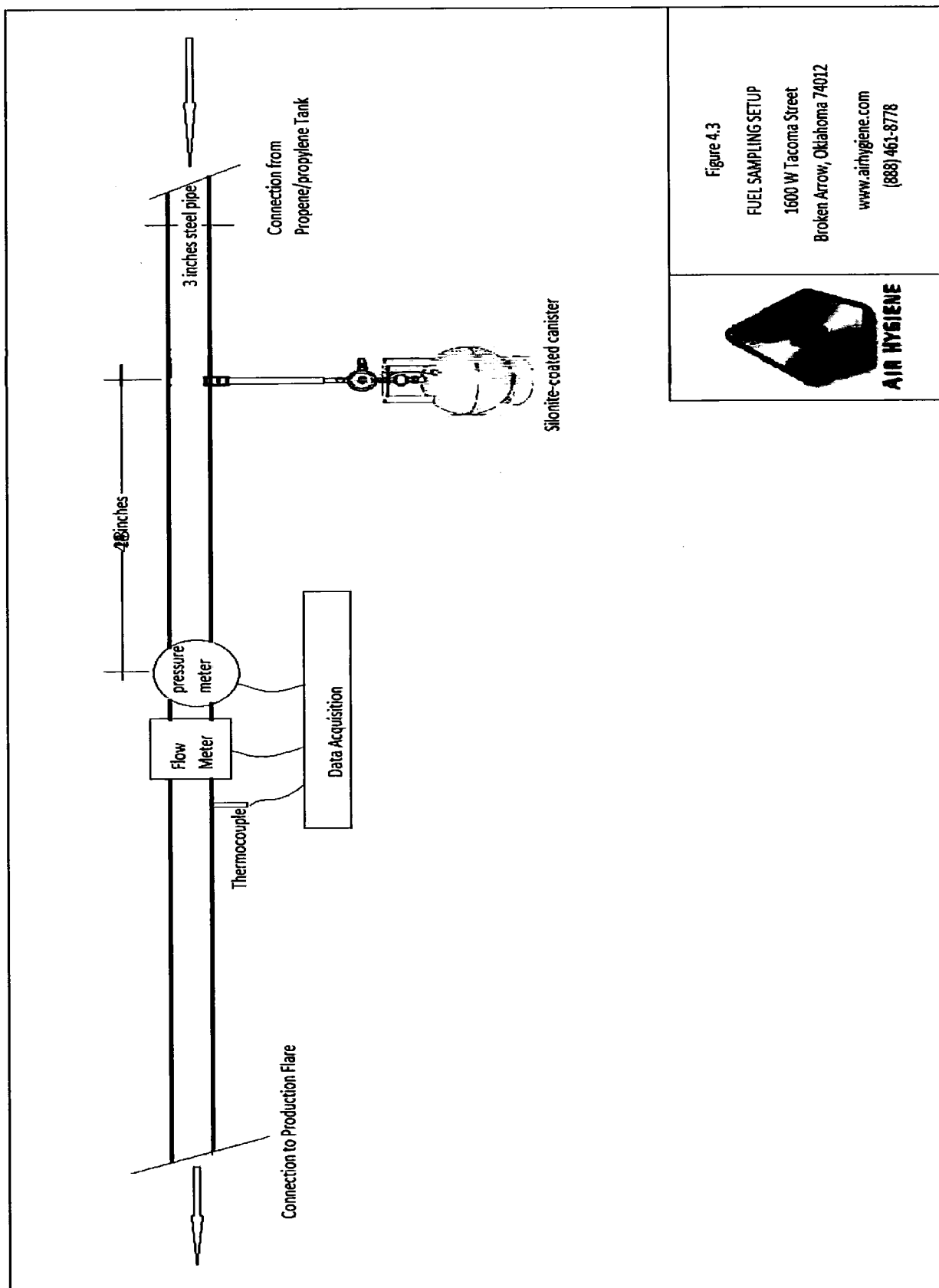


Figure 4.3
FUEL SAMPLING SETUP
1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
www.airhygiene.com
(888) 461-8778



APPENDIX A

TEST RESULTS AND CALCULATIONS

**TABLE A.1:
EMISSIONS TESTING SCHEDULE**

Unit	Load	Test Type	Run	Date	Start	Stop	Time Sync
Q250	90-100	CO,THC & Fuel Sampling	Q250-R10	02/25/15	8:44:25	9:54:55	CST
Q250	90-100	CO,THC & Fuel Sampling	Q250-R11	02/25/15	10:19:25	11:29:55	CST
Q250	90-100	CO,THC & Fuel Sampling	Q250-R12	02/25/15	13:38:25	14:48:55	CST
Q250	0-30-0	CO,THC & Fuel Sampling	Q250-R1	02/25/15	16:50:08	18:00:38	CST
Q250	0-30-0	CO,THC & Fuel Sampling	Q250-R2	02/26/15	15:55:08	17:05:38	CST
Q250	0-30-0	CO,THC & Fuel Sampling	Q250-R3	02/27/15	8:42:08	9:52:38	CST
Q250	30-70-30	CO,THC & Fuel Sampling	Q250-R4	02/27/15	10:47:08	11:57:38	CST
Q250	30-70-30	CO,THC & Fuel Sampling	Q250-R5	02/27/15	12:20:08	13:30:38	CST
Q250	30-70-30	CO,THC & Fuel Sampling	Q250-R6	02/27/15	13:49:08	14:59:38	CST
Q250	70-100-70	CO,THC & Fuel Sampling	Q250-R7	02/28/15	9:01:17	10:11:47	CST
Q250	70-100-70	CO,THC & Fuel Sampling	Q250-R8	02/28/15	10:31:17	11:41:47	CST
Q250	70-100-70	CO,THC & Fuel Sampling	Q250-R9	02/28/15	12:27:04	13:37:34	CST
Q250	90-100	Fixed Gas & Moisture	90-100%-1	02/25/15	8:44:00	9:55:00	CST
Q250	90-100	Fixed Gas & Moisture	90-100%-2	02/25/15	10:19:00	11:30:00	CST
Q250	90-100	Fixed Gas & Moisture	90-100%-3	02/25/15	13:38:00	14:49:00	CST
Q250	0-30-0	Fixed Gas & Moisture	0-30-0%-1	02/25/15	16:50:00	18:00:00	CST
Q250	0-30-0	Fixed Gas & Moisture	0-30-0%-2	02/26/15	15:55:00	17:05:00	CST
Q250	0-30-0	Fixed Gas & Moisture	0-30-0%-3	02/27/15	8:42:00	9:52:00	CST
Q250	30-70-30	Fixed Gas & Moisture	30-70-30%-1	02/27/15	10:47:00	11:57:00	CST
Q250	30-70-30	Fixed Gas & Moisture	30-70-30%-2	02/27/15	12:20:00	13:30:00	CST
Q250	30-70-30	Fixed Gas & Moisture	30-70-30%-3	02/27/15	13:49:00	14:59:00	CST
Q250	70-100-70	Fixed Gas & Moisture	70-100-70%-1	02/28/15	9:01:00	10:11:00	CST
Q250	70-100-70	Fixed Gas & Moisture	70-100-70%-2	02/28/15	10:31:00	11:41:00	CST
Q250	70-100-70	Fixed Gas & Moisture	70-100-70%-3	02/28/15	12:27:00	13:37:00	CST

EXAMPLE CALCULATIONS (INFORMATION)

Specific Humidity (RH_{sp})

Note: RH_{sp} (gr/lb) calculated using temperature, relative humidity, and barometric pressure with psychrometric chart, psychrometric calculator, or built in psychrometric algorithm.

$$RH_{sp} (lb/lb) = \left[\left(\frac{gr}{lb} \right) \times \frac{lb}{7000 gr} \right] \quad RH_{sp} = \frac{16.58 \text{ gr}}{lb} \times \frac{1 lb}{7000 gr} = 0.002369 \frac{lb \text{ H}_2\text{O}}{lb \text{ Air}}$$

EXAMPLE CALCULATIONS (CALIBRATION)

Calibration Error and Estimated Point, RM 25A, THC Analyzer

RM 25A, (12-17-09), 8.4 Calibration Error Test. Immediately prior to the test series (within 2 hours of the start of the test), introduce zero gas and high-level calibration gas at the calibration valve assembly. Adjust the analyzer output to the appropriate levels, if necessary. Calculate the predicted response for the low-level and mid-level gases based on a linear response line between the zero and high-level response. Then introduce low-level and mid-level calibration gases successively to the measurement system. ... These differences must be less than 5 percent of the respective calibration gas value. (calc for THC analyzer mid gas, if applicable)

$$E_p = \frac{C_{Dir(H)} - C_{Dir(Z)}}{C_{V(H)} - C_{V(Z)}} \times C_{Dir(M)} + C_{Dir(Z)} \quad \text{Eq. of a line } y=mx+b \quad E_p = \frac{8.42 \text{ ppm} - 0.10 \text{ ppm}}{8.48 \text{ ppm} - 0.00 \text{ ppm}} \times 5.01 \text{ ppm} + 0.10 = 5.02 \text{ ppm}$$

$$ACE = \left(\frac{C_{Dir} - C_V}{CS} \right) \times 100 \quad \text{Eq. 7E-1} \quad ACE_{THC} = \frac{5.08 \text{ ppm} - 5.02 \text{ ppm}}{5.01 \text{ ppm}} \times 100 = 1.29 \%$$

EXAMPLE CALCULATIONS (BIAS, DRIFT, AND CORRECTED RAW AVERAGE)

System Bias

RM 7E, (12-17-09), 12.3 System Bias. For non-dilution systems, use Equation 7E-2 to calculate the system bias separately for the low-level and upscale calibration gases. (calc for THC analyzer upscale gas, Run 1 initial bias, if applicable)

$$SB = \left(\frac{C_S - C_{Dir}}{CS} \right) \times 100 \quad \text{Eq. 7E-2} \quad SB = \frac{3.14 \text{ ppm} - 3.10 \text{ ppm}}{10.00 \text{ ppm}} \times 100 = 0.40 \%$$

Drift Assessment

RM 7E, (12-17-09), 12.5 Drift Assessment. Use Equation 7E-4 to separately calculate the low-level and upscale drift over each test run. (calc for THC analyzer upscale drift, Run 1, if applicable)

$$D = |SB_{final} - SB_i| \quad \text{Eq. 7E-4} \quad D = | -1.10 \% - 0.40 \% | = 1.50 \%$$

Alternative Drift and Bias

RM 7E, (12-17-09), 13.2 / 13.3 System Bias and Drift. Alternatively, the results are acceptable if $|C_S - C_{dir}|$ is ≤ 0.5 ppmv or if $|C_S - C_V|$ is ≤ 0.5 ppmv (as applicable). (calc for THC analyzer initial upscale, Run 1, if applicable)

$$SB / D_{Alt} = |C_S - C_{Dir}| \quad \text{Eq. Section 13.2 and 13.3} \quad SB / D_{Alt} = | 3.14 \text{ ppm} - 3.10 \text{ ppm} | = 0.04 \text{ ppm}$$

Bias Adjusted Average

RM 7E, (12-17-09), 12.6 Effluent Gas Concentration. For each test run, calculate Cavg, the arithmetic average of all valid THC concentration values (e.g., 1-minute averages). Then adjust the value of Cavg for bias, using Equation 7E-5b. (calc for THC analyzer, Run 1, if applicable)

$$C_{Gas} = (C_{Avg} - C_O) \times \left(\frac{C_{MA}}{C_M - C_O} \right) \quad \text{Eq. 7E-5b} \quad C_{Gas} = \left(0.04 \text{ ppm} - -0.03 \text{ ppm} \right) \times \left(\frac{3.02 \text{ ppm}}{3.07 \text{ ppm} - -0.03 \text{ ppm}} \right) = 0.06 \text{ ppm}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (RUNS)

Diluent-Corrected Pollutant Concentration, CO₂ Based

Calculate the CO₂ corrected pollutant concentration, as follows: (calc for THC gas, Run 1, if applicable)

Uinsg Method 3C fixed gas analysis

$$C_{adj} = 0.06 \text{ ppm} \times \left(\frac{3.00 \%}{5.90 \%} \right) = 0.03 \text{ ppm@3\%CO}_2$$

EXAMPLE CALCULATIONS (RUNS)

Emissions Rate (lb/hr)

Calculation for pound per hour emission rate. Calculate, as follows: (calc for THC gas Run 1, if applicable)

$$E_{lb/hr} = \frac{C_{Gas}}{10^6} \times \frac{Q_S \times MW}{G} \quad E_{lb/hr} = \frac{0.06 \text{ ppm}}{10^6 \text{ ppm/part}} \times \frac{114,783 \text{ SCFH} \times 44.00 \text{ lb/lb-mol}}{385.23 \text{ SCF/lb-mol}} = \frac{0.001 \text{ lb}}{\text{hr}}$$

VOC Destruction Efficiency

Calculation for VOC destruction Efficiency. Calculate, as follows: (calc for run 1, if applicable)

$$DE\% = \frac{259.729 - 0.001 \text{ lb/hr}}{259.729 \text{ lb/hr}} \times 100 = 99.9997 \%$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Reference Method 1 - Circular Stack)

Diameter of Stack (in.)

$$D(\text{in.}) = L_{fw} - L_{rw}$$

$$D(\text{in.}) = 35.31 \text{ in.} - 6.00 \text{ in.} = 29.31 \text{ in.}$$

Stack Diameters Downstream

$$B_D(\text{dia.}) = \frac{B}{D}$$

$$B_D(\text{dia.}) = \frac{180.00 \text{ in.}}{29.31 \text{ in.}} = 6.14 \text{ diameters}$$

Area of Stack (ft²)

$$A_s(\text{ft}^2) = \pi \times \left(\frac{D}{2 \times 12} \right)^2$$

$$A_s(\text{ft}^2) = 3.14 \times \left(\frac{29.31 \text{ in.}}{2 \times 12 \text{ in./ft}} \right)^2 = 4.69 \text{ ft}^2$$

Stack Diameters Upstream

$$A_D(\text{dia.}) = \frac{A}{D}$$

$$A_D(\text{dia.}) = \frac{36.00 \text{ in.}}{29.31 \text{ in.}} = 1.23 \text{ diameters}$$

EXAMPLE CALCULATIONS (Reference Method 3C) [Values from Run 1 test]

Carbon Monoxide Concentration (%)

$$\%CO = \frac{\text{ppmCO}}{10,000}$$

$$\%CO(\%) = \frac{0.00 \text{ ppm}}{10,000 \text{ ppm/\%}} = 0.0000 \%$$

Nitrogen Concentration (%)

$$\%N_2 = 100 - \%CO_2 - \%O_2 - \%CO$$

$$\%N_2(\%) = 100 - 5.78 \% - 14.20 \% - 0.00 / 10,000 \% = 80.02 \%$$

Stack Dry Molecular Weight (lb/lb-mole)

$$M_d(\text{lb/lb-mol}) = \sum \left(\frac{MW_{comp}}{100} \times \%component \right)$$

$$M_d(\text{lb/lb-mol}) = \left(\frac{44 \text{ lb/lb-mol}}{100} \times 5.78 \% \right) +$$

$$\left(\frac{32 \text{ lb/lb-mol}}{100} \times 14.20 \% \right) + \left(\frac{28 \text{ lb/lb-mol}}{100} \times \left[\frac{0.00}{10,000} + 80.00 \right] \right) = \frac{29.49 \text{ lb}}{\text{lb-mol}}$$

Stack Wet Molecular Weight (lb/lb-mole)

$$M_s(\text{lb/lb-mol}) = \left[M_d \times \left(1 - \frac{B_{ws}}{100} \right) \right] + \left[MW_{H_2O} \times \frac{B_{ws}}{100} \right]$$

$$M_s(\text{lb/lb-mol}) = \left\{ \frac{29.49 \text{ lb}}{\text{lb-mol}} \times \left(1 - \frac{3.65 \%}{100} \right) \right\} + \left\{ \frac{18 \text{ lb}}{\text{lb-mol}} \times \frac{3.65 \%}{100} \right\} = \frac{29.07 \text{ lb}}{\text{lb-mol}}$$

Average Excess Air (%)

$$\%EA_{avg}(\%) = \frac{100 \times \left[(\%O_2)_{avg} - (0.5 \times (\%CO)_{avg}) \right]}{\left[(0.264 \times (N_2)_{avg}) - \left[(\%O_2)_{avg} - (0.5 \times (\%CO)_{avg}) \right] \right]}$$

$$(\%EA)_{AVG} = \frac{100 \times \{ 14.20 \% - (0.5 \times 0.000 \%) \}}{(0.264 \times 80.00 \%) - \{ 14.20 \% - (0.5 \times 0.000 \%) \}} = 205.20 \%$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Reference Method 2) [Values from Run 1 test]

Absolute Stack Pressure (in. Hg)

$$P_s (\text{in. Hg}) = P_b + \frac{P_{\text{static}}}{13.6}$$

$$P_s (\text{in. Hg}) = 29.79 \text{ in. Hg} + \frac{0.00 \text{ in. H}_2\text{O}}{13.6 \text{ in. H}_2\text{O/in. Hg}} = 29.79 \text{ in. Hg}$$

Average Stack Gas Velocity (ft/sec)

$$v_s (\text{ft/sec}) = K_p \times C_p \times (\sqrt{\Delta p})_{\text{avg}} \times \sqrt{\frac{(t_s)_{\text{avg}} + T_u}{P_s \times M_s}}$$

$$v_{sl} (\text{ft/sec}) = \left(\frac{85.49 \text{ ft (lb/lb-mol)(in. Hg)}}{\text{sec (}^\circ\text{R)(in. H}_2\text{O)}} \right)^{1/2} \times 0.82 \times 0.09 \text{ in. H}_2\text{O}^{1/2} \times \sqrt{\frac{1219.75 + 460^\circ\text{R}}{29.79 \text{ in. Hg} \times 29.07 \text{ lb/lb-mol}}} = \frac{8.3 \text{ ft}}{\text{sec}}$$

Average Stack Dry Standard Flow Rate (dscfh)

$$Q_{sd} (\text{dscfh}) = \frac{60 \times 60 \times \left(1 - \frac{B_{ws}}{100} \right) \times v_s \times A_s \times T_{std} \times P_s}{(t_s + T_u) \times P_{std}}$$

$$Q_{sd} (\text{dscf/hr}) = \frac{3600 \text{ sec}}{\text{hr}} \times \left(1 - \frac{3.65 \%}{100} \right) \times \frac{8.37 \text{ ft}}{\text{sec}} \times 4.69 \text{ ft}^2 \times \frac{68.00 + 460^\circ\text{R}}{1,219.75 + 460^\circ\text{R}} \times \frac{29.79 \text{ in. Hg}}{29.92 \text{ in. Hg}} = \frac{42,560.24 \text{ dscf}}{\text{hr}}$$

Average Stack Wet Flow Rate (acfm)

$$Q_{aw} (\text{acfm}) = 60 \times v_s \times A_s$$

$$Q_{aw} (\text{acf/min}) = \frac{60 \text{ sec}}{\text{min}} \times \frac{8.37 \text{ ft}}{\text{sec}} \times 4.69 \text{ ft}^2 = \frac{2,352.31 \text{ acf}}{\text{min}}$$

Average Stack Wet Standard Flow Rate (ascfh)

$$Q_{sw} (\text{ascfh}) = \frac{60 \times Q_{aw} \times T_{std} \times P_s}{(t_s + T_u) \times P_{std}}$$

$$Q_{sw} (\text{ascf/hr}) = \frac{60 \text{ min}}{\text{hr}} \times \frac{2,352.31 \text{ acf}}{\text{min}} \times \frac{68.00 + 460^\circ\text{R}}{1,219.75 + 460^\circ\text{R}} \times \frac{29.79 \text{ in. Hg}}{29.92 \text{ in. Hg}} = \frac{44,171.73 \text{ ascf}}{\text{hr}}$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

EXAMPLE CALCULATIONS (Reference Method 4) [Values from Run 1 test]

Water Volume Weighed (scf)

$$V_{ws(g\ std)} (scf) = W_t \times K_5$$

$$V_{ws(g\ std)} = 38.50 \text{ g} \times 0.04715 \text{ ft}^3/\text{g} = 1.820 \text{ scf}$$

Standard Meter Volume (dscf)

$$V_{m(std)} (dscf) = \frac{K_1 \times Y \times V_m \times \left(P_b + \frac{\Delta H_{avg}}{13.6} \right)}{(t_m)_{avg} + T_u}$$

$$V_{m(std)} = \frac{17.65 \text{ }^{\circ}\text{R}}{\text{in. Hg}} \times 1.00 \times 48.96 \text{ dcf} \times \left(29.79 \text{ in. Hg} + \frac{1.60 \text{ in. H}_2\text{O}}{13.6 \text{ in. H}_2\text{O} / \text{in. Hg}} \right) = 47.94 \text{ dscf}$$

$$80.06 \text{ }^{\circ}\text{F} + 460 \text{ }^{\circ}\text{R}$$

Calculated Moisture Content (%)

$$B_{ws(calc)} (\%) = 100 \times \frac{V_{ws(g\ std)}}{V_{ws(g\ std)} + V_{m(std)}}$$

$$B_{ws(calc)} = 100 \times \frac{1.82 \text{ dscf}}{1.82 \text{ dscf} + 47.94 \text{ dscf}} = 3.65 \%$$

Saturated Moisture Content (%)

$$B_{ws(svp)} (\%) = 100 \times \frac{10^{\frac{6.691 - \frac{3144}{t_s(avg) + 390.86}}}{P_b + \frac{P_{static}}{13.6}}} \leq 100$$

$$B_{ws(svp)} = 100 \times \frac{10^{\left(6.691 - \frac{3144}{1219.75 \text{ }^{\circ}\text{F} + 390.86} \right)}}{29.79 \text{ in. Hg} + \frac{0.00 \text{ in. H}_2\text{O}}{13.6 \text{ in. H}_2\text{O} / \text{in. Hg}}} \leq 100 = 100.00 \%$$

Note: Lack of significant figures may cause rounding errors between actual calculations and example calculations.

RM 7E, (08-15-06), 12.1 Nomenclature. The terms used in the equations are defined as follows:

ACE = Analyzer calibration error, percent of calibration span.
B_{WS} = Moisture content of sample gas as measured by Method 4 or other approved method, percent/100.
C_{avg} = Average unadjusted gas concentration indicated by data recorder for the test run.
C_D = Pollutant concentration adjusted to dry conditions.
C_{dir} = Measured concentration of a calibration gas (low, mid, or high) when introduced in direct calibration mode.
C_{Gas} = Average effluent gas concentration adjusted for bias.
C_M = Average of initial and final system calibration bias (or 2-point system calibration error) check responses for the upscale calibration gas.
C_{MA} = Actual concentration of the upscale calibration gas, ppmv.
C_O = Average of the initial and final system calibration bias (or 2-point system calibration error) check responses from the low-level (or zero) calibration gas.
C_S = Measured concentration of a calibration gas (low, mid, or high) when introduced in system calibration mode.
C_{SS} = Concentration of NO_x measured in the spiked sample.
C_{Spike} = Concentration of NO_x in the undiluted spike gas.
C_{calc} = Calculated concentration of NO_x in the spike gas diluted in the sample.
C_V = Manufacturer certified concentration of a calibration gas (low, mid, or high).
C_W = Pollutant concentration measured under moist sample conditions, wet basis.
CS = Calibration span.
D = Drift assessment, percent of calibration span.
E_p = The predicted response for the low-level and mid-level gases based on a linear response line between the zero and high-level response.
Eff_{NO₂} = NO₂ to NO converter efficiency, percent.
H = High calibration gas, designator.
L = Low calibration gas, designator.
M = Mid calibration gas, designator.
NO_{Final} = The average NO concentration observed with the analyzer in the NO mode during the converter efficiency test in Section 16.2.2.
NO_xCorr = The NO_x concentration corrected for the converter efficiency.
NO_xFinal = The final NO_x concentration observed during the converter efficiency test in Section 16.2.2.
NO_xPeak = The highest NO_x concentration observed during the converter efficiency test in Section 16.2.2.
Q_{Spike} = Flow rate of spike gas introduced in system calibration mode, L/min.
Q_{Total} = Total sample flow rate during the spike test, L/min.
R = Spike recovery, percent.
SB = System bias, percent of calibration span.
SB_i = Pre-run system bias, percent of calibration span.
SB_f = Post-run system bias, percent of calibration span.
SB / D_{Alt} = Alternative absolute difference criteria to pass bias and/or drift checks.
SCE = System calibration error, percent of calibration span.
SCE_i = Pre-run system calibration error, percent of calibration span.
SCE_{final} = Post-run system calibration error, percent of calibration span.
Z = Zero calibration gas, designator.

40CFR60.355(b)(1), (09-20-06), Nomenclature. The terms used in the equations are defined as follows:

P_i = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg
P_o = observed combustor inlet absolute pressure at test, mm Hg
H_o = observed humidity of ambient air, g H₂O/g air
e = transcendental constant, 2.718
T_a = ambient temperature, K

RM 19, (07-29-06), 12.1 Nomenclature. The terms used in the equations are defined as follows:

AdjFactor = Percent oxygen or carbon dioxide adjustment applied to a target pollutant
 B_{wa} = Moisture fraction of ambient air, percent.
 Btu = British thermal unit
 $\%C$ = Concentration of carbon from an ultimate analysis of fuel, weight percent.
 $\%CO_{2d}, \%CO_{2w}$ = Concentration of carbon dioxide on a dry and wet basis, respectively, percent.
 CIP / CDP = Combustor inlet pressure / compressor discharge pressure (mm Hg); note, some manufactures reference as PCD.
 E = Pollutant emission rate, ng/J (lb/million Btu).
 E_a = Average pollutant rate for the specified performance test period, ng/J (lb/million Btu).
 E_{ao}, E_{ai} = Average pollutant rate of the control device, outlet and inlet, respectively, for the performance test period, ng/J (lb/million Btu).
 E_{gi} = Pollutant rate from the steam generating unit, ng/J (lb/million Btu).
 E_{go} = Pollutant emission rate from the steam generating unit, ng/J (lb/million Btu).
 E_{ci} = Pollutant rate in combined effluent, ng/J (lb/million Btu).
 E_{co} = Pollutant emission rate in combined effluent, ng/J (lb/million Btu).
 E_d = Average pollutant rate for each sampling period (e.g., 24-hr Method 6B sample or 24-hr fuel sample) or for each fuel lot (e.g., amount of fuel bunkered), ng/J (lb/million Btu).
 E_{di} = Average inlet SO_2 rate for each sampling period d, ng/J (lb/million Btu).
 E_g = Pollutant rate from gas turbine, ng/J (lb/million Btu).
 E_{ga} = Daily geometric average pollutant rate, ng/J (lbs/million Btu) or ppm corrected to 7 percent O_2 .
 E_{go}, E_{gi} = Matched pair hourly arithmetic average pollutant rate, outlet and inlet, respectively, ng/J (lb/million Btu) or ppm corrected to 7 percent O_2 .
 E_h = Hourly average pollutant, ng/J (lb/million Btu).
 E_{hj} = Hourly arithmetic average pollutant rate for hour "j," ng/J (lb/million Btu) or ppm corrected to 7 percent O_2 .
 EXP = Natural logarithmic base (2.718) raised to the value enclosed by brackets.
 Fc = Ratio of the volume of carbon dioxide produced to the gross calorific value of the fuel from Method 19
 F_d, F_w, F_c = Volumes of combustion components per unit of heat content, scm/J (scf/million Btu).
 ft^3 = cubic feet
 G = ideal gas conversion factor
 (385.23 SCF/lb-mol at 68 deg F & 14.696 psia)
 GCM = gross Btu per SCF (constant, compound based)
 GCV = Gross calorific value of the fuel consistent with the ultimate analysis, kJ/kg (Btu/lb).
 GCV_p, GCV_r = Gross calorific value for the product and raw fuel lots, respectively, dry basis, kJ/kg (Btu/lb).
 $\%H$ = Concentration of hydrogen from an ultimate analysis of fuel, weight percent.
 H_b = Heat input rate to the steam generating unit from fuels fired in the steam generating unit, J/hr (million Btu/hr).
 H_g = Heat input rate to gas turbine from all fuels fired in the gas turbine, J/hr (million Btu/hr).
 $\%H_2O$ = Concentration of water from an ultimate analysis of fuel, weight percent.
 H_t = Total numbers of hours in the performance test period (e.g., 720 hours for 30-day performance test period).
 K = volume of combustion component per pound of component (constant)
 K = Conversion factor, 10^{-5} (kJ/J)/(%) [10^6 Btu/million Btu].
 $K_c = (9.57 \text{ scm/kg})/\% [(1.53 \text{ scf/lb})/\%]$.
 $K_{cc} = (2.0 \text{ scm/kg})/\% [(0.321 \text{ scf/lb})/\%]$.
 $K_{hd} = (22.7 \text{ scm/kg})/\% [(3.64 \text{ scf/lb})/\%]$.
 $K_{hw} = (34.74 \text{ scm/kg})/\% [(5.57 \text{ scf/lb})/\%]$.
 $K_n = (0.86 \text{ scm/kg})/\% [(0.14 \text{ scf/lb})/\%]$.
 $K_o = (2.85 \text{ scm/kg})/\% [(0.46 \text{ scf/lb})/\%]$.
 $K_s = (3.54 \text{ scm/kg})/\% [(0.57 \text{ scf/lb})/\%]$.
 $K_{sulfur} = 2 \times 10^4 \text{ Btu/mt}\% \text{-MMBtu}$
 $K_w = (1.30 \text{ scm/kg})/\% [(0.21 \text{ scf/lb})/\%]$.
 lb = pound
 ln = Natural log of indicated value.
 L_p, L_r = Weight of the product and raw fuel lots, respectively, metric ton (ton).
 $\%N$ = Concentration of nitrogen from an ultimate analysis of fuel, weight percent.
 $M_{\%}$ = mole percent
 mol = mole
 MW = molecular weight (lb/lb-mol)
 MW_{AIR} = molecular weight of air (28.9625 lb/lb-mole)⁻¹
 NCM = net Btu per SCF (constant based on compound)
 $\%O$ = Concentration of oxygen from an ultimate analysis of fuel, weight percent.
 $\%O_{2d}, \%O_{2w}$ = Concentration of oxygen on a dry and wet basis, respectively, percent.
 P_B = barometric pressure, in Hg
 P_s = Potential SO_2 emissions, percent.
 $\%S$ = Sulfur content of as-fired fuel lot, dry basis, weight percent.
 S_a = Standard deviation of the hourly average pollutant rates for each performance test period, ng/J (lb/million Btu).
 $\%S_f$ = Concentration of sulfur from an ultimate analysis of fuel, weight percent.
 $S(\text{wt}\%)$ = weight percent of sulfur, per lab analysis by appropriate ASTM standard
 S_i = Standard deviation of the hourly average inlet pollutant rates for each performance test period, ng/J (lb/million Btu).
 S_o = Standard deviation of the hourly average emission rates for each performance test period, ng/J (lb/million Btu).
 $\%S_p, \%S_r$ = Sulfur content of the product and raw fuel lots respectively, dry basis, weight percent.
 SCF = standard cubic feet
 SH = specific humidity, pounds of water per pound of air
 $t_{0.95}$ = Values shown in Table 19-3 for the indicated number of data points n.
 T_{amb} = ambient temperature, °F
 W/D Factor = 1.0236 = conv. at 14.696 psia and
 68 deg F (ref. Civil Eng. Ref. Manual, 7th Ed.)
 X_{CO_2} = CO_2 Correction factor, percent.
 X_k = Fraction of total heat input from each type of fuel k.

Calculations, Formulas, and Constants

The following information supports the spreadsheets for this testing project.

Given Data:

Ideal Gas Conversion Factor = 385.23 SCF/lb-mol at 68 deg F & 14.696 psia

Fuel Heating Value is based upon Air Hygiene's fuel gas calculation sheet. All calculations are based upon a correction to 68 deg F & 14.696 psia

High Heating Values (HHV) are used for the Fuel Heating Value, F-Factor, and Fuel Flow Data per EPA requirements.

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Molecular Weight of NOx (lb/lb-mole)	= 46.01
Molecular Weight of CO (lb/lb-mole)	= 28.00
Molecular Weight of SO ₂ (lb/lb-mole)	= 64.00
Molecular Weight of THC (propane) (lb/lb-mole)	= 44.00
Molecular Weight of VOC (methane) (lb/lb-mole)	= 16.00
Molecular Weight of NH ₃ (lb/lb-mole)	= 17.03
Molecular Weight of HCHO (lb/lb-mole)	= 30.03

40CFR60, App. A, RM 19, Table 19-1

Conversion Constant for NOx	= 0.0000001194351
Conversion Constant for CO	= 0.0000000726839
Conversion Constant for SO ₂	= 0.0000001661345
Conversion Constant for THC	= 0.0000001142175
Conversion Constant for VOC (methane)	= 0.0000000415336
Conversion Constant for NH ₃	= 0.0000000442074
Conversion Constant for HCHO	= 0.0000000779534

NOTE: units are lb/ppm*ft³

Formulas:

1. Corrected Raw Average (C_{Gas}), 40CFR60, App. A, RM 7E, Eq. 7E-5 (08/15/06)

$$C_{Gas} = (C_{Avg} - C_o) \times \left(\frac{C_{MA}}{C_M - C_o} \right)$$

2. Correction to % O₂, 40CFR60, App. A, RM 20, Eq. 20-5 (11/26/02)

$$C_{adj} = C_{Gas(Target)} \times \left(\frac{20.9\% - AdjFactor}{20.9\% - C_{Gas(O_2)}} \right)$$

3. Correction to % O₂ and ISO Conditions

$$C_{ISO} = C_{Adj} \times \sqrt{\frac{P_r}{P_o}} \times e^{(19 \times (H_o - 0.00633))} \times \left(\frac{288}{T_a} \right)^{1.53}$$

4. Method 19 stack exhaust flow (scfh)

$$Q_s = \left(\frac{FFactor \times Q_f \times HHV}{1,000,000} \right) \times \left(\frac{20.9\%}{20.9\% - C_{Gas(O_2)}} \right)$$

5. Emission Rate in lb/hr

$$E_{lb/hr} = \frac{C_{Gas}}{10^6} \times \frac{Q_s \times MW}{G}$$

6. Emission Rate in tons per year

$$E_{ton/yr} = \frac{E_{lb/hr} \times hr_{year}}{2000}$$

7. Emission Concentration in lb/MMBtu (O₂ based)

$$E_{lb/MMBtu} = \frac{C_{Gas} \times F_d Factor \times Conv_c \times 20.9\%}{20.9\% - C_{Gas(O_2)}}$$

8. Emission Concentration in g/hp*hr

$$E_{g/hp \cdot hr} = \frac{E_{lb/hr} \times 453.6}{mw \times 1314.022} \text{ or } \frac{E_{lb/hr} \times 453.6}{hp}$$

Nomenclature

- %CO = carbon monoxide concentration (%)
- %CO₂ = carbon dioxide concentration (%)
- %N₂ = nitrogen concentration (%)
- %O₂ = oxygen concentration (%)
- %O_{2,wet} = Oxygen content of gas stream, % by volume of wet gas. (Note: The oxygen percentage used in Method 201A, Equation 3 is on a wet gas basis. That means that since oxygen is typically measured on a dry gas basis, the measured percent O₂ must be multiplied by the quantity (1 - B_{ws}) to convert to the actual volume fraction. Therefore, %O_{2,wet} = (1 - B_{ws}) * %O_{2, dry})
- (%EA)_{avg} = average excess air (%)
- (F_o)_{avg} = average calculated fuel factor
- [(Δp)^{0.5}]_{avg} = Average of square roots of the velocity pressures measured during the preliminary traverse, inches W.C.
- μ = Gas viscosity, micropoise
- 12.0 = Constant calculated as 60 percent of 20.5 square inch cross-sectional area of combined cyclone head, square inches
- 17.03 = mg/milliequivalents for ammonium ion
- 22.4 = liters of ideal gas per mol of substance at 0°C and 1 atm (ref. Civil Engineering Reference Manual, 7th ed. - Michael R. Lindeburg)
- 5.02 × 10⁴ = constant derived from the molecular weight and correcting standard temperature and pressure (ref. Bay Area Air Quality Management District, Source Test Procedure ST-1B, Ammonia Integrated Sampling, Adopted January 20, 1982, Regulation 7-303)
- A = distance upstream (in.)
- A_D = stack diameters upstream (dia.)
- A_n = Area of nozzle, square feet
- A_s = area of stack (ft²)
- B = distance downstream (in.)
- B_D = stack diameters downstream (dia.)
- b_f = Average blockage factor calculated in Equation 26, dimensionless
- B_{wm} = meter moisture content (%)
- B_{ws} = stack moisture content (%)
- C = Cunningham correction factor for particle diameter, D_p, and calculated using the actual stack gas temperature, dimensionless
- C₁ = -150.3162 (micropoise)
- C₂ = 18.0614 (micropoise/K^{0.5}) = 13.4622 (micropoise/R^{0.5})
- C₃ = 1.19183 × 10⁶ (micropoise/K²) = 3.86153 × 10⁶ (micropoise/R²)
- C₄ = 0.591123 (micropoise)
- C₅ = 91.9723 (micropoise)
- C₆ = 4.91705 × 10⁻⁵ (micropoise/K²) = 1.51761 × 10⁻⁵ (micropoise/R²)
- C_a = Acetone blank concentration, mg/mg
- C_b = Concentration of NH₃ ion in the back half of train (breakthrough)
- C_f = Concentration of NH₃ ion in the front half of train (main catch)
- C_{fPM10} = Conc. of filterable PM₁₀, gr/dscf
- C_{fPM2.5} = Conc. of filterable PM_{2.5}, gr/dscf
- C_k = K Factor Constant, 849.8
- C_n = nozzle diameter constant, 0.03575
- C_p' = Coefficient for the pitot used in the preliminary traverse, dimensionless

Nomenclature

- C_p = Pitot coefficient for the combined cyclone pitot, dimensionless
- C_{cpm} = Concentration of the condensable PM in the stack gas, dry basis, corrected to standard conditions, milligrams/dry standard cubic foot.
- C_r = Re-estimated Cunningham correction factor for particle diameter equivalent to the actual cut size diameter and calculated using the actual stack gas temperature, dimensionless
- D_{50} = Particle cut diameter, micrometers
- $D_{50(N+1)}$ = D_{50} value for cyclone IV calculated during the N+1 iterative step, micrometers
- D_{50-1} = Re-calculated particle cut diameters based on re-estimated C_r , micrometers
- D_{50LL} = Cut diameter for cyclone I corresponding to the 2.25 micrometer cut diameter for cyclone IV, micrometer
- D_{50N} = D_{50} value for cyclone IV calculated during the Nth iterative step, micrometers
- D_{50T} = Cyclone I cut diameter corresponding to the middle of the overlap zone shown in Method 201A, Figure 10 of Section 17, micrometers
- D_e = equivalent stack diameter (in.)
- $\Delta H@$ = ΔH @ 0.75 scfm (in. H₂O)
- ΔH_{avg} = average orifice pressure (in. H₂O)
- D_n = Inner diameter of sampling nozzle mounted on Cyclone I, inches
- D_{na} = actual nozzle diameter (in.)
- D_p = Physical particle size, micrometers
- Δp = velocity head (in. H₂O)
- Δp_1 = velocity head at first current traverse point (in. H₂O)
- $\Delta p'_1$ = velocity head at first preliminary traverse point (in. H₂O)
- Δp_{avg} = average pitot tube differential pressure (in. H₂O)
- Δp_n = velocity head at subsequent current traverse point (in. H₂O)
- Δp_{RM2} = method 2 velocity head (in. H₂O)
- D_s = diameter of stack (in.)
- F_d = fuel f-factor (dscf/MMBtu)
- f_{O_2} = stack gas fraction of O₂, by volume, dry basis
- I = Percent isokinetic sampling, dimensionless
- K_1 = standard volume correction, 17.65°R/in. Hg
- K_4 = isokinetic conversion constant, 0.0945min•in.Hg/sec•°R
- K_5 = water mass to std water vapor, 0.04715 ft³/g
- K_p = 85.49, ((ft/sec)/(pounds/mole •°R))
- L = length of stack (in.)
- L_{fw} = distance to far wall of stack (in.)
- L_{nw} = distance to near wall of stack (in.) [reference]
- $m_{\#x}$ = weight measurements (g)
- M_1 = Milligrams of PM collected on the filter, less than or equal to 2.5 micrometers
- M_2 = Milligrams of PM recovered from Container #2 (acetone blank corrected), greater than 10 micrometers
- M_3 = Milligrams of PM recovered from Container #3 (acetone blank corrected), less than or equal to 10 and greater than 2.5 micrometers
- M_4 = Milligrams of PM recovered from Container #4 (acetone blank corrected), less than or equal to 2.5 micrometers
- m_a = Mass of residue of acetone after evaporation, mg
- m_c = Mass of the NH₄⁺ added to sample to form ammonium sulfate, mg

Nomenclature

- m_{cpm} = Mass of the total condensable PM, mg
- M_d = Molecular weight of dry gas, pounds/pound mole
- m_{fb} = Mass of total CPM in field train recovery blank, mg
- m_{fx} = final weight, avg of last two measurements (g)
- mg = Milligram
- mg/L = Milligram per liter
- m_i = Mass of inorganic CPM, mg
- m_{ib} = Mass of inorganic CPM in field train recovery blank, mg
- M_n = total particulates (mg)
- m_o = Mass of organic CPM, mg
- m_{ob} = Mass of organic CPM in field train blank, mg
- m_r = Mass of dried sample from inorganic fraction, mg
- m_{tx} = tare weight (g)
- MW = molecular weight (lb/lb-mole)
- M_w = Molecular weight of wet gas, pounds/pound mole
- N = Normality of ammonium hydroxide titrant
- N_a = null angle (deg.)
- N_{re} = Reynolds number, dimensionless
- N_{tp} = Number of iterative steps or total traverse points
- $P_b = P_{\text{bar}}$ = barometric pressure (in. Hg)
- P_{bar} = barometric pressure (in. Hg)
- ppmCO = carbon monoxide concentration (ppm)
- ppmv = Parts per million by volume
- ppmw = Parts per million by weight
- P_s = absolute stack pressure (in. Hg)
- P_{static} = static pressure (in. H₂O)
- P_{std} = standard pressure, 29.92 in. Hg
- Θ = total sampling time (min)
- Q_{aw} = average stack wet flow rate (ascf/min)
- Q_l = Sampling rate for cyclone I to achieve specified D_{50}
- Q_m = estimated orifice flow rate, 0.750 acfm, else V_m/Q from previous run
- Q_s = Sampling rate for cyclone I to achieve specified D_{50}
- $Q_{s(\text{std})}$ = total cyclone flow rate at standard conditions (dscf/min)
- Q_{sd} = dry standard stack flow rate (dscfm)
- Q_{sST} = Dry gas sampling rate through the sampling assembly, dscfm
- Q_{sw} = wet standard stack flow rate (ascfm)
- R_{max} = Nozzle/stack velocity ratio parameter, dimensionless
- R_{min} = Nozzle/stack velocity ratio parameter, dimensionless
- t_1 = Sampling time at point 1, min
- t_m = average gas meter temperature (°F)
- t_m = average meter temperature (°F)
- T_m = Meter box and orifice gas temperature, °R
- t_n = Sampling time at point n, min
- t_r = Total projected run time, min
- T_s = Absolute stack gas temperature, °R
- T_{std} = standard temperature, 68°F, 528°R

Nomenclature

- T_u = absolute temperature offset, 460°R
- V_a = Volume of acetone blank, ml
- V_{aw} = Volume of acetone used in sample recovery wash, ml
- V_b = Volume of aliquot taken for IC analysis, ml
- V_c = Quantity of water captured in impingers and silica gel, ml
- V_f = final impinger volume (ml)
- V_i = initial impinger volume (ml)
- V_{ic} = Volume of impinger contents sample, ml
- V_m = Dry gas meter volume sampled, acf
- $V_{m(std)}$ = standard meter volume (dscf)
- v_{max} = Maximum gas velocity calculated from Equations 18 or 19, ft/sec
- v_{max} = maximum nozzle velocity (ft/sec)
- V_{mf} = final dry gas meter reading (dcf)
- V_{mi} = initial dry gas meter reading (dcf)
- v_{min} = Minimum gas velocity calculated from Method 201A, Equations 16 or 17, ft/sec
- V_{ms} = Dry gas meter volume sampled, corrected to standard conditions, dscf
- v_n = Sample gas velocity in the nozzle, ft/sec
- v_{org} = organics wash volume (ml)
- V_p = Volume of water added during train purge
- v_s = average stack gas velocity (ft/sec)
- v_{sl} = local velocity (ft/sec)
- V_t = total impinger volume (ml) = $;(V_f - V_i)$
- V_t = Volume of NH₄OH titrant, ml
- $V_{w(std)}$ = volume of water vapor in gas sample at standard conditions (scf)
- v_x = blank volume (ml)
- W = width of stack (in.)
- $W_{2,3,4}$ = Weight of PM recovered from Containers #2, #3, and #4, mg
- W_a = Weight of blank residue in acetone used to recover samples, mg
- W_f = final impinger weight (g)
- W_i = initial impinger weight (g)
- W_t = total impinger weight (g) = $;(W_f - W_i)$
- w_x = blank weight of solids (g)
- Y = meter calibration factor (a.k.a gamma)
- Z = Ratio between estimated cyclone IV D₅₀ values, dimensionless
- γ = Dry gas meter gamma value, dimensionless
- ΔH = Meter box orifice pressure drop, inches W.C.
- $\Delta H@$ = Pressure drop across orifice at flow rate of 0.75 scfm at standard conditions, inches W.C.
(Note: Specific to each orifice and meter box.)
- Δp_1 = Velocity pressure measured at point 1, inches W.C.
- Δp_{avg} = Average velocity pressure, inches W.C.
- Δp_m = Observed velocity pressure using S-type pitot tube in preliminary traverse, inches W.C.
- Δp_{max} = Maximum velocity pressure, inches W.C.
- Δp_{min} = Minimum velocity pressure, inches W.C.
- Δp_n = Velocity pressure measured at point n during the test run, inches W.C.
- Δp_s = Velocity pressure calculated in Method 201a, Equation 25, inches W.C.
- Δp_{s1} = Velocity pressure adjusted for combined cyclone pitot tube, inches W.C.

Nomenclature

- Δp_{s2} = Velocity pressure corrected for blockage, inches W.C.
- θ = Total run time, min
- ρ_a = Density of acetone, mg/ml (see label on bottle)
- Σ_n = total number of sampling points

APPENDIX B

EMISSION DATA RECORDS

Questor Technology Inc	
Air Permit # :	40 CFR 60 Sub Part OOOO
Plant Name or Location:	Broken Arrow Rental Facility
Date:	February 25, 2015
Project Number:	qti-15-brokenarrow.ok-com#1
Manufacturer & Equipment:	Q250
Test Load:	Multiple
Tester(s) / Test Unit(s):	MSL/CG/ZM/SB/601

		RUN											
	UNITS	Q250-R10	Q250-R11	Q250-R12	Q250-R1	Q250-R2	Q250-R3	Q250-R4	Q250-R5	Q250-R6	Q250-R7	Q250-R8	Q250-R9
Start Time	hh:mm:ss	08:44:25	10:19:25	13:38:25	16:50:08	15:55:08	08:42:08	10:47:08	12:20:08	13:49:08	09:01:17	10:31:17	12:27:04
End Time	hh:mm:ss	09:54:55	11:29:55	14:48:55	18:00:38	17:05:38	09:52:38	11:57:38	13:30:38	14:59:38	10:11:47	11:41:47	13:37:34
Bar. Pressure	in. Hg	29.94	29.91	29.80	29.79	30.42	30.61	30.62	30.59	30.55	30.48	30.47	30.43
Amb. Temp.	°F	35	39	54	55	40	29	26	21	25	26	25	27
Rel. Humidity	%	56	46	37	31	31	40	44	51	43	82	83	88
Spec. Humidity	lb water / lb air	0.002369	0.002308	0.003236	0.002798	0.001549	0.001287	0.001218	0.001129	0.001133	0.002296	0.002217	0.002587
Date	mm/dd/yy	02/25/15	02/25/15	02/25/15	02/25/15	02/26/15	02/27/15	02/27/15	02/27/15	02/27/15	02/28/15	02/28/15	02/28/15
Unit Number		Q-250	Q-250	Q-250	Q-250	Q-250	Q-250	Q-250	Q-250	Q-250	Q-250	Q-250	Q-250
Load Designator	%	90-100	90-100	90-100	0-30-0	0-30-0	0-30-0	30-70-30	30-70-30	30-70-30	70-100-70	70-100-70	70-100-70
Gross Fuel Heating Value	Btu/lb	2,503	2,503	2,503	2,533	2,533	2,533	2,509	2,509	2,509	2,527	2,527	2,527
Stack Flow (M2)	dscfh	139,014	143,525	138,517	42,560	37,124	39,355	68,668	68,903	76,873	75,725	81,549	76,880
Stack Moisture	Method 4	6.42	4.25	5.22	3.65	3.64	3.55	3.58	3.63	4.33	5.66	5.14	5.46
Wind Speed	mph	2	2	5	5	10	5	5	10	10	3	2	2
Wind Direction	--	N	N	N	N	N	N	N	N	N	NE	NE	NE
CO ₂ - Method 3C	%	5.33	5.24	4.70	5.78	5.63	5.96	5.39	4.95	4.50	5.43	5.65	5.70
O ₂ - Method 3C	%	14.80	14.90	15.70	14.20	14.50	14.00	14.80	15.40	16.00	14.70	14.30	14.30
N ₂ -Method 3C	%	79.80	79.80	79.60	80.00	79.90	80.10	79.80	79.70	79.50	79.90	80.00	80.00
Excess Air	%	235.30	241.60	295.40	205.20	219.90	195.90	236.20	273.00	320.00	229.90	209.70	209.70

METHOD 1 - ISOKINETIC TRAVERSE FOR A CIRCULAR SOURCE

Company	Questor Technology Inc.	Date	02/25/15
Plant Name	Questor, Broken Arrow Rent Site	Project #	qti-15-brokenarrow.ok-comp#1
Equipment	Q250	# of Ports Available	2
Location	Ports	# of Ports Used	2

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L _{fw})	35.31	in.
Distance to Near Wall of Stack	(L _{nw})	6.00	in.
Diameter of Stack	(D)	29.31	in.
Area of Stack	(A _s)	4.69	ft ²

Distance from Disturbances to Port			
Distance Upstream	(A)	36.00	in.
Diameters Upstream	(A _D)	1.23	diameters
Distance Downstream	(B)	180.00	in.
Diameters Downstream	(B _D)	6.14	diameters

Number of Traverse Points Required					
Diameters to Flow Disturbance		Minimum Number of ¹ Traverse Points		Minimum Number of Traverse Points	
Down (B _D)	Up (A _D)	Particulate	Velocity	Comp Stratification	
Stream	Stream	Points	Points	Criteria	Points
2.00-4.99	0.50-1.24	24	16	RM 7E 8.1.2	12 RM1 pts
5.00-5.99	1.25-1.49	20	16	OOOO Req.	3 points
6.00-6.99	1.50-1.74	16	12		
7.00-7.99	1.75-1.99	12	12		
>= 8.00	>= 2.00	8 or 12 ²	8 or 12 ²	Minimum Number of	
Upstream Spec		24	16	Traverse Points	
Downstream Spec		16	12	RATA Stratification	
Traverse Pts Required		24	16	Criteria	Points
				Part75/60	12 RM1 pts
				75 abrv (a)	3 points
				75 abrv (b)	6 points

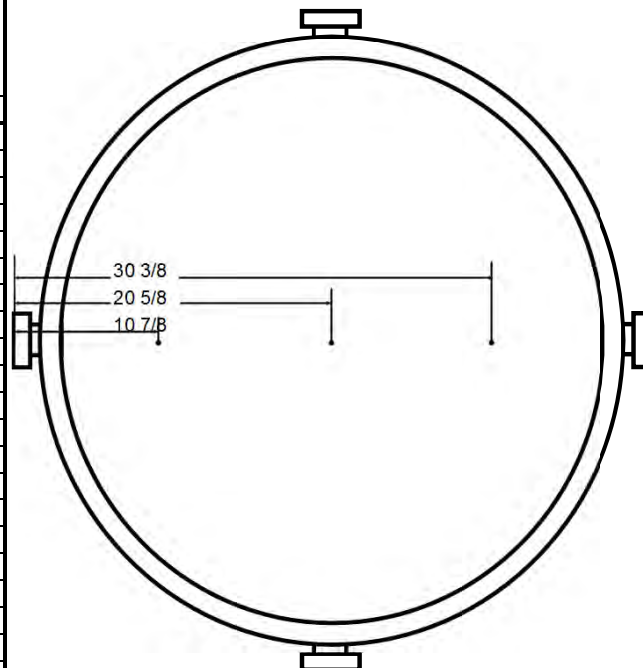
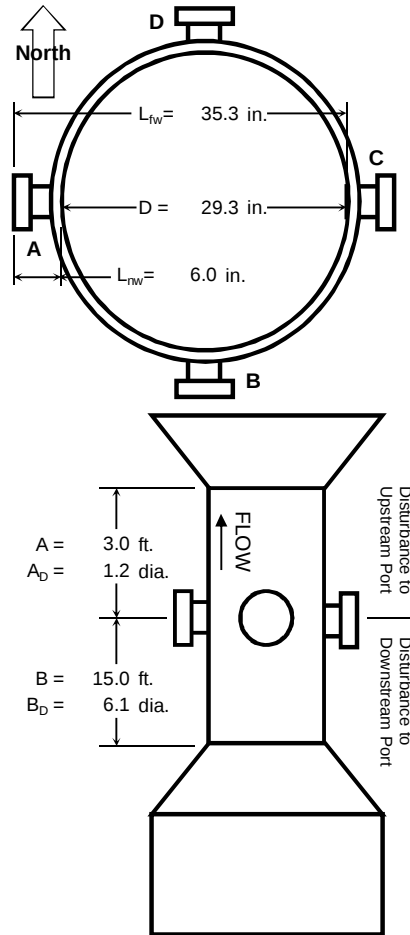
¹ Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.

² 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Number of Traverse Points Used			
2	Ports by	3	Pts / port
1	Pts Used	3	Required

Gas Sampling

Traverse Point Locations			
Traverse Point Number	Percent of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
	%	in.	in.
1	16.7%	4 7/8	10 7/8
2	50.0%	14 5/8	20 5/8
3	83.3%	24 3/8	30 3/8
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			



METHOD 1 - SAMPLE AND VELOCITY TRAVERSES FOR CIRCULAR SOURCES

Plant Name	Questor, Broken Arrow Rent Site	Date	02/25/15
Sampling Location	Q250	Stack Type	Circular
Operator	CG	Ports Available	2
Project #	qti-15-brokenarrow.ok-comp#1	Ports Used	2
Stack Size	Large (>24 inch diameter)	Port ID (inches)	3.00

Circular Stack or Duct Diameter			
Distance to Far Wall of Stack	(L_{fw})	35.31	in
Distance to Near Wall of Stack	(L_{nw})	6.00	in
Diameter of Stack	(D)	29.31	in
Area of Stack	(A_s)	4.69	ft ²

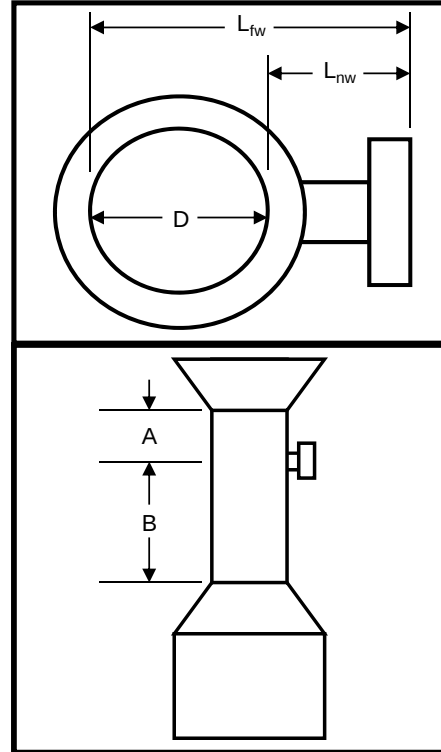
Distance from Port to Disturbances			
Distance Upstream	(A)	36.00	in
Diameters Upstream	(A_D)	1.23	diameters
Distance Downstream	(B)	180.00	in
Diameters Downstream	(B_D)	6.14	diameters

Number of Traverse Points Required			
Diameters to Flow Disturbance		Minimum Number of ¹ Traverse Points	
Down Stream	Up Stream	Particulate Points	Velocity Points
2.00-4.99	0.50-1.24	24	16
5.00-5.99	1.25-1.49	20	16
6.00-6.99	1.50-1.74	16	12
7.00-7.99	1.75-1.99	12	12
≥ 8.00	≥ 2.00	8 or 12 ²	8 or 12 ²
Upstream Spec		24	16
Downstream Spec		16	16
Traverse Pts Required		24	16

¹ Check Minimum Number of Points for the Upstream and Downstream conditions, then use the largest.

² 8 for Circular Stacks 12 to 24 inches
12 for Circular Stacks over 24 inches

Location of Traverse Points in Circular Stacks									
Traverse Point	(Fraction of Stack Dimension from Inside Wall to Traverse Point)								
Number	2	4	6	8	10	12	14	16	18
1	.146	.087	.044	.032	.026	.021	.018	.016	.014
2	.854	.250	.146	.105	.082	.067	.057	.049	.044
3		.750	.296	.194	.146	.118	.099	.085	.075
4		.933	.704	.323	.226	.177	.146	.125	.109
5			.854	.677	.342	.250	.201	.169	.146
6			.956	.806	.658	.356	.269	.220	.188
7				.895	.774	.644	.366	.283	.236
8				.968	.854	.750	.634	.375	.296
9					.918	.823	.731	.625	.382
10					.974	.882	.799	.717	.618
11						.933	.854	.780	.704
12						.979	.901	.831	.764



- ☒ Method 1 Trav
- ☐ 12 Point PM Trav
- ☐ Velocity

Number of Traverse Points Used			
2	Ports by	12	Across
24	Pts Used	24	Required

Traverse Point Locations			
Traverse Point Number	Fraction of Stack Diameter	Distance from Inside Wall	Distance Including Reference Length
		in	in
1	0.021	5/8	6 5/8
2	0.067	2	8
3	0.118	3 4/8	9 4/8
4	0.177	5 2/8	11 2/8
5	0.250	7 3/8	13 3/8
6	0.356	10 3/8	16 3/8
7	0.644	18 7/8	24 7/8
8	0.750	22	28
9	0.823	24 1/8	30 1/8
10	0.882	25 7/8	31 7/8
11	0.933	27 3/8	33 3/8
12	0.979	28 6/8	34 6/8

EMISSION DATA RECORDS

0-30-0% Ramp-up, Ramp-down Unit Operations Data

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	Questor, Broken Arrow Rent Site
Sampling Location	Q250
Fuel Type	Gas, Propene

Test Information			
Project #		qti-15-brokenarrow.ok-comp#1	
Operator		CG	
Date for Preliminary Run	(mm/dd/yy)	02/25/15	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	RM4, 8.1.1.2	21	scf
Run Duration	≤0.75 cfm	65	minutes
Unit Number		1	
Base Run Number		0-30-0%	
Number of Ports Available		2	
Number of Ports Used		2	
Port Inside Diameter		3.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		1	2	3	
Test Date	(mm/dd/yy)	02/25/15	02/26/15	02/27/15	
Load	% or w/DB	0-30-0	0-30-0	0-30-0	
Meter Box Number	from ACS	SAMP-CP-0007	SAMP-CP-0007	SAMP-CP-0007	
Meter Calibration Factor	(Y)	1.002	1.002	1.002	
Orifice Meter Coefficient	($\Delta H_{@}$)	1.672	1.672	1.672	in H ₂ O
Pitot Identification	from ACS	4174	4174	4174	
Pitot Tube Coefficient	(C _p)	0.819	0.819	0.819	
Probe Number	from ACS	SAMP-PF-0001	SAMP-SP-0001	SAMP-SP-0001	
Probe Length		60.0	60.0	60.0	in
(SS, Glass) Liner Material	from list	Hastelloy	Hastelloy	Hastelloy	
Impinger Case Number	from ACS	SAMP-BC-0009	SAMP-BC-0009	SAMP-BC-0009	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Min Sum Lee
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] - RESULTS

Plant Name	Questor, Broken Arrow Rent Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Historical Data	0-30-0%-1	0-30-0%-2	0-30-0%-3	Average	Units
Run Start Time	16:50	15:55	08:42		hh:mm
Run Stop Time	18:00	17:05	09:52		hh:mm
Test Date	02/25/15	02/26/15	02/27/15		mm/dd/yy
Meter Calibration Factor	1.002	1.002	1.002		
Pitot Tube Coefficient	0.819	0.819	0.819		
Initial Meter Volume	716.070	820.020	869.110		ft ³
Final Meter Volume	765.030	869.080	917.020		ft ³
Total Meter Volume	48.960	49.060	47.910	48.643	ft ³
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	80.06	70.35	52.31	67.58	°F
Average Stack Temperature	1219.75	1227.58	1128.17	1191.83	°F
Barometric Pressure	29.79	30.42	30.61	30.27	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H ₂ O
Absolute Stack Pressure	29.79	30.42	30.61	30.27	in Hg
Average Orifice Pressure Drop	1.60	1.60	1.60	1.60	in H ₂ O
Absolute Meter Pressure	29.91	30.54	30.73	30.40	in Hg
Avg Square Root Pitot Pressure	0.09	0.07	0.07	0.08	√(in H ₂ O)
Moisture Content Data	0-30-0%-1	0-30-0%-2	0-30-0%-3	Average	Units
Impinger Water Weight Gain	22.20	27.10	30.70	26.67	g
Silica Gel Weight Gain	16.30	12.90	9.00	12.73	g
Total Water Volume Collected	38.57	40.07	39.77	39.47	ml
Standard Water Vapor Volume	1.82	1.89	1.87	1.86	scf
Standard Meter Volume	47.9	50.0	50.8	49.6	dscf
Calculated Stack Moisture	3.65	3.64	3.55	3.61	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	3.65	3.64	3.55	3.61	%
Method 3C Gas Analysis Data	0-30-0%-1	0-30-0%-2	0-30-0%-3	Average	Units
Carbon Dioxide Content	5.8	5.6	6.0	5.8	%
Oxygen Content	14.2	14.5	14.0	14.2	%
Nitrogen Content	80.0	79.9	80.1	80.0	%
Stack Dry Molecular Weight	29.49	29.49	29.53	29.50	lb/lb-mole
Stack Wet Molecular Weight	29.07	29.07	29.12	29.09	lb/lb-mole
Percent Excess Air	205.2	219.9	195.9	207.0	%
Volumetric Flow Rate Data	0-30-0%-1	0-30-0%-2	0-30-0%-3	Average	Units
Average Stack Gas Velocity	8.37	7.18	6.94	7.49	ft/sec
Stack Cross-Sectional Area	4.69	4.69	4.69	4.69	ft ²
Actual Stack Flow Rate	2,352	2,018	1,950	2,107	acfm
Wet Standard Stack Flow Rate	44	39	40	41	wkscfh
Dry Standard Stack Flow Rate	42,560	37,124	38,380	39,355	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Questor, Broken Arrow Rent Site	Preliminary Date	02/25/15		
Sampling Location	Q250	Operator	CG		
Project #	qti-15-brokenarrow.ok-comp#1	# of Ports Used	2		
Fuel Type	Gas, Propene	Min. Fuel Factor	N/A	Max. Fuel Factor	N/A

Gas Analysis Data								
Run Number	0-30-0%-1		Date	02/25/15	Run Start Time	16:50	Run Stop Time	18:00
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm CH ₄)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.8	14.2	0.0	80.0	29.49	1.159	205.2	N/A

Gas Analysis Data								
Run Number	0-30-0%-2		Date	02/26/15	Run Start Time	15:55	Run Stop Time	17:05
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm CH ₄)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.6	14.5	0.0	79.9	29.49	1.137	219.9	N/A

Gas Analysis Data								
Run Number	0-30-0%-3		Date	02/27/15	Run Start Time	08:42	Run Stop Time	09:52
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppm CH ₄)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	6.0	14.0	0.0	80.1	29.53	1.158	195.9	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Questor, Broken Arrow Rent Site	Preliminary Date	02/25/15
Sampling Location	Q250	Operator	CG
Project #	qti-15-brokenarrow.ok-comp#1	Ports Used	2

Moisture Content Data								
Run Number	0-30-0%-1		Date	02/25/15	Start Time	16:50	Stop Time	18:00
Meter Box Number					Meter Cal Factor	(Y)	1.002	
Total Meter Volume	(V _m)	48.960	dcf	Barometric Pressure		(P _b)	29.79	in Hg
Average Stack Temp	(t _s) _{avg}	1220	°F	Stack Static Pressure		(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	80	°F	Avg Orifice Pressure		(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	821.70	772.40	599.00	814.40			
Initial Value	(V _i),(W _i)	801.70	772.40	596.80	798.10			
Net Value	(V _n),(W _n)	20.0	0.0	2.2	16.3			
Results								
Total Weight	(W _f)	38.50	g	Water Vol Weighed		(V _{wsg(std)})	1.815	scf
Std Meter Volume	(V _{m(std)})	47.942	dscf	Sat. Moisture Content		(B _{ws(svp)})	100.00	%
Calc Moisture Content	(B _{ws(calc)})	3.65	%	Final Moisture Content		(B _{ws})	3.65	%

Moisture Content Data								
Run Number	0-30-0%-2		Date	02/26/15	Start Time	15:55	Stop Time	17:05
Meter Box Number	SAMP-CP-0007				Meter Cal Factor	(Y)	1.002	
Total Meter Volume	(V _m)	49.060	dcf	Barometric Pressure		(P _b)	30.42	in Hg
Average Stack Temp	(t _s) _{avg}	1228	°F	Stack Static Pressure		(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	70	°F	Avg Orifice Pressure		(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	807.80	768.50	597.10	881.40			
Initial Value	(V _i),(W _i)	795.30	756.60	594.40	868.50			
Net Value	(V _n),(W _n)	12.5	11.9	2.7	12.9			
Results								
Total Weight	(W _f)	40.00	g	Water Vol Weighed		(V _{wsg(std)})	1.886	scf
Std Meter Volume	(V _{m(std)})	49.950	dscf	Sat. Moisture Content		(B _{ws(svp)})	100.00	%
Calc Moisture Content	(B _{ws(calc)})	3.64	%	Final Moisture Content		(B _{ws})	3.64	%

Moisture Content Data								
Run Number	0-30-0%-3		Date	02/27/15	Start Time	08:42	Stop Time	09:52
Meter Box Number	SAMP-CP-0007				Meter Cal Factor	(Y)	1.002	
Total Meter Volume	(V _m)	47.910	dcf	Barometric Pressure		(P _b)	30.61	in Hg
Average Stack Temp	(t _s) _{avg}	1128	°F	Stack Static Pressure		(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	52	°F	Avg Orifice Pressure		(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	823.90	776.70	598.50	767.10			
Initial Value	(V _i),(W _i)	802.80	768.50	597.10	758.10			
Net Value	(V _n),(W _n)	21.1	8.2	1.4	9.0			
Results								
Total Weight	(W _f)	39.70	g	Water Vol Weighed		(V _{wsg(std)})	1.872	scf
Std Meter Volume	(V _{m(std)})	50.811	dscf	Sat. Moisture Content		(B _{ws(svp)})	100.00	%
Calc Moisture Content	(B _{ws(calc)})	3.55	%	Final Moisture Content		(B _{ws})	3.55	%

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Rent Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/25/15
Operator	CG
Run Number	0-30-09%-1

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	10.0	in Hg
< 3.0	Pitot	Pre (+)	0.2	in H ₂ O for	15.0
		Pre (-)	0.2	in H ₂ O for	15.0
		Post (+)	0.3	in H ₂ O for	20.0
		Post (-)	0.2	in H ₂ O for	15.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	16:50	End	18:00

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	801.7	772.4	596.8	798.1				
Post	821.7	772.4	599.0	814.4				

Sampling Equipment		
Meter Box Number	SAMP-CP-0007	
Meter Cal Factor	(Y)	1.002
Low Flow Meter	SAMP-MN-0001	
Average Nozzle Diameter	(D _{na})	in
Suggested Nozzle Diameter	(D _n)	0.5012 in
Probe Number	SAMP-PF-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number		
Impinger Case Number	SAMP-BC-0009	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1219.8	°F
Average Meter Temp	(t _m)	80.1	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.09	in H ₂ O
Stack Moisture Content	(B _{ws})	3.65	%
Stack Dry Molecular Weight	(M _d)	29.49	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	29.79	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	29.79	in Hg
Absolute Meter Pressure	(P _m)	29.91	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	716.070	0.005	1.672	1.60	1288	252		50			73	76	9.0	0.07	7.04	1.929		46.304
A-2	2.7	00:02:43	718.020	0.010	1.672	1.60	1360	249		46			72	75	9.0	0.10	10.16	3.902		46.823
A-3	5.4	00:05:25	720.010	0.010	1.672	1.60	1397	253		48			75	75	9.0	0.10	10.26	5.938		47.506
A-4	8.1	00:08:07	722.070	0.010	1.672	1.60	1380	252		52			77	75	9.0	0.10	10.21	7.931		47.587
A-5	10.8	00:10:50	724.090	0.010	1.672	1.60	1378	251		55			79	75	9.0	0.10	10.21	9.871		47.382
A-6	13.5	00:13:33	726.060	0.010	1.672	1.60	1378	250		57			81	75	9.0	0.10	10.21	11.847		47.388
A-7	16.3	00:16:15	728.070	0.010	1.672	1.60	1374	254		58			82	75	9.0	0.10	10.19	13.782		47.252
A-8	19.0	00:18:58	730.040	0.010	1.672	1.60	1402	250		60			82	77	9.0	0.10	10.27	15.723		47.168
A-9	21.7	00:21:40	732.020	0.005	1.672	1.60	1470	252		61			83	78	9.0	0.07	7.39	17.748		47.328
A-10	24.4	00:24:22	734.090	0.005	1.672	1.60	911	254		61			85	78	9.0	0.07	6.23	19.662		47.189
A-11	27.1	00:27:05	736.050	0.005	1.672	1.60	799	250		62			85	79	9.0	0.07	5.97	21.643		47.221
A-12	29.8	00:29:47	738.080	0.005	1.672	1.60	871	252		61			83	80	9.0	0.07	6.14	23.606		47.212
B-1	32.5	00:32:30	740.090	0.005	1.672	1.60	1311	250		60			80	79	9.0	0.07	7.08	26.468		48.864
B-2	35.2	00:35:12	743.010	0.005	1.672	1.60	1370	256		60			81	80	9.0	0.07	7.20	28.464		48.796
B-3	37.9	00:37:55	745.050	0.005	1.672	1.60	1432	251		60			82	80	9.0	0.07	7.32	29.412		47.060
B-4	40.6	00:40:37	746.020	0.010	1.672	1.60	1394	253		63			83	80	9.0	0.10	10.25	31.365		47.048
B-5	43.3	00:43:20	748.020	0.010	1.672	1.60	1379	253		64			85	80	9.0	0.10	10.21	33.315		47.033
B-6	46.0	00:46:03	750.020	0.010	1.672	1.60	1352	251		65			85	79	9.0	0.10	10.13	36.311		48.414
B-7	48.8	00:48:45	753.090	0.010	1.672	1.60	1251	249		65			85	80	9.0	0.10	9.85	37.217		47.011
B-8	51.5	00:51:28	754.020	0.010	1.672	1.60	1280	250		66			86	80	9.0	0.10	9.93	39.223		47.068
B-9	54.2	00:54:10	756.080	0.005	1.672	1.60	1126	249		66			85	80	9.0	0.07	6.70	41.105		46.977
B-10	56.9	00:56:53	758.010	0.005	1.672	1.60	815	250		67			86	80	9.0	0.07	6.01	43.053		46.967
B-11	59.6	00:59:35	760.010	0.005	1.672	1.60	796	254		68			86	80	9.0	0.07	5.97	45.078		47.038
B-12	62.3	01:02:18	762.090	0.005	1.672	1.60	760	268		68			86	80	9.0	0.07	5.88	47.942		47.942
Last Pt	65.0	01:05:00	765.030																	
Final Val	65.0	01:05:00	765.030												Max Vac	9.0	Final Values	47.942		
Average Values				0.01		1.60	1220	252		60			82	78		0.09	8.37			
													80							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Rent Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/26/15
Operator	CG
Run Number	0-30-0%-2

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.25	in H ₂ O for	15.0
		Pre (-)	0.20	in H ₂ O for	20.0
		Post (+)	0.20	in H ₂ O for	25.0
		Post (-)	0.20	in H ₂ O for	15.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	15:55	End	17:05

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	795.3	756.6	594.4	868.5				
Post	807.8	768.5	597.1	881.4				

Sampling Equipment		
Meter Box Number	SAMP-CP-0007	
Meter Cal Factor	(Y)	1.002
Low Flow Meter	SAMP-MN-0001	
Average Nozzle Diameter	(D _{na})	in
Suggested Nozzle Diameter	(D _n)	0.5224 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number		
Impinger Case Number	SAMP-BC-0009	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1227.6	°F
Average Meter Temp	(t _m)	70.4	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.07	in H ₂ O
Stack Moisture Content	(B _{ws})	3.64	%
Stack Dry Molecular Weight	(M _d)	29.49	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.74	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.42	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.42	in Hg
Absolute Meter Pressure	(P _m)	30.54	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s) _i	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	820.020	0.005	1.672	1.60	1369	252		50			63	66	10.0	0.07	7.12	3.078		73.878
A-2	2.7	00:02:43	823.010	0.005	1.672	1.60	1378	248		52			64	65	10.0	0.07	7.14	5.199		62.388
A-3	5.4	00:05:25	825.070	0.010	1.672	1.60	1352	249		55			66	65	10.0	0.10	10.03	6.185		49.484
A-4	8.1	00:08:07	826.030	0.010	1.672	1.60	1355	250		57			69	65	10.0	0.10	10.04	9.280		55.679
A-5	10.8	00:10:50	829.050	0.005	1.672	1.60	1405	250		58			71	65	10.0	0.07	7.19	11.346		54.459
A-6	13.5	00:13:33	831.070	0.005	1.672	1.60	1400	250		60			57	65	10.0	0.07	7.18	13.356		53.425
A-7	16.3	00:16:15	833.010	0.005	1.672	1.60	1396	250		60			73	66	10.0	0.07	7.18	15.396		52.786
A-8	19.0	00:18:58	835.010	0.005	1.672	1.60	1368	248		60			75	66	10.0	0.07	7.12	17.442		52.325
A-9	21.7	00:21:40	837.020	0.005	1.672	1.60	1081	248		61			75	66	10.0	0.07	6.54	19.488		51.967
A-10	24.4	00:24:22	839.030	0.005	1.672	1.60	961	253		62			77	66	10.0	0.07	6.28	21.570		51.769
A-11	27.1	00:27:05	841.080	0.005	1.672	1.60	885	248		62			77	66	10.0	0.07	6.11	23.602		51.496
A-12	29.8	00:29:47	843.080	0.005	1.672	1.60	970	247		62			75	67	10.0	0.07	6.30	25.585		51.171
B-1	32.5	00:32:30	845.030	0.005	1.672	1.60	1376	247		61			73	67	10.0	0.07	7.14	27.684		51.109
B-2	35.2	00:35:12	847.090	0.005	1.672	1.60	1306	252		61			75	68	10.0	0.07	7.00	29.696		50.907
B-3	37.9	00:37:55	849.070	0.005	1.672	1.60	1322	256		62			75	68	10.0	0.07	7.03	31.687		50.699
B-4	40.6	00:40:37	851.030	0.005	1.672	1.60	1347	249		63			76	69	10.0	0.07	7.08	33.715		50.572
B-5	43.3	00:43:20	853.030	0.005	1.672	1.60	1411	248		63			77	68	10.0	0.07	7.20	35.763		50.489
B-6	46.0	00:46:03	855.050	0.005	1.672	1.60	1396	248		64			76	69	10.0	0.07	7.18	37.761		50.348
B-7	48.8	00:48:45	857.020	0.005	1.672	1.60	1401	250		64			78	69	10.0	0.07	7.19	39.775		50.242
B-8	51.5	00:51:28	859.010	0.005	1.672	1.60	1307	250		64			77	69	10.0	0.07	7.00	41.822		50.186
B-9	54.2	00:54:10	861.030	0.005	1.672	1.60	1187	249		65			78	70	10.0	0.07	6.76	43.834		50.096
B-10	56.9	00:56:53	863.020	0.010	1.672	1.60	939	252		66			79	70	10.0	0.10	8.81	45.844		50.012
B-11	59.6	00:59:35	865.010	0.005	1.672	1.60	834	249		66			77	70	10.0	0.07	5.99	47.869		49.950
B-12	62.3	01:02:18	867.010	0.005	1.672	1.60	716	253		66			78	71	10.0	0.07	5.71	49.960		49.960
Last Pt	65.0	01:05:00	869.080																	
Final Val	65.0	01:05:00	869.080												Max Vac	10.0	Final Values	49.960		
Average Values				0.01		1.60	1228	250		61			73	67		0.07	7.18			
													70							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Rent Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/27/15
Operator	CG
Run Number	0-30-09%-3

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.20	in H ₂ O for	20.0 sec
		Pre (-)	0.15	in H ₂ O for	20.0 sec
		Post (+)	0.25	in H ₂ O for	25.0 sec
		Post (-)	0.15	in H ₂ O for	25.0 sec

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	08:42	End	09:52

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	802.8	768.5	597.1	758.1				
Post	823.9	776.7	598.5	767.1				

Sampling Equipment		
Meter Box Number	SAMP-CP-0007	
Meter Cal Factor	(Y)	1.002
Low Flow Meter	SAMP-MN-0001	
Average Nozzle Diameter	(D _{na})	in
Suggested Nozzle Diameter	(D _n)	0.5354 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number		
Impinger Case Number	SAMP-BC-0009	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1128.2	°F
Average Meter Temp	(t _m)	52.3	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.07	in H ₂ O
Stack Moisture Content	(B _{ws})	3.55	%
Stack Dry Molecular Weight	(M _d)	29.53	lb/lb-mole
Estimated Orifice Flow Rate	(Q _o)	0.77	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.61	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.61	in Hg
Absolute Meter Pressure	(P _m)	30.73	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s) _i	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	869.110	0.005	1.672	1.60	1250	248		29			43	45	10.0	0.07	6.86	2.059		49.418
A-2	2.7	00:02:43	871.020	0.005	1.672	1.60	1318	248		33			41	44	10.0	0.07	7.00	4.254		51.049
A-3	5.4	00:05:25	873.050	0.010	1.672	1.60	1362	249		35			42	45	10.0	0.10	10.02	6.391		51.126
A-4	8.1	00:08:07	875.030	0.010	1.672	1.60	1349	248		36			45	44	10.5	0.10	9.98	8.566		51.397
A-5	10.8	00:10:50	877.050	0.005	1.672	1.60	1342	248		37			47	45	10.5	0.07	7.04	10.757		51.632
A-6	13.5	00:13:33	879.090	0.005	1.672	1.60	1338	248		37			49	44	10.5	0.07	7.03	12.838		51.351
A-7	16.3	00:16:15	881.030	0.005	1.672	1.60	1320	249		38			52	44	10.5	0.07	7.00	15.020		51.496
A-8	19.0	00:18:58	883.070	0.005	1.672	1.60	1156	251		40			53	44	10.5	0.07	6.67	17.114		51.342
A-9	21.7	00:21:40	885.030	0.005	1.672	1.60	996	251		40			55	44	10.5	0.07	6.33	19.311		51.496
A-10	24.4	00:24:22	887.090	0.005	1.672	1.60	794	249		41			55	45	10.5	0.07	5.88	21.388		51.332
A-11	27.1	00:27:05	889.040	0.005	1.672	1.60	763	249		42			55	45	10.5	0.07	5.80	23.540		51.361
A-12	29.8	00:29:47	891.060	0.005	1.672	1.60	745	249		40			50	46	10.5	0.07	5.76	25.690		51.380
B-1	32.5	00:32:30	893.070	0.005	1.672	1.60	1228	248		41			57	47	10.0	0.07	6.82	27.749		51.229
B-2	35.2	00:35:12	895.010	0.005	1.672	1.60	1267	253		42			59	48	10.0	0.07	6.89	29.918		51.288
B-3	37.9	00:37:55	897.060	0.005	1.672	1.60	1352	249		44			60	50	10.0	0.07	7.06	32.049		51.279
B-4	40.6	00:40:37	899.080	0.005	1.672	1.60	1370	250		44			61	50	10.0	0.07	7.10	34.104		51.157
B-5	43.3	00:43:20	901.030	0.005	1.672	1.60	1372	250		45			62	52	10.0	0.07	7.10	36.259		51.189
B-6	46.0	00:46:03	903.080	0.005	1.672	1.60	1372	248		46			62	52	10.0	0.07	7.10	38.308		51.078
B-7	48.8	00:48:45	905.030	0.005	1.672	1.60	1201	250		47			63	54	10.0	0.07	6.76	39.377		49.739
B-8	51.5	00:51:28	906.050	0.005	1.672	1.60	1001	250		47			65	54	10.0	0.07	6.34	42.525		51.030
B-9	54.2	00:54:10	909.060	0.005	1.672	1.60	889	251		47			65	56	10.0	0.07	6.09	43.527		49.746
B-10	56.9	00:56:53	910.020	0.005	1.672	1.60	748	252		47			65	56	10.0	0.07	5.77	45.636		49.785
B-11	59.6	00:59:35	912.040	0.010	1.672	1.60	782	251		47			67	58	10.0	0.10	8.27	48.776		50.897
B-12	62.3	01:02:18	915.060	0.005	1.672	1.60	761	249		48			67	59	10.0	0.07	5.80	50.813		50.813
Last Pt	65.0	01:05:00	917.020																	
Final Val	65.0	01:05:00	917.020												Max Vac	10.5	Final Values	50.813		
Average Values				0.01		1.60	1128	250		41			56	49		0.07	6.94			
													52							

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.7	%
Stack Exhaust Flow (M2)	42,560	SCFH

Weather Data

Barometric Pressure	29.79	in. Hg
Relative Humidity	31	%
Ambient Temperature	55	°F
Specific Humidity	0.002798	lb H ₂ O / lb air

0-30-0 Load, Run - Q250-R1

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/25/15 16:50:08	33133	13.23	0.27	0.05	5.61	28.28	56.10	331.00
	02/25/15 16:50:38	33163	13.34	0.22	-0.49	5.54	28.28	56.10	331.00
	02/25/15 16:51:08	33193	13.59	0.40	-0.33	5.40	28.33	56.00	372.00
	02/25/15 16:51:38	33223	14.00	2.75	-0.04	5.05	28.33	56.00	372.00
	02/25/15 16:52:08	33253	13.17	1.85	-0.18	5.67	28.26	55.70	538.00
	02/25/15 16:52:38	33283	13.39	0.57	-0.59	5.56	28.26	55.70	538.00
	02/25/15 16:53:08	33313	13.71	0.77	-0.46	5.32	28.29	55.20	572.00
	02/25/15 16:53:38	33343	13.44	0.54	-0.22	5.45	28.29	55.20	572.00
	02/25/15 16:54:08	33373	12.66	0.45	-0.53	6.12	28.28	54.70	638.00
	02/25/15 16:54:38	33403	12.53	0.51	-1.03	6.23	28.28	54.70	638.00
	02/25/15 16:55:08	33433	12.61	0.42	-1.06	6.22	28.27	54.30	689.00
	02/25/15 16:55:38	33463	12.70	0.55	-1.14	6.09	28.27	54.30	689.00
	02/25/15 16:56:08	33493	12.63	0.68	-1.15	6.15	28.29	53.80	698.00
	02/25/15 16:56:38	33523	12.67	0.66	-1.12	6.13	28.29	53.80	698.00
	02/25/15 16:57:08	33553	12.95	0.71	-1.22	5.87	28.30	53.40	690.00
	02/25/15 16:57:38	33583	12.99	0.73	-1.24	5.85	28.30	53.40	690.00
	02/25/15 16:58:08	33613	12.99	0.93	-1.17	5.84	28.31	53.10	699.00
	02/25/15 16:58:38	33643	13.00	0.70	-0.80	5.84	28.31	53.10	699.00
	02/25/15 16:59:08	33673	12.99	0.80	-0.35	5.85	28.32	52.80	691.00
	02/25/15 16:59:38	33703	12.98	0.94	-0.04	5.85	28.32	52.80	691.00
	02/25/15 17:00:08	33733	12.93	0.91	-0.35	5.86	28.34	52.60	692.00
	02/25/15 17:00:38	33763	13.03	0.85	-1.33	5.84	28.34	52.60	692.00
	02/25/15 17:01:08	33793	13.31	0.99	-1.84	5.57	28.35	52.40	692.00
	02/25/15 17:01:38	33823	13.01	1.05	-1.66	5.83	28.35	52.40	692.00
	02/25/15 17:02:08	33853	12.91	0.62	-1.76	5.93	28.36	52.20	701.00
	02/25/15 17:02:38	33883	12.90	0.55	-1.79	5.94	28.36	52.20	701.00
	02/25/15 17:03:08	33913	12.95	0.64	-1.59	5.89	28.39	52.00	702.00
	02/25/15 17:03:38	33943	12.98	0.67	-1.37	5.86	28.39	52.00	702.00
	02/25/15 17:04:08	33973	13.08	0.56	-0.99	5.78	28.41	51.80	702.00
	02/25/15 17:04:38	34003	13.15	0.70	-0.88	5.71	28.41	51.80	702.00
	02/25/15 17:05:08	34033	13.15	0.67	-1.16	5.71	28.42	51.60	703.00
	02/25/15 17:05:38	34063	13.04	0.72	-1.34	5.81	28.42	51.60	703.00
	02/25/15 17:06:08	34093	13.06	0.55	-1.24	5.82	28.44	51.40	704.00
	02/25/15 17:06:38	34123	13.28	0.46	-0.89	5.61	28.44	51.40	704.00
	02/25/15 17:07:08	34153	13.05	0.66	-1.18	5.81	28.45	51.10	696.00
	02/25/15 17:07:38	34183	13.09	0.40	-1.30	5.77	28.45	51.10	696.00
	02/25/15 17:08:08	34213	13.26	0.59	-1.50	5.63	28.46	50.80	696.00
	02/25/15 17:08:38	34243	13.32	0.68	-1.42	5.57	28.46	50.80	696.00
	02/25/15 17:09:08	34273	13.34	0.87	-0.83	5.55	28.49	50.50	680.00
	02/25/15 17:09:38	34303	12.98	0.95	-1.16	5.85	28.49	50.50	680.00
	02/25/15 17:10:08	34333	12.17	0.64	-1.33	6.52	28.52	50.10	639.00
	02/25/15 17:10:38	34363	11.23	0.28	-1.29	7.26	28.52	50.10	639.00
	02/25/15 17:11:08	34393	10.39	0.25	0.00	7.85	28.56	49.90	615.00
	02/25/15 17:11:38	34423	9.02	0.05	0.00	8.90	28.56	49.90	615.00
	02/25/15 17:12:08	34453	7.54	0.20	0.00	9.99	28.59	49.60	565.00
	02/25/15 17:12:38	34483	8.25	0.02	0.00	9.51	28.59	49.60	565.00
A2	02/25/15 17:13:08	34513	9.72	0.17	0.00	8.54	28.68	49.40	431.00
	02/25/15 17:13:38	34543	12.64	0.24	0.00	6.21	28.68	49.40	431.00
	02/25/15 17:14:08	34573	13.25	0.32	0.00	5.64	28.78	49.30	373.00
	02/25/15 17:14:38	34603	13.14	0.11	0.00	5.74	28.78	49.30	373.00
	02/25/15 17:15:08	34633	13.05	0.20	0.00	5.81	28.84	49.30	365.00
	02/25/15 17:15:38	34663	13.44	0.20	0.00	5.51	28.84	49.30	365.00
	02/25/15 17:16:08	34693	13.54	0.52	0.00	5.43	28.89	49.30	349.00
	02/25/15 17:16:38	34723	13.52	0.76	-1.22	5.44	28.89	49.30	349.00
	02/25/15 17:17:08	34753	13.63	1.38	-1.09	5.37	28.94	49.20	340.00
	02/25/15 17:17:38	34783	13.59	3.17	1.04	5.36	28.94	49.20	340.00
	02/25/15 17:18:08	34813	13.53	3.64	3.53	5.40	28.92	49.10	468.00
	02/25/15 17:18:38	34843	13.21	1.58	3.23	5.64	28.92	49.10	468.00
	02/25/15 17:19:08	34873	12.99	0.68	2.86	5.82	28.87	48.70	595.00
	02/25/15 17:19:38	34903	12.81	0.64	2.88	6.02	28.87	48.70	595.00
	02/25/15 17:20:08	34933	12.95	0.71	3.51	5.88	28.86	48.30	638.00
	02/25/15 17:20:38	34963	12.89	0.77	3.59	5.97	28.86	48.30	638.00

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.7	%
Stack Exhaust Flow (M2)	42,560	SCFH

Weather Data

Barometric Pressure	29.79	in. Hg
Relative Humidity	31	%
Ambient Temperature	55	°F
Specific Humidity	0.002798	lb H ₂ O / lb air

0-30-0 Load, Run - Q250-R1

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/25/15 17:21:08	34993	12.99	0.82	3.52	5.89	28.83	47.90	698.00
	02/25/15 17:21:38	35023	13.21	0.81	3.58	5.70	28.83	47.90	698.00
	02/25/15 17:22:08	35053	13.43	1.16	3.63	5.48	28.85	47.60	707.00
	02/25/15 17:22:38	35083	13.37	1.33	3.99	5.51	28.85	47.60	707.00
	02/25/15 17:23:08	35113	13.30	1.02	3.77	5.57	28.85	47.40	699.00
	02/25/15 17:23:38	35143	13.20	0.98	2.77	5.67	28.85	47.40	699.00
	02/25/15 17:24:08	35173	13.32	0.99	2.24	5.57	28.85	47.20	699.00
	02/25/15 17:24:38	35203	13.36	1.15	1.43	5.59	28.85	47.20	699.00
	02/25/15 17:25:08	35233	13.60	1.24	2.15	5.43	28.89	47.10	640.00
	02/25/15 17:25:38	35263	14.83	1.70	2.59	4.25	28.89	47.10	640.00
	02/25/15 17:26:08	35293	14.53	1.69	2.75	4.41	28.96	47.10	530.00
	02/25/15 17:26:38	35323	14.12	1.29	2.86	4.76	28.96	47.10	530.00
	02/25/15 17:27:08	35353	14.48	1.26	3.05	4.55	29.03	47.20	428.00
	02/25/15 17:27:38	35383	14.62	1.65	2.97	4.47	29.03	47.20	428.00
	02/25/15 17:28:08	35413	14.67	2.66	3.18	4.41	29.10	47.20	377.00
	02/25/15 17:28:38	35443	14.28	2.85	3.10	4.72	29.10	47.20	377.00
	02/25/15 17:29:08	35473	14.17	1.44	3.12	4.83	29.16	47.20	361.00
	02/25/15 17:29:38	35503	14.31	0.67	3.54	4.75	29.16	47.20	361.00
	02/25/15 17:30:08	35533	14.68	0.70	3.78	4.51	29.20	47.20	352.00
	02/25/15 17:30:38	35563	14.30	0.68	3.17	4.74	29.20	47.20	352.00
	02/25/15 17:31:08	35593	14.66	0.52	3.15	4.53	29.24	47.20	361.00
	02/25/15 17:31:38	35623	14.31	0.48	3.63	4.74	29.24	47.20	361.00
	02/25/15 17:32:08	35653	13.65	0.57	3.59	5.21	29.24	47.10	465.00
	02/25/15 17:32:38	35683	12.29	0.42	3.56	6.32	29.24	47.10	465.00
	02/25/15 17:33:08	35713	11.32	0.40	3.35	7.13	29.14	47.00	704.00
	02/25/15 17:33:38	35743	11.59	0.48	3.66	6.96	29.14	47.00	704.00
	02/25/15 17:34:08	35773	11.79	0.33	3.39	6.75	29.11	46.70	730.00
	02/25/15 17:34:38	35803	12.19	0.48	3.22	6.49	29.11	46.70	730.00
	02/25/15 17:35:08	35833	13.33	0.54	3.66	5.54	29.14	46.50	688.00
	02/25/15 17:35:38	35863	13.05	0.64	3.55	5.71	29.14	46.50	688.00
A3	02/25/15 17:36:08	35893	13.17	0.53	3.02	5.66	29.14	46.30	679.00
	02/25/15 17:36:38	35923	14.16	0.95	3.08	4.91	29.14	46.30	679.00
	02/25/15 17:37:08	35953	13.48	1.37	3.21	5.38	29.13	46.10	731.00
	02/25/15 17:37:38	35983	13.53	0.89	2.90	5.35	29.13	46.10	731.00
	02/25/15 17:38:08	36013	13.68	0.74	2.54	5.27	29.15	46.00	689.00
	02/25/15 17:38:38	36043	14.03	0.99	2.82	5.04	29.15	46.00	689.00
	02/25/15 17:39:08	36073	14.08	1.02	2.71	4.97	29.16	45.80	681.00
	02/25/15 17:39:38	36103	14.16	1.03	2.30	4.95	29.16	45.80	681.00
	02/25/15 17:40:08	36133	14.04	1.08	2.14	5.01	29.18	45.60	655.00
	02/25/15 17:40:38	36163	14.45	0.94	1.80	4.74	29.18	45.60	655.00
	02/25/15 17:41:08	36193	13.50	0.92	1.51	5.35	29.25	45.40	475.00
	02/25/15 17:41:38	36223	13.65	0.55	1.96	5.33	29.25	45.40	475.00
	02/25/15 17:42:08	36253	13.40	0.45	1.82	5.48	29.35	45.30	381.00
	02/25/15 17:42:38	36283	13.90	0.46	1.69	5.16	29.35	45.30	381.00
	02/25/15 17:43:08	36313	13.73	0.57	1.66	5.24	29.40	45.30	347.00
	02/25/15 17:43:38	36343	13.89	0.86	1.95	5.15	29.40	45.30	347.00
	02/25/15 17:44:08	36373	13.60	1.06	2.12	5.36	29.46	45.30	347.00
	02/25/15 17:44:38	36403	13.63	1.25	1.99	5.35	29.46	45.30	347.00
	02/25/15 17:45:08	36433	13.56	1.27	1.80	5.39	29.49	45.30	391.00
	02/25/15 17:45:38	36463	12.38	1.55	0.93	6.27	29.49	45.30	391.00
	02/25/15 17:46:08	36493	11.74	0.56	0.59	6.89	29.39	45.00	625.00
	02/25/15 17:46:38	36523	11.65	0.03	0.59	6.98	29.39	45.00	625.00
	02/25/15 17:47:08	36553	11.76	0.22	0.62	6.90	29.32	44.60	754.00
	02/25/15 17:47:38	36583	12.04	0.28	0.15	6.72	29.32	44.60	754.00
	02/25/15 17:48:08	36613	12.46	0.38	-0.04	6.42	29.33	44.10	703.00
	02/25/15 17:48:38	36643	13.24	0.29	0.00	5.68	29.33	44.10	703.00
	02/25/15 17:49:08	36673	13.31	0.43	0.00	5.56	29.35	43.80	669.00
	02/25/15 17:49:38	36703	13.19	0.58	1.21	5.67	29.35	43.80	669.00
	02/25/15 17:50:08	36733	13.24	0.50	1.77	5.64	29.35	43.60	669.00
	02/25/15 17:50:38	36763	13.38	0.54	1.82	5.53	29.35	43.60	669.00
	02/25/15 17:51:08	36793	13.36	0.67	1.89	5.52	29.35	43.50	669.00
	02/25/15 17:51:38	36823	13.30	0.67	1.98	5.58	29.35	43.50	669.00

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.7	%
Stack Exhaust Flow (M2)	42,560	SCFH

Weather Data

Barometric Pressure	29.79	in. Hg
Relative Humidity	31	%
Ambient Temperature	55	°F
Specific Humidity	0.002798	lb H ₂ O / lb air

0-30-0 Load, Run - Q250-R1

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/25/15 17:52:08	36853	13.38	0.55	1.96	5.54	29.35	43.20	678.00
02/25/15 17:52:38	36883	13.26	0.69	2.06	5.61	29.35	43.20	678.00
02/25/15 17:53:08	36913	13.67	0.74	2.21	5.34	29.36	42.80	679.00
02/25/15 17:53:38	36943	14.00	1.39	2.62	5.09	29.36	42.80	679.00
02/25/15 17:54:08	36973	13.72	1.78	2.40	5.29	29.34	42.70	688.00
02/25/15 17:54:38	37003	13.72	1.48	2.09	5.29	29.34	42.70	688.00
02/25/15 17:55:08	37033	13.87	1.27	2.40	5.17	29.40	42.60	549.00
02/25/15 17:55:38	37063	13.46	1.43	2.03	5.46	29.40	42.60	549.00
02/25/15 17:56:08	37093	13.83	1.01	2.07	5.24	29.49	42.60	411.00
02/25/15 17:56:38	37123	13.80	1.02	1.83	5.22	29.49	42.60	411.00
02/25/15 17:57:08	37153	13.49	1.03	1.99	5.43	29.53	42.60	385.00
02/25/15 17:57:38	37183	13.11	1.09	2.30	5.72	29.53	42.60	385.00
02/25/15 17:58:08	37213	12.85	0.73	2.62	5.99	29.58	42.60	376.00
02/25/15 17:58:38	37243	12.43	0.38	2.54	6.28	29.58	42.60	376.00
02/25/15 17:59:08	37273	12.02	0.30	2.59	6.67	29.62	42.60	359.00
02/25/15 17:59:38	37303	12.07	0.17	2.35	6.61	29.62	42.60	359.00
02/25/15 18:00:08	37333	11.60	0.21	2.00	7.02	29.66	42.50	351.00
02/25/15 18:00:38	37363	12.84	0.22	2.10	6.05	29.66	42.50	351.00
RAW AVERAGE		13.10	0.82	1.18	5.75	28.92	48.12	572.45

Bias		O ₂	CO	THC	CO ₂	Press.	Trans	Temp.	Trans.	F-Flow	Trans.
	Serial Number:	INST-O2-0013	INST-CO-0029	INST-TH-0009	INST-C2-0013	1442557		1442557		1442557	
						(in. H ₂ O)		(°F)		(SCFH)	
	Initial Zero	0.10	0.06	0.04	0.03	1442557		1442557		1442557	
	Final Zero	0.10	0.04	-0.01	0.05						
	Avg. Zero	0.10	0.05	0.02	0.04						
	Initial UpScale	12.01	9.33	3.10	9.34						
	Final UpScale	11.96	9.03	3.04	9.27						
	Avg. UpScale	11.99	9.18	3.07	6.00						
		12.00	8.98	3.04	9.42						

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	13.13	0.76	1.16	9.02
Corrected Raw Average (ppm/% wet basis)	12.65	0.73	1.16	8.69
Concentration (ppm@ 3%CO ₂)	N/A	0.25	0.39	N/A
Emission Rate (lb/hr)	N/A	0.00	0.01	N/A

Questor Technology Inc
February 26, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	37,124	SCFH

Weather Data

Barometric Pressure	30.42	in. Hg
Relative Humidity	31	%
Ambient Temperature	40	°F
Specific Humidity	0.001549	lb H ₂ O / lb air

0-30-0 Load, Run - Q250-R2

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/26/15 15:55:08	116233	15.00	0.00	1.26	4.38	54.07	39.70	358.00
	02/26/15 15:55:38	116263	14.77	0.13	1.20	4.52	54.07	39.70	358.00
	02/26/15 15:56:08	116293	14.65	0.23	1.21	4.51	54.19	39.90	372.00
	02/26/15 15:56:38	116323	14.09	-0.17	1.07	4.91	54.19	39.90	372.00
	02/26/15 15:57:08	116353	14.05	-0.10	1.01	5.03	54.28	40.10	414.00
	02/26/15 15:57:38	116383	14.95	0.63	0.95	4.40	54.28	40.10	414.00
	02/26/15 15:58:08	116413	14.94	3.59	0.90	4.38	54.31	40.00	525.00
	02/26/15 15:58:38	116443	14.84	4.15	0.87	4.41	54.31	40.00	525.00
	02/26/15 15:59:08	116473	14.71	2.92	0.85	4.51	54.33	39.90	594.00
	02/26/15 15:59:38	116503	13.79	2.00	0.85	5.12	54.33	39.90	594.00
	02/26/15 16:00:08	116533	13.77	1.09	0.87	5.15	54.34	39.60	678.00
	02/26/15 16:00:38	116563	13.74	0.83	0.86	5.18	54.34	39.60	678.00
	02/26/15 16:01:08	116593	13.66	0.68	0.86	5.23	54.39	39.40	692.00
	02/26/15 16:01:38	116623	13.60	0.60	0.88	5.27	54.39	39.40	692.00
	02/26/15 16:02:08	116653	13.59	0.40	0.86	5.31	54.44	39.30	693.00
	02/26/15 16:02:38	116683	13.54	0.55	0.83	5.35	54.44	39.30	693.00
	02/26/15 16:03:08	116713	13.47	0.58	0.79	5.39	54.48	39.20	680.00
	02/26/15 16:03:38	116743	13.24	0.85	0.79	5.58	54.48	39.20	680.00
	02/26/15 16:04:08	116773	13.50	0.85	0.78	5.39	54.53	39.00	695.00
	02/26/15 16:04:38	116803	13.27	0.61	0.77	5.52	54.53	39.00	695.00
	02/26/15 16:05:08	116833	13.18	0.41	0.79	5.61	54.58	38.90	681.00
	02/26/15 16:05:38	116863	13.43	0.40	0.86	5.40	54.58	38.90	681.00
	02/26/15 16:06:08	116893	13.52	0.45	0.80	5.32	54.63	38.80	682.00
	02/26/15 16:06:38	116923	13.37	0.33	0.74	5.44	54.63	38.80	682.00
	02/26/15 16:07:08	116953	13.33	0.22	0.73	5.50	54.68	38.70	682.00
	02/26/15 16:07:38	116983	13.36	0.16	0.74	5.53	54.68	38.70	682.00
	02/26/15 16:08:08	117013	13.49	0.17	0.79	5.37	54.73	38.70	683.00
	02/26/15 16:08:38	117043	13.64	0.27	0.79	5.26	54.73	38.70	683.00
	02/26/15 16:09:08	117073	13.54	0.52	0.79	5.32	54.76	38.80	683.00
	02/26/15 16:09:38	117103	13.66	0.61	0.81	5.26	54.76	38.80	683.00
	02/26/15 16:10:08	117133	13.61	0.43	0.78	5.28	54.82	38.60	684.00
	02/26/15 16:10:38	117163	13.55	0.35	0.77	5.35	54.82	38.60	684.00
	02/26/15 16:11:08	117193	13.56	0.23	0.78	5.31	54.86	38.50	685.00
	02/26/15 16:11:38	117223	13.50	0.26	0.78	5.37	54.86	38.50	685.00
	02/26/15 16:12:08	117253	13.72	0.29	0.80	5.28	54.97	38.40	518.00
	02/26/15 16:12:38	117283	13.83	0.60	0.81	5.10	54.97	38.40	518.00
	02/26/15 16:13:08	117313	14.33	0.18	0.93	4.81	55.13	38.40	407.00
	02/26/15 16:13:38	117343	14.51	-0.20	0.92	4.73	55.13	38.40	407.00
	02/26/15 16:14:08	117373	14.30	-0.03	0.94	4.76	55.23	38.30	407.00
	02/26/15 16:14:38	117403	13.55	-0.08	0.88	5.43	55.23	38.30	407.00
	02/26/15 16:15:08	117433	14.39	-0.16	0.92	4.75	55.32	38.30	422.00
	02/26/15 16:15:38	117463	14.33	-0.16	0.90	4.81	55.32	38.30	422.00
	02/26/15 16:16:08	117493	14.68	-0.04	0.99	4.53	55.40	38.20	395.00
	02/26/15 16:16:38	117523	14.42	-0.09	1.04	4.72	55.40	38.20	395.00
	02/26/15 16:17:08	117553	13.06	-0.15	0.95	5.72	55.47	38.00	466.00
	02/26/15 16:17:38	117583	14.50	0.17	0.80	4.75	55.47	38.00	466.00
A2	02/26/15 16:18:08	117613	13.55	0.58	0.70	5.30	55.43	37.80	663.00
	02/26/15 16:18:38	117643	13.13	0.10	0.67	5.70	55.43	37.80	663.00
	02/26/15 16:19:08	117673	12.79	0.04	0.61	5.96	55.44	37.60	692.00
	02/26/15 16:19:38	117703	12.62	0.02	0.56	6.13	55.44	37.60	692.00
	02/26/15 16:20:08	117733	13.11	-0.01	0.57	5.75	55.48	37.50	706.00
	02/26/15 16:20:38	117763	13.58	0.07	0.63	5.31	55.48	37.50	706.00
	02/26/15 16:21:08	117793	13.23	0.13	0.63	5.60	55.51	37.40	693.00
	02/26/15 16:21:38	117823	13.39	0.06	0.64	5.47	55.51	37.40	693.00
	02/26/15 16:22:08	117853	13.85	0.16	0.67	5.33	55.55	37.30	693.00
	02/26/15 16:22:38	117883	13.82	0.20	0.66	5.30	55.55	37.30	693.00
	02/26/15 16:23:08	117913	13.32	0.15	0.62	5.71	55.58	37.10	694.00
	02/26/15 16:23:38	117943	12.61	0.08	0.59	6.34	55.58	37.10	694.00
	02/26/15 16:24:08	117973	12.75	-0.12	0.61	6.21	55.62	37.00	680.00
	02/26/15 16:24:38	118003	12.68	-0.10	0.55	6.20	55.62	37.00	680.00
	02/26/15 16:25:08	118033	12.67	0.05	0.53	6.11	55.65	36.90	681.00
	02/26/15 16:25:38	118063	12.62	0.04	0.52	6.09	55.65	36.90	681.00

Questor Technology Inc
February 26, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	37,124	SCFH

Weather Data

Barometric Pressure	30.42	in. Hg
Relative Humidity	31	%
Ambient Temperature	40	°F
Specific Humidity	0.001549	lb H ₂ O / lb air

0-30-0 Load, Run - Q250-R2

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/26/15 16:26:08	118093	12.49	-0.15	0.52	6.26	55.68	36.70	710.00
	02/26/15 16:26:38	118123	12.76	-0.04	0.53	6.01	55.68	36.70	710.00
	02/26/15 16:27:08	118153	12.74	-0.12	0.54	6.00	55.73	36.60	682.00
	02/26/15 16:27:38	118183	12.50	0.01	0.50	6.22	55.73	36.60	682.00
	02/26/15 16:28:08	118213	12.52	-0.13	0.48	6.24	55.75	36.40	711.00
	02/26/15 16:28:38	118243	12.56	-0.13	0.48	6.18	55.75	36.40	711.00
	02/26/15 16:29:08	118273	12.48	-0.35	0.49	6.28	55.79	36.40	711.00
	02/26/15 16:29:38	118303	12.74	-0.29	0.52	6.06	55.79	36.40	711.00
	02/26/15 16:30:08	118333	13.15	-0.04	0.53	5.80	55.89	36.40	555.00
	02/26/15 16:30:38	118363	13.70	0.25	0.56	5.21	55.89	36.40	555.00
	02/26/15 16:31:08	118393	12.00	0.15	0.60	6.64	56.04	36.50	414.00
	02/26/15 16:31:38	118423	13.88	-0.16	0.70	5.21	56.04	36.50	414.00
	02/26/15 16:32:08	118453	13.99	-0.17	0.71	5.06	56.18	36.70	343.00
	02/26/15 16:32:38	118483	13.59	-0.30	0.67	5.38	56.18	36.70	343.00
	02/26/15 16:33:08	118513	14.60	-0.09	0.74	4.72	56.29	36.80	358.00
	02/26/15 16:33:38	118543	14.83	-0.18	0.81	4.42	56.29	36.80	358.00
	02/26/15 16:34:08	118573	14.80	-0.29	0.77	4.54	56.38	36.90	358.00
	02/26/15 16:34:38	118603	14.09	-0.14	0.72	4.88	56.38	36.90	358.00
	02/26/15 16:35:08	118633	13.02	-0.05	0.60	5.88	56.37	36.80	545.00
	02/26/15 16:35:38	118663	13.85	0.10	0.56	5.11	56.37	36.80	545.00
	02/26/15 16:36:08	118693	12.60	0.19	0.54	6.08	56.34	36.70	659.00
	02/26/15 16:36:38	118723	12.20	-0.11	0.51	6.45	56.34	36.70	659.00
	02/26/15 16:37:08	118753	12.61	-0.43	0.53	6.15	56.36	36.50	702.00
	02/26/15 16:37:38	118783	12.03	-0.13	0.55	6.56	56.36	36.50	702.00
	02/26/15 16:38:08	118813	12.87	-0.18	0.56	5.96	56.42	36.40	617.00
	02/26/15 16:38:38	118843	13.08	-0.12	0.55	5.77	56.42	36.40	617.00
	02/26/15 16:39:08	118873	13.01	0.02	0.56	5.78	56.45	36.40	661.00
	02/26/15 16:39:38	118903	12.37	-0.10	0.56	6.28	56.45	36.40	661.00
	02/26/15 16:40:08	118933	11.62	-0.17	0.57	6.91	56.45	36.30	732.00
	02/26/15 16:40:38	118963	11.83	-0.05	0.58	6.76	56.45	36.30	732.00
A3	02/26/15 16:41:08	118993	13.16	-0.04	0.60	5.75	56.54	36.20	618.00
	02/26/15 16:41:38	119023	13.62	0.22	0.60	5.30	56.54	36.20	618.00
	02/26/15 16:42:08	119053	13.58	0.53	0.60	5.30	56.58	36.30	676.00
	02/26/15 16:42:38	119083	13.01	0.24	0.59	5.78	56.58	36.30	676.00
	02/26/15 16:43:08	119113	12.75	0.06	0.54	5.99	56.60	36.30	691.00
	02/26/15 16:43:38	119143	12.93	0.03	0.54	5.91	56.60	36.30	691.00
	02/26/15 16:44:08	119173	12.84	0.04	0.53	5.93	56.63	36.20	677.00
	02/26/15 16:44:38	119203	12.79	-0.08	0.56	6.00	56.63	36.20	677.00
	02/26/15 16:45:08	119233	13.21	0.13	0.62	5.62	56.67	36.20	692.00
	02/26/15 16:45:38	119263	12.88	0.13	0.58	5.89	56.67	36.20	692.00
	02/26/15 16:46:08	119293	12.81	-0.06	0.52	5.98	56.72	36.20	663.00
	02/26/15 16:46:38	119323	13.14	0.08	0.45	5.75	56.72	36.20	663.00
	02/26/15 16:47:08	119353	14.03	0.39	0.47	5.04	56.83	36.30	505.00
	02/26/15 16:47:38	119383	15.45	2.18	0.57	4.12	56.83	36.30	505.00
	02/26/15 16:48:08	119413	14.86	4.20	0.62	4.41	57.01	36.40	347.00
	02/26/15 16:48:38	119443	15.14	2.87	0.70	4.28	57.01	36.40	347.00
	02/26/15 16:49:08	119473	15.69	3.34	0.80	3.93	57.14	36.50	304.00
	02/26/15 16:49:38	119503	15.63	1.05	0.91	3.88	57.14	36.50	304.00
	02/26/15 16:50:08	119533	13.76	-0.17	0.85	5.11	57.17	36.40	464.00
	02/26/15 16:50:38	119563	13.75	-0.30	0.90	5.27	57.17	36.40	464.00
	02/26/15 16:51:08	119593	14.42	-0.12	0.93	4.78	57.24	36.20	392.00
	02/26/15 16:51:38	119623	13.98	-0.23	0.85	5.03	57.24	36.20	392.00
	02/26/15 16:52:08	119653	14.38	-0.24	0.83	4.81	57.34	36.00	393.00
	02/26/15 16:52:38	119683	15.06	-0.15	0.87	4.36	57.34	36.00	393.00
	02/26/15 16:53:08	119713	14.41	-0.19	0.84	4.78	57.42	35.90	393.00
	02/26/15 16:53:38	119743	13.41	-0.19	0.74	5.44	57.42	35.90	393.00
	02/26/15 16:54:08	119773	13.39	-0.18	0.55	5.49	57.37	35.70	641.00
	02/26/15 16:54:38	119803	12.10	-0.11	0.48	6.49	57.37	35.70	641.00
	02/26/15 16:55:08	119833	12.14	-0.35	0.49	6.53	57.35	35.40	685.00
	02/26/15 16:55:38	119863	12.14	-0.10	0.50	6.48	57.35	35.40	685.00
	02/26/15 16:56:08	119893	12.81	-0.18	0.48	6.05	57.36	35.10	700.00
	02/26/15 16:56:38	119923	12.99	0.01	0.47	5.78	57.36	35.10	700.00

Questor Technology Inc
February 26, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	37,124	SCFH

Weather Data

Barometric Pressure	30.42	in. Hg
Relative Humidity	31	%
Ambient Temperature	40	°F
Specific Humidity	0.001549	lb H ₂ O / lb air

0-30-0 Load, Run - Q250-R2

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/26/15 16:57:08	119953	12.97	-0.02	0.51	5.86	57.38	34.90	701.00
02/26/15 16:57:38	119983	12.82	0.13	0.50	5.94	57.38	34.90	701.00
02/26/15 16:58:08	120013	12.62	-0.12	0.46	6.12	57.42	34.50	731.00
02/26/15 16:58:38	120043	12.82	-0.02	0.48	5.97	57.42	34.50	731.00
02/26/15 16:59:08	120073	12.25	-0.08	0.47	6.40	57.44	34.40	731.00
02/26/15 16:59:38	120103	12.63	-0.14	0.48	6.14	57.44	34.40	731.00
02/26/15 17:00:08	120133	12.51	-0.04	0.50	6.17	57.47	34.20	673.00
02/26/15 17:00:38	120163	12.34	-0.12	0.49	6.42	57.47	34.20	673.00
02/26/15 17:01:08	120193	12.80	-0.07	0.51	6.01	57.63	34.20	425.00
02/26/15 17:01:38	120223	12.96	-0.04	0.49	5.95	57.63	34.20	425.00
02/26/15 17:02:08	120253	15.02	1.00	0.53	4.36	57.74	34.20	382.00
02/26/15 17:02:38	120283	14.75	2.36	0.61	4.50	57.74	34.20	382.00
02/26/15 17:03:08	120313	13.88	0.38	0.71	5.09	57.83	34.10	383.00
02/26/15 17:03:38	120343	13.58	-0.19	0.73	5.39	57.83	34.10	383.00
02/26/15 17:04:08	120373	13.78	-0.20	0.74	5.22	57.90	34.00	383.00
02/26/15 17:04:38	120403	13.98	-0.26	0.75	4.97	57.90	34.00	383.00
02/26/15 17:05:08	120433	14.14	-0.22	0.73	5.11	57.98	33.80	384.00
02/26/15 17:05:38	120463	14.65	-0.15	0.73	4.62	57.98	33.80	384.00
RAW AVERAGE		13.50	0.27	0.69	5.44	55.99	37.03	577.32

Bias	Serial Number:	O ₂	CO	THC	CO ₂	Press.	Trans.	Temp.	Trans.	F-Flow	Trans.
	INST-O2-0013	INST-CO-0029	INST-TH-0009	INST-C2-0013	1442557	1442557	1442557				
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H ₂ O)	(°F)	(SCFH)			
	Initial Zero	0.10	0.04	-0.01	0.05						
	Final Zero	0.10	0.07	0.13	-0.07						
	Avg. Zero	0.10	0.06	0.06	-0.01						
	Initial UpScale	11.96	9.03	3.04	9.27						
	Final UpScale	12.02	9.12	3.05	9.17						
	Avg. UpScale	11.99	9.08	3.05	9.22						
Upscale Cal Gas		12.10	9.02	3.02	9.36						

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	13.63	0.22	0.67	5.53
Corrected Raw Average (ppm/% wet basis)	13.13	0.21	0.64	5.33
Concentration (ppm@ 3%CO ₂)	N/A	0.12	0.36	N/A
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

Questor Technology Inc
February 27, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	39,355	SCFH

Weather Data

Barometric Pressure	30.61	in. Hg
Relative Humidity	40	%
Ambient Temperature	29	°F
Specific Humidity	0.001287	lb H ₂ O / lb air

0-30-0 Load, Run - Q250-R3

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/27/15 8:42:08	176653	13.24	-0.18	0.32	5.43	58.80	23.10	428.00
	02/27/15 8:42:38	176683	12.93	-0.21	0.28	5.70	58.80	23.10	428.00
	02/27/15 8:43:08	176713	12.65	-0.11	0.27	5.88	58.80	23.10	412.00
	02/27/15 8:43:38	176743	12.19	-0.19	0.20	6.36	58.80	23.10	412.00
	02/27/15 8:44:08	176773	12.38	-0.17	0.19	6.18	58.79	23.20	397.00
	02/27/15 8:44:38	176803	12.74	-0.21	0.22	5.84	58.79	23.20	397.00
	02/27/15 8:45:08	176833	12.94	-0.16	0.21	5.70	58.79	23.10	428.00
	02/27/15 8:45:38	176863	12.09	-0.22	0.10	6.45	58.79	23.10	428.00
	02/27/15 8:46:08	176893	13.74	0.06	-0.01	5.09	58.73	23.10	564.00
	02/27/15 8:46:38	176923	13.27	0.75	-0.02	5.38	58.73	23.10	564.00
	02/27/15 8:47:08	176953	12.41	0.35	-0.02	6.13	58.63	23.00	701.00
	02/27/15 8:47:38	176983	12.16	0.21	-0.03	6.29	58.63	23.00	701.00
	02/27/15 8:48:08	177013	11.93	0.04	-0.03	6.53	58.53	22.90	731.00
	02/27/15 8:48:38	177043	12.13	0.03	-0.02	6.40	58.53	22.90	731.00
	02/27/15 8:49:08	177073	12.94	0.13	-0.01	5.73	58.52	22.90	669.00
	02/27/15 8:49:38	177103	12.77	0.27	-0.02	5.82	58.52	22.90	669.00
	02/27/15 8:50:08	177133	12.70	0.33	-0.05	5.88	58.44	22.90	684.00
	02/27/15 8:50:38	177163	12.34	0.27	-0.04	6.19	58.44	22.90	684.00
	02/27/15 8:51:08	177193	12.51	0.29	0.02	6.10	58.38	22.80	684.00
	02/27/15 8:51:38	177223	13.44	0.49	0.36	5.36	58.38	22.80	684.00
	02/27/15 8:52:08	177253	13.02	0.78	0.43	5.72	58.31	22.80	729.00
	02/27/15 8:52:38	177283	12.94	0.45	0.36	5.84	58.31	22.80	729.00
	02/27/15 8:53:08	177313	13.25	0.29	0.38	5.56	58.25	22.70	728.00
	02/27/15 8:53:38	177343	13.15	0.59	0.43	5.52	58.25	22.70	728.00
	02/27/15 8:54:08	177373	13.24	0.65	0.41	5.47	58.20	22.70	728.00
	02/27/15 8:54:38	177403	13.13	0.81	0.39	5.54	58.20	22.70	728.00
	02/27/15 8:55:08	177433	13.18	0.65	0.40	5.49	58.15	22.60	727.00
	02/27/15 8:55:38	177463	13.05	0.61	0.38	5.60	58.15	22.60	727.00
	02/27/15 8:56:08	177493	13.01	0.41	0.40	5.66	58.07	22.50	711.00
	02/27/15 8:56:38	177523	13.22	0.66	0.41	5.48	58.07	22.50	711.00
	02/27/15 8:57:08	177553	13.27	0.75	0.40	5.42	58.02	22.50	726.00
	02/27/15 8:57:38	177583	13.33	0.77	0.40	5.37	58.02	22.50	726.00
	02/27/15 8:58:08	177613	13.22	0.86	0.43	5.44	57.97	22.40	695.00
	02/27/15 8:58:38	177643	13.20	0.64	0.43	5.51	57.97	22.40	695.00
	02/27/15 8:59:08	177673	13.28	0.70	0.40	5.38	57.93	22.40	725.00
	02/27/15 8:59:38	177703	13.27	0.71	0.39	5.47	57.93	22.40	725.00
	02/27/15 9:00:08	177733	13.32	0.85	0.40	5.39	57.91	22.50	619.00
	02/27/15 9:00:38	177763	14.57	1.41	0.44	4.56	57.91	22.50	619.00
	02/27/15 9:01:08	177793	14.23	3.49	0.46	4.62	57.96	22.50	469.00
	02/27/15 9:01:38	177823	12.71	1.30	0.49	5.88	57.96	22.50	469.00
	02/27/15 9:02:08	177853	12.62	-0.21	0.54	5.95	57.97	22.50	408.00
	02/27/15 9:02:38	177883	13.90	-0.07	0.63	5.02	57.97	22.50	408.00
	02/27/15 9:03:08	177913	14.38	0.15	0.73	4.69	58.02	22.40	363.00
	02/27/15 9:03:38	177943	15.05	0.15	0.82	4.17	58.02	22.40	363.00
	02/27/15 9:04:08	177973	14.82	0.35	0.86	4.31	58.03	22.50	363.00
	02/27/15 9:04:38	178003	14.00	0.18	0.80	4.82	58.03	22.50	363.00
A2	02/27/15 9:05:08	178033	12.87	-0.12	0.73	5.66	58.04	22.60	378.00
	02/27/15 9:05:38	178063	12.55	-0.13	0.63	6.05	58.04	22.60	378.00
	02/27/15 9:06:08	178093	12.75	-0.18	0.64	5.84	58.03	22.50	439.00
	02/27/15 9:06:38	178123	13.27	-0.29	0.49	5.55	58.03	22.50	439.00
	02/27/15 9:07:08	178153	13.68	0.76	0.45	5.10	57.96	22.50	620.00
	02/27/15 9:07:38	178183	12.96	0.69	0.46	5.66	57.96	22.50	620.00
	02/27/15 9:08:08	178213	13.24	0.39	0.44	5.49	57.88	22.40	695.00
	02/27/15 9:08:38	178243	13.41	0.66	0.42	5.31	57.88	22.40	695.00
	02/27/15 9:09:08	178273	13.35	0.62	0.40	5.38	57.84	22.50	694.00
	02/27/15 9:09:38	178303	13.14	0.67	0.41	5.47	57.84	22.50	694.00
	02/27/15 9:10:08	178333	13.36	0.62	0.44	5.36	57.80	22.40	694.00
	02/27/15 9:10:38	178363	13.54	0.86	0.44	5.21	57.80	22.40	694.00
	02/27/15 9:11:08	178393	13.31	0.88	0.43	5.38	57.74	22.30	693.00
	02/27/15 9:11:38	178423	13.36	0.74	0.43	5.37	57.74	22.30	693.00
	02/27/15 9:12:08	178453	13.22	0.79	0.42	5.45	57.69	22.30	693.00
	02/27/15 9:12:38	178483	13.23	0.61	0.45	5.47	57.69	22.30	693.00

Questor Technology Inc
February 27, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	39,355	SCFH

Weather Data

Barometric Pressure	30.61	in. Hg
Relative Humidity	40	%
Ambient Temperature	29	°F
Specific Humidity	0.001287	lb H ₂ O / lb air

0-30-0 Load, Run - Q250-R3

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/27/15 9:13:08	178513	13.41	0.72	0.58	5.31	57.67	22.30	693.00
	02/27/15 9:13:38	178543	13.28	0.76	0.60	5.39	57.67	22.30	693.00
	02/27/15 9:14:08	178573	13.27	0.60	0.62	5.44	57.61	22.20	692.00
	02/27/15 9:14:38	178603	13.23	0.63	0.64	5.44	57.61	22.20	692.00
	02/27/15 9:15:08	178633	13.54	0.81	0.65	5.22	57.58	22.20	692.00
	02/27/15 9:15:38	178663	13.42	0.79	0.74	5.28	57.58	22.20	692.00
	02/27/15 9:16:08	178693	14.79	2.04	1.30	4.42	57.61	22.10	527.00
	02/27/15 9:16:38	178723	14.86	2.69	0.99	4.26	57.61	22.10	527.00
	02/27/15 9:17:08	178753	14.11	1.49	1.02	4.79	57.69	22.20	331.00
	02/27/15 9:17:38	178783	14.49	0.91	1.02	4.57	57.69	22.20	331.00
	02/27/15 9:18:08	178813	14.64	4.71	0.99	4.45	57.73	22.20	317.00
	02/27/15 9:18:38	178843	14.41	6.10	0.99	4.57	57.73	22.20	317.00
	02/27/15 9:19:08	178873	14.21	3.04	0.99	4.73	57.76	22.30	347.00
	02/27/15 9:19:38	178903	13.47	1.36	0.88	5.28	57.76	22.30	347.00
	02/27/15 9:20:08	178933	13.70	0.08	0.95	5.16	57.79	22.30	362.00
	02/27/15 9:20:38	178963	14.02	0.11	1.02	4.87	57.79	22.30	362.00
	02/27/15 9:21:08	178993	13.88	0.01	1.03	4.92	57.78	22.30	452.00
	02/27/15 9:21:38	179023	14.86	0.55	0.97	4.37	57.78	22.30	452.00
	02/27/15 9:22:08	179053	14.83	1.56	0.91	4.25	57.69	22.30	648.00
	02/27/15 9:22:38	179083	13.82	0.89	0.88	4.94	57.69	22.30	648.00
	02/27/15 9:23:08	179113	13.55	0.38	0.90	5.16	57.63	22.20	707.00
	02/27/15 9:23:38	179143	13.58	0.31	0.90	5.18	57.63	22.20	707.00
	02/27/15 9:24:08	179173	13.66	0.31	0.91	5.09	57.58	22.20	692.00
	02/27/15 9:24:38	179203	13.63	0.15	0.90	5.12	57.58	22.20	692.00
	02/27/15 9:25:08	179233	13.83	0.15	0.92	4.99	57.55	22.20	722.00
	02/27/15 9:25:38	179263	13.77	0.19	0.94	5.01	57.55	22.20	722.00
	02/27/15 9:26:08	179293	13.55	0.17	0.91	5.16	57.51	22.20	691.00
	02/27/15 9:26:38	179323	13.63	0.21	0.95	5.13	57.51	22.20	691.00
	02/27/15 9:27:08	179353	13.60	0.26	0.93	5.11	57.48	22.10	706.00
	02/27/15 9:27:38	179383	13.65	0.29	0.94	5.14	57.48	22.10	706.00
A3	02/27/15 9:28:08	179413	13.69	0.18	0.92	5.07	57.44	22.10	691.00
	02/27/15 9:28:38	179443	13.63	0.19	0.93	5.12	57.44	22.10	691.00
	02/27/15 9:29:08	179473	13.63	0.00	0.91	5.14	57.40	22.00	690.00
	02/27/15 9:29:38	179503	13.67	0.23	0.90	5.08	57.40	22.00	690.00
	02/27/15 9:30:08	179533	13.73	0.20	0.90	5.03	57.36	22.00	690.00
	02/27/15 9:30:38	179563	13.58	0.21	0.93	5.12	57.36	22.00	690.00
	02/27/15 9:31:08	179593	12.95	0.08	0.90	5.67	57.32	22.00	690.00
	02/27/15 9:31:38	179623	13.02	0.09	0.86	5.62	57.32	22.00	690.00
	02/27/15 9:32:08	179653	13.00	0.19	0.86	5.63	57.29	22.00	689.00
	02/27/15 9:32:38	179683	13.00	0.30	0.86	5.62	57.29	22.00	689.00
	02/27/15 9:33:08	179713	13.11	0.25	0.86	5.57	57.30	21.90	600.00
	02/27/15 9:33:38	179743	14.39	0.45	0.89	4.65	57.30	21.90	600.00
	02/27/15 9:34:08	179773	14.43	1.11	0.96	4.53	57.39	21.90	345.00
	02/27/15 9:34:38	179803	13.58	2.15	1.00	5.09	57.39	21.90	345.00
	02/27/15 9:35:08	179833	13.00	0.87	1.01	5.69	57.44	22.00	315.00
	02/27/15 9:35:38	179863	14.04	0.91	1.07	4.89	57.44	22.00	315.00
	02/27/15 9:36:08	179893	13.38	0.70	1.06	5.33	57.47	22.10	330.00
	02/27/15 9:36:38	179923	13.57	0.05	1.13	5.21	57.47	22.10	330.00
	02/27/15 9:37:08	179953	13.88	-0.07	1.22	4.95	57.51	22.10	331.00
	02/27/15 9:37:38	179983	13.74	0.08	1.29	5.08	57.51	22.10	331.00
	02/27/15 9:38:08	180013	14.00	0.19	1.31	4.91	57.54	22.10	361.00
	02/27/15 9:38:38	180043	13.15	-0.05	1.25	5.52	57.54	22.10	361.00
	02/27/15 9:39:08	180073	13.35	-0.03	1.02	5.39	57.49	22.20	586.00
	02/27/15 9:39:38	180103	13.12	0.19	0.96	5.43	57.49	22.20	586.00
	02/27/15 9:40:08	180133	12.03	0.05	0.91	6.44	57.43	22.10	646.00
	02/27/15 9:40:38	180163	12.68	0.00	0.89	5.91	57.43	22.10	646.00
	02/27/15 9:41:08	180193	12.66	0.03	0.89	5.91	57.39	22.10	660.00
	02/27/15 9:41:38	180223	12.39	0.04	0.85	6.13	57.39	22.10	660.00
	02/27/15 9:42:08	180253	12.41	0.08	0.85	6.10	57.37	22.00	690.00
	02/27/15 9:42:38	180283	12.50	0.03	0.90	6.08	57.37	22.00	690.00
	02/27/15 9:43:08	180313	12.48	0.05	0.89	6.07	57.33	22.00	690.00
	02/27/15 9:43:38	180343	12.76	0.10	0.93	5.84	57.33	22.00	690.00

Questor Technology Inc
February 27, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	39,355	SCFH

Weather Data

Barometric Pressure	30.61	in. Hg
Relative Humidity	40	%
Ambient Temperature	29	°F
Specific Humidity	0.001287	lb H ₂ O / lb air

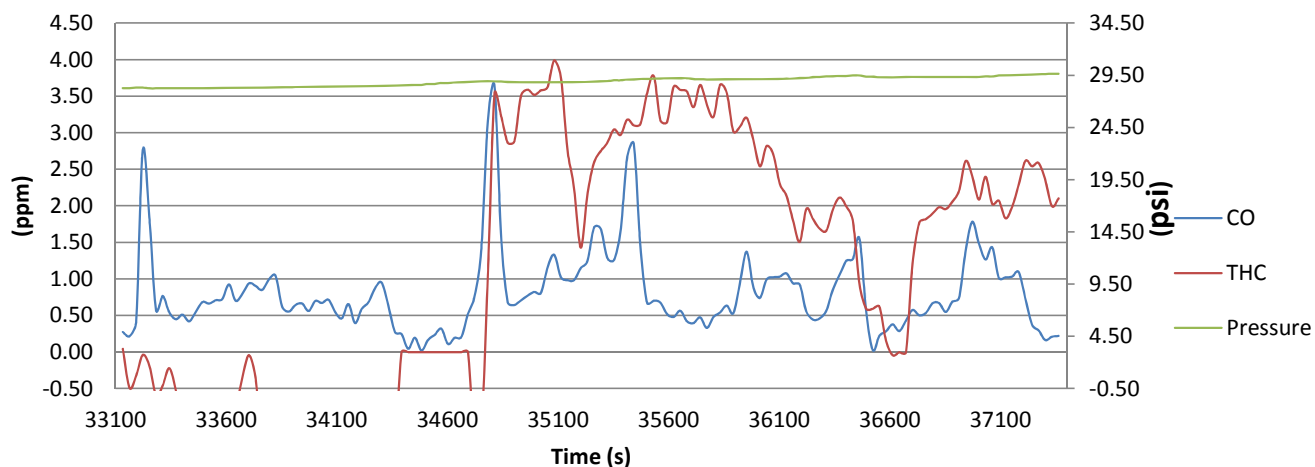
0-30-0 Load, Run - Q250-R3

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/27/15 9:44:08	180373	12.63	0.05	0.93	5.92	57.29	21.90	660.00
02/27/15 9:44:38	180403	12.55	0.12	0.91	5.99	57.29	21.90	660.00
02/27/15 9:45:08	180433	12.72	-0.01	0.92	5.87	57.24	21.90	689.00
02/27/15 9:45:38	180463	12.23	0.07	0.90	6.25	57.24	21.90	689.00
02/27/15 9:46:08	180493	12.32	0.07	0.90	6.20	57.20	21.90	674.00
02/27/15 9:46:38	180523	12.53	-0.07	0.90	6.03	57.20	21.90	674.00
02/27/15 9:47:08	180553	12.47	0.10	0.86	6.03	57.19	21.80	659.00
02/27/15 9:47:38	180583	12.33	-0.01	0.87	6.18	57.19	21.80	659.00
02/27/15 9:48:08	180613	12.29	0.02	0.87	6.20	57.27	21.90	405.00
02/27/15 9:48:38	180643	12.42	-0.02	0.88	6.18	57.27	21.90	405.00
02/27/15 9:49:08	180673	14.30	0.42	0.95	4.74	57.35	22.00	300.00
02/27/15 9:49:38	180703	14.71	1.70	1.02	4.43	57.35	22.00	300.00
02/27/15 9:50:08	180733	14.70	5.82	1.12	4.31	57.41	22.00	345.00
02/27/15 9:50:38	180763	15.19	8.49	1.30	4.06	57.41	22.00	345.00
02/27/15 9:51:08	180793	14.35	2.88	1.40	4.62	57.41	22.10	375.00
02/27/15 9:51:38	180823	13.52	0.07	1.40	5.12	57.41	22.10	375.00
02/27/15 9:52:08	180853	13.52	0.00	1.37	5.19	57.45	22.10	360.00
02/27/15 9:52:38	180883	12.48	-0.09	1.32	5.98	57.45	22.10	360.00
RAW AVERAGE		13.34	0.62	0.70	5.39	57.79	22.34	572.46

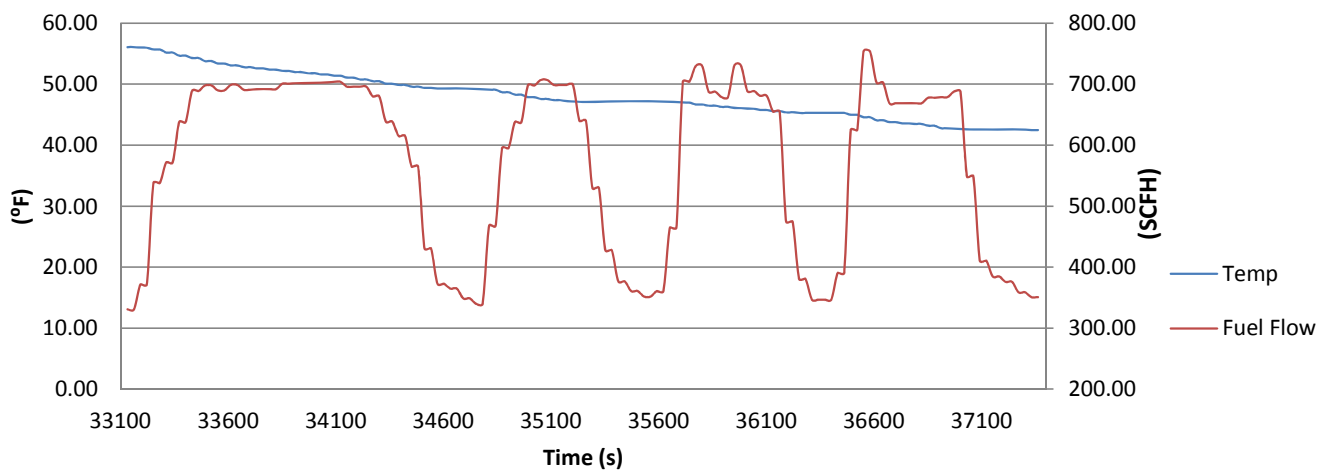
Bias	Serial Number:	O ₂	CO	THC	CO ₂	Press.	Trans.	Temp.	Trans.	F-Flow	Trans.
	INST-O2-0013	INST-CO-0029	INST-TH-0009	INST-C2-0013	1442557	1442557	1442557				
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H ₂ O)	(°F)	(SCFH)			
	Initial Zero	0.08	-0.02	-0.03	0.09						
	Final Zero	0.09	0.02	0.23	0.10						
	Avg. Zero	0.09	0.00	0.10	0.10						
	Initial UpScale	11.80	9.16	5.07	9.03						
	Final UpScale	11.86	9.15	5.01	9.05						
	Avg. UpScale	11.83	9.16	5.04	9.04						
Upscale Cal Gas		11.88	9.02	5.01	9.11						

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	13.40	0.61	0.61	5.40
Corrected Raw Average (ppm/% wet basis)	12.92	0.59	0.58	5.20
Emission Rate (lb/hr)	N/A	0.00	0.00	N/A

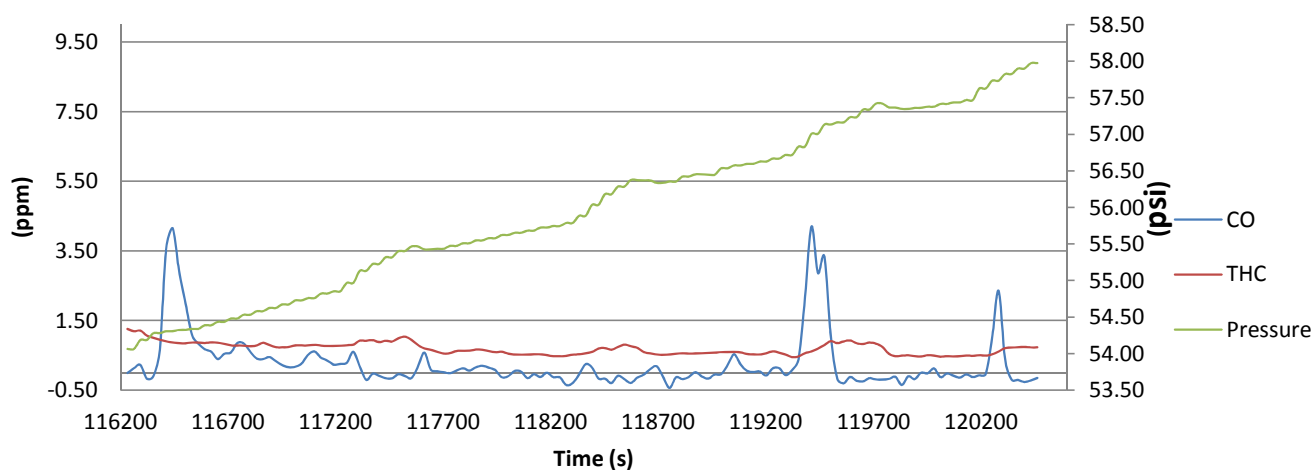
Q250-R1

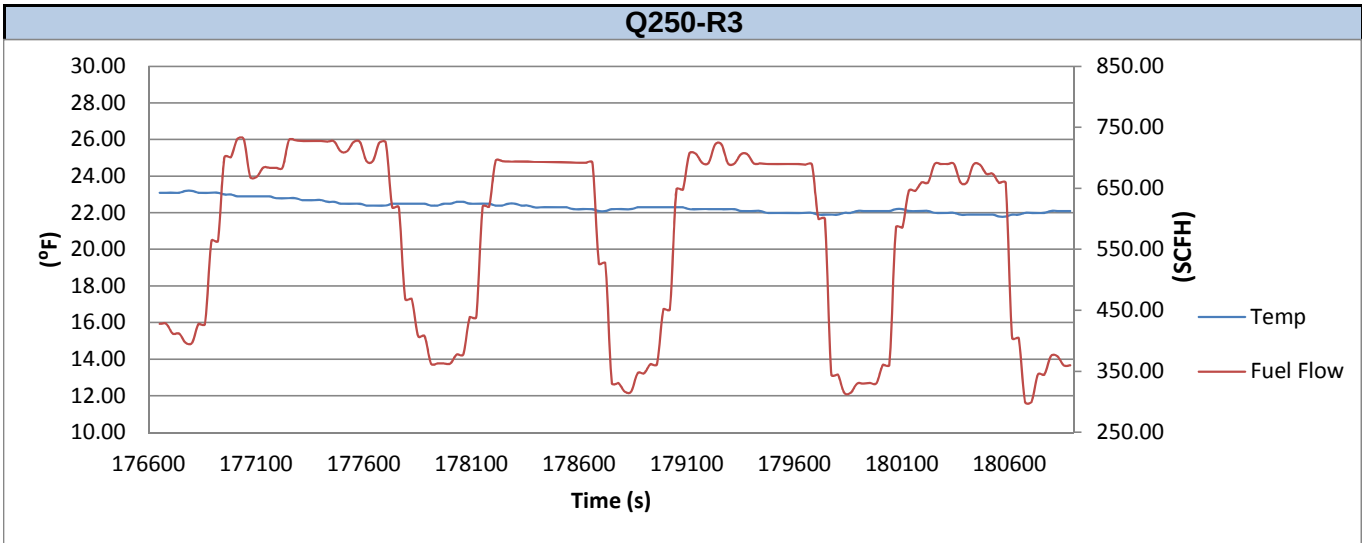
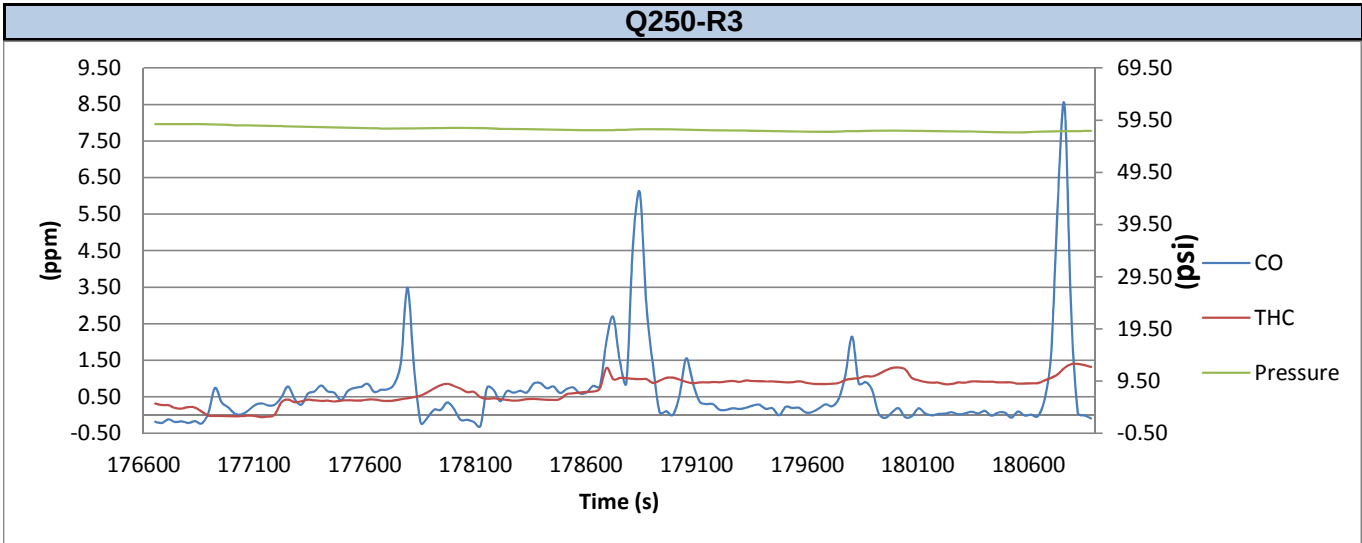
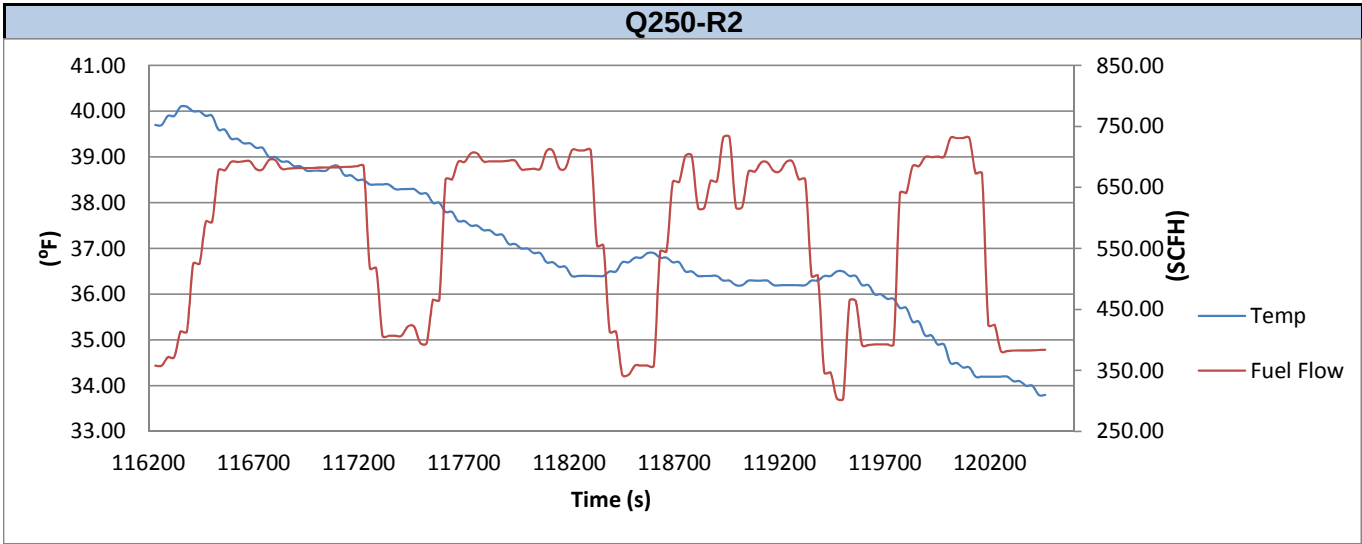


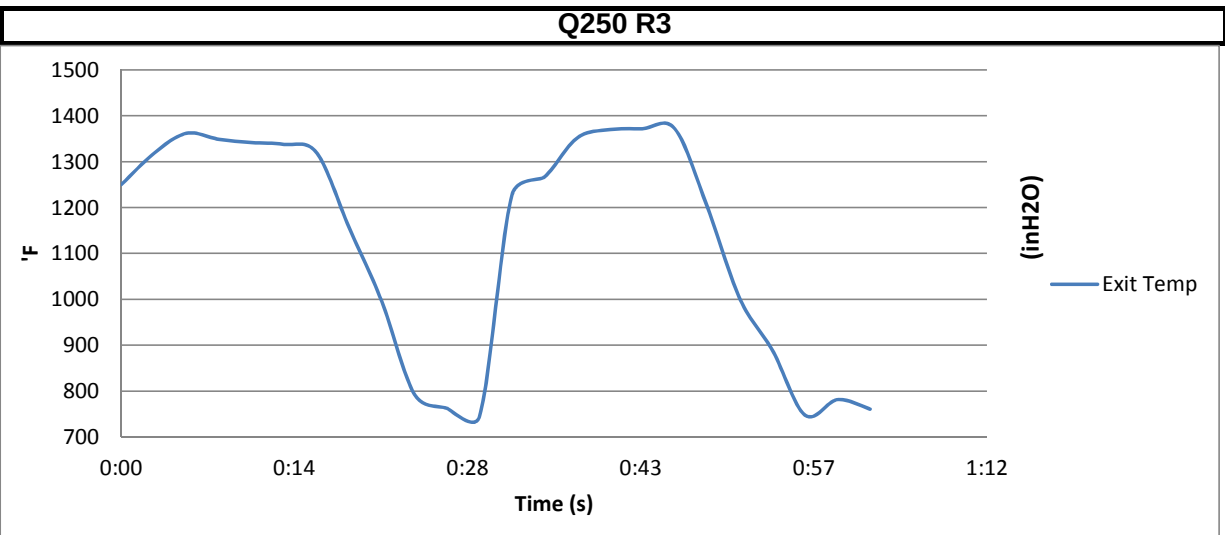
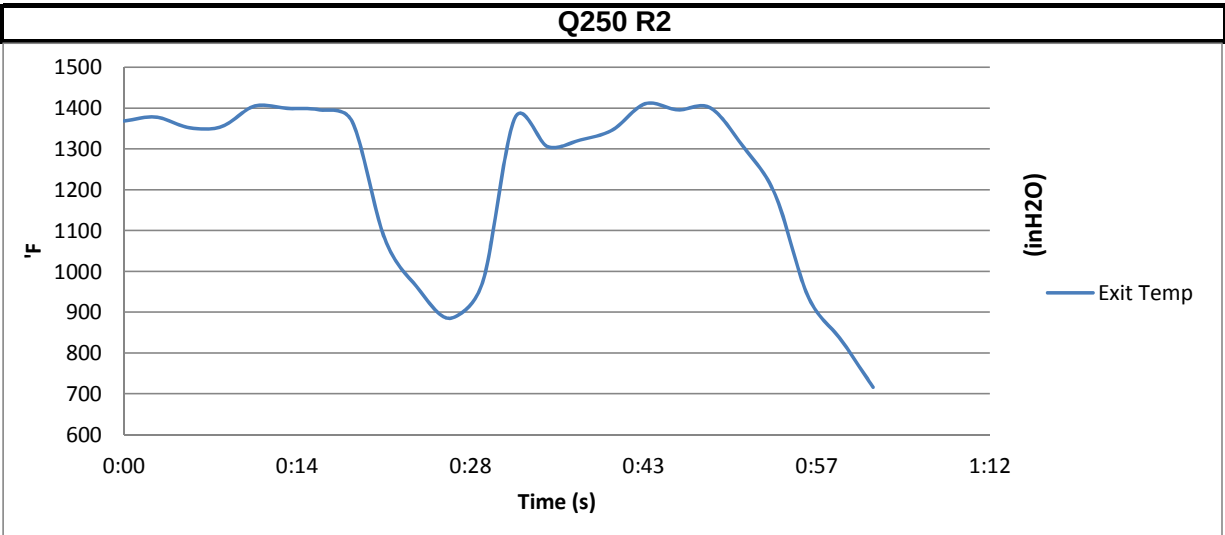
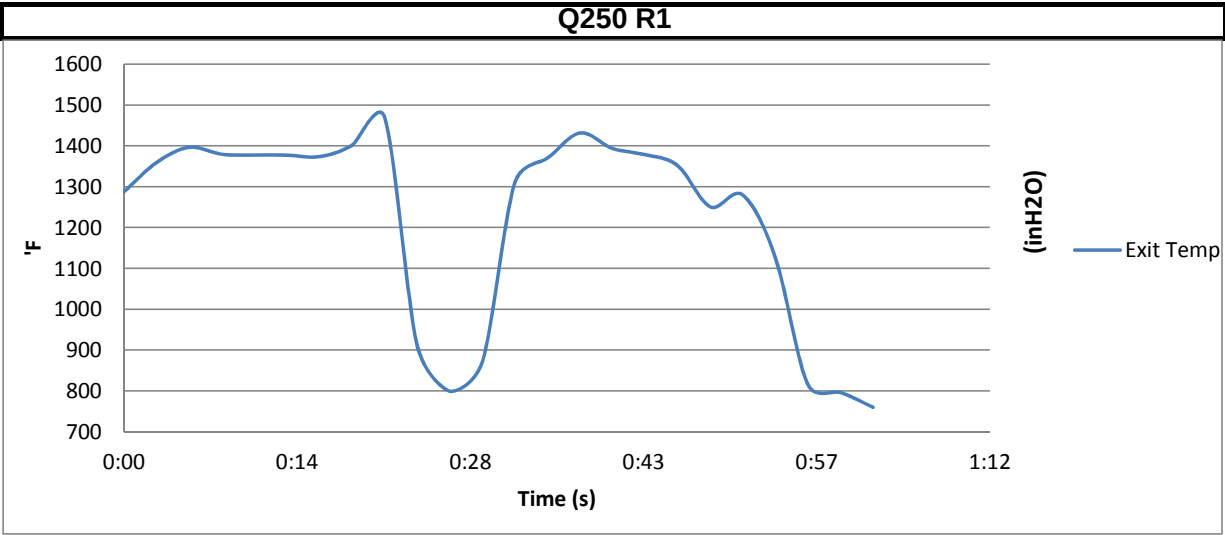
Q250-R1



Q250-R2







EMISSION DATA RECORDS

30-70-30% Ramp-up, Ramp-down Unit Operations Data

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Fuel Type	Gas, Propene

Test Information			
Project #		qti-15-brokenarrow.ok-comp#1	
Operator		CG	
Date for Preliminary Run	(mm/dd/yy)	02/25/15	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	RM4, 8.1.1.2	21	scf
Run Duration	≤0.75 cfm	65	minutes
Unit Number		1	
Base Run Number		30-70-30%	
Number of Ports Available		2	
Number of Ports Used		2	
Port Inside Diameter		3.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		4	5	6	
Test Date	(mm/dd/yy)	02/27/15	02/27/15	02/27/15	
Load	% or w/DB	30-70-30	30-70-30	30-70-30	
Meter Box Number	from ACS	SAMP-CP-0023	SAMP-CP-0023	SAMP-CP-0023	
Meter Calibration Factor	(Y)	1.002	1.002	1.002	
Orifice Meter Coefficient	(ΔH_{or})	1.672	1.672	1.672	in H ₂ O
Pitot Identification	from ACS	4174	4174	4174	
Pitot Tube Coefficient	(C _p)	0.819	0.819	0.819	
Probe Number	from ACS	SAMP-PF-0001	SAMP-SP-0001	SAMP-SP-0001	
Probe Length		60.0	60.0	60.0	in
(SS, Glass) Liner Material	from list	Hastelloy	Hastelloy	Hastelloy	
Impinger Case Number	from ACS	SAMP-BC-0009	SAMP-BC-0009	SAMP-BC-0009	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Min Sum Lee
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] - RESULTS

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Historical Data	30-70-30%-4	30-70-30%-5	30-70-30%-6	Average	Units
Run Start Time	10:47	12:20	13:49		hh:mm
Run Stop Time	11:57	13:30	14:59		hh:mm
Test Date	02/27/15	02/27/15	02/27/15		mm/dd/yy
Meter Calibration Factor	1.002	1.002	1.002		
Pitot Tube Coefficient	0.819	0.819	0.819		
Stack Test Data	30-70-30%-4	30-70-30%-5	30-70-30%-6	Average	Units
Initial Meter Volume	917.280	965.100	14.110		ft ³
Final Meter Volume	965.030	1014.040	61.900		ft ³
Total Meter Volume	47.750	48.940	47.790	48.160	ft ³
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	62.65	68.31	71.73	67.56	°F
Average Stack Temperature	1340.50	1326.00	1308.63	1325.04	°F
Barometric Pressure	30.62	30.59	30.48	30.56	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H ₂ O
Absolute Stack Pressure	30.62	30.59	30.48	30.56	in Hg
Average Orifice Pressure Drop	1.60	1.60	1.60	1.60	in H ₂ O
Absolute Meter Pressure	30.74	30.71	30.60	30.69	in Hg
Avg Square Root Pitot Pressure	0.14	0.14	0.16	0.15	√(in H ₂ O)
Moisture Content Data	30-70-30%-4	30-70-30%-5	30-70-30%-6	Average	Units
Impinger Water Weight Gain	28.10	29.60	27.90	28.53	g
Silica Gel Weight Gain	11.00	10.60	18.80	13.47	g
Total Water Volume Collected	39.17	40.27	46.78	42.08	ml
Standard Water Vapor Volume	1.84	1.90	2.20	1.98	scf
Standard Meter Volume	49.7	50.3	48.6	49.5	dscf
Calculated Stack Moisture	3.58	3.63	4.33	3.85	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	3.58	3.63	4.33	3.85	%
Gas Analysis Data	30-70-30%-4	30-70-30%-5	30-70-30%-6	Average	Units
Carbon Dioxide Content	5.4	5.0	4.5	4.9	%
Oxygen Content	14.8	15.4	16.0	15.4	%
Nitrogen Content	79.8	79.7	79.5	79.7	%
Stack Dry Molecular Weight	29.45	29.42	29.36	29.41	lb/lb-mole
Stack Wet Molecular Weight	29.04	29.01	28.87	28.97	lb/lb-mole
Percent Excess Air	236.2	273.0	320.8	276.6	%
Volumetric Flow Rate Data	30-70-30%-4	30-70-30%-5	30-70-30%-6	Average	Units
Average Stack Gas Velocity	14.07	14.02	15.66	14.59	ft/sec
Stack Cross-Sectional Area	4.69	4.69	4.69	4.69	ft ²
Actual Stack Flow Rate	3,955	3,943	4,404	4,100	acfm
Wet Standard Stack Flow Rate	71	71	80	74	wkscfh
Dry Standard Stack Flow Rate	68,668	68,903	76,873	71,481	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Questor, Broken Arrow Test Site	Preliminary Date	02/25/15		
Sampling Location	Q250	Operator	CG		
Project #	qti-15-brokenarrow.ok-comp#1	# of Ports Used	2		
Fuel Type	Gas, Propene	Min. Fuel Factor	N/A	Max. Fuel Factor	N/A

Gas Analysis Data								
Run Number	30-70-30%-4		Date	02/27/15	Run Start Time	10:47	Run Stop Time	11:57
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppmCH ₄)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.4	14.8	0.0	79.8	29.45	1.132	236.2	N/A

Gas Analysis Data								
Run Number	30-70-30%-5		Date	02/27/15	Run Start Time	12:20	Run Stop Time	13:30
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppmCH ₄)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.0	15.4	0.0	79.7	29.42	1.111	273.0	N/A

Gas Analysis Data								
Run Number	30-70-30%-6		Date	02/27/15	Run Start Time	13:49	Run Stop Time	14:59
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppmCH ₄)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	4.5	16.0	0.0	79.5	29.36	1.089	320.8	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Questor, Broken Arrow Test Site	Preliminary Date	02/25/15
Sampling Location	Q250	Operator	CG
Project #	qti-15-brokenarrow.ok-comp#1	Ports Used	2

Moisture Content Data								
Run Number	30-70-30%-4	Date	02/27/15	Start Time	10:47	Stop Time	11:57	
Meter Box Number	SAMP-CP-0023			Meter Cal Factor	(Y)	1.002		
Total Meter Volume	(V _m)	47.750	dcf	Barometric Pressure	(P _b)	30.62	in Hg	
Average Stack Temp	(t _s) _{avg}	1341	°F	Stack Static Pressure	(P _{static})	0.00	in H ₂ O	
Average Meter Temp	(t _m) _{avg}	63	°F	Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O	
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	839.80	787.00	600.40	828.40			
Initial Value	(V _i),(W _i)	823.90	776.70	598.50	817.40			
Net Value	(V _n),(W _n)	15.9	10.3	1.9	11.0			
Results								
Total Weight	(W _t)	39.10	g	Water Vol Weighed	(V _{wsg(std)})	1.844	scf	
Std Meter Volume	(V _{m(std)})	49.657	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	3.58	%	Final Moisture Content	(B _{ws})	3.58	%	

Moisture Content Data								
Run Number	30-70-30%-5	Date	02/27/15	Start Time	12:20	Stop Time	13:30	
Meter Box Number	SAMP-CP-0023			Meter Cal Factor	(Y)	1.002		
Total Meter Volume	(V _m)	48.940	dcf	Barometric Pressure	(P _b)	30.59	in Hg	
Average Stack Temp	(t _s) _{avg}	1326	°F	Stack Static Pressure	(P _{static})	0.00	in H ₂ O	
Average Meter Temp	(t _m) _{avg}	68	°F	Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O	
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	855.40	798.00	603.40	839.00			
Initial Value	(V _i),(W _i)	839.80	787.00	600.40	828.40			
Net Value	(V _n),(W _n)	15.6	11.0	3.0	10.6			
Results								
Total Weight	(W _t)	40.20	g	Water Vol Weighed	(V _{wsg(std)})	1.895	scf	
Std Meter Volume	(V _{m(std)})	50.299	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	3.63	%	Final Moisture Content	(B _{ws})	3.63	%	

Moisture Content Data								
Run Number	30-70-30%-6	Date	02/27/15	Start Time	13:49	Stop Time	14:59	
Meter Box Number	SAMP-CP-0023			Meter Cal Factor	(Y)	1.002		
Total Meter Volume	(V _m)	47.790	dcf	Barometric Pressure	(P _b)	30.48	in Hg	
Average Stack Temp	(t _s) _{avg}	1309	°F	Stack Static Pressure	(P _{static})	0.00	in H ₂ O	
Average Meter Temp	(t _m) _{avg}	72	°F	Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O	
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	870.70	807.90	606.10	917.80			
Initial Value	(V _i),(W _i)	855.40	798.00	603.40	899.00			
Net Value	(V _n),(W _n)	15.3	9.9	2.7	18.8			
Results								
Total Weight	(W _t)	46.70	g	Water Vol Weighed	(V _{wsg(std)})	2.202	scf	
Std Meter Volume	(V _{m(std)})	48.627	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	4.33	%	Final Moisture Content	(B _{ws})	4.33	%	

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/27/15
Operator	CG
Run Number	30-70-30%-4

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.250	in H ₂ O for	25.0 sec
		Pre (-)	0.200	in H ₂ O for	20.0 sec
		Post (+)	0.200	in H ₂ O for	20.0 sec
		Post (-)	0.250	in H ₂ O for	20.0 sec

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	10:47	End	11:57

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	823.9	776.7	598.5	817.4				
Post	839.8	787.0	600.4	828.4				

Sampling Equipment		
Meter Box Number	SAMP-CP-0023	
Meter Cal Factor	(Y)	1.002
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.4600 in
Probe Number	SAMP-PF-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0009	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1340.5	°F
Average Meter Temp	(t _m)	62.6	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(Δp ^{1/2} _{avg})	0.14	in H ₂ O
Stack Moisture Content	(B _{ws})	3.58	%
Stack Dry Molecular Weight	(M _d)	29.45	lb/lb-mole
Estimated Orifice Flow Rate	(Q _o)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.62	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.62	in Hg
Absolute Meter Pressure	(P _m)	30.74	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (Δp ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	917.280	0.020	1.672	1.60	1288	249		36			48	57	10.0	0.14	13.88	2.969		71.267
A-2	2.7	00:02:43	920.080	0.020	1.672	1.60	1332	251		37			50	55	10.0	0.14	14.06	5.016		60.195
A-3	5.4	00:05:25	922.010	0.020	1.672	1.60	1579	255		37			52	55	10.0	0.14	14.99	7.154		57.234
A-4	8.1	00:08:07	924.030	0.020	1.672	1.60	1554	248		37			55	55	10.0	0.14	14.90	9.307		55.844
A-5	10.8	00:10:50	926.070	0.020	1.672	1.60	1501	248		37			58	55	10.0	0.14	14.70	11.391		54.676
A-6	13.5	00:13:33	928.050	0.020	1.672	1.60	1511	252		38			59	55	10.0	0.14	14.74	13.441		53.763
A-7	16.3	00:16:15	930.000	0.020	1.672	1.60	1505	248		41			60	55	10.0	0.14	14.72	15.573		53.393
A-8	19.0	00:18:58	932.030	0.020	1.672	1.60	1308	248		43			60	57	10.0	0.14	13.96	16.600		49.800
A-9	21.7	00:21:40	933.010	0.020	1.672	1.60	1087	248		45			61	56	10.0	0.14	13.06	19.818		52.849
A-10	24.4	00:24:22	936.080	0.020	1.672	1.60	998	248		48			64	63	10.0	0.14	12.68	21.905		52.572
A-11	27.1	00:27:05	938.090	0.020	1.672	1.60	1014	250		48			65	58	10.0	0.14	12.75	22.937		50.044
A-12	29.8	00:29:47	939.080	0.020	1.672	1.60	1093	251		46			61	59	10.0	0.14	13.09	25.038		50.076
B-1	32.5	00:32:30	941.090	0.020	1.672	1.60	1554	249		48			67	61	10.0	0.14	14.90	28.108		51.892
B-2	35.2	00:35:12	944.050	0.020	1.672	1.60	1400	247		50			69	62	10.0	0.14	14.32	29.111		49.905
B-3	37.9	00:37:55	945.020	0.020	1.672	1.60	1385	246		51			69	63	10.0	0.14	14.26	31.230		49.967
B-4	40.6	00:40:37	947.070	0.020	1.672	1.60	1496	253		52			70	64	10.0	0.14	14.69	34.282		51.423
B-5	43.3	00:43:20	950.030	0.020	1.672	1.60	1572	247		52			71	65	10.0	0.14	14.97	36.341		51.305
B-6	46.0	00:46:03	952.030	0.020	1.672	1.60	1616	249		52			72	65	10.0	0.14	15.13	37.411		49.881
B-7	48.8	00:48:45	953.070	0.020	1.672	1.60	1393	252		54			73	66	10.0	0.14	14.29	39.474		49.862
B-8	51.5	00:51:28	955.080	0.020	1.672	1.60	1328	248		55			72	67	10.0	0.14	14.04	41.516		49.820
B-9	54.2	00:54:10	957.070	0.020	1.672	1.60	1346	248		55			72	68	10.0	0.14	14.11	43.578		49.803
B-10	56.9	00:56:53	959.080	0.020	1.672	1.60	1135	248		55			72	67	10.0	0.14	13.26	45.600		49.745
B-11	59.6	00:59:35	961.050	0.020	1.672	1.60	1096	249		55			72	67	10.0	0.14	13.10	47.632		49.703
B-12	62.3	01:02:18	963.030	0.020	1.672	1.60	1081	252		56			72	68	10.0	0.14	13.03	49.683		49.683
Last Pt	65.0	01:05:00	965.030																	
Final Val	65.0	01:05:00	965.030												Max Vac	10.0	Final Values	49.683		
Average Values				0.02		1.60	1341	249		47			64	61		0.14	14.07			
													63							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/27/15
Operator	CG
Run Number	30-70-30%-5

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1326.0	°F
Average Meter Temp	(t _m)	68.3	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(Δp ^{1/2} _{avg})	0.14	in H ₂ O
Stack Moisture Content	(B _{ws})	3.63	%
Stack Dry Molecular Weight	(M _d)	29.42	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.76	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.250	in H ₂ O for	15.0
		Pre (-)	0.250	in H ₂ O for	20.0
		Post (+)	0.200	in H ₂ O for	20.0
		Post (-)	0.200	in H ₂ O for	25.0

Sampling Equipment		
Meter Box Number	SAMP-CP-0023	
Meter Cal Factor	(Y)	1.002
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.4606 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0009	

Nozzle Measurements			
Pre			PASS
Post			PASS

Run Time			
Start	12:20	End	13:30

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	839.8	787.0	600.4	828.4				
Post	855.4	798.0	603.4	839.0				

Pressures			
Barometric Pressure	(P _b)	30.59	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.59	in Hg
Absolute Meter Pressure	(P _m)	30.71	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (Δp ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	965.100	0.020	1.600	1.60	1286	248		48			59	66	10.0	0.14	13.89	3.045		73.077
A-2	2.7	00:02:43	968.030	0.020	1.672	1.60	1300	248		49			58	66	10.0	0.14	13.95	5.125		61.503
A-3	5.4	00:05:25	970.030	0.020	1.672	1.60	1425	249		49			60	66	10.0	0.14	14.43	7.222		57.780
A-4	8.1	00:08:07	972.050	0.020	1.672	1.60	1510	249		50			63	65	10.0	0.14	14.75	9.336		56.018
A-5	10.8	00:10:50	974.090	0.020	1.672	1.60	1540	248		51			64	66	10.0	0.14	14.87	11.322		54.346
A-6	13.5	00:13:33	976.010	0.020	1.672	1.60	1571	249		52			67	65	10.0	0.14	14.98	13.397		53.588
A-7	16.3	00:16:15	978.020	0.020	1.672	1.60	1600	248		53			67	65	10.0	0.14	15.09	15.472		53.047
A-8	19.0	00:18:58	980.030	0.020	1.672	1.60	1309	249		53			68	64	10.0	0.14	13.98	17.567		52.702
A-9	21.7	00:21:40	982.060	0.020	1.672	1.60	1100	249		54			69	64	10.0	0.14	13.13	19.568		52.182
A-10	24.4	00:24:22	984.000	0.020	1.672	1.60	1002	250		54			70	64	10.0	0.14	12.71	21.680		52.033
A-11	27.1	00:27:05	986.050	0.020	1.672	1.60	1094	250		54			71	64	10.0	0.14	13.10	23.739		51.794
A-12	29.8	00:29:47	988.050	0.020	1.672	1.60	1160	248		50			67	65	10.0	0.14	13.38	25.773		51.545
B-1	32.5	00:32:30	990.020	0.020	1.672	1.60	1430	249		51			71	66	10.0	0.14	14.45	27.838		51.393
B-2	35.2	00:35:12	992.030	0.020	1.672	1.60	1437	248		51			72	66	10.0	0.14	14.48	29.891		51.241
B-3	37.9	00:37:55	994.030	0.020	1.672	1.60	1549	249		52			74	67	10.0	0.14	14.90	31.958		51.133
B-4	40.6	00:40:37	996.050	0.020	1.672	1.60	1560	249		52			74	68	10.0	0.14	14.94	33.962		50.944
B-5	43.3	00:43:20	998.010	0.020	1.672	1.60	1544	249		52			75	68	10.0	0.14	14.88	36.026		50.860
B-6	46.0	00:46:03	1000.030	0.020	1.672	1.60	1557	251		53			75	69	10.0	0.14	14.93	38.129		50.838
B-7	48.8	00:48:45	1002.090	0.020	1.672	1.60	1377	250		54			75	69	10.0	0.14	14.25	40.160		50.728
B-8	51.5	00:51:28	1004.080	0.020	1.672	1.60	1299	251		54			75	69	10.0	0.14	13.94	42.201		50.641
B-9	54.2	00:54:10	1006.080	0.020	1.672	1.60	1088	250		55			74	69	10.0	0.14	13.08	43.141		49.304
B-10	56.9	00:56:53	1007.000	0.020	1.672	1.60	1075	250		54			74	68	10.0	0.14	13.02	46.209		50.409
B-11	59.6	00:59:35	1010.000	0.020	1.672	1.60	989	250		55			78	71	10.0	0.14	12.65	48.250		50.348
B-12	62.3	01:02:18	1012.010	0.020	1.672	1.60	1022	249		54			77	72	10.0	0.14	12.80	50.313		50.313
Last Pt	65.0	01:05:00	1014.040																	
Final Val	65.0	01:05:00	1014.040											Max Vac	10.0		Final Values	50.313		
Average Values				0.02		1.60	1326	249		52			70	67		0.14	14.02			
													68							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/27/15
Operator	CG
Run Number	30-70-30%-6

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1308.6	°F
Average Meter Temp	(t _m)	71.7	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.16	in H ₂ O
Stack Moisture Content	(B _{ws})	4.33	%
Stack Dry Molecular Weight	(M _d)	29.36	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.77	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.200	in H ₂ O for	20.0 sec
		Pre (-)	0.250	in H ₂ O for	20.0 sec
		Post (+)	0.250	in H ₂ O for	25.0 sec
		Post (-)	0.250	in H ₂ O for	20.0 sec

Sampling Equipment		
Meter Box Number	SAMP-CP-0023	
Meter Cal Factor	(Y)	1.002
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.4471 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0009	

Nozzle Measurements			
Pre			PASS
Post			PASS

Run Time			
Start	13:49	End	14:59

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	855.4	798.0	603.4	899.0				
Post	870.7	807.9	606.1	917.8				

Pressures			
Barometric Pressure	(P _b)	30.48	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.48	in Hg
Absolute Meter Pressure	(P _m)	30.60	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	14.110	0.020	1.672	1.60	1244	251		46			65	72	10.0	0.14	13.78	0.932		22.358
A-2	2.7	00:02:43	15.020	0.020	1.672	1.60	1272	248		47			65	73	10.0	0.14	13.89	4.051		48.612
A-3	5.4	00:05:25	18.070	0.030	1.672	1.60	1428	252		47			65	72	10.0	0.17	17.76	6.047		48.378
A-4	8.1	00:08:07	20.020	0.020	1.672	1.60	1505	249		49			68	71	10.0	0.14	14.80	8.101		48.606
A-5	10.8	00:10:50	22.030	0.030	1.672	1.60	1522	249		51			70	70	10.0	0.17	18.20	10.184		48.881
A-6	13.5	00:13:33	24.070	0.020	1.672	1.60	1547	248		54			71	70	10.0	0.14	14.95	12.162		48.648
A-7	16.3	00:16:15	26.010	0.030	1.672	1.60	1542	250		56			72	70	10.0	0.17	18.29	13.263		45.471
A-8	19.0	00:18:58	27.090	0.020	1.672	1.60	1493	250		58			73	70	10.0	0.14	14.75	14.280		42.841
A-9	21.7	00:21:40	28.090	0.030	1.672	1.60	1021	250		59			73	71	10.0	0.17	15.73	17.250		46.000
A-10	24.4	00:24:22	31.010	0.040	1.672	1.60	869	250		60			73	71	10.0	0.20	17.21	19.284		46.282
A-11	27.1	00:27:05	33.010	0.020	1.672	1.60	720	250		61			75	71	10.0	0.14	11.47	21.375		46.637
A-12	29.8	00:29:47	35.070	0.030	1.672	1.60	754	250		59			73	72	10.0	0.17	14.24	23.407		46.814
B-1	32.5	00:32:30	37.070	0.030	1.672	1.60	1615	250		54			73	72	10.0	0.17	18.62	26.404		48.747
B-2	35.2	00:35:12	40.020	0.020	1.672	1.60	1399	250		61			73	71	10.0	0.14	14.39	28.469		48.804
B-3	37.9	00:37:55	42.050	0.020	1.672	1.60	1351	250		60			75	71	10.0	0.14	14.21	29.504		47.207
B-4	40.6	00:40:37	43.070	0.030	1.672	1.60	1444	250		63			75	72	10.0	0.17	17.84	32.526		48.790
B-5	43.3	00:43:20	46.050	0.030	1.672	1.60	1546	250		63			74	74	10.0	0.17	18.31	33.509		47.307
B-6	46.0	00:46:03	47.020	0.020	1.672	1.60	1525	250		63			74	71	10.0	0.14	14.87	35.612		47.483
B-7	48.8	00:48:45	49.090	0.020	1.672	1.60	1535	250		64			76	72	10.0	0.14	14.91	37.629		47.531
B-8	51.5	00:51:28	51.080	0.030	1.672	1.60	1321	250		65			75	71	10.0	0.17	17.25	39.649		47.578
B-9	54.2	00:54:10	53.070	0.030	1.672	1.60	1220	250		65			76	72	10.0	0.17	16.76	41.635		47.582
B-10	56.9	00:56:53	55.030	0.030	1.672	1.60	1318	250		65			65	74	10.0	0.17	17.24	43.699		47.671
B-11	59.6	00:59:35	57.050	0.020	1.672	1.60	1074	250		65			75	71	10.0	0.14	13.07	45.708		47.696
B-12	62.3	01:02:18	59.030	0.020	1.672	1.60	1142	250		65			74	71	10.0	0.14	13.36	48.624		48.624
Last Pt	65.0	01:05:00	61.900																	
Final Val	65.0	01:05:00	61.900												Max Vac	10.0	Final Values	48.624		
Average Values				0.03		1.60	1309	250		58			72	71		0.16	15.66			
													72							

Questor Technology Inc
February 27, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	68,668	SCFH

Weather Data

Barometric Pressure	30.62	in. Hg
Relative Humidity	44	%
Ambient Temperature	26	°F
Specific Humidity	0.001218	lb H ₂ O / lb air

30-70-30 Load, Run - Q250-R4

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/27/15 10:47:08	184153	14.00	2.61	0.63	4.84	50.99	16.80	718.00
	02/27/15 10:47:38	184183	14.12	2.53	0.66	4.81	50.99	16.80	718.00
	02/27/15 10:48:08	184213	14.20	1.98	0.68	4.72	50.94	16.80	814.00
	02/27/15 10:48:38	184243	14.35	2.07	0.70	4.68	50.94	16.80	814.00
	02/27/15 10:49:08	184273	14.34	2.84	0.70	4.72	50.61	16.40	1,319.00
	02/27/15 10:49:38	184303	14.43	2.45	0.70	4.61	50.61	16.40	1,319.00
	02/27/15 10:50:08	184333	14.20	2.07	0.70	4.73	50.37	16.20	1,410.00
	02/27/15 10:50:38	184363	14.26	1.76	0.70	4.69	50.37	16.20	1,410.00
	02/27/15 10:51:08	184393	14.30	1.98	0.70	4.66	50.21	16.10	1,462.00
	02/27/15 10:51:38	184423	14.17	2.53	0.68	4.79	50.21	16.10	1,462.00
	02/27/15 10:52:08	184453	13.98	2.03	0.68	4.88	50.01	15.90	1,499.00
	02/27/15 10:52:38	184483	12.64	1.32	0.66	5.79	50.01	15.90	1,499.00
	02/27/15 10:53:08	184513	10.30	0.10	0.61	7.62	49.85	15.70	1,495.00
	02/27/15 10:53:38	184543	9.48	-0.20	0.60	8.31	49.85	15.70	1,495.00
	02/27/15 10:54:08	184573	10.35	-0.17	0.63	7.70	49.67	15.60	1,505.00
	02/27/15 10:54:38	184603	10.26	-0.24	0.62	7.72	49.67	15.60	1,505.00
	02/27/15 10:55:08	184633	10.17	-0.14	0.59	7.82	49.51	15.40	1,502.00
	02/27/15 10:55:38	184663	11.29	-0.08	0.60	7.05	49.51	15.40	1,502.00
	02/27/15 10:56:08	184693	12.00	0.19	0.64	6.55	49.35	15.30	1,512.00
	02/27/15 10:56:38	184723	13.00	0.90	0.66	5.70	49.35	15.30	1,512.00
	02/27/15 10:57:08	184753	12.77	1.19	0.68	5.90	49.20	15.20	1,509.00
	02/27/15 10:57:38	184783	12.92	0.96	0.67	5.83	49.20	15.20	1,509.00
	02/27/15 10:58:08	184813	12.76	1.23	0.68	5.90	49.05	15.10	1,506.00
	02/27/15 10:58:38	184843	12.89	1.00	0.68	5.85	49.05	15.10	1,506.00
	02/27/15 10:59:08	184873	13.20	1.58	0.68	5.59	48.87	14.90	1,502.00
	02/27/15 10:59:38	184903	13.02	1.91	0.67	5.72	48.87	14.90	1,502.00
	02/27/15 11:00:08	184933	13.00	1.59	0.66	5.73	48.71	14.70	1,512.00
	02/27/15 11:00:38	184963	13.37	1.67	0.63	5.45	48.71	14.70	1,512.00
	02/27/15 11:01:08	184993	13.28	2.19	0.65	5.52	48.55	14.60	1,509.00
	02/27/15 11:01:38	185023	13.42	2.19	0.68	5.38	48.55	14.60	1,509.00
	02/27/15 11:02:08	185053	12.85	2.10	0.68	5.86	48.49	14.40	1,361.00
	02/27/15 11:02:38	185083	12.96	1.59	0.69	5.76	48.49	14.40	1,361.00
	02/27/15 11:03:08	185113	12.80	1.51	0.66	5.93	48.64	14.60	882.00
	02/27/15 11:03:38	185143	12.74	1.40	0.66	5.84	48.64	14.60	882.00
	02/27/15 11:04:08	185173	12.85	1.28	0.66	5.84	48.70	14.70	749.00
	02/27/15 11:04:38	185203	13.55	1.87	0.66	5.16	48.70	14.70	749.00
	02/27/15 11:05:08	185233	13.03	2.61	0.67	5.66	48.71	14.80	722.00
	02/27/15 11:05:38	185263	13.08	1.76	0.67	5.57	48.71	14.80	722.00
	02/27/15 11:06:08	185293	12.70	1.46	0.67	5.93	48.72	14.80	696.00
	02/27/15 11:06:38	185323	14.02	2.52	0.70	4.91	48.72	14.80	696.00
	02/27/15 11:07:08	185353	14.70	4.37	0.76	4.48	48.72	14.90	696.00
	02/27/15 11:07:38	185383	15.86	12.63	0.99	3.66	48.72	14.90	696.00
	02/27/15 11:08:08	185413	16.01	20.16	1.14	3.50	48.72	14.80	696.00
	02/27/15 11:08:38	185443	15.43	28.45	1.04	3.81	48.72	14.80	696.00
	02/27/15 11:09:08	185473	14.14	8.56	0.75	4.79	48.65	14.80	869.00
	02/27/15 11:09:38	185503	14.40	2.57	0.70	4.61	48.65	14.80	869.00
A2	02/27/15 11:10:08	185533	14.51	3.41	0.67	4.52	48.29	14.40	1,409.00
	02/27/15 11:10:38	185563	14.33	4.91	0.65	4.68	48.29	14.40	1,409.00
	02/27/15 11:11:08	185593	14.57	3.44	0.71	4.49	48.06	14.20	1,498.00
	02/27/15 11:11:38	185623	14.40	3.45	0.70	4.61	48.06	14.20	1,498.00
	02/27/15 11:12:08	185653	14.56	3.18	0.72	4.48	47.90	14.00	1,508.00
	02/27/15 11:12:38	185683	14.25	2.45	0.70	4.71	47.90	14.00	1,508.00
	02/27/15 11:13:08	185713	14.36	2.07	0.71	4.61	47.75	13.80	1,505.00
	02/27/15 11:13:38	185743	12.93	1.88	0.71	5.59	47.75	13.80	1,505.00
	02/27/15 11:14:08	185773	11.16	0.32	0.68	7.06	47.58	13.70	1,501.00
	02/27/15 11:14:38	185803	11.67	0.07	0.69	6.75	47.58	13.70	1,501.00
	02/27/15 11:15:08	185833	13.02	0.61	0.71	5.72	47.44	13.60	1,524.00
	02/27/15 11:15:38	185863	12.83	1.82	0.71	5.77	47.44	13.60	1,524.00
	02/27/15 11:16:08	185893	12.82	1.26	0.70	5.80	47.28	13.50	1,507.00
	02/27/15 11:16:38	185923	13.02	1.50	0.69	5.66	47.28	13.50	1,507.00
	02/27/15 11:17:08	185953	13.02	1.64	0.68	5.67	47.12	13.40	1,517.00
	02/27/15 11:17:38	185983	12.63	1.41	0.68	5.93	47.12	13.40	1,517.00

Questor Technology Inc
February 27, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	68,668	SCFH

Weather Data

Barometric Pressure	30.62	in. Hg
Relative Humidity	44	%
Ambient Temperature	26	°F
Specific Humidity	0.001218	lb H ₂ O / lb air

30-70-30 Load, Run - Q250-R4

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/27/15 11:18:08	186013	12.93	1.31	0.71	5.76	46.96	13.30	1,513.00
	02/27/15 11:18:38	186043	12.97	1.55	0.72	5.69	46.96	13.30	1,513.00
	02/27/15 11:19:08	186073	12.62	1.37	0.69	5.94	46.81	13.10	1,523.00
	02/27/15 11:19:38	186103	12.74	0.99	0.71	5.88	46.81	13.10	1,523.00
	02/27/15 11:20:08	186133	12.86	1.24	0.73	5.79	46.65	13.00	1,507.00
	02/27/15 11:20:38	186163	12.89	1.27	0.72	5.76	46.65	13.00	1,507.00
	02/27/15 11:21:08	186193	12.92	1.50	0.74	5.71	46.51	12.80	1,504.00
	02/27/15 11:21:38	186223	13.03	1.56	0.77	5.63	46.51	12.80	1,504.00
	02/27/15 11:22:08	186253	12.77	1.67	0.80	5.83	46.48	12.70	1,348.00
	02/27/15 11:22:38	186283	13.26	1.47	0.77	5.53	46.48	12.70	1,348.00
	02/27/15 11:23:08	186313	14.21	2.44	0.78	4.72	46.50	13.10	1,114.00
	02/27/15 11:23:38	186343	14.30	2.48	0.81	4.69	46.50	13.10	1,114.00
	02/27/15 11:24:08	186373	14.11	2.62	0.78	4.84	46.66	12.90	740.00
	02/27/15 11:24:38	186403	14.48	3.07	0.78	4.56	46.66	12.90	740.00
	02/27/15 11:25:08	186433	14.17	3.62	0.79	4.73	46.69	13.10	702.00
	02/27/15 11:25:38	186463	14.45	3.54	0.83	4.60	46.69	13.10	702.00
	02/27/15 11:26:08	186493	14.14	3.93	0.85	4.76	46.70	13.10	715.00
	02/27/15 11:26:38	186523	13.69	3.61	0.78	5.03	46.70	13.10	715.00
	02/27/15 11:27:08	186553	11.63	2.74	0.67	6.70	46.69	13.20	702.00
	02/27/15 11:27:38	186583	12.75	2.22	0.74	5.94	46.69	13.20	702.00
	02/27/15 11:28:08	186613	14.60	2.22	0.80	4.53	46.49	13.30	1,151.00
	02/27/15 11:28:38	186643	15.47	2.35	0.89	3.89	46.49	13.30	1,151.00
	02/27/15 11:29:08	186673	15.58	2.73	0.86	3.79	46.14	13.70	1,466.00
	02/27/15 11:29:38	186703	15.49	2.61	0.85	3.84	46.14	13.70	1,466.00
	02/27/15 11:30:08	186733	15.34	2.26	0.88	3.94	45.98	14.60	1,510.00
	02/27/15 11:30:38	186763	15.45	2.19	0.90	3.86	45.98	14.60	1,510.00
	02/27/15 11:31:08	186793	15.52	2.01	0.91	3.86	45.80	15.10	1,517.00
	02/27/15 11:31:38	186823	15.47	2.24	0.96	3.84	45.80	15.10	1,517.00
	02/27/15 11:32:08	186853	14.85	2.08	0.94	4.26	45.66	15.30	1,525.00
	02/27/15 11:32:38	186883	15.21	1.90	0.92	4.04	45.66	15.30	1,525.00
A3	02/27/15 11:33:08	186913	14.37	3.09	0.88	4.53	45.50	15.30	1,521.00
	02/27/15 11:33:38	186943	13.93	1.81	0.84	4.90	45.50	15.30	1,521.00
	02/27/15 11:34:08	186973	13.51	1.24	0.85	5.19	45.36	15.30	1,517.00
	02/27/15 11:34:38	187003	13.32	1.03	0.85	5.38	45.36	15.30	1,517.00
	02/27/15 11:35:08	187033	13.64	1.05	0.82	5.17	45.29	15.40	1,389.00
	02/27/15 11:35:38	187063	13.54	1.33	0.82	5.17	45.29	15.40	1,389.00
	02/27/15 11:36:08	187093	13.86	1.42	0.84	4.99	45.42	15.50	949.00
	02/27/15 11:36:38	187123	13.68	1.70	0.84	5.05	45.42	15.50	949.00
	02/27/15 11:37:08	187153	13.10	1.41	0.78	5.54	45.58	15.50	660.00
	02/27/15 11:37:38	187183	13.62	1.11	0.80	5.22	45.58	15.50	660.00
	02/27/15 11:38:08	187213	13.97	1.61	0.87	4.85	45.61	15.50	673.00
	02/27/15 11:38:38	187243	14.25	1.54	0.88	4.72	45.61	15.50	673.00
	02/27/15 11:39:08	187273	14.12	1.58	0.86	4.80	45.62	15.50	685.00
	02/27/15 11:39:38	187303	12.98	1.59	0.87	5.50	45.62	15.50	685.00
	02/27/15 11:40:08	187333	11.44	0.83	0.87	6.91	45.64	15.60	686.00
	02/27/15 11:40:38	187363	14.18	0.55	0.92	4.88	45.64	15.60	686.00
	02/27/15 11:41:08	187393	15.62	1.36	0.97	3.77	45.39	15.60	1,175.00
	02/27/15 11:41:38	187423	15.55	2.18	1.04	3.79	45.39	15.60	1,175.00
	02/27/15 11:42:08	187453	14.92	2.55	1.07	4.18	45.07	15.70	1,471.00
	02/27/15 11:42:38	187483	14.65	2.50	1.07	4.38	45.07	15.70	1,471.00
	02/27/15 11:43:08	187513	14.40	3.81	1.02	4.62	44.90	15.70	1,504.00
	02/27/15 11:43:38	187543	14.66	3.33	0.94	4.40	44.90	15.70	1,504.00
	02/27/15 11:44:08	187573	14.75	2.76	0.83	4.33	44.74	15.80	1,512.00
	02/27/15 11:44:38	187603	14.71	2.94	0.95	4.36	44.74	15.80	1,512.00
	02/27/15 11:45:08	187633	13.61	2.65	1.02	5.06	44.58	15.70	1,521.00
	02/27/15 11:45:38	187663	13.23	1.21	1.02	5.45	44.58	15.70	1,521.00
	02/27/15 11:46:08	187693	13.13	1.43	0.97	5.51	44.44	15.70	1,517.00
	02/27/15 11:46:38	187723	12.70	1.37	0.99	5.87	44.44	15.70	1,517.00
	02/27/15 11:47:08	187753	12.50	1.18	1.01	6.02	44.29	15.70	1,513.00
	02/27/15 11:47:38	187783	12.73	1.12	1.03	5.89	44.29	15.70	1,513.00
	02/27/15 11:48:08	187813	12.99	1.35	1.07	5.64	44.15	15.70	1,510.00
	02/27/15 11:48:38	187843	12.74	1.62	1.07	5.83	44.15	15.70	1,510.00

Questor Technology Inc
February 27, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	68,668	SCFH

Weather Data

Barometric Pressure	30.62	in. Hg
Relative Humidity	44	%
Ambient Temperature	26	° F
Specific Humidity	0.001218	lb H ₂ O / lb air

30-70-30 Load, Run - Q250-R4

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/27/15 11:49:08	187873	12.71	1.38	1.09	5.84	44.00	15.70	1,518.00
02/27/15 11:49:38	187903	12.60	1.01	1.11	5.96	44.00	15.70	1,518.00
02/27/15 11:50:08	187933	12.44	1.02	1.08	6.09	44.01	15.80	1,123.00
02/27/15 11:50:38	187963	12.19	0.89	1.11	6.25	44.01	15.80	1,123.00
02/27/15 11:51:08	187993	12.12	0.58	1.11	6.37	44.16	15.80	755.00
02/27/15 11:51:38	188023	12.55	0.58	1.17	6.00	44.16	15.80	755.00
02/27/15 11:52:08	188053	12.44	0.59	1.16	6.09	44.25	15.90	669.00
02/27/15 11:52:38	188083	12.53	0.70	1.14	6.00	44.25	15.90	669.00
02/27/15 11:53:08	188113	12.30	0.72	1.17	6.18	44.25	16.20	669.00
02/27/15 11:53:38	188143	12.34	0.34	1.12	6.20	44.25	16.20	669.00
02/27/15 11:54:08	188173	12.55	0.41	1.16	6.02	44.25	16.30	681.00
02/27/15 11:54:38	188203	10.93	0.30	1.20	7.05	44.25	16.30	681.00
02/27/15 11:55:08	188233	9.29	0.05	1.18	8.40	44.26	16.40	693.00
02/27/15 11:55:38	188263	10.79	-0.03	1.21	7.45	44.26	16.40	693.00
02/27/15 11:56:08	188293	12.84	0.00	1.25	5.85	44.27	16.60	693.00
02/27/15 11:56:38	188323	14.28	0.65	1.26	4.73	44.27	16.60	693.00
02/27/15 11:57:08	188353	14.80	2.86	1.31	4.31	44.29	16.80	693.00
02/27/15 11:57:38	188383	14.54	2.44	1.59	5.27	44.29	16.80	693.00
RAW AVERAGE		13.42	2.17	0.83	5.36	46.94	14.93	1,200.68

Bias	Serial Number:	O ₂	CO	THC	CO ₂	Press. Trans.	Temp. Trans.	F-Flow Trans.
		INST-O2-0013	INST-CO-0029	INST-TH-0009	INST-C2-0013	1442557	1442557	1442557
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H ₂ O)	(°F)	(SCFH)
	Initial Zero	0.09	0.02	0.23	0.10			
	Final Zero	0.11	0.07	0.21	0.12			
	Avg. Zero	0.10	0.05	0.22	0.11			
	Initial UpScale	11.86	9.15	5.01	9.05			
	Final UpScale	11.84	9.22	4.99	9.08			
	Avg. UpScale	11.85	9.19	5.00	9.07			
		11.88	9.02	5.01	9.11			

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	13.47	2.09	0.64	5.34
Corrected Raw Average (ppm/% wet basis)	12.99	2.02	0.61	5.14
Emission Rate (lb/hr)	N/A	0.01	0.01	N/A

Questor Technology Inc
February 27, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	68,903	SCFH

Weather Data

Barometric Pressure	30.59	in. Hg
Relative Humidity	51	%
Ambient Temperature	21	°F
Specific Humidity	0.001129	lb H ₂ O / lb air

30-70-30 Load, Run - Q250-R5

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/27/15 12:20:08	189733	14.79	2.56	1.00	4.33	44.51	19.70	691.00
	02/27/15 12:20:38	189763	14.86	2.59	1.05	4.28	44.51	19.70	691.00
	02/27/15 12:21:08	189793	15.16	2.66	1.00	4.08	44.43	19.80	875.00
	02/27/15 12:21:38	189823	15.11	3.24	1.06	4.09	44.43	19.80	875.00
	02/27/15 12:22:08	189853	15.04	3.66	1.11	4.14	44.01	19.90	1,431.00
	02/27/15 12:22:38	189883	15.20	3.74	1.10	4.04	44.01	19.90	1,431.00
	02/27/15 12:23:08	189913	15.04	3.41	1.10	4.14	43.81	20.00	1,511.00
	02/27/15 12:23:38	189943	15.25	2.86	1.09	4.02	43.81	20.00	1,511.00
	02/27/15 12:24:08	189973	15.25	3.20	1.05	4.01	43.64	19.90	1,531.00
	02/27/15 12:24:38	190003	15.19	3.08	1.10	4.04	43.64	19.90	1,531.00
	02/27/15 12:25:08	190033	15.19	3.45	1.14	4.04	43.48	20.00	1,527.00
	02/27/15 12:25:38	190063	13.88	2.93	1.13	4.87	43.48	20.00	1,527.00
	02/27/15 12:26:08	190093	13.83	0.85	1.12	5.05	43.32	20.20	1,534.00
	02/27/15 12:26:38	190123	14.11	1.74	1.10	4.78	43.32	20.20	1,534.00
	02/27/15 12:27:08	190153	13.63	1.66	1.07	5.12	43.14	20.40	1,528.00
	02/27/15 12:27:38	190183	13.55	1.34	1.04	5.19	43.14	20.40	1,528.00
	02/27/15 12:28:08	190213	13.92	1.28	1.03	4.93	42.99	20.60	1,536.00
	02/27/15 12:28:38	190243	13.93	1.26	0.98	4.95	42.99	20.60	1,536.00
	02/27/15 12:29:08	190273	14.05	1.10	0.97	4.88	42.83	20.90	1,531.00
	02/27/15 12:29:38	190303	14.16	1.35	1.02	4.70	42.83	20.90	1,531.00
	02/27/15 12:30:08	190333	13.15	1.20	0.85	5.46	42.68	21.10	1,526.00
	02/27/15 12:30:38	190363	13.24	0.86	1.02	5.47	42.68	21.10	1,526.00
	02/27/15 12:31:08	190393	13.30	1.03	1.05	5.39	42.56	21.30	1,522.00
	02/27/15 12:31:38	190423	13.78	1.01	1.09	5.05	42.56	21.30	1,522.00
	02/27/15 12:32:08	190453	13.72	1.28	1.13	5.03	42.40	21.60	1,528.00
	02/27/15 12:32:38	190483	13.84	0.99	1.12	5.02	42.40	21.60	1,528.00
	02/27/15 12:33:08	190513	14.09	1.25	1.14	4.78	42.38	21.80	1,338.00
	02/27/15 12:33:38	190543	13.93	1.30	1.10	4.94	42.38	21.80	1,338.00
	02/27/15 12:34:08	190573	13.93	1.50	1.13	4.91	42.53	22.00	961.00
	02/27/15 12:34:38	190603	14.17	1.49	1.13	4.73	42.53	22.00	961.00
	02/27/15 12:35:08	190633	13.46	1.33	1.10	5.20	42.66	22.10	690.00
	02/27/15 12:35:38	190663	13.37	0.90	1.15	5.37	42.66	22.10	690.00
	02/27/15 12:36:08	190693	12.90	1.21	1.11	5.67	42.69	22.20	690.00
	02/27/15 12:36:38	190723	12.17	1.15	1.07	6.29	42.69	22.20	690.00
	02/27/15 12:37:08	190753	12.58	0.81	1.07	6.00	42.70	22.30	690.00
	02/27/15 12:37:38	190783	11.30	0.79	1.05	6.80	42.70	22.30	690.00
	02/27/15 12:38:08	190813	9.25	0.19	0.99	8.46	42.70	22.40	701.00
	02/27/15 12:38:38	190843	12.43	0.02	1.05	6.29	42.70	22.40	701.00
	02/27/15 12:39:08	190873	14.03	0.23	1.05	4.89	42.72	22.40	690.00
	02/27/15 12:39:38	190903	14.12	0.86	1.06	4.79	42.72	22.40	690.00
	02/27/15 12:40:08	190933	14.10	1.06	1.06	4.80	42.48	22.50	1,136.00
	02/27/15 12:40:38	190963	14.01	0.83	1.04	4.88	42.48	22.50	1,136.00
	02/27/15 12:41:08	190993	13.93	0.88	1.07	4.90	42.13	22.60	1,494.00
	02/27/15 12:41:38	191023	13.95	0.74	1.03	4.90	42.13	22.60	1,494.00
	02/27/15 12:42:08	191053	14.14	0.87	1.05	4.79	41.97	22.60	1,513.00
	02/27/15 12:42:38	191083	14.01	1.13	1.03	4.86	41.97	22.60	1,513.00
A2	02/27/15 12:43:08	191113	14.18	1.34	1.06	4.74	41.80	22.60	1,509.00
	02/27/15 12:43:38	191143	14.00	1.18	1.00	4.89	41.80	22.60	1,509.00
	02/27/15 12:44:08	191173	13.21	1.05	1.05	5.35	41.65	22.50	1,517.00
	02/27/15 12:44:38	191203	12.68	0.47	1.03	6.01	41.65	22.50	1,517.00
	02/27/15 12:45:08	191233	13.15	1.42	1.04	5.50	41.50	22.50	1,524.00
	02/27/15 12:45:38	191263	12.92	1.68	1.04	5.69	41.50	22.50	1,524.00
	02/27/15 12:46:08	191293	12.43	1.60	1.06	6.04	41.36	22.50	1,520.00
	02/27/15 12:46:38	191323	12.61	0.88	1.04	6.01	41.36	22.50	1,520.00

Questor Technology Inc
February 27, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	68,903	SCFH

Weather Data

Barometric Pressure	30.59	in. Hg
Relative Humidity	51	%
Ambient Temperature	21	°F
Specific Humidity	0.001129	lb H ₂ O / lb air

30-70-30 Load, Run - Q250-R5

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/27/15 12:47:08	191353	12.35	1.11	1.04	6.15	41.21	22.50	1,528.00
	02/27/15 12:47:38	191383	12.74	0.90	1.12	5.86	41.21	22.50	1,528.00
	02/27/15 12:48:08	191413	12.41	1.19	1.13	6.08	41.06	22.40	1,512.00
	02/27/15 12:48:38	191443	12.23	0.77	1.07	6.27	41.06	22.40	1,512.00
	02/27/15 12:49:08	191473	12.35	0.70	1.08	6.13	40.91	22.40	1,508.00
	02/27/15 12:49:38	191503	12.25	0.58	1.07	6.26	40.91	22.40	1,508.00
	02/27/15 12:50:08	191533	12.55	0.71	1.08	6.01	40.79	22.40	1,493.00
	02/27/15 12:50:38	191563	12.16	0.73	1.02	6.29	40.79	22.40	1,493.00
	02/27/15 12:51:08	191593	12.61	0.62	0.97	6.00	40.79	22.40	1,286.00
	02/27/15 12:51:38	191623	12.62	1.13	1.02	5.92	40.79	22.40	1,286.00
	02/27/15 12:52:08	191653	12.31	1.09	1.04	6.16	40.93	22.50	909.00
	02/27/15 12:52:38	191683	12.35	0.62	1.05	6.18	40.93	22.50	909.00
	02/27/15 12:53:08	191713	12.22	0.72	1.06	6.25	41.06	22.70	715.00
	02/27/15 12:53:38	191743	12.24	0.49	1.08	6.27	41.06	22.70	715.00
	02/27/15 12:54:08	191773	12.26	0.60	1.08	6.25	41.09	22.70	658.00
	02/27/15 12:54:38	191803	12.47	0.68	1.07	6.04	41.09	22.70	658.00
	02/27/15 12:55:08	191833	12.38	0.98	1.02	6.10	41.13	22.80	670.00
	02/27/15 12:55:38	191863	10.25	0.69	1.05	7.57	41.13	22.80	670.00
	02/27/15 12:56:08	191893	9.82	0.18	1.01	8.13	41.11	22.90	762.00
	02/27/15 12:56:38	191923	12.59	0.16	1.07	6.10	41.11	22.90	762.00
	02/27/15 12:57:08	191953	13.92	0.50	1.08	4.91	40.77	22.80	1,273.00
	02/27/15 12:57:38	191983	14.03	0.93	1.11	4.83	40.77	22.80	1,273.00
	02/27/15 12:58:08	192013	14.25	0.93	1.15	4.71	40.49	22.80	1,495.00
	02/27/15 12:58:38	192043	14.41	1.40	1.18	4.56	40.49	22.80	1,495.00
	02/27/15 12:59:08	192073	14.32	2.34	1.18	4.62	40.34	22.70	1,503.00
	02/27/15 12:59:38	192103	14.17	2.48	1.12	4.73	40.34	22.70	1,503.00
	02/27/15 13:00:08	192133	14.35	1.99	1.14	4.61	40.20	22.70	1,499.00
	02/27/15 13:00:38	192163	13.22	2.38	1.07	5.35	40.20	22.70	1,499.00
	02/27/15 13:01:08	192193	12.59	0.66	1.06	6.00	40.05	22.60	1,506.00
	02/27/15 13:01:38	192223	12.43	0.50	1.06	6.04	40.05	22.60	1,506.00
	02/27/15 13:02:08	192253	12.25	0.56	1.05	6.22	39.91	22.60	1,514.00
	02/27/15 13:02:38	192283	12.28	0.58	1.06	6.24	39.91	22.60	1,514.00
	02/27/15 13:03:08	192313	12.54	0.88	1.10	6.02	39.77	22.60	1,510.00
	02/27/15 13:03:38	192343	12.22	1.15	1.11	6.23	39.77	22.60	1,510.00
	02/27/15 13:04:08	192373	12.22	0.70	1.11	6.29	39.61	22.70	1,505.00
	02/27/15 13:04:38	192403	12.31	0.90	1.09	6.14	39.61	22.70	1,505.00
	02/27/15 13:05:08	192433	11.90	0.87	1.06	6.50	39.48	22.70	1,513.00
	02/27/15 13:05:38	192463	12.58	0.80	0.93	6.03	39.48	22.70	1,513.00
A3	02/27/15 13:06:08	192493	12.66	1.50	0.92	5.86	39.33	22.70	1,520.00
	02/27/15 13:06:38	192523	12.60	1.45	0.98	5.95	39.33	22.70	1,520.00
	02/27/15 13:07:08	192553	12.50	1.51	0.97	6.04	39.33	22.60	1,341.00
	02/27/15 13:07:38	192583	12.58	1.62	0.76	5.94	39.33	22.60	1,341.00
	02/27/15 13:08:08	192613	12.66	1.48	0.92	5.91	39.52	22.70	830.00
	02/27/15 13:08:38	192643	12.91	1.75	0.99	5.73	39.52	22.70	830.00
	02/27/15 13:09:08	192673	12.94	2.00	1.02	5.68	39.64	22.80	697.00
	02/27/15 13:09:38	192703	12.62	2.01	1.05	5.88	39.64	22.80	697.00
	02/27/15 13:10:08	192733	12.44	1.57	1.01	6.09	39.64	22.90	730.00
	02/27/15 13:10:38	192763	12.40	1.41	1.01	6.11	39.64	22.90	730.00
	02/27/15 13:11:08	192793	12.70	1.27	1.00	5.90	39.66	23.00	730.00
	02/27/15 13:11:38	192823	10.88	1.30	1.00	7.08	39.66	23.00	730.00
	02/27/15 13:12:08	192853	10.73	0.48	0.97	7.44	39.64	23.10	797.00
	02/27/15 13:12:38	192883	13.55	0.48	1.02	5.39	39.64	23.10	797.00
	02/27/15 13:13:08	192913	14.39	1.39	1.08	4.59	39.29	23.20	1,316.00
	02/27/15 13:13:38	192943	14.30	1.59	1.07	4.63	39.29	23.20	1,316.00

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February 27, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	3.6	%
Stack Exhaust Flow (M2)	68,903	SCFH

Weather Data

Barometric Pressure	30.59	in. Hg
Relative Humidity	51	%
Ambient Temperature	21	°F
Specific Humidity	0.001129	lb H ₂ O / lb air

30-70-30 Load, Run - Q250-R5

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/27/15 13:14:08	192973	14.34	1.56	1.06	4.62	39.05	23.20	1,488.00
02/27/15 13:14:38	193003	14.32	1.71	1.07	4.63	39.05	23.20	1,488.00
02/27/15 13:15:08	193033	14.41	1.83	1.02	4.57	38.88	23.20	1,527.00
02/27/15 13:15:38	193063	14.33	1.90	1.00	4.59	38.88	23.20	1,527.00
02/27/15 13:16:08	193093	14.19	1.65	1.05	4.74	38.73	23.10	1,523.00
02/27/15 13:16:38	193123	13.74	1.50	1.04	4.98	38.73	23.10	1,523.00
02/27/15 13:17:08	193153	13.78	1.40	1.05	5.02	38.59	22.90	1,531.00
02/27/15 13:17:38	193183	13.88	3.37	1.05	4.90	38.59	22.90	1,531.00
02/27/15 13:18:08	193213	13.33	3.71	1.01	5.30	38.45	22.80	1,527.00
02/27/15 13:18:38	193243	12.83	2.24	1.04	5.74	38.45	22.80	1,527.00
02/27/15 13:20:38	193363	12.07	1.09	0.99	6.32	38.18	22.70	1,530.00
02/27/15 13:29:38	193903	14.42	2.34	1.10	4.56	38.36	23.40	690.00
02/27/15 13:30:38	193963	14.63	2.38	1.14	4.37	38.39	23.50	690.00
RAW AVERAGE		13.16	1.36	1.04	5.52	40.76	22.29	1,210.72

Bias	Serial Number:	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Press. Trans (in. H ₂ O)	Temp. Trans. (°F)	F-Flow Trans. (SCFH)
	INST-O2-0013	INST-CO-0029	INST-TH-0009	INST-C2-0013	1442557	1442557	1442557	
	Initial Zero	0.11	0.07	0.21	0.12			
	Final Zero	0.14	0.01	0.15	0.12			
	Avg. Zero	0.13	0.04	0.18	0.12			
	Initial UpScale	11.84	9.22	4.99	9.08			
	Final UpScale	11.77	9.15	5.04	9.07			
	Avg. UpScale	11.81	9.19	5.02	9.08			
Upscale Cal Gas		11.88	9.02	5.01	9.11			

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	13.26	1.30	0.89	5.49
Corrected Raw Average (ppm/% wet basis)	12.77	1.25	0.85	5.29
Emission Rate (lb/hr)	N/A	0.01	0.01	N/A

Questor Technology Inc
February 27, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	4.3	%
Stack Exhaust Flow (M2)	76,873	SCFH

Weather Data

Barometric Pressure	30.55	in. Hg
Relative Humidity	43	%
Ambient Temperature	25	°F
Specific Humidity	0.001133	lb H ₂ O / lb air

30-70-30 Load, Run - Q250-R6

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/27/15 13:49:08	195073	15.32	6.31	0.65	3.94	38.70	23.90	694.00
	02/27/15 13:49:38	195103	15.47	7.32	0.72	3.85	38.70	23.90	694.00
	02/27/15 13:50:08	195133	15.50	8.21	0.77	3.83	38.68	23.80	760.00
	02/27/15 13:50:38	195163	15.42	8.04	0.74	3.86	38.68	23.80	760.00
	02/27/15 13:51:08	195193	15.37	8.30	0.65	3.89	38.33	23.60	1,313.00
	02/27/15 13:51:38	195223	15.43	8.36	0.63	3.88	38.33	23.60	1,313.00
	02/27/15 13:52:08	195253	15.35	8.22	0.66	3.91	38.05	23.30	1,514.00
	02/27/15 13:52:38	195283	15.30	9.18	0.66	3.95	38.05	23.30	1,514.00
	02/27/15 13:53:08	195313	15.34	9.79	0.66	3.92	37.91	23.00	1,521.00
	02/27/15 13:53:38	195343	15.33	9.16	0.69	3.96	37.91	23.00	1,521.00
	02/27/15 13:54:08	195373	16.01	12.70	0.82	3.40	37.76	22.90	1,507.00
	02/27/15 13:54:38	195403	14.48	16.90	0.72	4.48	37.76	22.90	1,507.00
	02/27/15 13:55:08	195433	14.39	19.15	0.70	4.60	37.62	22.70	1,525.00
	02/27/15 13:55:38	195463	14.40	19.97	0.74	4.56	37.62	22.70	1,525.00
	02/27/15 13:56:08	195493	13.41	19.96	0.69	5.26	37.48	22.60	1,510.00
	02/27/15 13:56:38	195523	13.65	17.37	0.77	5.04	37.48	22.60	1,510.00
	02/27/15 13:57:08	195553	13.68	4.97	0.87	5.06	37.35	22.40	1,518.00
	02/27/15 13:57:38	195583	13.19	1.93	0.98	5.25	37.35	22.40	1,518.00
	02/27/15 13:58:08	195613	13.44	1.36	1.10	5.11	37.22	22.20	1,525.00
	02/27/15 13:58:38	195643	13.33	1.40	1.20	5.17	37.22	22.20	1,525.00
	02/27/15 13:59:08	195673	12.89	1.14	1.22	5.46	37.08	22.10	1,500.00
	02/27/15 13:59:38	195703	13.46	0.94	1.15	5.08	37.08	22.10	1,500.00
	02/27/15 14:00:08	195733	13.30	1.18	1.24	5.17	36.95	21.80	1,518.00
	02/27/15 14:00:38	195763	13.26	1.14	1.26	5.21	36.95	21.80	1,518.00
	02/27/15 14:01:08	195793	13.58	1.34	1.20	4.97	36.83	21.60	1,515.00
	02/27/15 14:01:38	195823	13.64	1.42	1.12	4.90	36.83	21.60	1,515.00
	02/27/15 14:02:08	195853	13.34	1.23	1.12	5.14	36.69	21.60	1,512.00
	02/27/15 14:02:38	195883	13.47	1.02	1.09	5.01	36.69	21.60	1,512.00
	02/27/15 14:03:08	195913	13.49	1.12	1.01	4.98	36.57	21.50	1,508.00
	02/27/15 14:03:38	195943	13.46	1.12	0.96	5.06	36.57	21.50	1,508.00
	02/27/15 14:04:08	195973	13.19	1.00	1.10	5.28	36.45	21.50	1,504.00
	02/27/15 14:04:38	196003	13.39	1.17	1.27	5.06	36.45	21.50	1,504.00
	02/27/15 14:05:08	196033	13.47	0.99	1.24	5.05	36.32	21.50	1,511.00
	02/27/15 14:05:38	196063	13.41	1.02	1.27	5.07	36.32	21.50	1,511.00
	02/27/15 14:06:08	196093	13.63	1.13	1.27	4.92	36.26	21.50	1,425.00
	02/27/15 14:06:38	196123	13.66	1.19	1.31	4.89	36.26	21.50	1,425.00
	02/27/15 14:07:08	196153	13.41	1.22	1.32	5.06	36.42	21.50	1,016.00
	02/27/15 14:07:38	196183	13.46	1.12	1.23	5.04	36.42	21.50	1,016.00
	02/27/15 14:08:08	196213	13.51	1.18	1.21	4.99	36.59	21.50	722.00
	02/27/15 14:08:38	196243	13.56	1.21	1.24	5.01	36.59	21.50	722.00
	02/27/15 14:09:08	196273	13.29	1.30	1.22	5.14	36.63	21.60	712.00
	02/27/15 14:09:38	196303	12.80	1.30	1.10	5.56	36.63	21.60	712.00
	02/27/15 14:10:08	196333	10.99	1.24	1.11	6.85	36.66	21.70	712.00
	02/27/15 14:10:38	196363	11.61	0.22	1.16	6.68	36.66	21.70	712.00
	02/27/15 14:11:08	196393	13.77	0.41	1.21	4.95	36.69	21.80	723.00
	02/27/15 14:11:38	196423	13.99	1.36	1.29	4.68	36.69	21.80	723.00
A2	02/27/15 14:12:08	196453	13.86	1.32	1.23	4.77	36.69	21.80	713.00
	02/27/15 14:12:38	196483	14.01	1.28	1.21	4.69	36.69	21.80	713.00
	02/27/15 14:13:08	196513	14.01	1.54	1.19	4.67	36.65	21.80	861.00
	02/27/15 14:13:38	196543	14.06	1.49	1.15	4.65	36.65	21.80	861.00
	02/27/15 14:14:08	196573	14.03	1.52	1.10	4.69	36.26	21.80	1,424.00
	02/27/15 14:14:38	196603	14.23	2.22	1.05	4.53	36.26	21.80	1,424.00
	02/27/15 14:15:08	196633	14.15	2.49	1.16	4.56	36.05	21.80	1,523.00
	02/27/15 14:15:38	196663	14.10	1.89	1.14	4.61	36.05	21.80	1,523.00
	02/27/15 14:16:08	196693	14.16	1.82	1.18	4.57	35.89	21.70	1,539.00
	02/27/15 14:16:38	196723	13.60	1.85	1.13	4.97	35.89	21.70	1,539.00
	02/27/15 14:17:08	196753	13.95	2.74	1.17	4.70	35.76	21.70	1,546.00
	02/27/15 14:17:38	196783	12.68	3.68	1.12	5.64	35.76	21.70	1,546.00
	02/27/15 14:18:08	196813	12.63	1.89	1.09	5.75	35.61	21.70	1,552.00
	02/27/15 14:18:38	196843	12.47	1.79	1.09	5.85	35.61	21.70	1,552.00
	02/27/15 14:19:08	196873	12.29	1.19	1.08	6.03	35.49	21.60	1,538.00
	02/27/15 14:19:38	196903	12.41	1.17	1.12	5.91	35.49	21.60	1,538.00

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Unit Data

Meas. Stack Moisture	4.3	%
Stack Exhaust Flow (M2)	76,873	SCFH

Weather Data

Barometric Pressure	30.55	in. Hg
Relative Humidity	43	%
Ambient Temperature	25	°F
Specific Humidity	0.001133	lb H ₂ O / lb air

30-70-30 Load, Run - Q250-R6

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/27/15 14:20:08	196933	12.28	1.04	1.08	6.02	35.34	21.60	1,544.00
	02/27/15 14:20:38	196963	12.57	0.94	1.05	5.83	35.34	21.60	1,544.00
	02/27/15 14:21:08	196993	12.51	1.39	1.00	5.82	35.21	21.50	1,550.00
	02/27/15 14:21:38	197023	12.41	1.14	0.90	5.96	35.21	21.50	1,550.00
	02/27/15 14:22:08	197053	12.10	1.11	0.72	6.14	35.11	21.50	1,547.00
	02/27/15 14:22:38	197083	12.01	0.75	0.87	6.23	35.11	21.50	1,547.00
	02/27/15 14:23:08	197113	11.88	0.58	0.98	6.36	35.02	21.50	1,503.00
	02/27/15 14:23:38	197143	12.21	0.53	1.00	6.12	35.02	21.50	1,503.00
	02/27/15 14:24:08	197173	12.35	0.90	1.02	5.96	35.12	21.50	1,166.00
	02/27/15 14:24:38	197203	12.68	1.31	0.99	5.69	35.12	21.50	1,166.00
	02/27/15 14:25:08	197233	12.37	1.40	0.93	5.95	35.29	21.50	859.00
	02/27/15 14:25:38	197263	12.45	1.16	0.96	5.90	35.29	21.50	859.00
	02/27/15 14:26:08	197293	12.21	1.19	0.89	6.07	35.31	21.60	849.00
	02/27/15 14:26:38	197323	11.81	0.88	0.86	6.37	35.31	21.60	849.00
	02/27/15 14:27:08	197353	10.16	0.46	0.76	7.51	35.38	21.70	726.00
	02/27/15 14:27:38	197383	10.17	0.10	0.79	7.71	35.38	21.70	726.00
	02/27/15 14:28:08	197413	12.04	0.05	0.88	6.33	35.44	21.80	685.00
	02/27/15 14:28:38	197443	12.72	0.12	0.81	5.65	35.44	21.80	685.00
	02/27/15 14:29:08	197473	12.68	0.22	0.83	5.73	35.49	21.80	665.00
	02/27/15 14:29:38	197503	12.50	0.22	0.84	5.84	35.49	21.80	665.00
	02/27/15 14:30:08	197533	13.43	0.43	0.87	5.13	35.53	21.90	676.00
	02/27/15 14:30:38	197563	13.99	0.99	0.91	4.75	35.53	21.90	676.00
	02/27/15 14:31:08	197593	14.11	1.68	0.91	4.63	35.53	21.80	738.00
	02/27/15 14:31:38	197623	14.53	2.19	0.94	4.34	35.53	21.80	738.00
	02/27/15 14:32:08	197653	14.39	2.72	0.96	4.44	35.20	21.80	1,311.00
	02/27/15 14:32:38	197683	14.51	2.89	0.92	4.33	35.20	21.80	1,311.00
	02/27/15 14:33:08	197713	14.46	2.64	0.92	4.37	34.92	21.70	1,530.00
	02/27/15 14:33:38	197743	14.45	3.35	0.95	4.38	34.92	21.70	1,530.00
	02/27/15 14:34:08	197773	14.40	2.85	0.95	4.44	34.78	21.50	1,536.00
	02/27/15 14:34:38	197803	13.55	2.47	0.96	4.94	34.78	21.50	1,536.00
A3	02/27/15 14:35:08	197833	11.88	0.85	0.90	6.26	34.65	21.50	1,533.00
	02/27/15 14:35:38	197863	12.62	0.52	0.88	5.77	34.65	21.50	1,533.00
	02/27/15 14:36:08	197893	12.20	1.00	0.81	6.09	34.53	21.40	1,549.00
	02/27/15 14:36:38	197923	12.37	0.83	0.84	6.01	34.53	21.40	1,549.00
	02/27/15 14:37:08	197953	12.05	0.96	0.86	6.21	34.40	21.40	1,545.00
	02/27/15 14:37:38	197983	12.23	0.85	0.81	6.04	34.40	21.40	1,545.00
	02/27/15 14:38:08	198013	12.30	0.71	0.80	6.05	34.38	21.40	1,402.00
	02/27/15 14:38:38	198043	12.49	0.93	0.85	5.89	34.38	21.40	1,402.00
	02/27/15 14:39:08	198073	12.59	1.16	0.87	5.79	34.48	21.50	1,079.00
	02/27/15 14:39:38	198103	12.46	1.36	0.89	5.87	34.48	21.50	1,079.00
	02/27/15 14:40:08	198133	12.65	1.54	0.84	5.71	34.59	21.60	928.00
	02/27/15 14:40:38	198163	12.35	1.43	0.73	5.98	34.59	21.60	928.00
	02/27/15 14:41:08	198193	12.52	1.18	0.72	5.84	34.67	21.70	766.00
	02/27/15 14:41:38	198223	11.55	1.06	0.61	6.44	34.67	21.70	766.00
	02/27/15 14:42:08	198253	10.00	0.29	0.62	7.76	34.76	21.80	675.00
	02/27/15 14:42:38	198283	11.25	0.05	0.63	6.92	34.76	21.80	675.00
	02/27/15 14:43:08	198313	11.97	0.04	0.61	6.29	34.79	21.80	676.00
	02/27/15 14:43:38	198343	12.14	0.10	0.61	6.20	34.79	21.80	676.00
	02/27/15 14:44:08	198373	13.34	0.20	0.63	5.22	34.84	21.90	676.00
	02/27/15 14:44:38	198403	13.58	0.72	0.62	4.97	34.84	21.90	676.00
	02/27/15 14:45:08	198433	14.32	1.28	0.47	4.53	34.89	22.10	677.00
	02/27/15 14:45:38	198463	14.44	2.04	0.42	4.39	34.89	22.10	677.00
	02/27/15 14:46:08	198493	14.36	2.47	0.60	4.43	34.58	22.30	1,242.00
	02/27/15 14:46:38	198523	14.59	2.60	0.61	4.27	34.58	22.30	1,242.00
	02/27/15 14:47:08	198553	14.51	2.74	0.65	4.32	34.28	22.20	1,528.00
	02/27/15 14:47:38	198583	14.35	2.71	0.64	4.44	34.28	22.20	1,528.00
	02/27/15 14:48:08	198613	14.36	2.65	0.64	4.45	34.15	22.10	1,535.00
	02/27/15 14:48:38	198643	14.39	2.69	0.64	4.43	34.15	22.10	1,535.00
	02/27/15 14:49:08	198673	13.42	2.80	0.64	5.01	34.01	22.00	1,541.00
	02/27/15 14:49:38	198703	12.98	1.46	0.63	5.46	34.01	22.00	1,541.00
	02/27/15 14:50:08	198733	12.75	2.16	0.64	5.62	33.88	21.90	1,547.00
	02/27/15 14:50:38	198763	12.75	1.69	0.63	5.70	33.88	21.90	1,547.00

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Unit Data

Meas. Stack Moisture	4.3	%
Stack Exhaust Flow (M2)	76,873	SCFH

Weather Data

Barometric Pressure	30.55	in. Hg
Relative Humidity	43	%
Ambient Temperature	25	°F
Specific Humidity	0.001133	lb H ₂ O / lb air

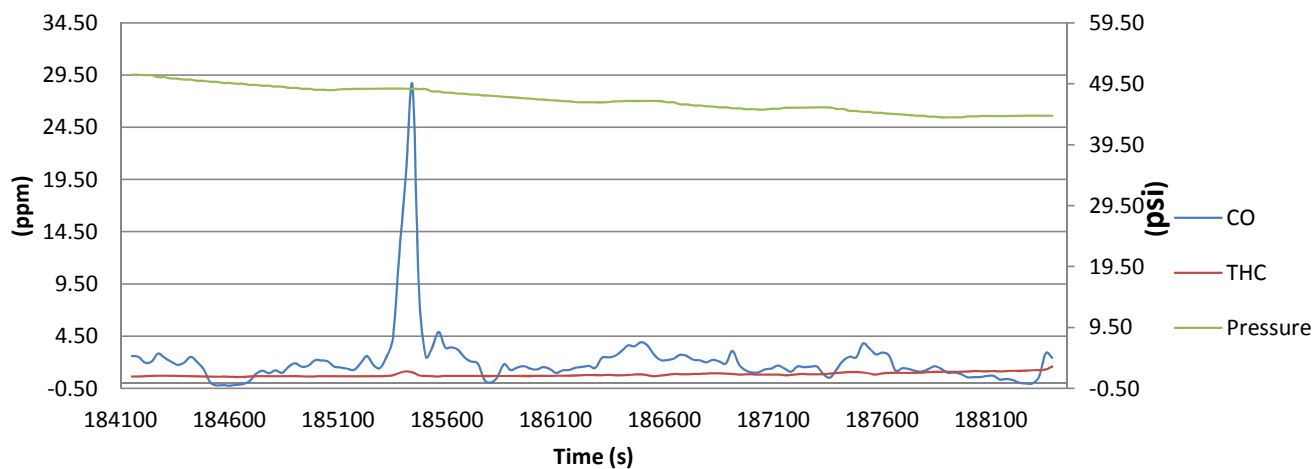
30-70-30 Load, Run - Q250-R6

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/27/15 14:51:08	198793	12.55	1.78	0.67	5.76	33.75	21.90	1,543.00
02/27/15 14:51:38	198823	12.35	1.38	0.63	5.98	33.75	21.90	1,543.00
02/27/15 14:52:08	198853	12.43	1.23	0.65	5.95	33.75	21.80	1,212.00
02/27/15 14:52:38	198883	12.56	1.44	0.64	5.81	33.75	21.80	1,212.00
02/27/15 14:53:08	198913	11.91	1.08	0.62	6.32	34.00	21.90	725.00
02/27/15 14:53:38	198943	12.54	0.89	0.66	5.87	34.00	21.90	725.00
02/27/15 14:54:08	198973	12.60	1.36	0.62	5.78	34.05	22.10	706.00
02/27/15 14:54:38	199003	12.70	1.46	0.57	5.72	34.05	22.10	706.00
02/27/15 14:55:08	199033	12.85	1.64	0.57	5.58	34.11	22.20	726.00
02/27/15 14:55:38	199063	12.52	1.82	0.57	5.88	34.11	22.20	726.00
02/27/15 14:56:08	199093	11.30	1.15	0.57	6.62	34.08	22.40	786.00
02/27/15 14:56:38	199123	10.20	0.25	0.55	7.68	34.08	22.40	786.00
02/27/15 14:57:08	199153	12.88	0.09	0.53	5.74	34.10	22.50	786.00
02/27/15 14:57:38	199183	14.09	0.87	0.58	4.67	34.10	22.50	786.00
02/27/15 14:58:08	199213	14.23	1.60	0.64	4.55	34.12	22.60	786.00
02/27/15 14:58:38	199243	14.12	1.75	0.61	4.63	34.12	22.60	786.00
02/27/15 14:59:08	199273	14.49	1.97	0.55	4.36	34.15	22.70	787.00
02/27/15 14:59:38	199303	14.37	2.48	0.54	4.39	34.15	22.70	787.00
RAW AVERAGE		13.25	2.55	0.88	5.29	35.64	21.96	1,180.31

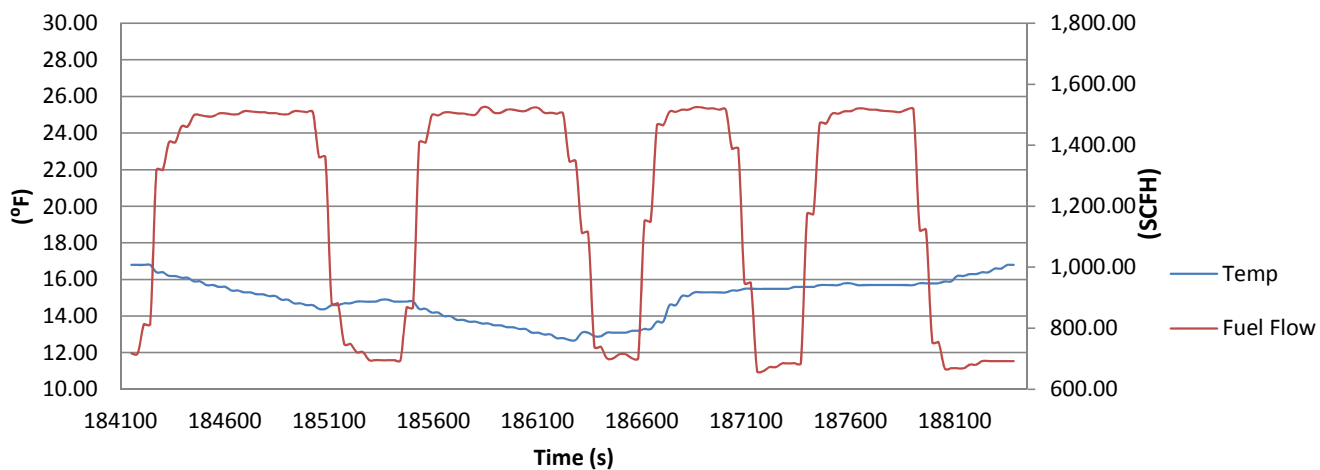
Bias	Serial Number: INST-O2-0013 INST-CO-0029 INST-TH-0009 INST-C2-0013				1442557	1442557	1442557
					Press. (in. H ₂ O)	Trans. Temp. (°F)	F-Flow Trans. (SCFH)
		O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)		
	Initial Zero	0.14	0.01	0.15	0.12		
	Final Zero	0.15	0.01	-0.01	0.12		
	Avg. Zero	0.15	0.01	0.07	0.12		
	Initial UpScale	11.77	9.15	5.04	9.07		
	Final UpScale	11.88	9.26	5.08	9.03		
Upscale Cal Gas		11.88	9.02	5.01	9.11		

EMISSIONS DATA		O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)		13.33	2.49	0.81	5.28
Corrected Raw Average (ppm/% wet basis)		12.75	2.38	0.78	5.04
Emission Rate (lb/hr)		N/A	0.01	0.01	N/A

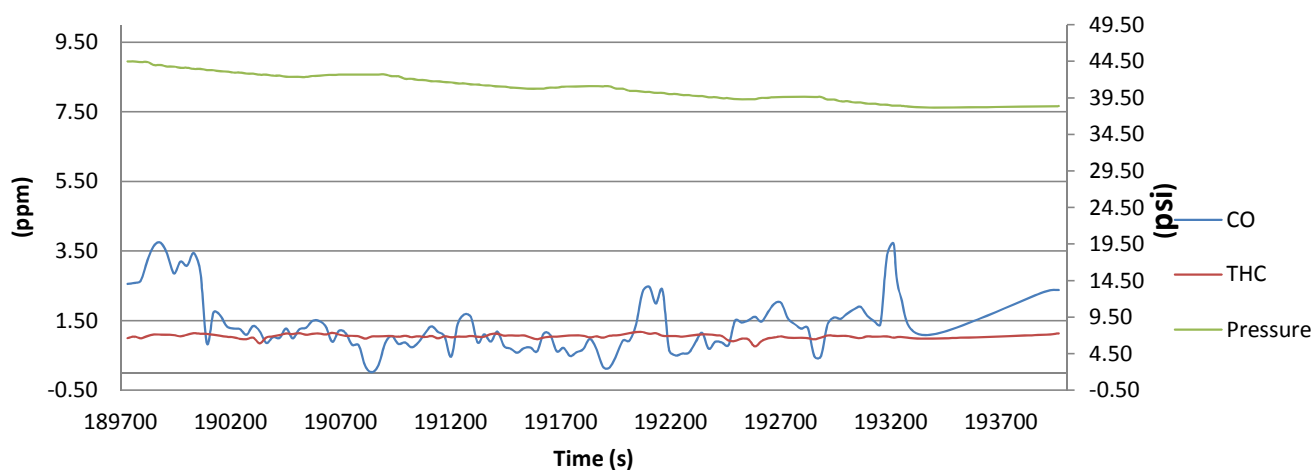
Q250-R4



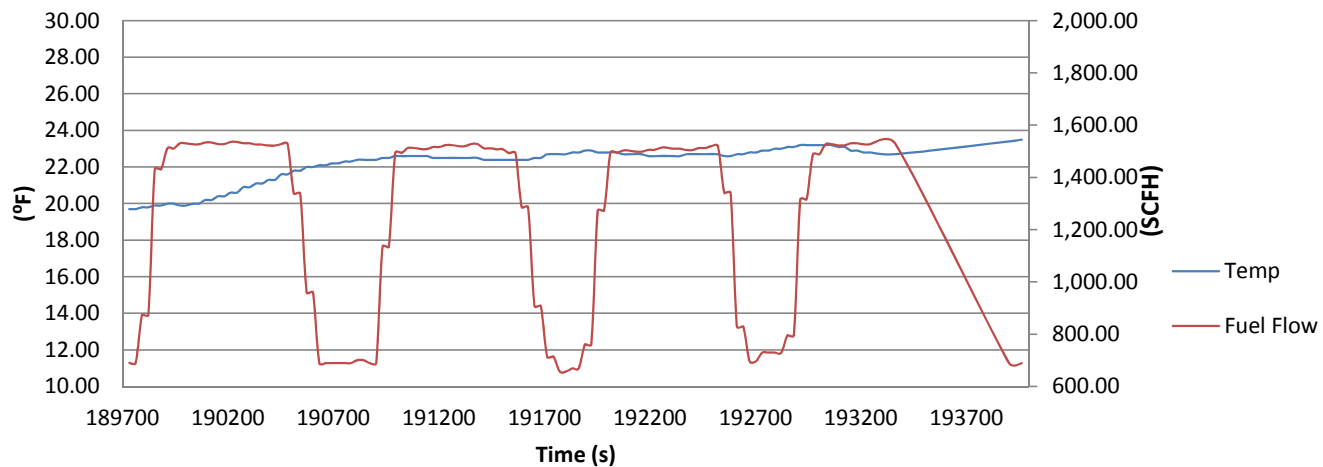
Q250-R4



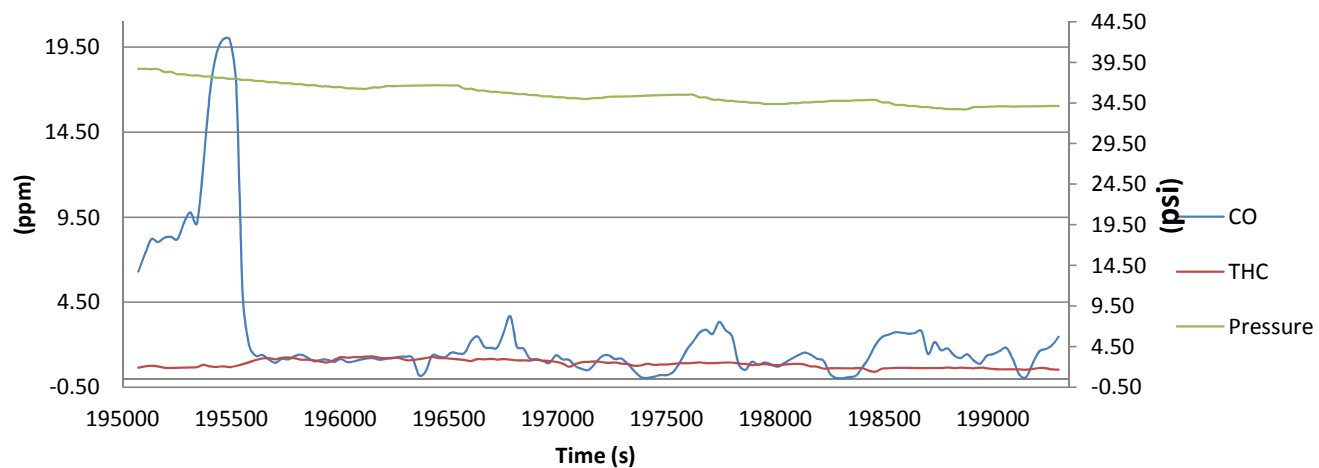
Q250-R5



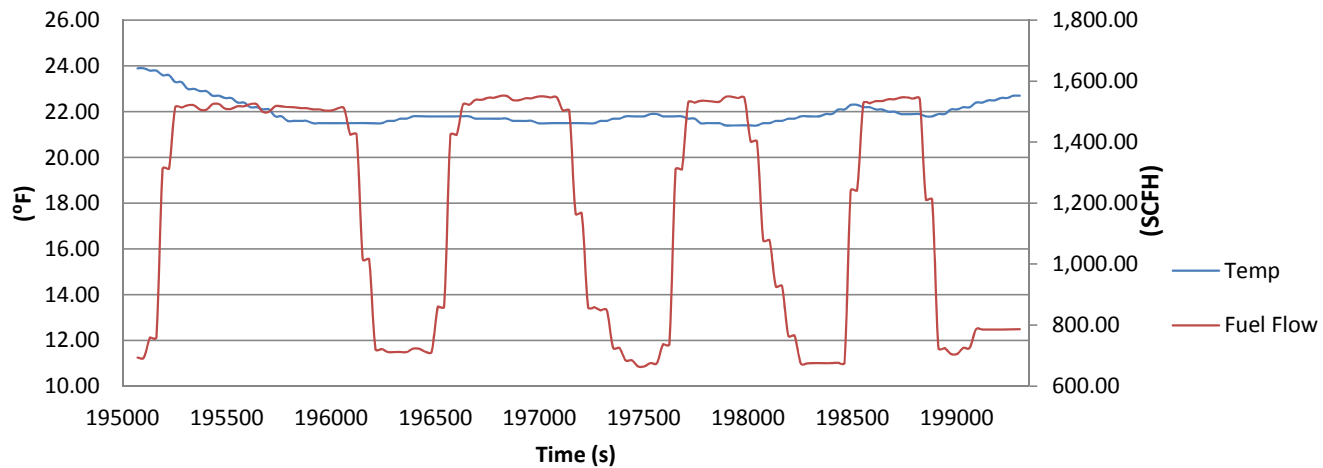
Q250-R5

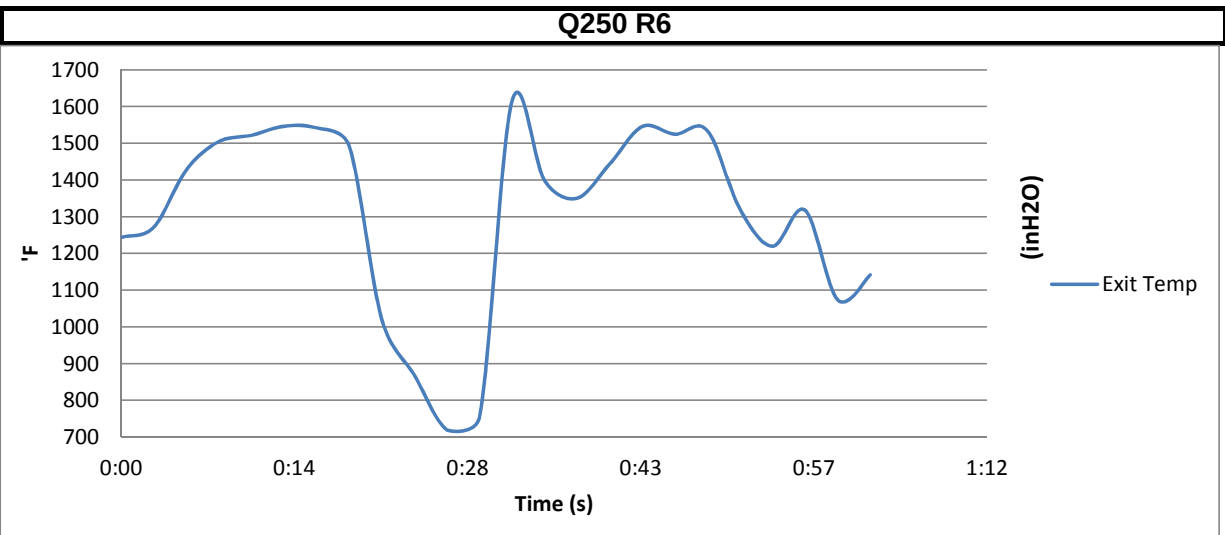
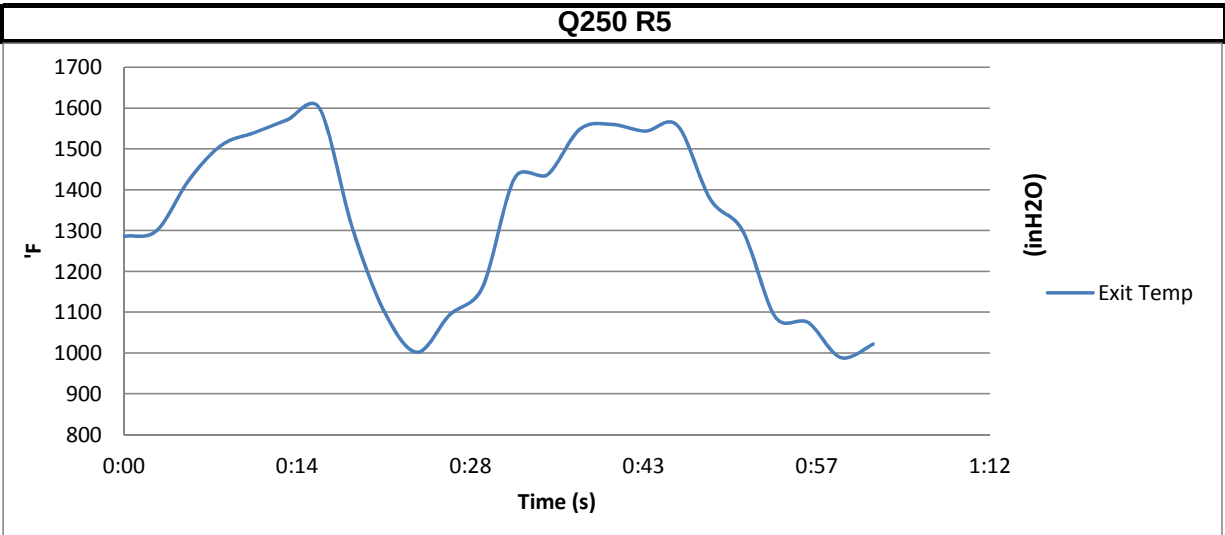
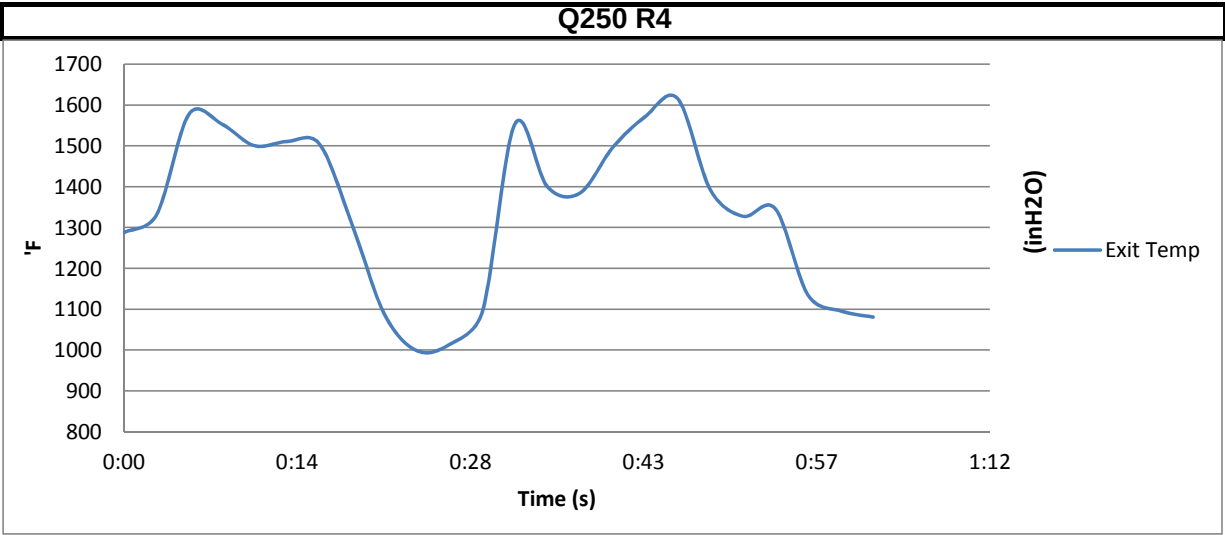


Q250-R6



Q250-R6





EMISSION DATA RECORDS

70-100-70% Ramp-up, Ramp-down Unit Operations Data

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Fuel Type	Gas, Propene

Test Information			
Project #		qti-15-brokenarrow.ok-comp#1	
Operator		CG	
Date for Preliminary Run	(mm/dd/yy)	02/25/15	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	RM4, 8.1.1.2	21	scf
Run Duration	≤0.75 cfm	65	minutes
Unit Number		1	
Base Run Number		70-100-70%	
Number of Ports Available		2	
Number of Ports Used		2	
Port Inside Diameter		3.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		7	8	9	
Test Date	(mm/dd/yy)	02/28/15	02/28/15	02/28/15	
Load	% or w/DB	70-100-70	70-100-70	70-100-70	
Meter Box Number	from ACS	SAMP-CP-0023	SAMP-CP-0023	SAMP-CP-0023	
Meter Calibration Factor	(Y)	1.002	1.002	1.002	
Orifice Meter Coefficient	($\Delta H_{@}$)	1.672	1.672	1.672	in H ₂ O
Pitot Identification	from ACS	4174	4174	4174	
Pitot Tube Coefficient	(C _p)	0.819	0.819	0.819	
Probe Number	from ACS	SAMP-PF-0001	SAMP-SP-0001	SAMP-SP-0001	
Probe Length		60.0	60.0	60.0	in
(SS, Glass) Liner Material	from list	Hastelloy	Hastelloy	Hastelloy	
Impinger Case Number	from ACS	SAMP-BC-0009	SAMP-BC-0009	SAMP-BC-0009	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Min Sum Lee
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] - RESULTS

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Historical Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	Average	Units
Run Start Time	09:01	10:31	12:27		hh:mm
Run Stop Time	10:11	11:41	13:37		hh:mm
Test Date	02/28/15	02/28/15	02/28/15		mm/dd/yy
Meter Calibration Factor	1.002	1.002	1.002		
Pitot Tube Coefficient	0.819	0.819	0.819		
Stack Test Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	Average	Units
Initial Meter Volume	80.010	128.330	175.510		ft ³
Final Meter Volume	128.170	175.380	223.460		ft ³
Total Meter Volume	48.160	47.050	47.950	47.720	ft ³
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	65.90	73.29	72.46	70.55	°F
Average Stack Temperature	1561.96	1596.75	1562.38	1573.69	°F
Barometric Pressure	30.48	30.47	30.45	30.47	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H ₂ O
Absolute Stack Pressure	30.48	30.47	30.45	30.47	in Hg
Average Orifice Pressure Drop	1.60	1.60	1.60	1.60	in H ₂ O
Absolute Meter Pressure	30.60	30.59	30.57	30.59	in Hg
Avg Square Root Pitot Pressure	0.17	0.18	0.17	0.17	√(in H ₂ O)
Moisture Content Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	Average	Units
Impinger Water Weight Gain	49.90	40.40	43.40	44.57	g
Silica Gel Weight Gain	13.20	14.40	16.20	14.60	g
Total Water Volume Collected	63.21	54.90	59.71	59.27	ml
Standard Water Vapor Volume	2.98	2.58	2.81	2.79	scf
Standard Meter Volume	49.5	47.7	48.7	48.6	dscf
Calculated Stack Moisture	5.66	5.14	5.46	5.42	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	5.66	5.14	5.46	5.42	%
Gas Analysis Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	Average	Units
Carbon Dioxide Content	5.4	5.7	5.7	5.6	%
Oxygen Content	14.7	14.3	14.3	14.4	%
Nitrogen Content	79.9	80.0	80.0	80.0	%
Stack Dry Molecular Weight	29.47	29.46	29.48	29.47	lb/lb-mole
Stack Wet Molecular Weight	28.82	28.87	28.86	28.85	lb/lb-mole
Percent Excess Air	229.9	209.7	209.7	216.4	%
Volumetric Flow Rate Data	70-100-70%-7	70-100-70%-8	70-100-70%-9	Average	Units
Average Stack Gas Velocity	17.89	19.49	18.14	18.51	ft/sec
Stack Cross-Sectional Area	4.69	4.69	4.69	4.69	ft ²
Actual Stack Flow Rate	5,029	5,480	5,101	5,203	acfm
Wet Standard Stack Flow Rate	80	86	81	83	wkscfh
Dry Standard Stack Flow Rate	75,725	81,549	76,880	78,051	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Questor, Broken Arrow Test Site	Preliminary Date	02/25/15		
Sampling Location	Q250	Operator	CG		
Project #	qti-15-brokenarrow.ok-comp#1	# of Ports Used	2		
Fuel Type	Gas, Propene	Min. Fuel Factor	N/A	Max. Fuel Factor	N/A

Gas Analysis Data								
Run Number	70-100-70%-7		Date	02/28/15	Run Start Time	09:01	Run Stop Time	10:11
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppmCO)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.4	14.7	0.0	79.9	29.47	1.142	229.9	N/A

Gas Analysis Data								
Run Number	70-100-70%-8		Date	02/28/15	Run Start Time	10:31	Run Stop Time	11:41
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppmCO)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.7	14.3	0.0	80.0	29.46	1.168	209.7	N/A

Gas Analysis Data								
Run Number	70-100-70%-9		Date	02/28/15	Run Start Time	12:27	Run Stop Time	13:37
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppmCO)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:10	5.7	14.3	0.0	80.0	29.48	1.158	209.7	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Questor, Broken Arrow Test Site	Preliminary Date	02/25/15
Sampling Location	Q250	Operator	CG
Project #	qti-15-brokenarrow.ok-comp#1	Ports Used	2

Moisture Content Data								
Run Number	70-100-70%-7		Date	02/28/15	Start Time	09:01	Stop Time	10:11
Meter Box Number	SAMP-CP-0023				Meter Cal Factor	(Y)	1.002	
Total Meter Volume	(V _m)	48.160	dcf		Barometric Pressure	(P _b)	30.48	in Hg
Average Stack Temp	(t _s) _{avg}	1562	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	66	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	840.50	826.40	610.10	827.00			
Initial Value	(V _i),(W _i)	807.90	812.00	607.20	813.80			
Net Value	(V _n),(W _n)	32.6	14.4	2.9	13.2			
Results								
Total Weight	(W _f)	63.10	g	Water Vol Weighed	(V _{wsg(std)})	2.975	scf	
Std Meter Volume	(V _{m(std)})	49.547	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	5.66	%	Final Moisture Content	(B _{ws})	5.66	%	

Moisture Content Data								
Run Number	70-100-70%-8		Date	02/28/15	Start Time	10:31	Stop Time	11:41
Meter Box Number	SAMP-CP-0023				Meter Cal Factor	(Y)	1.002	
Total Meter Volume	(V _m)	47.050	dcf		Barometric Pressure	(P _b)	30.47	in Hg
Average Stack Temp	(t _s) _{avg}	1597	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	73	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	788.30	787.40	613.00	841.40			
Initial Value	(V _i),(W _i)	765.50	772.70	610.10	827.00			
Net Value	(V _n),(W _n)	22.8	14.7	2.9	14.4			
Results								
Total Weight	(W _f)	54.80	g	Water Vol Weighed	(V _{wsg(std)})	2.584	scf	
Std Meter Volume	(V _{m(std)})	47.718	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	5.14	%	Final Moisture Content	(B _{ws})	5.14	%	

Moisture Content Data								
Run Number	70-100-70%-9		Date	02/28/15	Start Time	12:27	Stop Time	13:37
Meter Box Number	SAMP-CP-0023				Meter Cal Factor	(Y)	1.002	
Total Meter Volume	(V _m)	47.950	dcf		Barometric Pressure	(P _b)	30.45	in Hg
Average Stack Temp	(t _s) _{avg}	1562	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	72	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	754.50	800.90	616.50	852.40			
Initial Value	(V _i),(W _i)	728.20	787.30	613.00	836.20			
Net Value	(V _n),(W _n)	26.3	13.6	3.5	16.2			
Results								
Total Weight	(W _f)	59.60	g	Water Vol Weighed	(V _{wsg(std)})	2.810	scf	
Std Meter Volume	(V _{m(std)})	48.675	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	5.46	%	Final Moisture Content	(B _{ws})	5.46	%	

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/28/15
Operator	CG
Run Number	70-100-70%-7

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.20	in H ₂ O for	20.0
		Pre (-)	0.20	in H ₂ O for	25.0
		Post (+)	0.25	in H ₂ O for	20.0
		Post (-)	0.25	in H ₂ O for	20.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	09:01	End	10:11

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	807.9	812.0	607.2	813.8				
Post	840.5	826.4	610.1	827.0				

Sampling Equipment		
Meter Box Number	SAMP-CP-0023	
Meter Cal Factor	(Y)	1.002
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.4508 in
Probe Number	SAMP-PF-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0009	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1562.0	°F
Average Meter Temp	(t _m)	65.9	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.17	in H ₂ O
Stack Moisture Content	(B _{ws})	5.66	%
Stack Dry Molecular Weight	(M _d)	29.47	lb/lb-mole
Estimated Orifice Flow Rate	(Q _o)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.48	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.48	in Hg
Absolute Meter Pressure	(P _m)	30.60	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s) _i	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	80.010	0.020	1.672	1.60	1484	254		33			57	61	13.0	0.14	14.73	3.232		77.559
A-2	2.7	00:02:43	83.110	0.020	1.672	1.60	1523	261		33			56	61	13.0	0.14	14.88	5.204		62.445
A-3	5.4	00:05:25	85.000	0.020	1.672	1.60	1510	261		34			57	61	13.0	0.14	14.83	7.216		57.726
A-4	8.1	00:08:07	86.930	0.020	1.672	1.60	1549	256		35			59	60	13.0	0.14	14.98	9.278		55.667
A-5	10.8	00:10:50	88.910	0.020	1.672	1.60	1555	260		36			60	60	13.0	0.14	15.00	11.276		54.122
A-6	13.5	00:13:33	90.830	0.020	1.672	1.60	1555	258		37			63	61	13.0	0.14	15.00	13.400		53.601
A-7	16.3	00:16:15	92.880	0.020	1.672	1.60	1396	257		38			64	61	13.0	0.14	14.39	15.057		51.624
A-8	19.0	00:18:58	94.480	0.020	1.672	1.60	1456	256		39			65	61	13.0	0.14	14.62	17.426		52.278
A-9	21.7	00:21:40	96.770	0.020	1.672	1.60	1455	256		40			66	62	13.0	0.14	14.62	19.419		51.783
A-10	24.4	00:24:22	98.700	0.020	1.672	1.60	1542	257		42			67	63	13.0	0.14	14.95	21.480		51.552
A-11	27.1	00:27:05	100.700	0.020	1.672	1.60	1547	255		43			68	64	13.0	0.14	14.97	23.475		51.219
A-12	29.8	00:29:47	102.640	0.020	1.672	1.60	1568	256		44			69	64	13.0	0.14	15.05	25.500		51.000
B-1	32.5	00:32:30	104.610	0.020	1.672	1.60	1385	257		44			67	64	13.0	0.14	14.35	27.569		50.897
B-2	35.2	00:35:12	106.620	0.020	1.672	1.60	1583	256		45			69	66	13.0	0.14	15.10	29.590		50.725
B-3	37.9	00:37:55	108.590	0.030	1.672	1.60	1637	259		46			70	67	13.0	0.17	18.74	31.719		50.751
B-4	40.6	00:40:37	110.670	0.020	1.672	1.60	1694	257		47			69	67	13.0	0.14	15.51	33.605		50.407
B-5	43.3	00:43:20	112.510	0.050	1.672	1.60	1667	253		48			71	67	13.0	0.22	24.36	35.722		50.431
B-6	46.0	00:46:03	114.580	0.040	1.672	1.60	1666	255		50			71	69	13.0	0.20	21.79	37.600		50.133
B-7	48.8	00:48:45	116.420	0.050	1.672	1.60	1627	258		50			72	69	13.0	0.22	24.13	39.599		50.020
B-8	51.5	00:51:28	118.380	0.050	1.672	1.60	1554	255		49			72	70	13.0	0.22	23.71	41.637		49.964
B-9	54.2	00:54:10	120.380	0.030	1.672	1.60	1572	257		50			72	70	13.0	0.17	18.45	43.613		49.844
B-10	56.9	00:56:53	122.320	0.05	1.672	1.60	1648	257		50			73	70	13.0	0.22	24.25	45.609		49.755
B-11	59.6	00:59:35	124.280	0.05	1.672	1.60	1657	260		51			73	70	13.0	0.22	24.31	47.604		49.673
B-12	62.3	01:02:18	126.240	0.06	1.672	1.60	1657	255		51			73	72	13.0	0.24	26.63	49.565		49.565
Last Pt	65.0	01:05:00	128.170																	
Final Val	65.0	01:05:00	128.170												Max Vac	13.0	Final Values	49.565		
Average Values				0.03		1.60	1562	257		43			67	65		0.17	17.89			
													66							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/28/15
Operator	CG
Run Number	70-100-70%-8

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.25	in H ₂ O for	25.0
		Pre (-)	0.25	in H ₂ O for	25.0
		Post (+)	0.25	in H ₂ O for	20.0
		Post (-)	0.20	in H ₂ O for	25.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	10:31	End	11:41

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	765.5	772.7	610.1	827.0				
Post	788.3	787.4	613.0	841.4				

Sampling Equipment		
Meter Box Number	SAMP-CP-0023	
Meter Cal Factor	(Y)	1.002
Nozzle Number		
Average Nozzle Diameter	(D _{na})	in
Suggested Nozzle Diameter	(D _{ni})	0.4445 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0009	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1596.8	°F
Average Meter Temp	(t _m)	73.3	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.18	in H ₂ O
Stack Moisture Content	(B _{ws})	5.14	%
Stack Dry Molecular Weight	(M _d)	29.46	lb/lb-mole
Estimated Orifice Flow Rate	(Q _o)	0.76	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.47	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.47	in Hg
Absolute Meter Pressure	(P _m)	30.59	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _{s,i})	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	128.330	0.030	1.672	1.60	1562	257		45			67	73	12.0	0.17	18.39	1.990		47.759
A-2	2.7	00:02:43	130.280	0.030	1.672	1.60	1577	257		46			67	72	12.0	0.17	18.45	4.043		48.517
A-3	5.4	00:05:25	132.290	0.030	1.672	1.60	1625	260		47			68	71	12.0	0.17	18.67	5.923		47.381
A-4	8.1	00:08:07	134.130	0.050	1.672	1.60	1650	255		49			70	71	12.0	0.22	24.25	7.849		47.097
A-5	10.8	00:10:50	136.020	0.040	1.672	1.60	1664	256		51			71	71	12.0	0.20	21.76	9.866		47.358
A-6	13.5	00:13:33	138.000	0.040	1.672	1.60	1654	256		52			71	70	12.0	0.20	21.71	11.885		47.540
A-7	16.3	00:16:15	139.980	0.040	1.672	1.60	1679	255		53			71	71	12.5	0.20	21.83	13.820		47.384
A-8	19.0	00:18:58	141.880	0.030	1.672	1.60	1701	258		54			73	70	12.5	0.17	19.01	15.815		47.444
A-9	21.7	00:21:40	143.840	0.030	1.672	1.60	1594	254		54			72	71	13.0	0.17	18.53	17.830		47.546
A-10	24.4	00:24:22	145.820	0.020	1.672	1.60	1413	257		55			74	71	13.0	0.14	14.45	19.820		47.569
A-11	27.1	00:27:05	147.780	0.030	1.672	1.60	1595	254		56			73	72	13.0	0.17	18.53	21.791		47.544
A-12	29.8	00:29:47	149.720	0.040	1.672	1.60	1640	255		56			74	73	13.0	0.20	21.63	23.758		47.515
B-1	32.5	00:32:30	151.660	0.040	1.672	1.60	1547	257		56			74	72	13.0	0.20	21.15	25.818		47.663
B-2	35.2	00:35:12	153.690	0.030	1.672	1.60	1549	257		56			74	73	13.0	0.17	18.33	27.835		47.717
B-3	37.9	00:37:55	155.680	0.050	1.672	1.60	1601	255		58			75	74	13.0	0.22	23.96	29.798		47.677
B-4	40.6	00:40:37	157.620	0.050	1.672	1.60	1626	257		59			76	74	13.0	0.22	24.11	31.790		47.685
B-5	43.3	00:43:20	159.590	0.050	1.672	1.60	1630	255		60			76	75	13.0	0.22	24.13	33.790		47.703
B-6	46.0	00:46:03	161.570	0.020	1.672	1.60	1624	255		60			77	74	13.0	0.14	15.24	35.830		47.773
B-7	48.8	00:48:45	163.590	0.020	1.672	1.60	1535	256		61			78	75	13.0	0.14	14.91	37.786		47.729
B-8	51.5	00:51:28	165.530	0.020	1.672	1.60	1494	255		60			77	75	13.0	0.14	14.76	39.783		47.740
B-9	54.2	00:54:10	167.510	0.030	1.672	1.60	1583	258		60			77	76	13.0	0.17	18.48	41.880		47.863
B-10	56.9	00:56:53	169.590	0.03	1.672	1.60	1616	254		58			77	75	13.0	0.17	18.63	43.757		47.735
B-11	59.6	00:59:35	171.450	0.03	1.672	1.60	1589	258		59			77	76	13.0	0.17	18.51	45.794		47.785
B-12	62.3	01:02:18	173.470	0.03	1.672	1.60	1574	256		59			78	76	13.0	0.17	18.44	47.717		47.717
Last Pt	65.0	01:05:00	175.380																	
Final Val	65.0	01:05:00	175.380												Max Vac	13.0	Final Values	47.717		
Average Values				0.03		1.60	1597	256		55			74	73		0.18	19.49			
													73							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/28/15
Operator	CG
Run Number	70-100-70%-9

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	15.0	in Hg
< 3.0	Pitot	Pre (+)	0.20	in H ₂ O for	20.0 sec
		Pre (-)	0.20	in H ₂ O for	20.0 sec
		Post (+)	0.25	in H ₂ O for	25.0 sec
		Post (-)	0.25	in H ₂ O for	20.0 sec

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	12:27	End	13:37

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	728.2	787.3	613.0	836.2				
Post	754.5	800.9	616.5	852.4				

Sampling Equipment		
Meter Box Number	SAMP-CP-0023	
Meter Cal Factor	(Y)	1.002
Nozzle Number		
Average Nozzle Diameter	(D _{na})	in
Suggested Nozzle Diameter	(D _n)	0.4415 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0009	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1562.4	°F
Average Meter Temp	(t _m)	72.5	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.17	in H ₂ O
Stack Moisture Content	(B _{ws})	5.46	%
Stack Dry Molecular Weight	(M _d)	29.48	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.73	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	30.45	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	30.45	in Hg
Absolute Meter Pressure	(P _m)	30.57	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (248±25°F)	Impinger Exit Temp (568°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _{s,i})	Cumul. Meter Volume (V _{m,Std})	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _{m,Std})
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	175.510	0.030	1.672	1.60	1379	258		40			65	71	12.5	0.17	17.54	2.170		52.085
A-2	2.7	00:02:43	177.630	0.020	1.672	1.60	1579	260		43			62	71	13.0	0.14	15.08	4.347		52.160
A-3	5.4	00:05:25	179.750	0.030	1.672	1.60	1587	255		48			62	69	13.0	0.17	18.51	6.414		51.312
A-4	8.1	00:08:07	181.760	0.040	1.672	1.60	1634	258		52			64	69	11.0	0.20	21.62	8.426		50.557
A-5	10.8	00:10:50	183.720	0.030	1.672	1.60	1674	258		55			67	68	11.0	0.17	18.90	10.547		50.627
A-6	13.5	00:13:33	185.790	0.030	1.672	1.60	1677	260		57			68	69	11.0	0.17	18.91	12.593		50.371
A-7	16.3	00:16:15	187.790	0.020	1.672	1.60	1689	258		60			71	69	11.0	0.14	15.49	14.469		49.608
A-8	19.0	00:18:58	189.630	0.020	1.672	1.60	1665	255		62			72	69	11.0	0.14	15.40	16.568		49.704
A-9	21.7	00:21:40	191.690	0.020	1.672	1.60	1611	255		63			73	69	11.0	0.14	15.20	18.594		49.583
A-10	24.4	00:24:22	193.680	0.030	1.672	1.60	1540	254		60			74	70	11.0	0.17	18.30	20.555		49.331
A-11	27.1	00:27:05	195.610	0.040	1.672	1.60	1601	257		59			75	71	11.0	0.20	21.45	22.471		49.028
A-12	29.8	00:29:47	197.500	0.040	1.672	1.60	1601	254		58			76	72	11.0	0.20	21.45	24.506		49.011
B-1	32.5	00:32:30	199.510	0.040	1.672	1.60	1533	256		56			75	72	11.0	0.20	21.09	26.491		48.907
B-2	35.2	00:35:12	201.470	0.030	1.672	1.60	1509	258		56			76	72	11.0	0.17	18.15	28.637		49.092
B-3	37.9	00:37:55	203.590	0.030	1.672	1.60	1528	256		57			77	73	11.0	0.17	18.24	30.537		48.858
B-4	40.6	00:40:37	205.470	0.030	1.672	1.60	1591	259		58			77	72	11.0	0.17	18.53	32.559		48.839
B-5	43.3	00:43:20	207.470	0.030	1.672	1.60	1603	255		58			77	74	11.0	0.17	18.58	34.608		48.858
B-6	46.0	00:46:03	209.500	0.030	1.672	1.60	1611	259		59			77	74	11.0	0.17	18.62	36.586		48.782
B-7	48.8	00:48:45	211.460	0.030	1.672	1.60	1514	257		59			76	75	11.0	0.17	18.18	38.605		48.764
B-8	51.5	00:51:28	213.460	0.020	1.672	1.60	1460	258		59			77	74	11.0	0.14	14.64	40.644		48.773
B-9	54.2	00:54:10	215.480	0.02	1.672	1.60	1434	260		59			76	76	11.0	0.14	14.54	42.651		48.744
B-10	56.9	00:56:53	217.470	0.03	1.672	1.60	1420	256		60			78	76	11.0	0.17	17.74	44.644		48.702
B-11	59.6	00:59:35	219.450	0.04	1.672	1.60	1539	257		60			77	76	11.0	0.20	21.12	46.669		48.698
B-12	62.3	01:02:18	221.460	0.03	1.672	1.60	1518	260		60			78	77	11.0	0.17	18.20	48.680		48.680
Last Pt	65.0	01:05:00	223.460																	
Final Val	65.0	01:05:00	223.460												Max Vac	13.0	Final Values	48.680		
Average Values				0.03		1.60	1562	257		57			73	72		0.17	18.14			
													72							

Questor Technology Inc
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.7	%
Stack Exhaust Flow (M2)	75,725	SCFH

Weather Data

Barometric Pressure	30.48	in. Hg
Relative Humidity	82	%
Ambient Temperature	26	° F
Specific Humidity	0.002296	lb H ₂ O / lb air

70-100-70 Load, Run - Q250-R7

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/28/15 9:01:17	55560	12.50	0.98	0.79	6.14	63.72	29.00	1,514.00
	02/28/15 9:01:47	55590	12.71	1.05	0.79	5.96	63.72	29.00	1,514.00
	02/28/15 9:02:17	55620	12.69	1.14	0.79	5.96	63.44	28.90	1,637.00
	02/28/15 9:02:47	55650	12.84	1.13	0.80	5.93	63.44	28.90	1,637.00
	02/28/15 9:03:17	55680	12.95	1.18	0.80	5.84	62.83	28.80	2,118.00
	02/28/15 9:03:47	55710	12.79	1.20	0.81	6.02	62.83	28.80	2,118.00
	02/28/15 9:04:17	55740	12.78	1.11	0.80	6.03	62.39	28.70	2,154.00
	02/28/15 9:04:47	55770	12.71	1.02	0.80	6.12	62.39	28.70	2,154.00
	02/28/15 9:05:17	55800	12.71	0.98	0.78	6.13	61.97	28.60	2,205.00
	02/28/15 9:05:47	55830	12.64	0.87	0.79	6.09	61.97	28.60	2,205.00
	02/28/15 9:06:17	55860	12.54	0.78	0.79	6.17	61.55	28.50	2,241.00
	02/28/15 9:06:47	55890	12.42	0.84	0.76	6.32	61.55	28.50	2,241.00
	02/28/15 9:07:17	55920	13.05	2.96	0.76	5.75	61.16	28.40	2,214.00
	02/28/15 9:07:47	55950	13.30	3.32	0.81	5.59	61.16	28.40	2,214.00
	02/28/15 9:08:17	55980	13.39	4.17	0.81	5.46	60.74	28.20	2,218.00
	02/28/15 9:08:47	56010	13.25	4.09	0.80	5.62	60.74	28.20	2,218.00
	02/28/15 9:09:17	56040	13.08	3.81	0.79	5.73	60.34	28.10	2,222.00
	02/28/15 9:09:47	56070	13.02	3.40	0.76	5.81	60.34	28.10	2,222.00
	02/28/15 9:10:17	56100	13.13	3.10	0.79	5.70	59.98	27.90	2,212.00
	02/28/15 9:10:47	56130	12.91	3.01	0.83	5.77	59.98	27.90	2,212.00
	02/28/15 9:11:17	56160	12.90	2.96	0.79	5.80	59.62	27.70	2,217.00
	02/28/15 9:11:47	56190	12.97	3.05	0.78	5.73	59.62	27.70	2,217.00
	02/28/15 9:12:17	56220	12.94	3.08	0.80	5.75	59.25	27.60	2,221.00
	02/28/15 9:12:47	56250	12.87	2.78	0.79	5.81	59.25	27.60	2,221.00
	02/28/15 9:13:17	56280	12.98	2.89	0.81	5.73	58.90	27.50	2,196.00
	02/28/15 9:13:47	56310	13.00	2.67	0.79	5.71	58.90	27.50	2,196.00
	02/28/15 9:14:17	56340	13.05	2.52	0.80	5.67	58.78	27.50	1,845.00
	02/28/15 9:14:47	56370	13.20	2.67	0.80	5.57	58.78	27.50	1,845.00
	02/28/15 9:15:17	56400	13.08	2.66	0.80	5.65	58.66	27.40	1,646.00
	02/28/15 9:15:47	56430	13.31	2.61	0.80	5.45	58.66	27.40	1,646.00
	02/28/15 9:16:17	56460	13.17	2.91	0.81	5.57	58.54	27.30	1,508.00
	02/28/15 9:16:47	56490	13.06	2.82	0.83	5.64	58.54	27.30	1,508.00
	02/28/15 9:17:17	56520	13.11	2.93	0.83	5.66	58.38	27.30	1,504.00
	02/28/15 9:17:47	56550	13.57	3.18	0.82	5.25	58.38	27.30	1,504.00
	02/28/15 9:18:17	56580	14.56	5.09	0.86	4.58	58.22	27.40	1,501.00
	02/28/15 9:18:47	56610	14.37	8.92	0.82	4.69	58.22	27.40	1,501.00
	02/28/15 9:19:17	56640	14.57	9.05	0.81	4.60	58.07	27.40	1,468.00
	02/28/15 9:19:47	56670	15.03	12.04	0.88	4.21	58.07	27.40	1,468.00
	02/28/15 9:20:17	56700	15.40	14.05	0.90	4.03	57.88	27.40	1,538.00
	02/28/15 9:20:47	56730	15.50	16.65	0.92	3.90	57.88	27.40	1,538.00
	02/28/15 9:21:17	56760	15.65	17.86	0.96	3.84	57.30	27.50	2,133.00
	02/28/15 9:21:47	56790	13.82	16.43	0.85	4.96	57.30	27.50	2,133.00
	02/28/15 9:22:17	56820	12.64	4.08	0.70	6.03	56.87	27.40	2,194.00
	02/28/15 9:22:47	56850	12.92	1.25	0.71	5.77	56.87	27.40	2,194.00
	02/28/15 9:23:17	56880	12.72	1.22	0.73	5.93	56.50	27.30	2,212.00
	02/28/15 9:23:47	56910	12.74	0.97	0.72	5.93	56.50	27.30	2,212.00
A2	02/28/15 9:24:17	56940	13.02	1.11	0.72	5.70	56.13	27.20	2,245.00
	02/28/15 9:24:47	56970	12.69	1.21	0.71	5.95	56.13	27.20	2,245.00
	02/28/15 9:25:17	57000	13.71	2.46	0.75	5.20	55.77	27.10	2,233.00
	02/28/15 9:25:47	57030	13.25	3.84	0.74	5.51	55.77	27.10	2,233.00
	02/28/15 9:26:17	57060	13.42	3.53	0.75	5.35	55.45	27.10	2,223.00
	02/28/15 9:26:47	57090	13.26	3.61	0.73	5.49	55.45	27.10	2,223.00
	02/28/15 9:27:17	57120	13.17	3.20	0.73	5.53	55.13	27.10	2,227.00
	02/28/15 9:27:47	57150	13.22	3.27	0.73	5.57	55.13	27.10	2,227.00
	02/28/15 9:28:17	57180	13.07	3.07	0.72	5.63	54.81	27.30	2,230.00
	02/28/15 9:28:47	57210	13.18	2.84	0.68	5.60	54.81	27.30	2,230.00
	02/28/15 9:29:17	57240	13.33	2.96	0.70	5.45	54.47	27.40	2,219.00
	02/28/15 9:29:47	57270	13.37	2.91	0.73	5.40	54.47	27.40	2,219.00
	02/28/15 9:30:17	57300	13.23	2.85	0.73	5.48	54.15	27.50	2,222.00
	02/28/15 9:30:47	57330	13.35	2.68	0.72	5.45	54.15	27.50	2,222.00
	02/28/15 9:31:17	57360	13.43	3.03	0.76	5.33	53.83	27.50	2,225.00

Questor Technology Inc
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.7	%
Stack Exhaust Flow (M2)	75,725	SCFH

Weather Data

Barometric Pressure	30.48	in. Hg
Relative Humidity	82	%
Ambient Temperature	26	° F
Specific Humidity	0.002296	lb H ₂ O / lb air

70-100-70 Load, Run - Q250-R7

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/28/15 9:31:47	57390	13.42	2.88	0.74	5.34	53.83	27.50	2,225.00
	02/28/15 9:32:17	57420	13.26	2.61	0.69	5.52	53.73	27.50	1,926.00
	02/28/15 9:32:47	57450	13.61	2.69	0.71	5.21	53.73	27.50	1,926.00
	02/28/15 9:33:17	57480	13.30	2.84	0.75	5.46	53.67	27.70	1,657.00
	02/28/15 9:33:47	57510	13.50	2.68	0.76	5.30	53.67	27.70	1,657.00
	02/28/15 9:34:17	57540	13.30	2.90	0.75	5.45	53.60	27.80	1,529.00
	02/28/15 9:34:47	57570	13.19	2.66	0.76	5.52	53.60	27.80	1,529.00
	02/28/15 9:35:17	57600	13.02	2.35	0.72	5.68	53.47	27.90	1,498.00
	02/28/15 9:35:47	57630	13.16	2.56	0.74	5.59	53.47	27.90	1,498.00
	02/28/15 9:36:17	57660	13.70	2.51	0.75	5.24	53.35	28.10	1,494.00
	02/28/15 9:36:47	57690	14.63	5.01	0.78	4.49	53.35	28.10	1,494.00
	02/28/15 9:37:17	57720	13.86	6.35	0.79	5.02	53.15	28.20	1,684.00
	02/28/15 9:37:47	57750	13.90	4.25	0.78	5.03	53.15	28.20	1,684.00
	02/28/15 9:38:17	57780	14.44	5.03	0.79	4.65	52.72	28.20	2,213.00
	02/28/15 9:38:47	57810	14.47	5.75	0.82	4.57	52.72	28.20	2,213.00
	02/28/15 9:39:17	57840	12.54	3.73	0.78	6.03	52.44	28.30	2,245.00
	02/28/15 9:39:47	57870	12.35	0.84	0.75	6.22	52.44	28.30	2,245.00
	02/28/15 9:40:17	57900	12.32	0.55	0.72	6.23	52.17	28.30	2,277.00
	02/28/15 9:40:47	57930	12.22	0.47	0.71	6.34	52.17	28.30	2,277.00
	02/28/15 9:41:17	57960	12.71	0.46	0.73	5.95	51.89	28.20	2,267.00
	02/28/15 9:41:47	57990	12.22	0.77	0.71	6.31	51.89	28.20	2,267.00
	02/28/15 9:42:17	58020	11.99	1.12	0.72	6.48	51.61	28.10	2,258.00
	02/28/15 9:42:47	58050	12.95	0.95	0.68	5.80	51.61	28.10	2,258.00
	02/28/15 9:43:17	58080	12.67	1.35	0.68	5.98	51.35	27.90	2,250.00
	02/28/15 9:43:47	58110	13.08	1.42	0.72	5.65	51.35	27.90	2,250.00
	02/28/15 9:44:17	58140	12.83	1.58	0.73	5.79	51.08	27.80	2,254.00
	02/28/15 9:44:47	58170	12.88	1.40	0.72	5.84	51.08	27.80	2,254.00
	02/28/15 9:45:17	58200	12.68	1.38	0.74	5.96	50.82	28.00	2,272.00
	02/28/15 9:45:47	58230	12.03	1.27	0.71	6.41	50.82	28.00	2,272.00
	02/28/15 9:46:17	58260	12.09	0.80	0.71	6.44	50.56	28.10	2,249.00
	02/28/15 9:46:47	58290	12.03	0.81	0.66	6.46	50.56	28.10	2,249.00
A3	02/28/15 9:47:17	58320	12.25	0.67	0.65	6.37	50.31	28.20	2,266.00
	02/28/15 9:47:47	58350	12.88	0.86	0.66	5.81	50.31	28.20	2,266.00
	02/28/15 9:48:17	58380	12.71	1.19	0.69	5.95	50.06	28.30	2,256.00
	02/28/15 9:48:47	58410	13.09	1.20	0.70	5.63	50.06	28.30	2,256.00
	02/28/15 9:49:17	58440	12.98	1.41	0.71	5.66	49.80	28.30	2,247.00
	02/28/15 9:49:47	58470	12.64	1.51	0.71	6.01	49.80	28.30	2,247.00
	02/28/15 9:50:17	58500	12.57	1.53	0.71	6.04	49.80	28.40	1,850.00
	02/28/15 9:50:47	58530	12.60	1.28	0.71	6.03	49.80	28.40	1,850.00
	02/28/15 9:51:17	58560	12.55	1.19	0.72	6.06	49.74	28.50	1,677.00
	02/28/15 9:51:47	58590	12.69	1.11	0.75	5.94	49.74	28.50	1,677.00
	02/28/15 9:52:17	58620	12.77	1.14	0.79	5.89	49.72	28.50	1,491.00
	02/28/15 9:52:47	58650	12.71	1.09	0.78	5.92	49.72	28.50	1,491.00
	02/28/15 9:53:17	58680	12.87	1.00	0.76	5.80	49.63	28.50	1,515.00
	02/28/15 9:53:47	58710	12.79	0.98	0.78	5.88	49.63	28.50	1,515.00
	02/28/15 9:54:17	58740	13.42	1.16	0.83	5.36	49.52	28.60	1,539.00
	02/28/15 9:54:47	58770	11.96	1.48	0.84	6.45	49.52	28.60	1,539.00
	02/28/15 9:55:17	58800	11.73	0.60	0.83	6.70	49.41	28.60	1,523.00
	02/28/15 9:55:47	58830	12.58	0.37	0.83	6.03	49.41	28.60	1,523.00
	02/28/15 9:56:17	58860	12.81	0.35	0.82	5.86	49.03	28.70	1,983.00
	02/28/15 9:56:47	58890	13.35	0.53	0.86	5.42	49.03	28.70	1,983.00
	02/28/15 9:57:17	58920	13.32	0.82	0.87	5.39	48.62	28.60	2,256.00
	02/28/15 9:57:47	58950	13.09	0.83	0.87	5.62	48.62	28.60	2,256.00
	02/28/15 9:58:17	58980	12.97	0.71	0.83	5.69	48.36	28.40	2,260.00
	02/28/15 9:58:47	59010	12.37	0.55	0.83	6.14	48.36	28.40	2,260.00
	02/28/15 9:59:17	59040	12.27	0.36	0.85	6.26	48.10	28.20	2,252.00
	02/28/15 9:59:47	59070	12.38	0.31	0.84	6.20	48.10	28.20	2,252.00
	02/28/15 10:00:17	59100	13.20	0.65	0.84	5.61	47.84	28.00	2,256.00
	02/28/15 10:00:47	59130	12.84	2.12	0.85	5.74	47.84	28.00	2,256.00
	02/28/15 10:01:17	59160	12.67	1.30	0.85	5.95	47.58	27.90	2,260.00
	02/28/15 10:01:47	59190	12.09	0.97	0.83	6.34	47.58	27.90	2,260.00

Questor Technology Inc
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.7	%
Stack Exhaust Flow (M2)	75,725	SCFH

Weather Data

Barometric Pressure	30.48	in. Hg
Relative Humidity	82	%
Ambient Temperature	26	°F
Specific Humidity	0.002296	lb H ₂ O / lb air

70-100-70 Load, Run - Q250-R7

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/28/15 10:02:17	59220	12.31	0.71	0.79	6.25	47.33	27.80	2,264.00
02/28/15 10:02:47	59250	12.46	0.75	0.80	6.13	47.33	27.80	2,264.00
02/28/15 10:03:17	59280	12.54	0.74	0.82	6.06	47.09	27.60	2,256.00
02/28/15 10:03:47	59310	12.69	0.70	0.81	5.97	47.09	27.60	2,256.00
02/28/15 10:04:17	59340	12.60	0.82	0.82	5.98	46.96	27.50	1,720.00
02/28/15 10:04:47	59370	12.28	0.75	0.81	6.23	46.96	27.50	1,720.00
02/28/15 10:05:17	59400	12.36	0.58	0.82	6.22	46.89	27.40	1,605.00
02/28/15 10:05:47	59430	12.07	0.53	0.79	6.41	46.89	27.40	1,605.00
02/28/15 10:06:17	59460	12.15	0.43	0.76	6.35	46.85	27.50	1,502.00
02/28/15 10:06:47	59490	12.37	0.42	0.79	6.21	46.85	27.50	1,502.00
02/28/15 10:07:17	59520	11.92	0.43	0.76	6.52	46.74	27.50	1,550.00
02/28/15 10:07:47	59550	12.43	0.36	0.76	6.19	46.74	27.50	1,550.00
02/28/15 10:08:17	59580	12.58	0.45	0.79	6.02	46.64	27.50	1,548.00
02/28/15 10:08:47	59610	12.73	0.58	0.80	5.90	46.64	27.50	1,548.00
02/28/15 10:09:17	59640	12.06	0.56	0.76	6.40	46.55	27.60	1,545.00
02/28/15 10:09:47	59670	12.02	0.34	0.76	6.51	46.55	27.60	1,545.00
02/28/15 10:10:17	59700	12.65	0.31	0.76	5.98	46.44	27.50	1,542.00
02/28/15 10:10:47	59730	12.80	0.40	0.75	5.89	46.44	27.50	1,542.00
02/28/15 10:11:17	59760	13.20	0.50	0.76	5.51	46.34	27.50	1,540.00
02/28/15 10:11:47	59790	13.15	0.55	0.77	5.58	46.34	27.50	1,540.00
RAW AVERAGE		12.99	2.41	0.77	5.73	53.60	27.90	1,965.04

Bias	Serial Number: INST-O2-0013 INST-CO-0029 INST-TH-0009 INST-C2-0013				1442557	1442557	1442557
					(in. H ₂ O)	(°F)	(SCFH)
		O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Press. Trans	Temp. Trans.
	Initial Zero	0.09	0.03	0.08	0.10		
	Final Zero	0.09	0.08	0.04	0.15		
	Avg. Zero	0.09	0.06	0.06	0.13		
	Initial UpScale	12.01	8.99	5.01	9.07		
	Final UpScale	11.89	9.13	5.02	9.06		
	Avg. UpScale	11.95	9.06	5.02	9.07		
Upscale Cal Gas		11.88	9.02	5.01	9.11		

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	12.92	2.36	0.72	5.72
Corrected Raw Average (ppm/% wet basis)	12.18	2.22	0.68	5.39
Emission Rate (lb/hr)	N/A	0.01	0.01	N/A

Questor Technology Inc
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.1	%
Stack Exhaust Flow (M2)	81,549	SCFH

Weather Data

Barometric Pressure	30.47	in. Hg
Relative Humidity	83	%
Ambient Temperature	25	° F
Specific Humidity	0.002217	lb H ₂ O / lb air

70-100-70 Load, Run - Q250-R8

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/28/15 10:31:17	60960	13.53	1.34	0.69	5.32	44.46	27.10	1,529.00
	02/28/15 10:31:47	60990	13.26	1.28	0.68	5.53	44.46	27.10	1,529.00
	02/28/15 10:32:17	61020	13.19	1.09	0.70	5.59	44.08	27.20	1,989.00
	02/28/15 10:32:47	61050	13.22	0.98	0.68	5.58	44.08	27.20	1,989.00
	02/28/15 10:33:17	61080	13.54	1.11	0.67	5.35	43.65	27.20	2,285.00
	02/28/15 10:33:47	61110	13.47	1.37	0.69	5.38	43.65	27.20	2,285.00
	02/28/15 10:34:17	61140	13.45	1.27	0.68	5.39	43.41	27.10	2,276.00
	02/28/15 10:34:47	61170	13.10	1.16	0.68	5.62	43.41	27.10	2,276.00
	02/28/15 10:35:17	61200	13.31	1.06	0.70	5.48	43.15	27.10	2,254.00
	02/28/15 10:35:47	61230	13.41	1.27	0.67	5.38	43.15	27.10	2,254.00
	02/28/15 10:36:17	61260	12.95	1.20	0.64	5.77	42.94	27.10	2,269.00
	02/28/15 10:36:47	61290	13.07	2.22	0.65	5.58	42.94	27.10	2,269.00
	02/28/15 10:37:17	61320	12.99	1.51	0.64	5.74	42.71	26.90	2,249.00
	02/28/15 10:37:47	61350	13.11	1.56	0.64	5.64	42.71	26.90	2,249.00
	02/28/15 10:38:17	61380	13.22	1.48	0.65	5.54	42.48	26.90	2,252.00
	02/28/15 10:38:47	61410	13.20	1.52	0.65	5.53	42.48	26.90	2,252.00
	02/28/15 10:39:17	61440	13.15	1.58	0.66	5.58	42.25	26.90	2,243.00
	02/28/15 10:39:47	61470	12.82	1.43	0.67	5.88	42.25	26.90	2,243.00
	02/28/15 10:40:17	61500	13.05	1.24	0.68	5.68	42.03	26.90	2,258.00
	02/28/15 10:40:47	61530	12.76	1.17	0.68	5.90	42.03	26.90	2,258.00
	02/28/15 10:41:17	61560	13.08	1.11	0.67	5.66	41.82	26.90	2,249.00
	02/28/15 10:41:47	61590	12.78	1.16	0.68	5.85	41.82	26.90	2,249.00
	02/28/15 10:42:17	61620	12.97	1.03	0.66	5.80	41.60	27.00	2,251.00
	02/28/15 10:42:47	61650	13.00	1.08	0.68	5.72	41.60	27.00	2,251.00
	02/28/15 10:43:17	61680	13.09	1.16	0.66	5.65	41.38	27.00	2,242.00
	02/28/15 10:43:47	61710	13.13	1.11	0.64	5.61	41.38	27.00	2,242.00
	02/28/15 10:44:17	61740	13.18	1.25	0.68	5.54	41.17	27.00	2,233.00
	02/28/15 10:44:47	61770	13.21	1.29	0.64	5.52	41.17	27.00	2,233.00
	02/28/15 10:45:17	61800	13.26	1.36	0.66	5.45	40.96	27.00	2,236.00
	02/28/15 10:45:47	61830	13.19	1.37	0.65	5.57	40.96	27.00	2,236.00
	02/28/15 10:46:17	61860	13.14	1.33	0.63	5.56	40.74	26.90	2,228.00
	02/28/15 10:46:47	61890	13.30	1.26	0.65	5.50	40.74	26.90	2,228.00
	02/28/15 10:47:17	61920	13.31	1.43	0.64	5.43	40.53	26.90	2,242.00
	02/28/15 10:47:47	61950	13.14	1.25	0.64	5.58	40.53	26.90	2,242.00
	02/28/15 10:48:17	61980	12.91	1.27	0.60	5.78	40.32	26.80	2,234.00
	02/28/15 10:48:47	62010	13.15	1.16	0.53	5.54	40.32	26.80	2,234.00
	02/28/15 10:49:17	62040	12.84	1.14	0.51	5.87	40.47	26.70	1,663.00
	02/28/15 10:49:47	62070	12.98	0.93	0.51	5.73	40.47	26.70	1,663.00
	02/28/15 10:50:17	62100	13.37	1.04	0.53	5.39	40.47	26.70	1,539.00
	02/28/15 10:50:47	62130	13.31	1.19	0.52	5.44	40.47	26.70	1,539.00
	02/28/15 10:51:17	62160	13.28	1.13	0.49	5.48	40.45	26.80	1,504.00
	02/28/15 10:51:47	62190	12.94	1.22	0.47	5.71	40.45	26.80	1,504.00
	02/28/15 10:52:17	62220	12.93	1.04	0.44	5.80	40.38	26.90	1,524.00
	02/28/15 10:52:47	62250	13.17	1.04	0.40	5.54	40.38	26.90	1,524.00
	02/28/15 10:53:17	62280	13.95	1.49	0.35	5.02	40.11	27.00	1,863.00
	02/28/15 10:53:47	62310	14.41	3.23	0.34	4.68	40.11	27.00	1,863.00
A2	02/28/15 10:54:17	62340	14.79	4.78	0.35	4.41	39.69	27.00	2,240.00
	02/28/15 10:54:47	62370	14.90	5.70	0.36	4.32	39.69	27.00	2,240.00
	02/28/15 10:55:17	62400	15.17	6.92	0.35	4.11	39.47	26.90	2,254.00
	02/28/15 10:55:47	62430	15.04	7.82	0.32	4.21	39.47	26.90	2,254.00
	02/28/15 10:56:17	62460	14.99	7.89	0.27	4.25	39.25	26.90	2,233.00
	02/28/15 10:56:47	62490	15.26	8.45	0.26	4.09	39.25	26.90	2,233.00
	02/28/15 10:57:17	62520	15.04	9.45	0.23	4.21	39.03	26.90	2,246.00
	02/28/15 10:57:47	62550	12.97	7.16	0.16	5.57	39.03	26.90	2,246.00
	02/28/15 10:58:17	62580	12.11	1.74	0.09	6.36	38.83	26.90	2,238.00
	02/28/15 10:58:47	62610	12.21	0.68	0.05	6.38	38.83	26.90	2,238.00
	02/28/15 10:59:17	62640	12.99	0.81	0.03	5.72	38.63	27.00	2,229.00
	02/28/15 10:59:47	62670	12.97	1.06	-0.02	5.72	38.63	27.00	2,229.00
	02/28/15 11:00:17	62700	13.02	1.12	-0.03	5.67	38.43	27.00	2,242.00
	02/28/15 11:00:47	62730	12.91	1.09	-0.03	5.75	38.43	27.00	2,242.00
	02/28/15 11:01:17	62760	13.16	1.11	-0.04	5.57	38.33	27.00	2,096.00

Questor Technology Inc
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.1	%
Stack Exhaust Flow (M2)	81,549	SCFH

Weather Data

Barometric Pressure	30.47	in. Hg
Relative Humidity	83	%
Ambient Temperature	25	° F
Specific Humidity	0.002217	lb H ₂ O / lb air

70-100-70 Load, Run - Q250-R8

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/28/15 11:01:47	62790	13.06	1.11	-0.08	5.64	38.33	27.00	2,096.00
	02/28/15 11:02:17	62820	13.06	0.96	-0.11	5.64	38.53	27.20	1,537.00
	02/28/15 11:02:47	62850	13.01	0.91	-0.13	5.70	38.53	27.20	1,537.00
	02/28/15 11:03:17	62880	13.02	0.89	-0.16	5.68	38.51	27.40	1,525.00
	02/28/15 11:03:47	62910	13.00	0.88	-0.23	5.70	38.51	27.40	1,525.00
	02/28/15 11:04:17	62940	13.04	0.92	-0.25	5.65	38.45	27.60	1,522.00
	02/28/15 11:04:47	62970	12.92	0.90	-0.28	5.75	38.45	27.60	1,522.00
	02/28/15 11:05:17	63000	12.97	0.79	-0.32	5.72	38.38	27.90	1,509.00
	02/28/15 11:05:47	63030	13.30	0.84	-0.05	5.51	38.38	27.90	1,509.00
	02/28/15 11:06:17	63060	14.06	1.92	0.47	4.88	38.33	28.10	1,506.00
	02/28/15 11:06:47	63090	13.85	2.52	0.42	5.02	38.33	28.10	1,506.00
	02/28/15 11:07:17	63120	13.94	3.17	0.38	4.96	38.05	28.20	1,862.00
	02/28/15 11:07:47	63150	13.99	3.21	0.36	4.93	38.05	28.20	1,862.00
	02/28/15 11:08:17	63180	13.86	3.30	0.37	5.00	37.62	28.20	2,212.00
	02/28/15 11:08:47	63210	13.65	2.86	0.34	5.15	37.62	28.20	2,212.00
	02/28/15 11:09:17	63240	13.85	2.72	0.34	5.02	37.41	28.10	2,235.00
	02/28/15 11:09:47	63270	13.85	3.26	0.31	5.02	37.41	28.10	2,235.00
	02/28/15 11:10:17	63300	13.93	3.88	0.26	4.96	37.20	28.00	2,227.00
	02/28/15 11:10:47	63330	13.88	3.83	0.24	5.02	37.20	28.00	2,227.00
	02/28/15 11:11:17	63360	13.74	3.75	0.23	5.06	36.99	27.80	2,240.00
	02/28/15 11:11:47	63390	11.96	2.41	0.16	6.47	36.99	27.80	2,240.00
	02/28/15 11:12:17	63420	12.99	1.48	0.12	5.73	36.79	27.70	2,232.00
	02/28/15 11:12:47	63450	12.98	2.00	0.12	5.69	36.79	27.70	2,232.00
	02/28/15 11:13:17	63480	12.83	1.81	0.07	5.81	36.59	27.60	2,223.00
	02/28/15 11:13:47	63510	12.89	1.77	0.07	5.78	36.59	27.60	2,223.00
	02/28/15 11:14:17	63540	12.84	1.84	0.03	5.79	36.40	27.50	2,236.00
	02/28/15 11:14:47	63570	12.75	1.99	0.04	5.87	36.40	27.50	2,236.00
	02/28/15 11:15:17	63600	12.68	2.82	0.01	5.93	36.20	27.50	2,217.00
	02/28/15 11:15:47	63630	12.80	2.92	-0.04	5.85	36.20	27.50	2,217.00
	02/28/15 11:16:17	63660	12.75	2.60	-0.10	5.88	36.03	27.40	2,210.00
	02/28/15 11:16:47	63690	12.78	2.18	0.12	5.85	36.03	27.40	2,210.00
A3	02/28/15 11:17:17	63720	13.06	1.66	0.38	5.68	36.17	27.40	1,706.00
	02/28/15 11:17:47	63750	13.20	1.18	0.33	5.52	36.17	27.40	1,706.00
	02/28/15 11:18:17	63780	13.10	0.98	0.26	5.60	36.23	27.40	1,510.00
	02/28/15 11:18:47	63810	13.08	0.87	0.24	5.62	36.23	27.40	1,510.00
	02/28/15 11:19:17	63840	13.10	0.85	0.23	5.62	36.19	27.60	1,509.00
	02/28/15 11:19:47	63870	13.13	0.93	0.17	5.56	36.19	27.60	1,509.00
	02/28/15 11:20:17	63900	13.20	0.95	0.17	5.52	36.15	27.70	1,496.00
	02/28/15 11:20:47	63930	13.31	1.00	0.12	5.46	36.15	27.70	1,496.00
	02/28/15 11:21:17	63960	13.60	1.33	0.08	5.24	36.10	27.80	1,495.00
	02/28/15 11:21:47	63990	13.90	1.66	0.06	5.00	36.10	27.80	1,495.00
	02/28/15 11:22:17	64020	13.73	1.39	0.04	5.08	36.05	28.00	1,482.00
	02/28/15 11:22:47	64050	13.65	1.21	0.01	5.15	36.05	28.00	1,482.00
	02/28/15 11:23:17	64080	13.76	1.22	-0.01	5.08	35.71	28.10	1,934.00
	02/28/15 11:23:47	64110	13.80	1.35	-0.03	5.10	35.71	28.10	1,934.00
	02/28/15 11:24:17	64140	13.82	1.73	-0.05	5.04	35.38	28.10	2,188.00
	02/28/15 11:24:47	64170	13.83	1.69	-0.09	5.03	35.38	28.10	2,188.00
	02/28/15 11:25:17	64200	13.89	1.87	0.11	5.00	35.18	28.00	2,179.00
	02/28/15 11:25:47	64230	13.77	1.87	0.50	5.06	35.18	28.00	2,179.00
	02/28/15 11:26:17	64260	13.96	1.88	0.46	4.95	35.00	27.90	2,182.00
	02/28/15 11:26:47	64290	13.86	2.31	0.42	5.01	35.00	27.90	2,182.00
	02/28/15 11:27:17	64320	13.61	2.17	0.40	5.16	34.83	27.80	2,175.00
	02/28/15 11:27:47	64350	12.43	1.49	0.37	6.11	34.83	27.80	2,175.00
	02/28/15 11:28:17	64380	12.67	0.84	0.35	5.97	34.64	27.80	2,157.00
	02/28/15 11:28:47	64410	12.83	0.96	0.32	5.81	34.64	27.80	2,157.00
	02/28/15 11:29:17	64440	13.04	1.02	0.30	5.63	34.47	27.80	2,159.00
	02/28/15 11:29:47	64470	12.81	1.01	0.28	5.82	34.47	27.80	2,159.00
	02/28/15 11:30:17	64500	12.84	0.86	0.22	5.86	34.31	27.80	2,162.00
	02/28/15 11:30:47	64530	13.08	0.85	0.19	5.63	34.31	27.80	2,162.00
	02/28/15 11:31:17	64560	12.93	0.82	0.15	5.74	34.14	27.90	2,154.00
	02/28/15 11:31:47	64590	12.88	0.81	0.13	5.80	34.14	27.90	2,154.00

Questor Technology Inc
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.1	%
Stack Exhaust Flow (M2)	81,549	SCFH

Weather Data

Barometric Pressure	30.47	in. Hg
Relative Humidity	83	%
Ambient Temperature	25	°F
Specific Humidity	0.002217	lb H ₂ O / lb air

70-100-70 Load, Run - Q250-R8

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/28/15 11:32:17	64620	13.10	0.70	0.09	5.64	33.98	28.00	2,146.00
02/28/15 11:32:47	64650	13.07	0.86	0.07	5.63	33.98	28.00	2,146.00
02/28/15 11:33:17	64680	13.12	0.92	0.00	5.60	34.12	28.10	1,654.00
02/28/15 11:33:47	64710	13.14	0.99	-0.03	5.58	34.12	28.10	1,654.00
02/28/15 11:34:17	64740	13.25	0.91	-0.03	5.50	34.14	28.40	1,514.00
02/28/15 11:34:47	64770	13.16	0.88	-0.04	5.57	34.14	28.40	1,514.00
02/28/15 11:35:17	64800	13.34	0.95	-0.10	5.42	34.09	28.60	1,512.00
02/28/15 11:35:47	64830	13.20	0.98	-0.14	5.50	34.09	28.60	1,512.00
02/28/15 11:36:17	64860	13.25	0.99	-0.15	5.49	34.06	28.90	1,520.00
02/28/15 11:36:47	64890	13.26	1.00	-0.17	5.49	34.06	28.90	1,520.00
02/28/15 11:37:17	64920	13.84	1.25	-0.21	5.07	34.00	29.00	1,527.00
02/28/15 11:37:47	64950	14.90	2.53	-0.22	4.33	34.00	29.00	1,527.00
02/28/15 11:38:17	64980	14.93	3.86	-0.26	4.31	33.95	29.20	1,526.00
02/28/15 11:38:47	65010	14.93	4.73	-0.29	4.26	33.95	29.20	1,526.00
02/28/15 11:39:17	65040	14.78	5.41	-0.32	4.40	33.91	29.30	1,514.00
02/28/15 11:39:47	65070	14.83	5.63	-0.36	4.36	33.91	29.30	1,514.00
02/28/15 11:40:17	65100	14.83	5.35	-0.38	4.35	33.85	29.40	1,522.00
02/28/15 11:40:47	65130	14.85	5.42	-0.45	4.34	33.85	29.40	1,522.00
02/28/15 11:41:17	65160	14.75	5.98	-0.49	4.41	33.80	29.50	1,520.00
02/28/15 11:41:47	65190	14.89	5.99	-0.53	4.31	33.80	29.50	1,520.00
RAW AVERAGE		13.41	2.02	0.25	5.39	38.10	27.57	1,962.34

Bias	Serial Number: INST-O2-0013 INST-CO-0029 INST-TH-0009 INST-C2-0013				1442557	1442557	1442557
					(in. H ₂ O)	(°F)	(SCFH)
		O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Press. Trans	Temp. Trans.
	Initial Zero	0.09	0.08	0.04	0.15		
	Final Zero	0.10	0.20	-0.07	0.10		
	Avg. Zero	0.10	0.14	-0.02	0.13		
	Initial UpScale	11.89	9.13	5.02	9.06		
	Final UpScale	11.92	9.08	5.04	8.99		
	Avg. UpScale	11.91	9.11	5.03	9.03		
Upscale Cal Gas		11.88	9.02	5.01	9.11		

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	13.39	1.89	0.26	5.39
Corrected Raw Average (ppm/% wet basis)	12.70	1.78	0.25	5.11
Emission Rate (lb/hr)	N/A	0.01	0.00	N/A

Questor Technology Inc
February 28, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.5	%
Stack Exhaust Flow (M2)	76,880	SCFH

Weather Data

Barometric Pressure	30.43	in. Hg
Relative Humidity	88	%
Ambient Temperature	27	°F
Specific Humidity	0.002587	lb H ₂ O / lb air

70-100-70 Load, Run - Q250-R9

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/28/15 12:27:04	1500	12.81	0.40	1.04	5.80	34.19	30.80	1,448.00
	02/28/15 12:27:34	1530	12.42	0.38	1.06	6.13	34.19	30.80	1,448.00
	02/28/15 12:28:04	1560	12.62	0.34	1.08	5.99	34.14	30.70	1,447.00
	02/28/15 12:28:34	1590	12.70	0.37	1.08	5.92	34.14	30.70	1,447.00
	02/28/15 12:29:04	1620	12.76	0.39	1.07	5.88	34.09	30.70	1,436.00
	02/28/15 12:29:34	1650	12.94	0.47	1.08	5.74	34.09	30.70	1,436.00
	02/28/15 12:30:04	1680	13.11	0.63	1.26	5.58	34.04	30.70	1,424.00
	02/28/15 12:30:34	1710	13.05	0.63	1.26	5.65	34.04	30.70	1,424.00
	02/28/15 12:31:04	1740	13.05	0.71	1.27	5.60	33.99	30.70	1,423.00
	02/28/15 12:31:34	1770	12.69	0.54	1.27	5.94	33.99	30.70	1,423.00
	02/28/15 12:32:04	1800	12.92	0.44	1.22	5.71	33.66	30.60	1,855.00
	02/28/15 12:32:34	1830	12.85	0.53	1.45	5.76	33.66	30.60	1,855.00
	02/28/15 12:33:04	1860	12.63	0.48	2.04	5.97	33.33	30.50	2,116.00
	02/28/15 12:33:34	1890	13.84	0.86	2.03	5.10	33.33	30.50	2,116.00
	02/28/15 12:34:04	1920	13.34	2.58	2.03	5.36	33.10	30.50	2,144.00
	02/28/15 12:34:34	1950	13.02	2.58	2.03	5.65	33.10	30.50	2,144.00
	02/28/15 12:35:04	1980	12.99	1.31	0.59	5.67	32.87	30.40	2,202.00
	02/28/15 12:35:34	2010	12.86	1.12	0.60	5.80	32.87	30.40	2,202.00
	02/28/15 12:36:04	2040	12.70	0.90	0.58	5.89	32.66	30.20	2,212.00
	02/28/15 12:36:34	2070	12.70	0.75	0.57	5.92	32.66	30.20	2,212.00
	02/28/15 12:37:04	2100	12.65	0.75	0.60	5.97	32.46	30.10	2,213.00
	02/28/15 12:37:34	2130	12.50	0.71	0.58	6.05	32.46	30.10	2,213.00
	02/28/15 12:38:04	2160	12.68	0.65	0.58	5.96	32.26	30.00	2,194.00
	02/28/15 12:38:34	2190	12.54	0.71	0.58	6.04	32.26	30.00	2,194.00
	02/28/15 12:39:04	2220	12.69	0.72	0.58	5.94	32.07	29.90	2,205.00
	02/28/15 12:39:34	2250	12.83	0.82	0.60	5.82	32.07	29.90	2,205.00
	02/28/15 12:40:04	2280	12.64	0.77	0.58	5.96	31.88	29.90	2,195.00
	02/28/15 12:40:34	2310	12.76	0.72	0.59	5.87	31.88	29.90	2,195.00
	02/28/15 12:41:04	2340	12.78	0.70	0.58	5.85	31.70	29.80	2,187.00
	02/28/15 12:41:34	2370	12.80	0.74	0.58	5.83	31.70	29.80	2,187.00
	02/28/15 12:42:04	2400	12.67	0.76	0.59	5.91	31.57	29.70	2,097.00
	02/28/15 12:42:34	2430	12.78	0.71	0.60	5.83	31.57	29.70	2,097.00
	02/28/15 12:43:04	2460	12.69	0.67	0.59	5.92	31.63	29.70	1,817.00
	02/28/15 12:43:34	2490	12.89	0.65	0.60	5.78	31.63	29.70	1,817.00
	02/28/15 12:44:04	2520	12.71	0.80	0.59	5.81	31.56	29.80	1,748.00
	02/28/15 12:44:34	2550	11.28	0.53	0.61	6.96	31.56	29.80	1,748.00
	02/28/15 12:45:04	2580	11.76	0.18	0.60	6.68	31.60	29.80	1,571.00
	02/28/15 12:45:34	2610	11.80	0.22	0.60	6.59	31.60	29.80	1,571.00
	02/28/15 12:46:04	2640	12.09	0.20	0.60	6.41	31.61	29.90	1,486.00
	02/28/15 12:46:34	2670	12.61	0.19	0.57	6.02	31.61	29.90	1,486.00
	02/28/15 12:47:04	2700	12.89	0.27	0.59	5.73	31.55	30.00	1,493.00
	02/28/15 12:47:34	2730	12.86	0.34	0.58	5.80	31.55	30.00	1,493.00
	02/28/15 12:48:04	2760	12.97	0.36	0.57	5.71	31.50	30.20	1,491.00
	02/28/15 12:48:34	2790	12.97	0.38	0.58	5.68	31.50	30.20	1,491.00
	02/28/15 12:49:04	2820	12.99	0.44	0.59	5.67	31.45	30.30	1,480.00
	02/28/15 12:49:34	2850	12.71	0.43	0.59	5.87	31.45	30.30	1,480.00
A2	02/28/15 12:50:04	2880	12.76	0.33	0.59	5.88	31.36	30.40	1,552.00
	02/28/15 12:50:34	2910	12.96	0.39	0.60	5.70	31.36	30.40	1,552.00
	02/28/15 12:51:04	2940	12.99	0.43	0.58	5.69	30.92	30.40	2,082.00
	02/28/15 12:51:34	2970	12.72	0.49	0.59	5.84	30.92	30.40	2,082.00
	02/28/15 12:52:04	3000	12.23	0.36	0.58	6.22	30.65	30.30	2,172.00
	02/28/15 12:52:34	3030	12.75	0.47	0.60	5.96	30.65	30.30	2,172.00
	02/28/15 12:53:04	3060	13.32	0.99	0.56	5.38	30.44	30.20	2,180.00
	02/28/15 12:53:34	3090	13.40	1.30	0.58	5.34	30.44	30.20	2,180.00
	02/28/15 12:54:04	3120	13.32	1.44	0.59	5.40	30.24	30.00	2,181.00
	02/28/15 12:54:34	3150	13.29	1.37	0.59	5.43	30.24	30.00	2,181.00
	02/28/15 12:55:04	3180	13.26	1.29	0.58	5.46	30.05	29.90	2,181.00
	02/28/15 12:55:34	3210	13.35	1.20	0.59	5.38	30.05	29.90	2,181.00
	02/28/15 12:56:04	3240	13.30	1.20	0.59	5.40	29.85	29.70	2,154.00
	02/28/15 12:56:34	3270	13.16	1.11	0.59	5.52	29.85	29.70	2,154.00
	02/28/15 12:57:04	3300	13.19	1.04	0.58	5.50	29.69	29.50	2,164.00
	02/28/15 12:57:34	3330	13.18	1.06	0.59	5.52	29.69	29.50	2,164.00

Questor Technology Inc
February 28, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.5	%
Stack Exhaust Flow (M2)	76,880	SCFH

Weather Data

Barometric Pressure	30.43	in. Hg
Relative Humidity	88	%
Ambient Temperature	27	°F
Specific Humidity	0.002587	lb H ₂ O / lb air

70-100-70 Load, Run - Q250-R9

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/28/15 12:58:04	3360	13.38	1.25	0.60	5.34	29.51	29.40	2,156.00
	02/28/15 12:58:34	3390	13.38	1.34	0.57	5.34	29.51	29.40	2,156.00
	02/28/15 12:59:04	3420	13.35	1.28	0.59	5.37	29.32	29.40	2,156.00
	02/28/15 12:59:34	3450	13.32	1.27	0.58	5.39	29.32	29.40	2,156.00
	02/28/15 13:00:04	3480	13.44	1.25	0.58	5.30	29.14	29.30	2,138.00
	02/28/15 13:00:34	3510	13.27	1.28	0.59	5.42	29.14	29.30	2,138.00
	02/28/15 13:01:04	3540	13.36	1.08	0.59	5.38	28.96	29.20	2,147.00
	02/28/15 13:01:34	3570	13.41	1.16	0.59	5.30	28.96	29.20	2,147.00
	02/28/15 13:02:04	3600	13.24	1.52	0.59	5.44	29.14	29.10	1,621.00
	02/28/15 13:02:34	3630	13.24	2.80	0.59	5.45	29.14	29.10	1,621.00
	02/28/15 13:03:04	3660	13.27	2.60	0.59	5.43	29.33	29.10	1,262.00
	02/28/15 13:03:34	3690	13.83	1.85	0.58	5.09	29.33	29.10	1,262.00
	02/28/15 13:04:04	3720	14.93	3.08	0.58	4.25	29.27	29.20	1,412.00
	02/28/15 13:04:34	3750	14.89	3.37	0.60	4.30	29.27	29.20	1,412.00
	02/28/15 13:05:04	3780	14.69	3.67	0.58	4.41	29.19	29.40	1,463.00
	02/28/15 13:05:34	3810	14.47	3.40	0.59	4.55	29.19	29.40	1,463.00
	02/28/15 13:06:04	3840	13.97	2.48	0.60	4.91	29.12	29.40	1,478.00
	02/28/15 13:06:34	3870	13.94	1.89	0.58	4.93	29.12	29.40	1,478.00
	02/28/15 13:07:04	3900	13.80	1.99	0.57	4.99	28.84	29.50	1,820.00
	02/28/15 13:07:34	3930	13.79	1.55	0.58	5.02	28.84	29.50	1,820.00
	02/28/15 13:08:04	3960	13.79	1.57	0.59	5.05	28.45	29.40	2,121.00
	02/28/15 13:08:34	3990	13.88	2.06	0.59	4.94	28.45	29.40	2,121.00
	02/28/15 13:09:04	4020	13.35	2.64	0.59	5.37	28.26	29.20	2,121.00
	02/28/15 13:09:34	4050	13.31	1.95	0.60	5.38	28.26	29.20	2,121.00
	02/28/15 13:10:04	4080	13.34	1.78	0.60	5.38	28.07	29.00	2,121.00
	02/28/15 13:10:34	4110	13.37	1.59	0.58	5.33	28.07	29.00	2,121.00
	02/28/15 13:11:04	4140	13.30	1.38	0.59	5.42	27.88	28.90	2,130.00
	02/28/15 13:11:34	4170	13.35	1.35	0.59	5.35	27.88	28.90	2,130.00
	02/28/15 13:12:04	4200	13.39	1.35	0.61	5.34	27.72	28.70	2,122.00
	02/28/15 13:12:34	4230	13.51	1.36	0.60	5.24	27.72	28.70	2,122.00
A3	02/28/15 13:13:04	4260	13.37	1.31	0.59	5.34	27.54	28.50	2,114.00
	02/28/15 13:13:34	4290	13.52	1.33	0.58	5.23	27.54	28.50	2,114.00
	02/28/15 13:14:04	4320	13.45	1.40	0.58	5.27	27.37	28.30	2,106.00
	02/28/15 13:14:34	4350	13.38	1.36	0.23	5.34	27.37	28.30	2,106.00
	02/28/15 13:15:04	4380	13.37	1.30	0.19	5.36	27.21	28.20	2,098.00
	02/28/15 13:15:34	4410	13.33	1.30	0.21	5.39	27.21	28.20	2,098.00
	02/28/15 13:16:04	4440	13.57	1.31	0.20	5.19	27.16	28.10	1,925.00
	02/28/15 13:16:34	4470	13.43	1.45	0.20	5.30	27.16	28.10	1,925.00
	02/28/15 13:17:04	4500	13.49	1.49	0.21	5.22	27.53	28.10	1,255.00
	02/28/15 13:17:34	4530	13.72	1.52	0.21	5.12	27.53	28.10	1,255.00
	02/28/15 13:18:04	4560	15.16	2.85	0.19	4.21	27.48	28.20	1,383.00
	02/28/15 13:18:34	4590	15.36	6.71	0.19	3.94	27.48	28.20	1,383.00
	02/28/15 13:19:04	4620	15.28	6.35	0.57	4.00	27.39	28.30	1,482.00
	02/28/15 13:19:34	4650	14.73	5.71	1.08	4.39	27.39	28.30	1,482.00
	02/28/15 13:20:04	4680	14.39	4.36	1.07	4.61	27.32	28.30	1,505.00
	02/28/15 13:20:34	4710	14.27	3.27	1.08	4.69	27.32	28.30	1,505.00
	02/28/15 13:21:04	4740	14.02	2.75	1.07	4.88	27.26	28.40	1,511.00
	02/28/15 13:21:34	4770	14.15	2.55	1.06	4.79	27.26	28.40	1,511.00
	02/28/15 13:22:04	4800	14.21	2.60	1.06	4.75	27.20	28.60	1,508.00
	02/28/15 13:22:34	4830	14.19	2.77	1.06	4.75	27.20	28.60	1,508.00
	02/28/15 13:23:04	4860	14.14	2.82	1.07	4.78	27.15	28.60	1,515.00
	02/28/15 13:23:34	4890	13.87	2.56	1.08	4.97	27.15	28.60	1,515.00
	02/28/15 13:24:04	4920	13.81	1.96	1.06	5.00	27.09	28.60	1,504.00
	02/28/15 13:24:34	4950	13.99	1.88	1.08	4.92	27.09	28.60	1,504.00
	02/28/15 13:25:04	4980	14.07	2.41	1.06	4.83	26.75	28.60	1,913.00
	02/28/15 13:25:34	5010	13.99	2.52	1.07	4.91	26.75	28.60	1,913.00
	02/28/15 13:26:04	5040	14.05	2.52	1.08	4.85	26.44	28.50	2,075.00
	02/28/15 13:26:34	5070	13.45	2.64	1.08	5.23	26.44	28.50	2,075.00
	02/28/15 13:27:04	5100	13.69	3.48	1.06	5.10	26.25	28.40	2,074.00
	02/28/15 13:27:34	5130	13.44	3.28	1.06	5.27	26.25	28.40	2,074.00
	02/28/15 13:28:04	5160	13.61	2.64	1.08	5.15	26.08	28.20	2,066.00
	02/28/15 13:28:34	5190	13.61	2.58	1.07	5.15	26.08	28.20	2,066.00

Questor Technology Inc
February 28, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.5	%
Stack Exhaust Flow (M2)	76,880	SCFH

Weather Data

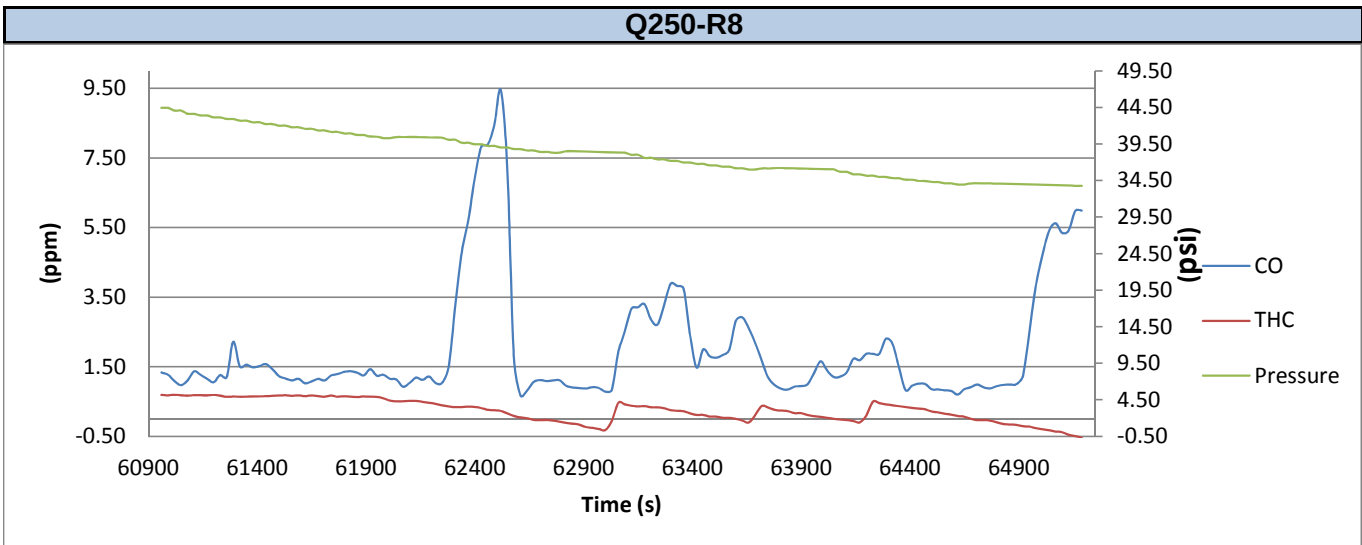
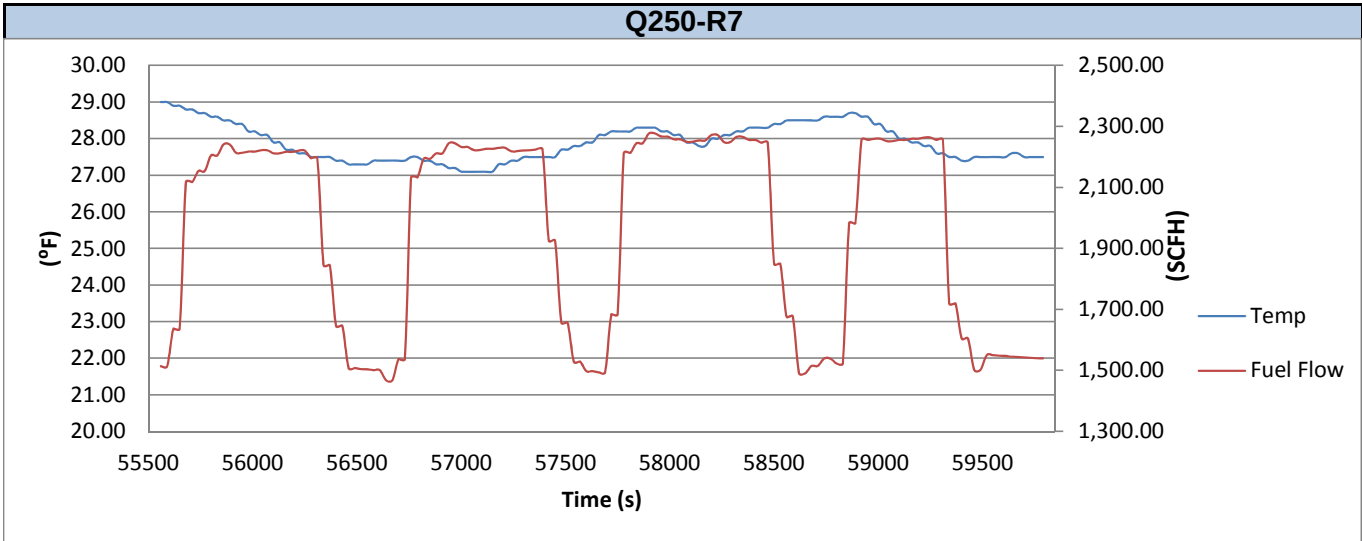
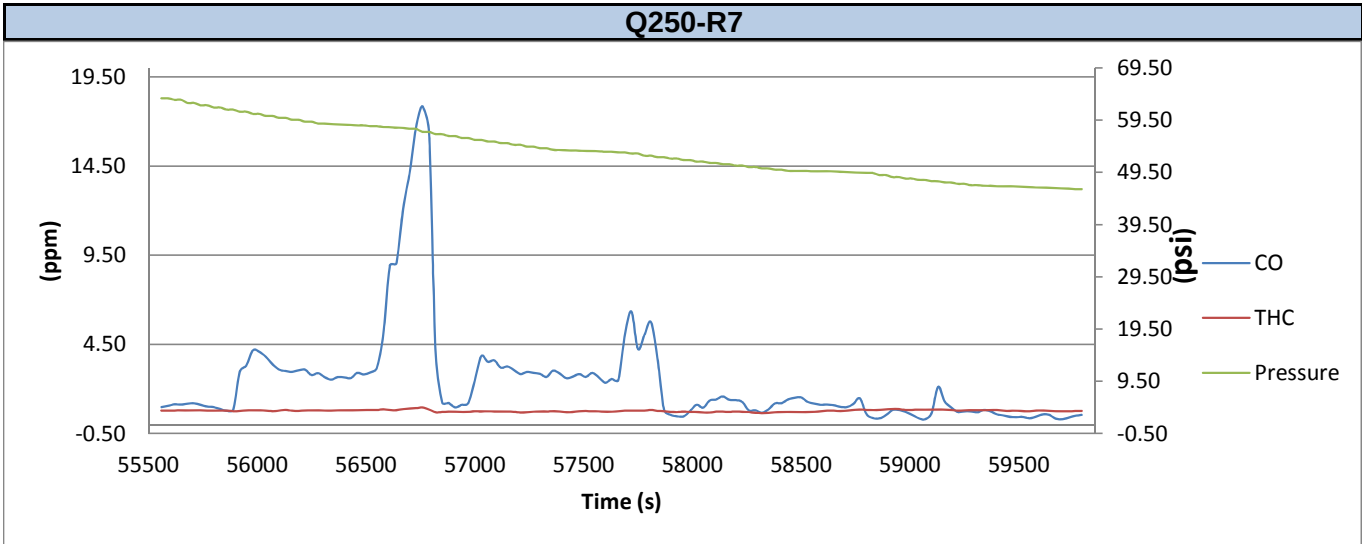
Barometric Pressure	30.43	in. Hg
Relative Humidity	88	%
Ambient Temperature	27	°F
Specific Humidity	0.002587	lb H ₂ O / lb air

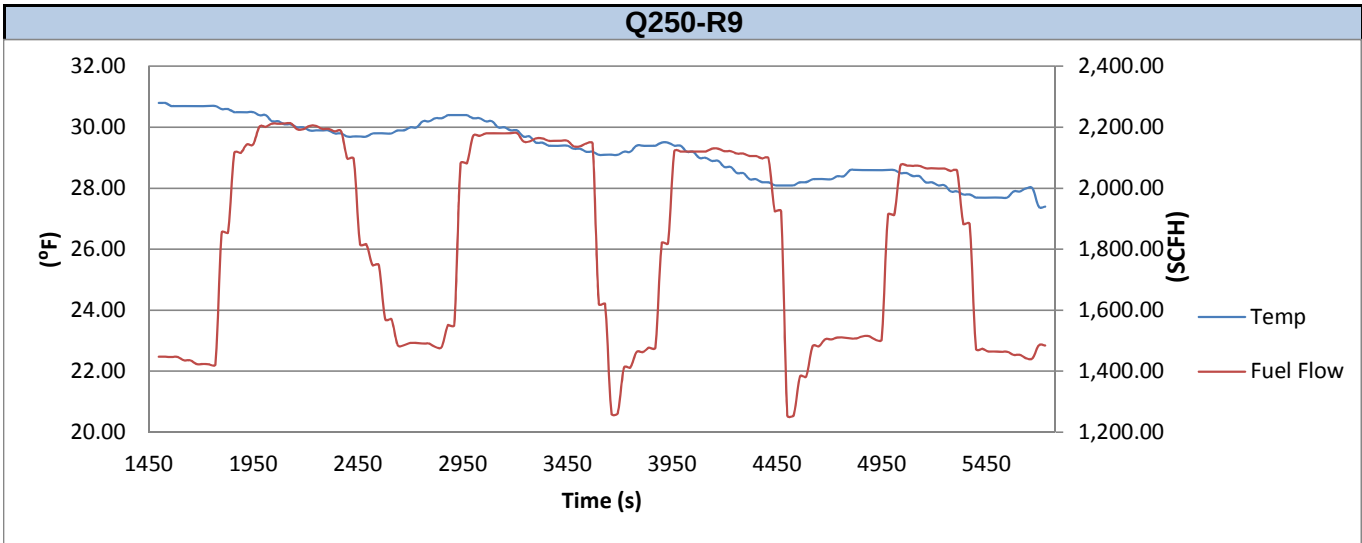
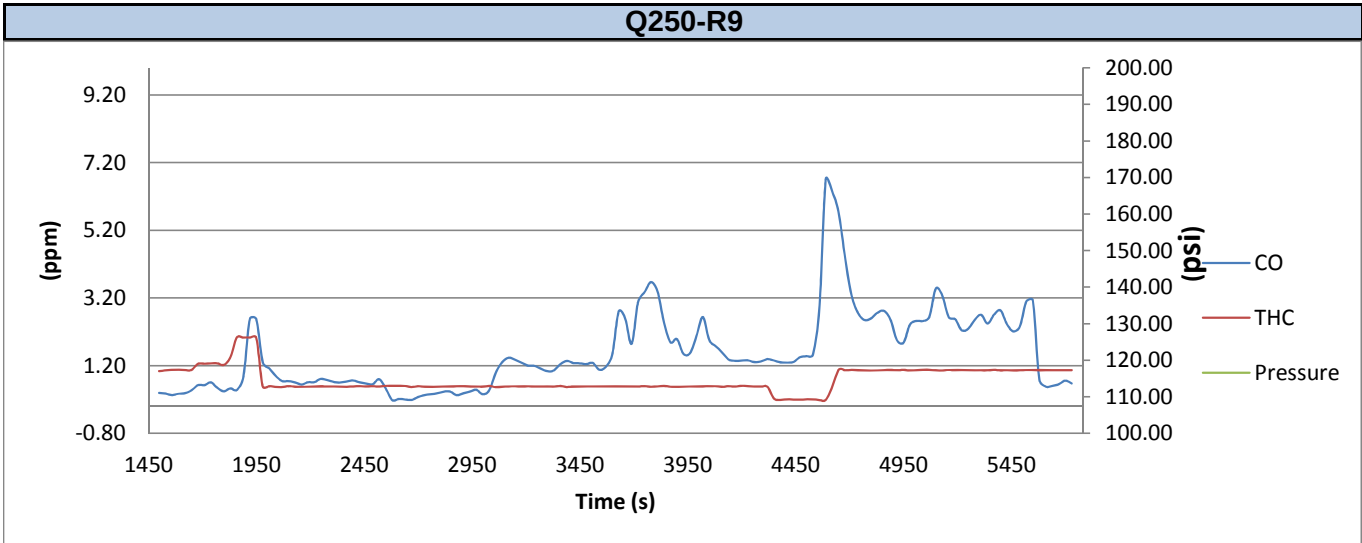
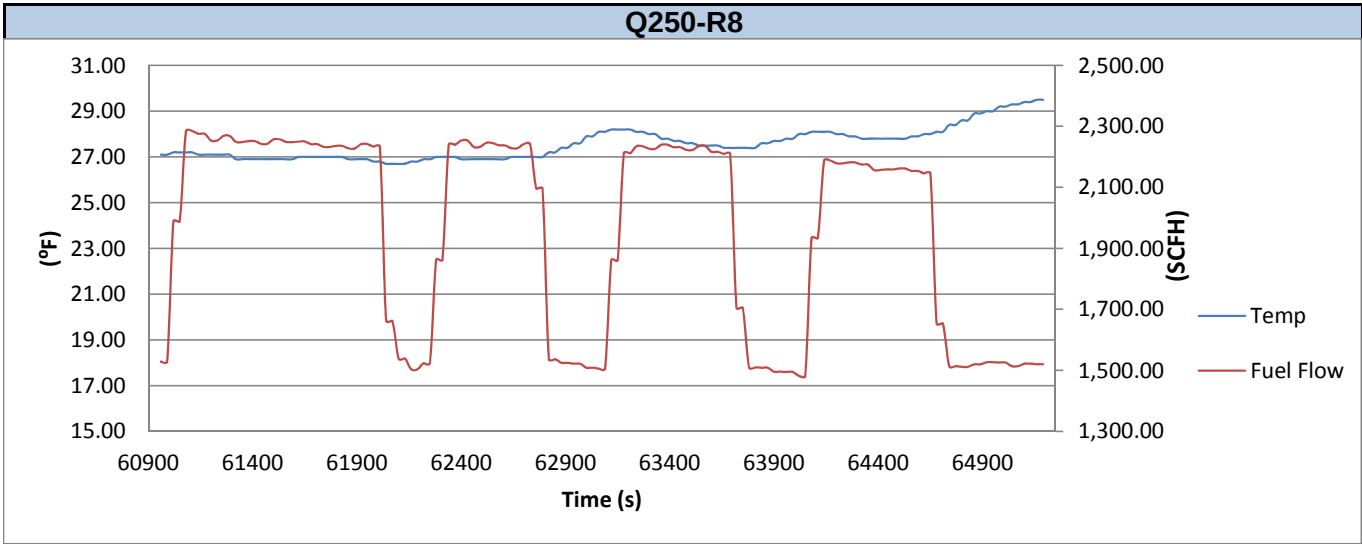
70-100-70 Load, Run - Q250-R9

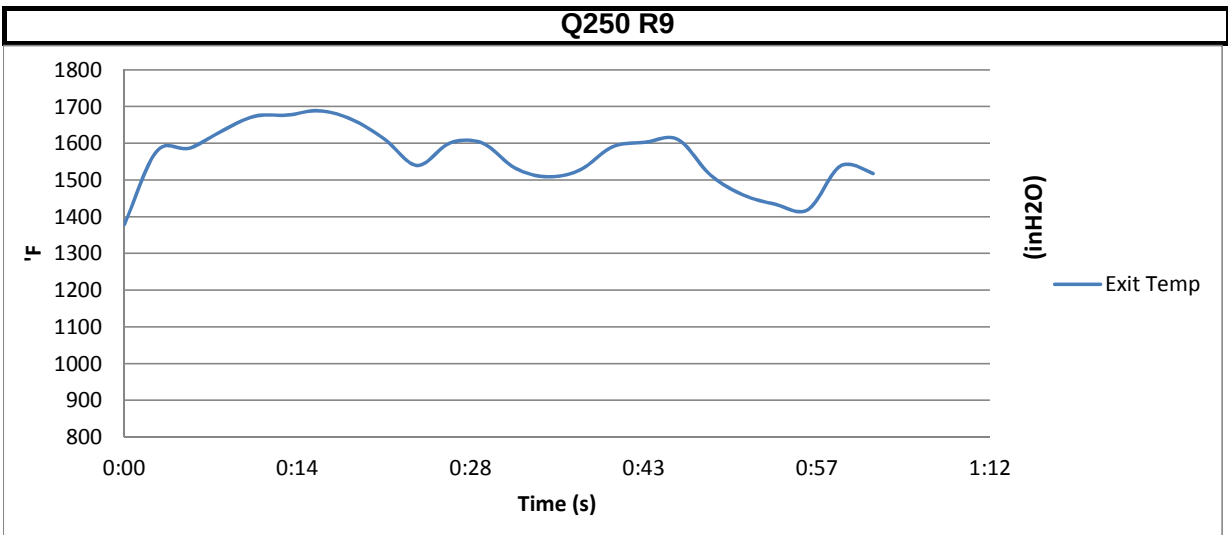
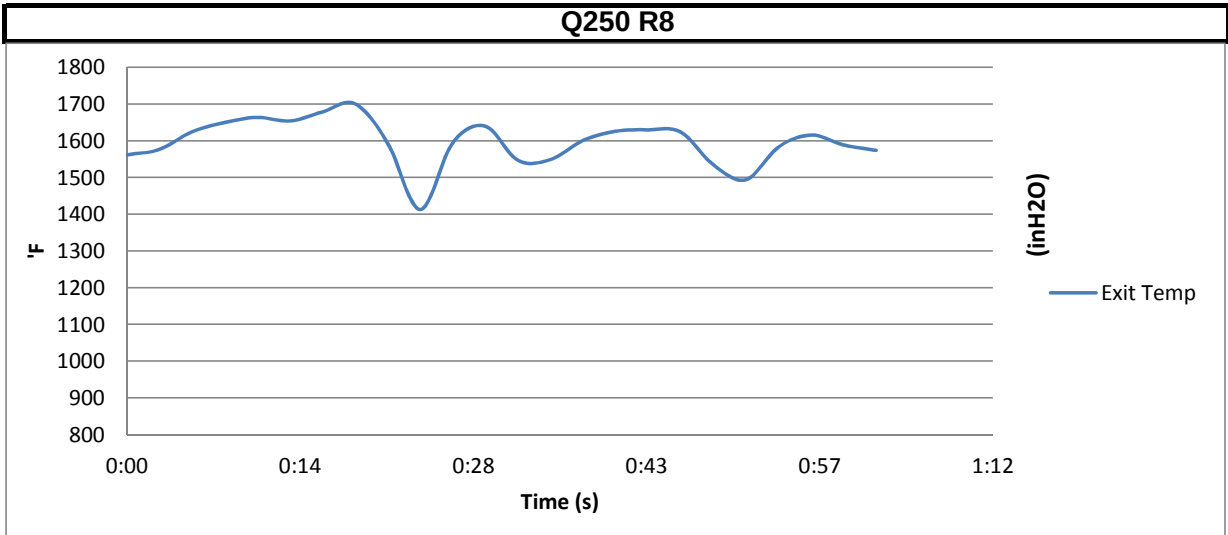
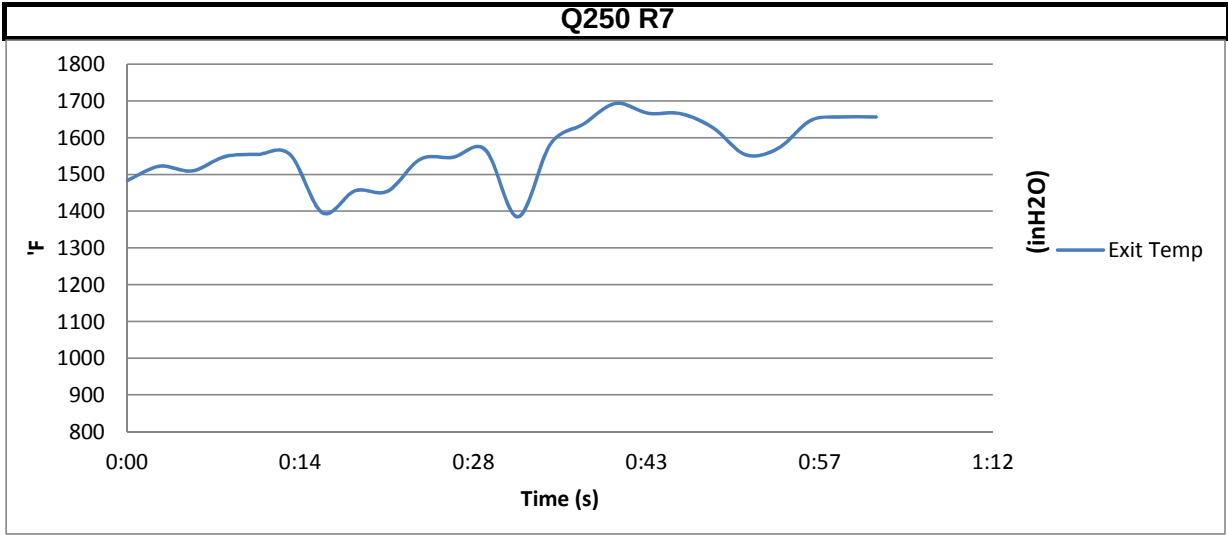
Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/28/15 13:29:04	5220	13.54	2.25	1.08	5.20	25.90	28.10	2,065.00
02/28/15 13:29:34	5250	13.70	2.29	1.07	5.08	25.90	28.10	2,065.00
02/28/15 13:30:04	5280	13.72	2.55	1.07	5.09	25.57	27.90	2,057.00
02/28/15 13:30:34	5310	13.60	2.71	1.06	5.13	25.57	27.90	2,057.00
02/28/15 13:31:04	5340	13.57	2.45	1.06	5.17	25.52	27.80	1,883.00
02/28/15 13:31:34	5370	13.74	2.71	1.08	5.05	25.52	27.80	1,883.00
02/28/15 13:32:04	5400	13.62	2.84	1.06	5.13	25.74	27.70	1,474.00
02/28/15 13:32:34	5430	13.48	2.43	1.07	5.24	25.74	27.70	1,474.00
02/28/15 13:33:04	5460	13.70	2.21	1.06	5.11	25.72	27.70	1,465.00
02/28/15 13:33:34	5490	13.62	2.36	1.06	5.16	25.72	27.70	1,465.00
02/28/15 13:34:04	5520	14.59	3.11	1.08	4.50	25.70	27.70	1,464.00
02/28/15 13:34:34	5550	13.17	3.13	1.07	5.44	25.70	27.70	1,464.00
02/28/15 13:35:04	5580	12.85	0.79	1.07	5.79	25.66	27.90	1,454.00
02/28/15 13:35:34	5610	12.98	0.58	1.07	5.64	25.66	27.90	1,454.00
02/28/15 13:36:04	5640	13.08	0.60	1.07	5.60	25.59	28.00	1,443.00
02/28/15 13:36:34	5670	13.26	0.65	1.07	5.45	25.59	28.00	1,443.00
02/28/15 13:37:04	5700	13.06	0.76	1.07	5.58	26.45	27.40	1,485.00
02/28/15 13:37:34	5730	13.22	0.68	1.07	5.47	26.45	27.40	1,485.00
RAW AVERAGE		13.33	1.57	0.78	5.40	29.43	29.26	1,825.94

Bias	Serial Number:	O ₂	CO	THC	CO ₂	Press.	Trans.	Temp.	Trans.	F-Flow	Trans.
	INST-O2-0013	INST-CO-0029	INST-TH-0009	INST-C2-0013	1442557	1442557	1442557				
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H ₂ O)	(°F)	(SCFH)			
	Initial Zero	0.10	0.20	-0.07	0.10						
	Final Zero	0.11	0.18	-0.01	0.20						
	Avg. Zero	0.11	0.19	-0.04	0.15						
	Initial UpScale	11.92	9.08	5.04	8.99						
	Final UpScale	11.86	9.24	5.08	9.00						
	Avg. UpScale	11.89	9.16	5.06	9.00						
Upscale Cal Gas		11.88	9.02	5.01	9.11						

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	13.33	1.39	0.80	5.41
Corrected Raw Average (ppm/% wet basis)	12.60	1.30	0.76	5.11
Concentration (ppm@ 3%CO ₂)	N/A	0.77	0.45	N/A
Emission Rate (lb/hr)	N/A	0.01	0.01	N/A







EMISSION DATA RECORDS

90-100% Fixed Rate Unit Operations Data

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE

Source Information	
Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Fuel Type	Gas, Propene

Test Information			
Project #		qti-15-brokenarrow.ok-comp#1	
Operator		CG	
Date for Preliminary Run	(mm/dd/yy)	02/23/15	
Standard Temperature		68	°F
Standard Pressure		29.92	in Hg
Required Sample Vol.	RM4, 8.1.1.2	21	scf
Run Duration	≤0.75 cfm	65	minutes
Unit Number		1	
Base Run Number		90-100%	
Number of Ports Available		2	
Number of Ports Used		2	
Port Inside Diameter		3.00	in
Stack Shape		Circular	

Test Equipment Information					
Run		10	11	12	
Test Date	(mm/dd/yy)	02/25/15	02/25/15	02/25/15	
Load	% or w/DB	90-100	90-100	90-100	
Meter Box Number	from ACS	SAMP-CP-0023	SAMP-CP-0023	SAMP-CP-0023	
Meter Calibration Factor	(Y)	1.002	1.002	1.002	
Orifice Meter Coefficient	(ΔH_{or})	1.672	1.672	1.672	in H ₂ O
Pitot Identification	from ACS	4174	4174	4174	
Pitot Tube Coefficient	(C _p)	0.819	0.819	0.819	
Probe Number	from ACS	SAMP-PF-0001	SAMP-SP-0001	SAMP-SP-0001	
Probe Length		60.0	60.0	60.0	in
(SS, Glass) Liner Material	from list	Hastelloy	Hastelloy	Hastelloy	
Impinger Case Number	from ACS	SAMP-BC-0009	SAMP-BC-0009	SAMP-BC-0009	

Testing Company Information	
Company Name	Air Hygiene International, Inc. (Tulsa, Oklahoma)
Address	1600 W Tacoma Street
City, State Zip	Broken Arrow, Oklahoma 74012
Project Manager	Min Sum Lee
Phone Number	(918) 307-8865
Fax Number	(918) 307-9131

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] - RESULTS

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Historical Data	90-100%-10	90-100%-11	90-100%-12	Average	Units
Run Start Time	08:44	10:19	13:38		hh:mm
Run Stop Time	09:55	11:30	14:49		hh:mm
Test Date	02/25/15	02/25/15	02/25/15		mm/dd/yy
Meter Calibration Factor	1.002	1.002	1.002		
Pitot Tube Coefficient	0.819	0.819	0.819		
Stack Test Data	90-100%-10	90-100%-11	90-100%-12	Average	Units
Initial Meter Volume	563.150	610.220	658.060		ft ³
Final Meter Volume	610.115	658.060	707.010		ft ³
Total Meter Volume	46.965	47.840	48.950	47.918	ft ³
Total Sampling Time	65.00	65.00	65.00	65.00	min
Average Meter Temperature	82.67	82.40	77.79	80.95	°F
Average Stack Temperature	1449.00	1452.13	1477.67	1459.60	°F
Barometric Pressure	29.94	29.91	29.80	29.88	in Hg
Stack Static Pressure	0.00	0.00	0.00	0.00	in H ₂ O
Absolute Stack Pressure	29.94	29.91	29.80	29.88	in Hg
Average Orifice Pressure Drop	1.55	1.60	1.60	1.58	in H ₂ O
Absolute Meter Pressure	30.06	30.03	29.92	30.01	in Hg
Avg Square Root Pitot Pressure	0.30	0.31	0.29	0.30	√(in H ₂ O)
Moisture Content Data	90-100%-10	90-100%-11	90-100%-12	Average	Units
Impinger Water Weight Gain	41.70	37.70	40.00	39.80	g
Silica Gel Weight Gain	25.20	6.40	13.70	15.10	g
Total Water Volume Collected	67.02	44.18	53.80	55.00	ml
Standard Water Vapor Volume	3.15	2.08	2.53	2.59	scf
Standard Meter Volume	46.0	46.8	48.2	47.0	dscf
Calculated Stack Moisture	6.42	4.25	5.00	5.22	%
Saturated Stack Moisture	100.00	100.00	100.00	100.00	%
Reported Stack Moisture Content	6.42	4.25	5.00	5.22	%
Gas Analysis Data	90-100%-10	90-100%-11	90-100%-12	Average	Units
Carbon Dioxide Content	5.3	5.2	4.7	5.1	%
Oxygen Content	14.8	14.9	15.7	15.1	%
Nitrogen Content	79.8	79.8	79.6	79.7	%
Stack Dry Molecular Weight	29.43	29.42	29.39	29.41	lb/lb-mole
Stack Wet Molecular Weight	28.69	28.93	28.82	28.81	lb/lb-mole
Percent Excess Air	236.2	241.6	295.4	257.7	%
Volumetric Flow Rate Data	90-100%-10	90-100%-11	90-100%-12	Average	Units
Average Stack Gas Velocity	31.82	32.19	30.58	31.53	ft/sec
Stack Cross-Sectional Area	4.69	4.69	4.69	4.69	ft ²
Actual Stack Flow Rate	8,945	9,050	8,598	8,865	acfm
Wet Standard Stack Flow Rate	149	150	140	146	wkscfh
Dry Standard Stack Flow Rate	139,014	143,525	133,013	138,517	dscfh

METHOD 3C - DETERMINATION OF DRY MOLECULAR WEIGHT BY ANALYZER

Plant Name	Questor, Broken Arrow Test Site	Preliminary Date	02/23/15		
Sampling Location	Q250	Operator	CG		
Project #	qti-15-brokenarrow.ok-comp#1	# of Ports Used	2		
Fuel Type	Gas, Propene	Min. Fuel Factor	N/A	Max. Fuel Factor	N/A

Gas Analysis Data								
Run Number	90-100%-10		Date	02/25/15	Run Start Time	08:44	Run Stop Time	09:55
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppmCO)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:11	5.3	14.8	0.0	79.8	29.43	1.144	236.2	N/A

Gas Analysis Data								
Run Number	90-100%-11		Date	02/25/15	Run Start Time	10:19	Run Stop Time	11:30
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppmCO)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:11	5.2	14.9	0.0	79.8	29.42	1.145	241.6	N/A

Gas Analysis Data								
Run Number	90-100%-12		Date	02/25/15	Run Start Time	13:38	Run Stop Time	14:49
Sample Analysis Time	CO₂ Conc.	O₂ Conc.	Methane Conc.	N₂ Conc.	Dry Molecular Weight	Calculated Fuel Factor	Excess Air	Fuel Factor in Range
	(%CO ₂)	(%O ₂)	(ppmCO)	(%N ₂)	(M _d)	(F _o) _{avg}	(%EA) _{avg}	
hh:mm	%	%	ppm	%	lb/lb-mole		%	
01:11	4.7	15.7	0.0	79.6	29.39	1.102	295.4	N/A

METHOD 4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Plant Name	Questor, Broken Arrow Test Site	Preliminary Date	02/23/15
Sampling Location	Q250	Operator	CG
Project #	qti-15-brokenarrow.ok-comp#1	Ports Used	2

Moisture Content Data								
Run Number	90-100%-10		Date	02/25/15	Start Time	08:44	Stop Time	09:55
Meter Box Number	SAMP-CP-0023				Meter Cal Factor	(Y)	1.002	
Total Meter Volume	(V _m)	46.965	dcf		Barometric Pressure	(P _b)	29.94	in Hg
Average Stack Temp	(t _s) _{avg}	1449	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	83	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.55	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	756.80	733.10	591.70	835.00			
Initial Value	(V _i),(W _i)	743.80	714.70	581.40	809.80			
Net Value	(V _n),(W _n)	13.0	18.4	10.3	25.2			
Results								
Total Weight	(W _t)	66.90	g	Water Vol Weighed	(V _{wsg(std)})	3.154	scf	
Std Meter Volume	(V _{m(std)})	45.993	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	6.42	%	Final Moisture Content	(B _{ws})	6.42	%	

Moisture Content Data								
Run Number	90-100%-11		Date	02/25/15	Start Time	10:19	Stop Time	11:30
Meter Box Number	SAMP-CP-0023				Meter Cal Factor	(Y)	1.002	
Total Meter Volume	(V _m)	47.840	dcf		Barometric Pressure	(P _b)	29.91	in Hg
Average Stack Temp	(t _s) _{avg}	1452	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	82	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	777.80	747.50	594.00	841.40			
Initial Value	(V _i),(W _i)	756.80	733.10	591.70	835.00			
Net Value	(V _n),(W _n)	21.0	14.4	2.3	6.4			
Results								
Total Weight	(W _t)	44.10	g	Water Vol Weighed	(V _{wsg(std)})	2.079	scf	
Std Meter Volume	(V _{m(std)})	46.831	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	4.25	%	Final Moisture Content	(B _{ws})	4.25	%	

Moisture Content Data								
Run Number	90-100%-12		Date	02/25/15	Start Time	13:38	Stop Time	14:49
Meter Box Number	SAMP-CP-0023				Meter Cal Factor	(Y)	1.002	
Total Meter Volume	(V _m)	48.950	dcf		Barometric Pressure	(P _b)	29.80	in Hg
Average Stack Temp	(t _s) _{avg}	1478	°F		Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Average Meter Temp	(t _m) _{avg}	78	°F		Avg Orifice Pressure	(ΔH) _{avg}	1.60	in H ₂ O
	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7	Impinger 8
	(g)	(g)	(g)	(g)				
Contents	H ₂ O	H ₂ O	-	Sil Gel				
Final Value	(V _f),(W _f)	801.70	760.80	596.80	798.10			
Initial Value	(V _i),(W _i)	777.80	747.50	594.00	784.40			
Net Value	(V _n),(W _n)	23.9	13.3	2.8	13.7			
Results								
Total Weight	(W _t)	53.70	g	Water Vol Weighed	(V _{wsg(std)})	2.532	scf	
Std Meter Volume	(V _{m(std)})	48.151	dscf	Sat. Moisture Content	(B _{ws(svp)})	100.00	%	
Calc Moisture Content	(B _{ws(calc)})	5.00	%	Final Moisture Content	(B _{ws})	5.00	%	

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/25/15
Operator	CG
Run Number	90-100%-10

Leak Checks					
Train	Pre	0.000	ft ³ /min@	15.0	in Hg
PASS	Post	0.000	ft ³ /min@	10.0	in Hg
< 3.0	Pitot	Pre (+)	0.25	in H ₂ O for	20.0
		Pre (-)	0.20	in H ₂ O for	15.0
		Post (+)	0.25	in H ₂ O for	20.0
		Post (-)	0.20	in H ₂ O for	20.0

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	08:44	End	09:55

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	743.8	714.7	581.4	809.8				
Post	756.8	733.1	591.7	835.0				

Sampling Equipment		
Meter Box Number	SAMP-CP-0023	
Meter Cal Factor	(Y)	1.002
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.3750 in
Probe Number	SAMP-PF-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0009	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1449.0	°F
Average Meter Temp	(t _m)	82.7	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.30	in H ₂ O
Stack Moisture Content	(B _{wt})	6.42	%
Stack Dry Molecular Weight	(M _d)	29.43	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.75	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	29.94	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	29.94	in Hg
Absolute Meter Pressure	(P _m)	30.06	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (≤-°F)	Impinger Exit Temp (≤68°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	563.150	0.060	1.672	1.60	1466	235		47			75	81	5.5	0.24	25.68	1.897		45.522
A-2	2.7	00:02:43	565.070	0.060	1.672	1.60	1486	240		48			72	81	5.5	0.24	25.81	3.779		45.348
A-3	5.4	00:05:25	566.970	0.065	1.672	1.60	1530	242		48			72	80	5.5	0.25	27.17	5.663		45.304
A-4	8.1	00:08:07	568.870	0.060	1.672	1.60	1568	244		50			74	79	6.0	0.24	26.35	7.565		45.391
A-5	10.8	00:10:50	570.790	0.095	1.672	1.50	1602	245		53			78	78	6.5	0.31	33.43	9.442		45.320
A-6	13.5	00:13:33	572.690	0.100	1.672	1.50	1570	245		56			79	79	7.0	0.32	34.04	11.354		45.417
A-7	16.3	00:16:15	574.630	0.105	1.672	1.40	1630	247		61			82	78	7.5	0.32	35.39	13.194		45.236
A-8	19.0	00:18:58	576.500	0.115	1.672	1.50	1520	248		63			83	78	7.5	0.34	36.05	15.032		45.096
A-9	21.7	00:21:40	578.370	0.085	1.672	1.50	1252	248		66			84	79	7.5	0.29	28.82	16.965		45.241
A-10	24.4	00:24:22	580.340	0.065	1.672	1.50	1250	250		67			85	79	7.5	0.25	25.19	18.838		45.211
A-11	27.1	00:27:05	582.250	0.050	1.672	1.50	1200	251		68			86	80	7.5	0.22	21.76	20.677		45.114
A-12	29.8	00:29:47	584.130	0.025	1.672	1.50	1195	252		67			86	81	8.5	0.16	15.37	22.701		45.402
B-1	32.5	00:32:30	586.200	0.130	1.672	1.50	1576	250		56			84	83	8.0	0.36	38.86	24.471		45.177
B-2	35.2	00:35:12	588.010	0.125	1.672	1.50	1585	250		54			86	83	8.0	0.35	38.19	26.471		45.379
B-3	37.9	00:37:55	590.060	0.120	1.672	1.60	1562	251		52			87	83	8.0	0.35	37.21	28.383		45.412
B-4	40.6	00:40:37	592.020	0.110	1.672	1.60	1571	249		49			87	84	8.0	0.33	35.71	30.322		45.482
B-5	43.3	00:43:20	594.010	0.115	1.672	1.60	1547	254		49			87	84	8.0	0.34	36.29	32.251		45.531
B-6	46.0	00:46:03	595.990	0.105	1.672	1.60	1575	248		49			88	84	8.0	0.32	34.92	34.159		45.545
B-7	48.8	00:48:45	597.950	0.125	1.672	1.60	1581	247		49			88	84	8.0	0.35	38.16	36.106		45.607
B-8	51.5	00:51:28	599.950	0.125	1.672	1.60	1533	245		49			88	84	8.5	0.35	37.71	38.121		45.745
B-9	54.2	00:54:10	602.020	0.120	1.672	1.60	1404	248		49			88	85	8.5	0.35	35.73	40.017		45.734
B-10	56.9	00:56:53	603.970	0.115	1.672	1.60	1224	249		50			89	85	8.5	0.34	33.24	41.999		45.817
B-11	59.6	00:59:35	606.010	0.110	1.672	1.60	1195	251		51			89	85	8.5	0.33	32.23	43.981		45.894
B-12	62.3	01:02:18	608.050	0.100	1.672	1.60	1154	250		52			89	85	8.5	0.32	30.35	45.988		45.988
Last Pt	65.0	01:05:00	610.115																	
Final Val	65.0	01:05:00	610.115												Max Vac	8.5	Final Values	45.988		
Average Values				0.10		1.55	1449	247		54			84	82		0.30	31.82			
													83							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/25/15
Operator	CG
Run Number	90-100%-11

Leak Checks					
Train	Pre	0.000	ft ³ /min@	13.0	in Hg
PASS	Post	0.000	ft ³ /min@	10.0	in Hg
< 3.0	Pitot	Pre (+)	0.20	in H ₂ O for	20.0 sec
		Pre (-)	0.25	in H ₂ O for	20.0 sec
		Post (+)	0.20	in H ₂ O for	15.0 sec
		Post (-)	0.20	in H ₂ O for	15.0 sec

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	10:19	End	11:30

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	756.8	733.1	591.7	835.0				
Post	777.8	747.5	594.0	841.4				

Sampling Equipment		
Meter Box Number	SAMP-CP-0023	
Meter Cal Factor	(Y)	1.002
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.3636 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0009	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1452.1	°F
Average Meter Temp	(t _m)	82.4	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.31	in H ₂ O
Stack Moisture Content	(B _{ws})	4.25	%
Stack Dry Molecular Weight	(M _d)	29.42	lb/lb-mole
Estimated Orifice Flow Rate	(Q _m)	0.71	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	29.91	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	29.91	in Hg
Absolute Meter Pressure	(P _m)	30.03	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (≤-°F)	Impinger Exit Temp (≤68°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	610.220	0.090	1.672	1.50	1510	249		50			76	85	8.0	0.30	31.69	1.935		46.434
A-2	2.7	00:02:43	612.190	0.085	1.672	1.60	1548	251		49			74	85	8.5	0.29	31.10	3.883		46.601
A-3	5.4	00:05:25	614.170	0.075	1.672	1.60	1570	249		47			76	83	8.5	0.27	29.37	5.842		46.735
A-4	8.1	00:08:07	616.160	0.085	1.672	1.60	1539	250		47			78	82	8.5	0.29	31.03	7.808		46.851
A-5	10.8	00:10:50	618.160	0.085	1.672	1.60	1535	250		47			80	82	8.5	0.29	30.99	9.781		46.949
A-6	13.5	00:13:33	620.170	0.080	1.672	1.60	1653	247		48			81	81	8.5	0.28	30.95	11.734		46.937
A-7	16.3	00:16:15	622.160	0.095	1.672	1.60	1685	251		49			82	81	8.5	0.31	33.98	13.705		46.989
A-8	19.0	00:18:58	624.170	0.125	1.672	1.60	1613	249		49			83	81	8.5	0.35	38.31	15.645		46.934
A-9	21.7	00:21:40	626.150	0.115	1.672	1.60	1380	250		50			84	81	8.5	0.34	34.62	17.622		46.991
A-10	24.4	00:24:22	628.170	0.100	1.672	1.60	1210	249		50			84	81	8.5	0.32	30.76	19.638		47.131
A-11	27.1	00:27:05	630.230	0.095	1.672	1.60	1136	249		51			85	81	8.5	0.31	29.31	21.652		47.241
A-12	29.8	00:29:47	632.290	0.100	1.672	1.60	1127	248		52			85	82	8.5	0.32	29.98	23.684		47.369
B-1	32.5	00:32:30	634.370	0.130	1.672	1.60	1571	251		52			80	83	8.5	0.36	38.67	25.292		46.694
B-2	35.2	00:35:12	636.010	0.135	1.672	1.60	1573	249		52			80	83	8.5	0.37	39.43	27.263		46.737
B-3	37.9	00:37:55	638.020	0.125	1.672	1.60	1547	251		51			82	83	8.5	0.35	37.70	29.270		46.831
B-4	40.6	00:40:37	640.070	0.100	1.672	1.60	1538	253		51			83	82	8.5	0.32	33.64	31.237		46.855
B-5	43.3	00:43:20	642.080	0.100	1.672	1.60	1544	252		52			85	81	8.5	0.32	33.69	33.134		46.777
B-6	46.0	00:46:03	644.020	0.100	1.672	1.60	1537	252		52			85	83	8.5	0.32	33.63	35.135		46.846
B-7	48.8	00:48:45	646.070	0.080	1.672	1.60	1512	250		53			85	83	8.5	0.28	29.90	37.057		46.809
B-8	51.5	00:51:28	648.040	0.080	1.672	1.60	1486	253		53			86	82	8.5	0.28	29.70	39.058		46.870
B-9	54.2	00:54:10	650.090	0.080	1.672	1.60	1375	252		54			85	82	8.5	0.28	28.84	40.944		46.793
B-10	56.9	00:56:53	652.020	0.085	1.672	1.60	1248	255		55			85	82	8.5	0.29	28.68	43.875		47.863
B-11	59.6	00:59:35	655.020	0.085	1.672	1.60	1203	255		55			87	82	8.5	0.29	28.30	44.869		46.820
B-12	62.3	01:02:18	656.040	0.085	1.672	1.60	1211	253		55			86	87	8.5	0.29	28.37	46.832		46.832
Last Pt	65.0	01:05:00	658.060																	
Final Val	65.0	01:05:00	658.060												Max Vac	8.5	Final Values	46.832		
Average Values				0.10		1.60	1452	251		51			82	82		0.31	32.19			
													82							

METHOD 4 (MOISTURE) [MULTI POINT, NO VARIATION] SOURCE SAMPLING TITLE PAGE ISOKINETIC SAMPLING DATA

Plant Name	Questor, Broken Arrow Test Site
Sampling Location	Q250
Project #	qti-15-brokenarrow.ok-comp#1

Date	02/25/15
Operator	CG
Run Number	90-100%-12

Leak Checks					
Train	Pre	0.000	ft ³ /min@	10.0	in Hg
PASS	Post	0.000	ft ³ /min@	10.0	in Hg
< 3.0	Pitot	Pre (+)	0.20	in H ₂ O for	20.0 sec
		Pre (-)	0.25	in H ₂ O for	20.0 sec
		Post (+)	0.20	in H ₂ O for	15.0 sec
		Post (-)	0.20	in H ₂ O for	20.0 sec

Nozzle Measurements				
Pre				PASS
Post				PASS

Run Time			
Start	13:38	End	14:49

Weights	Imp 1	Imp 2	Imp 3	Imp 4	Imp 5	Imp 6	Imp 7	Imp 8
Pre	777.8	747.5	594.0	784.4				
Post	801.7	760.8	596.8	798.1				

Sampling Equipment		
Meter Box Number	SAMP-CP-0023	
Meter Cal Factor	(Y)	1.002
Nozzle Number		
Average Nozzle Diameter	(D _{no})	in
Suggested Nozzle Diameter	(D _n)	0.3749 in
Probe Number	SAMP-SP-0001	in
Probe Length	60	in
Liner Material	Hastelloy	
Sample Case / Oven Number	SAMP-BC-0012	
Impinger Case Number	SAMP-BC-0009	

Ideal Nozzle Diameter and IsoKinetic Factor Setup			
Pitot Coefficient	(C _p)	0.819	
Average Stack Temp	(t _s)	1477.7	°F
Average Meter Temp	(t _m)	77.8	
Orifice Meter Coefficient	(ΔH@)	1.672	in H ₂ O
Square Root ΔP	(ΔP ^{1/2} _{avg})	0.29	in H ₂ O
Stack Moisture Content	(B _{ws})	5.00	%
Stack Dry Molecular Weight	(M _d)	29.39	lb/lb-mole
Estimated Orifice Flow Rate	(Q _o)	0.72	acfm
ΔP to ΔH Isokinetic Factor	(K)		

Pressures			
Barometric Pressure	(P _b)	29.80	in Hg
Stack Static Pressure	(P _{static})	0.00	in H ₂ O
Absolute Stack Pressure	(P _a)	29.80	in Hg
Absolute Meter Pressure	(P _m)	29.92	in Hg

Wash Volumes					ml
					ml

Traverse Point #	Sampling Time (Θ)	Timer Time	Dry Gas Meter Reading (V _m)	Velocity Head (Δp)	Desired Orifice ΔH (ΔH _d)	Actual Orifice ΔH (ΔH _a)	Stack Temp (t _s)	Snorkel Temp (248±25°F)	Filter Temp (≤-°F)	Impinger Exit Temp (≤68°F)	Cond. Temp (≤-°F)	CPM Filter Temp (-±-°F)	Meter Inlet Temp (t _{mi})	Meter Outlet Temp (t _{mo})	Pump Vacuum	Square Root ΔP (ΔP ^{1/2})	Local Stack Velocity (v _s)	Cumul. Meter Volume (V _m) _{std}	Cumul. Percent IsoKinetic (I)	Est-Run Meter Volume (V _m) _{std}
	min	hh:mm:ss	ft ³	in H ₂ O	in H ₂ O	in H ₂ O	°F	°F	°F	°F	°F	°F	°F	°F	in Hg	√(in H ₂ O)	ft/sec	dscf	%	dscf
A-1	0.0	00:00:00	658.060	0.070	1.672	1.60	1466	248		54			69	69	8.5	0.26	27.74	3.000		72.002
A-2	2.7	00:02:43	661.060	0.075	1.672	1.60	1497	252		44			67	67	8.5	0.27	28.94	4.968		59.611
A-3	5.4	00:05:25	663.020	0.070	1.672	1.60	1520	255		43			70	68	8.5	0.26	28.13	5.978		47.821
A-4	8.1	00:08:07	664.030	0.065	1.672	1.60	1528	251		44			72	68	8.5	0.25	27.16	9.741		58.444
A-5	10.8	00:10:50	667.800	0.070	1.672	1.60	1568	257		47			75	69	8.5	0.26	28.47	10.954		52.578
A-6	13.5	00:13:33	669.020	0.080	1.672	1.60	1532	255		47			76	70	8.5	0.28	30.16	11.996		47.984
A-7	16.3	00:16:15	670.070	0.090	1.672	1.60	1514	253		50			77	70	8.5	0.30	31.84	14.961		51.294
A-8	19.0	00:18:58	673.060	0.075	1.672	1.60	1462	254		51			79	71	8.5	0.27	28.68	15.930		47.789
A-9	21.7	00:21:40	674.040	0.055	1.672	1.60	1440	253		52			79	72	8.5	0.23	24.42	18.933		50.488
A-10	24.4	00:24:22	677.080	0.075	1.672	1.60	1200	253		53			80	73	8.5	0.27	26.66	20.895		50.148
A-11	27.1	00:27:05	679.070	0.065	1.672	1.60	1006	251		53			82	73	8.5	0.25	23.32	22.805		49.755
A-12	29.8	00:29:47	681.010	0.055	1.672	1.60	1015	252		52			77	74	8.5	0.23	21.52	24.800		49.600
B-1	32.5	00:32:30	683.030	0.100	1.672	1.60	1620	251		50			83	76	8.5	0.32	34.46	26.742		49.369
B-2	35.2	00:35:12	685.010	0.100	1.672	1.60	1610	253		50			84	77	8.5	0.32	34.37	28.758		49.299
B-3	37.9	00:37:55	687.070	0.100	1.672	1.60	1594	250		52			84	77	8.5	0.32	34.24	30.676		49.082
B-4	40.6	00:40:37	689.030	0.100	1.672	1.60	1576	252		53			86	77	8.5	0.32	34.09	32.640		48.960
B-5	43.3	00:43:20	691.040	0.095	1.672	1.60	1584	254		54			86	78	8.5	0.31	33.29	34.631		48.891
B-6	46.0	00:46:03	693.080	0.080	1.672	1.60	1626	254		55			87	80	8.5	0.28	30.86	36.568		48.757
B-7	48.8	00:48:45	695.070	0.095	1.672	1.60	1620	250		56			87	80	8.5	0.31	33.58	38.495		48.625
B-8	51.5	00:51:28	697.050	0.110	1.672	1.60	1593	248		58			88	81	8.5	0.33	35.90	40.399		48.479
B-9	54.2	00:54:10	699.010	0.12	1.672	1.60	1550	251		58			88	81	8.5	0.34	36.32	42.343		48.391
B-10	56.9	00:56:53	701.010	0.11	1.672	1.60	1445	250		60			88	81	8.5	0.32	33.79	44.286		48.312
B-11	59.6	00:59:35	703.010	0.10	1.672	1.60	1446	254		61			88	81	8.5	0.32	32.98	46.229		48.239
B-12	62.3	01:02:18	705.010	0.10	1.672	1.60	1452	248		61			88	81	8.5	0.32	33.04	48.172		48.172
Last Pt	65.0	01:05:00	707.010																	
Final Val	65.0	01:05:00	707.010												Max Vac	8.5	Final Values	48.172		
Average Values				0.09		1.60	1478	252		52			81	75		0.29	30.58			
													78							

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.4	%
Stack Exhaust Flow (M2)	143,525	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	56	%
Ambient Temperature	35	°F
Specific Humidity	0.002369	lb H ₂ O / lb air

90-100 Load, Run - Q250-R10

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/25/15 8:44:25	3990	13.81	2.44	3.37	5.11	26.74	21.20	1,763.00
	02/25/15 8:44:55	4020	14.32	1.98	3.49	4.77	26.74	21.20	1,763.00
	02/25/15 8:45:25	4050	14.32	2.31	0.31	4.76	31.15	22.30	1,874.00
	02/25/15 8:45:55	4080	14.14	2.28	-1.09	4.87	31.15	22.30	1,874.00
	02/25/15 8:46:25	4110	13.72	1.91	-0.83	5.19	43.70	23.10	1,920.00
	02/25/15 8:46:55	4140	13.30	2.25	-0.33	5.53	43.70	23.10	1,920.00
	02/25/15 8:47:25	4170	13.35	5.05	-0.63	5.49	46.86	23.50	1,885.00
	02/25/15 8:47:55	4200	13.32	16.40	0.60	5.50	46.86	23.50	1,885.00
	02/25/15 8:48:25	4230	13.23	28.45	1.09	5.57	47.45	23.90	1,876.00
	02/25/15 8:48:55	4260	13.16	22.61	0.71	5.61	47.45	23.90	1,876.00
	02/25/15 8:49:25	4290	13.19	11.38	1.43	5.59	48.14	24.30	1,870.00
	02/25/15 8:49:55	4320	12.85	8.13	1.13	5.88	48.14	24.30	1,870.00
	02/25/15 8:50:25	4350	13.00	7.32	0.20	5.75	48.74	24.80	1,912.00
	02/25/15 8:50:55	4380	12.76	6.79	0.54	5.97	48.74	24.80	1,912.00
	02/25/15 8:51:25	4410	12.95	5.64	1.22	5.75	48.71	25.30	2,040.00
	02/25/15 8:51:55	4440	12.73	4.23	1.65	5.93	48.71	25.30	2,040.00
	02/25/15 8:52:25	4470	12.66	2.98	1.72	6.00	50.37	25.60	2,186.00
	02/25/15 8:52:55	4500	12.83	2.26	2.05	5.83	50.37	25.60	2,186.00
	02/25/15 8:53:25	4530	12.84	1.72	0.86	5.82	50.56	25.90	2,300.00
	02/25/15 8:53:55	4560	12.49	1.22	0.48	6.14	50.56	25.90	2,300.00
	02/25/15 8:54:25	4590	12.44	0.86	-0.81	6.18	50.37	26.10	2,292.00
	02/25/15 8:54:55	4620	12.52	0.41	0.09	6.12	50.37	26.10	2,292.00
	02/25/15 8:55:25	4650	12.45	0.21	0.65	6.17	50.04	26.20	2,306.00
	02/25/15 8:55:55	4680	12.27	0.27	1.28	6.42	50.04	26.20	2,306.00
	02/25/15 8:56:25	4710	13.82	1.09	1.33	5.12	49.68	26.40	2,318.00
	02/25/15 8:56:55	4740	14.02	3.09	0.14	4.93	49.68	26.40	2,318.00
	02/25/15 8:57:25	4770	13.61	3.53	-0.83	5.23	49.26	26.50	2,302.00
	02/25/15 8:57:55	4800	13.58	2.92	-1.00	5.25	49.26	26.50	2,302.00
	02/25/15 8:58:25	4830	13.45	2.61	0.16	5.38	48.86	26.70	2,313.00
	02/25/15 8:58:55	4860	13.33	2.27	0.51	5.45	48.86	26.70	2,313.00
	02/25/15 8:59:25	4890	13.28	1.99	-0.03	5.48	48.46	26.90	2,323.00
	02/25/15 8:59:55	4920	13.18	1.55	-0.03	5.57	48.46	26.90	2,323.00
	02/25/15 9:00:25	4950	13.11	1.31	0.38	5.63	48.08	27.10	2,308.00
	02/25/15 9:00:55	4980	12.94	1.52	-0.81	5.77	48.08	27.10	2,308.00
	02/25/15 9:01:25	5010	12.78	1.22	-1.76	5.94	47.70	27.20	2,319.00
	02/25/15 9:01:55	5040	13.06	0.97	0.00	5.71	47.70	27.20	2,319.00
	02/25/15 9:02:25	5070	12.90	1.03	0.00	5.84	47.27	27.40	2,315.00
	02/25/15 9:02:55	5100	12.76	0.97	-1.34	5.99	47.27	27.40	2,315.00
	02/25/15 9:03:25	5130	12.94	0.87	0.72	5.80	46.82	27.40	2,310.00
	02/25/15 9:03:55	5160	12.93	1.05	-1.24	5.80	46.82	27.40	2,310.00
	02/25/15 9:04:25	5190	13.17	1.09	-1.28	5.62	46.40	27.50	2,318.00
	02/25/15 9:04:55	5220	13.52	1.60	-0.25	5.33	46.40	27.50	2,318.00
	02/25/15 9:05:25	5250	13.46	2.16	0.56	5.40	46.02	27.60	2,315.00
	02/25/15 9:05:55	5280	13.46	2.28	0.54	5.39	46.02	27.60	2,315.00
	02/25/15 9:06:25	5310	13.54	2.13	1.14	5.32	45.63	27.70	2,325.00
	02/25/15 9:06:55	5340	13.55	2.56	1.62	5.31	45.63	27.70	2,325.00
A2	02/25/15 9:07:25	5370	13.48	2.43	1.97	5.36	45.22	27.80	2,296.00
	02/25/15 9:07:55	5400	13.48	2.17	1.87	5.38	45.22	27.80	2,296.00
	02/25/15 9:08:25	5430	13.74	2.28	2.82	5.22	44.86	27.80	2,307.00
	02/25/15 9:08:55	5460	13.72	2.86	1.67	5.20	44.86	27.80	2,307.00
	02/25/15 9:09:25	5490	13.66	2.89	1.70	5.25	44.46	27.70	2,303.00
	02/25/15 9:09:55	5520	13.65	2.89	1.59	5.25	44.46	27.70	2,303.00
	02/25/15 9:10:25	5550	13.63	3.17	0.21	5.26	44.06	27.70	2,311.00
	02/25/15 9:10:55	5580	13.62	2.75	0.59	5.28	44.06	27.70	2,311.00
	02/25/15 9:11:25	5610	13.78	2.61	1.68	5.18	43.71	27.60	2,298.00
	02/25/15 9:11:55	5640	13.72	2.86	0.89	5.21	43.71	27.60	2,298.00
	02/25/15 9:12:25	5670	13.84	3.05	-0.18	5.11	43.33	27.60	2,283.00
	02/25/15 9:12:55	5700	13.65	2.88	-0.10	5.27	43.33	27.60	2,283.00
	02/25/15 9:13:25	5730	13.95	2.91	-0.14	5.03	42.94	27.50	2,303.00
	02/25/15 9:13:55	5760	13.52	3.08	0.12	5.34	42.94	27.50	2,303.00
	02/25/15 9:14:25	5790	13.45	2.43	0.02	5.40	42.54	27.50	2,287.00
	02/25/15 9:14:55	5820	13.70	2.14	-0.06	5.23	42.54	27.50	2,287.00

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.4	%
Stack Exhaust Flow (M2)	143,525	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	56	%
Ambient Temperature	35	°F
Specific Humidity	0.002369	lb H ₂ O / lb air

90-100 Load, Run - Q250-R10

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/25/15 9:15:25	5850	13.77	2.53	-1.05	5.17	42.18	27.40	2,285.00
	02/25/15 9:15:55	5880	13.89	2.95	-1.95	5.10	42.18	27.40	2,285.00
	02/25/15 9:16:25	5910	13.85	3.23	0.00	5.14	41.81	27.40	2,304.00
	02/25/15 9:16:55	5940	13.71	3.11	0.00	5.21	41.81	27.40	2,304.00
	02/25/15 9:17:25	5970	13.92	2.95	0.00	5.07	41.48	27.40	2,290.00
	02/25/15 9:17:55	6000	13.79	3.25	0.00	5.16	41.48	27.40	2,290.00
	02/25/15 9:18:25	6030	13.54	3.25	-1.52	5.32	41.11	27.50	2,286.00
	02/25/15 9:18:55	6060	13.56	2.13	-1.41	5.33	41.11	27.50	2,286.00
	02/25/15 9:19:25	6090	13.89	2.58	-1.03	5.12	40.77	27.50	2,295.00
	02/25/15 9:19:55	6120	13.84	2.83	-1.04	5.16	40.77	27.50	2,295.00
	02/25/15 9:20:25	6150	14.06	3.30	-1.89	5.00	40.44	27.50	2,281.00
	02/25/15 9:20:55	6180	13.70	3.49	0.00	5.24	40.44	27.50	2,281.00
	02/25/15 9:21:25	6210	13.71	2.91	-1.49	5.26	40.09	27.40	2,289.00
	02/25/15 9:21:55	6240	13.69	2.87	0.00	5.27	40.09	27.40	2,289.00
	02/25/15 9:22:25	6270	13.72	2.94	0.00	5.22	39.73	27.50	2,284.00
	02/25/15 9:22:55	6300	13.71	3.04	0.00	5.23	39.73	27.50	2,284.00
	02/25/15 9:23:25	6330	13.58	2.79	0.00	5.33	39.39	27.60	2,280.00
	02/25/15 9:23:55	6360	13.82	2.82	0.00	5.14	39.39	27.60	2,280.00
	02/25/15 9:24:25	6390	13.72	3.31	0.00	5.21	39.06	27.60	2,266.00
	02/25/15 9:24:55	6420	13.76	2.94	0.00	5.18	39.06	27.60	2,266.00
	02/25/15 9:25:25	6450	13.55	2.93	0.00	5.33	38.74	27.60	2,275.00
	02/25/15 9:25:55	6480	13.83	2.61	0.00	5.14	38.74	27.60	2,275.00
	02/25/15 9:26:25	6510	13.82	3.15	0.00	5.14	38.40	27.50	2,270.00
	02/25/15 9:26:55	6540	13.46	3.21	0.00	5.39	38.40	27.50	2,270.00
	02/25/15 9:27:25	6570	13.82	3.54	0.00	5.13	38.07	27.40	2,267.00
	02/25/15 9:27:55	6600	13.79	4.04	-2.13	5.13	38.07	27.40	2,267.00
	02/25/15 9:28:25	6630	13.74	3.75	0.00	5.19	37.75	27.40	2,254.00
	02/25/15 9:28:55	6660	13.98	4.30	0.44	5.03	37.75	27.40	2,254.00
	02/25/15 9:29:25	6690	13.90	4.43	-0.14	5.08	37.42	27.30	2,261.00
	02/25/15 9:29:55	6720	13.89	4.32	-0.72	5.06	37.42	27.30	2,261.00
A3	02/25/15 9:30:25	6750	13.87	3.90	-0.93	5.11	37.10	27.30	2,268.00
	02/25/15 9:30:55	6780	13.84	4.13	-0.59	5.11	37.10	27.30	2,268.00
	02/25/15 9:31:25	6810	13.78	3.70	0.17	5.18	36.80	27.20	2,266.00
	02/25/15 9:31:55	6840	13.74	3.67	-0.73	5.17	36.80	27.20	2,266.00
	02/25/15 9:32:25	6870	13.82	3.47	-0.36	5.13	36.74	27.10	2,274.00
	02/25/15 9:32:55	6900	13.99	3.82	-0.47	5.00	36.74	27.10	2,274.00
	02/25/15 9:33:25	6930	13.56	3.96	-1.21	5.31	36.61	27.00	2,269.00
	02/25/15 9:33:55	6960	13.87	3.42	-0.84	5.08	36.61	27.00	2,269.00
	02/25/15 9:34:25	6990	13.84	3.70	-1.04	5.11	36.37	27.00	2,258.00
	02/25/15 9:34:55	7020	13.95	3.70	-0.53	5.02	36.37	27.00	2,258.00
	02/25/15 9:35:25	7050	13.89	3.82	-0.16	5.07	36.10	27.10	2,246.00
	02/25/15 9:35:55	7080	13.95	3.56	-0.69	5.03	36.10	27.10	2,246.00
	02/25/15 9:36:25	7110	13.98	3.58	-0.40	5.01	35.83	27.20	2,243.00
	02/25/15 9:36:55	7140	13.80	3.86	0.32	5.12	35.83	27.20	2,243.00
	02/25/15 9:37:25	7170	13.81	3.83	0.63	5.13	35.55	27.30	2,240.00
	02/25/15 9:37:55	7200	13.72	3.53	-0.36	5.19	35.55	27.30	2,240.00
	02/25/15 9:38:25	7230	13.75	3.56	-0.76	5.18	35.29	27.40	2,218.00
	02/25/15 9:38:55	7260	13.68	3.40	-1.27	5.21	35.29	27.40	2,218.00
	02/25/15 9:39:25	7290	13.81	3.19	-1.02	5.15	35.03	27.60	2,216.00
	02/25/15 9:39:55	7320	13.90	3.12	-0.59	5.10	35.03	27.60	2,216.00
	02/25/15 9:40:25	7350	14.04	3.85	-0.59	4.96	34.70	27.70	2,271.00
	02/25/15 9:40:55	7380	14.10	4.15	-1.73	4.92	34.70	27.70	2,271.00
	02/25/15 9:41:25	7410	13.94	4.27	-1.52	5.04	34.36	27.90	2,294.00
	02/25/15 9:41:55	7440	14.06	3.72	-1.64	4.97	34.36	27.90	2,294.00
	02/25/15 9:42:25	7470	14.08	3.82	-0.96	4.94	34.10	27.90	2,271.00
	02/25/15 9:42:55	7500	14.02	4.07	-0.74	4.97	34.10	27.90	2,271.00
	02/25/15 9:43:25	7530	14.03	4.54	-0.46	4.98	33.82	28.00	2,278.00
	02/25/15 9:43:55	7560	14.19	4.78	-0.55	4.85	33.82	28.00	2,278.00
	02/25/15 9:44:25	7590	14.05	4.96	-1.46	4.93	33.57	28.10	2,275.00
	02/25/15 9:44:55	7620	14.06	4.30	-1.78	4.94	33.57	28.10	2,275.00
	02/25/15 9:45:25	7650	13.80	4.43	-1.50	5.12	33.40	28.30	2,276.00
	02/25/15 9:45:55	7680	13.63	3.51	-1.85	5.26	33.40	28.30	2,276.00

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	6.4	%
Stack Exhaust Flow (M2)	143,525	SCFH

Weather Data

Barometric Pressure	29.94	in. Hg
Relative Humidity	56	%
Ambient Temperature	35	°F
Specific Humidity	0.002369	lb H ₂ O / lb air

90-100 Load, Run - Q250-R10

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/25/15 9:46:25	7710	13.92	3.60	0.00	5.08	33.28	28.60	2,278.00
02/25/15 9:46:55	7740	13.85	3.84	-1.95	5.09	33.28	28.60	2,278.00
02/25/15 9:47:25	7770	13.74	3.63	0.00	5.18	33.16	29.70	2,277.00
02/25/15 9:47:55	7800	13.73	3.53	-1.32	5.20	33.16	29.70	2,277.00
02/25/15 9:48:25	7830	13.80	3.45	0.21	5.14	33.05	30.40	2,268.00
02/25/15 9:48:55	7860	13.96	3.37	0.36	5.04	33.05	30.40	2,268.00
02/25/15 9:49:25	7890	14.01	3.75	0.52	4.98	32.92	31.00	2,269.00
02/25/15 9:49:55	7920	13.85	3.60	1.29	5.09	32.92	31.00	2,269.00
02/25/15 9:50:25	7950	13.92	3.07	0.56	5.09	32.79	31.40	2,261.00
02/25/15 9:50:55	7980	14.17	3.55	-0.12	4.91	32.79	31.40	2,261.00
02/25/15 9:51:25	8010	14.05	4.14	0.30	4.95	32.64	31.70	2,243.00
02/25/15 9:51:55	8040	13.97	3.82	0.72	5.02	32.64	31.70	2,243.00
02/25/15 9:52:25	8070	14.04	4.25	-0.19	4.95	32.53	32.00	2,255.00
02/25/15 9:52:55	8100	13.91	4.39	-0.43	5.05	32.53	32.00	2,255.00
02/25/15 9:53:25	8130	13.99	4.55	-0.88	4.99	32.40	32.20	2,248.00
02/25/15 9:53:55	8160	13.82	5.23	0.89	5.11	32.40	32.20	2,248.00
02/25/15 9:54:25	8190	14.02	5.15	0.61	4.98	32.40	32.20	2,248.00
02/25/15 9:54:55	8220	13.94	5.44	1.42	5.03	32.40	32.20	2,248.00
RAW AVERAGE		13.62	3.62	0.04	5.28	40.49	27.37	2,236.27

Bias	Serial Number:	O ₂	CO	THC	CO ₂	Press.	Trans.	Temp.	Trans.	F-Flow	Trans.
	INST-O2-0013	INST-CO-0029	INST-TH-0009	INST-C2-0013	1442557	1442557	1442557				
		(%)	(ppmvd)	(ppmvw)	(%)	(in. H ₂ O)	(°F)	(SCFH)			
	Initial Zero	0.13	0.07	-0.09	0.01						
	Final Zero	0.12	0.16	0.04	0.06						
	Avg. Zero	0.13	0.12	-0.03	0.04						
	Initial UpScale	11.93	9.07	3.14	9.43						
	Final UpScale	11.95	9.08	2.99	9.42						
	Avg. UpScale	11.94	9.08	3.07	9.43						
Upscale Cal Gas		12.10	9.02	3.02	9.36						

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	13.82	3.52	0.06	5.23
Corrected Raw Average (ppm/% wet basis)	12.92	3.29	0.06	4.89
Emission Rate (lb/hr)	N/A	0.04	0.00	N/A

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	4.3	%
Stack Exhaust Flow (M2)	138,517	SCFH

Weather Data

Barometric Pressure	29.91	in. Hg
Relative Humidity	46	%
Ambient Temperature	39	°F
Specific Humidity	0.002308	lb H ₂ O / lb air

90-100 Load, Run - Q250-R11

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/25/15 10:19:25	9690	13.72	4.79	0.72	5.34	33.10	39.10	1,849.00
	02/25/15 10:19:55	9720	13.64	4.27	0.60	5.42	33.10	39.10	1,849.00
	02/25/15 10:20:25	9750	13.50	3.58	0.82	5.51	32.93	38.80	1,928.00
	02/25/15 10:20:55	9780	13.59	2.98	-0.06	5.44	32.93	38.80	1,928.00
	02/25/15 10:21:25	9810	13.82	2.82	0.46	5.31	32.77	38.60	1,989.00
	02/25/15 10:21:55	9840	13.63	3.53	2.09	5.40	32.77	38.60	1,989.00
	02/25/15 10:22:25	9870	13.37	3.09	2.52	5.64	32.60	38.30	2,049.00
	02/25/15 10:22:55	9900	13.37	3.22	3.02	5.62	32.60	38.30	2,049.00
	02/25/15 10:23:25	9930	13.61	3.45	3.35	5.45	32.49	38.10	2,055.00
	02/25/15 10:23:55	9960	13.63	4.00	3.74	5.42	32.49	38.10	2,055.00
	02/25/15 10:24:25	9990	13.62	3.93	4.10	5.43	32.38	37.80	2,061.00
	02/25/15 10:24:55	10020	13.78	3.74	4.18	5.32	32.38	37.80	2,061.00
	02/25/15 10:25:25	10050	13.53	3.89	4.90	5.49	32.28	37.70	2,057.00
	02/25/15 10:25:55	10080	13.46	3.45	5.08	5.55	32.28	37.70	2,057.00
	02/25/15 10:26:25	10110	13.44	3.57	6.21	5.56	32.17	37.60	2,043.00
	02/25/15 10:26:55	10140	13.55	3.61	7.12	5.48	32.17	37.60	2,043.00
	02/25/15 10:27:25	10170	13.17	3.65	7.19	5.82	32.07	37.70	2,057.00
	02/25/15 10:27:55	10200	13.75	2.96	7.11	5.37	32.07	37.70	2,057.00
	02/25/15 10:28:25	10230	14.08	3.46	7.54	5.12	31.97	37.70	2,052.00
	02/25/15 10:28:55	10260	13.88	3.56	8.75	5.25	31.97	37.70	2,052.00
	02/25/15 10:29:25	10290	13.98	3.48	9.60	5.19	31.87	37.80	2,047.00
	02/25/15 10:29:55	10320	13.96	3.47	6.98	5.18	31.87	37.80	2,047.00
	02/25/15 10:30:25	10350	13.75	3.20	6.90	5.36	31.76	37.80	2,043.00
	02/25/15 10:30:55	10380	13.60	3.04	7.15	5.46	31.76	37.80	2,043.00
	02/25/15 10:31:25	10410	13.99	3.00	6.70	5.18	31.66	37.80	2,029.00
	02/25/15 10:31:55	10440	13.96	3.51	8.40	5.20	31.66	37.80	2,029.00
	02/25/15 10:32:25	10470	13.64	3.20	4.46	5.38	31.55	37.80	2,034.00
	02/25/15 10:32:55	10500	13.36	2.35	2.28	5.64	31.55	37.80	2,034.00
	02/25/15 10:33:25	10530	13.14	1.95	0.21	5.79	31.46	37.70	2,020.00
	02/25/15 10:33:55	10560	13.08	1.46	0.39	5.85	31.46	37.70	2,020.00
	02/25/15 10:34:25	10590	12.95	1.14	0.41	5.99	31.34	37.60	2,015.00
	02/25/15 10:34:55	10620	13.08	1.02	1.03	5.90	31.34	37.60	2,015.00
	02/25/15 10:35:25	10650	13.30	1.02	1.56	5.68	31.11	37.60	2,133.00
	02/25/15 10:35:55	10680	13.43	1.12	2.22	5.59	31.11	37.60	2,133.00
	02/25/15 10:36:25	10710	13.25	1.04	-0.62	5.73	30.88	37.50	2,241.00
	02/25/15 10:36:55	10740	13.24	0.84	-0.52	5.76	30.88	37.50	2,241.00
	02/25/15 10:37:25	10770	13.40	0.76	0.29	5.61	30.76	37.30	2,254.00
	02/25/15 10:37:55	10800	13.39	1.21	-0.73	5.58	30.76	37.30	2,254.00
	02/25/15 10:38:25	10830	13.01	1.34	-0.22	5.96	30.62	37.10	2,248.00
	02/25/15 10:38:55	10860	13.99	1.64	0.97	5.20	30.62	37.10	2,248.00
	02/25/15 10:39:25	10890	14.22	3.03	0.94	5.01	30.50	37.00	2,234.00
	02/25/15 10:39:55	10920	14.18	3.76	1.06	5.05	30.50	37.00	2,234.00
	02/25/15 10:40:25	10950	14.41	3.95	0.46	4.88	30.39	37.00	2,228.00
	02/25/15 10:40:55	10980	14.56	4.38	0.90	4.77	30.39	37.00	2,228.00
	02/25/15 10:41:25	11010	14.46	4.81	1.16	4.84	30.25	36.90	2,231.00
	02/25/15 10:41:55	11040	14.21	4.79	1.67	5.01	30.25	36.90	2,231.00
A2	02/25/15 10:42:25	11070	14.43	4.22	2.81	4.86	30.13	36.70	2,226.00
	02/25/15 10:42:55	11100	14.29	4.65	3.90	4.98	30.13	36.70	2,226.00
	02/25/15 10:43:25	11130	14.14	4.53	-0.17	5.08	29.99	36.60	2,228.00
	02/25/15 10:43:55	11160	14.32	4.35	-0.41	4.92	29.99	36.60	2,228.00
	02/25/15 10:44:25	11190	14.39	4.45	-0.50	4.90	29.84	36.30	2,231.00
	02/25/15 10:44:55	11220	14.66	4.87	-0.57	4.70	29.84	36.30	2,231.00
	02/25/15 10:45:25	11250	14.33	5.16	-0.38	4.93	29.71	36.10	2,216.00
	02/25/15 10:45:55	11280	14.26	4.40	0.16	4.98	29.71	36.10	2,216.00
	02/25/15 10:46:25	11310	14.18	4.29	0.20	5.02	29.58	36.10	2,227.00
	02/25/15 10:46:55	11340	14.05	4.02	0.05	5.12	29.58	36.10	2,227.00
	02/25/15 10:47:25	11370	14.14	3.87	-0.36	5.08	29.44	36.10	2,212.00
	02/25/15 10:47:55	11400	14.17	4.14	-0.68	5.02	29.44	36.10	2,212.00
	02/25/15 10:48:25	11430	14.36	3.97	-0.02	4.93	29.33	36.00	2,224.00
	02/25/15 10:48:55	11460	14.46	4.59	0.12	4.83	29.33	36.00	2,224.00
	02/25/15 10:49:25	11490	14.45	4.56	0.42	4.85	29.19	36.00	2,217.00
	02/25/15 10:49:55	11520	14.50	4.98	0.49	4.81	29.19	36.00	2,217.00

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	4.3	%
Stack Exhaust Flow (M2)	138,517	SCFH

Weather Data

Barometric Pressure	29.91	in. Hg
Relative Humidity	46	%
Ambient Temperature	39	°F
Specific Humidity	0.002308	lb H ₂ O / lb air

90-100 Load, Run - Q250-R11

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/25/15 10:50:25	11550	14.17	4.42	0.63	5.06	29.07	35.90	2,211.00
	02/25/15 10:50:55	11580	14.48	4.04	0.93	4.85	29.07	35.90	2,211.00
	02/25/15 10:51:25	11610	14.61	5.01	0.96	4.76	28.94	35.90	2,204.00
	02/25/15 10:51:55	11640	14.53	5.61	-0.51	4.77	28.94	35.90	2,204.00
	02/25/15 10:52:25	11670	14.31	4.72	0.00	4.96	28.82	35.80	2,216.00
	02/25/15 10:52:55	11700	14.44	4.47	0.00	4.88	28.82	35.80	2,216.00
	02/25/15 10:53:25	11730	14.52	4.69	0.00	4.78	28.70	35.60	2,202.00
	02/25/15 10:53:55	11760	13.95	5.10	0.00	5.19	28.70	35.60	2,202.00
	02/25/15 10:54:25	11790	14.32	4.01	0.00	4.95	28.59	35.60	2,205.00
	02/25/15 10:54:55	11820	14.33	4.71	0.00	4.93	28.59	35.60	2,205.00
	02/25/15 10:55:25	11850	14.07	4.62	0.77	5.10	28.46	35.50	2,207.00
	02/25/15 10:55:55	11880	14.26	4.23	2.07	5.00	28.46	35.50	2,207.00
	02/25/15 10:56:25	11910	14.31	4.76	1.83	4.93	28.34	35.50	2,201.00
	02/25/15 10:56:55	11940	14.31	4.56	1.54	4.95	28.34	35.50	2,201.00
	02/25/15 10:57:25	11970	14.81	4.85	1.14	4.61	28.22	35.50	2,195.00
	02/25/15 10:57:55	12000	14.79	5.72	0.26	4.57	28.22	35.50	2,195.00
	02/25/15 10:58:25	12030	14.72	5.50	-0.06	4.67	28.10	35.50	2,189.00
	02/25/15 10:58:55	12060	14.98	5.79	-0.87	4.46	28.10	35.50	2,189.00
	02/25/15 10:59:25	12090	15.04	6.52	-2.08	4.40	27.99	35.60	2,191.00
	02/25/15 10:59:55	12120	14.89	6.64	-2.12	4.52	27.99	35.60	2,191.00
	02/25/15 11:00:25	12150	14.89	6.61	-2.29	4.53	27.88	35.60	2,185.00
	02/25/15 11:00:55	12180	14.95	6.22	-1.27	4.49	27.88	35.60	2,185.00
	02/25/15 11:01:25	12210	15.03	6.23	0.61	4.41	27.77	35.70	2,179.00
	02/25/15 11:01:55	12240	14.95	6.77	0.07	4.45	27.77	35.70	2,179.00
	02/25/15 11:02:25	12270	14.88	6.49	0.09	4.53	27.64	35.70	2,189.00
	02/25/15 11:02:55	12300	14.87	5.77	1.15	4.53	27.64	35.70	2,189.00
	02/25/15 11:03:25	12330	14.94	6.17	0.93	4.48	27.53	35.80	2,175.00
	02/25/15 11:03:55	12360	15.00	6.88	1.22	4.45	27.53	35.80	2,175.00
	02/25/15 11:04:25	12390	14.68	6.50	-0.10	4.66	27.41	35.90	2,176.00
	02/25/15 11:04:55	12420	14.73	5.55	0.59	4.64	27.41	35.90	2,176.00
A3	02/25/15 11:05:25	12450	14.74	5.86	0.55	4.64	27.29	36.10	2,186.00
	02/25/15 11:05:55	12480	14.84	5.37	1.39	4.54	27.29	36.10	2,186.00
	02/25/15 11:06:25	12510	15.07	5.78	0.84	4.40	27.17	36.20	2,179.00
	02/25/15 11:06:55	12540	14.99	6.96	0.13	4.45	27.17	36.20	2,179.00
	02/25/15 11:07:25	12570	14.85	6.39	1.32	4.53	27.06	36.30	2,173.00
	02/25/15 11:07:55	12600	14.48	5.51	1.50	4.80	27.06	36.30	2,173.00
	02/25/15 11:08:25	12630	14.68	4.50	1.44	4.67	26.96	36.40	2,176.00
	02/25/15 11:08:55	12660	14.91	5.44	0.27	4.51	26.96	36.40	2,176.00
	02/25/15 11:09:25	12690	14.52	5.65	0.49	4.77	26.87	36.40	2,171.00
	02/25/15 11:09:55	12720	14.50	4.33	1.36	4.79	26.87	36.40	2,171.00
	02/25/15 11:10:25	12750	14.62	4.19	2.03	4.72	26.77	36.40	2,174.00
	02/25/15 11:10:55	12780	14.61	4.39	0.66	4.72	26.77	36.40	2,174.00
	02/25/15 11:11:25	12810	14.66	4.38	0.52	4.67	25.50	36.30	2,114.00
	02/25/15 11:11:55	12840	14.70	4.54	1.24	4.67	25.50	36.30	2,114.00
	02/25/15 11:12:25	12870	14.69	4.61	1.64	4.66	26.60	35.60	2,185.00
	02/25/15 11:12:55	12900	14.58	4.47	-0.20	4.74	26.60	35.60	2,185.00
	02/25/15 11:13:25	12930	14.70	4.61	-0.88	4.67	26.45	35.80	2,176.00
	02/25/15 11:13:55	12960	14.67	5.01	-1.55	4.67	26.45	35.80	2,176.00
	02/25/15 11:14:25	12990	14.63	5.29	-1.63	4.71	26.35	36.10	2,169.00
	02/25/15 11:14:55	13020	14.73	5.19	-1.23	4.62	26.35	36.10	2,169.00
	02/25/15 11:15:25	13050	14.47	5.24	-0.86	4.84	26.24	36.50	2,161.00
	02/25/15 11:15:55	13080	14.85	5.49	-0.76	4.55	26.24	36.50	2,161.00
	02/25/15 11:16:25	13110	14.79	5.54	-1.22	4.59	26.16	36.90	2,147.00
	02/25/15 11:16:55	13140	14.62	5.22	0.31	4.73	26.16	36.90	2,147.00
	02/25/15 11:17:25	13170	14.73	4.88	-0.39	4.64	26.05	37.20	2,148.00
	02/25/15 11:17:55	13200	14.82	5.18	-0.77	4.58	26.05	37.20	2,148.00
	02/25/15 11:18:25	13230	14.68	5.52	0.93	4.64	25.95	37.50	2,141.00
	02/25/15 11:18:55	13260	14.72	5.48	0.62	4.65	25.95	37.50	2,141.00
	02/25/15 11:19:25	13290	14.95	5.64	0.01	4.47	25.84	37.80	2,135.00
	02/25/15 11:19:55	13320	14.83	6.34	0.01	4.55	25.84	37.80	2,135.00
	02/25/15 11:20:25	13350	14.55	5.51	-0.84	4.78	25.74	38.10	2,128.00
	02/25/15 11:20:55	13380	14.54	4.74	-0.33	4.78	25.74	38.10	2,128.00

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	4.3	%
Stack Exhaust Flow (M2)	138,517	SCFH

Weather Data

Barometric Pressure	29.91	in. Hg
Relative Humidity	46	%
Ambient Temperature	39	°F
Specific Humidity	0.002308	lb H ₂ O / lb air

90-100 Load, Run - Q250-R11

Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/25/15 11:21:25	13410	14.48	4.74	1.20	4.82	25.65	38.60	2,137.00
02/25/15 11:21:55	13440	14.62	4.92	0.62	4.73	25.65	38.60	2,137.00
02/25/15 11:22:25	13470	14.91	5.56	-0.17	4.51	25.46	39.40	2,123.00
02/25/15 11:22:55	13500	14.85	6.24	-1.06	4.54	25.46	39.40	2,123.00
02/25/15 11:23:25	13530	14.90	6.23	-0.08	4.50	25.38	39.80	2,117.00
02/25/15 11:23:55	13560	14.61	6.10	0.41	4.68	25.38	39.80	2,117.00
02/25/15 11:24:25	13590	14.70	5.20	-0.22	4.70	25.30	40.10	2,103.00
02/25/15 11:24:55	13620	15.08	6.24	0.38	4.37	25.30	40.10	2,103.00
02/25/15 11:25:25	13650	14.81	7.12	0.56	4.57	25.21	40.40	2,105.00
02/25/15 11:25:55	13680	15.08	6.65	-0.53	4.39	25.21	40.40	2,105.00
02/25/15 11:26:25	13710	14.79	6.68	0.19	4.58	25.12	40.70	2,099.00
02/25/15 11:26:55	13740	14.69	5.85	1.28	4.67	25.12	40.70	2,099.00
02/25/15 11:27:25	13770	14.64	5.91	0.99	4.68	32.53	32.00	2,255.00
02/25/15 11:27:55	13800	14.67	5.45	-0.73	4.71	32.53	32.00	2,255.00
02/25/15 11:28:25	13830	14.69	5.85	-0.39	4.67	32.40	32.20	2,248.00
02/25/15 11:28:55	13860	14.59	6.07	0.81	4.74	32.40	32.20	2,248.00
02/25/15 11:29:25	13890	14.67	5.84	0.62	4.71	25.03	41.10	2,092.00
02/25/15 11:29:55	13920	14.93	6.36	0.53	4.51	25.03	41.10	2,092.00
RAW AVERAGE		14.31	4.54	1.16	4.94	28.94	36.95	2,147.11

Bias	Serial Number: INST-O2-0013 INST-CO-0029 INST-TH-0009 INST-C2-0013				Press. Trans.	Temp. Trans.	F-Flow Trans.
					1442557	1442557	1442557
					(in. H ₂ O)	(°F)	(SCFH)
	Initial Zero	0.12	0.16	0.04	0.06		
	Final Zero	0.11	0.18	0.13	0.08		
	Avg. Zero	0.12	0.17	0.09	0.07		
	Initial UpScale	11.95	9.08	2.99	9.42		
	Final UpScale	12.03	9.20	3.09	9.41		
	Avg. UpScale	11.99	9.14	3.04	9.42		
Upscale Cal Gas		12.10	9.02	3.02	9.36		

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	14.46	4.39	1.10	4.88
Corrected Raw Average (ppm/% wet basis)	13.84	4.20	1.05	4.67
Emission Rate (lb/hr)	N/A	0.04	0.02	N/A

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.2	%
Stack Exhaust Flow (M2)	42,560	SCFH

Weather Data

Barometric Pressure	29.80	in. Hg
Relative Humidity	37	%
Ambient Temperature	54	°F
Specific Humidity	0.003236	lb H ₂ O / lb air

90-100 Load, Run - Q250-R12

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
A1	02/25/15 13:38:25	21630	15.16	3.45	2.67	4.33	33.78	59.60	1,985.00
	02/25/15 13:38:55	21660	15.94	2.59	2.54	3.75	33.78	59.60	1,985.00
	02/25/15 13:39:25	21690	15.94	2.89	2.62	3.71	33.71	59.30	1,992.00
	02/25/15 13:39:55	21720	15.48	2.84	2.47	4.02	33.71	59.30	1,992.00
	02/25/15 13:40:25	21750	14.67	2.92	2.12	4.61	33.61	59.20	1,980.00
	02/25/15 13:40:55	21780	14.95	3.01	1.87	4.42	33.61	59.20	1,980.00
	02/25/15 13:41:25	21810	14.70	3.26	2.09	4.60	33.54	59.10	1,986.00
	02/25/15 13:41:55	21840	14.96	3.07	2.62	4.40	33.54	59.10	1,986.00
	02/25/15 13:42:25	21870	15.20	3.00	3.46	4.28	33.46	58.90	1,974.00
	02/25/15 13:42:55	21900	15.35	3.09	3.06	4.12	33.46	58.90	1,974.00
	02/25/15 13:43:25	21930	15.31	2.72	0.19	4.15	33.38	58.80	1,981.00
	02/25/15 13:43:55	21960	15.20	2.38	0.01	4.26	33.38	58.80	1,981.00
	02/25/15 13:44:25	21990	15.23	2.33	0.67	4.22	33.29	58.60	1,969.00
	02/25/15 13:44:55	22020	15.39	2.36	0.87	4.14	33.29	58.60	1,969.00
	02/25/15 13:45:25	22050	15.55	2.41	0.81	4.01	32.90	58.40	2,309.00
	02/25/15 13:45:55	22080	15.51	2.68	0.91	4.01	32.90	58.40	2,309.00
	02/25/15 13:46:25	22110	15.48	2.78	0.89	4.03	32.75	58.30	2,311.00
	02/25/15 13:46:55	22140	14.71	2.77	0.73	4.58	32.75	58.30	2,311.00
	02/25/15 13:47:25	22170	14.26	2.10	0.34	4.89	32.63	58.20	2,315.00
	02/25/15 13:47:55	22200	14.26	2.32	0.23	4.92	32.63	58.20	2,315.00
	02/25/15 13:48:25	22230	14.55	2.12	0.01	4.72	32.52	58.20	2,300.00
	02/25/15 13:48:55	22260	14.70	2.40	0.01	4.59	32.52	58.20	2,300.00
	02/25/15 13:49:25	22290	14.63	2.37	-0.26	4.65	32.39	57.90	2,295.00
	02/25/15 13:49:55	22320	14.29	2.38	-0.39	4.85	32.39	57.90	2,295.00
	02/25/15 13:50:25	22350	13.42	1.59	-0.45	5.55	32.26	57.80	2,290.00
	02/25/15 13:50:55	22380	14.19	2.62	-0.21	4.98	32.26	57.80	2,290.00
	02/25/15 13:51:25	22410	14.18	5.47	-0.10	4.97	32.16	57.40	2,286.00
	02/25/15 13:51:55	22440	14.19	4.81	-0.87	4.98	32.16	57.40	2,286.00
	02/25/15 13:52:25	22470	13.36	4.73	-1.05	5.58	32.06	57.10	2,291.00
	02/25/15 13:52:55	22500	13.71	3.57	-0.80	5.34	32.06	57.10	2,291.00
	02/25/15 13:53:25	22530	13.99	4.57	-0.76	5.08	31.96	56.70	2,288.00
	02/25/15 13:53:55	22560	14.15	5.02	-1.11	4.99	31.96	56.70	2,288.00
	02/25/15 13:54:25	22590	14.02	5.29	-1.48	5.10	31.88	56.40	2,285.00
	02/25/15 13:54:55	22620	14.16	5.15	-1.45	5.01	31.88	56.40	2,285.00
	02/25/15 13:55:25	22650	14.31	5.15	-1.43	4.87	31.79	56.30	2,273.00
	02/25/15 13:55:55	22680	14.26	5.42	-1.28	4.92	31.79	56.30	2,273.00
	02/25/15 13:56:25	22710	14.35	5.36	-1.51	4.84	31.68	56.30	2,267.00
	02/25/15 13:56:55	22740	14.39	5.48	-1.51	4.83	31.68	56.30	2,267.00
	02/25/15 13:57:25	22770	14.20	5.83	-1.52	4.95	31.57	56.40	2,270.00
	02/25/15 13:57:55	22800	14.20	5.32	-1.59	4.96	31.57	56.40	2,270.00
	02/25/15 13:58:25	22830	14.55	5.17	-1.51	4.71	31.48	56.40	2,257.00
	02/25/15 13:58:55	22860	14.22	5.79	-1.66	4.92	31.48	56.40	2,257.00
	02/25/15 13:59:25	22890	14.13	4.66	-0.49	5.01	31.37	56.40	2,261.00
	02/25/15 13:59:55	22920	14.31	4.99	-0.05	4.88	31.37	56.40	2,261.00
	02/25/15 14:00:25	22950	14.28	4.98	-0.78	4.91	31.26	56.30	2,246.00
	02/25/15 14:00:55	22980	14.48	5.00	-1.06	4.78	31.26	56.30	2,246.00
A2	02/25/15 14:01:25	23010	14.61	5.61	-0.75	4.64	31.16	56.20	2,260.00
	02/25/15 14:01:55	23040	14.48	5.74	-0.62	4.76	31.16	56.20	2,260.00
	02/25/15 14:02:25	23070	14.44	5.27	0.02	4.78	31.04	56.20	2,245.00
	02/25/15 14:02:55	23100	14.68	5.56	-0.40	4.57	31.04	56.20	2,245.00
	02/25/15 14:03:25	23130	14.30	5.81	-0.33	4.88	30.94	56.20	2,231.00
	02/25/15 14:03:55	23160	14.68	6.13	-0.51	4.60	30.94	56.20	2,231.00
	02/25/15 14:04:25	23190	14.45	6.81	0.31	4.78	30.83	56.20	2,234.00
	02/25/15 14:04:55	23220	14.55	5.83	0.07	4.73	30.83	56.20	2,234.00
	02/25/15 14:05:25	23250	14.11	5.30	-0.42	5.02	30.72	56.20	2,238.00
	02/25/15 14:05:55	23280	14.42	4.81	1.10	4.82	30.72	56.20	2,238.00
	02/25/15 14:06:25	23310	14.44	5.77	2.92	4.77	30.62	56.10	2,225.00
	02/25/15 14:06:55	23340	13.40	5.53	1.79	5.51	30.62	56.10	2,225.00
	02/25/15 14:07:25	23370	12.91	3.20	0.95	5.85	30.50	56.00	2,228.00
	02/25/15 14:07:55	23400	13.60	2.11	0.79	5.48	30.50	56.00	2,228.00
	02/25/15 14:08:25	23430	13.75	2.93	0.74	5.27	30.40	55.90	2,223.00
	02/25/15 14:08:55	23460	14.13	3.07	0.80	5.05	30.40	55.90	2,223.00

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.2	%
Stack Exhaust Flow (M2)	42,560	SCFH

Weather Data

Barometric Pressure	29.80	in. Hg
Relative Humidity	37	%
Ambient Temperature	54	°F
Specific Humidity	0.003236	lb H ₂ O / lb air

90-100 Load, Run - Q250-R12

	Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
	02/25/15 14:09:25	23490	13.99	3.68	0.76	5.10	30.33	55.90	2,220.00
	02/25/15 14:09:55	23520	14.01	3.72	0.75	5.07	30.33	55.90	2,220.00
	02/25/15 14:10:25	23550	13.86	3.31	0.76	5.21	30.28	55.80	2,218.00
	02/25/15 14:10:55	23580	14.19	3.89	0.76	4.98	30.28	55.80	2,218.00
	02/25/15 14:11:25	23610	14.12	4.42	0.80	5.03	30.19	55.50	2,214.00
	02/25/15 14:11:55	23640	14.19	4.65	0.52	4.97	30.19	55.50	2,214.00
	02/25/15 14:12:25	23670	14.21	4.58	-0.02	4.96	30.12	55.40	2,211.00
	02/25/15 14:12:55	23700	14.20	4.88	0.01	4.95	30.12	55.40	2,211.00
	02/25/15 14:13:25	23730	14.20	4.77	-0.49	4.96	30.03	55.20	2,224.00
	02/25/15 14:13:55	23760	13.92	4.37	0.06	5.16	30.03	55.20	2,224.00
	02/25/15 14:14:25	23790	14.07	3.87	1.01	5.03	29.91	55.10	2,228.00
	02/25/15 14:14:55	23820	13.91	3.90	0.73	5.17	29.91	55.10	2,228.00
	02/25/15 14:15:25	23850	13.73	3.77	0.16	5.26	29.85	55.00	2,251.00
	02/25/15 14:15:55	23880	13.96	2.80	-0.17	5.16	29.85	55.00	2,251.00
	02/25/15 14:16:25	23910	13.97	3.48	0.24	5.11	29.75	54.90	2,238.00
	02/25/15 14:16:55	23940	13.94	3.21	0.17	5.16	29.75	54.90	2,238.00
	02/25/15 14:17:25	23970	13.97	3.27	-0.07	5.12	29.66	54.80	2,225.00
	02/25/15 14:17:55	24000	13.81	3.22	0.00	5.25	29.66	54.80	2,225.00
	02/25/15 14:18:25	24030	13.45	2.78	-0.31	5.49	29.57	54.70	2,238.00
	02/25/15 14:18:55	24060	13.88	2.53	-0.05	5.20	29.57	54.70	2,238.00
	02/25/15 14:19:25	24090	13.66	2.93	0.38	5.32	29.46	54.70	2,215.00
	02/25/15 14:19:55	24120	13.32	1.92	0.34	5.62	29.46	54.70	2,215.00
	02/25/15 14:20:25	24150	13.90	2.20	0.57	5.18	29.35	54.80	2,226.00
	02/25/15 14:20:55	24180	13.47	2.55	0.24	5.49	29.35	54.80	2,226.00
	02/25/15 14:21:25	24210	13.66	2.21	-0.52	5.32	29.24	54.90	2,220.00
	02/25/15 14:21:55	24240	13.72	2.33	-0.42	5.32	29.24	54.90	2,220.00
	02/25/15 14:22:25	24270	13.85	2.50	-0.52	5.21	29.15	54.90	2,215.00
	02/25/15 14:22:55	24300	14.00	2.62	-0.54	5.12	29.15	54.90	2,215.00
	02/25/15 14:23:25	24330	13.86	2.70	-1.07	5.20	29.04	55.00	2,209.00
	02/25/15 14:23:55	24360	14.03	2.74	-1.36	5.08	29.04	55.00	2,209.00
A3	02/25/15 14:24:25	24390	13.97	2.87	-0.79	5.14	28.94	55.10	2,213.00
	02/25/15 14:24:55	24420	14.21	3.20	-0.57	4.93	28.94	55.10	2,213.00
	02/25/15 14:25:25	24450	13.99	3.15	-0.34	5.11	28.84	55.10	2,207.00
	02/25/15 14:25:55	24480	14.07	2.89	-0.10	5.07	28.84	55.10	2,207.00
	02/25/15 14:26:25	24510	14.27	3.07	0.55	4.92	28.74	55.00	2,194.00
	02/25/15 14:26:55	24540	14.28	3.37	0.13	4.90	28.74	55.00	2,194.00
	02/25/15 14:27:25	24570	14.34	3.62	0.08	4.85	28.68	54.90	2,208.00
	02/25/15 14:27:55	24600	14.27	3.66	-0.09	4.89	28.68	54.90	2,208.00
	02/25/15 14:28:25	24630	14.14	3.36	-0.12	5.01	28.60	54.70	2,188.00
	02/25/15 14:28:55	24660	13.92	3.14	-0.04	5.17	28.60	54.70	2,188.00
	02/25/15 14:29:25	24690	14.04	2.97	-0.18	5.09	28.52	54.60	2,201.00
	02/25/15 14:29:55	24720	14.24	3.56	-0.88	4.91	28.52	54.60	2,201.00
	02/25/15 14:30:25	24750	13.93	3.10	-1.56	5.17	28.41	54.60	2,179.00
	02/25/15 14:30:55	24780	14.23	3.04	-1.48	4.94	28.41	54.60	2,179.00
	02/25/15 14:31:25	24810	14.06	3.03	1.78	5.07	28.33	54.50	2,192.00
	02/25/15 14:31:55	24840	13.80	2.76	2.16	5.24	28.33	54.50	2,192.00
	02/25/15 14:32:25	24870	13.58	2.61	1.68	5.38	28.22	54.50	2,186.00
	02/25/15 14:32:55	24900	13.39	1.92	1.96	5.57	28.22	54.50	2,186.00
	02/25/15 14:33:25	24930	13.99	2.15	1.81	5.13	28.13	54.50	2,181.00
	02/25/15 14:33:55	24960	14.09	2.73	1.86	5.05	28.13	54.50	2,181.00
	02/25/15 14:34:25	24990	14.20	2.99	1.60	4.95	28.03	54.50	2,176.00
	02/25/15 14:34:55	25020	13.81	3.01	1.48	5.22	28.03	54.50	2,176.00
	02/25/15 14:35:25	25050	14.08	2.72	1.41	5.05	27.93	54.50	2,179.00
	02/25/15 14:35:55	25080	14.32	3.22	1.19	4.87	27.93	54.50	2,179.00
	02/25/15 14:36:25	25110	14.17	3.35	1.02	4.98	27.84	54.50	2,175.00
	02/25/15 14:36:55	25140	14.23	3.30	1.30	4.94	27.84	54.50	2,175.00
	02/25/15 14:37:25	25170	14.42	3.43	0.96	4.79	27.74	54.50	2,178.00
	02/25/15 14:37:55	25200	14.35	3.76	0.78	4.88	27.74	54.50	2,178.00
	02/25/15 14:38:25	25230	14.43	3.91	1.09	4.79	27.66	54.50	2,174.00
	02/25/15 14:38:55	25260	14.46	4.19	1.22	4.78	27.66	54.50	2,174.00
	02/25/15 14:39:25	25290	14.49	4.17	1.40	4.76	27.58	54.40	2,170.00
	02/25/15 14:39:55	25320	14.59	4.38	1.36	4.70	27.58	54.40	2,170.00

Questor Technology Inc
February 25, 2015
Q250
Broken Arrow Rental Facility

Unit Data

Meas. Stack Moisture	5.2	%
Stack Exhaust Flow (M2)	42,560	SCFH

Weather Data

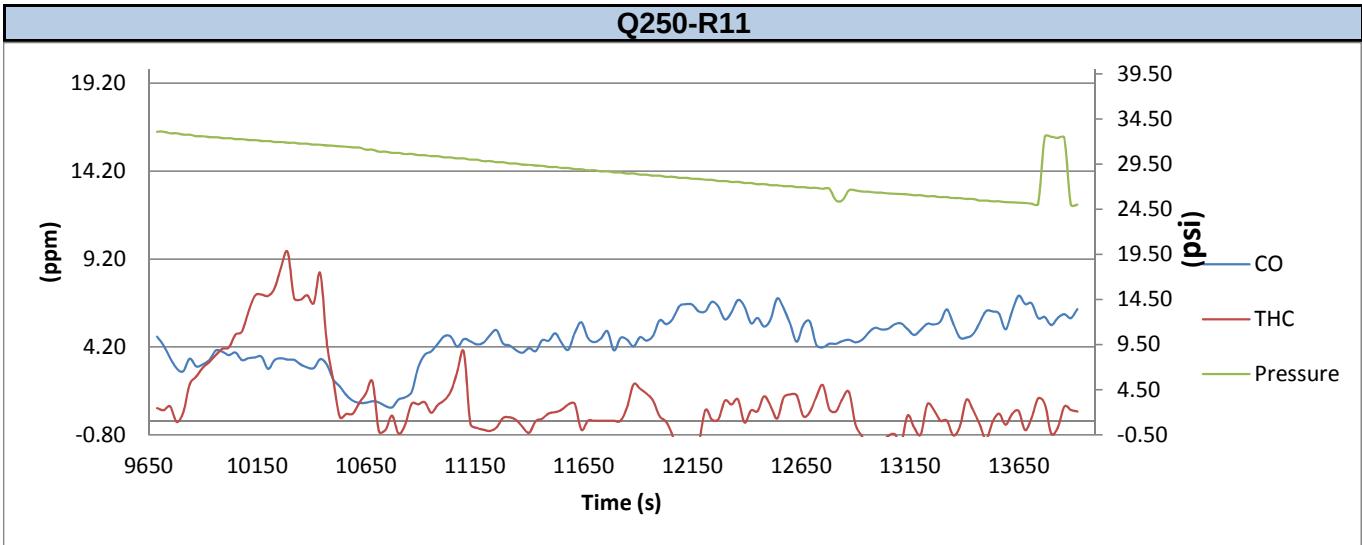
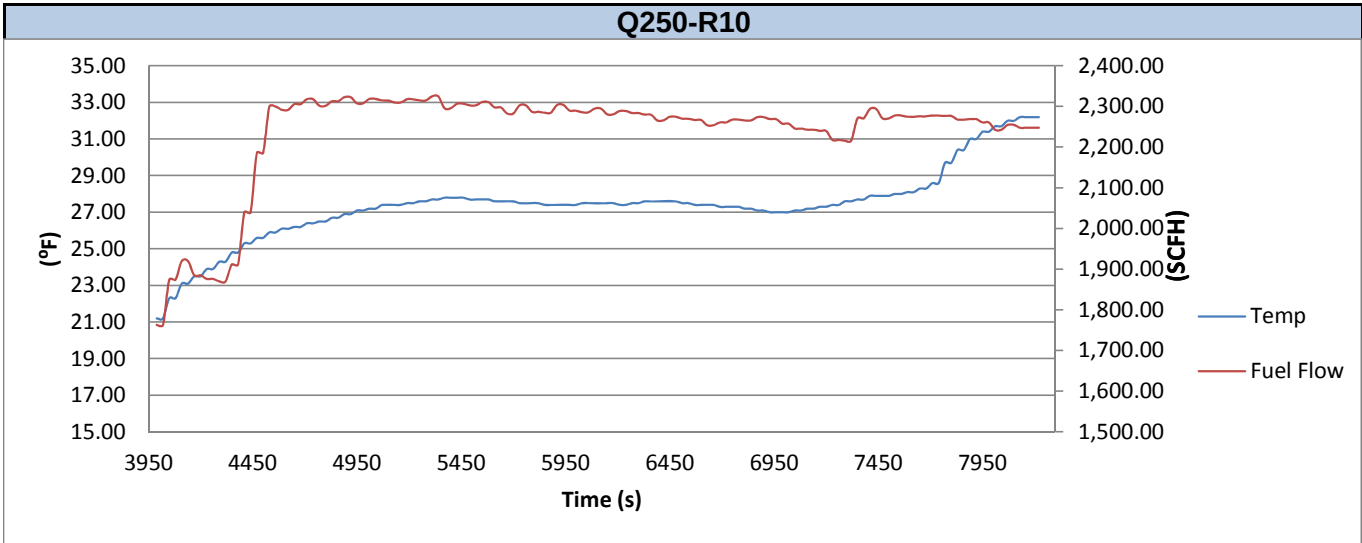
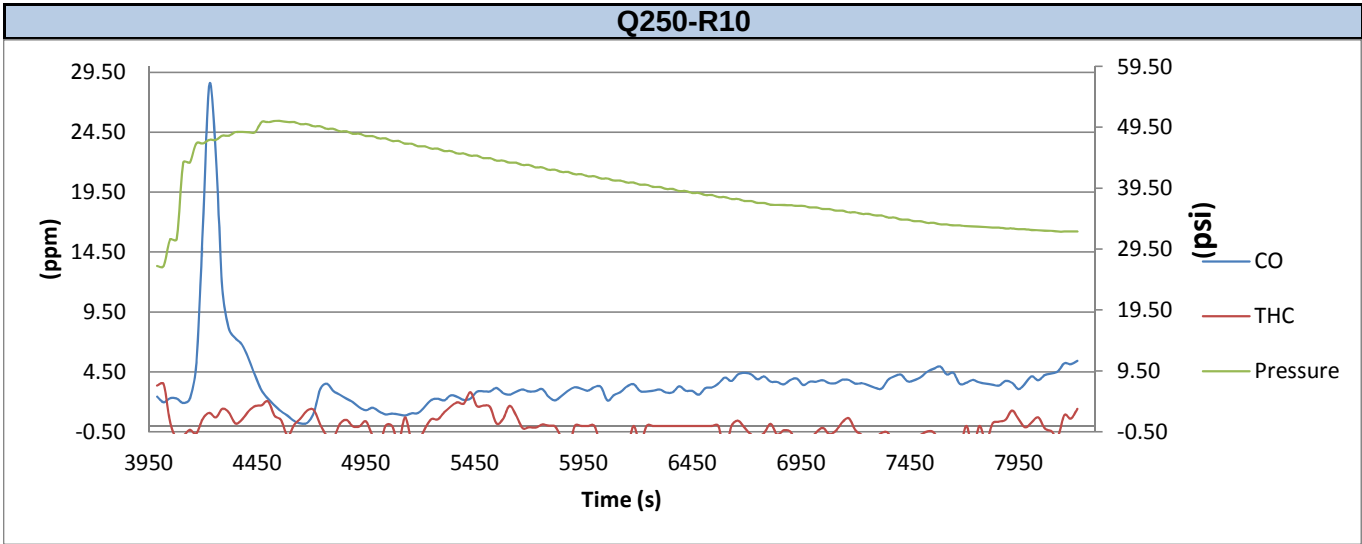
Barometric Pressure	29.80	in. Hg
Relative Humidity	37	%
Ambient Temperature	54	°F
Specific Humidity	0.003236	lb H ₂ O / lb air

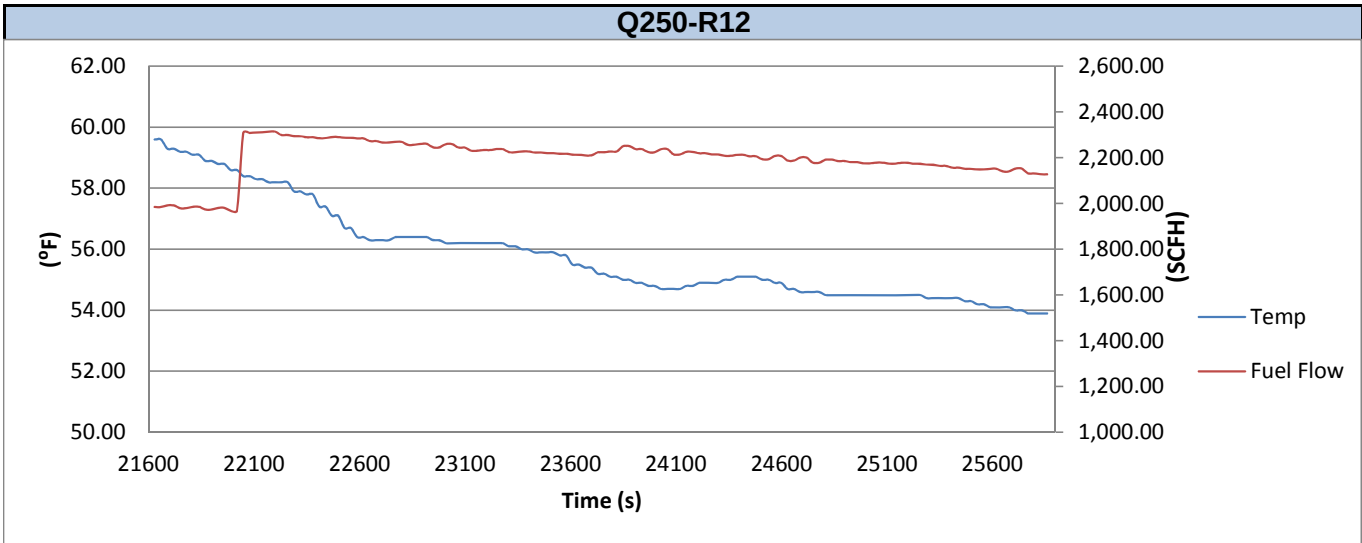
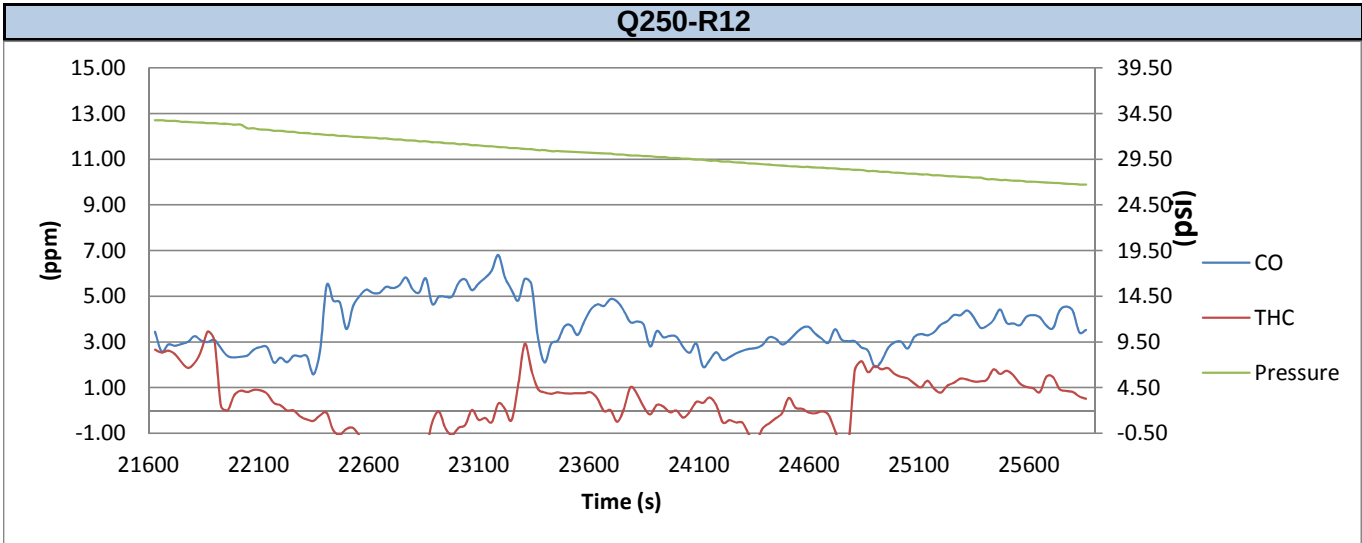
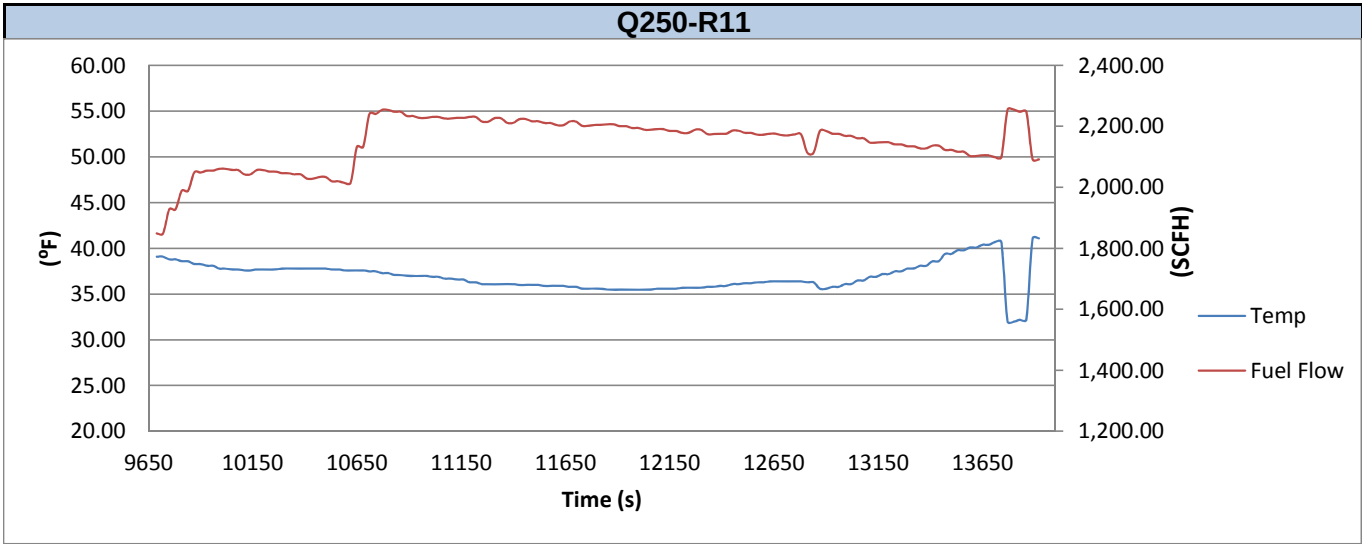
90-100 Load, Run - Q250-R12

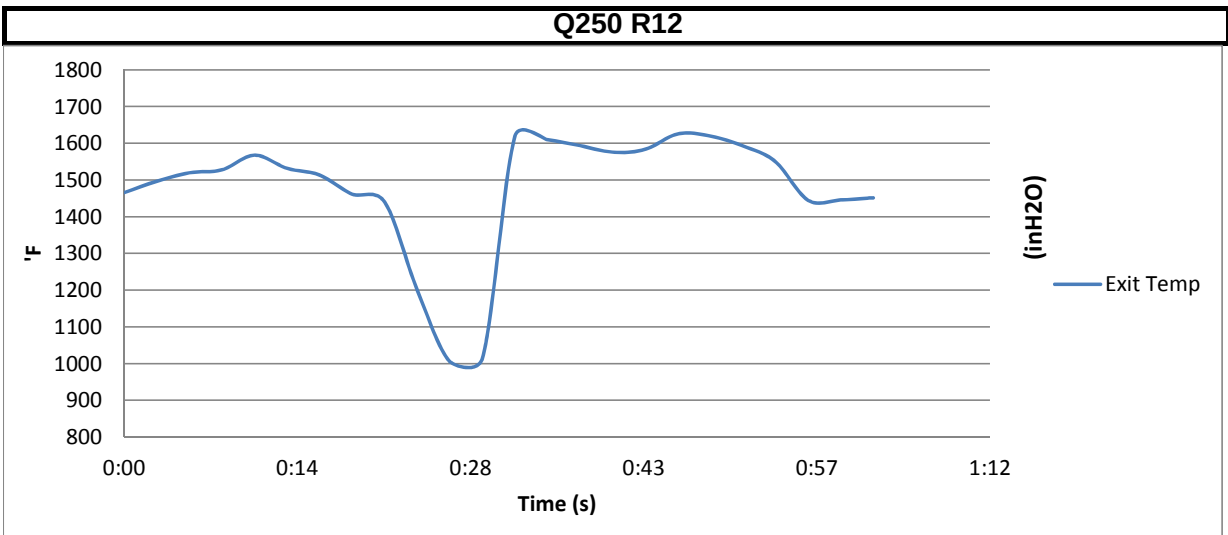
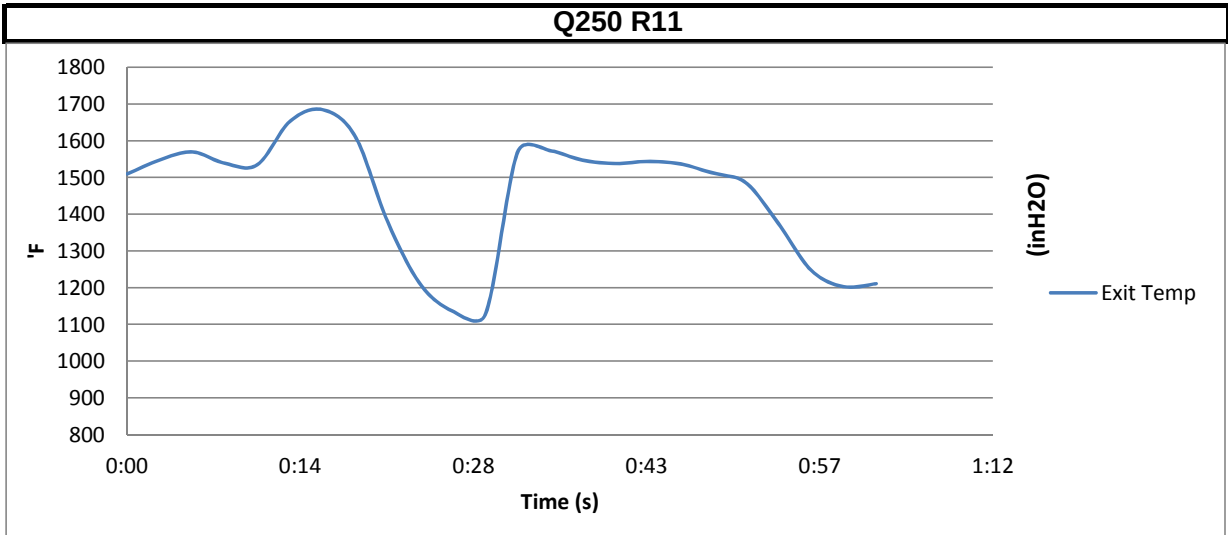
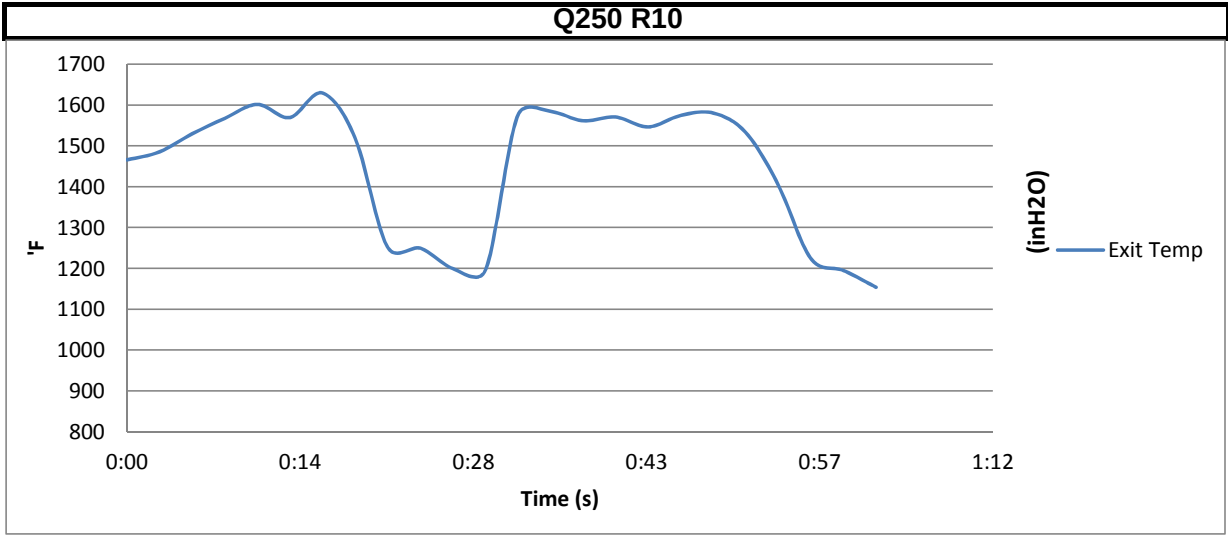
Date/Time (mm/dd/yy hh:mm:ss)	Elapsed Time (seconds)	O ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Fuel Pressure psi	Fuel Temp. °F	Fuel Flow SCFH
02/25/15 14:40:25	25350	14.29	4.09	1.27	4.89	27.49	54.40	2,165.00
02/25/15 14:40:55	25380	14.40	3.63	1.28	4.83	27.49	54.40	2,165.00
02/25/15 14:41:25	25410	14.22	3.71	1.35	4.95	27.32	54.40	2,157.00
02/25/15 14:41:55	25440	14.54	3.98	1.80	4.70	27.32	54.40	2,157.00
02/25/15 14:42:25	25470	14.54	4.42	1.60	4.70	27.24	54.30	2,152.00
02/25/15 14:42:55	25500	14.33	3.84	1.74	4.86	27.24	54.30	2,152.00
02/25/15 14:43:25	25530	14.30	3.82	1.54	4.88	27.16	54.20	2,149.00
02/25/15 14:43:55	25560	14.43	3.74	1.19	4.81	27.16	54.20	2,149.00
02/25/15 14:44:25	25590	14.63	4.11	1.03	4.64	27.06	54.10	2,152.00
02/25/15 14:44:55	25620	14.56	4.18	0.98	4.70	27.06	54.10	2,152.00
02/25/15 14:45:25	25650	14.30	4.09	0.81	4.89	26.99	54.10	2,141.00
02/25/15 14:45:55	25680	14.17	3.72	1.48	4.99	26.99	54.10	2,141.00
02/25/15 14:46:25	25710	14.67	3.61	1.47	4.63	26.91	54.00	2,153.00
02/25/15 14:46:55	25740	14.61	4.37	0.94	4.66	26.91	54.00	2,153.00
02/25/15 14:47:25	25770	14.49	4.55	0.86	4.77	26.82	53.90	2,132.00
02/25/15 14:47:55	25800	14.19	4.36	0.81	4.96	26.82	53.90	2,132.00
02/25/15 14:48:25	25830	14.11	3.43	0.62	5.03	26.74	53.90	2,128.00
02/25/15 14:48:55	25860	14.35	3.53	0.52	4.84	26.74	53.90	2,128.00
RAW AVERAGE		14.28	3.69	0.42	4.90	30.08	55.85	2,196.86

Bias	Serial Number:	CO ₂ (%)	CO (ppmvd)	THC (ppmvw)	CO ₂ (%)	Press. Trans. (in. H ₂ O)	Temp. Trans. (°F)	F-Flow Trans. (SCFH)
	INST-O2-0013	INST-CO-0029	INST-TH-0009	INST-C2-0013	1442557	1442557	1442557	
	Initial Zero	0.11	0.18	0.13	0.08			
	Final Zero	0.10	0.06	0.04	0.03			
	Avg. Zero	0.11	0.12	0.09	0.06			
	Initial UpScale	12.03	9.20	3.09	9.41			
	Final UpScale	12.01	9.33	3.10	9.34			
	Avg. UpScale	12.02	9.27	3.10	9.38			
Upscale Cal Gas		12.10	9.02	3.02	9.36			

EMISSIONS DATA	O ₂	CO	THC	CO ₂
Corrected Raw Average (ppm/% dry basis)	14.40	3.52	0.33	4.87
Corrected Raw Average (ppm/% wet basis)	13.64	3.33	0.31	4.61
Emission Rate (lb/hr)	N/A	0.01	0.00	N/A





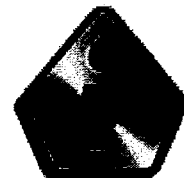


EMISSION DATA RECORDS
VISUAL EMISSION DATA RECORD

Photo

R1

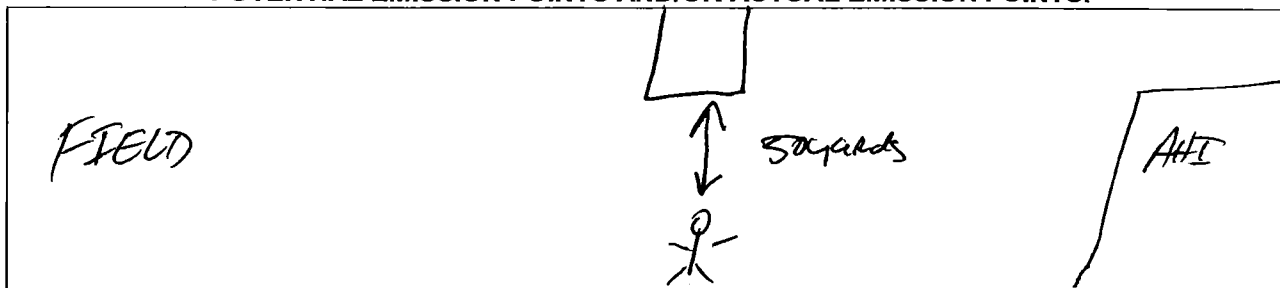
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 2/25/15
SKY CONDITIONS: Clear PRECIPITATION: X	WIND DIRECTION: N WIND SPEED: 5 mph
INDUSTRY:	PROCESS UNIT: Q250

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

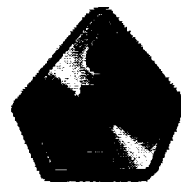
CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
① 4:50	20:00	00:00	N/E of point
5:10	Break 5:00	00:00	
② 5:15	20:00	00:00	
5:35	Break 5:00	00:00	
③ 5:40	20:00	00:00	
6:00			


SIGNATURE



Q-250 @ Run 1

R2



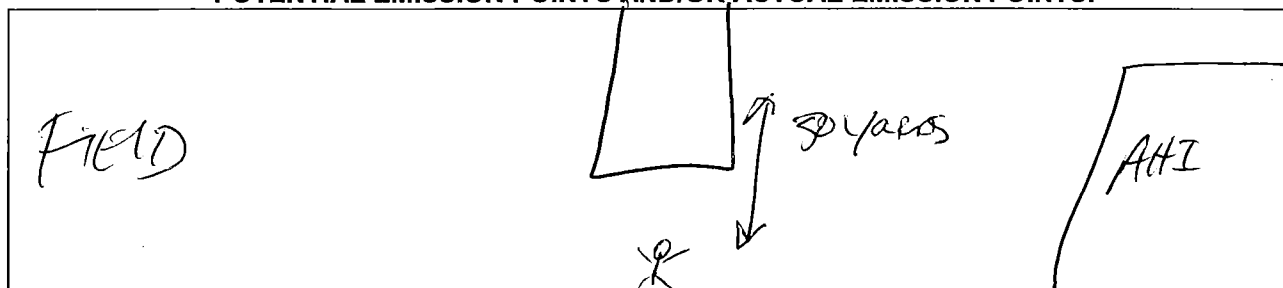
AIR HYGIENE

METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

photo

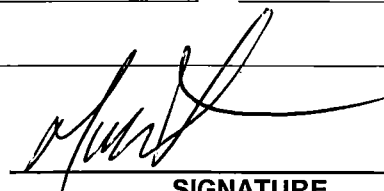
COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 2/26/15
SKY CONDITIONS: GREY / cloudy PRECIPITATION: X	WIND DIRECTION: N WIND SPEED: 10
INDUSTRY:	PROCESS UNIT: Q250

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
① 3:55	20:00	00:00	N/E
4:15	Break 5:00	00:00	
2/26/15 4:20	20:00	00:00	
4:40	Break 5:00	00:00	
4:45	20:00	00:00	
5:05			


SIGNATURE

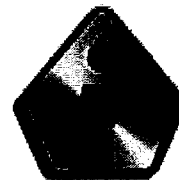


Q-250 @ Run 2

Photo / Reading &

R3

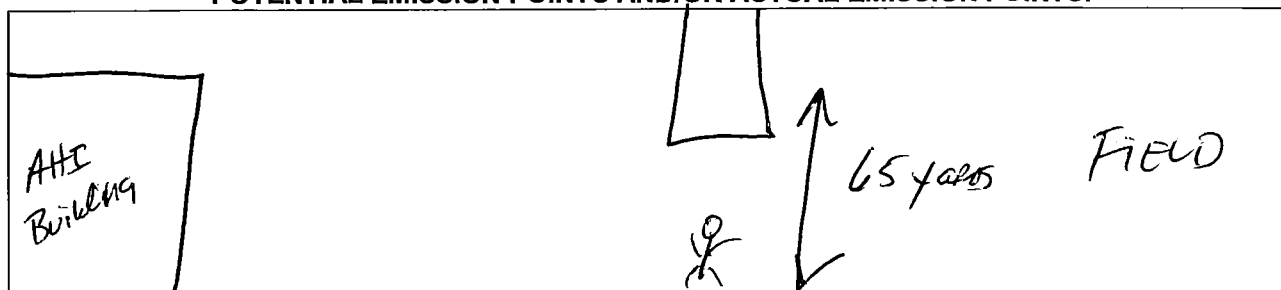
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 2/27/15
SKY CONDITIONS: Grey - cloudy PRECIPITATION: X	WIND DIRECTION: North WIND SPEED: 5 MPH - 10 MPH
INDUSTRY:	PROCESS UNIT: Q250

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
0842	20:00	00:00	N/W of point
0902	Break 5:00	00:00	
0907	20:00	00:00	
0927	Break 5:00	00:00	
0932	20:00	00:00	
0952			


SIGNATURE

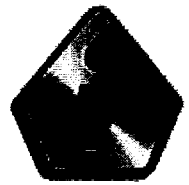


Q-250 @ Run 3

photo -

R 4

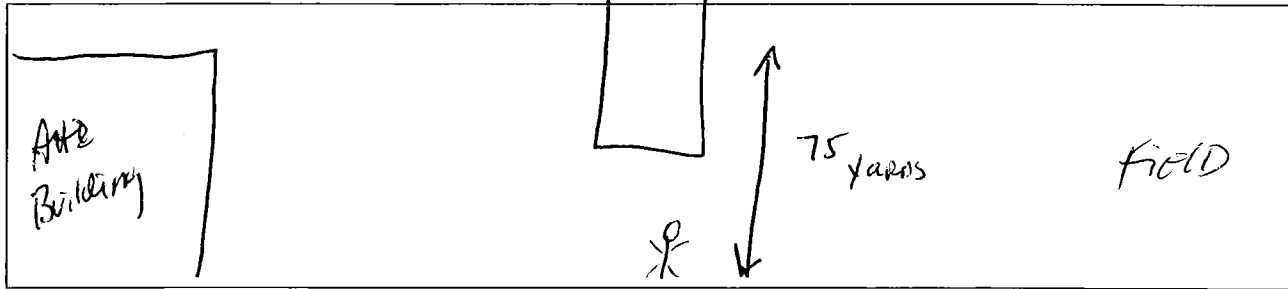
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 2/27/15
SKY CONDITIONS: grey overcast PRECIPITATION: X	WIND DIRECTION: N WIND SPEED: 5-10 mph
INDUSTRY:	PROCESS UNIT: Q250

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
10:47	20:00	00:00	N/W of point
11:07	Break 5:00	00:00	
11:12	20:00	00:00	
11:32	Break 5:00	00:00	
11:37	20:00	00:00	
11:57			

BARO
30.61
27.5
43.0

SIGNATURE



Q-250 @ Run 4

R 5



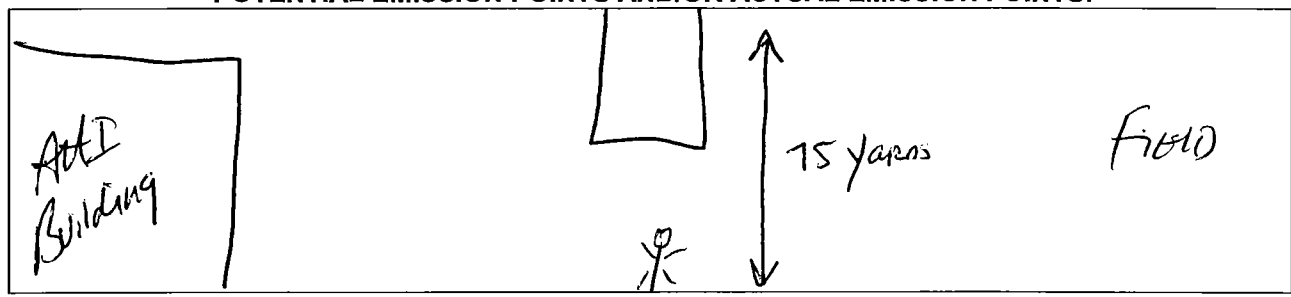
METHOD 22

FUGITIVE OR SMOKE EMISSION INSPECTION FORM

AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 2 - 22 - 15
SKY CONDITIONS: GREY PRECIPITATION: X _{am} - @ 1320... Flurries	WIND DIRECTION: N WIND SPEED: 5 mph - 10 mph
INDUSTRY:	PROCESS UNIT: Q 250

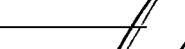
SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

[illegible]

20.4 °F
51.4
30.54
Duro


SIGNATURE

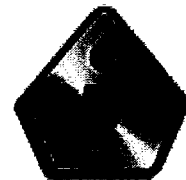


Q-250 @ Run 5

photo/Reading of

R 6

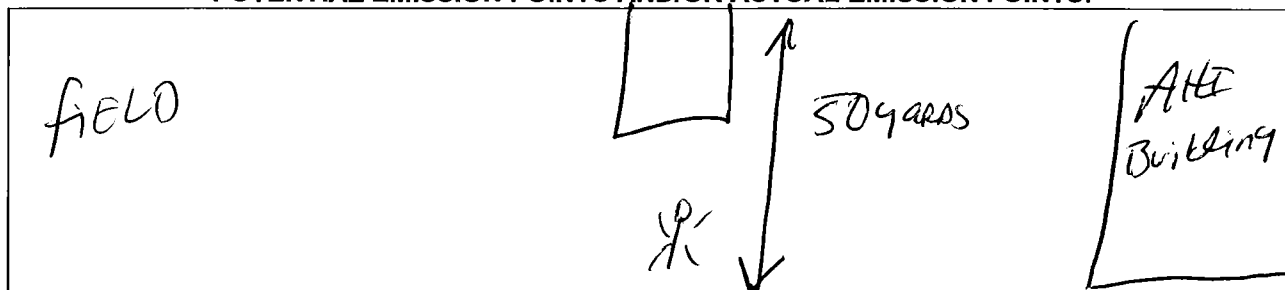
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 2/27/15
SKY CONDITIONS: Grey - PRECIPITATION: Snow flurries	WIND DIRECTION: N WIND SPEED: 10 MPH
INDUSTRY:	PROCESS UNIT: Q250

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
1:49	20:00	00:00	N/E of point
2:09	Break 5:00	00:00	
2:14	20:00	00:00	
2:34	Break 5:00	00:00	
2:39			
2:54			
2:59	20:00	00:00	

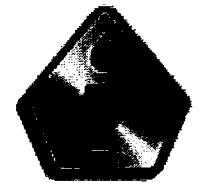
SIGNATURE



Friday, February 27, 2015 14:15:51
1702 W Tacoma St Broken Arrow OK 74012 United States

Q-250 @ Run 6

27



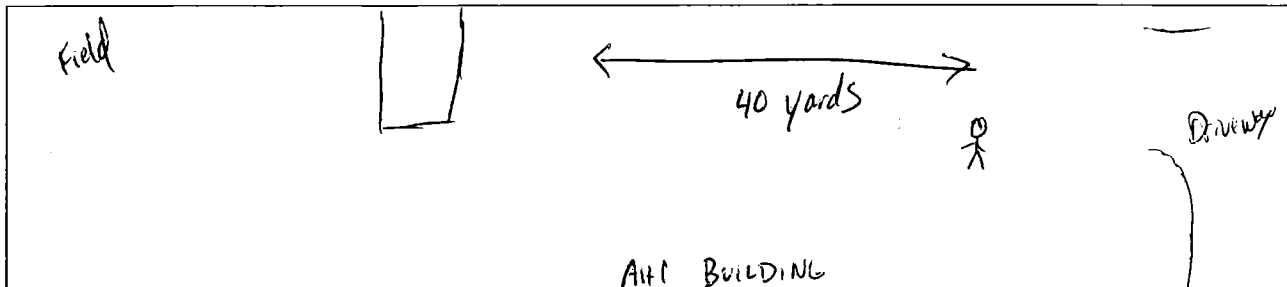
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder ^{2/28/15} Clint Davis AFFILIATION: Air Hygiene DATE: 2/28/15
SKY CONDITIONS: Gray PRECIPITATION: Snow	WIND DIRECTION: NE WIND SPEED: 3.2 MPH
INDUSTRY:	PROCESS UNIT: Q 250

AM

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
9:01			
9:26	20:13	00:00	W/W of point
	5 min break		
9:46	20 min	00:00	S/E of Point
	5 min break		
9:51	20 min	00:00	S/E of Point
10:11			

2/28/15

Baro 30.48
Temp 25.4
Hum. 85

Clint Davis

SIGNATURE



Q-250 @ Run 7

R 8

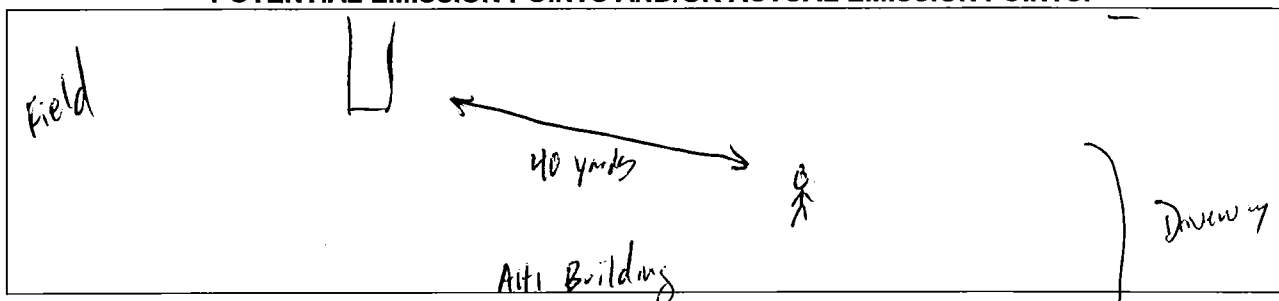
**METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM**

**AIR HYGIENE**

2/28/15
AM

COMPANY: Questor Technology Incinerator	OBSERVER: Mike Schroeder <i>Clint Davis</i>
LOCATION: Broken Arrow	AFFILIATION: Air Hygiene
COMPANY REP: Benjamin	DATE: 2/28/15
SKY CONDITIONS: Grey	WIND DIRECTION: NE
PRECIPITATION: Snow	WIND SPEED: 2 MPH
INDUSTRY:	PROCESS UNIT: Q250

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.

**OBSERVATIONS**

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
10:31	20 min	00:00	S/E of point
10:51	5 min break		
10:56	20 min	00:00	S/E of Point
11:16	5 min break		
11:21	20 min	00:00	S/E of Point
11:41			

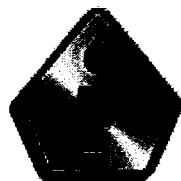
Clint Davis

SIGNATURE



Q-250 @ Run 8

R9

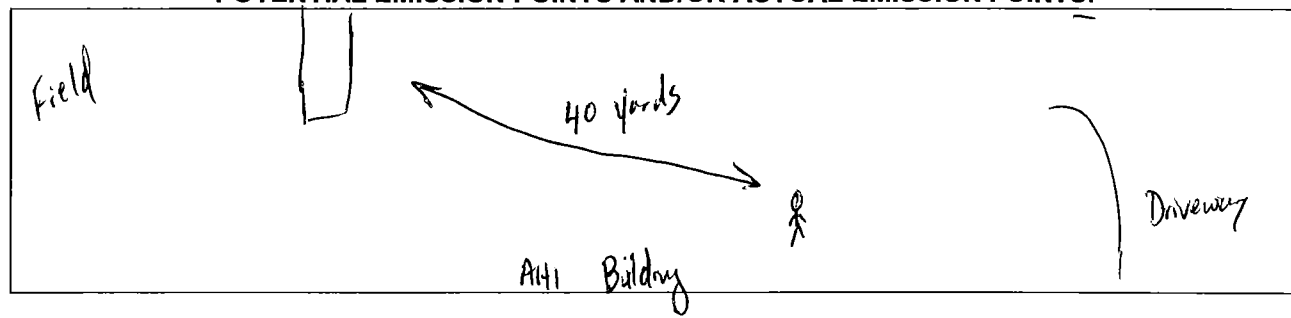


METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM

AIR HYGIENE

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder Clint Davis AFFILIATION: Air Hygiene DATE: 2/28/15
SKY CONDITIONS: Grey PRECIPITATION: Snow	WIND DIRECTION: NE WIND SPEED: 1.7 MPH
INDUSTRY:	PROCESS UNIT: Q250

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE
POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
12:27	20 min	00:00	S/E of Pond
12:47	5 min break		
12:52	20 min	00:00	S/E of Pond
1:12	5 min break		
1:17	20 min	00:00	S/E of Pond
1:37			

Baro 30.45
Temp 26.7
Hum 80.3

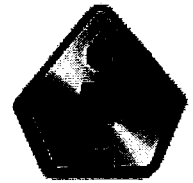
SIGNATURE



Q-250 @ Run 9

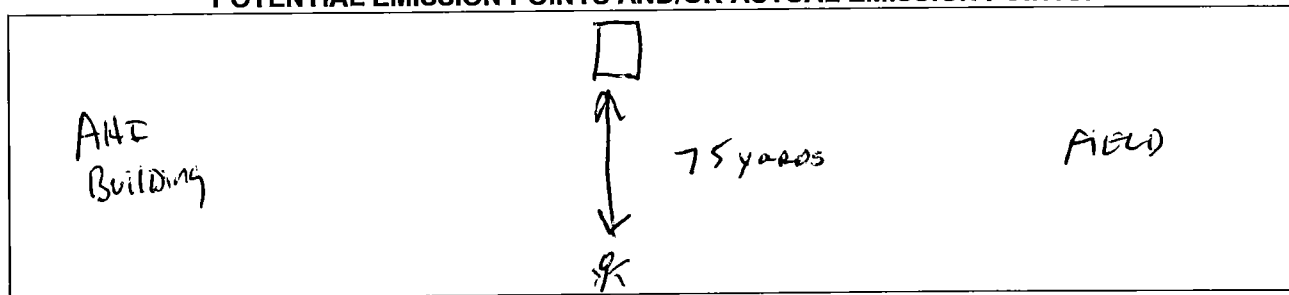
R10

**METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM**

**AIR HYGIENE**

COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 2/25/15
SKY CONDITIONS: Part Cloud PRECIPITATION: X	WIND DIRECTION: 2 mph ↗ WIND SPEED: 1
INDUSTRY:	PROCESS UNIT: Q 250

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.

**OBSERVATIONS**

	CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
①	0844	20:00	00:00	N/W of Point
	0904	5 min Brake	00:00	
②	09:09	20:00	00:00	
	09:29	5 min Brake	00:00	
	09:34	20:00	00:00	
③	09:54			

SIGNATURE

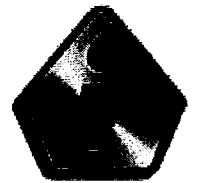


Wednesday, February 25, 2015 09:07:54

Q-250 @ Run 10

R11

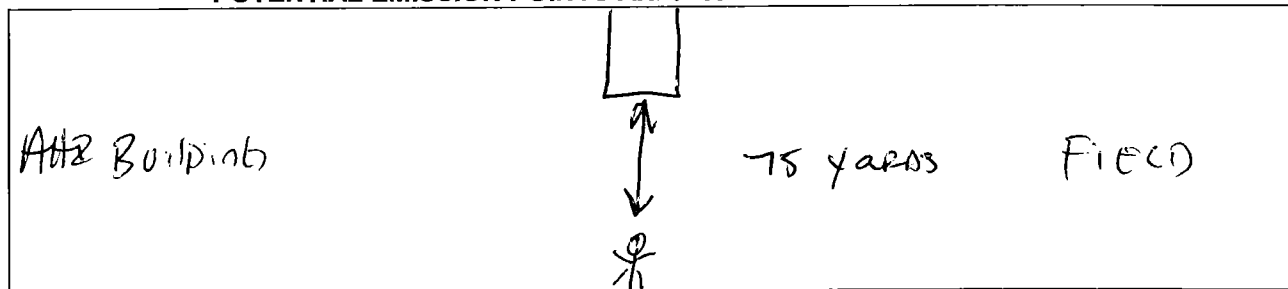
METHOD 22
FUGITIVE OR SMOKE EMISSION
INSPECTION FORM



AIR HYGIENE

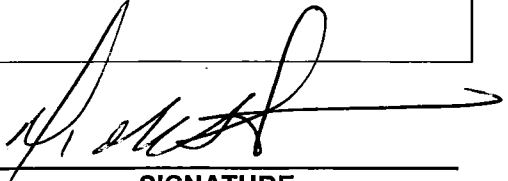
COMPANY: Questor Technology Incinerator LOCATION: Broken Arrow COMPANY REP: Benjamin	OBSERVER: Mike Schroeder AFFILIATION: Air Hygiene DATE: 10/25/15
SKY CONDITIONS: Clear PRECIPITATION: X	WIND DIRECTION: 2 mph (N) WIND SPEED: 2 mph (N)
INDUSTRY:	PROCESS UNIT: Q250

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.



OBSERVATIONS

	CLOCK TIME	OBSERVATION PERIOD DURATION (MIN:SEC)	ACCUMULATION EMISSION TIME (MIN:SEC)	OBSERVATION LOCATION
①	10:19	20:00	00:00	N/W of point
	10:39	5:00 RATE	00:00	
②	10:44	20:00	00:00	
	11:04	RATE 5:00	00:00	
③	11:09	20:00	00:00	
	11:29			

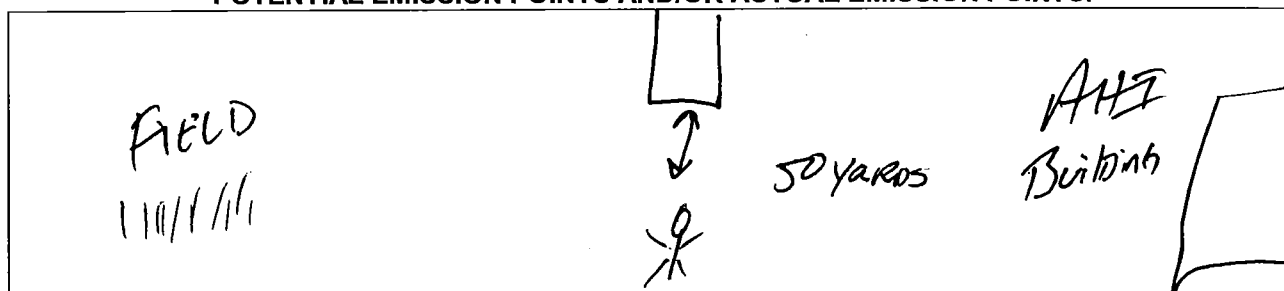

SIGNATURE



Q-250 @ Run 11

AIR HYGIENE

SKETCH PROCESS UNIT: INDICATE OBSERVER POSITION RELATIVE TO SOURCE; INDICATE POTENTIAL EMISSION POINTS AND/OR ACTUAL EMISSION POINTS.

[illegible]

Page 138 of 515



Q-250 @ Run 12

APPENDIX C

CALIBRATION GAS CERTIFICATIONS



Air Liquide America
Specialty Gases LLC



RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A22012

P.O. No.: 48529652
Document #: 48529652-002

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
1290 COMBERMERE STREET
TROY, MI 48083

Customer
AIR HYGIENE

MAX CORBIN
1600 W TACOMA
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : NONE

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM035126
Cylinder Pressure***: 1950 PSIG

Certification Date: 19Nov2012

Exp. Date: 20Nov2020
Batch No: TRO0069975

COMPONENT
PROPANE
AIR

CERTIFIED CONCENTRATION (Moles)
8.48 PPM
BALANCE

ACCURACY**
+/- 1%

TRACEABILITY
Direct NIST and VSL

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.
NTRM 1668

EXPIRATION DATE
12Jul2018

CYLINDER NUMBER
ALM038653

CONCENTRATION
98.80 PPM

COMPONENT
PROPANE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#
VARIAN/3400/7506

DATE LAST CALIBRATED
01Nov2012

ANALYTICAL PRINCIPLE
TCD/FID

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

First Triad Analysis

Second Triad Analysis

Calibration Curve

PROPANE

Date: 19Nov2012 Response Unit: AREA
Z1=0.00000 R1=2561613. T1=218575.0
R2=2563611. Z2=0.00000 T2=218288.0
Z3=0.00000 T3=218534.0 R3=2564288.
Avg. Concentration: 8.480 PPM

Concentration = A + Bx + Cx² + Dx³ + Ex⁴
r = 0.999998155
Constants: A = -0.0106566
B = 3.80809E-05 C = 0
D = 0 E = 0

APPROVED BY:

ROBERT LESMAK



Air Liquide America
Specialty Gases LLC



RATA CLASS

Guaranteed +/- 1% Accuracy

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A22014

AIR LIQUIDE AMERICA SPECIALTY GASES LLC P.O. No.: MAX
1290 COMBERMERE STREET Document # : 54740879-001
TROY, MI 48083

Customer

AIR HYGIENE
MAX CORBIN
1600 W TACOMA
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : PPN,BALA

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1. EPA/600/R-12/531; May 2012. Do not use this standard if pressure is less than 100 psig.

Cylinder Number: ALM010279 Certification Date: 21Apr2014 Exp. Date: 22Apr2022
Cylinder Pressure: 1950 PSIG Batch No: TRO0107817

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY (ABSOLUTE / RELATIVE)
PROPANE	5.01 PPM	0.03 PPM / 0.7 %
AIR	BALANCE	

TRACEABILITY

REFERENCE STANDARD

COMPONENT	CONCENTRATION	UNCERTAINTY	CYLINDER	TYPE/SRM SAMPLE	EXP. DATE
PROPANE	9.6000 PPM	0.0600 PPM	K012629	9 PPM C3H	24Feb2016

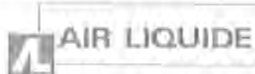
ANALYTICAL METHOD

1st Analysis: 21Apr2014

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
PROPANE	HORIBA/FIA-220/G05000JAS	FLAME IONIZATION	17Apr2014	5.010 PPM

APPROVED BY:

ROBERT LESNIAK



Air Liquide America
Specialty Gases LLC



RATA CLASS

Guaranteed +/- 1% Accuracy

8832 DICE ROAD, SANTA FE SPRINGS, CA 90670-2516

Phone: 800-323-2212

Fax: 562-464-5262

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A52014

AIR LIQUIDE AMERICA SPECIALTY GASES LLC P.O. No.: MAX
8832 DICE ROAD Document # : 55842938-001
SANTA FE SPRINGS, CA 90670-2516

Customer

AIR HYGIENE
MAX CORBIN
1600 W TACOMA
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : PPN,BALA

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1. EPA/600/R-12/531; May 2012. Do not use this standard if pressure is less than 100 psig.

Cylinder Number: CC113372 Certification Date: 28Jul2014 Exp. Date: 29Jul2022
Cylinder Pressure: 2000 PSIG Batch No: SBO0096462

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY (ABSOLUTE / RELATIVE)
PROPANE	3.02 PPM	0.04 PPM / 1.3 %
AIR	BALANCE	

TRACEABILITY

REFERENCE STANDARD

COMPONENT	CONCENTRATION	UNCERTAINTY	CYLINDER	TYPE/SRM SAMPLE	EXP. DATE
PROPANE	2.9500 PPM	0.0300 PPM	ALM023477	NTRM 1665/112097	03Aug2017

ANALYTICAL METHOD

1st Analysis: 28Jul2014

COMPONENT	INSTRUMENT	ANALYTICAL/PRINCIPLE	CALIBRATED	CONCENTRATION
PROPANE	GC-TCD/HP 5890 II/3140A38374	GC	25Jul2014	3.019 PPM

APPROVED BY: _____

JMU



Air Liquide America
Specialty Gases LLC



RATA CLASS

Dual-Analyzed Calibration Standard

11426 FAIRMONT PKWY, LA PORTE, TX 77571

Phone: 800-248-1427

Fax: 281-474-8419

CERTIFICATE OF ACCURACY: Interference Free Multi-Component EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A32012

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
11426 FAIRMONT PKWY
LA PORTE, TX 77571

P.O. No.:
Document #: 45457634-001
Folio #: AH073

Customer
AIR HYGIENE

MIKE SCOTT
1600 WEST TACOMA ST
BROKEN ARROW OK 74012
US

ANALYTICAL INFORMATION Gas Type : CO,NO,BALN

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: AAL069826 Certification Date: 27Mar2012 Exp. Date: 29Mar2015
Cylinder Pressure***: 1950 PSIG Batch No: LAP0061242

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ACCURACY**	TRACEABILITY
NITRIC OXIDE	18.3	PPM	+/- 1%	Direct NIST and VSL
CARBON MONOXIDE	17.3	PPM	+/- 1%	
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	18.5	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2629	15Aug2013	KAL003017	19.83 PPM	NITRIC OXIDE
NTRM 2635	01Jun2016	AAL073309	25.54 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
NOX ANALYZER/400-CLD/7M07001	08Mar2012	CHEMI
FTIR/000929060	08Mar2012	FTIR

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

First Triad Analysis

NITRIC OXIDE

Date: 21Mar2012 Response Unit: PPM
Z1 = 0.00000 R1 = 19.55000 T1 = 18.00000
R2 = 19.55000 Z2 = 0.00000 T2 = 18.00000
Z3 = 0.00000 T3 = 18.05000 R3 = 19.50000
Avg. Concentration: 18.29 PPM

Second Triad Analysis

Date: 28Mar2012 Response Unit: PPM
Z1 = 0.00000 R1 = 19.75000 T1 = 18.15000
R2 = 19.60000 Z2 = 0.00000 T2 = 18.00000
Z3 = 0.00000 T3 = 18.00000 R3 = 19.55000
Avg. Concentration: 18.23 PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.9999927
Constants: A = 0.043392918
B = 1.016595028 C =
D = E =

CARBON MONOXIDE

Date: 20Mar2012 Response Unit: PPM
Z1 = -0.00994 R1 = 25.52915 T1 = 17.27219
R2 = 25.59899 Z2 = -0.00458 T2 = 17.29330
Z3 = -0.00378 T3 = 17.33222 R3 = 25.61528
Avg. Concentration: 17.27 PPM

Date: 27Mar2012 Response Unit: PPM
Z1 = -0.00936 R1 = 25.54199 T1 = 17.30894
R2 = 25.56195 Z2 = 0.00050 T2 = 17.35698
Z3 = 0.01579 T3 = 17.35856 R3 = 25.57913
Avg. Concentration: 17.32 PPM

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 9.99995E-1
Constants: A = -9.34270E + 2
B = 1.76177E + 0 C = 0.00000E + 0
D = 0.00000E + 0 E = 0.00000E + 0

Special Notes:

AH073 LIST ITEM AH073 ON CERTS ANG TAGS CGA 660; DEW PT. 40 DEG.F.
The expiration date has been extended without re-assay per EPA 600/R23-23/542.

APPROVED BY:

RON STITT



Air Liquide America
Specialty Gases LLC



RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory - PGVP Vendor ID: A22013

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
1290 COMBERMERE STREET
TROY, MI 48083

P.O. No.:
Document # : 51128940-002
Folio #: AH071

Customer

LA-CYL-TULSA OK (LOC 84231)

1319 NORTH PEORIA
TRANSFER ACCOUNT
TULSA OK 74106
US

ANALYTICAL INFORMATION Gas Type : CO,NO,BALN

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM053342
Cylinder Pressure***: 1950 PSIG

Certification Date: 27Jun2013

Exp. Date: 28Jun2016
Batch No: TRO0085678

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ACCURACY**	TRACEABILITY
NITRIC OXIDE	9.04	PPM	+/- 1%	Direct NIST and VSL
CARBON MONOXIDE	9.02	PPM	+/- 1%	Direct NIST and VSL
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	9.06	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2629 20	31May2016	KAL004232	20.34 PPM	NITRIC OXIDE
NTRM 1677	14Mar2018	KAL003992	9.855 PPM	CARBON MONOXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#
CAI/600/X11041
SIEMENS I/ULTRAMAT 6E/N1-VN-0545

DATE LAST CALIBRATED
14Jun2013
01Jun2013

ANALYTICAL PRINCIPLE
CHEMI
NDIR

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

First Triad Analysis

NITRIC OXIDE

Date: 19Jun2013 Response Unit: PPM
Z1=0.00000 R1=20.34000 T1=9.04000
R2=20.34000 Z2=0.00000 T2=9.04000
Z3=0.00000 T3=9.04000 R3=20.34000
Avg. Concentration: 9.040 PPM

Second Triad Analysis

Date: 27Jun2013 Response Unit: PPM
Z1=0.00000 R1=20.34000 T1=9.05000
R2=20.34000 Z2=0.00000 T2=9.05000
Z3=0.00000 T3=9.05000 R3=20.34000
Avg. Concentration: 9.050 PPM

Calibration Curve

Concentration = A + Bx + Cx² + Dx³ + Ex⁴

Constants: A =
B =
C =
D =
E =

CARBON MONOXIDE

Date: 18Jun2013 Response Unit: PPM
Z1=0.00000 R1=25.00000 T1=9.01000
R2=25.00000 Z2=0.00000 T2=9.01000
Z3=0.00000 T3=9.01000 R3=25.00000
Avg. Concentration: 9.010 PPM

Date: 25Jun2013 Response Unit: PPM
Z1=0.00000 R1=0.00000 T1=0.00000
R2=0.00000 Z2=0.00000 T2=0.00000
Z3=0.00000 T3=0.00000 R3=0.00000
Avg. Concentration: 0.000

Concentration = A + Bx + Cx² + Dx³ + Ex⁴

Constants: A =
B =
C =
D =
E =

Special Notes: AH071 LIST ITEM AH071 ON CERTS AND TAGS

APPROVED BY:

HILARY THATCHER



Assay Laboratory: Red Ball TGS
609 North Market St.
Shreveport, LA 71107
800-551-8150

CERTIFICATE OF ANALYSIS (Zero Ambient Nitrogen)

Cylinder Number:	EB0038415	Certification Date:	9/24/2014
Product ID Number:	121026	Expiration Date:	9/25/2019
Cylinder Pressure:	2015 PSI	MFG Facility:	RBTGS - SHREVEPORT
Standard Cubic Feet	140	Lot Number:	GC1409241119
CGA	580	Tracking Number:	056853463

Do Not Use This Cylinder Below 150 psig (1.0 Megapascal).

Composing Material: Zero Ambient Nitrogen 152SZ

<u>Component</u>	<u>Specifications</u>	<u>Concentration</u>
Nitrogen		Balance
Carbon Dioxide as Impurity	0.5 PPM	<0.5 PPM
Carbon Monoxide as Impurity	0.5 PPM	<0.5 PPM
Total Oxides of Nitrogen as Impurity	0.1 PPM	<0.1 PPM
Oxygen as Impurity	1.0 PPM	<1.0 PPM
Sulfur Dioxide as Impurity	0.1 PPM	<0.1 PPM
Total Hydrocarbons as Impurity	0.1 PPM	<0.1 PPM

This material has a recommended shelf life of **five years**

The above mixture is certified in Mole % to be within +/- 2% of the actual number reported relative to each component.

It is recommended that this mixture not be used below **150 PSIG**

This calibration mixture was manufactured by scale; weights traceable to N.I.S.T.

Certificate: #822/266926-02

LaMeka Dennis
Analytical Chemist

Red Ball Technical Gas Service
Information and Ordering
800-551-8150
Fax (318-425-6309)

APPENDIX D

QUALITY ASSURANCE AND QUALITY CONTROL DATA

QA/QC PROGRAM

Air Hygiene ensures the quality and validity of its emission measurement and reporting procedures through a rigorous quality assurance (QA) program. The program is developed and administered by an internal QA team and encompasses five major areas:

1. QA reviews of reports, laboratory work, and field testing
2. Equipment calibration and maintenance
3. Chain-of-custody
4. Training
5. Knowledge of current test methods

Each of these areas is discussed individually below.

QA Reviews

Air Hygiene's review procedure includes review of each source test report, along with laboratory and fieldwork, by the QA Team. The most important review is the one that takes place before a test program begins. The QA Team works closely with technical division personnel to prepare and review test protocols. Test protocol review includes selection of appropriate test procedures, evaluation of interferences or other restrictions that might preclude use of standard test procedures, and evaluation and/or development of alternate procedures.

Equipment Calibration and Maintenance

The equipment used to conduct the emission measurements is maintained according to the manufacturer's instructions to ensure proper operation. In addition to the maintenance program, calibrations are carried out on each measurement device according to the schedule outlined by the Environmental Protection Agency. Quality control checks are also conducted in the field for each test program.

Chain-of-Custody

Air Hygiene maintains full chain-of-custody documentation on all samples and data sheets. In addition to normal documentation of changes between field sample custodians, laboratory personnel, and field test personnel, Air Hygiene documents every individual who handles any test component in the field (e.g., probe wash, impinger loading and recovery, filter loading and recovery, etc.). Samples were stored in a locked area to which only Air Hygiene personnel have access. Field data sheets are secured at Air Hygiene's offices upon return from the field.

Training

Personnel's training is essential to ensure quality testing. Air Hygiene has formal and informal training programs, which include:

1. Attendance at EPA-sponsored training courses
2. Enrollment in EPA correspondence courses
3. A requirement for all technicians to read and understand Air Hygiene's QA manual
4. In-house training and QA meetings on a regular basis
5. Maintenance of training records

Knowledge of Current Test Methods

With the constant updating of standard test methods and the wide variety of emerging test procedures, it is essential that any qualified source tester keep abreast of new developments. Air Hygiene subscribes to services, which provide updates on EPA reference methods, rules, and regulations. Additionally, source test personnel regularly attend and present papers at testing and emission-related seminars and conferences. Air Hygiene personnel maintain membership in the Air and Waste Management Association and the American Industrial Hygiene Association.

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COMBUSTION TESTING QUALITY ASSURANCE ACTIVITIES

A number of quality assurance activities were undertaken before, during, and after this testing project. This section of the report combined with the documentation in Appendix C describes each of those activities.

Each instrument's response was checked and adjusted in the field prior to the collection of data via multi-point calibration. The instrument's linearity was checked by adjusting its zero and span responses to zero nitrogen and an upscale calibration gas in the range of the expected concentrations. The instrument response was then challenged with other calibration gases of known concentration and accepted as being linear if the response of the other calibration gases agreed within plus or minus two percent of the range of predicted values.

After each test run, the analyzers were checked for zero and span drift. This allowed each test run to be bracketed by calibrations and documents the precision of the data just collected. The criterion for acceptable data is that the instrument drift is no more than three percent of the full-scale response. The quality assurance worksheets in the following pages summarize all multipoint calibration checks and zero to span checks performed during the tests. These worksheets (as prepared from the data records of Appendix A) show that no drifts in excess of three percent occurred in the zero to span checks following each test run.

The sampling systems were leak checked by demonstrating that a vacuum greater than 10 in Hg could be held for at least one minute with a decline of less than one inch of Hg. A leak test was conducted after the sample system was set up and before the system was dismantled. This test was conducted to ensure that ambient air had not diluted the sample. Any leakage detected prior to the tests would be repaired and another leak check conducted before testing commenced. No leaks were found during the pre or post-test leak checks.

The absence of leaks in the sampling system was also verified by a sampling system bias check. The sampling system's integrity was tested by comparing the responses of the analyzers to the calibration gases introduced via two paths. The first path was directly into the analyzer and the second path via the sample system at the sample probe. Any difference in the instrument responses by these two methods was attributed to sampling system bias or leakage. The criterion for acceptance is agreement within five percent of the span of the analyzer.

The control gases used to calibrate the instruments were analyzed and certified by the compressed gas vendors to plus or minus one percent accuracy for all gases. EPA Protocol No. 1 was used, where applicable to assign the concentration values traceable to the National Institute of Standards and Technology (NIST), Standard Reference Materials (SRM's). The gas calibration sheets as prepared by the vendor are contained in Appendix C.

Air Hygiene collected and reported the enclosed test data in accordance with the procedures and quality assurance activities described in this test report. Air Hygiene makes no warranty as to the suitability of the test methods. Air Hygiene also assumes no liability relating to the interpretation and use of the test data.

INSTRUMENTAL ANALYSIS QUALITY ASSURANCE DATA

Date: February 25-28, 2015
Company: Questor Technology Inc.
Location: Broken Arrow, Oklahoma
Techs: MSL, ML,MM

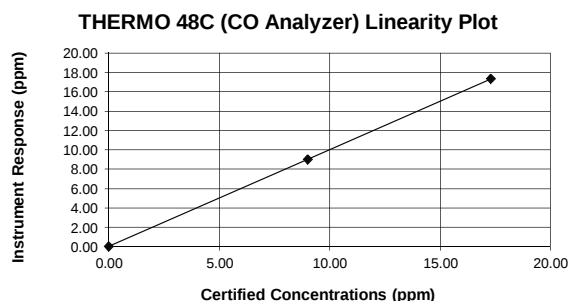
Sample System Leak Check

Date	Sample System	Leak Rate (l/min)
February 25-28, 2015	1	0

Calibration Date: February 25, 2015
Client: Questor Technology Inc

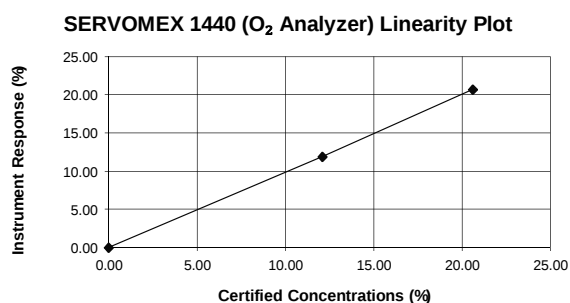
CO Span (ppm) = 17.30

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail ($\pm 2\%$, $\leq 0.5\text{ppm}$)
0.00	0.03	0.17	0.03	YES (%)
9.02	9.03	0.06	0.01	YES (%)
17.30	17.32	0.12	0.02	YES (%)
Linearity = 1.001				



O₂ Span (%) = 20.62

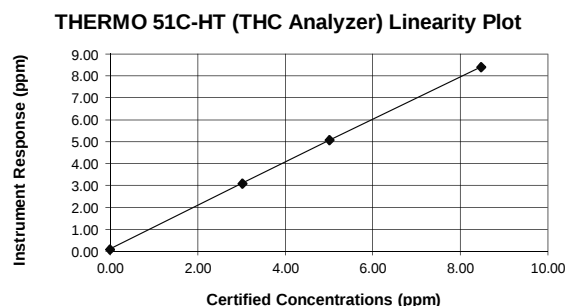
SERVOMEX 1440 (O ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.01	0.05	0.01	YES (%)
12.10	11.93	-0.82	0.17	YES (%)
20.62	20.70	0.39	0.08	YES (%)
Linearity = 0.998				



THC Range (ppm) = 10

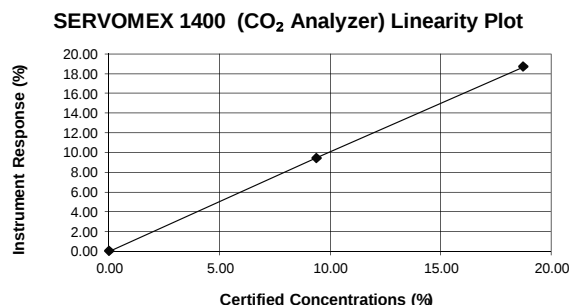
THERMO 51C-HT (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail ($\pm 2, 5\%$) ¹
0.00	0.10	1.00	N/A	YES
3.02	3.10	1.22	3.06	YES
5.01	5.08	1.29	5.02	YES
8.48	8.42	-0.60	N/A	YES
Linearity = 1.028				

¹zero/high based on 2% of span, low/mid based on 5% of concentration



CO₂ Span (%) = 18.73

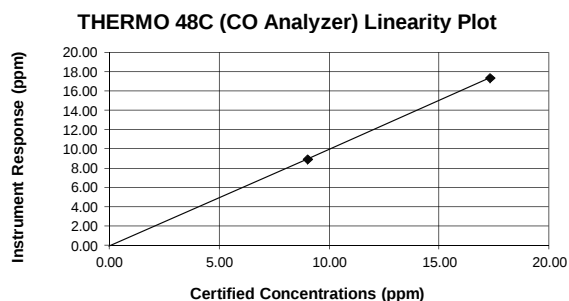
SERVOMEX 1400 (CO ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.01	0.05	0.01	YES (%)
9.36	9.44	0.43	0.08	YES (%)
18.73	18.68	-0.27	0.05	YES (%)
Linearity = 1.003				



Calibration Date: February 26, 2015
Client: Questor Technology Inc

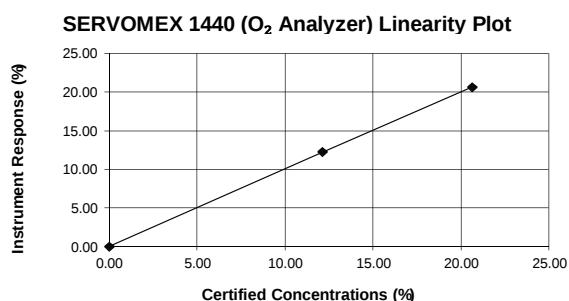
CO Span (ppm) = 17.30

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail ($\pm 2\%$, $\leq 0.5\text{ppm}$)
0.00	-0.06	-0.35	0.06	YES (%)
9.02	8.91	-0.64	0.11	YES (%)
17.30	17.34	0.23	0.04	YES (%)
Linearity = 0.994				



O2 Span (%) = 20.62

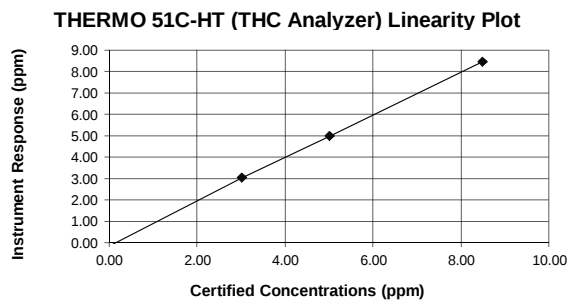
SERVOMEX 1440 (O ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.03	0.15	0.03	YES (%)
12.10	12.23	0.63	0.13	YES (%)
20.62	20.63	0.05	0.01	YES (%)
Linearity = 1.000				



THC Range (ppm) = 10

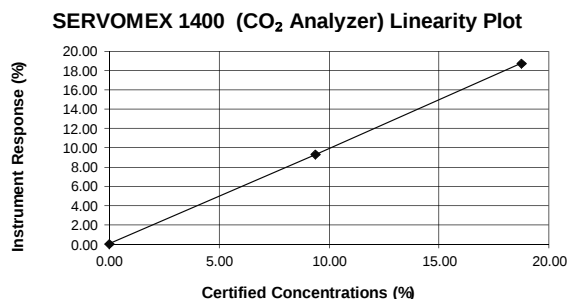
THERMO 51C-HT (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail ($\pm 2, 5\%$) ¹
0.00	-0.16	-1.60	N/A	YES
3.02	3.04	4.43	2.91	YES
5.01	4.98	1.06	4.93	YES
8.48	8.45	-0.30	N/A	YES
Linearity = 1.008				

¹zero/high based on 2% of span, low/mid based on 5% of concentration



CO2 Span (%) = 18.73

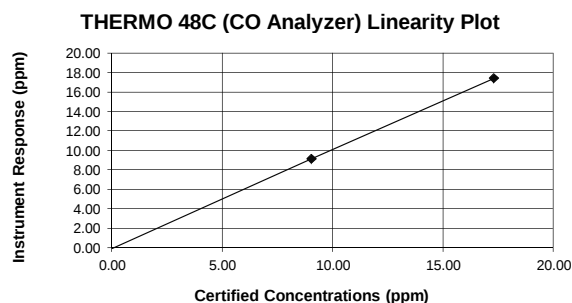
SERVOMEX 1400 (CO ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail ($\pm 2\%$, $\leq 0.5\%$)
0.00	0.04	0.21	0.04	YES (%)
9.36	9.28	-0.43	0.08	YES (%)
18.73	18.75	0.11	0.02	YES (%)
Linearity = 1.001				



Calibration Date: February 27, 2015
Client: Questor Technology Inc

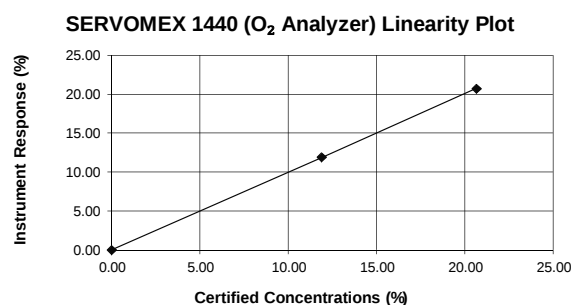
CO Span (ppm) = 17.30

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	-0.12	-0.69	0.12	YES (%)
9.02	9.11	0.52	0.09	YES (%)
17.30	17.41	0.64	0.11	YES (%)
Linearity = 0.987				



O2 Span (%) = 20.62

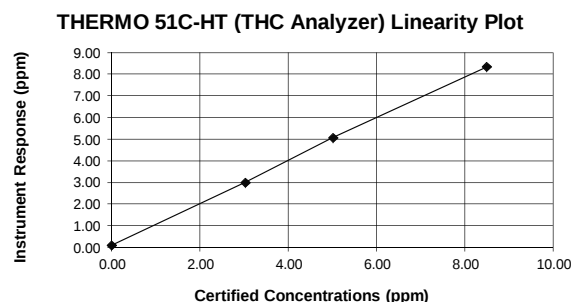
SERVOMEX 1440 (O ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.01	0.05	0.01	YES (%)
11.88	11.91	0.15	0.03	YES (%)
20.62	20.71	0.44	0.09	YES (%)
Linearity = 0.996				



THC Range (ppm) = 10

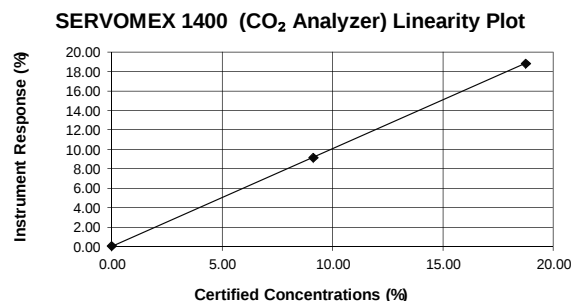
THERMO 51C-HT (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail (±2.5%) ¹
0.00	0.09	0.90	N/A	YES
3.02	2.99	-1.14	3.02	YES
5.01	5.07	2.23	4.96	YES
8.48	8.33	-1.50	N/A	YES
Linearity = 1.026				

¹zero/high based on 2% of span, low/mid based on 5% of concentration



CO₂ Span (%) = 18.73

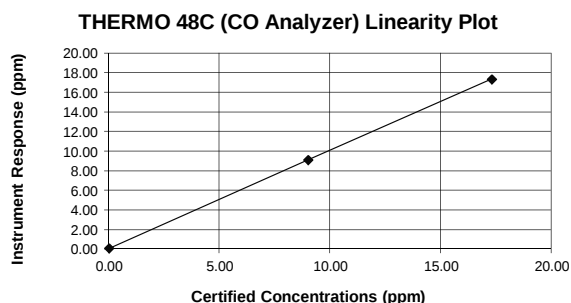
SERVOMEX 1400 (CO ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.06	0.32	0.06	YES (%)
9.11	9.15	0.21	0.04	YES (%)
18.73	18.83	0.53	0.10	YES (%)
Linearity = 0.998				



Calibration Date: February 28, 2015
Client: Questor Technology Inc

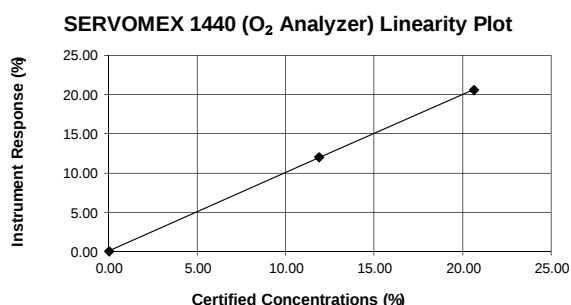
CO Span (ppm) = 17.30

THERMO 48C (CO Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Absolute Conc. (ppm)	Pass or Fail (±2%, ≤0.5ppm)
0.00	0.09	0.52	0.09	YES (%)
9.02	9.11	0.52	0.09	YES (%)
17.30	17.32	0.12	0.02	YES (%)
Linearity = 1.004				



O2 Span (%) = 20.62

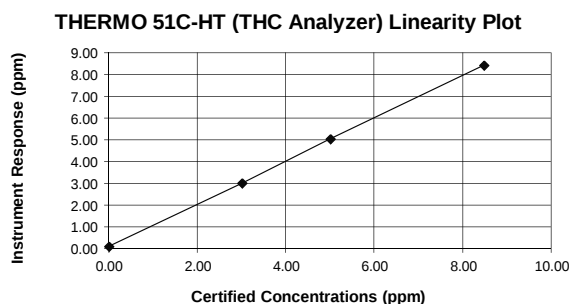
SERVOMEX 1440 (O ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.07	0.34	0.07	YES (%)
11.88	11.99	0.53	0.11	YES (%)
20.62	20.61	-0.05	0.01	YES (%)
Linearity = 1.003				



THC Range (ppm) = 10

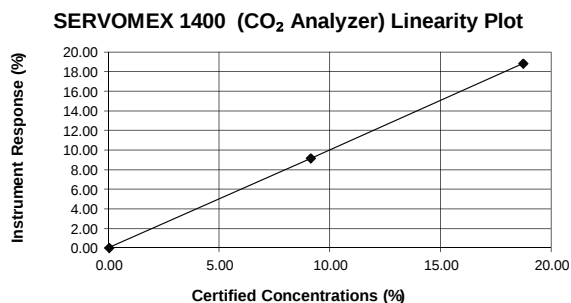
THERMO 51C-HT (THC Analyzer)				
Certified Concentration (ppm)	Instrument Response (ppm)	Calibration Error (%)	Estimated Point (ppm)	Pass or Fail (±2.5%) ¹
0.00	0.11	1.10	N/A	YES
3.02	3.01	-1.85	3.07	YES
5.01	5.03	0.33	5.01	YES
8.48	8.41	-0.70	N/A	YES
Linearity = 1.013				

¹zero/high based on 2% of span, low/mid based on 5% of concentration



CO2 Span (%) = 18.73

SERVOMEX 1400 (CO ₂ Analyzer)				
Certified Concentration (%)	Instrument Response (%)	Calibration Error (%)	Absolute Conc. (%)	Pass or Fail (±2%, ≤0.5%)
0.00	0.06	0.32	0.06	YES (%)
9.11	9.15	0.21	0.04	YES (%)
18.73	18.83	0.53	0.10	YES (%)
Linearity = 0.998				



DRIFT AND BIAS CHECK				
90-100 Load, Run - Q250-R10	O ₂	CO	THC	CO ₂
Raw Average	13.62	3.62	0.04	5.28
Corrected Average	13.82	3.52	0.06	5.23
Initial Zero	0.13	0.07	-0.09	0.01
Final Zero	0.12	0.16	0.04	0.06
Avg. Zero	0.13	0.12	-0.03	0.04
Initial UpScale	11.93	9.07	3.14	9.43
Final UpScale	11.95	9.08	2.99	9.42
Avg. UpScale	11.94	9.08	3.07	9.43
Sys Resp (Zero)	0.01	0.03	0.10	0.01
Sys Resp (Upscale)	11.93	9.03	3.10	9.44
Upscale Cal Gas	12.10	9.02	3.02	9.36
Initial Zero Bias	0.58%	0.23%	-1.90%	0.00%
Final Zero Bias	0.53%	0.75%	-0.60%	0.27%
Zero Drift	0.05%	0.52%	1.30%	0.27%
Initial Upscale Bias	0.00%	0.23%	0.40%	-0.05%
Final Upscale Bias	0.10%	0.29%	-1.10%	-0.11%
Upscale Drift	0.10%	0.06%	1.50%	0.05%
Alternative Specification Abs Diff	Initial Zero	0.12	0.04	--
	Final Zero	0.11	0.13	--
	Initial Upscale	0.00	0.04	--
	Final Upscale	0.02	0.05	--
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
90-100 Load, Run - Q250-R11	O ₂	CO	THC	CO ₂
Raw Average	14.31	4.54	1.16	4.94
Corrected Average	14.46	4.39	1.10	4.88
Initial Zero	0.12	0.16	0.04	0.06
Final Zero	0.11	0.18	0.13	0.08
Avg. Zero	0.12	0.17	0.09	0.07
Initial UpScale	11.95	9.08	2.99	9.42
Final UpScale	12.03	9.20	3.09	9.41
Avg. UpScale	11.99	9.14	3.04	9.42
Sys Resp (Zero)	0.01	0.03	0.10	0.01
Sys Resp (Upscale)	11.93	9.03	3.10	9.44
Upscale Cal Gas	12.10	9.02	3.02	9.36
Initial Zero Bias	0.53%	0.75%	-0.60%	0.27%
Final Zero Bias	0.48%	0.87%	0.30%	0.37%
Zero Drift	0.05%	0.12%	0.90%	0.11%
Initial Upscale Bias	0.10%	0.29%	-1.10%	-0.11%
Final Upscale Bias	0.48%	0.98%	-0.10%	-0.16%
Upscale Drift	0.39%	0.69%	1.00%	0.05%
Alternative Specification Abs Diff	Initial Zero	0.11	0.13	--
	Final Zero	0.10	0.15	--
	Initial Upscale	0.02	0.05	--
	Final Upscale	0.10	0.17	--
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
90-100 Load, Run - Q250-R12	O ₂	CO	THC	CO ₂
Raw Average	14.28	3.69	0.42	4.90
Corrected Average	14.40	3.52	0.33	4.87
Initial Zero	0.11	0.18	0.13	0.08
Final Zero	0.10	0.06	0.04	0.03
Avg. Zero	0.11	0.12	0.09	0.06
Initial UpScale	12.03	9.20	3.09	9.41
Final UpScale	12.01	9.33	3.10	9.34
Avg. UpScale	12.02	9.27	3.10	9.38
Sys Resp (Zero)	0.01	0.03	0.10	0.01
Sys Resp (Upscale)	11.93	9.03	3.10	9.44
Upscale Cal Gas	12.10	9.02	3.02	9.36
Initial Zero Bias	0.48%	0.87%	0.30%	0.37%
Final Zero Bias	0.44%	0.17%	-0.60%	0.11%
Zero Drift	0.05%	0.69%	0.90%	0.27%
Initial Upscale Bias	0.48%	0.98%	-0.10%	-0.16%
Final Upscale Bias	0.39%	1.73%	0.00%	-0.53%
Upscale Drift	0.10%	0.75%	0.10%	0.37%
Alternative Specification Abs Diff	Initial Zero	0.10	0.15	--
	Final Zero	0.09	0.03	--
	Initial Upscale	0.10	0.17	--
	Final Upscale	0.08	0.30	--
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
0-30-0 Load, Run - Q250-R1	O ₂	CO	THC	CO ₂
Raw Average	13.10	0.82	1.18	5.75
Corrected Average	13.13	0.76	1.16	9.02
Initial Zero	0.10	0.06	0.04	0.03
Final Zero	0.10	0.04	-0.01	0.05
Avg. Zero	0.10	0.05	0.02	0.04
Initial UpScale	12.01	9.33	3.10	9.34
Final UpScale	11.96	9.03	3.04	9.27
Avg. UpScale	11.99	9.18	3.07	9.31
Sys Resp (Zero)	0.01	0.03	0.10	0.01
Sys Resp (Upscale)	11.93	9.03	3.10	9.44
Upscale Cal Gas	12.10	9.02	3.02	9.36
Initial Zero Bias	0.44%	0.17%	-0.60%	0.11%
Final Zero Bias	0.44%	0.06%	-1.10%	0.21%
Zero Drift	0.00%	0.12%	0.50%	0.11%
Initial Upscale Bias	0.39%	1.73%	0.00%	-0.53%
Final Upscale Bias	0.15%	0.00%	-0.60%	-0.91%
Upscale Drift	0.24%	1.73%	0.60%	0.37%
Alternative Specification Abs Diff	Initial Zero	0.09	0.03	--
	Final Zero	0.09	0.01	--
	Initial Upscale	0.08	0.30	--
	Final Upscale	0.03	0.00	--
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
0-30-0 Load, Run - Q250-R2	O ₂	CO	THC	CO ₂
Raw Average	13.50	0.27	0.69	5.44
Corrected Average	13.63	0.22	0.67	5.53
Initial Zero	0.10	0.04	-0.01	0.05
Final Zero	0.10	0.07	0.13	-0.07
Avg. Zero	0.10	0.06	0.06	-0.01
Initial UpScale	11.96	9.03	3.04	9.27
Final UpScale	12.02	9.12	3.05	9.17
Avg. UpScale	11.99	9.08	3.05	9.22
Sys Resp (Zero)	0.03	-0.06	-0.16	0.04
Sys Resp (Upscale)	12.23	8.91	3.04	9.28
Upscale Cal Gas	12.10	9.02	3.02	9.36
Initial Zero Bias	0.34%	0.58%	1.50%	0.05%
Final Zero Bias	0.34%	0.75%	2.90%	-0.59%
Zero Drift	0.00%	0.17%	1.40%	0.64%
Initial Upscale Bias	-1.31%	0.69%	0.00%	-0.05%
Final Upscale Bias	-1.02%	1.21%	0.10%	-0.59%
Upscale Drift	0.29%	0.52%	0.10%	0.53%
Alternative Specification Abs Diff	Initial Zero	0.07	0.10	0.01
	Final Zero	0.07	0.13	0.11
	Initial Upscale	0.27	0.12	0.01
	Final Upscale	0.21	0.21	0.11
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
0-30-0 Load, Run - Q250-R3	O ₂	CO	THC	CO ₂
Raw Average	13.34	0.62	0.70	5.39
Corrected Average	13.40	0.61	0.61	5.40
Initial Zero	0.08	-0.02	-0.03	0.09
Final Zero	0.09	0.02	0.23	0.10
Avg. Zero	0.09	0.00	0.10	0.10
Initial UpScale	11.80	9.16	5.07	9.03
Final UpScale	11.86	9.15	5.01	9.05
Avg. UpScale	11.83	9.16	5.04	9.04
Sys Resp (Zero)	0.01	-0.12	0.09	0.06
Sys Resp (Upscale)	11.91	9.11	5.07	9.15
Upscale Cal Gas	11.88	9.02	5.01	9.11
Initial Zero Bias	0.34%	0.58%	-1.20%	0.16%
Final Zero Bias	0.39%	0.81%	1.40%	0.21%
Zero Drift	0.05%	0.23%	2.60%	0.05%
Initial Upscale Bias	-0.53%	0.29%	0.00%	-0.64%
Final Upscale Bias	-0.24%	0.23%	-0.60%	-0.53%
Upscale Drift	0.29%	0.06%	0.60%	0.11%
Alternative Specification Abs Diff	Initial Zero	0.07	0.10	0.03
	Final Zero	0.08	0.14	0.04
	Initial Upscale	0.11	0.05	0.12
	Final Upscale	0.05	0.04	0.10
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
30-70-30 Load, Run - Q250-R4	O ₂	CO	THC	CO ₂
Raw Average	13.42	2.17	0.83	5.36
Corrected Average	13.47	2.09	0.64	5.34
Initial Zero	0.09	0.02	0.23	0.10
Final Zero	0.11	0.07	0.21	0.12
Avg. Zero	0.10	0.05	0.22	0.11
Initial UpScale	11.86	9.15	5.01	9.05
Final UpScale	11.84	9.22	4.99	9.08
Avg. UpScale	11.85	9.19	5.00	9.07
Sys Resp (Zero)	0.01	-0.12	0.09	0.06
Sys Resp (Upscale)	11.91	9.11	5.07	9.15
Upscale Cal Gas	11.88	9.02	5.01	9.11
Initial Zero Bias	0.39%	0.81%	1.40%	0.21%
Final Zero Bias	0.48%	1.10%	1.20%	0.32%
Zero Drift	0.10%	0.29%	0.20%	0.11%
Initial Upscale Bias	-0.24%	0.23%	-0.60%	-0.53%
Final Upscale Bias	-0.34%	0.64%	-0.80%	-0.37%
Upscale Drift	0.10%	0.40%	0.20%	0.16%
Alternative Specification Abs Diff	Initial Zero	0.08	0.14	--
	Final Zero	0.10	0.19	--
	Initial Upscale	0.05	0.04	--
	Final Upscale	0.07	0.11	--
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
30-70-30 Load, Run - Q250-R5	O ₂	CO	THC	CO ₂
Raw Average	13.16	1.36	1.04	5.52
Corrected Average	13.26	1.30	0.89	5.49
Initial Zero	0.11	0.07	0.21	0.12
Final Zero	0.14	0.01	0.15	0.12
Avg. Zero	0.13	0.04	0.18	0.12
Initial UpScale	11.84	9.22	4.99	9.08
Final UpScale	11.77	9.15	5.04	9.07
Avg. UpScale	11.81	9.19	5.02	9.08
Sys Resp (Zero)	0.01	-0.12	0.09	0.06
Sys Resp (Upscale)	11.91	9.11	5.07	9.15
Upscale Cal Gas	11.88	9.02	5.01	9.11
Initial Zero Bias	0.48%	1.10%	1.20%	0.32%
Final Zero Bias	0.63%	0.75%	0.60%	0.32%
Zero Drift	0.15%	0.35%	0.60%	0.00%
Initial Upscale Bias	-0.34%	0.64%	-0.80%	-0.37%
Final Upscale Bias	-0.68%	0.23%	-0.30%	-0.43%
Upscale Drift	0.34%	0.40%	0.50%	0.05%
Alternative Specification Abs Diff	Initial Zero	0.10	0.19	--
	Final Zero	0.13	0.13	--
	Initial Upscale	0.07	0.11	--
	Final Upscale	0.14	0.04	--
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
30-70-30 Load, Run - Q250-R6	O ₂	CO	THC	CO ₂
Raw Average	13.25	2.55	0.88	5.29
Corrected Average	13.33	2.49	0.81	5.28
Initial Zero	0.14	0.01	0.15	0.12
Final Zero	0.15	0.01	-0.01	0.12
Avg. Zero	0.15	0.01	0.07	0.12
Initial UpScale	11.77	9.15	5.04	9.07
Final UpScale	11.88	9.26	5.08	9.03
Avg. UpScale	11.83	9.21	5.06	9.05
Sys Resp (Zero)	0.01	-0.12	0.09	0.06
Sys Resp (Upscale)	11.91	9.11	5.07	9.15
Upscale Cal Gas	11.88	9.02	5.01	9.11
Initial Zero Bias	0.63%	0.75%	0.60%	0.32%
Final Zero Bias	0.68%	0.75%	-1.00%	0.32%
Zero Drift	0.05%	0.00%	1.60%	0.00%
Initial Upscale Bias	-0.68%	0.23%	-0.30%	-0.43%
Final Upscale Bias	-0.15%	0.87%	0.10%	-0.64%
Upscale Drift	0.53%	0.64%	0.40%	0.21%
Alternative Specification Abs Diff	Initial Zero	0.13	--	0.06
	Final Zero	0.14	--	0.06
	Initial Upscale	0.14	--	0.08
	Final Upscale	0.03	--	0.12
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
70-100-70 Load, Run - Q250-R7	O ₂	CO	THC	CO ₂
Raw Average	12.99	2.41	0.77	5.73
Corrected Average	12.92	2.36	0.72	5.72
Initial Zero	0.09	0.03	0.08	0.10
Final Zero	0.09	0.08	0.04	0.15
Avg. Zero	0.09	0.06	0.06	0.13
Initial UpScale	12.01	8.99	5.01	9.07
Final UpScale	11.89	9.13	5.02	9.06
Avg. UpScale	11.95	9.06	5.02	9.07
Sys Resp (Zero)	0.07	0.09	0.11	0.06
Sys Resp (Upscale)	11.99	9.11	5.03	9.15
Upscale Cal Gas	11.88	9.02	5.01	9.11
Initial Zero Bias	0.10%	-0.35%	-0.30%	0.21%
Final Zero Bias	0.10%	-0.06%	-0.70%	0.48%
Zero Drift	0.00%	0.29%	0.40%	0.27%
Initial Upscale Bias	0.10%	-0.69%	-0.20%	-0.43%
Final Upscale Bias	-0.48%	0.12%	-0.10%	-0.48%
Upscale Drift	0.58%	0.81%	0.10%	0.05%
Alternative Specification Abs Diff	Initial Zero	0.02	--	0.04
	Final Zero	0.02	--	0.09
	Initial Upscale	0.02	--	0.08
	Final Upscale	0.10	--	0.09
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
70-100-70 Load, Run - Q250-R8	O ₂	CO	THC	CO ₂
Raw Average	13.41	2.02	0.25	5.39
Corrected Average	13.39	1.89	0.26	5.39
Initial Zero	0.09	0.08	0.04	0.15
Final Zero	0.10	0.20	-0.07	0.10
Avg. Zero	0.10	0.14	-0.02	0.13
Initial UpScale	11.89	9.13	5.02	9.06
Final UpScale	11.92	9.08	5.04	8.99
Avg. UpScale	11.91	9.11	5.03	9.03
Sys Resp (Zero)	0.07	0.09	0.11	0.06
Sys Resp (Upscale)	11.99	9.11	5.03	9.15
Upscale Cal Gas	11.88	9.02	5.01	9.11
Initial Zero Bias	0.10%	-0.06%	-0.70%	0.48%
Final Zero Bias	0.15%	0.64%	-1.80%	0.21%
Zero Drift	0.05%	0.69%	1.10%	0.27%
Initial Upscale Bias	-0.48%	0.12%	-0.10%	-0.48%
Final Upscale Bias	-0.34%	-0.17%	0.10%	-0.85%
Upscale Drift	0.15%	0.29%	0.20%	0.37%
Alternative Specification Abs Diff	Initial Zero	0.02	0.01	--
	Final Zero	0.03	0.11	--
	Initial Upscale	0.10	0.02	--
	Final Upscale	0.07	0.03	--
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

DRIFT AND BIAS CHECK				
70-100-70 Load, Run - Q250-R9	O ₂	CO	THC	CO ₂
Raw Average	13.33	1.57	0.78	5.40
Corrected Average	13.33	1.39	0.80	5.41
Initial Zero	0.10	0.20	-0.07	0.10
Final Zero	0.11	0.18	-0.01	0.20
Avg. Zero	0.11	0.19	-0.04	0.15
Initial UpScale	11.92	9.08	5.04	8.99
Final UpScale	11.86	9.24	5.08	9.00
Avg. UpScale	11.89	9.16	5.06	9.00
Sys Resp (Zero)	0.07	0.09	0.11	0.06
Sys Resp (Upscale)	11.99	9.11	5.03	9.15
Upscale Cal Gas	11.88	9.02	5.01	9.11
Initial Zero Bias	0.15%	0.64%	-1.80%	0.21%
Final Zero Bias	0.19%	0.52%	-1.20%	0.75%
Zero Drift	0.05%	0.12%	0.60%	0.53%
Initial Upscale Bias	-0.34%	-0.17%	0.10%	-0.85%
Final Upscale Bias	-0.63%	0.75%	0.50%	-0.80%
Upscale Drift	0.29%	0.92%	0.40%	0.05%
Alternative Specification Abs Diff	Initial Zero	0.03	0.11	--
	Final Zero	0.04	0.09	--
	Initial Upscale	0.07	0.03	--
	Final Upscale	0.13	0.13	--
Calibration Span	20.62	17.30	10.00	18.73
3% of Cal. Span (drift)	0.62	0.52	0.30	0.56
5% of Cal. Span (bias)	1.03	0.87	0.50	0.94

METERING SYSTEM DRY GAS METER CALIBRATION SHEET

EPA Reference Method

Metering System Pre-Test Calibration

Air Hygiene Asset ID: samp-cp-0007

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current[SAMP-CP-0007 Calibration 5-21-14.xls]Original (5 point)

Make: Thermo Environmental

Date: 05/21/14

Model #: MST-C1

Barometric Pressure: 29.41 (in. Hg)

Serial #: 90704

Theoretical Critical Vacuum: 13.87 (in. Hg)

DRY GAS METER READINGS

ΔH (in. H ₂ O)	Time (min)	Volume			Initial Temperature	
		Initial (ft ³)	Final (ft ³)	Total (ft ³)	Inlet (°F)	Outlet (°F)
0.25	17.00	12.830	18.030	5.200	78.0	73.0
0.54	12.00	18.030	23.330	5.300	78.0	73.0
1.10	10.00	23.330	29.330	6.000	79.0	73.0
1.90	10.00	29.330	37.400	8.070	79.0	74.0
3.40	10.00	37.400	48.010	10.610	80.0	74.0

Final Temperature		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in. Hg)	Ambient Temperature		
Inlet (°F)	Outlet (°F)				Initial (°F)	Final (°F)	Average (°F)
78.0	73.0	40	0.2355	16.0	71.4	70.7	71.1
79.0	73.0	48	0.3369	16.0	70.7	70.7	70.7
80.0	74.0	55	0.4557	16.0	70.7	70.7	70.7
81.0	74.0	63	0.6099	16.0	70.7	71.0	70.9
82.0	74.0	73	0.8065	14.5	71.0	71.2	71.1

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft ³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft ³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft ³)
5.041	142.76	5.109	144.7	5.230
5.139	145.54	5.161	146.2	5.280
5.818	164.76	5.818	164.8	5.951
7.833	221.84	7.785	220.5	7.966
10.328	292.48	10.292	291.5	10.536
DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR $\Delta H@$		
Variation (number)	Value (number)	Value (in. H ₂ O)	Value (mm H ₂ O)	Variation (in. H ₂ O)
0.012	1.014	1.516	38.50	-0.156
0.003	1.004	1.599	40.61	-0.073
-0.002	1.000	1.778	45.17	0.106
-0.008	0.994	1.714	43.53	0.041
-0.005	0.997	1.755	44.57	0.082
AVERAGE:	1.002	1.672	42.48	PASSED

Notes:

For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor $\Delta H@$, the orifice differential pressure in inches of H₂O that equates to 0.75 cfm of air at 68 °F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)³*(deg R)^{0.5}/((in.Hg)*(min)).

SIGNATURE:

Craig McCarty

DATE: 05/21/14 05/21/14

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET

EPA Reference Method

Metering System Pre-Test Calibration

Air Hygiene Asset ID: samp-cp-0007

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\IM-5 Consoles\Calibration Sheet v4.1\Current\{SAMP-CP-0007 Calibration 5-21-14.xls}Original (5 point)

Make: Thermo Environmental

Date: 05/21/14

Model #: MST-C1

Barometric Pressure: 29.41 (in. Hg)

Serial #: 90704

Temperature (ASTM cal): 71.20 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	99.00	0.50	601.00	0.17	1203.00	0.25
Probe	100.00	0.00	601.00	0.17	1203.00	0.25
Filter	100.00	0.00	601.00	0.17	1203.00	0.25
Dryer	100.00	0.00	601.00	0.17	1203.00	0.25
Aux.	99.00	0.50	601.00	0.17	1203.00	0.25

Note: Calibrated against an ALTEK Thermocouple Source Series 22, direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	71.20 (°F)	
	Reading	(±°F)
DGM In	71.0	0.20
DGM Out	71.0	0.20

Note: Calibrated against ASTM Reference Thermometer.

SIGNATURE: _____

Craig M. Carthy

DATE: 05/21/14 05/21/14

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60

Appendix A, Method 5

10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET

EPA Reference Method

Metering System Pre-Test Calibration

Air Hygiene Asset ID(s):

Probe: samp-hp-0059

Hotbox: samp-,bh-0002

Gooseneck: samp-ad-0010

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\TM-5 Consoles\Calibration Sheet v4.1\Current[SAMP-CP-0007 Calibration 5-21-14.xls]Original (5 point)

Barometric Pressure: 29.41

Thermo-couples	Temps		Signature	Date	
		(°F)			
Stack	Ref	71.20	<i>Craig McCarty</i>	<u>05/21/14</u>	<u>05/21/14</u>
	Read	71.00			
	±°F	0.20			
Filter	Ref	71.20	<i>Craig McCarty</i>	<u>05/21/14</u>	<u>05/21/14</u>
	Read	71.00			
	±°F	0.20			
Exit	Ref	71.20	<i>Craig McCarty</i>	<u>05/21/14</u>	<u>05/21/14</u>
	Read	71.00			
	±°F	0.20			

Note: Calibrated against ASTM Reference Thermometer.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

METERING SYSTEM DRY GAS METER CALIBRATION SHEET

EPA Reference Method

Metering System Post-Test Calibration

Air Hygiene Asset ID: samp-cp-0007

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\{SAMP-CP-0007 Calibration 5-21-14.xls}3-2-15 (3 point)

Make: Thermo Environmental

Date: 03/02/15

Model #: MST-C1

Barometric Pressure: 29.74 (in. Hg)

Serial #: 90704

Theoretical Critical Vacuum: 14.03 (in. Hg)

DRY GAS METER READINGS

ΔH (in. H2O)		Time (min)	Volume			Initial Temperature	
			Initial (ft³)	Final (ft³)	Total (ft³)	Inlet (°F)	Outlet (°F)
1.90		10.00	278.040	286.150	8.110	73.0	65.0
1.90		10.00	286.150	294.260	8.110	75.0	67.0
1.90		10.00	294.260	302.390	8.130	76.0	68.0
Final Temperature		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in. Hg)	Ambient Temperature		
Inlet (°F)	Outlet (°F)				Initial (°F)	Final (°F)	Average (°F)
74.0	67.0	63	0.6099	16.0	68.5	68.5	68.5
75.0	67.0	63	0.6099	16.0	68.7	68.7	68.7
76.0	68.0	63	0.6099	16.0	68.9	68.9	68.9

RESULTS

DRY GAS METER		ORIFICE		
VOLUME CORRECTED Vm(std) (ft ³)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (ft ³)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (ft ³)
8.069	228.52	7.890	223.4	7.948
8.050	227.98	7.889	223.4	7.950
8.055	228.11	7.887	223.4	7.951
DRY GAS METER CALIBRATION FACTOR Y		ORIFICE CALIBRATION FACTOR $\Delta H@$		
Variation (number)	Value (number)	Value (in. H ₂ O)	Value (mm H ₂ O)	Variation (in. H ₂ O)
-0.001	0.978	1.713	43.51	0.003
0.001	0.980	1.710	43.44	0.000
0.000	0.979	1.708	43.38	-0.003
AVERAGE:	0.979	1.710	43.44	PASSED
LAST 5-PT:	1.002	1.672	PASSED	5-PT Date:
% DIFF:	2.3%	2.3%		05/21/14

40 CFR - CHAPTER I - PART 60

Appendix A, Method 5

10.3.2 Calibration After Use

After each field use, the calibration of the metering system shall be checked by performing three calibration runs at a single, intermediate orifice setting (based on the previous field test)...Calculate the average value of the DGM calibration factor. If the value has changed by more than 5 percent, recalibrate the meter over the full range of orifice settings, as detailed in Section 10.3.1.

10.3.3 Acceptable Variation in Calibration

If the DGM coefficient values obtained before and after a test series differ by more than 5 percent, the test series shall either be voided, or calculations for the test series shall be performed using whichever meter coefficient value (i.e., before or after) gives the lower value of total sample volume.

Notes: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +/- 0.02. For Orifice Calibration Factor $\Delta H@$, the orifice differential pressure in inches of H₂O that equates to 0.75 cfm of air at 68 °F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +/- 0.2. For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above. The Critical Orifice Coefficient, K', must be entered in English units, (ft)³*(deg R)^{0.5}/((in.Hg)*(min)).

SIGNATURE: _____

Craig McCarty

DATE: 03/02/15 03/02/15

METERING SYSTEM THERMOCOUPLE CALIBRATION SHEET

EPA Reference Method

Metering System Post-Test Calibration

Air Hygiene Asset ID: samp-cp-0007

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\[SAMP-CP-0007 Calibration 5-21-14.xls]3-2-15 (3 point)

Make: Thermo Environmental

Date: 03/02/15

Model #: MST-C1

Barometric Pressure: 29.74 (in. Hg)

Serial #: 90704

Temperature (ASTM cal): 68.50 (°F)

Thermocouple	100 (°F)		600 (°F)		1200 (°F)	
	Reading	% Error	Reading	% Error	Reading	% Error
Stack	99.00	0.50	600.00	0.00	1203.00	0.25
Probe	99.00	0.50	600.00	0.00	1203.00	0.25
Filter	99.00	0.50	600.00	0.00	1203.00	0.25
Dryer	99.00	0.50	600.00	0.00	1203.00	0.25
Aux.	99.00	0.50	600.00	0.00	1203.00	0.25

Note: Calibrated against an ALTEK Thermocouple Source Series 22, direct temperature output calibrated to ASTM and IPTS standards as outlined in ALTEK Data Sheet 22.

Thermocouple	68.50 (°F)	
	Reading	(±°F)
DGM In	69.0	0.50
DGM Out	67.0	1.50

Note: Calibrated against ASTM Reference Thermometer.

SIGNATURE: _____

Craig McCarty

DATE: 03/02/15 03/02/15

Standard for Calibration of Console Thermocouple Systems

40 CFR, Part 60

Appendix A, Method 5

10.3.2 The temperature data recorded in the field shall be considered valid. If, during calibration, the absolute temperature measured with the sensor being calibrated and the reference sensor **agree within 1.5 percent**, the temperature data taken in the field shall be considered valid.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

PROBE (STACK), HOTBOX (FILTER), AND GOOSENECK (EXIT) THERMOCOUPLE CALIBRATION SHEET

EPA Reference Method

Metering System Post-Test Calibration

Air Hygiene Asset ID(s):

Probe: samp-hp-0033

Hotbox: samp-bh-0012

Gooseneck: samp-ad-0028

Filename: P:\Shared\QAQC\Calibrations\PM-Equipment\M-5 Consoles\Calibration Sheet v4.1\Current\{SAMP-CP-0007 Calibration 5-21-14.xls}3-2-15 (3 point)

Barometric Pressure: 29.74

Thermo-couples	Temps		Signature	Date	
		(°F)			
Stack	Ref	68.50	<i>Craig McCarty</i>	<u>03/02/15</u>	<u>03/02/15</u>
	Read	69.00			
	±°F	0.50			
Filter	Ref	68.50	<i>Craig McCarty</i>	<u>03/02/15</u>	<u>03/02/15</u>
	Read	69.00			
	±°F	0.50			
Exit	Ref	68.50	<i>Craig McCarty</i>	<u>03/02/15</u>	<u>03/02/15</u>
	Read	69.00			
	±°F	0.50			

Note: Calibrated against ASTM Reference Thermometer.

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall **agree to within ±2°F**.

WEATHER STATION CALIBRATION SHEET
Temperature, Barometric Pressure, and Relative Humidity Periodic Calibration
Air Hygiene Asset ID: samp-we-0026

Filename: P:\Shared\QAQC\Calibrations\Weather Stations\2014\[Weather Station Calibration_samp-we-0026.xlsm]112013

Make: Kestrel

NIST ID 21470653

Model #: 4000

NIST S/N 21470653

Serial #: 693110

Cal Due 12/27/2014

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.00	0.00	29.85	29.84	0.01

Sean Barnes

02/03/14

(signature)

(date)

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.10	0.10	29.85	29.85	0.00

Sean Barnes

02/03/14

(signature)

(date)

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.20	0.20	29.85	29.89	0.04

Sean Barnes

02/03/14

(signature)

(date)

ASTM Temp (deg F)	Thermo. (deg F)	± deg F	ASTM Barometer (in. Hg)	Barometric (in. Hg)	± in. Hg
68.00	68.40	0.40	29.85	29.86	0.01

Sean Barnes

02/03/14

(signature)

(date)

Note: Calibrated against NIST Traceable Barometer and Thermometer (SAMP-WE-0100).

Standard for Calibration of Individual Thermocouples

EMC, ALT-011: After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacturer, using a reference thermometer (either ASTM reference thermometer or a thermometer that has been calibrated against an ASTM reference thermometer). The temperatures of the thermocouple and reference thermometers shall agree to within ±2F.

Standard of Calibration for Barometers

40 CFR Part 60, Appendix A, Method 5, Section:

6.0 Equipment and Supplies, 6.1 Sample Collection., 6.1.2 Barometer. Mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in.).

10.0 Calibration and Standardization, 10.6 Barometer. Calibrate against a mercury barometer.

S-TYPE PITOT TUBE CALIBRATION SHEET

Reference USEPA Reference Method 2 (40CFR60, App. A, Meth. 2)

PITOT SERIAL# <u>4174</u>	CALIBRATION DATE: <u>11-Jan-13</u>
PITOT TYPE: <u>S-Type</u>	BAROMETRIC PRESSURE: <u>29.88</u> in Hg
STD. PITOT TYPE: <u>Ellipsoidal</u>	STATIC PRESSURE: <u>1.4</u> in H ₂ O
Cp(std): <u>0.990</u>	BLOCKAGE %: <u>N/A</u>
PROBE SERIAL# <u>NICK</u>	CORRECTION FACTOR: <u>1.00</u>

SIDE "A" CALIBRATION				
RUN NO.	Δ Pstd in H ₂ O	Δ Ps in H ₂ O	Cp(s)	DEVIATION Cp(s) - avg.Cp(s)
1	0.560	0.820	0.818	0.000
2	0.560	0.820	0.818	0.000
3	0.560	0.820	0.818	0.000
"A" AVERAGE			0.818	0.0000 (must be ≤ 0.01)

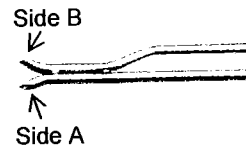
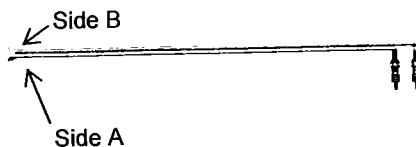
SIDE "B" CALIBRATION				
RUN NO.	Δ Pstd in H ₂ O	Δ Ps in H ₂ O	Cp(s)	DEVIATION Cp(s) - avg.Cp(s)
1	0.560	0.815	0.821	0.000
2	0.560	0.815	0.821	0.000
3	0.560	0.815	0.821	0.000
"B" AVERAGE			0.821	0.0000 (must be ≤ 0.01)

ACCEPTANCE CRITERIA

AVERAGE -0.0025 AVG. Cp (A) - AVG. Cp (B) must be ≤ 0.01

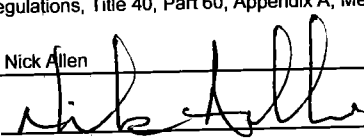
If the Average and both Deviation Averages "A" & "B" are ≤ 0.01, then the OVERALL AVERAGE below may be used.
* If NOT, use the "A" Average OR "B" Average.

OVERALL AVERAGE 0.8194



I certify that the above pitot tube was tested in accordance with the US EPA Method 2 standards.
See the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2, Item 4.

Print Name: Nick Allen

Signature: 

Date 1.11.13



GE Oil & Gas
Dresser Inc.
16240 Port Northwest Drive, Suite 100
Houston, TX 77041
USA
T +1 800 521 1114 +1 832 590 2303
F +1 800 335 5224 +1 832 590 2494

Customer Information

Name : PROCESS VALVE & EQUIPMENT
PO No. : 14-3156
Badge No. : NONE

Unit Description

3M175 SERIES B3 ROOTS METER,
COUNTER VERSION *1MC/W2*

Date Printed : 09 08 2014
Bill of Material : 055215-012
Model : 3M175
Serial No. : 1442557
Accessory S/N : UC324167
Sales Order No. : 206502-5
Spec. Req. No.
Prover Used : 50 cu. ft. (A)

MIN STATIC TEST PRESSURE	MIN LEAK TEST PRESSURE	MAX ALLOWABLE OPER PRESSURE	TC Acc at (deg F)	Accuracy	Proof	% Error
350 psig	219 psig	175 psig				

This meter has been tested and successfully passed a Shell Pressure Test and Leak Test at the above conditions.

P R O V E R T E S T D A T A

Test Point	Flow Rate Dis Vol	% Rated Capacity	Meter Accuracy	ERROR +/- %	Diff Pressure	TC Meter Accuracy	TC Meter Proof %	ERROR +/- %
1	3039.0	101.3	100.19	0.19	1.05			
2	300.0	10.0	99.67	-0.33	0.03			

Above data has been determined from tests performed with air at atmospheric pressure and ambient temperature, using positive displacement bell or piston provers dimensionally traceable to the United States National Institute of Standards and Technology (NIST) and traceable to NMI- Netherlands Measurement Institute for volumetric flow rate.

TC instrument accuracy has been determined from test performed in liquid baths at the temperatures show above using calibrated measurement instruments whose accuracy is traceable to NIST. TC Meter Accuracy (TC Meter Proof) of both meter and instrument in conjunction is calculated using TC accuracy (TC proof) at 60 degree F.

NMI accredited laboratory no: CE-085

This meter conforms to purchaser specifications.

Test date 06-September-14 by SANDOVAL, NEREIDA

IMCW2 #400 ASSEMBLY/TEST/SHIPPING CHECKLIST

Date: <u>11/24/14</u>	Instrument Serial #: <u>1408032553</u>
Customer & Work Order #: <u>206930-1</u>	Micro Corrector Serial #: <u>11-14-142838</u>
Process Value & Equipment	
Work Order Configuration Code: <u>W400XX SERB EN PTZ GA 12B 1P 1T CND5 IMP</u>	
Customer Special Req. Eng. Spec. #:	

TEST CHECKLIST

Mfg QA Initials
(as applicable)

DISPLAY TEST

~~PASS~~ / FAIL

TEMPERATURE TEST

~~PASS~~ / FAIL

IMCW TEMP: 70.4° REFERENCE TEMP: 70.2° DIF (IMCW T - REF T): .2°

T

VOLUME TEST

~~PASS~~ / FAIL (Include test sheet)

PULSE OUTPUT TEST:

~~PASS~~ / FAIL (Include test sheet)

LEAK TEST:

~~PASS~~ / FAIL

TEST TECHNICIAN INITIALS JO

PLACE TEST STAMP ON IMC (On back of IMCW2)

SHIPPING/QA CHECKLIST

Mfg QA Initials

Verify Test Stamp on back of IMCW2

Verify Tamper Evidence label is in place

Verify 3mm Allen wrench (1), drilled-head M4 screws (3) & spacers (4) provided

Verify hardware kit provided.

Verify meter & IMCW2 specs to work order config code specs or customer specs.

Perform scroll test

Verify mag pickup has tested identification mark on connector

Check unit configuration software (Read only mode)

The following documentation must be included:

- UK Calibration Certificate
- UK Volume/Pulse Output Test Certification
- Volume/Pulse Output Test Certification
- Unit Configuration Report
- Blueline Customer Wiring Diagram, 056903-000 (Cable Gland & Conduit only)
- Blueline Customer Field Installation, 056684-000

Q. A. STAMP





Volume Certification

Instrument

Type: IMC/W2
Firmware: 1.95
Serial Number: 11/14/142838 (Manuf.) 1408032553 (Inst.)

Configuration

Meter Type: Series B, Imperial
Meter Size: 3M
Pulse Outputs: Single

Test Conditions

Test Date: 11-24-2014 Time: 07:25
Fixture: E-0111
Temperature: 70.4 F.
Line Pressure: 0.06 psi G PASS
Battery: 6.20 Volts PASS
Flow Rate: 3000 cfh
Test Volume: 100.0 cu.ft. (uncorrected)
Correction Factor: 0.96381

Results:

PASS

VOLUME (CU.FT.)

	<u>Uncorrected</u>	<u>Corrected</u>
Initial:	0.0000	0.0000
Final:	100.0063	96.4101
Accumulated:	100.0063	96.4101
Calculated:	100.0000	96.3806
Error:	0.01 %	0.03 %

	<u>HF (Unc.)</u>	<u>Corrected (Prove)</u>
Comms Pulses:	PASS	PASS

PULSE OUTPUTS

	<u>Uncorrected</u>	<u>Corrected</u>	<u>Fault</u>
Multiplier:	1.0	1.0	-
Expected (± 1):	100	96	-
Received (Ch.A):	100	96	-
Error:	0	0	-
Min. Width (msec):	124.84	124.84	499.87
Result:	PASS	PASS	PASS

This test performs a check of the configuration, volume input, and pulse outputs of the instrument. The volume input is driven at a precise flow rate for a precise number of revolutions. The test is performed at ambient temperature and pressure.

Operator: JD



Dresser Roots Meters
and Instruments
Dresser, Inc.
16240 Port Northwest
Houston, TX 77041
Tel: 832-590-2300

Calibration Certificate

Corrector Serial No. 11/14/142838
Transducer Serial No. 48623-042
PCB Serial No. 666029607

Transducer: 12bar G
Date: 12/11/2014

Test Equipment

Envio. Chamber: LE0061
Druck 1: 51501570

PRT Simulator: RIG_C
Druck 2: 0624/98-02

Calibration Points

Temperatures: 60.00°C, 35.00°C, 10.00°C, -15.00°C, -40.00°C
Pressures: 0.000bar, 3.000bar, 6.000bar, 9.000bar, 12.000bar

Pressure Checks

Applied Pressure	Ambient @60.0°C		Ambient @35.0°C		Ambient @10.0°C		Ambient @-15.0°C		Ambient @-40.0°C	
	PTZ Reading	Deviation %	PTZ Reading	Deviation %	PTZ Reading	Deviation %	PTZ Reading	Deviation %	PTZ Reading	Deviation %
0.000Bar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.000Bar	2.995	-0.038	2.999	-0.011	3.000	0.004	3.000	-0.004	3.000	0.000
6.000Bar	5.983	-0.140	5.995	-0.045	6.000	0.001	5.998	-0.017	6.000	0.001
9.000Bar	8.968	-0.270	8.989	-0.088	8.998	-0.016	8.995	-0.042	9.000	0.001
12.000Bar	11.946	-0.449	11.981	-0.160	11.986	-0.113	11.991	-0.071	12.001	0.008

Errors are shown as %RDG at or above 20% of range, otherwise errors are displayed as %FS

Temperature Checks

Nominal Temperature	Ambient @60°C		Ambient @35°C		Ambient @10°C		Ambient @-15°C		Ambient @-40°C	
	PTZ Reading	Diff. °C	PTZ Reading	Diff. °C	PTZ Reading	Diff. °C	PTZ Reading	Diff. °C	PTZ Reading	Diff. °C
-40.0°C	-40.01	-0.01	-39.97	0.03	-39.96	0.04	-39.97	0.03	-39.97	0.03
10.0°C	9.99	-0.01	10.04	0.04	10.05	0.05	10.04	0.04	10.06	0.06
60.0°C	60.01	0.01	60.05	0.05	60.07	0.07	60.04	0.04	60.07	0.07

Note 1: Accuracy limits of the Micro Series Corrector readings are better than 0.7% of reading for 20% to 100% pressure range over the full temperature range of -40.0°C to 60.0°C (-40.0°F to 140.0°F).

Note 2: All pressure Measurements used in the calibration and check procedures have certificates issued in accordance with the conditions of accreditation granted by the National Measurement Accreditation Service. NMAS has assessed the measuring capability of the laboratory issuing the certificate and its traceability to British national standards and to the units of measurement realised at the corresponding laboratory (National Physical Laboratory).

Certified By E. Avera

Date 11/19/2014



Volume Certification

Instrument

Type: IMC/W2
Firmware: 1.95
Serial Number: 11/14/142838

Configuration

Meter Type: Series B, Imperial
Meter Size: 3M
Pulse Outputs: Single

Test Conditions

Test Date: 11-18-2014 Time: 18:24:16
Fixture: 11
Temperature: 69.5 °F.
Line Pressure: 0.07 psi G PASS
Battery: 6.25 Volts PASS
Flow Rate: 3000 cfh
Test Volume: 100.0 cu.ft. (uncorrected)
Correction Factor: 0.98719

Results:

PASS

VOLUME (CU.FT.)

	<u>Uncorrected</u>	<u>Corrected</u>
Initial:	-0.0063	-0.0062
Final:	99.9938	98.7089
Accumulated:	100.0000	98.7151
Calculated:	100.0000	98.7186
Error:	0.00 %	-0.00 %

	<u>HF (Unc.)</u>	<u>Corrected (Prove)</u>
Comms Pulses:	PASS	PASS

PULSE OUTPUTS

	<u>Uncorrected</u>	<u>Corrected</u>	<u>Fault</u>
Multiplier:	1.0	1.0	-
Expected (± 1):	100	99	-
Received (Ch.A):	100	98	-
Error:	0	-1	-
Min. Width (msec):	187.34	187.34	499.86
Result:	PASS	PASS	PASS

This test performs a check of the configuration, volume input, and pulse outputs of the instrument. The volume input is driven at a precise flow rate for a precise number of revolutions. The test is performed at ambient temperature and pressure.

Operator: SG

APPENDIX E

FUEL ANALYSIS RECORDS

GAS INNOVATIONS

CERTIFICATE OF CONFORMANCE

PROPYLENE

C.P. GRADE

Guaranteed Specifications

99.0 % +

Propylene

Sum of all impurities to

Ethane

be < 1 %

Total saturated C4's

Sulfur < 0.50 PPM

Propane

Water < 5 PPM

Water

Liquid Phase Analysis

Sulfur

Lot Analysis

99.105 % +

0.021 %

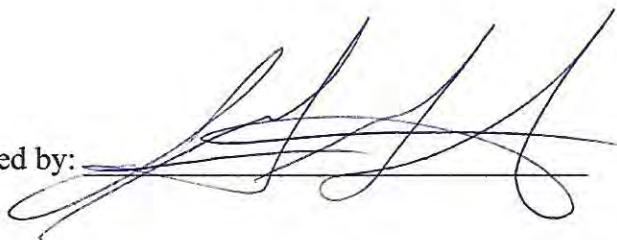
0.006 %

0.868 %

< 3 PPM

< 0.50 PPM

Certified by:



Date:

02/16/15

SO# 00056581

Cylinder Serial Number(s)

BULK LOAD – 1000 gal. Deck Tanks:

#23194, #22577.

Lot Number

PRY-021615-C

CYLINDER - ½ TON:

#V849065, #V849117, #V849073.

CUSTOMER PO#: 170318

18005 E. Highway 225, La Porte, TX 77571 Tel- 281-471-2200 Fax- 281-471-2201 www.gasinnovations.com

LABORATORY REPORT

March 10, 2015

Min Lee
Air Hygiene, Incorporated
1600 West Tacoma Street
Broken Arrow, OK 74012

RE: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

Dear Min:

Enclosed are the results of the samples submitted to our laboratory on March 6, 2015. For your reference, these analyses have been assigned our service request number P1500876.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental



By Sue Anderson at 4:19 pm, Mar 10, 2015

For Kelly Horiuchi
Laboratory Director

Client: Air Hygiene, Incorporated

Service Request No: P1500876

Project: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

CASE NARRATIVE

The samples were received intact under chain of custody on March 6, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Benzene Analysis

The samples were analyzed per ASTM D1945-03 for benzene using a gas chromatograph equipped with a flame ionization detector (FID). This procedure is described in laboratory SOP VOA-TO3C1C6. This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

BTU and CHONS Analysis

The results for BTU and CHONS were generated according to ASTM D 3588-98. The following analyses were performed and used to calculate the BTU and CHONS results. This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

C2 through C6 Hydrocarbon Analysis

The samples were analyzed according to ASTM D1945-03 for C2 through >C6 hydrocarbons using a gas chromatograph equipped with a flame ionization detector (FID). This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

Fixed Gases Analysis

The samples were also analyzed for fixed gases (hydrogen, oxygen/argon, nitrogen, carbon monoxide, methane and carbon dioxide) according to ASTM D1945-03 (single injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

Hydrogen Sulfide Analysis

The samples were also analyzed for hydrogen sulfide per ASTM D 5504-08 using a gas

Client: Air Hygiene, Incorporated
Project: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

Service Request No: P1500876

CASE NARRATIVE

chromatograph equipped with a sulfur chemiluminescence detector (SCD). This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	876241
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-001
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-14-5
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 4-4
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Air Hygiene, Incorporated
 Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

Service Request: P1500876

Date Received: 3/6/2015
 Time Received: 10:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	TO-3 Modified - C1C6+ Can	3C Modified - Fxd Gases Can	ASTM D5504-01 - H2S Can
Qti:-90-100%-Q250-can	P1500876-001	Air	2/25/2015	15:09	SSC00229	-2.69	3.78	X	X	X
Qti:-0-30-0%-Q250-can	P1500876-002	Air	2/27/2015	10:00	SSC00235	-0.38	3.53	X	X	X
Qti:-30-70-30%-Q250-can	P1500876-003	Air	2/27/2015	15:20	SSC00143	-0.64	3.86	X	X	X
Qti:-70-100-70%-Q250-can	P1500876-004	Air	2/28/2015	13:45	SSC00219	-0.39	3.57	X	X	X

Air - Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Page: _____ of _____

[illegible]

ALS Environmental **Sample Acceptance Check Form**

Client: Air Hygiene, Incorporated

Work order: P1500876

Project: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

Sample(s) received on: 3/6/15

Date opened: 3/6/15

by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

	Yes	No	N/A
1 Were sample containers properly marked with client sample ID?	☒	☐	☐
2 Container(s) supplied by ALS ?	☒	☐	☐
3 Did sample containers arrive in good condition?	☒	☐	☐
4 Were chain-of-custody papers used and filled out?	☒	☐	☐
5 Did sample container labels and/or tags agree with custody papers?	☒	☐	☐
6 Was sample volume received adequate for analysis?	☒	☐	☐
7 Are samples within specified holding times?	☒	☐	☐
8 Was proper temperature (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9 Was a trip blank received?	☐	☒	☐
10 Were custody seals on outside of cooler/Box?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
Were custody seals on outside of sample container?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
11 Do containers have appropriate preservation , according to method/SOP or Client specified information?	☐	☐	☒
Is there a client indication that the submitted samples are pH preserved?	☐	☐	☒
Were VOA vials checked for presence/absence of air bubbles?	☐	☐	☒
Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	☐	☐	☒
12 Tubes: Are the tubes capped and intact?	☐	☐	☒
Do they contain moisture?	☐	☐	☒
13 Badges: Are the badges properly capped and intact?	☐	☐	☒
Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1500876-001.01	6.0 L Silonite Can					
P1500876-002.01	6.0 L Silonite Can					
P1500876-003.01	6.0 L Silonite Can					
P1500876-004.01	6.0 L Silonite Can					

Explain any discrepancies: (include lab sample ID numbers): _____

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti:-90-100%-Q250-can

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P1500876-001

Test Code: ASTM D3588-98

Analyst: Mike Conejo/Wade Henton/Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00229

Date Collected: 2/25/15

Date Received: 3/6/15

Initial Pressure (psig): -2.69

Final Pressure (psig): 3.78

Canister Dilution Factor: 1.54

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	0.48	0.35	
Nitrogen	1.67	1.07	
Carbon Monoxide	< 0.01	< 0.01	
Methane	< 0.01	< 0.01	
Carbon Dioxide	< 0.01	< 0.01	
Hydrogen Sulfide	< 0.01	< 0.01	
C2 as Ethane	0.12	0.08	
C3 as Propane	97.72	98.49	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	< 0.01	< 0.01	
C6 as n-Hexane	< 0.01	< 0.01	
> C6 as n-Hexane	< 0.01	< 0.01	
TOTALS	99.99	99.99	

Components	Mole %	Weight %
Carbon	27.16	80.55
Hydrogen	72.44	18.03
Oxygen + Argon	< 0.10	0.35
Nitrogen	0.31	1.07
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		1.5106
Specific Volume	ft3/lb	8.67
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,502.6
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,302.5
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,417.8
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,224.5
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	21,707.6
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	19,971.7
Compressibility Factor "Z" (60 F, 14.696 psia)		0.9833

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti:-0-30-0%-Q250-can

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P1500876-002

Test Code: ASTM D3588-98

Analyst: Mike Conejo/Wade Henton/Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00235

Date Collected: 2/27/15

Date Received: 3/6/15

Initial Pressure (psig): -0.38

Final Pressure (psig): 3.53

Canister Dilution Factor: 1.27

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	0.21	0.16	
Nitrogen	0.81	0.51	
Carbon Monoxide	< 0.01	< 0.01	
Methane	< 0.01	< 0.01	
Carbon Dioxide	< 0.01	< 0.01	
Hydrogen Sulfide	< 0.01	< 0.01	
C2 as Ethane	0.05	0.03	
C3 as Propane	98.92	99.29	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	< 0.01	< 0.01	
C6 as n-Hexane	< 0.01	< 0.01	
> C6 as n-Hexane	< 0.01	< 0.01	
TOTALS	99.99	99.99	

Components	Mole %	Weight %
Carbon	27.22	81.17
Hydrogen	72.59	18.16
Oxygen + Argon	< 0.10	0.16
Nitrogen	0.15	0.51
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		1.5169
Specific Volume	ft3/lb	8.64
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,533.1
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,330.5
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,446.4
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,250.7
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	21,880.7
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	20,131.0
Compressibility Factor "Z" (60 F, 14.696 psia)		0.9829

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti:-30-70-30%-Q250-can

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P1500876-003

Test Code: ASTM D3588-98

Analyst: Mike Conejo/Wade Henton/Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00143

Date Collected: 2/27/15

Date Received: 3/6/15

Initial Pressure (psig): -0.64

Final Pressure (psig): 3.86

Canister Dilution Factor: 1.32

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	0.43	0.31	
Nitrogen	1.52	0.97	
Carbon Monoxide	< 0.01	< 0.01	
Methane	< 0.01	< 0.01	
Carbon Dioxide	< 0.01	< 0.01	
Hydrogen Sulfide	< 0.01	< 0.01	
C2 as Ethane	0.02	0.02	
C3 as Propane	98.02	98.69	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	< 0.01	< 0.01	
C6 as n-Hexane	< 0.01	< 0.01	
> C6 as n-Hexane	< 0.01	< 0.01	
TOTALS	99.99	99.99	

Components	Mole %	Weight %
Carbon	27.17	80.66
Hydrogen	72.47	18.05
Oxygen + Argon	< 0.10	0.31
Nitrogen	0.28	0.97
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		1.5121
Specific Volume	ft3/lb	8.67
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,508.8
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,308.2
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,423.7
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,229.9
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	21,739.2
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	20,000.8
Compressibility Factor "Z" (60 F, 14.696 psia)		0.9832

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti:-70-100-70%-Q250-can

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P1500876-004

Test Code: ASTM D3588-98

Analyst: Mike Conejo/Wade Henton/Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00219

Date Collected: 2/28/15

Date Received: 3/6/15

Initial Pressure (psig): -0.39

Final Pressure (psig): 3.57

Canister Dilution Factor: 1.28

Components	Result Volume %	Result Weight %	Data Qualifier
Hydrogen	< 0.01	< 0.01	
Oxygen + Argon	0.23	0.17	
Nitrogen	1.02	0.65	
Carbon Monoxide	< 0.01	< 0.01	
Methane	< 0.01	< 0.01	
Carbon Dioxide	< 0.01	< 0.01	
Hydrogen Sulfide	< 0.01	< 0.01	
C2 as Ethane	0.02	0.01	
C3 as Propane	98.72	99.16	
C4 as n-Butane	< 0.01	< 0.01	
C5 as n-Pentane	< 0.01	< 0.01	
C6 as n-Hexane	< 0.01	< 0.01	
> C6 as n-Hexane	< 0.01	< 0.01	
TOTALS	99.99	99.99	

Components	Mole %	Weight %
Carbon	27.21	81.05
Hydrogen	72.56	18.14
Oxygen + Argon	< 0.10	0.17
Nitrogen	0.19	0.65
Sulfur	< 0.10	< 0.10

Specific Gravity (Air = 1)		1.5157
Specific Volume	ft3/lb	8.64
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,527.3
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/ft3	2,325.2
Gross Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,441.1
Net Heating Value (Water Saturated at 0.25636 psia)	BTU/ft3	2,245.9
Gross Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	21,847.3
Net Heating Value (Dry Gas @ 60 F, 14.696 psia)	BTU/lb	20,100.3
Compressibility Factor "Z" (60 F, 14.696 psia)		0.9830

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

Benzene

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Wade Henton

Sampling Media: 6.0 L Silonite Canister(s)

Test Notes:

Date(s) Collected: 2/25 - 2/28/15

Date Received: 3/6/15

Date Analyzed: 3/9/15

Client Sample ID	ALS Sample ID	Canister Dilution Factor	Injection Volume ml(s)	Result ppmV	MRL ppmV	Data Qualifier
Qti:-90-100%-Q250-can	P1500876-001	1.54	0.050	ND	18	
Qti:-0-30-0%-Q250-can	P1500876-002	1.27	0.050	ND	15	
Qti:-30-70-30%-Q250-can	P1500876-003	1.32	0.050	ND	16	
Qti:-70-100-70%-Q250-can	P1500876-004	1.28	0.050	ND	15	
Method Blank	P150309-MB	1.00	1.0	ND	0.60	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Lab Control Sample

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P150309-LCS

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Wade Henton

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 3/09/15

Volume(s) Analyzed: NA ml(s)

Compound	Spike Amount ppmV	Result ppmV	% Recovery	ALS	Data Qualifier
				Acceptance Limits	
Benzene	54.9	49.1	89	50-150	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti:-90-100%-Q250-can

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P1500876-001

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Nalini Lall

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00229

Date Collected: 2/25/15

Date Received: 3/6/15

Date Analyzed: 3/9/15

Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -2.69 Final Pressure (psig): 3.78

Canister Dilution Factor: 1.54

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	15	
C ₂ as Ethane	1,200	15	
C ₃ as Propane	980,000	15	
C ₄ as n-Butane	ND	15	
C ₅ as n-Pentane	ND	15	
C ₆ as n-Hexane	ND	15	
C ₆ ⁺ as n-Hexane	ND	31	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti:-0-30-0%-Q250-can

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P1500876-002

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Nalini Lall

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00235

Date Collected: 2/27/15

Date Received: 3/6/15

Date Analyzed: 3/9/15

Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -0.38 Final Pressure (psig): 3.53

Canister Dilution Factor: 1.27

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	13	
C ₂ as Ethane	450	13	
C ₃ as Propane	990,000	13	
C ₄ as n-Butane	13	13	
C ₅ as n-Pentane	ND	13	
C ₆ as n-Hexane	ND	13	
C ₆ + as n-Hexane	ND	25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti:-30-70-30%-Q250-can

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P1500876-003

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Nalini Lall

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00143

Date Collected: 2/27/15

Date Received: 3/6/15

Date Analyzed: 3/9/15

Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -0.64 Final Pressure (psig): 3.86

Canister Dilution Factor: 1.32

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	13	
C ₂ as Ethane	230	13	
C ₃ as Propane	980,000	13	
C ₄ as n-Butane	17	13	
C ₅ as n-Pentane	ND	13	
C ₆ as n-Hexane	ND	13	
C ₆ ⁺ as n-Hexane	ND	26	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: Qti:-70-100-70%-Q250-can
Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876
 ALS Sample ID: P1500876-004

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC8/FID
Analyst: Nalini Lall
Sampling Media: 6.0 L Silonite Canister
Test Notes:
Container ID: SSC00219

Date Collected: 2/28/15
Date Received: 3/6/15
Date Analyzed: 3/9/15
Volume(s) Analyzed: 0.050 ml(s)

Initial Pressure (psig): -0.39 **Final Pressure (psig):** 3.57

Canister Dilution Factor: 1.28

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	13	
C ₂ as Ethane	190	13	
C ₃ as Propane	990,000	13	
C ₄ as n-Butane	19	13	
C ₅ as n-Pentane	ND	13	
C ₆ as n-Hexane	ND	13	
C ₆ + as n-Hexane	ND	26	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: Method Blank
Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876
ALS Sample ID: P150309-MB

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC8/FID
Analyst: Nalini Lall
Sampling Media: 6.0 L Silonite Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/09/15
Volume(s) Analyzed: 1.0 ml(s)

Compound	Result ppmV	MRL ppmV	Data Qualifier
Methane	ND	0.50	
C ₂ as Ethane	ND	0.50	
C ₃ as Propane	ND	0.50	
C ₄ as n-Butane	ND	0.50	
C ₅ as n-Pentane	ND	0.50	
C ₆ as n-Hexane	ND	0.50	
C ₆ + as n-Hexane	ND	1.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Lab Control Sample

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P150309-LCS

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC8/FID

Analyst: Nalini Lall

Sampling Media: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 3/09/15

Volume(s) Analyzed: NA ml(s)

Compound	Spike Amount ppmV	Result ppmV	% Recovery	ALS	Data Qualifier
				Acceptance Limits	
Methane	1,000	1,000	100	83-120	
Ethane	1,000	992	99	85-122	
Propane	1,000	1,010	101	84-121	
n-Butane	1,000	949	95	79-114	
n-Pentane	1,020	972	95	80-121	
n-Hexane	1,010	992	98	73-121	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti:-90-100%-Q250-can

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P1500876-001

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 6.0 L Silonite Canister
Test Notes:
Container ID: SSC00229

Date Collected: 2/25/15
Date Received: 3/6/15
Date Analyzed: 3/9/15
Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -2.69 Final Pressure (psig): 3.78

Canister Dilution Factor: 1.54

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.15	
7782-44-7	Oxygen +			
7440-37-1	Argon	0.481	0.15	
7727-37-9	Nitrogen	1.67	0.15	
630-08-0	Carbon Monoxide	ND	0.15	
124-38-9	Carbon Dioxide	ND	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti:-0-30-0%-Q250-can

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P1500876-002

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC1/TCD

Analyst: Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00235

Date Collected: 2/27/15

Date Received: 3/6/15

Date Analyzed: 3/9/15

Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -0.38

Final Pressure (psig): 3.53

Canister Dilution Factor: 1.27

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.13	
7782-44-7	Oxygen +			
7440-37-1	Argon	0.215	0.13	
7727-37-9	Nitrogen	0.807	0.13	
630-08-0	Carbon Monoxide	ND	0.13	
124-38-9	Carbon Dioxide	ND	0.13	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Qti:-30-70-30%-Q250-can

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876

ALS Sample ID: P1500876-003

Test Code: ASTM D1945-03

Instrument ID: HP5890 II/GC1/TCD

Analyst: Nalini Lall

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00143

Date Collected: 2/27/15

Date Received: 3/6/15

Date Analyzed: 3/9/15

Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -0.64

Final Pressure (psig): 3.86

Canister Dilution Factor: 1.32

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.13	
7782-44-7	Oxygen +			
7440-37-1	Argon	0.492	0.13	
7727-37-9	Nitrogen	1.52	0.13	
630-08-0	Carbon Monoxide	ND	0.13	
124-38-9	Carbon Dioxide	ND	0.13	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: Qti:-70-100-70%-Q250-can
Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876
 ALS Sample ID: P1500876-004

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 6.0 L Silonite Canister
Test Notes:
Container ID: SSC00219

Date Collected: 2/28/15
Date Received: 3/6/15
Date Analyzed: 3/9/15
Volume(s) Analyzed: 0.10 ml(s)

Initial Pressure (psig): -0.39 **Final Pressure (psig):** 3.57

Canister Dilution Factor: 1.28

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.13	
7782-44-7	Oxygen +			
7440-37-1	Argon	0.229	0.13	
7727-37-9	Nitrogen	1.02	0.13	
630-08-0	Carbon Monoxide	ND	0.13	
124-38-9	Carbon Dioxide	ND	0.13	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: Method Blank
Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500876
ALS Sample ID: P150309-MB

Test Code: ASTM D1945-03
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 6.0 L Silonite Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/09/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
1333-74-0	Hydrogen	ND	0.10	
7782-44-7	Oxygen +			
7440-37-1	Argon	ND	0.10	
7727-37-9	Nitrogen	ND	0.10	
630-08-0	Carbon Monoxide	ND	0.10	
124-38-9	Carbon Dioxide	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Air Hygiene, Incorporated

Client Sample ID: Lab Control Sample

ALS Project ID: P1500876

Client Project ID: Questor Q250 Test / Qti-15-brokenarrow.ok-comp#1

ALS Sample ID: P150309-LCS

Test Code: ASTM D1945-03

Date Collected: NA

Instrument ID: HP5890 II/GC1/TCD

Date Received: NA

Analyst: Nalini Lall

Date Analyzed: 3/09/15

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: NA ml(s)

Test Notes:

CAS #	Compound	Spike Amount ppmV	Result ppmV	% Recovery	ALS Acceptance Limits	Data Qualifier
1333-74-0	Hydrogen	40,000	43,100	108	83-114	
7782-44-7	Oxygen +					
7440-37-1	Argon	50,000	57,400	115	84-121	
7727-37-9	Nitrogen	50,000	58,400	117	88-122	
630-08-0	Carbon Monoxide	50,000	56,000	112	87-118	
124-38-9	Carbon Dioxide	50,000	54,100	108	84-117	

APPENDIX F

METHOD 3C RESULTS

LABORATORY REPORT

March 9, 2015

Min Lee
Air Hygiene, Incorporated
1600 West Tacoma Street
Broken Arrow, OK 74012

RE: qti-15-brokenarrow.ok-comp#1

Dear Min:

Your report number P1500761 has been amended for the samples submitted to our laboratory on February 27, 2015. At the client's request a validation data package has been provided. The additional pages have been indicated by the "Added Page" footer located at the bottom right of the page.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental



By Kelly Horiuchi at 5:28 pm, Mar 09, 2015

Kelly Horiuchi
Laboratory Director

Client: Air Hygiene, Incorporated
Project: qti-15-brokenarrow.ok-comp#1

Service Request No: P1500761

CASE NARRATIVE

The samples were received intact under chain of custody on February 27, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Fixed Gases Analysis

The samples were analyzed for fixed gases (oxygen/argon, nitrogen, methane and carbon dioxide) according to EPA Method 3C (triplicate injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This procedure is described in laboratory SOP VOA-EPA3C. This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

Samples R10-90-100%-Q250 (P1500761-001), R11-90-100%-Q250 (P1500761-003) and R12-90-100%-Q250 (P2500761-005) were analyzed past the three day holding time. The data has been flagged accordingly.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	838341
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-001
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-14-5
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 4-4
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Air Hygiene, Incorporated
Project ID: qti-15-brokenarrow.ok-comp#1

Service Request: P1500761

Date Received: 2/27/2015
Time Received: 09:50

3C Modified - Fxd Gases Bag 2X

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
R10-90-100%-Q250	P1500761-001	Air	2/25/2015	09:58	X
R11-90-100%-Q250	P1500761-003	Air	2/25/2015	11:32	X
R12-90-100%-Q250	P1500761-005	Air	2/25/2015	15:05	X
R1-0-30-0%-Q250	P1500761-007	Air	2/25/2015	18:05	X
R2-0-30-0%-Q250	P1500761-009	Air	2/26/2015	17:08	X

P1568761



Air Hygiene International, Inc.
1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
(888) 461-8778
www.airhygiene.com

SAMPLE DESCRIPTION AND CHAIN OF CUSTODY RECORD

Project Number: qti-15-brokenarrow.ok-comp#1		Laboratory Analysis Requested: Method 3C						
Person Taking Samples: MSL								
Sample Number	Location	Date	Time	Volume (L)	Analysis Method			
					O ₂	CO ₂	Nitrogen	Methane
R10-90-100%-Q250	Broken Arrow Rental Facility	25-Feb	9:58	10	X	X	X	X
R10-90-100%-Q250-Backup	Broken Arrow Rental Facility	25-Feb		5	X	X	X	X
R11-90-100%-Q250	Broken Arrow Rental Facility	25-Feb	11:32	10	X	X	X	X
R11-90-100%-Q250-Backup	Broken Arrow Rental Facility	25-Feb		5	X	X	X	X
R12-90-100%-Q250	Broken Arrow Rental Facility	25-Feb	15:05	10	X	X	X	X
R12-90-100%-Q250-Backup	Broken Arrow Rental Facility	25-Feb		5	X	X	X	X
R1-0-30-0%-Q250	Broken Arrow Rental Facility	25-Feb	18:05	10	X	X	X	X
R1-0-30-0%-Q250-Backup	Broken Arrow Rental Facility	25-Feb		5	X	X	X	X
R2-0-30-0%-Q250	Broken Arrow Rental Facility	26-Feb	17:08	10	X	X	X	X
R2-0-30-0%-Q250-Backup	Broken Arrow Rental Facility	26-Feb		5	X	X	X	X

Relinquished by: (Signature) *[Signature]* Date: 2/26/15 Time: 17:40
 Received by: (Signature) *[Signature]* Date: 2/27/15 Time: 0950

3-brokenarrow.ok-comp#1-coc-q250

ALS Environmental Sample Acceptance Check Form

Client: Air Hygiene, Incorporated

Work order: P1500761

Project: qti-15-brokenarrow.ok-comp#1

Sample(s) received on: 2/27/15

Date opened: 2/27/15

by: KKELPE

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

	Yes	No	N/A
1 Were sample containers properly marked with client sample ID?	☒	☐	☐
2 Container(s) supplied by ALS ?	☐	☒	☐
3 Did sample containers arrive in good condition?	☒	☐	☐
4 Were chain-of-custody papers used and filled out?	☒	☐	☐
5 Did sample container labels and/or tags agree with custody papers?	☐	☒	☐
6 Was sample volume received adequate for analysis?	☒	☐	☐
7 Are samples within specified holding times?	☒	☐	☐
8 Was proper temperature (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9 Was a trip blank received?	☐	☒	☐
10 Were custody seals on outside of cooler/Box?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
Were custody seals on outside of sample container?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
11 Do containers have appropriate preservation , according to method/SOP or Client specified information?	☐	☐	☒
Is there a client indication that the submitted samples are pH preserved?	☐	☐	☒
Were VOA vials checked for presence/absence of air bubbles?	☐	☐	☒
Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	☐	☐	☒
12 Tubes: Are the tubes capped and intact?	☐	☐	☒
Do they contain moisture?	☐	☐	☒
13 Badges: Are the badges properly capped and intact?	☐	☐	☒
Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1500761-001.01	10 L Tedlar Bag					
P1500761-002.01	5.0 L Tedlar Bag					
P1500761-003.01	10 L Tedlar Bag					
P1500761-004.01	5.0 L Tedlar Bag					
P1500761-005.01	10 L Tedlar Bag					
P1500761-006.01	5.0 L Tedlar Bag					
P1500761-007.01	10 L Tedlar Bag					
P1500761-008.01	5.0 L Tedlar Bag					

Explain any discrepancies: (include lab sample ID numbers): _____

Missing sample # 10 from chain (backup bag) _____

ALS Environmental Sample Acceptance Check Form

Client: Air Hygiene, Incorporated

Work order: P1500761

Project: qti-15-brokenarrow.ok-comp#1

Sample(s) received on: 2/27/15

Date opened: 2/27/15

by: KKELPE

[illegible]

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO₂, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R10-90-100%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500761
 ALS Sample ID: P1500761-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes: H1

Date Collected: 2/25/15
Date Received: 2/27/15
Date Analyzed: 2/28/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.8	0.10	
7727-37-9	Nitrogen	79.8	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.33	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

H1 = Sample analysis performed past holding time. See case narrative.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R11-90-100%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500761
 ALS Sample ID: P1500761-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes: H1

Date Collected: 2/25/15
Date Received: 2/27/15
Date Analyzed: 2/28/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.9	0.10	
7727-37-9	Nitrogen	79.8	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.24	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

H1 = Sample analysis performed past holding time. See case narrative.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R12-90-100%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500761
ALS Sample ID: P1500761-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes: H1

Date Collected: 2/25/15
Date Received: 2/27/15
Date Analyzed: 2/28/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	15.7	0.10	
7727-37-9	Nitrogen	79.6	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	4.72	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

H1 = Sample analysis performed past holding time. See case narrative.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R1-0-30-0%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500761
ALS Sample ID: P1500761-007

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 2/25/15
Date Received: 2/27/15
Date Analyzed: 2/28/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.2	0.10	
7727-37-9	Nitrogen	80.0	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.78	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R2-0-30-0%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500761
ALS Sample ID: P1500761-009

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 2/26/15
Date Received: 2/27/15
Date Analyzed: 2/28/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.5	0.10	
7727-37-9	Nitrogen	79.9	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.63	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: Method Blank
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500761
ALS Sample ID: P150228-MB

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 2/28/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	ND	0.10	
7727-37-9	Nitrogen	ND	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281518.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 7:38 pm
Operator : WH
Sample : 0761-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:46 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.130	224465	135830.081	ppm
3) Nitrogen	2.257	1406172	732384.186	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.708	105132	48864.961	ppm

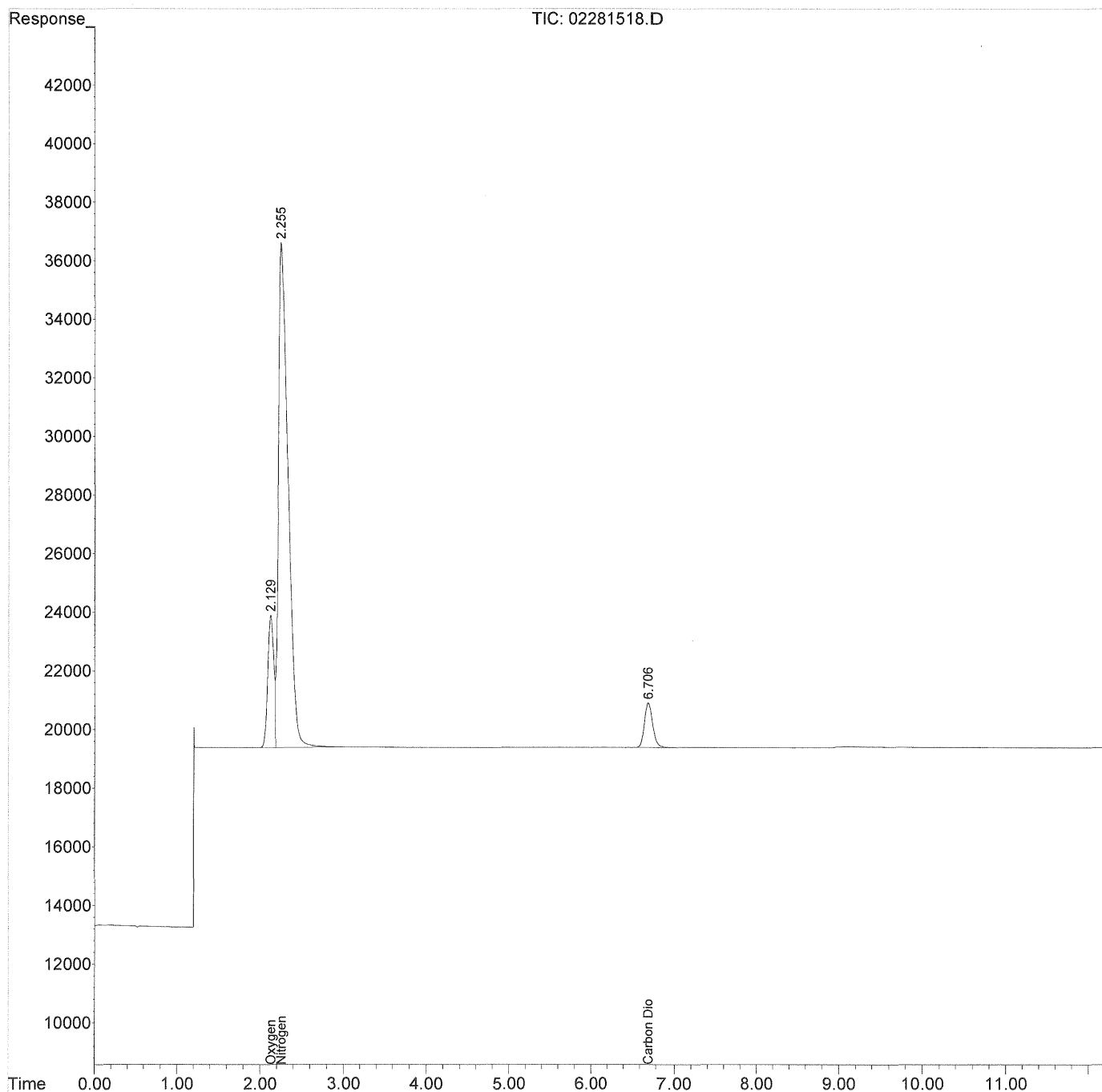
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Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281518.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 7:38 pm
Operator : WH
Sample : 0761-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:46 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281519.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 7:54 pm
Operator : WH
Sample : 0761-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:50 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.130	225008	136158.537	ppm
3) Nitrogen	2.256	1407580	733117.295	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.707	105693	49125.470	ppm

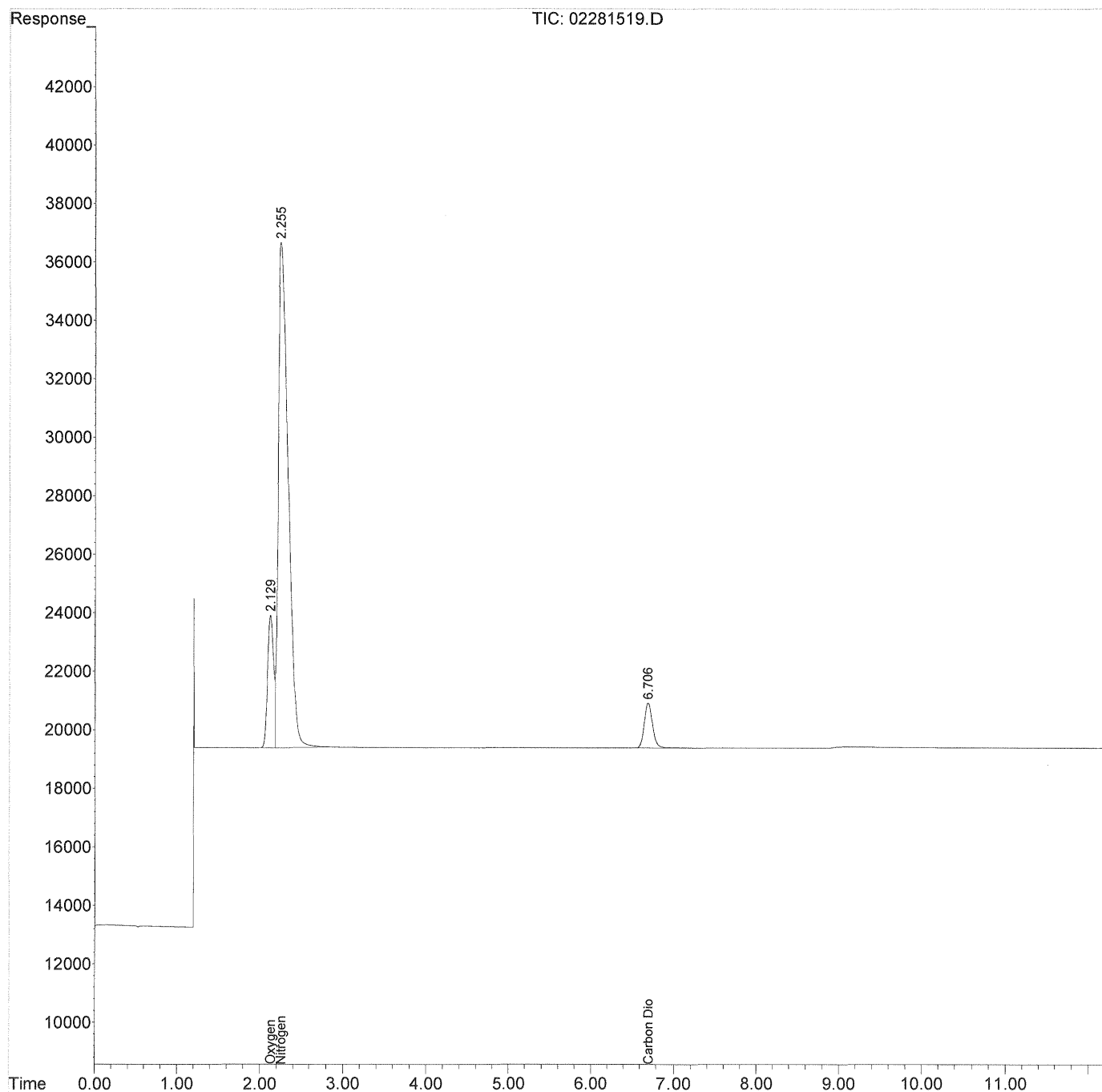
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281519.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 7:54 pm
Operator : WH
Sample : 0761-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:50 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281520.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 8:10 pm
Operator : WH
Sample : 0761-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:53 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.149	225670	136558.905 ppm
3) Nitrogen	2.275	1411945	735390.561 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.710	105500	49035.921 ppm

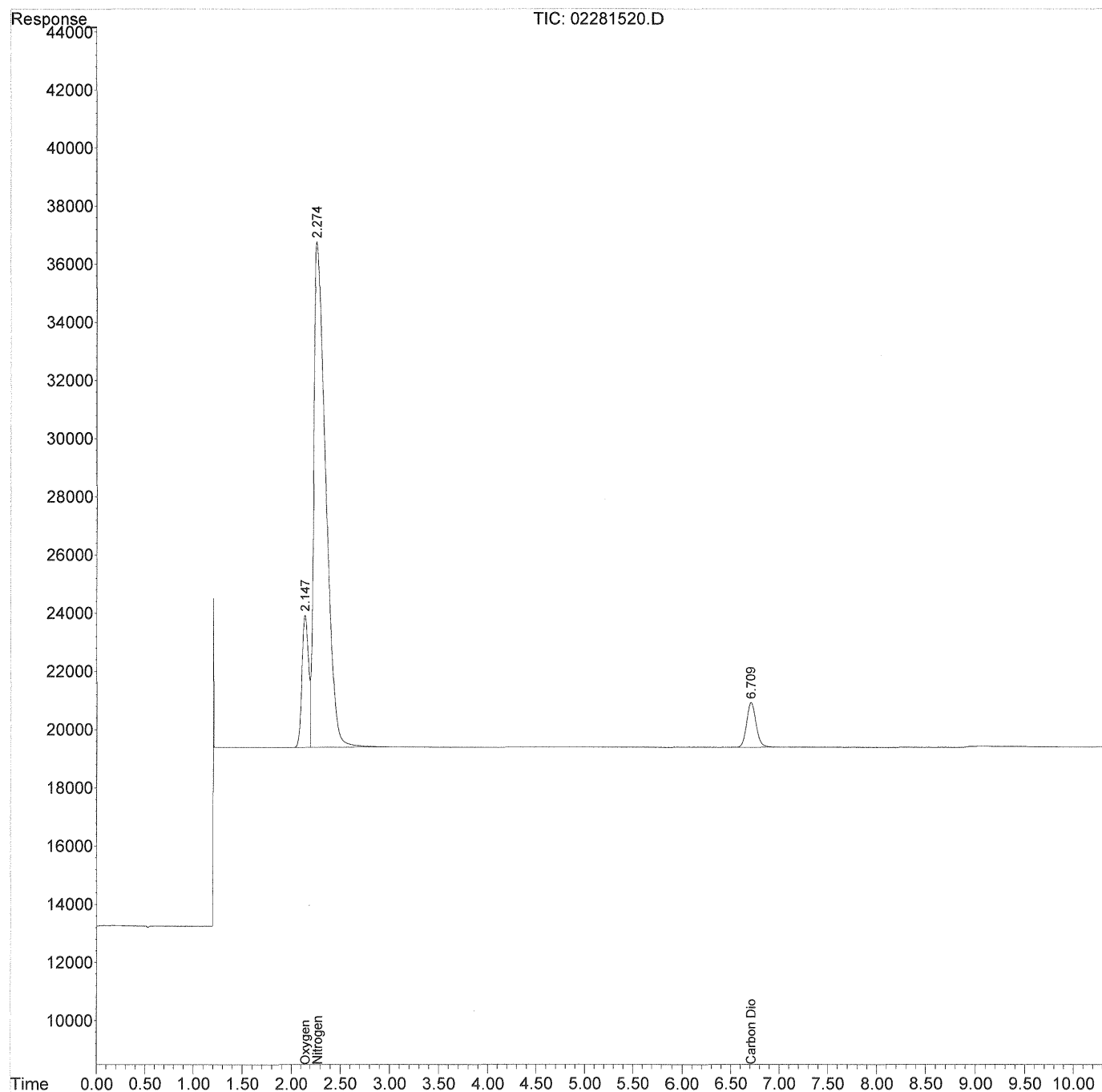
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281520.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 8:10 pm
Operator : WH
Sample : 0761-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:53 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281515.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 6:50 pm
Operator : WH
Sample : 0761-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:37 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.154	226262	136917.534 ppm
3) Nitrogen	2.281	1403870	731185.099 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.714	103488	48100.698 ppm

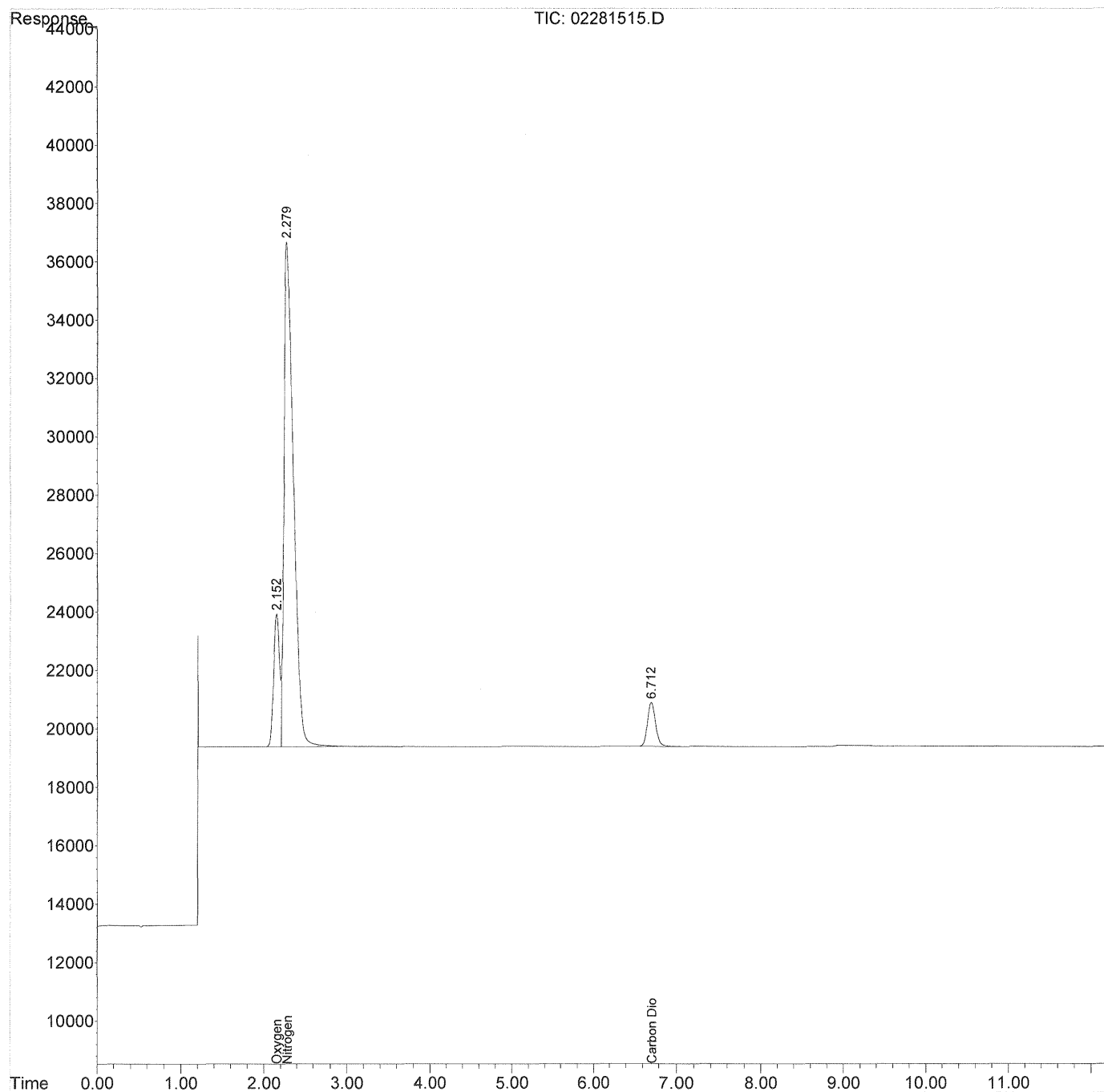
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Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281515.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 6:50 pm
Operator : WH
Sample : 0761-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:37 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281516.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 7:06 pm
Operator : WH
Sample : 0761-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:40 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.136	226809	137248.335 ppm
3) Nitrogen	2.263	1409004	733858.948 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.710	103362	48042.082 ppm

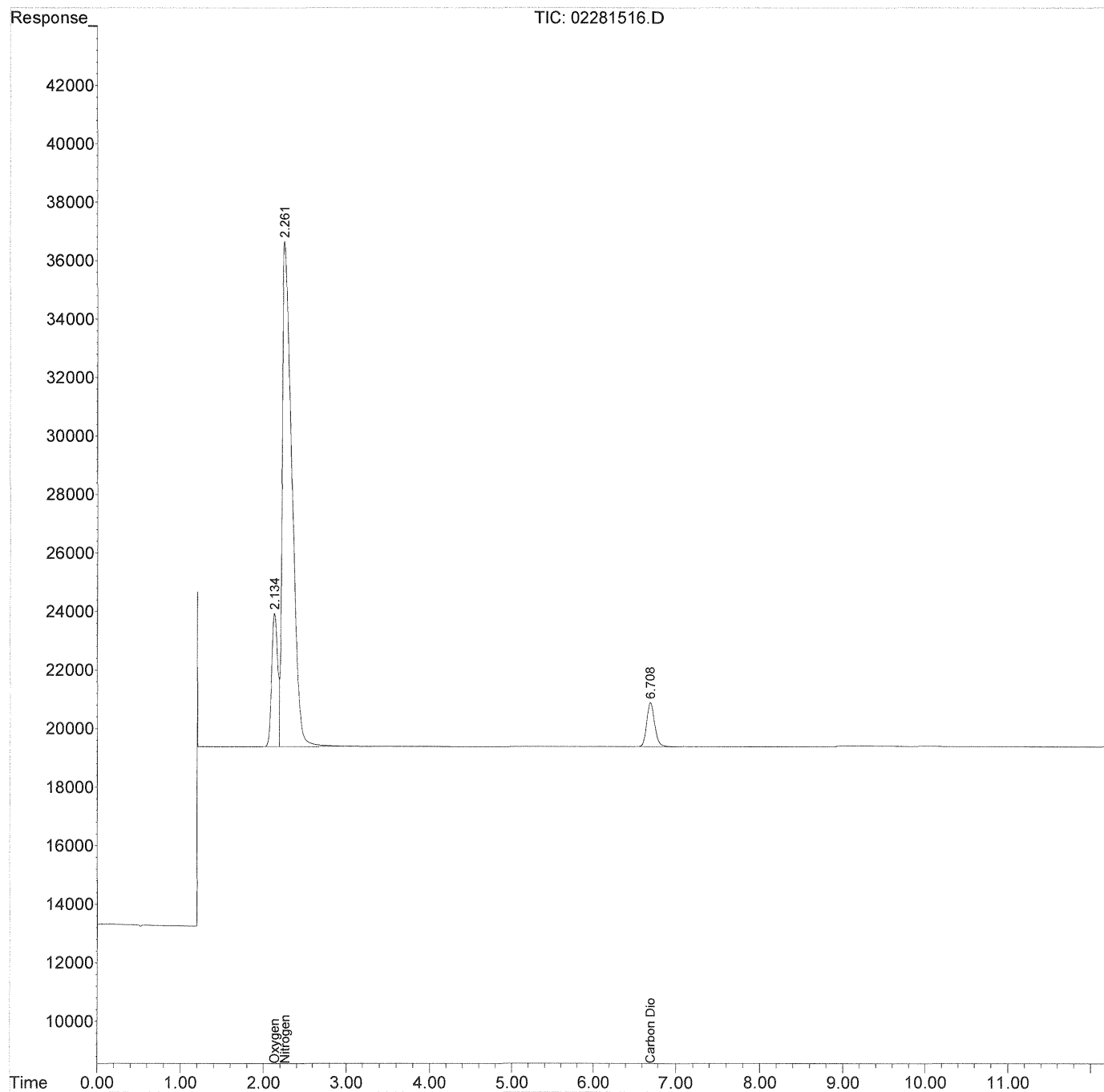
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281516.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 7:06 pm
Operator : WH
Sample : 0761-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:40 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281517.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 7:22 pm
Operator : WH
Sample : 0761-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:43 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.128	227372	137589.018 ppm
3) Nitrogen	2.255	1413719	736314.924 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.707	103893	48288.998 ppm

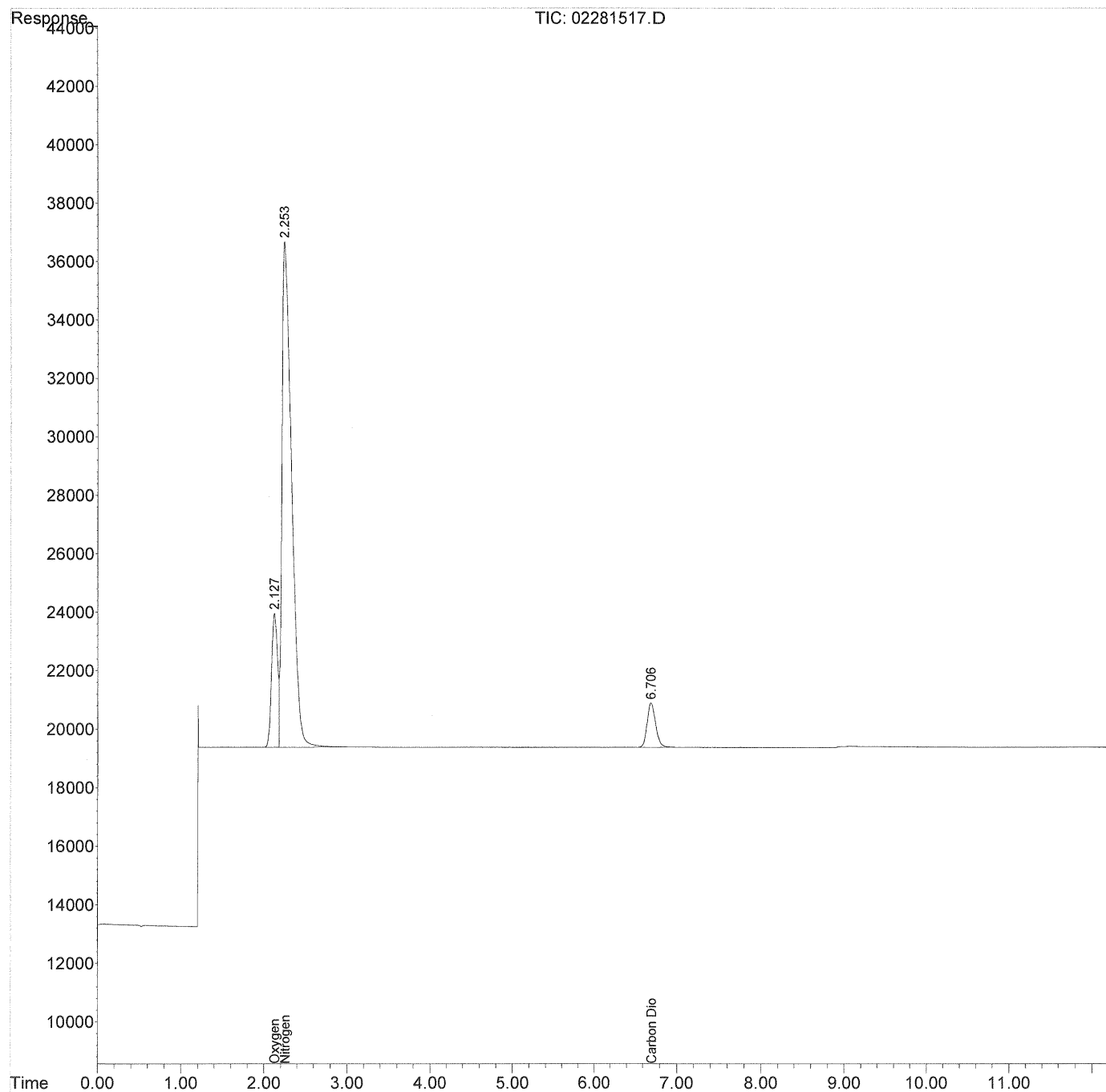
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281517.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 7:22 pm
Operator : WH
Sample : 0761-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:43 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281512.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 5:59 pm
Operator : WH
Sample : 0761-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:28 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.146	238696	144441.473 ppm
3) Nitrogen	2.274	1408241	733461.633 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.712	93526	43470.353 ppm

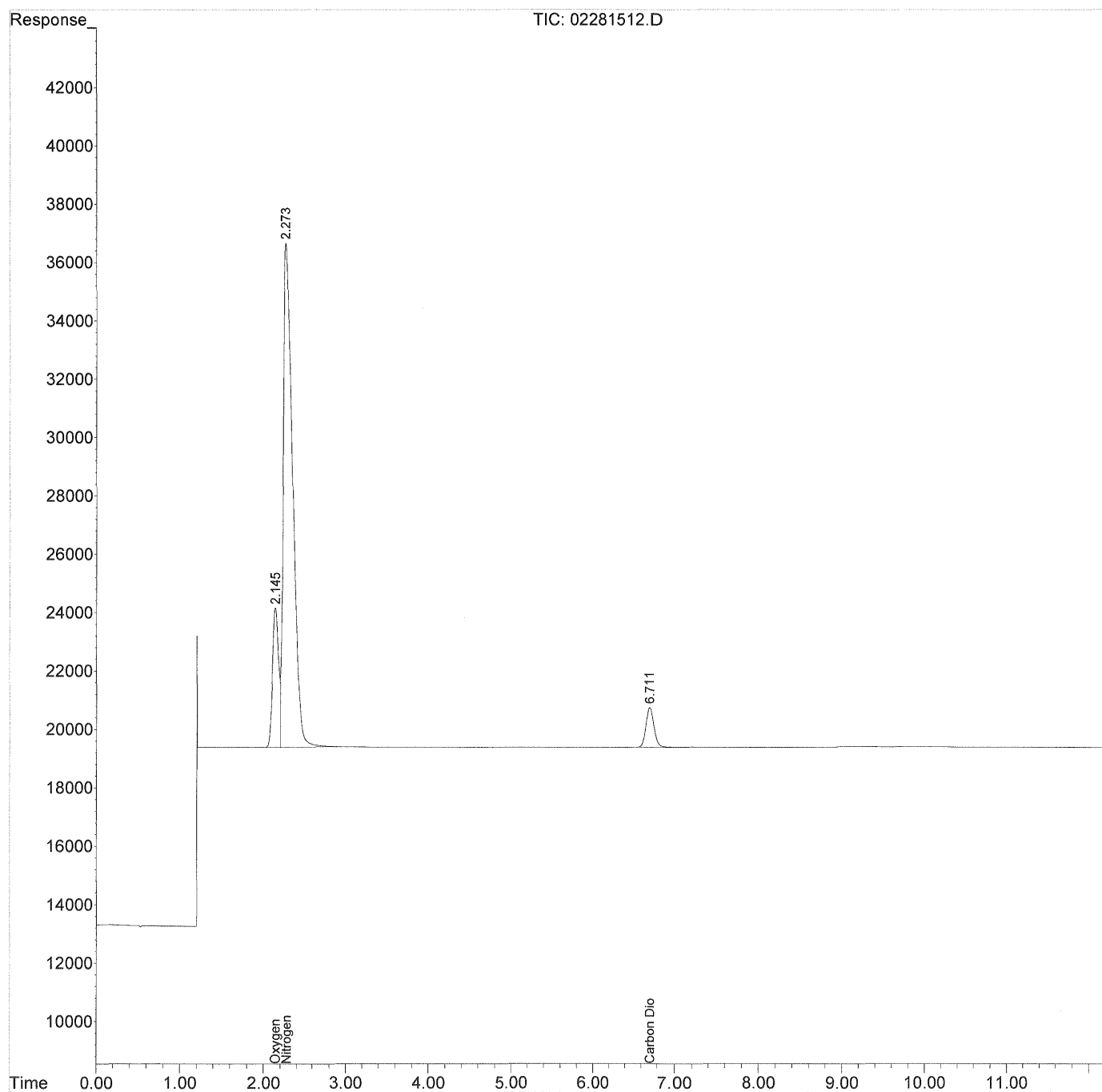
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281512.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 5:59 pm
Operator : WH
Sample : 0761-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:28 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281513.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 6:16 pm
Operator : WH
Sample : 0761-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:31 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.141	239425	144882.704 ppm
3) Nitrogen	2.269	1413155	736021.118 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.711	94100	43737.103 ppm

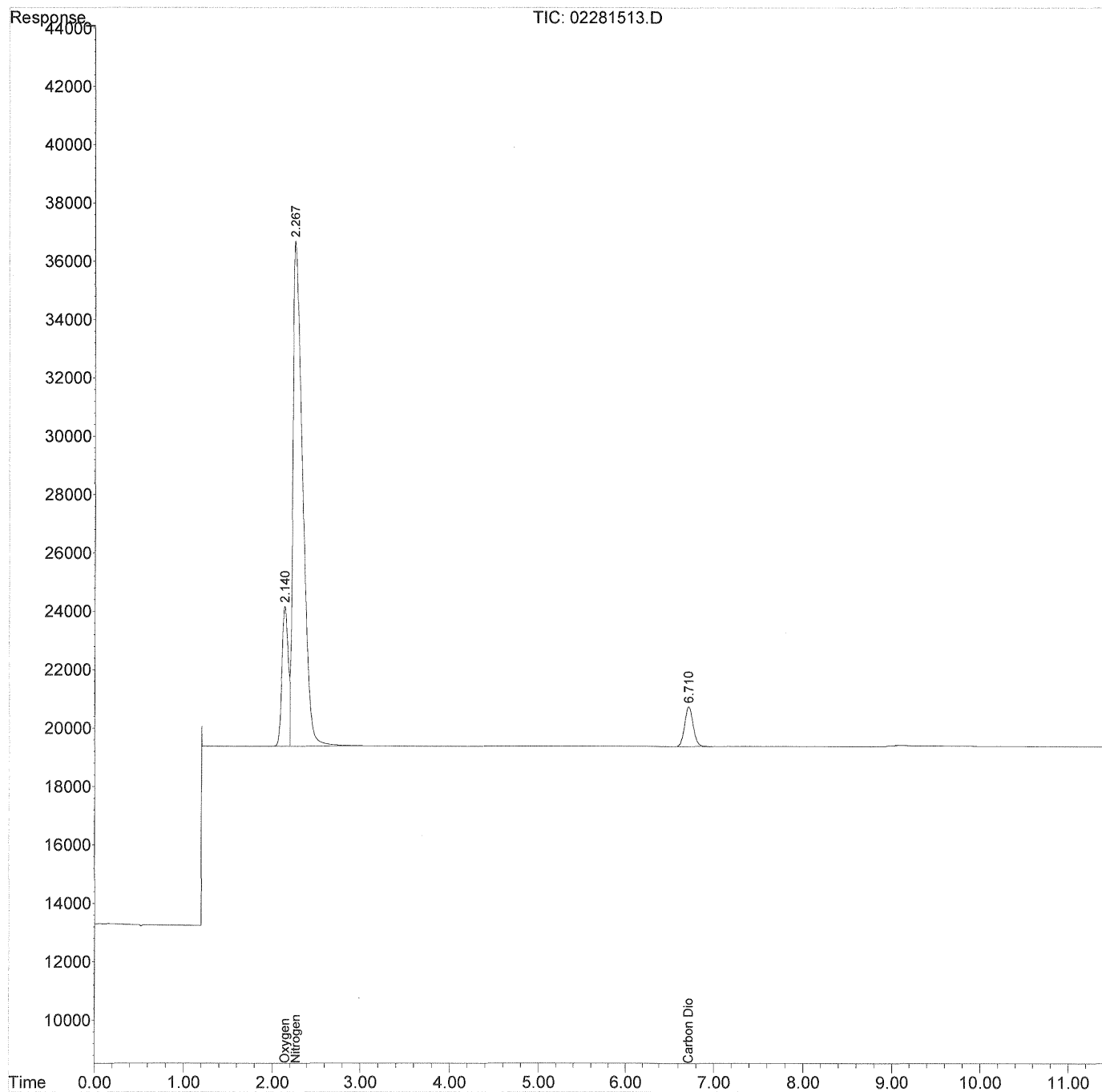
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Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281513.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 6:16 pm
Operator : WH
Sample : 0761-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:31 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281514.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 6:34 pm
Operator : WH
Sample : 0761-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:34 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.154	236515	143121.636 ppm
3) Nitrogen	2.283	1393327	725693.968 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.715	92449	42969.795 ppm

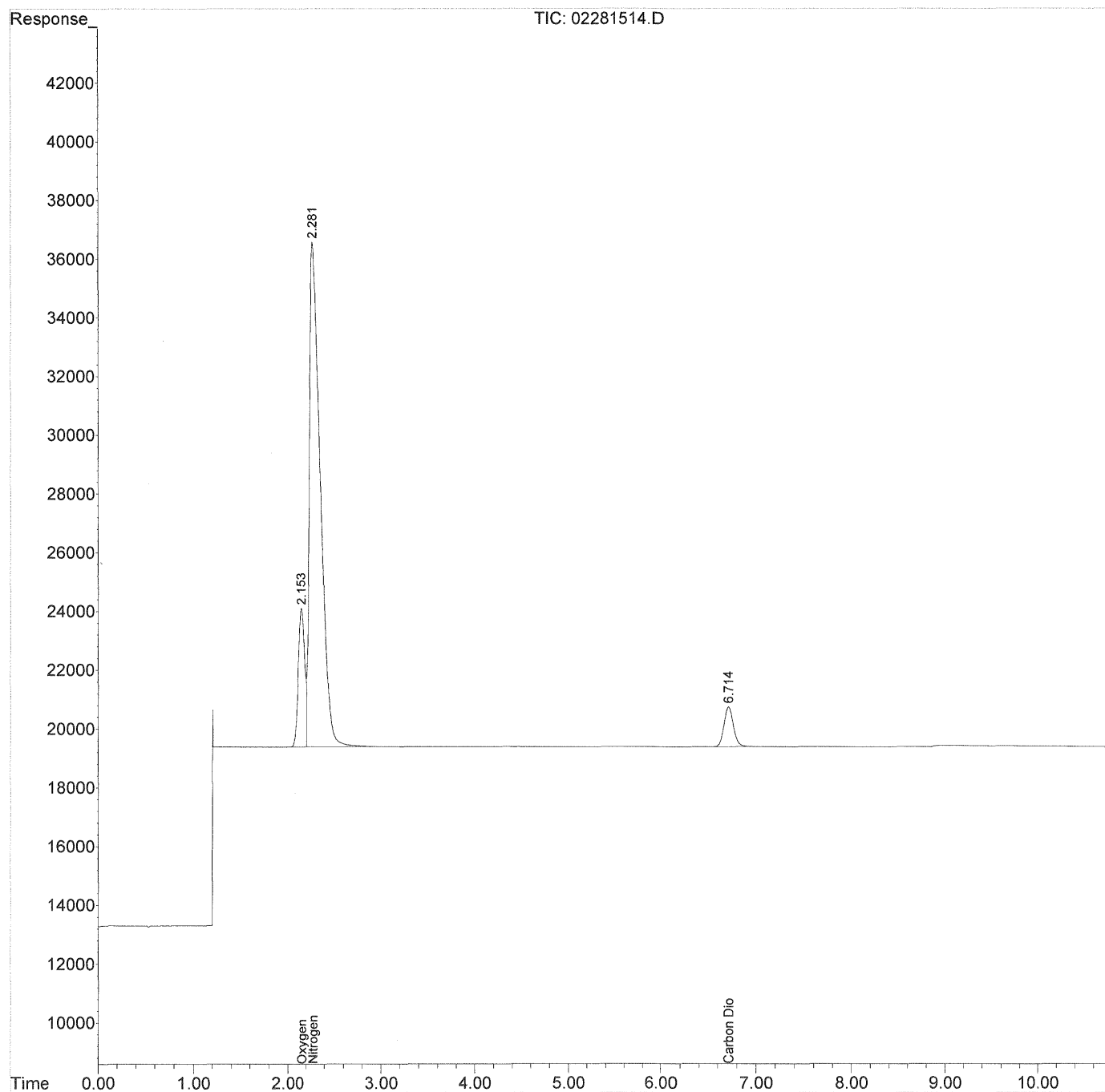
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281514.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 6:34 pm
Operator : WH
Sample : 0761-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:34 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281509.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 5:06 pm
Operator : WH
Sample : 0761-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:17 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.119	215909	130652.330 ppm
3) Nitrogen	2.245	1417590	738330.620 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.705	114445	53193.736 ppm

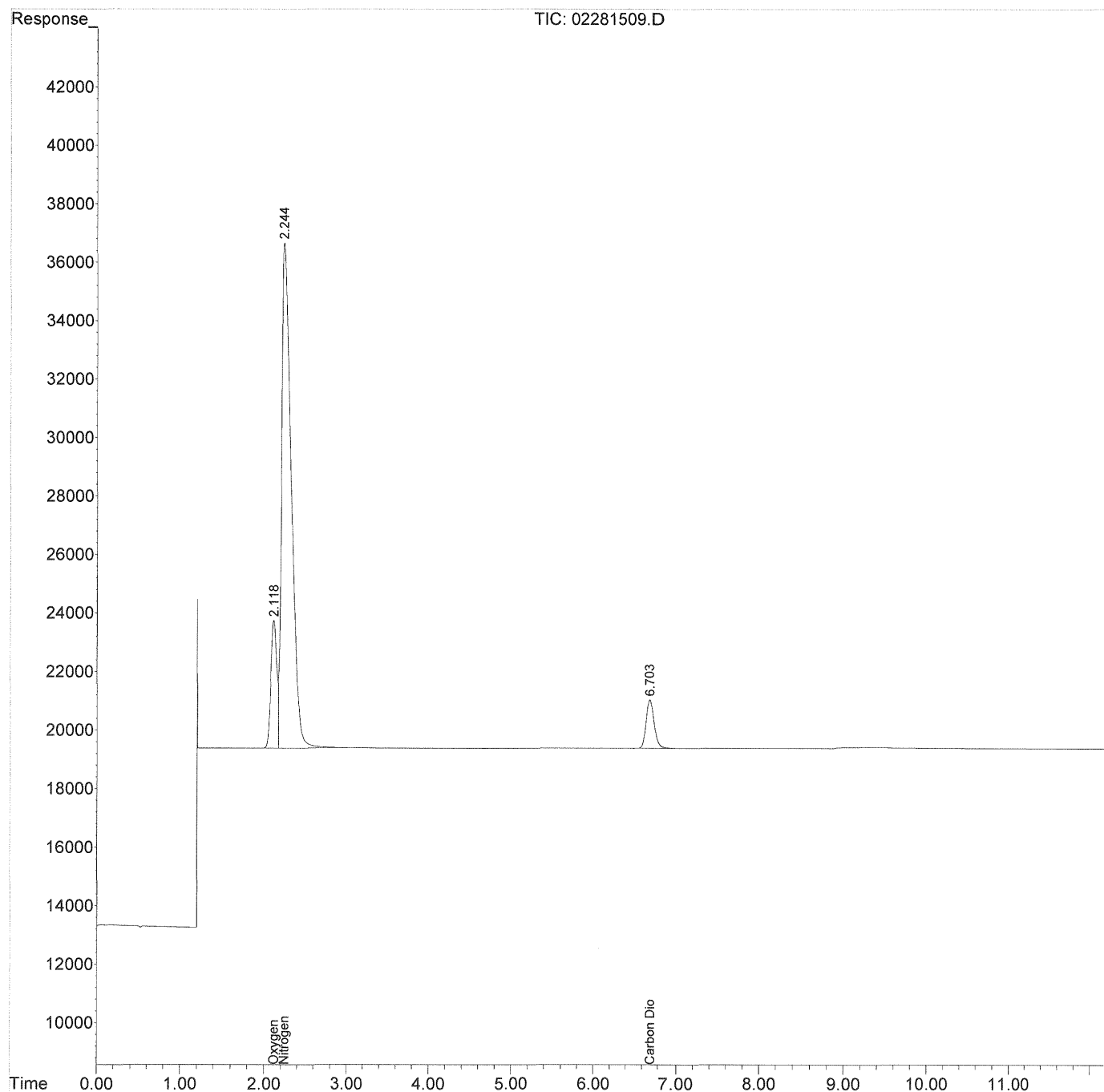
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281509.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 5:06 pm
Operator : WH
Sample : 0761-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:17 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281510.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 5:23 pm
Operator : WH
Sample : 0761-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:21 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.154	214287	129670.549 ppm
3) Nitrogen	2.280	1399486	728901.880 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.713	113456	52733.808 ppm

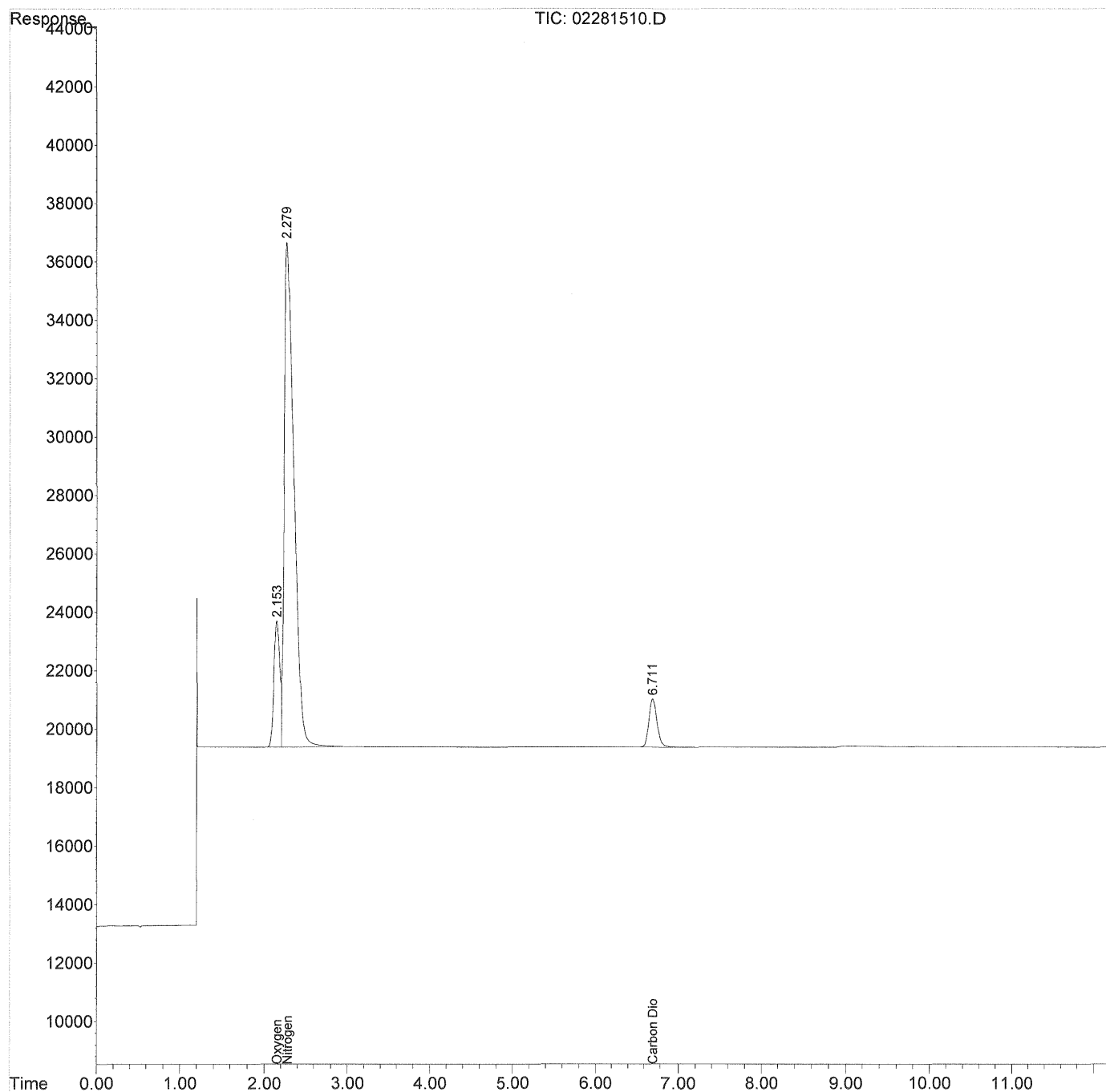
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281510.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 5:23 pm
Operator : WH
Sample : 0761-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:21 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281511.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 5:43 pm
Operator : WH
Sample : 0761-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:25 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.156	214811	129987.667 ppm
3) Nitrogen	2.283	1401053	729717.954 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.714	113364	52691.335 ppm

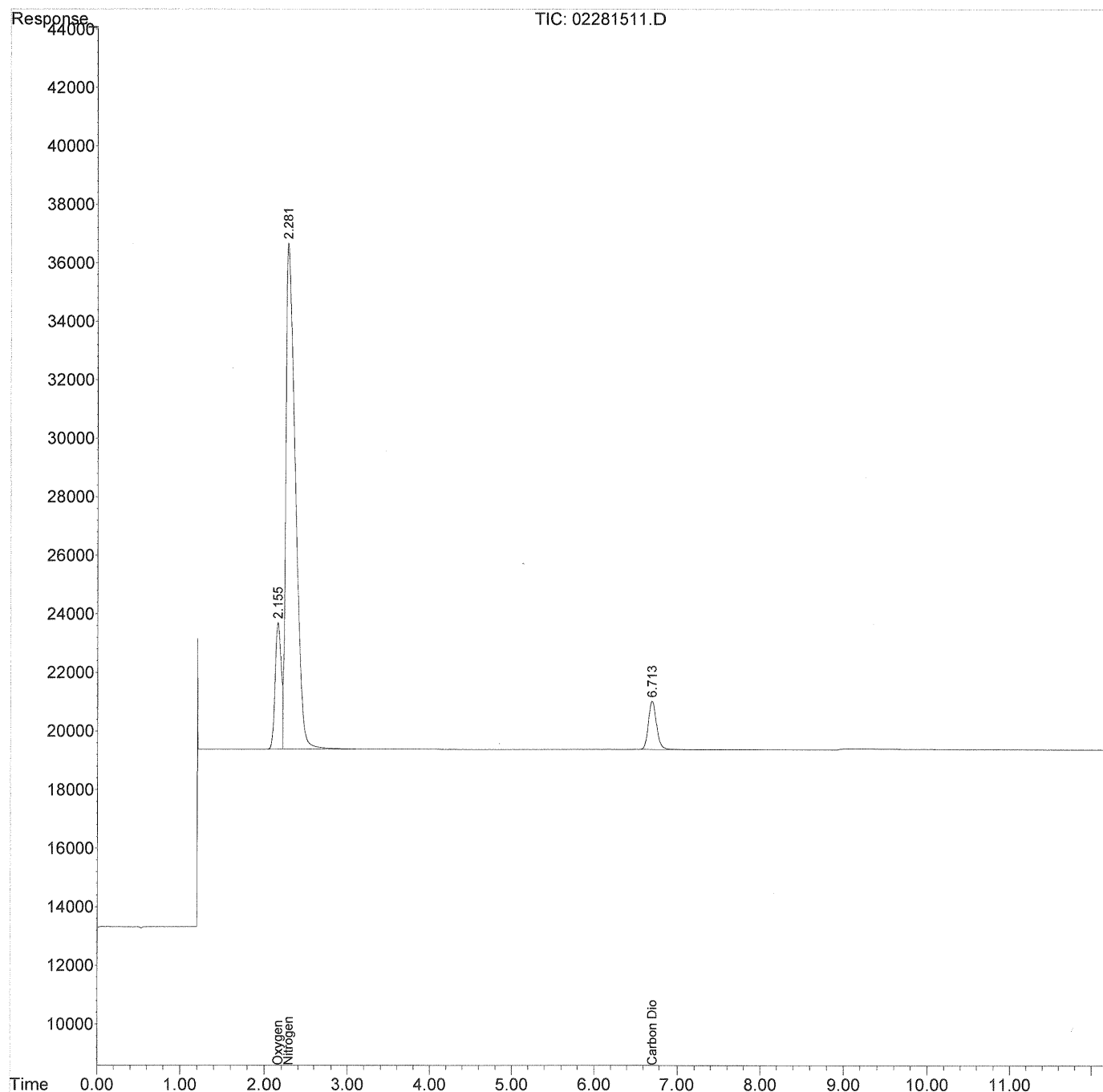
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281511.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 5:43 pm
Operator : WH
Sample : 0761-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:25 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281506.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 4:08 pm
Operator : WH
Sample : 0761-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:08 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.149	219403	132766.820 ppm
3) Nitrogen	2.275	1409007	733860.550 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.709	111277	51721.170 ppm

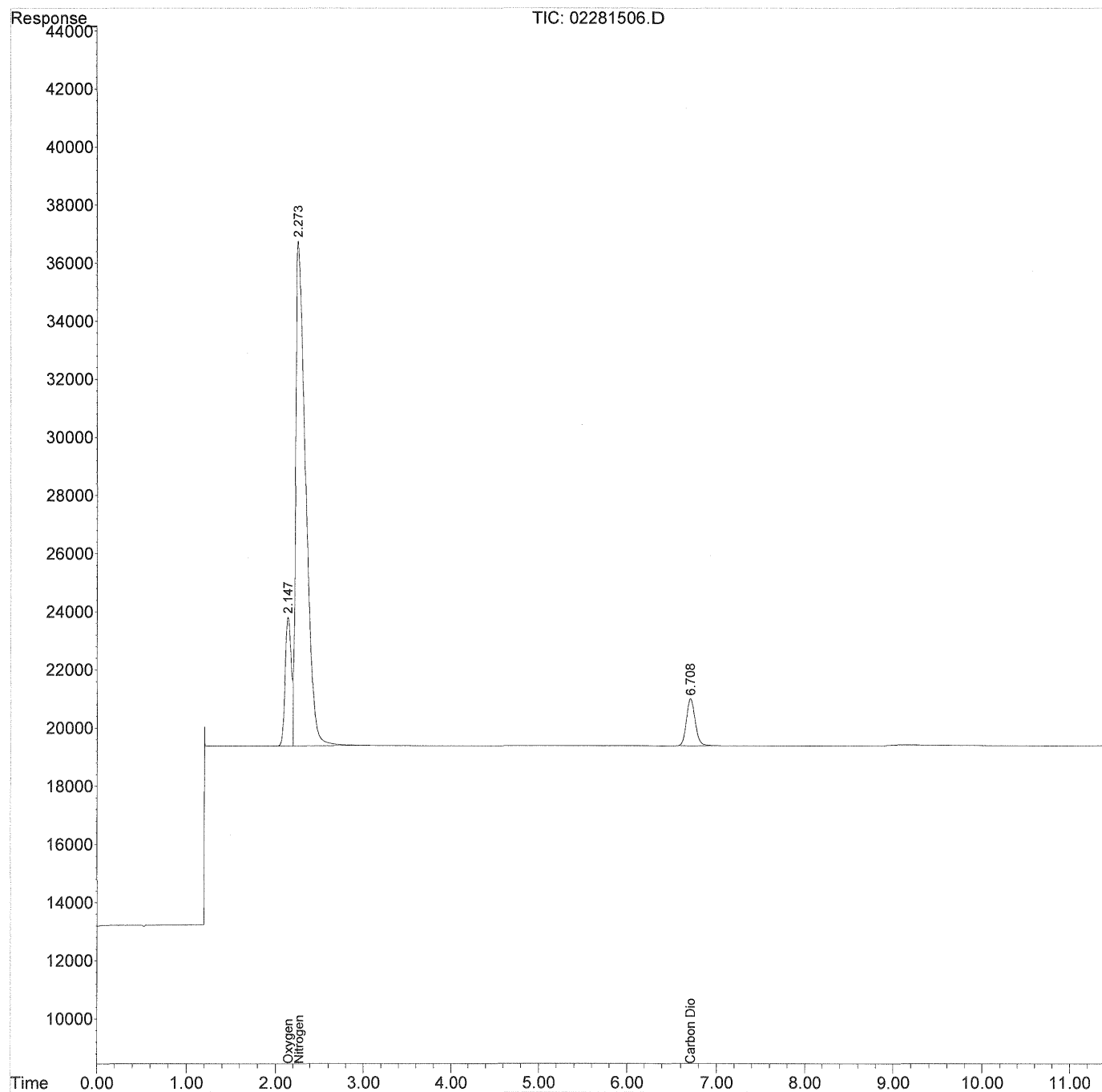
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281506.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 4:08 pm
Operator : WH
Sample : 0761-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:08 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281507.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 4:33 pm
Operator : WH
Sample : 0761-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:11 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.154	218259	132074.519	ppm
3) Nitrogen	2.281	1400449	729403.343	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.714	110425	51325.303	ppm

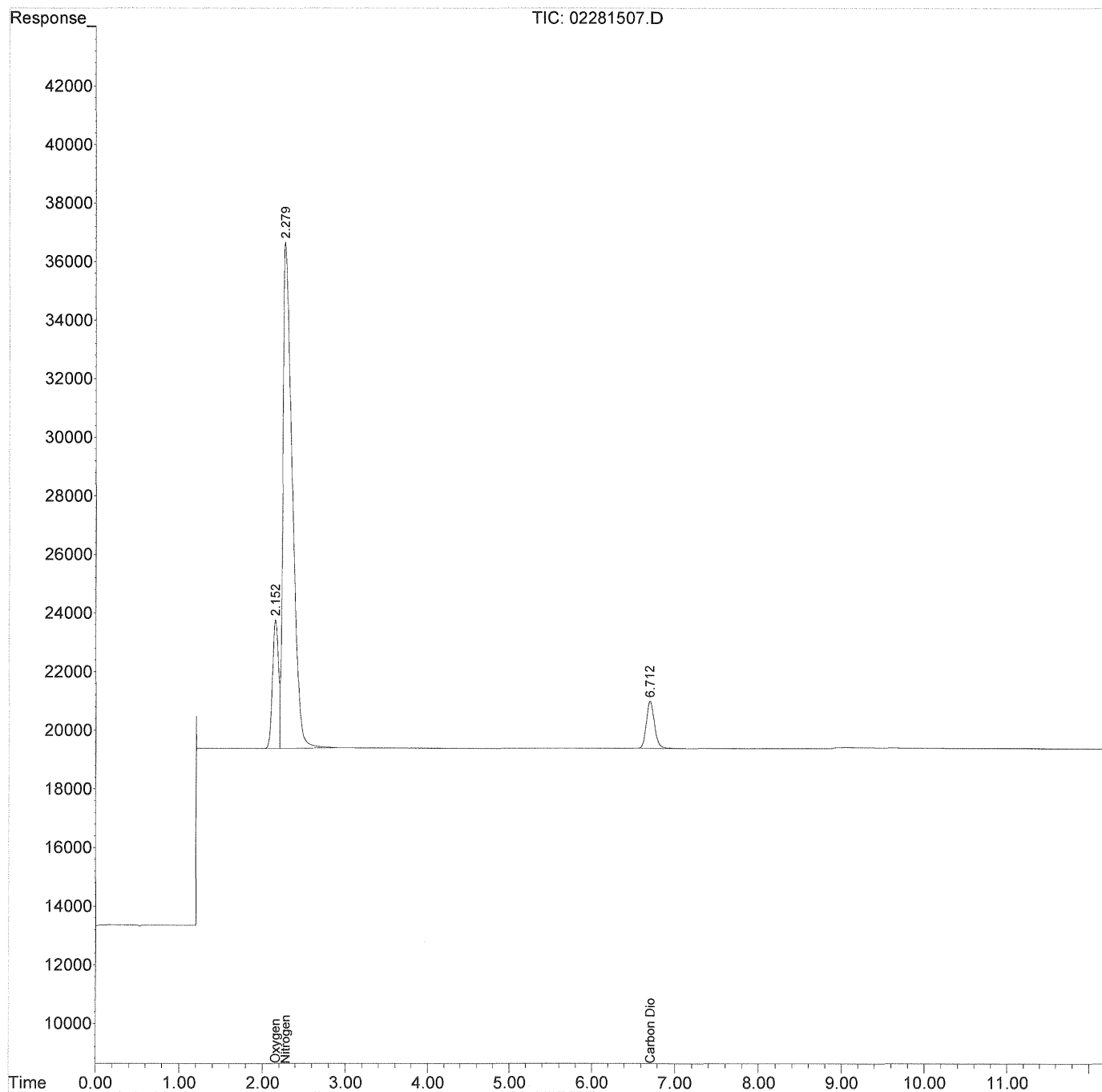
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281507.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 4:33 pm
Operator : WH
Sample : 0761-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:11 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281508.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 4:50 pm
Operator : WH
Sample : 0761-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:14 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.145	220543	133456.564	ppm
3) Nitrogen	2.271	1415529	737257.503	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.710	111696	51915.974	ppm

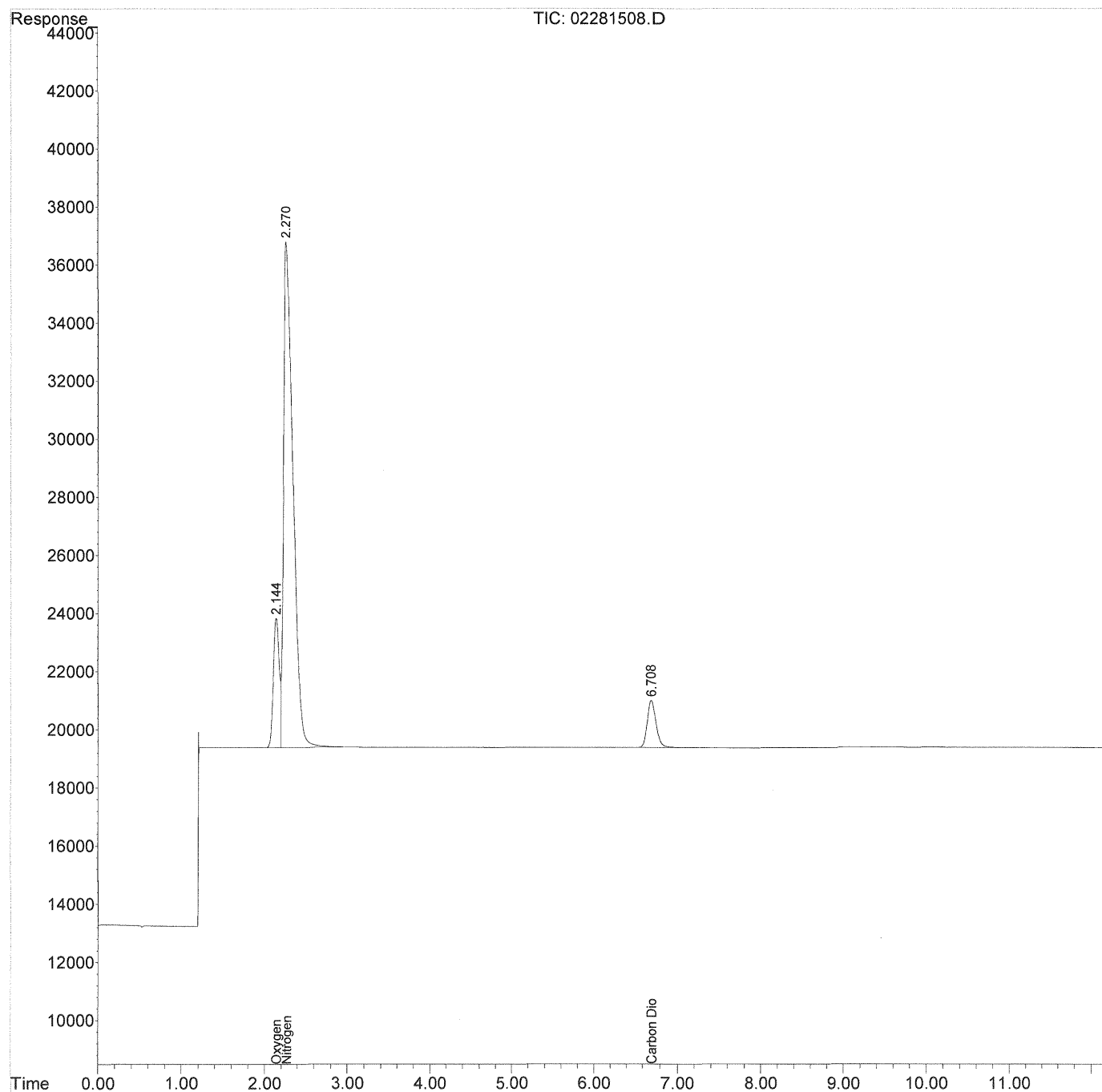
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281508.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 4:50 pm
Operator : WH
Sample : 0761-009
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:14 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281502.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 2:59 pm
Operator : WH
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:02 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	0.000	0	N.D.	ppm
3) Nitrogen	0.000	0	N.D.	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	0.000	0	N.D.	ppm

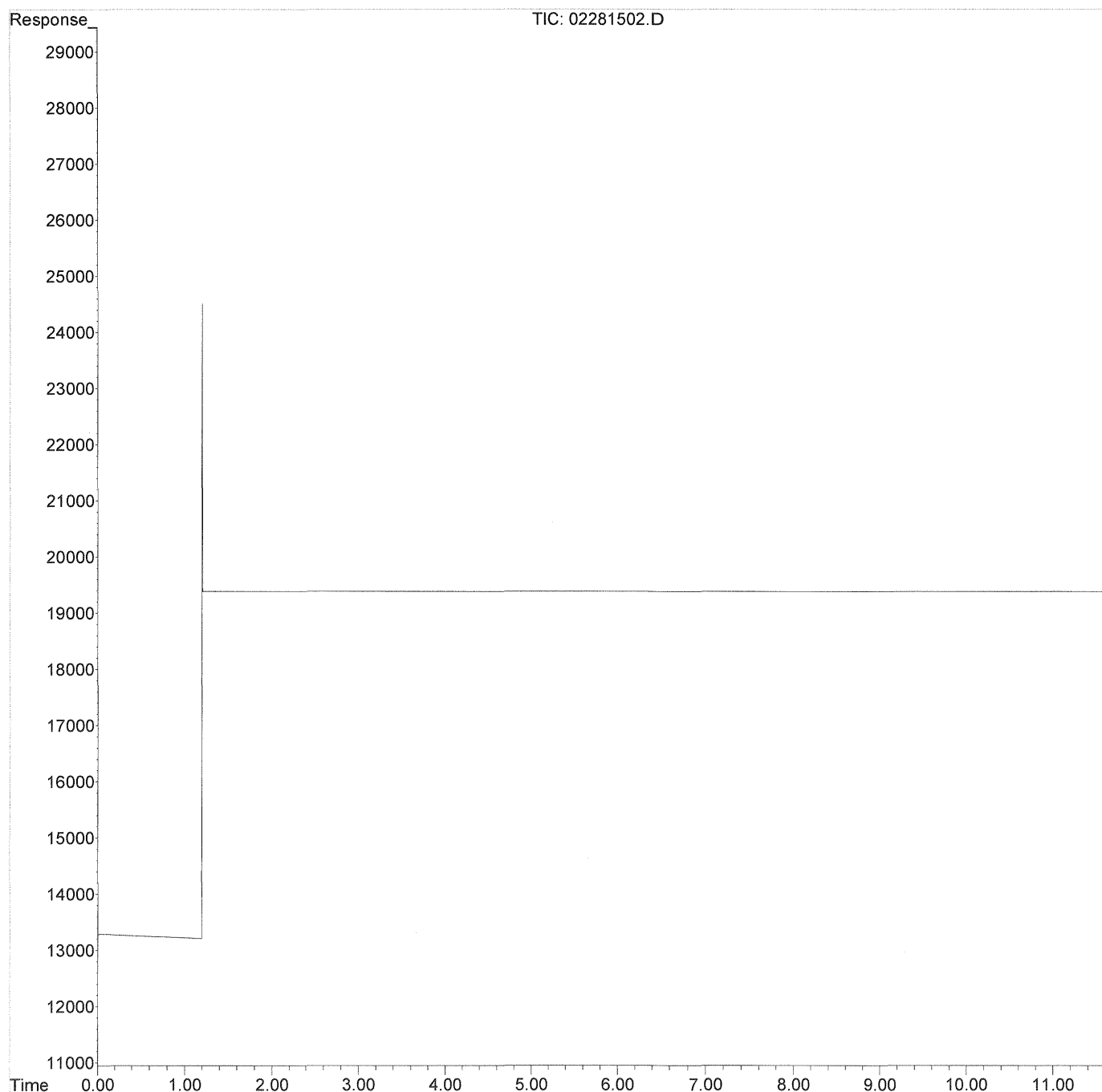
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281502.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 2:59 pm
Operator : WH
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:02 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



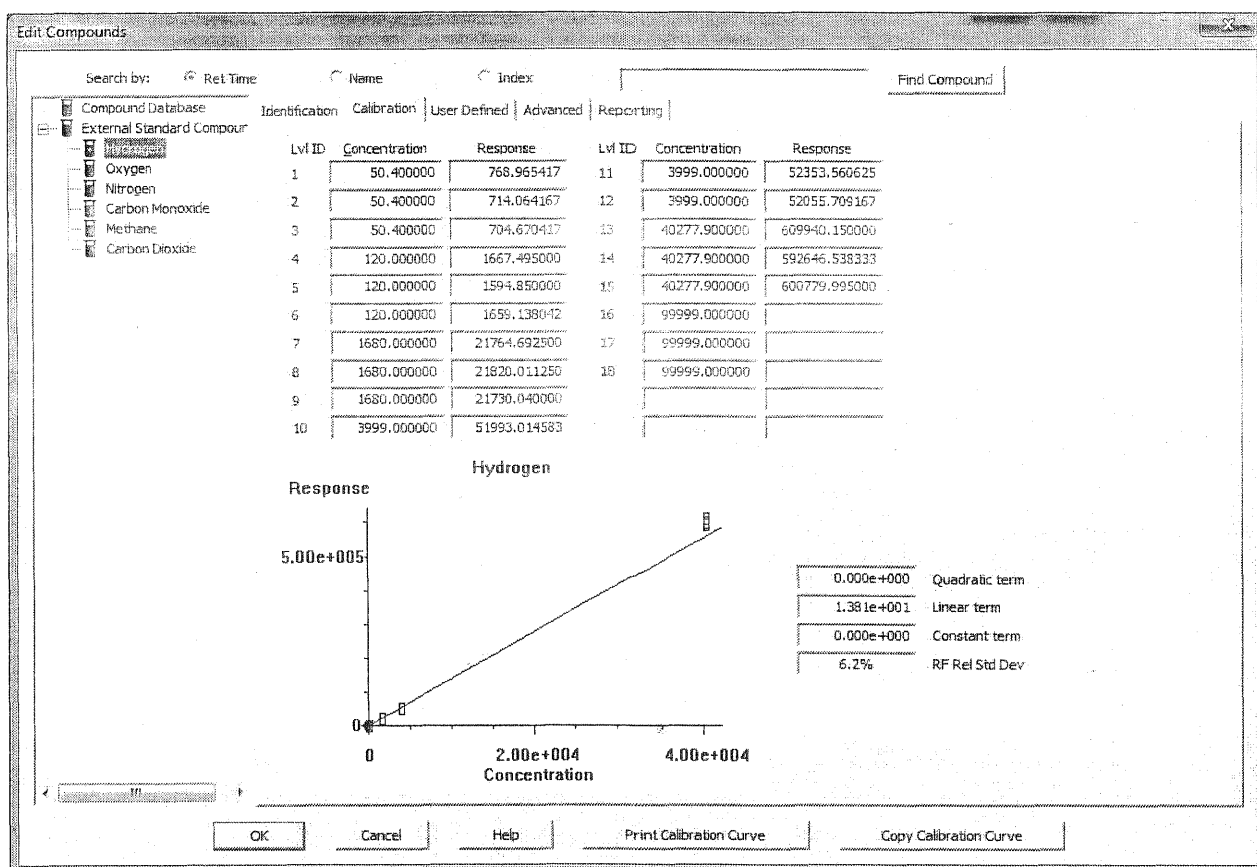
Method Path : J:\GC01\METHODS\
 Method File : TR031014.M
 Title : EPA 3C GC/TCD Analysis for Fixed Gases
 Last Update : Tue Mar 11 11:04:23 2014
 Response Via : Initial Calibration

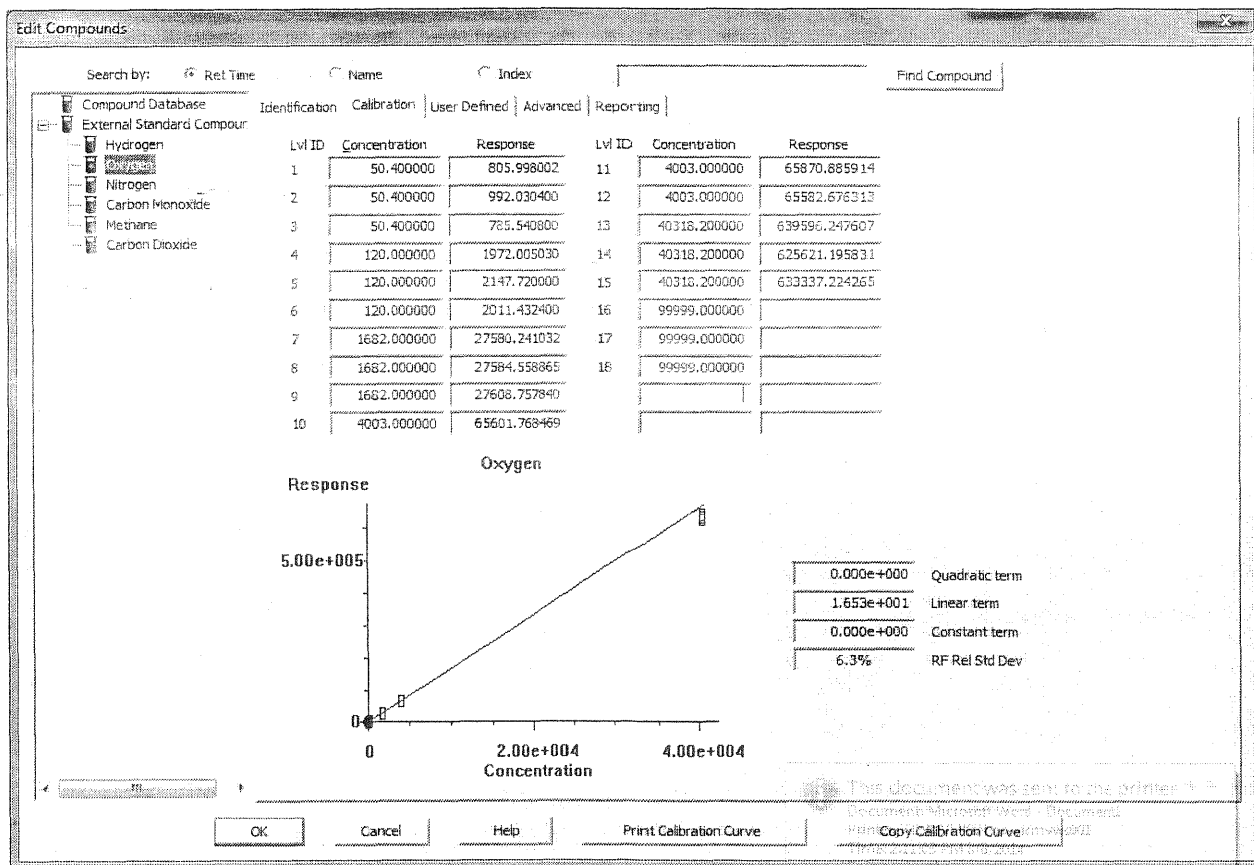
Calibration Files

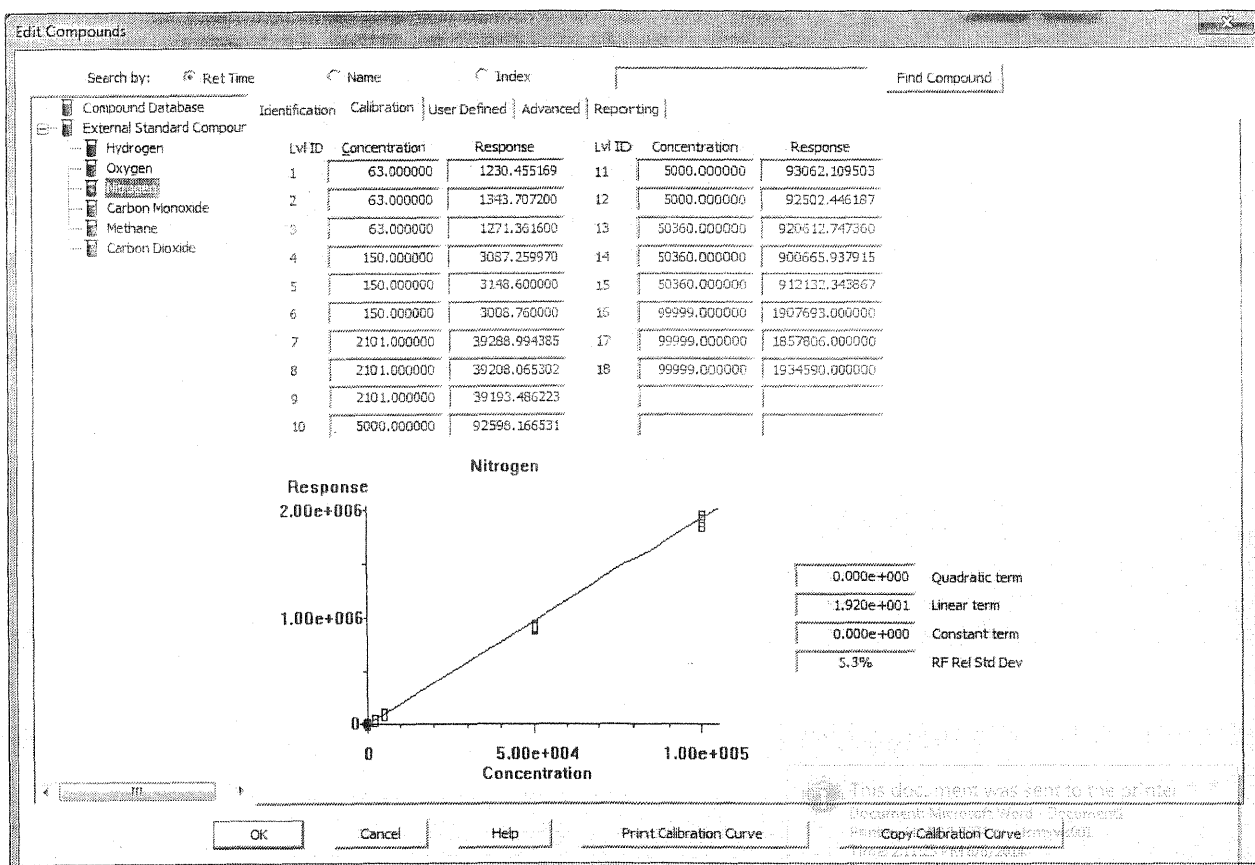
1	=03101403.D	2	=03101404.D	3	=03101405.D
4	=03101406.D	5	=03101407.D	6	=03101408.D

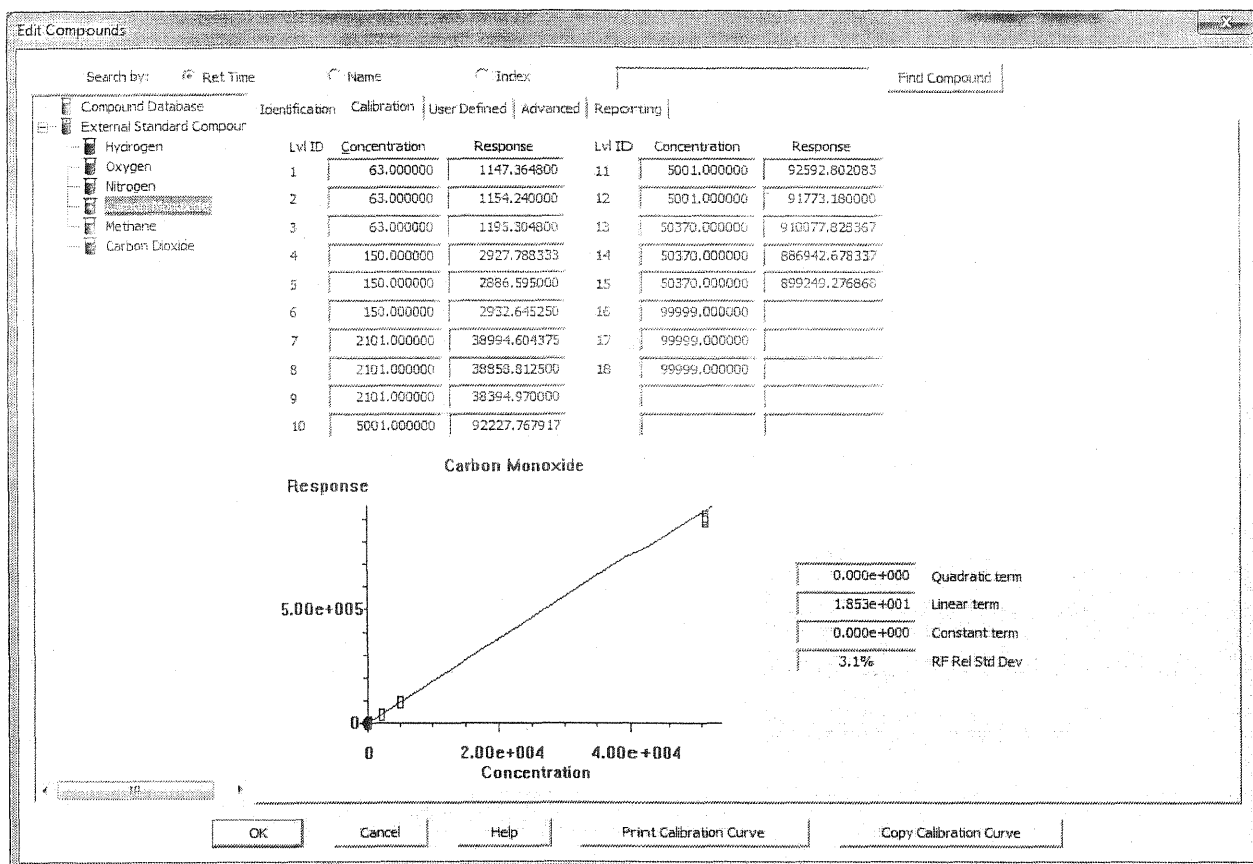
	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Hydrogen	1.526	1.417	1.398	1.390	1.329	1.383	1.381	E1	6.22
2)	Oxygen	1.599	1.968	1.559	1.643	1.790	1.676	1.653	E1	6.33
3)	Nitrogen	1.953	2.133	2.018	2.058	2.099	2.006	1.920	E1	5.33
4)	Carbon Monoxide	1.821	1.832	1.897	1.952	1.924	1.955	1.853	E1	3.06
5)	Methane	1.435	1.340	1.378	1.499	1.440	1.406	1.396	E1	3.12
6)	Carbon Dioxide	2.233	2.138	2.113	2.234	2.287	2.291	2.151	E1	3.66

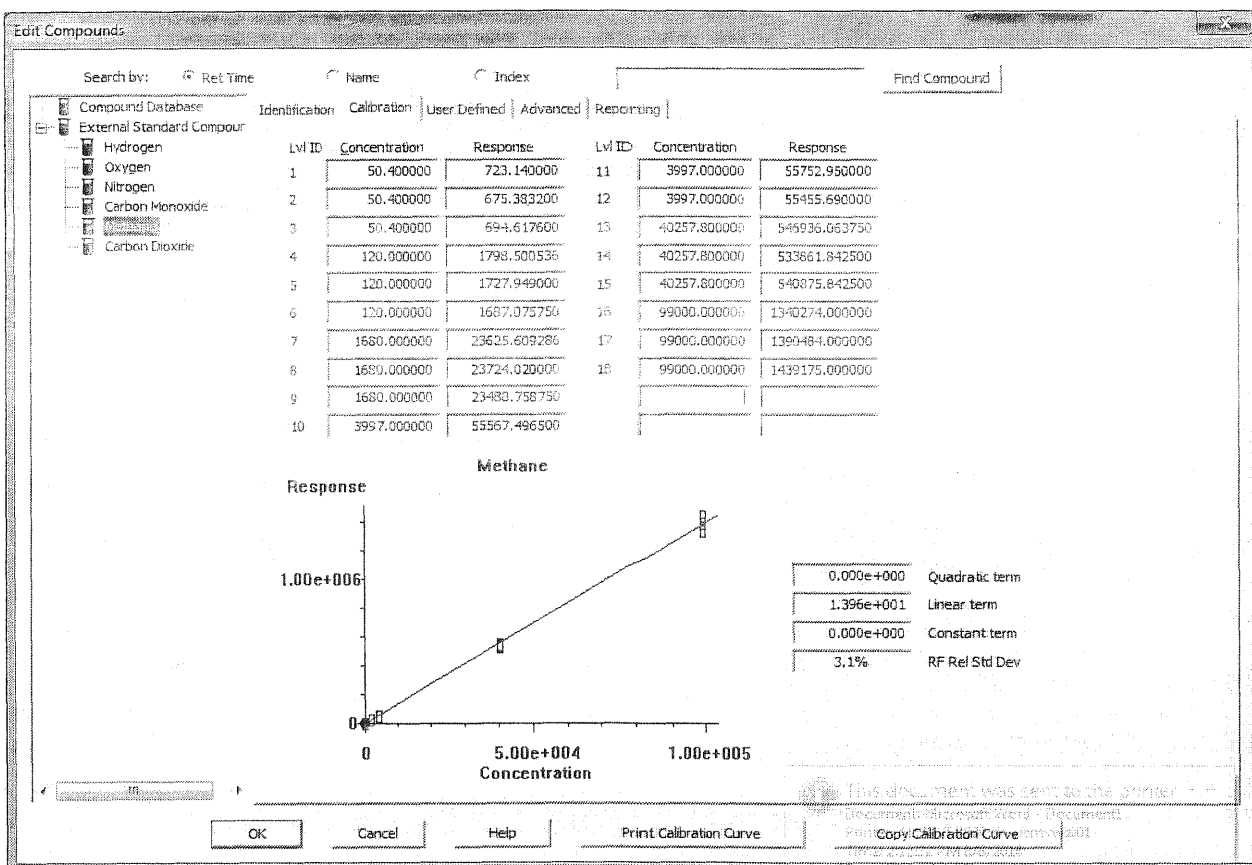
(#) = Out of Range ### Number of calibration levels exceeded format ###

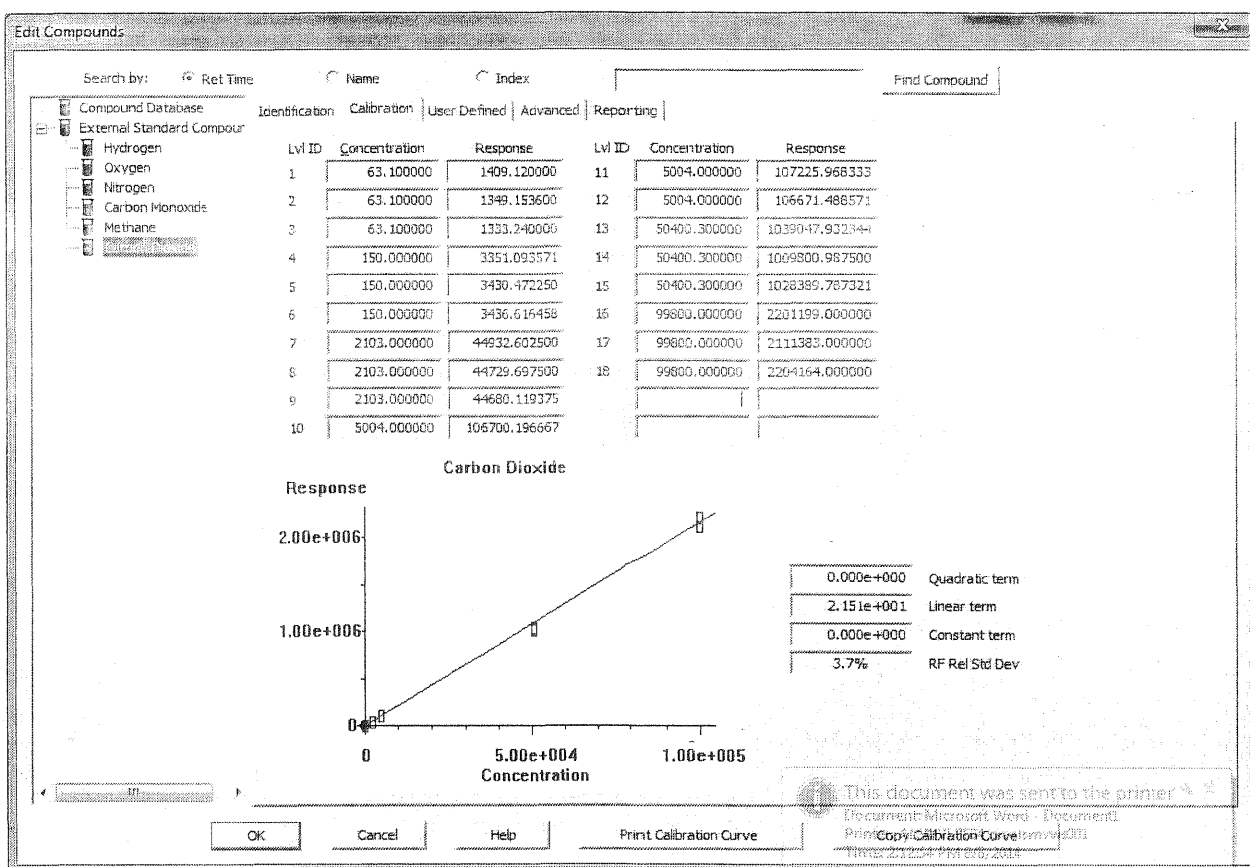








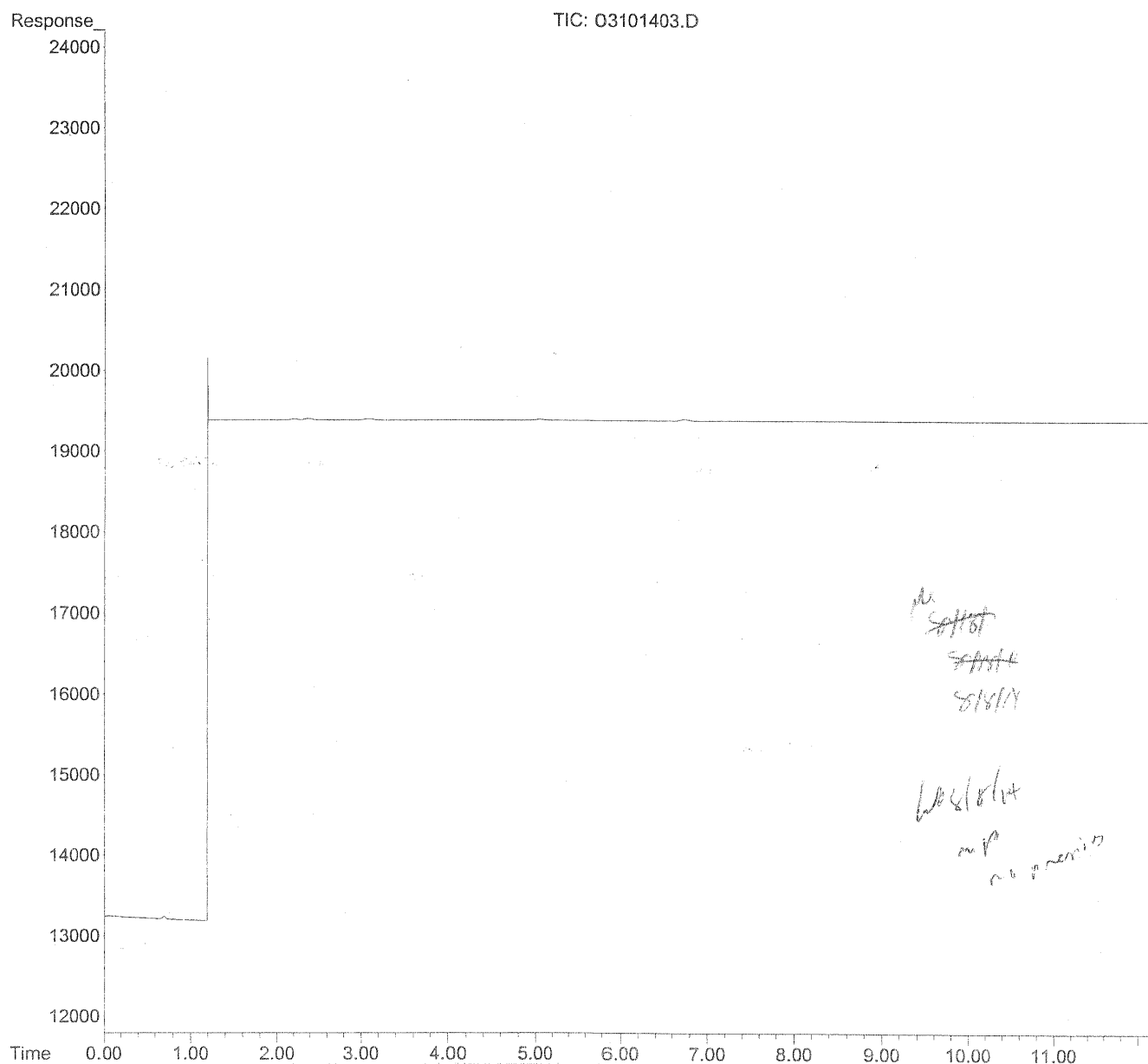




Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101403.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 10:59
Operator : WH
Sample : std 1 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:13:11 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:11:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101403.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 10:59
Operator : WH
Sample : std 1 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:13:11 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:11:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.700	769	NoCal	ppm
2) Oxygen	2.227	806	NoCal	ppm m
3) Nitrogen	2.393	1230	NoCal	ppm m
4) Carbon Monoxide	3.092	1147	NoCal	ppm m
5) Methane	5.085	723	NoCal	ppm m
6) Carbon Dioxide	6.748	1409	NoCal	ppm m

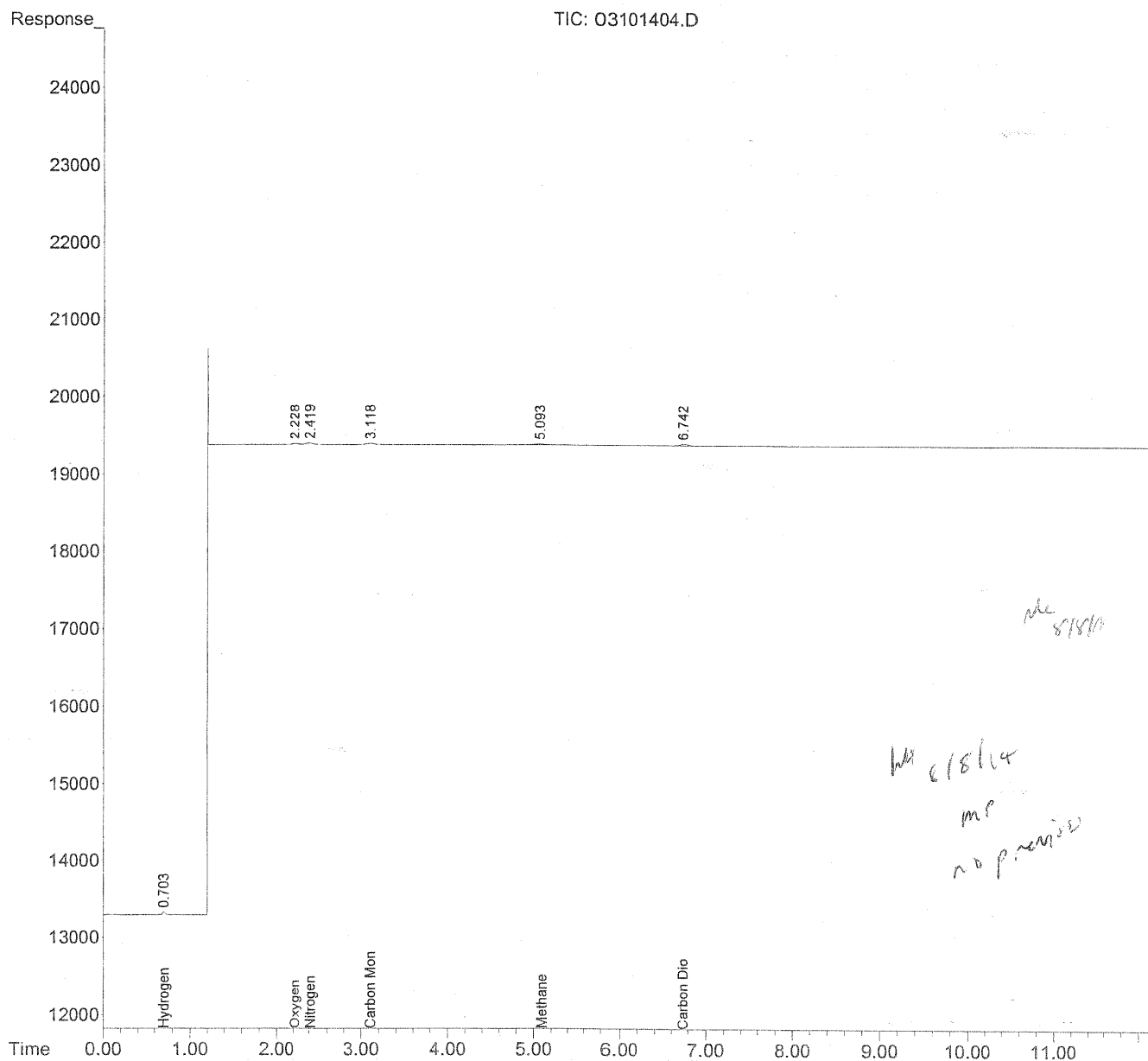
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101404.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:29
Operator : WH
Sample : std 1 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:56:49 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:13:33 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101404.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 11:29
 Operator : WH
 Sample : std 1 2
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 14:56:49 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 13:13:33 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.704	714	468.016	ppm
2) Oxygen	2.228	992	620.328	ppm m
3) Nitrogen	2.419	1344	687.986	ppm m
4) Carbon Monoxide	3.118	1154	633.775	ppm m
5) Methane	5.093	675	470.715	ppm m
6) Carbon Dioxide	6.742	1349	604.147	ppm m

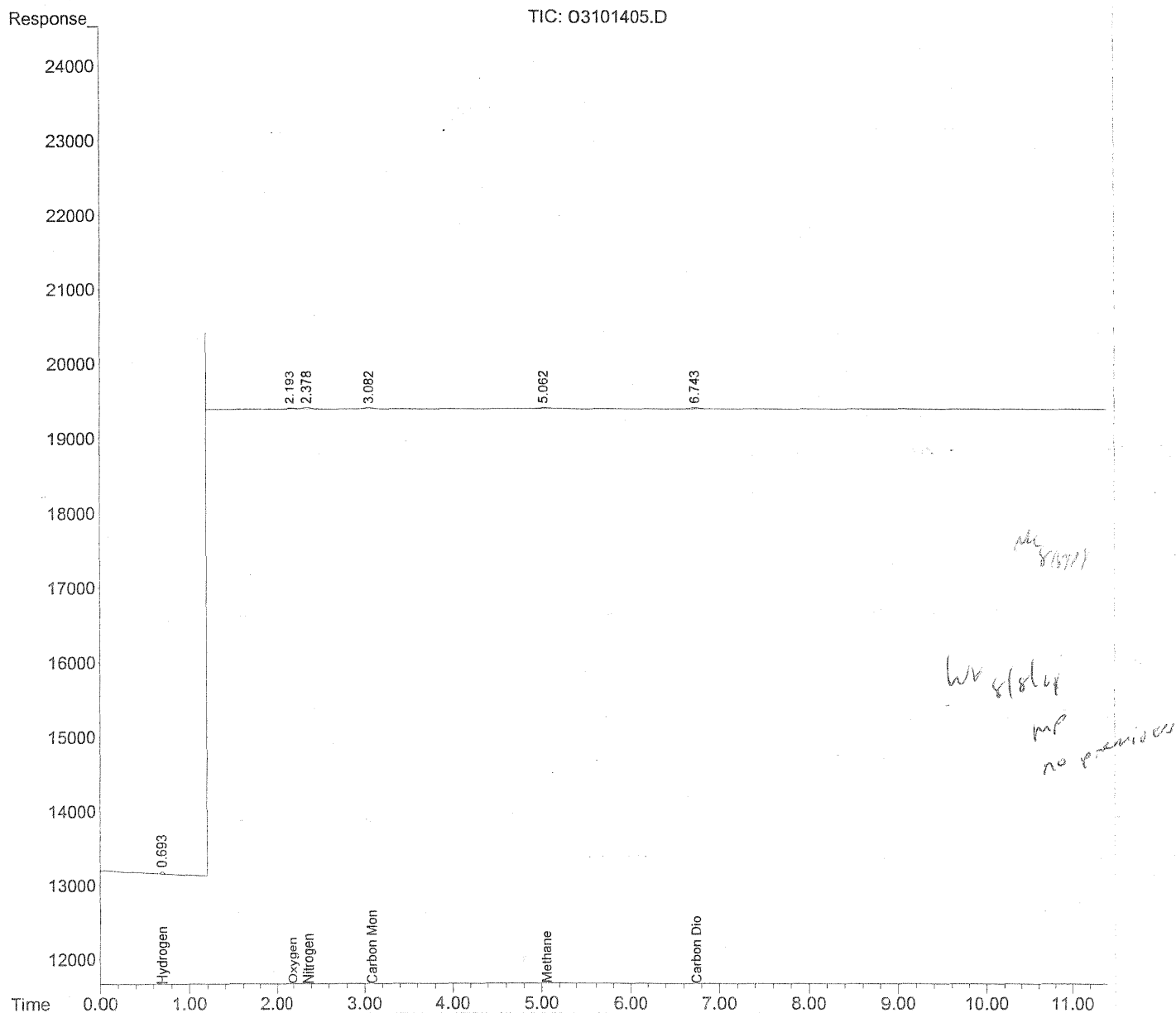
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101405.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 11:44
 Operator : WH
 Sample : std 1 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 13:16:20 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 13:15:04 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101405.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 11:44
 Operator : WH
 Sample : std 1 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 13:16:20 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 13:15:04 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.695	705	478.957	ppm
2) Oxygen	2.193	786	440.385	ppm m
3) Nitrogen	2.378	1271	592.487	ppm m
4) Carbon Monoxide	3.082	1195	654.363	ppm m
5) Methane	5.062	695	500.653	ppm m
6) Carbon Dioxide	6.743	1333	610.001	ppm m

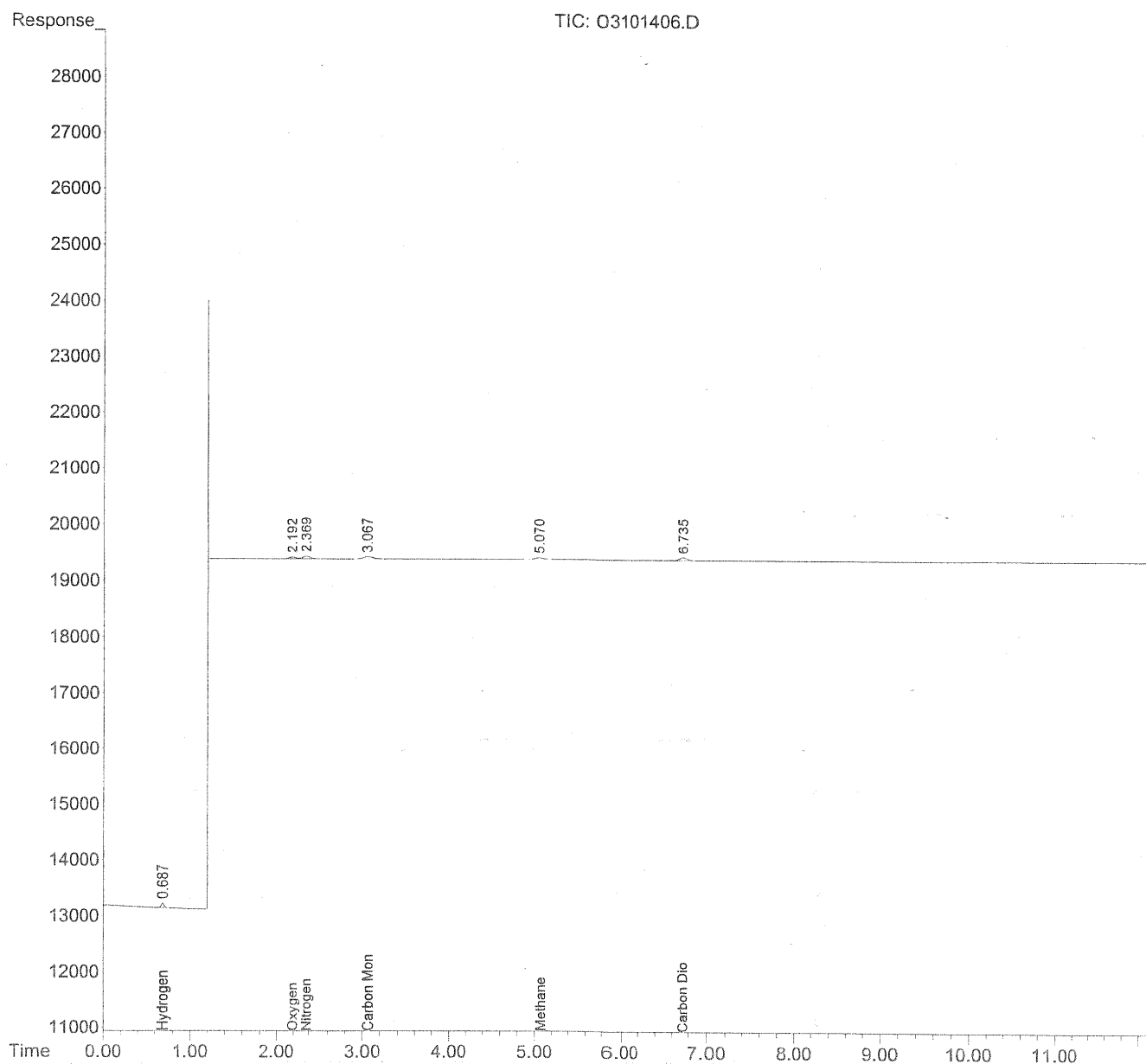
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101406.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:59
Operator : WH
Sample : std 2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:16:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101406.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:59
Operator : WH
Sample : std 2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:16:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.688	1667	1152.467 ppm
2) Oxygen	2.195	1972	1154.090 ppm
3) Nitrogen	2.367	3087	1467.876 ppm
4) Carbon Monoxide	3.067	2928	1582.403 ppm
5) Methane	5.070	1799	1299.164 ppm
6) Carbon Dioxide	6.738	3351	1550.434 ppm

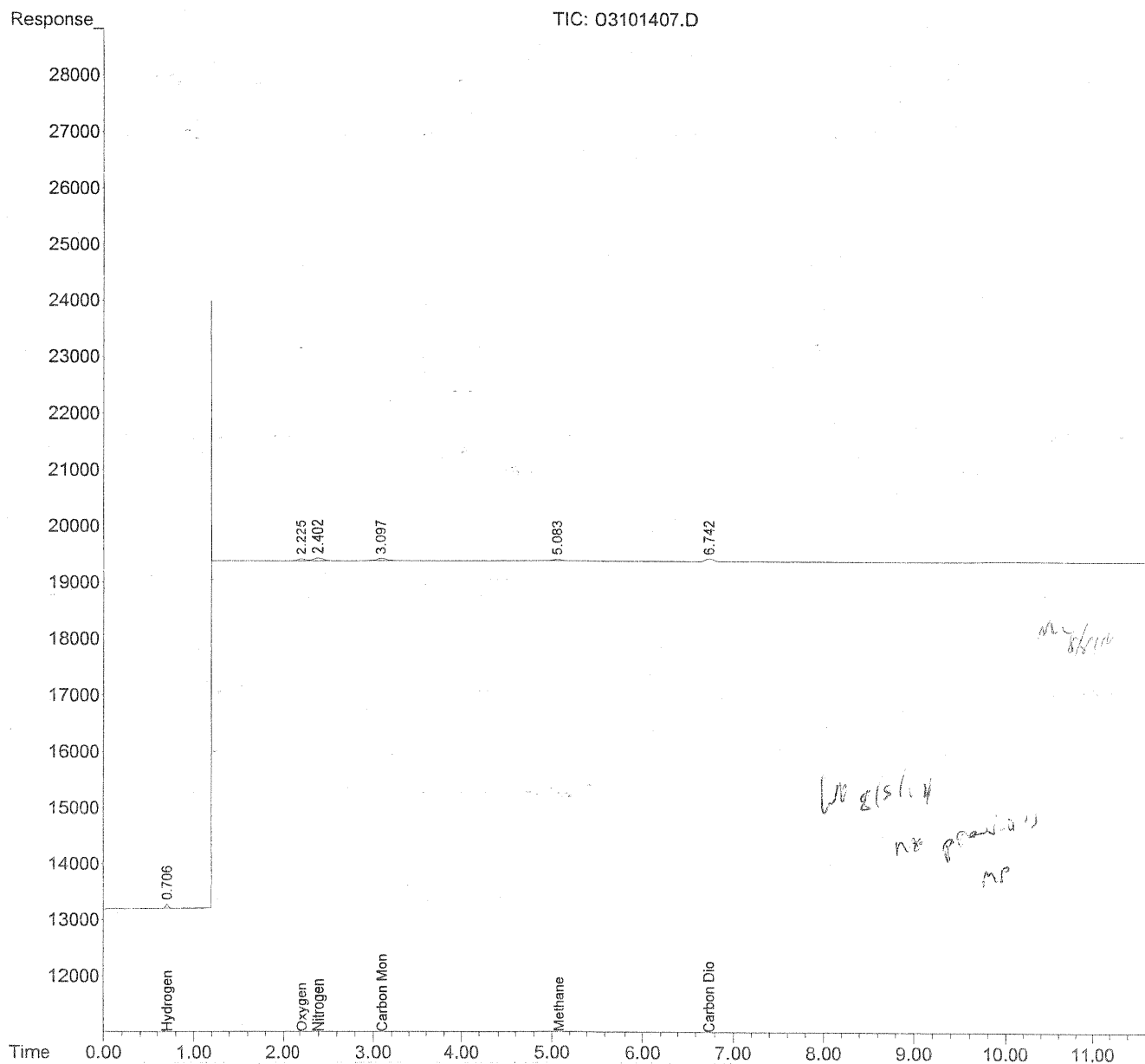
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101407.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:18
Operator : WH
Sample : std 2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:18:19 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:17:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101407.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:18
Operator : WH
Sample : std 2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:18:19 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:17:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.708	1595	1113.284	ppm
2) Oxygen	2.225	2148	1269.063	ppm m
3) Nitrogen	2.402	3149	1505.099	ppm m
4) Carbon Monoxide	3.106	2887	1539.002	ppm
5) Methane	5.082	1728	1222.935	ppm
6) Carbon Dioxide	6.744	3430	1573.930	ppm

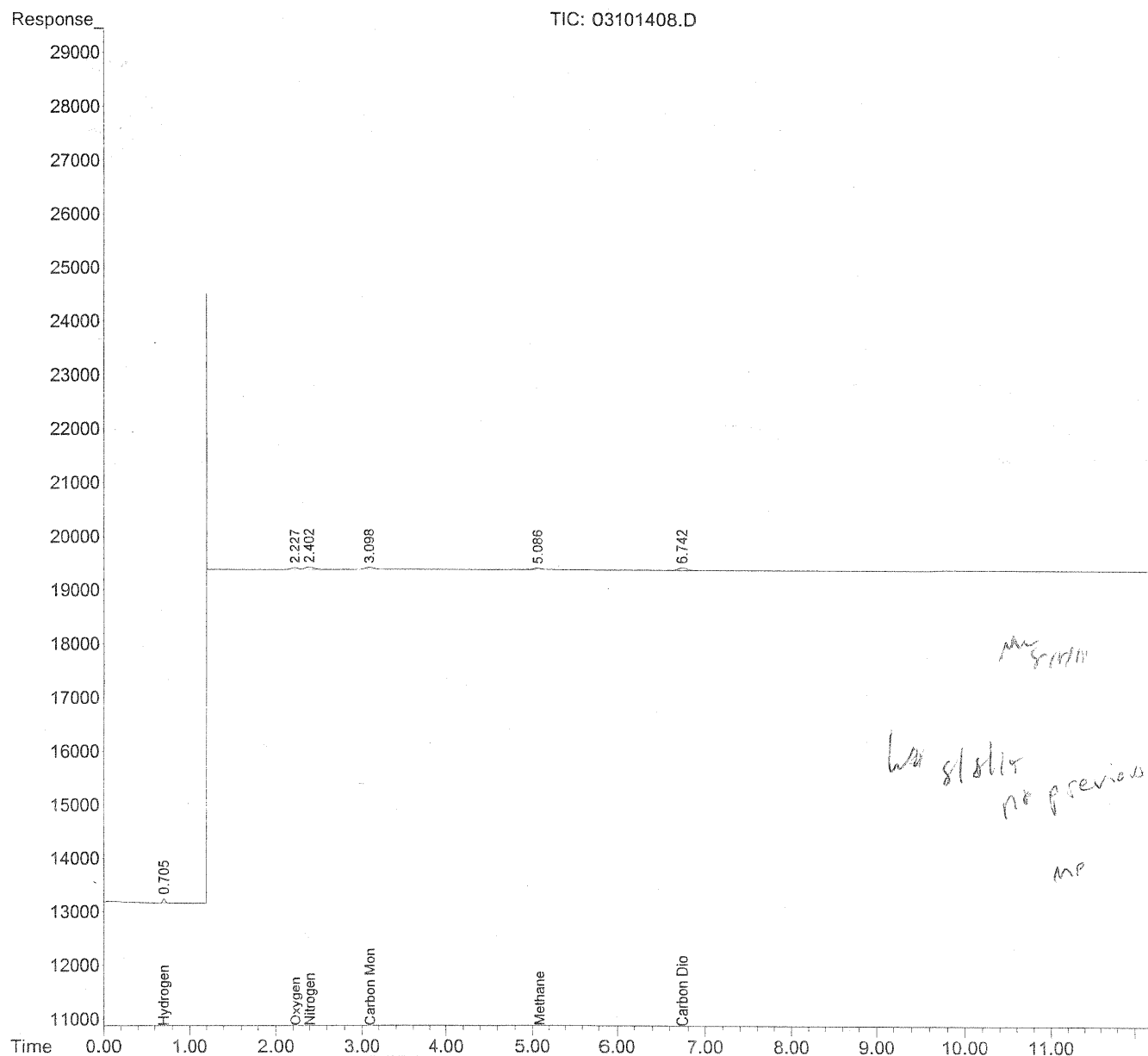
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101408.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:34
Operator : WH
Sample : std 2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:19:15 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:18:37 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101408.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:34
Operator : WH
Sample : std 2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:19:15 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:18:37 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.707	1659	1175.144	ppm
2) Oxygen	2.227	2011	1175.007	ppm m
3) Nitrogen	2.402	3009	1437.275	ppm m
4) Carbon Monoxide	3.103	2933	1555.465	ppm
5) Methane	5.087	1687	1189.461	ppm
6) Carbon Dioxide	6.745	3437	1561.358	ppm

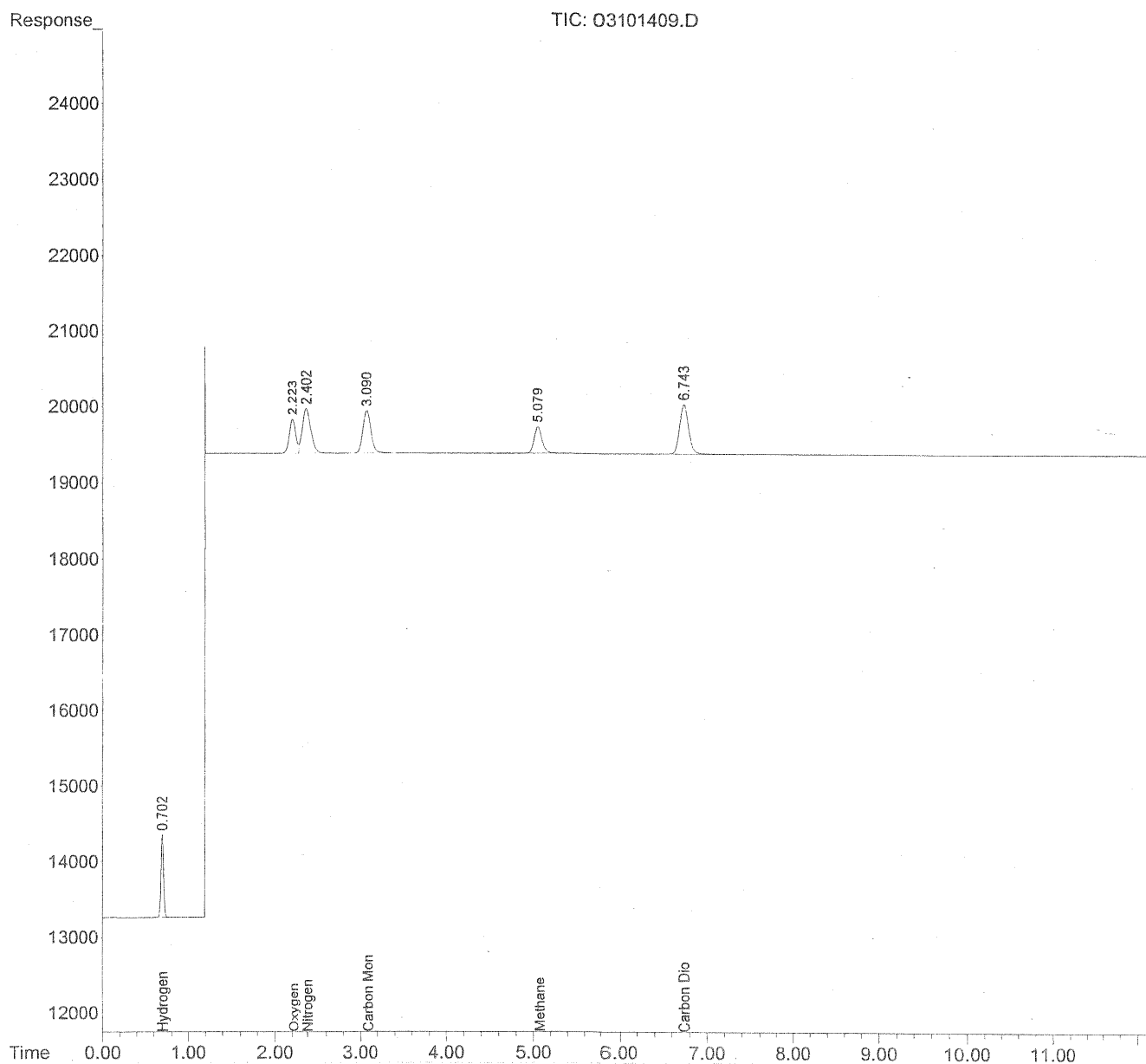
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101409.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:05
Operator : WH
Sample : std 3 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:22:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:19:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101409.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:05
Operator : WH
Sample : std 3 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:22:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:19:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.703	21765	15469.029 ppm
2) Oxygen	2.225	27580	16167.517 ppm
3) Nitrogen	2.402	39289	18899.954 ppm
4) Carbon Monoxide	3.092	38995	20555.928 ppm
5) Methane	5.081	23626	16681.490 ppm
6) Carbon Dioxide	6.744	44933	20275.995 ppm

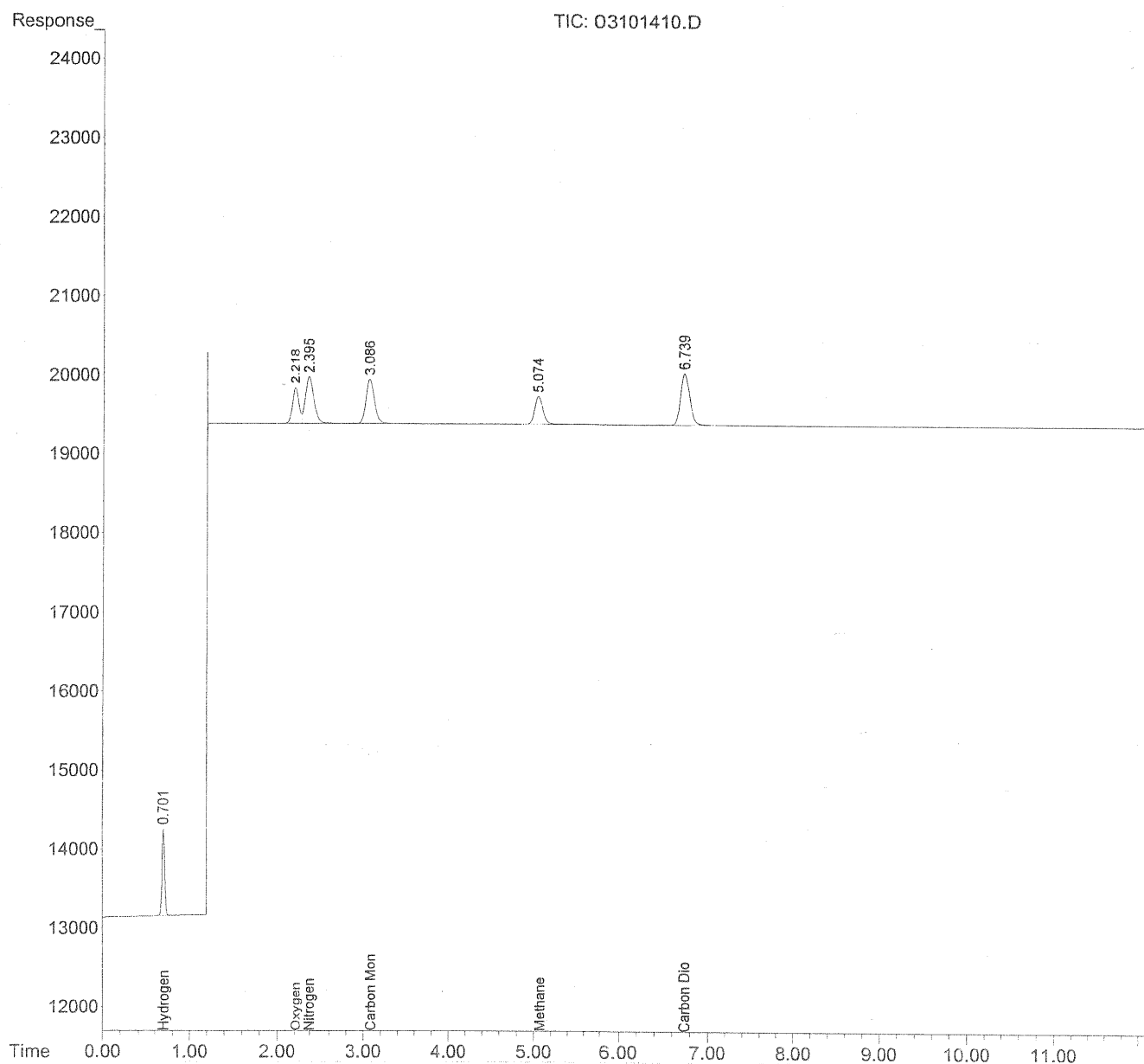
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101410.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:23
Operator : WH
Sample : std 3 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:22:44 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101410.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:23
Operator : WH
Sample : std 3 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:22:44 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	21820	15685.875 ppm
2) Oxygen	2.219	27585	16260.158 ppm
3) Nitrogen	2.397	39208	19135.565 ppm
4) Carbon Monoxide	3.087	38859	20547.786 ppm
5) Methane	5.076	23724	16767.873 ppm
6) Carbon Dioxide	6.740	44730	20288.350 ppm

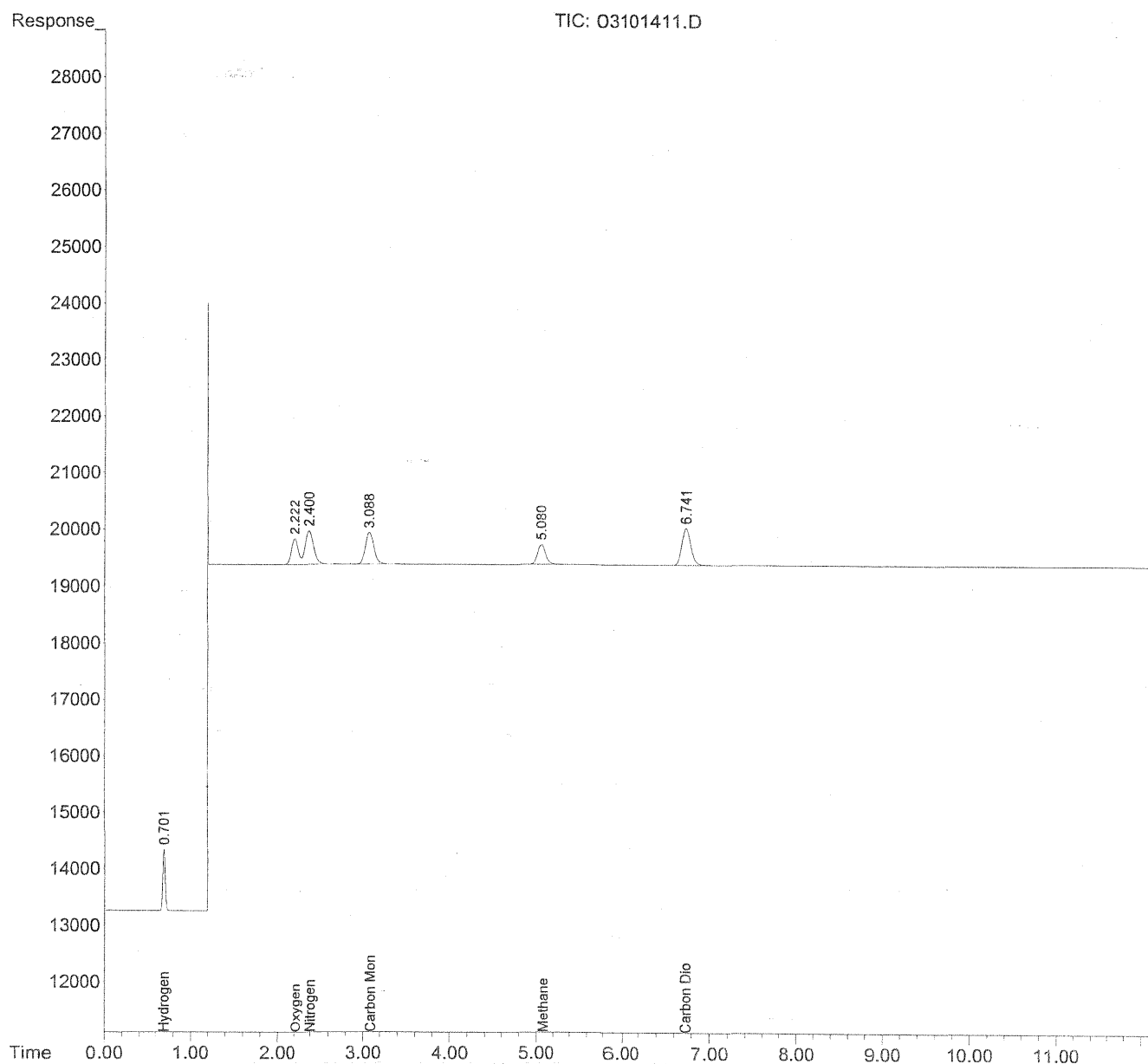
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101411.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:56
Operator : WH
Sample : std 3 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:27 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101411.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:56
Operator : WH
Sample : std 3 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:27 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.703	21730	15751.773 ppm
2) Oxygen	2.224	27609	16342.415 ppm
3) Nitrogen	2.401	39193	19344.177 ppm
4) Carbon Monoxide	3.090	38395	20358.500 ppm
5) Methane	5.081	23489	16605.562 ppm
6) Carbon Dioxide	6.743	44680	20355.596 ppm

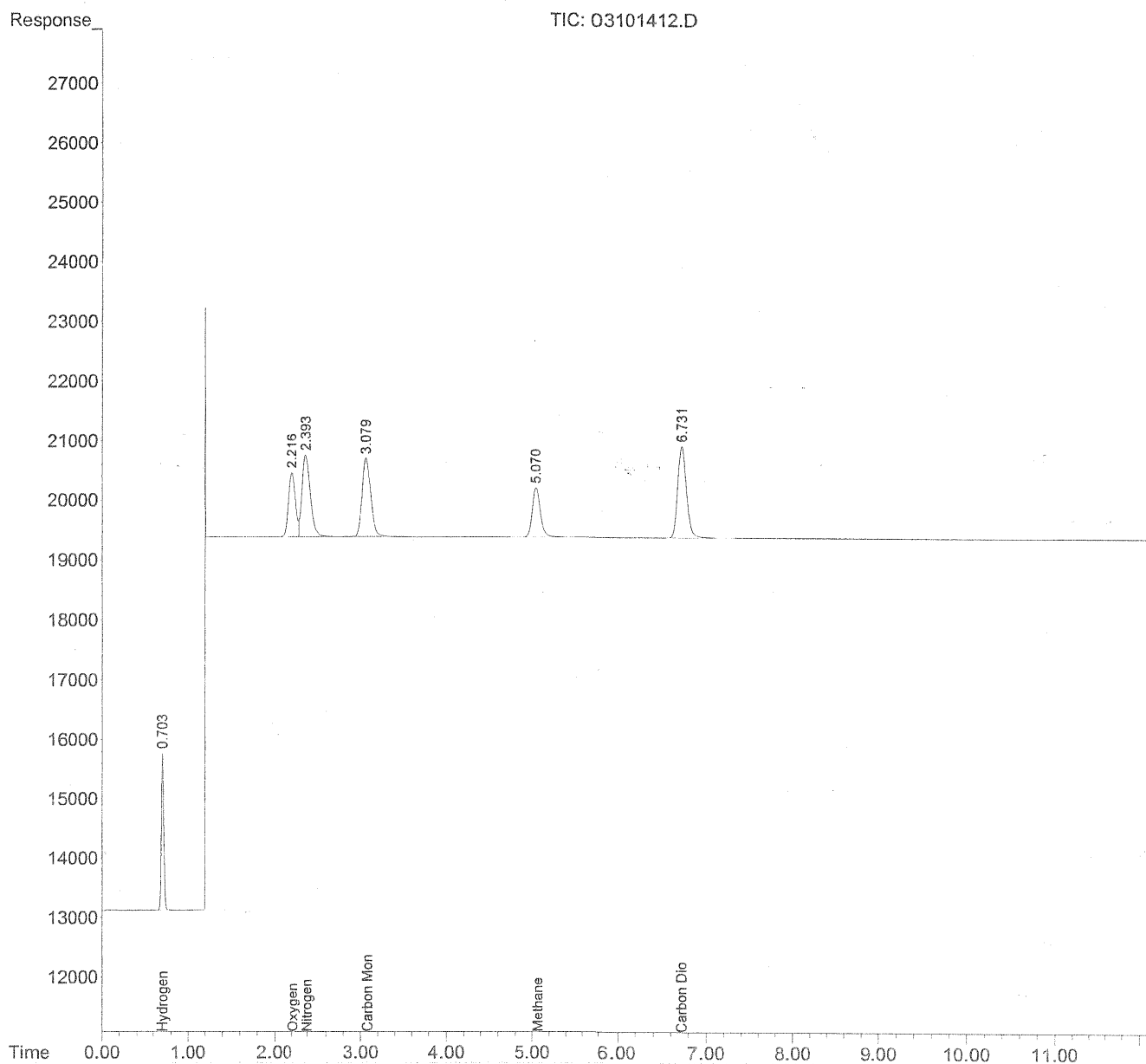
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101412.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:15
Operator : WH
Sample : std 4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:31:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:50 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101412.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:15
Operator : WH
Sample : std 4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:31:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:50 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.705	51993	37952.051 ppm
2) Oxygen	2.217	65602	38954.464 ppm
3) Nitrogen	2.394	92598	46108.575 ppm
4) Carbon Monoxide	3.081	92228	49071.809 ppm
5) Methane	5.072	55567	39334.461 ppm
6) Carbon Dioxide	6.733	106700	48784.847 ppm

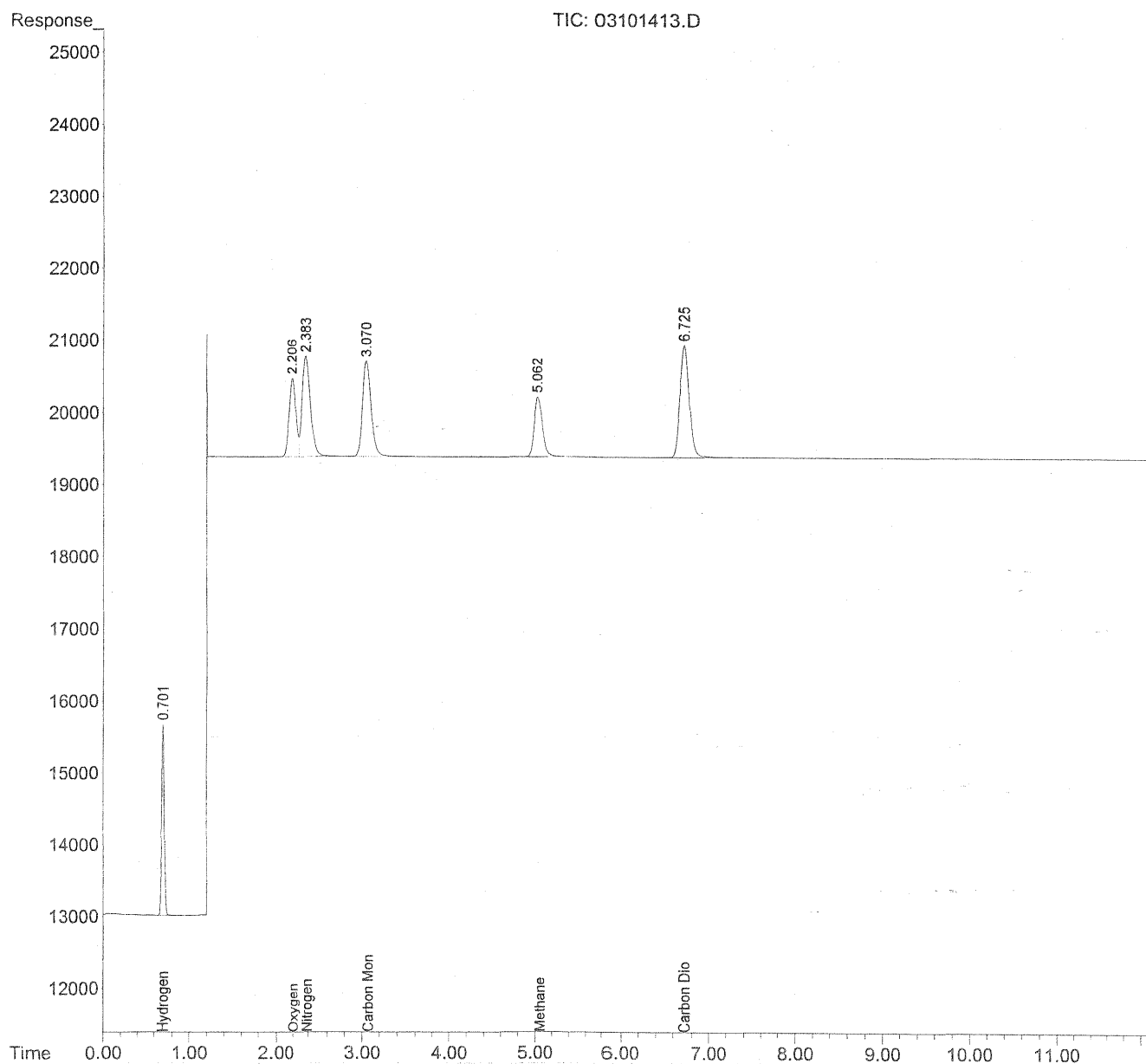
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101413.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:32
Operator : WH
Sample : std 4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:57:23 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:57:03 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101413.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:32
Operator : WH
Sample : std 4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:57:23 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:57:03 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	52354	38549.354 ppm
2) Oxygen	2.208	65871	39291.954 ppm
3) Nitrogen	2.385	93062	47432.408 ppm
4) Carbon Monoxide	3.072	92593	49417.144 ppm
5) Methane	5.064	55753	39568.314 ppm
6) Carbon Dioxide	6.726	107226	49228.245 ppm

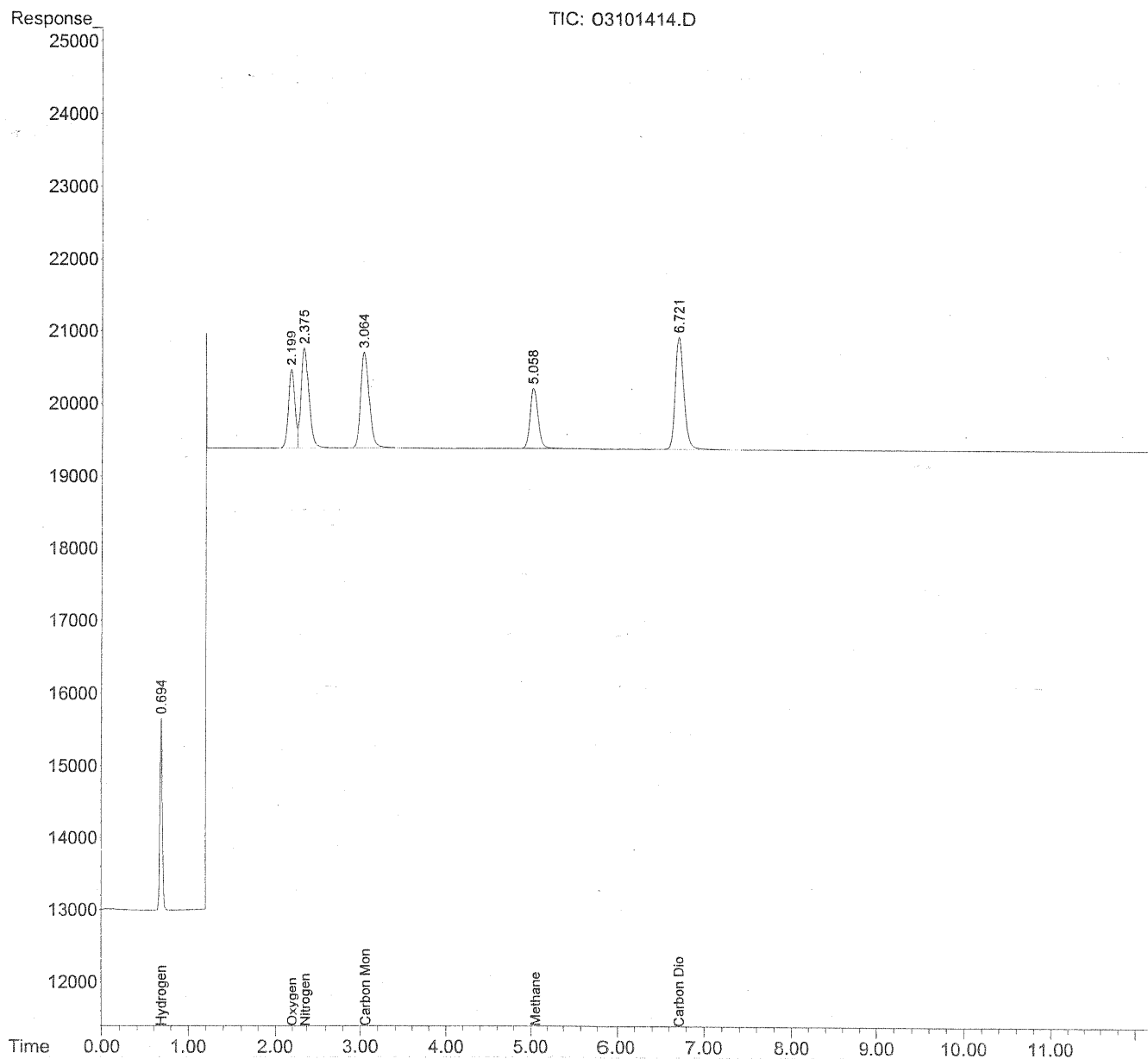
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101414.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 14:49
 Operator : WH
 Sample : std 4 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 18:45:17 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:44:30 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101414.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:49
Operator : WH
Sample : std 4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:45:17 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:44:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.696	52056	37688.686 ppm
2) Oxygen	2.200	65583	39685.849 ppm
3) Nitrogen	2.377	92502	48078.649 ppm
4) Carbon Monoxide	3.065	91773	49520.215 ppm
5) Methane	5.059	55456	39726.222 ppm
6) Carbon Dioxide	6.723	106671	49580.495 ppm

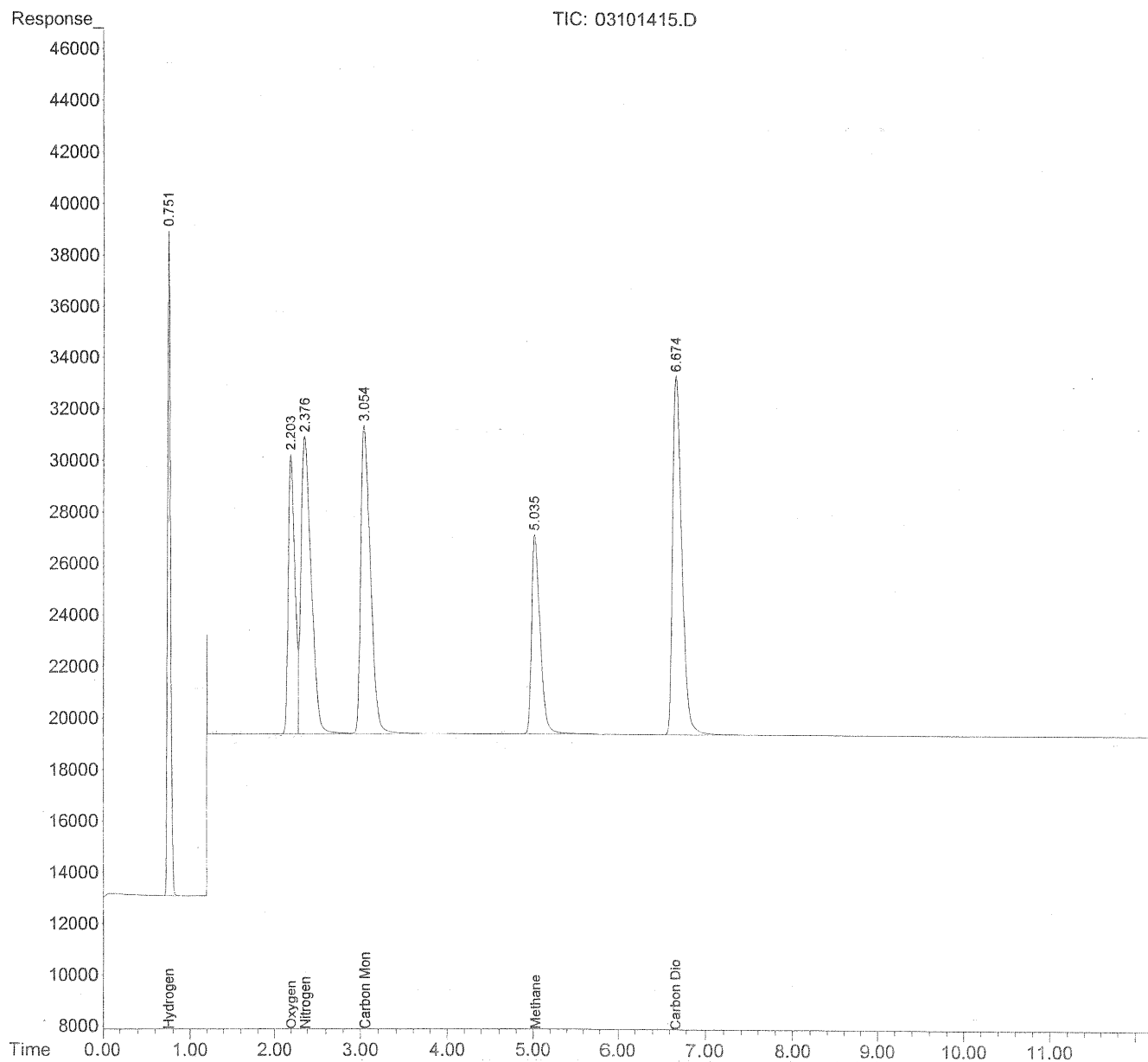
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101415.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:08
Operator : WH
Sample : std 5_1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 15:28:26 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:28:13 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101415.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:08
Operator : WH
Sample : std 5 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 15:28:26 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:28:13 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.753	609940	450674.500 ppm
2) Oxygen	2.204	639596	382242.968 ppm
3) Nitrogen	2.378	920613	471464.666 ppm
4) Carbon Monoxide	3.056	910078	486547.441 ppm
5) Methane	5.037	546936	388661.341 ppm
6) Carbon Dioxide	6.676	1039048	477883.306 ppm

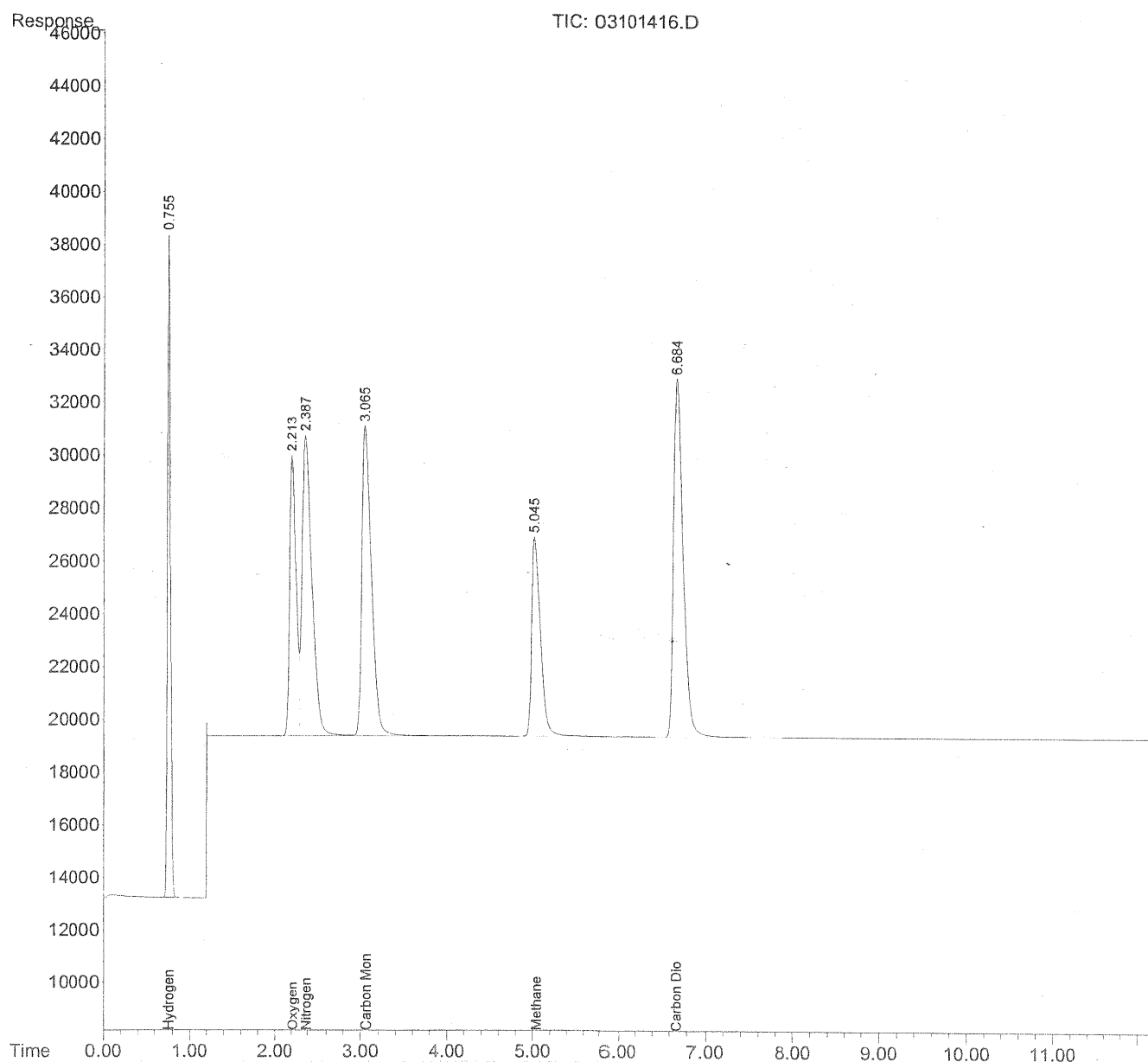
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101416.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:34
Operator : WH
Sample : std 5 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:22 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101416.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:34
Operator : WH
Sample : std 5 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:22 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.757	592647	433927.352 ppm
2) Oxygen	2.215	625621	375390.705 ppm
3) Nitrogen	2.388	900666	463524.733 ppm
4) Carbon Monoxide	3.067	886943	475424.245 ppm
5) Methane	5.047	533862	380382.085 ppm
6) Carbon Dioxide	6.686	1009801	466290.795 ppm

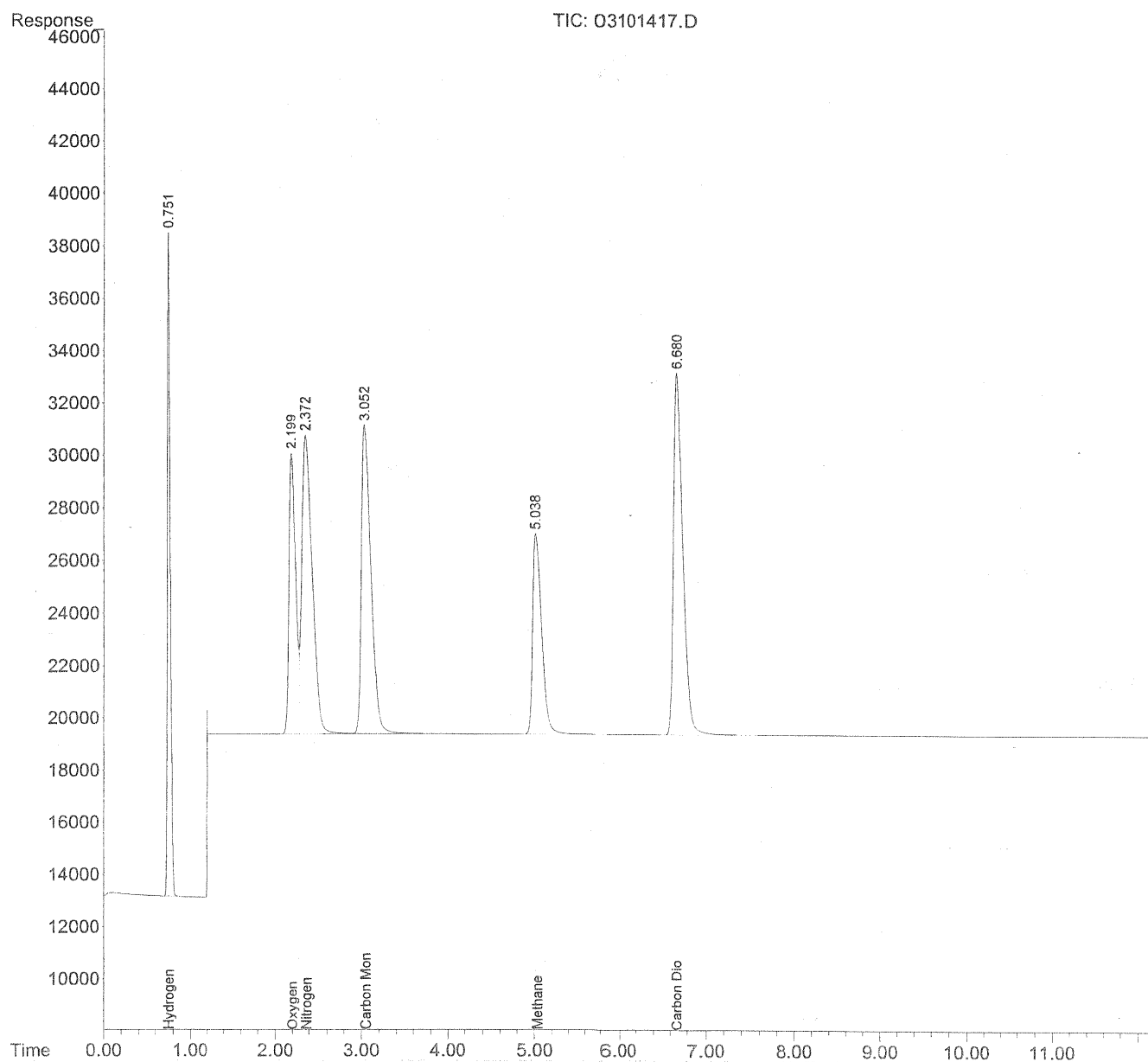
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101417.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:50
Operator : WH
Sample : std 5 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101417.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:50
Operator : WH
Sample : std 5 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.753	600780	437466.065 ppm
2) Oxygen	2.200	633337	381900.857 ppm
3) Nitrogen	2.374	912132	472109.403 ppm
4) Carbon Monoxide	3.054	899249	483961.452 ppm
5) Methane	5.040	540876	386903.325 ppm
6) Carbon Dioxide	6.681	1028390	477426.138 ppm

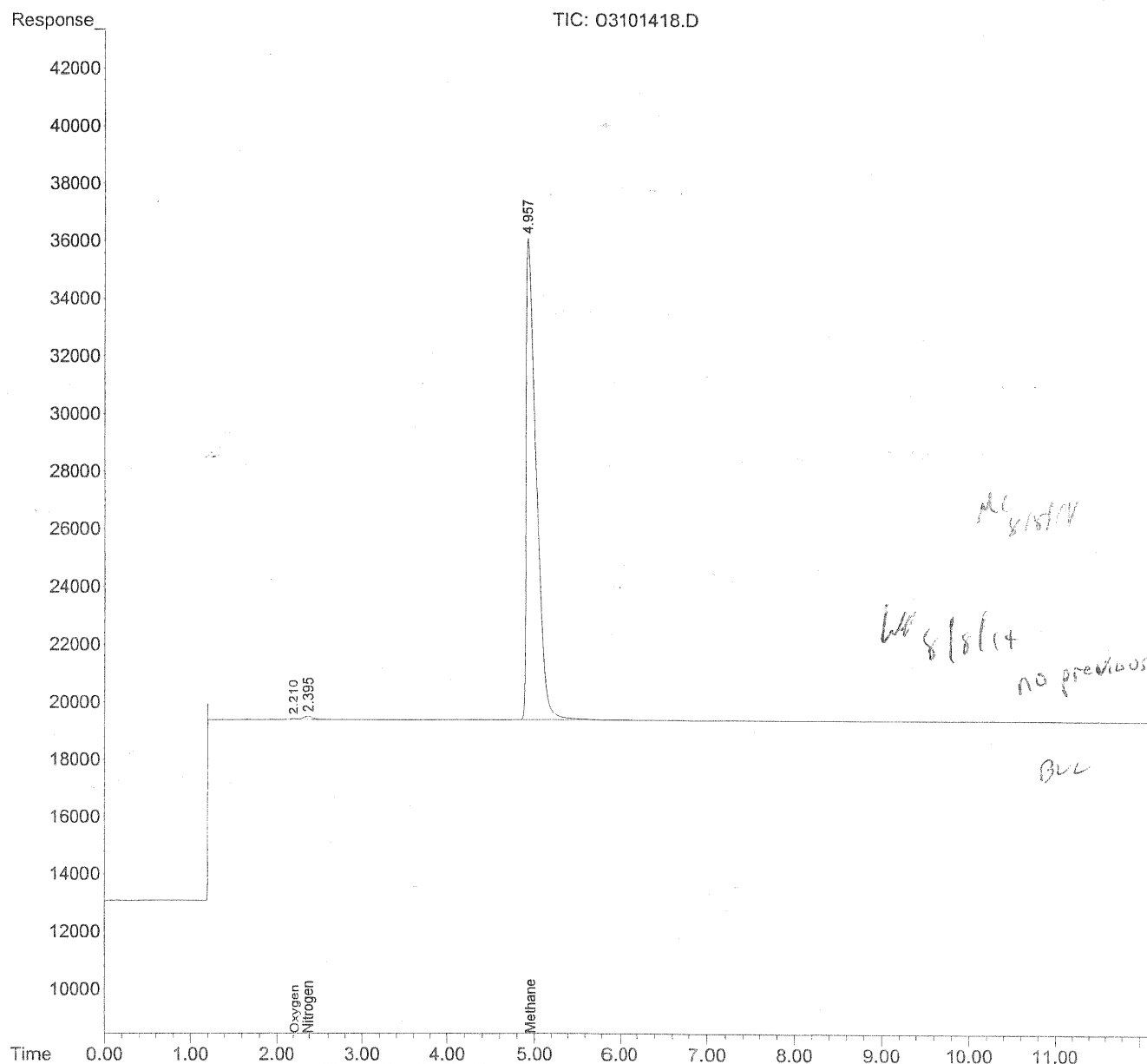
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101418.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 16:55
Operator : WH
Sample : std ch4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:11:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101418.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 16:55
Operator : WH
Sample : std ch4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:11:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.225	1686	1020.031 ppm
3) Nitrogen	2.395	7810	4059.131 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.957	1340274	961229.509 ppm m
6) Carbon Dioxide	0.000	0	N.D. ppm

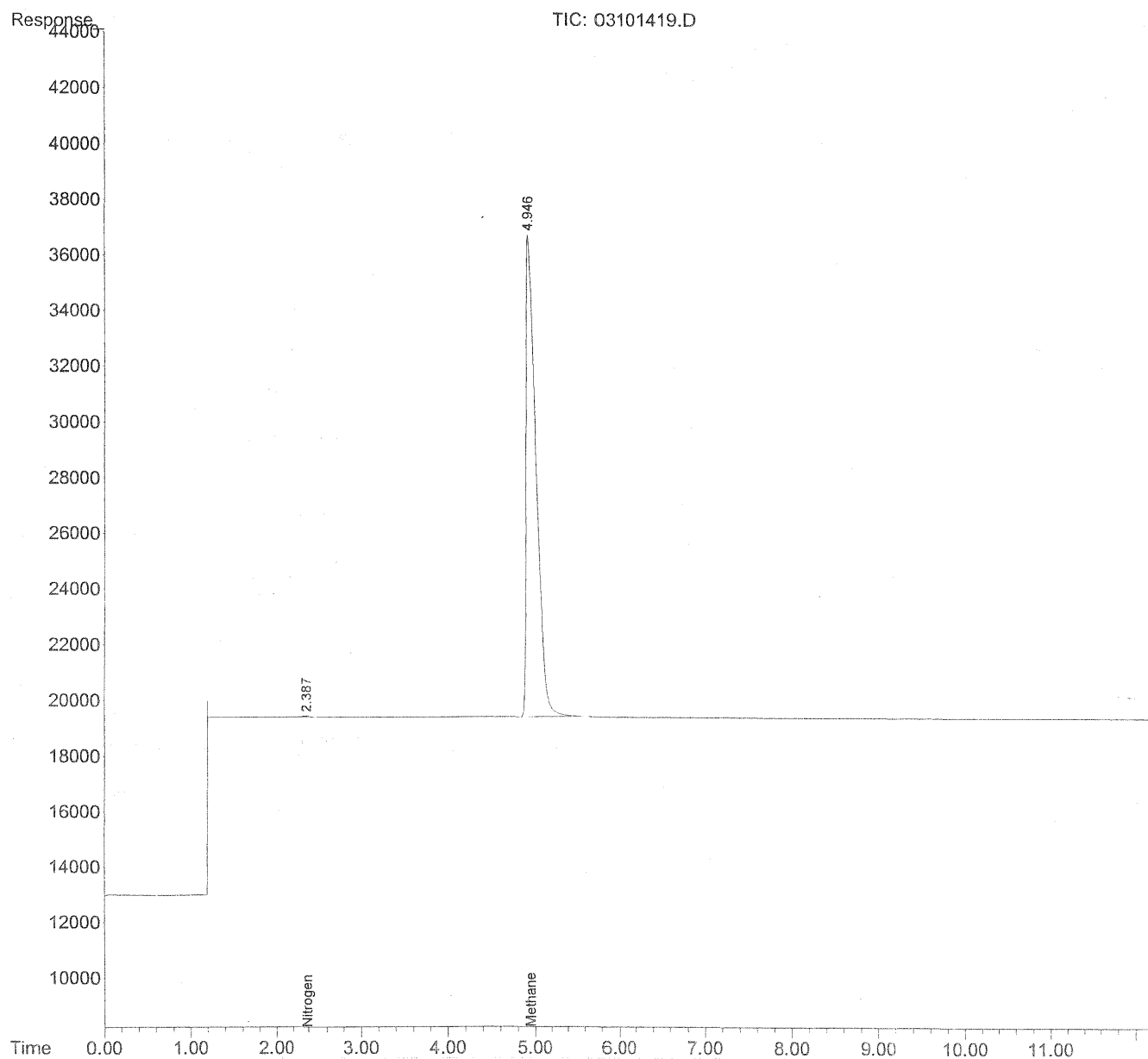
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101419.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:11
Operator : WH
Sample : std ch4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:28:59 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101419.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:11
Operator : WH
Sample : std ch4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:28:59 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis For Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	2.389	2357	1225.098 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.948	1390484	997239.566 ppm
6) Carbon Dioxide	0.000	0	N.D. ppm

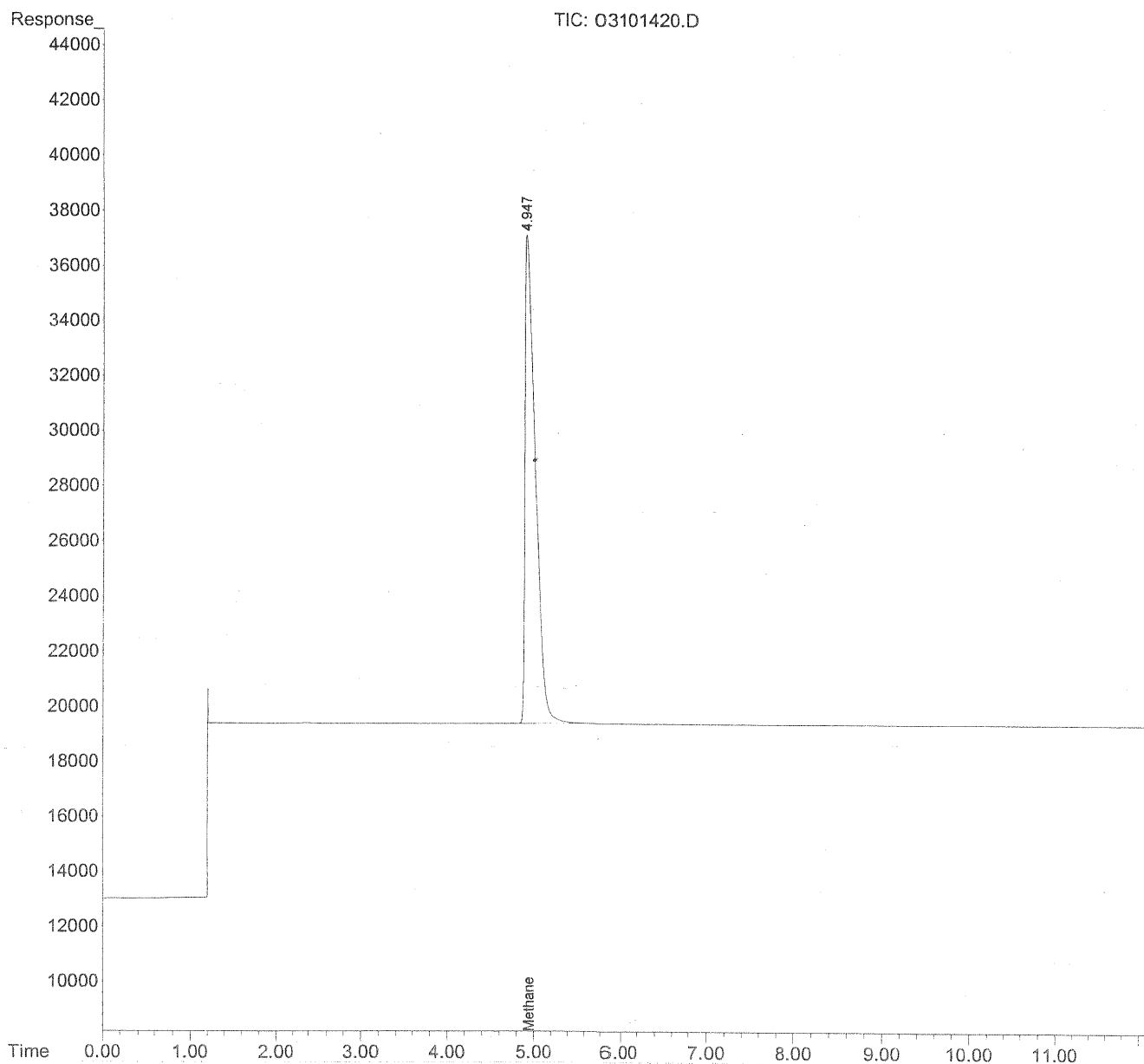
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101420.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:29
Operator : WH
Sample : std ch4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:46:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101420.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:29
Operator : WH
Sample : std ch4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:46:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	0.000	0	N.D. ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.949	1439175	1032160.623 ppm
6) Carbon Dioxide	0.000	0	N.D. ppm

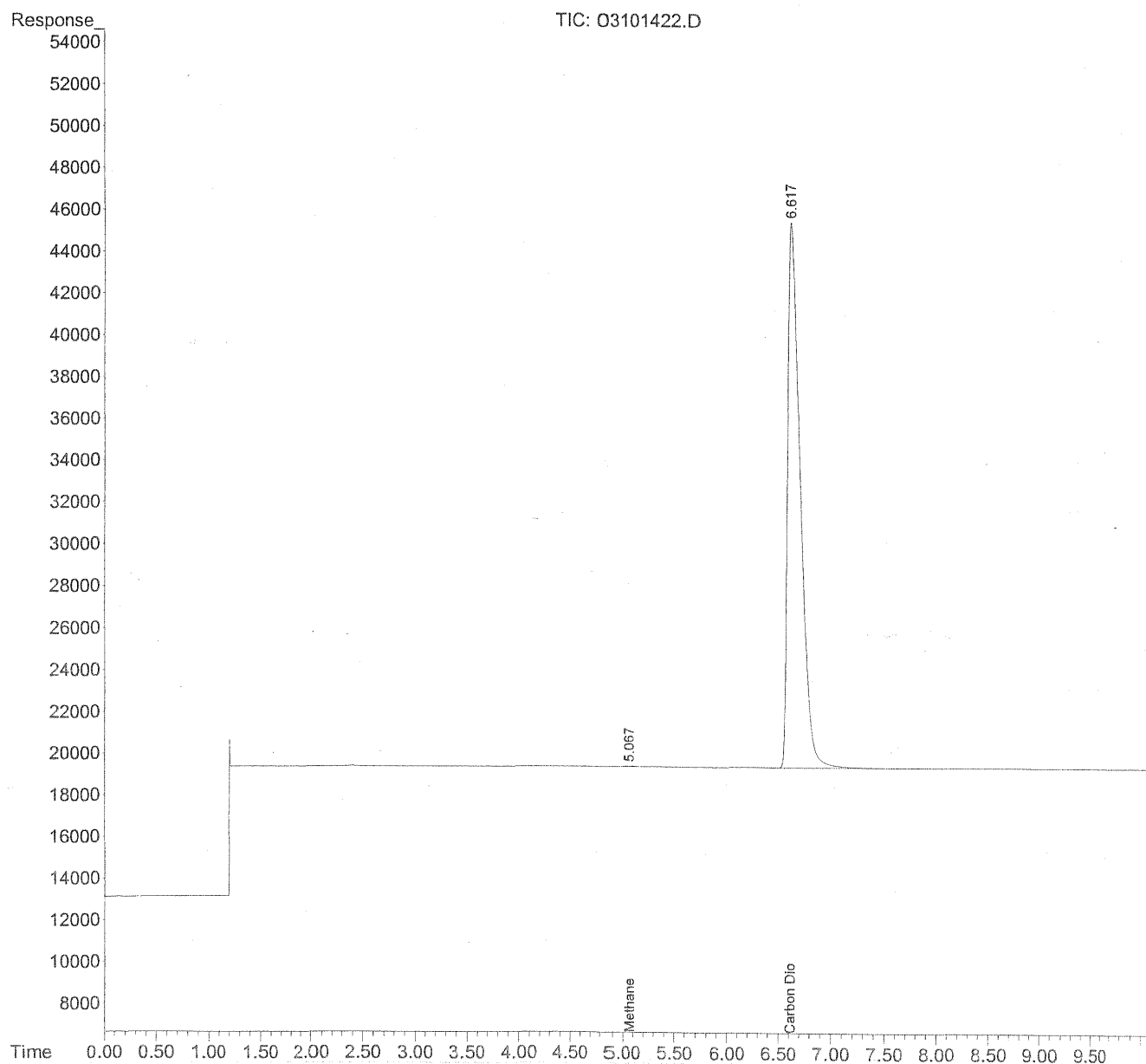
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101422.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:05
Operator : WH
Sample : std c02 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:17:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101422.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:05
Operator : WH
Sample : std c02 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:17:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	0.000	0	N.D. ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.069	1775	1271.240 ppm
6) Carbon Dioxide	6.618	2201199	1025503.777 ppm

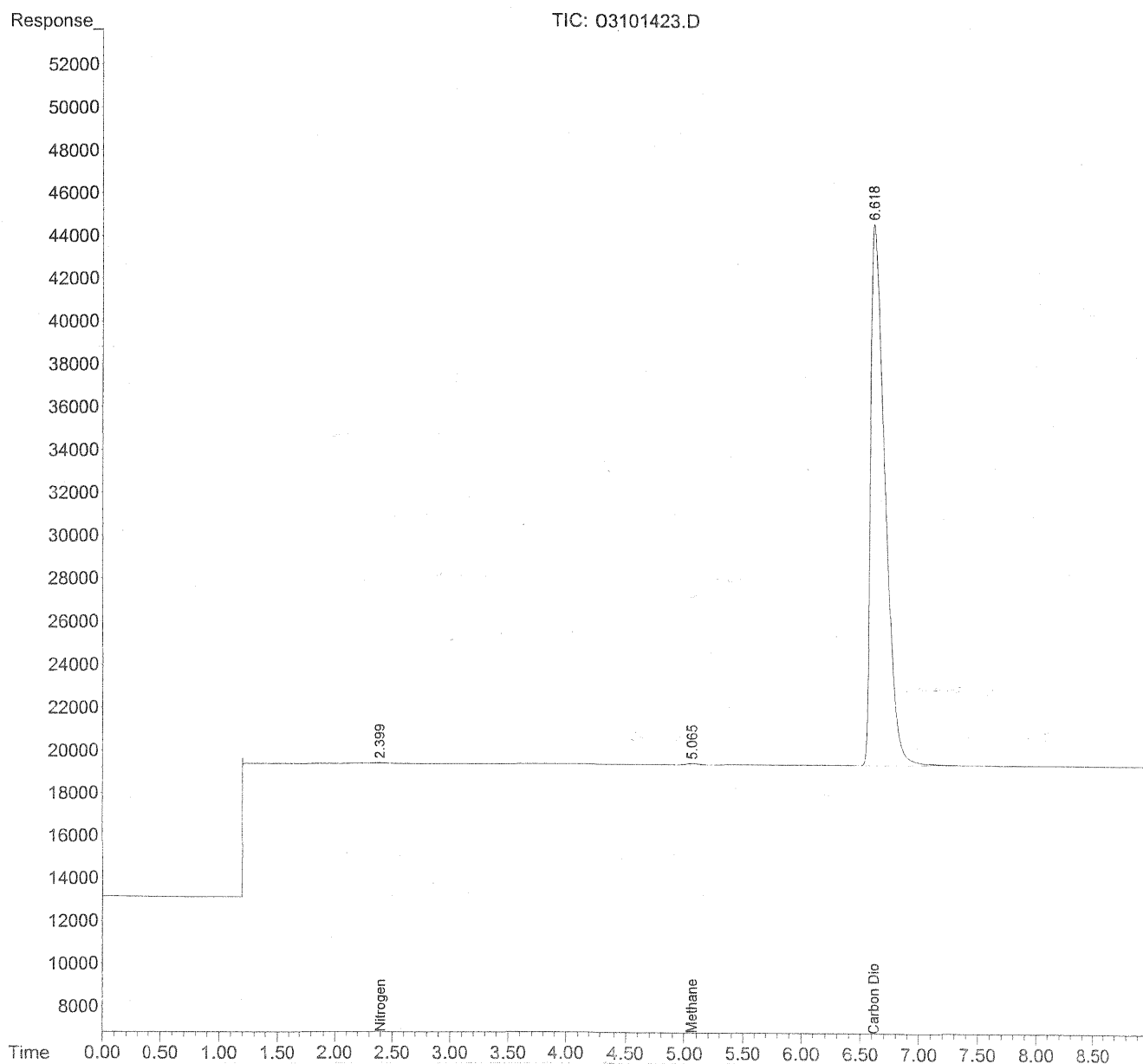
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101423.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:19
Operator : WH
Sample : std c02 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:30:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101423.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:19
Operator : WH
Sample : std c02 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:30:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	2.401	2050	1065.315 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.069	4323	3097.155 ppm
6) Carbon Dioxide	6.619	2111383	983659.786 ppm

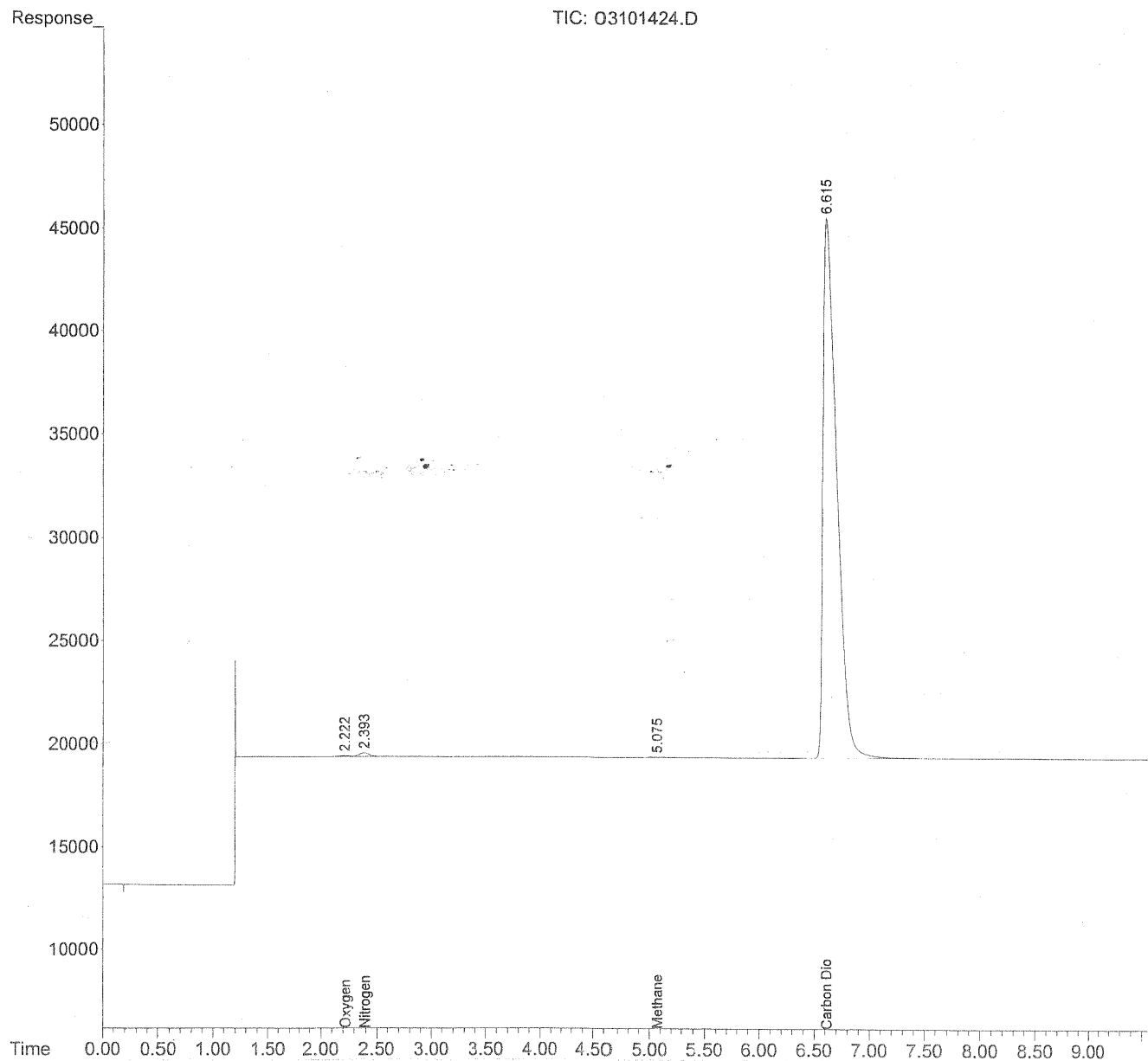
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101424.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 18:32
 Operator : WH
 Sample : std c02 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 18:43:57 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:42:24 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101424.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:32
Operator : WH
Sample : std c02 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:43:57 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:42:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.223	2425	1467.619 ppm
3) Nitrogen	2.396	11513	5983.691 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.076	523	374.374 ppm
6) Carbon Dioxide	6.617	2204164	1026088.843 ppm

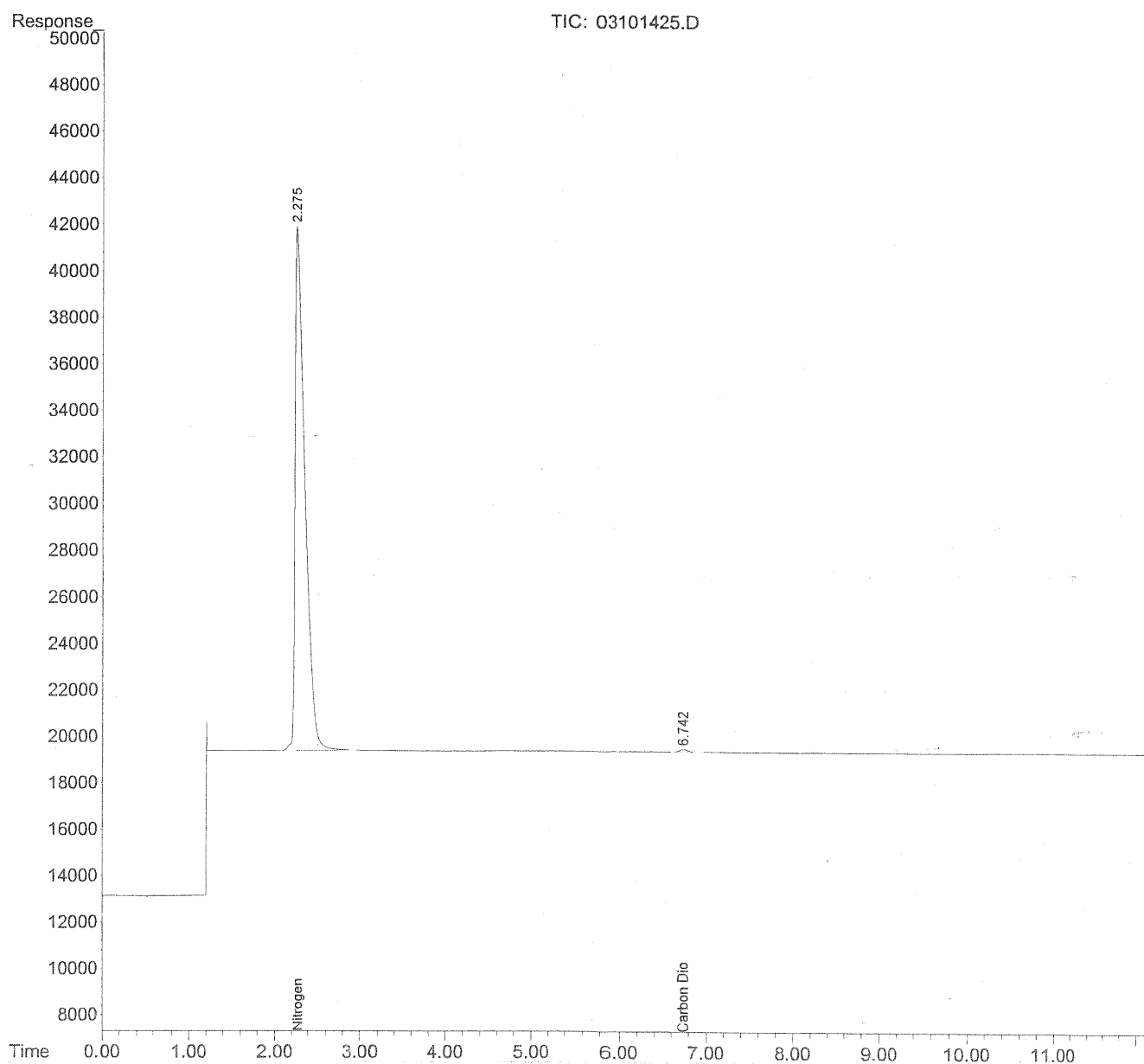
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101425.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:11
Operator : WH
Sample : std n2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:26:33 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101425.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:11
Operator : WH
Sample : std n2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:26:33 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.277	1907693	991533.750 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.744	7551	3509.651 ppm

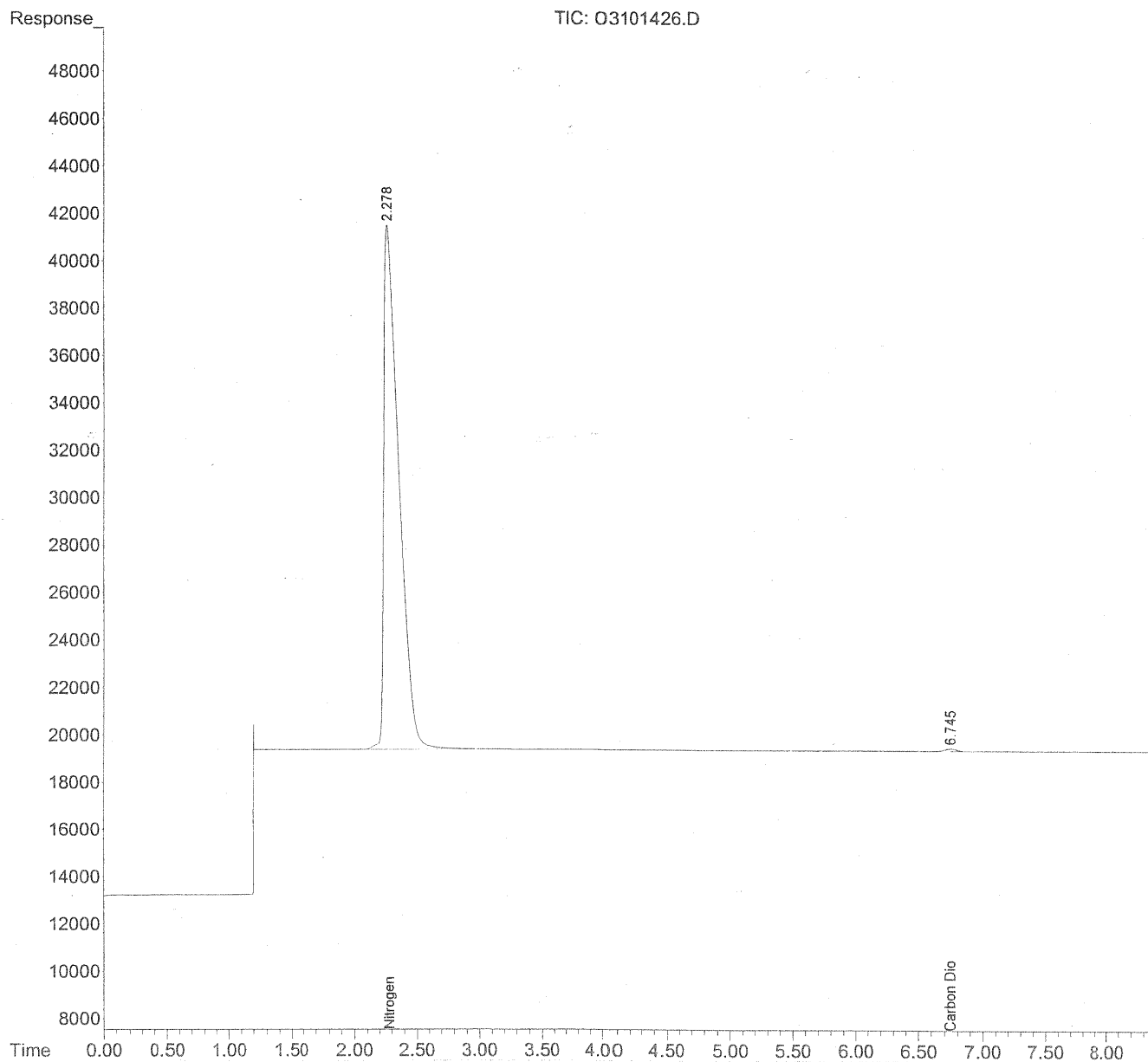
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101426.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:30
Operator : WH
Sample : std n2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:40:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101426.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:30
Operator : WH
Sample : std n2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:40:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.280	1857806	965604.527 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.748	7247	3368.284 ppm

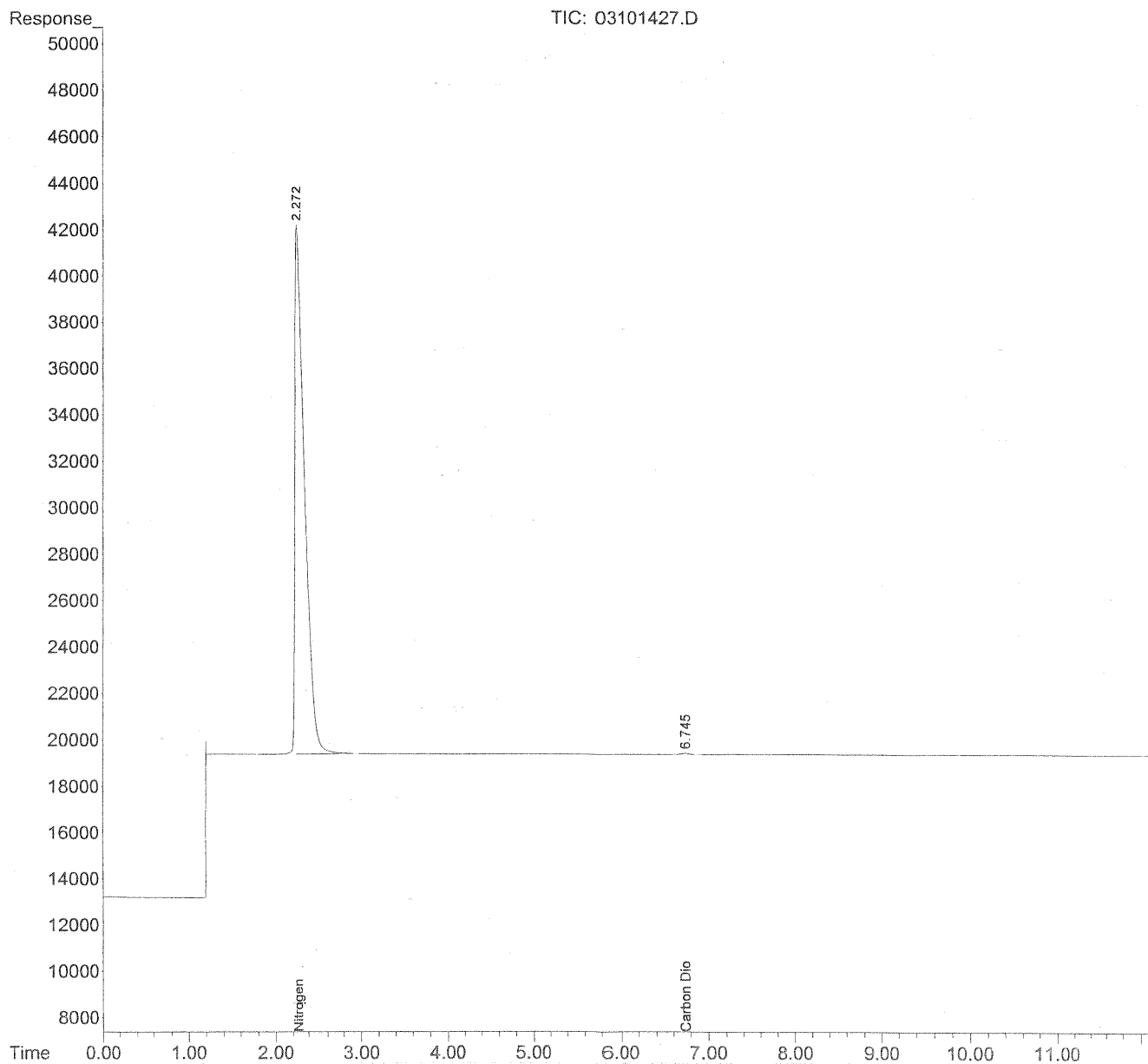
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101427.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:42
 Operator : WH
 Sample : std n2 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 11:02:52 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101427.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:42
 Operator : WH
 Sample : std n2 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 11:02:52 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound		R.T.	Response	Conc	Units

Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm d
3)	Nitrogen	2.273	1934590	1005513.839	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.747	3210	1492.185	ppm

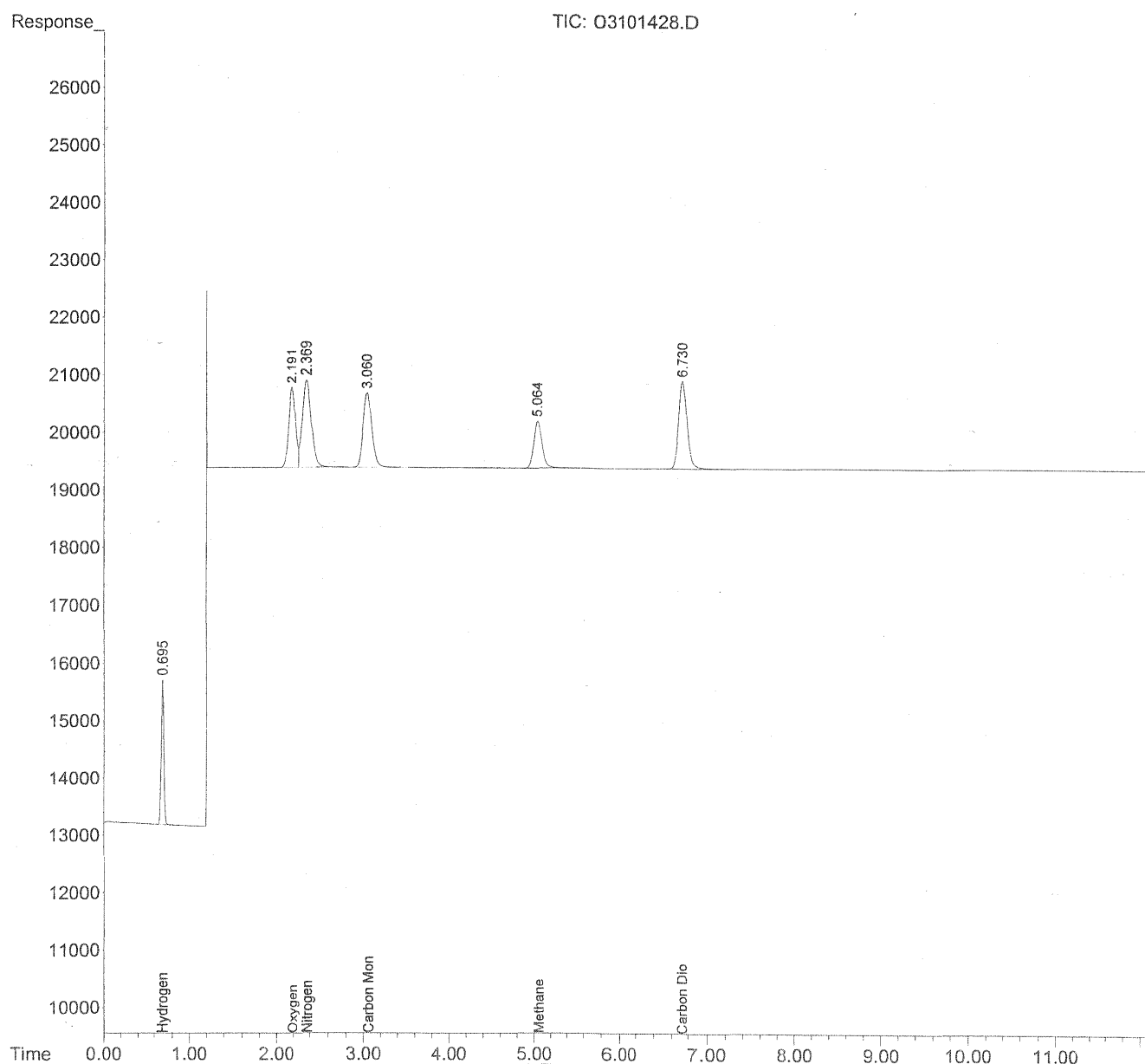
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101428.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 11:20
Operator : WH
Sample : icv s30-02051401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:35:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101428.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 11:20
Operator : WH
Sample : icv s30-02051401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:35:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	Actual ppm	R.T.	Response	Conc Units	% recovery

Target Compounds					
1) Hydrogen	40000	0.696	49944	36159.891 ppm	90.4%
2) Oxygen	50000	2.193	85837	51942.494 ppm	103.9%
3) Nitrogen	50000	2.370	104375	54362.122 ppm	108.7%
4) Carbon Monoxide	50000	3.061	91720	49491.765 ppm	99.0%
5) Methane	40000	5.066	55315	39625.390 ppm	99.1%
6) Carbon Dioxide	50000	6.732	105938	49239.725 ppm	98.5%

(f)=RT Delta > 1/2 Window

(m)=manual int.

WA 8/8/14

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 3/2/2015

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 2/28/2015

PAI Job : P1500761

Sample amount : 100uL

MP
3/2/15

Sample Result

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	
STD S30-12161401	40171	41743	52330	50993	40695	50792	
ACTUAL	39990	40030	50000	50010	39970	50040	
% Difference	0.5%	4.3%	4.7%	2.0%	1.8%	1.5%	
Lab Air		203879	720761			477	
MB							
0761-001		135830	0.3%	732384	0.2%	48865	0.3%
0761-001 - 2		136159	0.0%	733117	0.1%	49125	0.2%
0761-001 - 3		136559	0.3%	735391	0.2%	49036	0.1%
0761-001 - Mean		136182		733631		49009	
0761-003		136918	0.2%	731185	0.4%	48101	0.1%
0761-003 - 2		137248	0.0%	733859	0.0%	48042	0.2%
0761-003 - 3		137589	0.2%	736315	0.3%	48289	0.3%
0761-003 - Mean		137252		733786		48144	

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 3/2/2015

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 2/28/2015

PAI Job : P1500761

Sample amount : 100uL

0761-005	144441	0.2%	733462	0.2%	43470	0.2%
0761-005 - 2	144883	0.5%	736021	0.6%	43737	0.8%
0761-005 - 3	143122	0.7%	725694	0.8%	42970	1.0%
0761-005 - Mean	144148		731726		43392	
0761-007	130652	0.4%	738331	0.8%	53194	0.6%
0761-007 - 2	129671	0.3%	728902	0.5%	52734	0.3%
0761-007 - 3	129988	0.1%	729718	0.4%	52691	0.3%
0761-007 - Mean	130103		732317		52873	
0761-009	132767	0.0%	733861	0.0%	51721	0.1%
0761-009 - 2	132075	0.5%	729403	0.6%	51325	0.6%
0761-009 - 3	133457	0.5%	737258	0.5%	51916	0.5%
0761-009 - Mean	132766		733507		51654	
STD S30-12161401	39775	41731	52847	50651	40449	50532
ACTUAL	39990	40030	50000	50010	39970	50040
% Difference	0.5%	4.3%	5.7%	1.3%	1.2%	1.0%

M
3/2/15

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281501.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 2:45 pm
Operator : WH
Sample : std s30-12161403
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:01:59 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.697	55484	40171.152 ppm
2) Oxygen	2.193	68983	41743.468 ppm
3) Nitrogen	2.369	100472	52329.531 ppm
4) Carbon Monoxide	3.055	94503	50992.985 ppm
5) Methane	5.048	56809	40695.408 ppm
6) Carbon Dioxide	6.710	109279	50792.474 ppm

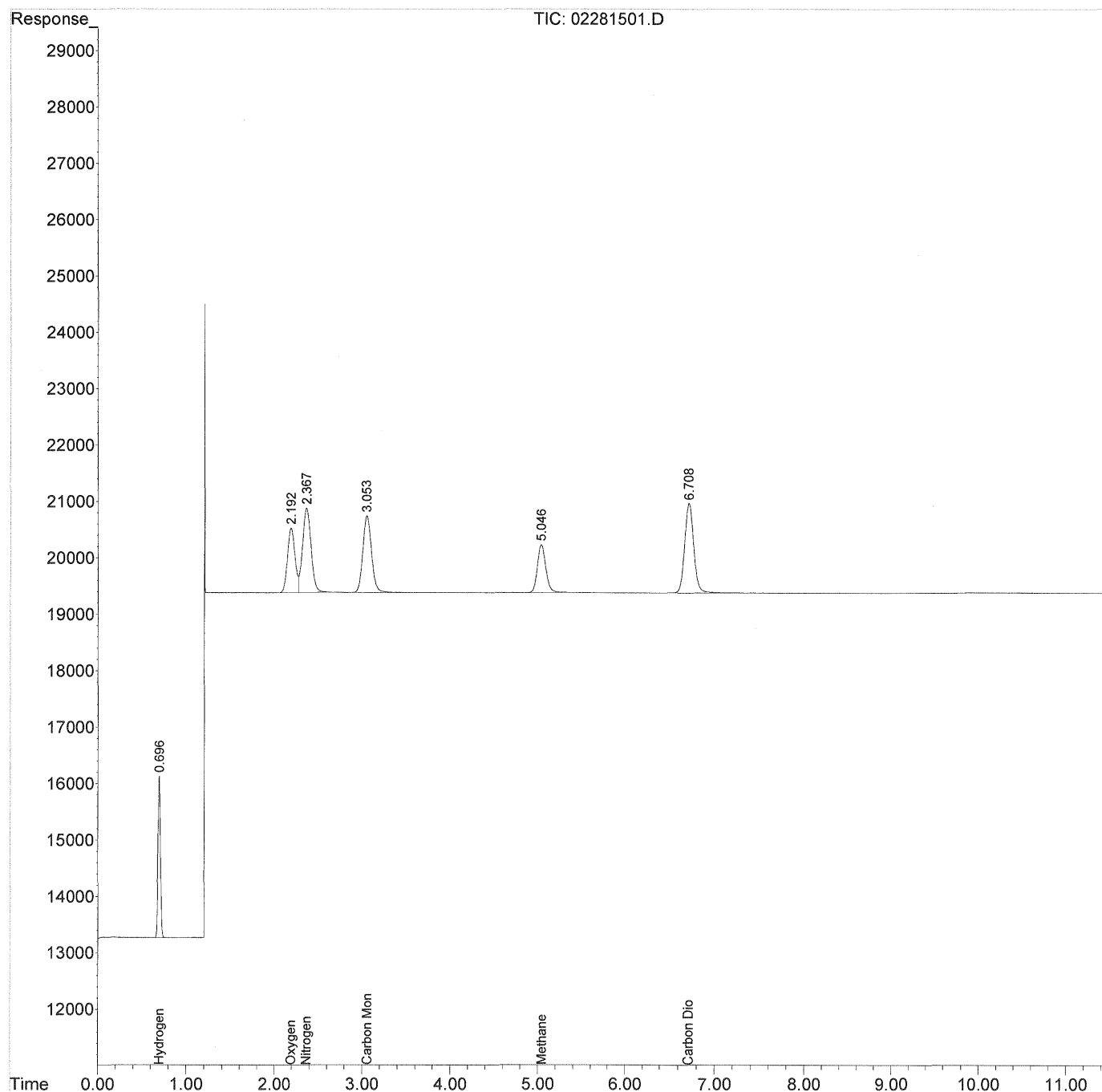
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281501.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 2:45 pm
Operator : WH
Sample : std s30-12161403
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:01:59 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281521.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 8:24 pm
Operator : WH
Sample : std s30-12161401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:56 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.691	54937	39774.771 ppm
2) Oxygen	2.171	68963	41731.341 ppm
3) Nitrogen	2.346	101467	52847.712 ppm
4) Carbon Monoxide	3.035	93869	50651.291 ppm
5) Methane	5.040	56465	40449.014 ppm
6) Carbon Dioxide	6.707	108718	50531.639 ppm

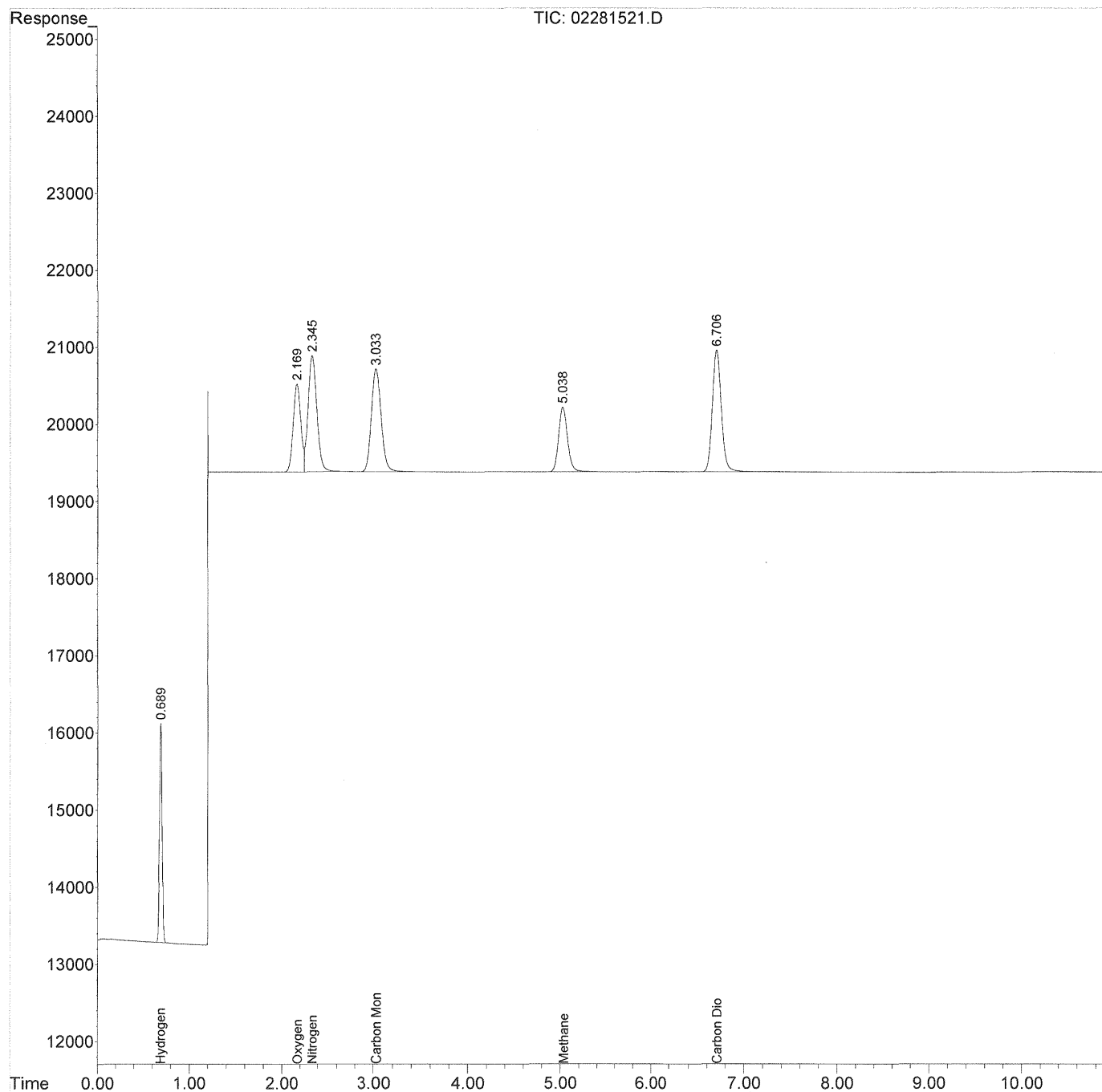
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_02\28\
Data File : 02281521.D
Signal(s) : TCD1A.CH
Acq On : 28 Feb 2015 8:24 pm
Operator : WH
Sample : std s30-12161401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:02:56 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Line	Vial	FileName	Multipiler	SampleName	Misc Info	Injected
1	1	03101401.d	10.	MB		10 Mar 2014 10:27
2	1	03101402.d	10.	xstd 1 1		10 Mar 2014 10:43
3	1	03101403.d	10.	std 1 1		10 Mar 2014 10:59
4	1	03101404.d	10.	std 1 2		10 Mar 2014 11:29
5	1	03101405.d	10.	std 1 3		10 Mar 2014 11:44
6	1	03101406.d	10.	std 2 1		10 Mar 2014 11:59
7	1	03101407.d	10.	std 2 2		10 Mar 2014 12:18
8	1	03101408.d	10.	std 2 3		10 Mar 2014 12:34
9	1	03101409.d	10.	std 3 1		10 Mar 2014 13:05
10	1	03101410.d	10.	std 3 2		10 Mar 2014 13:23
11	1	03101411.d	10.	std 3 3		10 Mar 2014 13:56
12	1	03101412.d	10.	std 4 1		10 Mar 2014 14:15
13	1	03101413.d	10.	std 4 2		10 Mar 2014 14:32
14	1	03101414.d	10.	std 4 3		10 Mar 2014 14:49
15	1	03101415.d	10.	std 5 1		10 Mar 2014 15:08
16	1	03101416.d	10.	std 5 2		10 Mar 2014 15:34
17	1	03101417.d	10.	std 5 3		10 Mar 2014 15:50
18	1	03101418.d	10.	std ch4 1		10 Mar 2014 16:55
19	1	03101419.d	10.	std ch4 2		10 Mar 2014 17:11
20	1	03101420.d	10.	std ch4 3		10 Mar 2014 17:29
21	1	03101421.d	10.	xstd c02 1		10 Mar 2014 17:47
22	1	03101422.d	10.	std c02 1		10 Mar 2014 18:05
23	1	03101423.d	10.	std c02 2		10 Mar 2014 18:19
24	1	03101424.d	10.	std c02 3		10 Mar 2014 18:32
25	1	03101425.d	10.	std n2 1		11 Mar 2014 10:11
26	1	03101426.d	10.	std n2 2		11 Mar 2014 10:30
27	1	03101427.d	10.	std n2 3		11 Mar 2014 10:42
28	1	03101428.d	10.	lcs		11 Mar 2014 11:20
29	1	03101429.d	10.	lab air		11 Mar 2014 11:37

Injection Log

Directory: J:\GC01\DATA\FXG\2015_02\28

Line	Vial	FileName	Multiplier	SampleName	Misc Info
1	1	02281501.d	10.	std s30-12161403	
2	1	02281502.d	10.	mb	
3	1	02281503.d	10.	lab air	
4	1	02281504.d	10.	lcs	
5	1	02281505.d	10.	lcs	
6	1	02281506.d	10.	0761-009	
7	1	02281507.d	10.	0761-009	
8	1	02281508.d	10.	0761-009	
9	1	02281509.d	10.	0761-007	
10	1	02281510.d	10.	0761-007	
11	1	02281511.d	10.	0761-007	
12	1	02281512.d	10.	0761-005	
13	1	02281513.d	10.	0761-005	
14	1	02281514.d	10.	0761-005	
15	1	02281515.d	10.	0761-003	
16	1	02281516.d	10.	0761-003	
17	1	02281517.d	10.	0761-003	
18	1	02281518.d	10.	0761-001	
19	1	02281519.d	10.	0761-001	
20	1	02281520.d	10.	0761-001	
21	1	02281521.d	10.	std s30-12161401	

LABORATORY REPORT

March 9, 2015

Min Lee
Air Hygiene, Incorporated
1600 West Tacoma Street
Broken Arrow, OK 74012

RE: qti-15-brokenarrow.ok-comp#1

Dear Min:

Enclosed are the results of the samples submitted to our laboratory on February 28, 2015. For your reference, these analyses have been assigned our service request number P1500781.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental



By Kelly Horiuchi at 5:31 pm, Mar 09, 2015

Kelly Horiuchi
Laboratory Director

Client: Air Hygiene, Incorporated
Project: qti-15-brokenarrow.ok-comp#1

Service Request No: P1500781

CASE NARRATIVE

The samples were received intact under chain of custody on February 28, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Fixed Gases Analysis

The samples were analyzed for fixed gases (oxygen/argon, nitrogen, methane and carbon dioxide) according to modified EPA Method 3C (triplicate injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This procedure is described in laboratory SOP VOA-EPA3C. This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	838341
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-001
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-14-5
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 4-4
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Air Hygiene, Incorporated
Project ID: qti-15-brokenarrow.ok-comp#1

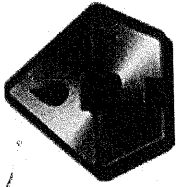
Service Request: P1500781

Date Received: 2/28/2015
Time Received: 09:20

3C Modified - Fxd Gases Bag 2X

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
R3-0-30-0%-Q250	P1500781-001	Air	2/27/2015	09:55	X
R4-30-70-30%-Q250	P1500781-003	Air	2/27/2015	12:00	X
R5-30-70-30%-Q250	P1500781-005	Air	2/27/2015	13:35	X
R6-30-70-30%-Q250	P1500781-007	Air	2/27/2015	15:02	X

1500781



Air Hygiene International, Inc.
1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
(888) 461-8778
www.airhygiene.com

SAMPLE DESCRIPTION AND CHAIN OF CUSTODY RECORD

Project Number: qti-15-brokenarrow.ok-comp#1		Laboratory Analysis Requested: Methd 3C						
Person Taking Samples: MSL								
Sample Number	Location	Date	Time	Volume (L)	Analysis Method			
					O ₂	CO ₂	Nitrogen	Methane
R3-0-30-0%-Q250	Broken Arrow Rental Facility	27-Feb	9:55	10	X	X	X	X
R3-0-30-0%-Q250-Backup	Broken Arrow Rental Facility	27-Feb		5	X	X	X	X
R4-30-70-30%-Q250	Broken Arrow Rental Facility	27-Feb	12:00	10	X	X	X	X
R4-30-70-30%-Q250-Backup	Broken Arrow Rental Facility	27-Feb		5	X	X	X	X
R5-30-70-30%-Q250	Broken Arrow Rental Facility	27-Feb	13:35	10	X	X	X	X
R5-30-70-30%-Q250-Backup	Broken Arrow Rental Facility	27-Feb		5	X	X	X	X
R6-30-70-30%-Q250	Broken Arrow Rental Facility	27-Feb	15:02	10	X	X	X	X
R6-30-70-30%-Q250-Backup	Broken Arrow Rental Facility	27-Feb		5	X	X	X	X
				10				
				5				

Relinquished by (Signature)	2/27/15	5:27pm	Time:
Received by (Signature)	Jamath Hester	2/28/15	Time: 0900

3-brokenarrow.ok-comp#1-coc-q250

ALS Environmental Sample Acceptance Check Form

Client: Air Hygiene, Incorporated

Work order: P1500781

Project: qti-15-brokenarrow.ok-comp#1

Sample(s) received on: 2/28/15

Date opened: 2/28/15

by: SHENNINGSEN

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

	<u>Yes</u>	<u>No</u>	<u>N/A</u>
1 Were sample containers properly marked with client sample ID?	☒	☐	☐
2 Container(s) supplied by ALS ?	☒	☐	☐
3 Did sample containers arrive in good condition?	☒	☐	☐
4 Were chain-of-custody papers used and filled out?	☒	☐	☐
5 Did sample container labels and/or tags agree with custody papers?	☒	☐	☐
6 Was sample volume received adequate for analysis?	☒	☐	☐
7 Are samples within specified holding times?	☒	☐	☐
8 Was proper temperature (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9 Was a trip blank received?	☐	☒	☐
10 Were custody seals on outside of cooler/Box?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
Were custody seals on outside of sample container?	☐	☐	☒
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
11 Do containers have appropriate preservation , according to method/SOP or Client specified information?	☐	☐	☒
Is there a client indication that the submitted samples are pH preserved?	☐	☐	☒
Were VOA vials checked for presence/absence of air bubbles?	☐	☐	☒
Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	☐	☐	☒
12 Tubes: Are the tubes capped and intact?	☐	☐	☒
Do they contain moisture?	☐	☐	☒
13 Badges: Are the badges properly capped and intact?	☐	☐	☒
Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1500781-001.01	10 L Tedlar Bag					
P1500781-002.01	5.0 L Tedlar Bag					
P1500781-003.01	10 L Tedlar Bag					
P1500781-004.01	5.0 L Tedlar Bag					
P1500781-005.01	10 L Tedlar Bag					
P1500781-006.01	5.0 L Tedlar Bag					
P1500781-007.01	10 L Tedlar Bag					
P1500781-008.01	5.0 L Tedlar Bag					

Explain any discrepancies: (include lab sample ID numbers): _____

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R3-0-30-0%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500781
 ALS Sample ID: P1500781-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 2/27/15
Date Received: 2/28/15
Date Analyzed: 3/1/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.0	0.10	
7727-37-9	Nitrogen	80.1	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.96	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R4-30-70-30%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500781
ALS Sample ID: P1500781-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 2/27/15
Date Received: 2/28/15
Date Analyzed: 3/1/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.8	0.10	
7727-37-9	Nitrogen	79.8	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.39	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R5-30-70-30%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500781
ALS Sample ID: P1500781-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 2/27/15
Date Received: 2/28/15
Date Analyzed: 3/1/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	15.4	0.10	
7727-37-9	Nitrogen	79.7	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	4.95	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R6-30-70-30%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500781
ALS Sample ID: P1500781-007

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: 2/27/15
Date Received: 2/28/15
Date Analyzed: 3/1/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	16.0	0.10	
7727-37-9	Nitrogen	79.5	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	4.50	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: Method Blank
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500781
ALS Sample ID: P150301-MB

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Wade Henton
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/01/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	ND	0.10	
7727-37-9	Nitrogen	ND	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011507.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 4:29 pm
Operator : WH
Sample : 0781-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:14 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.128	213329	129091.116 ppm
3) Nitrogen	2.253	1420132	739654.720 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.705	118490	55073.748 ppm

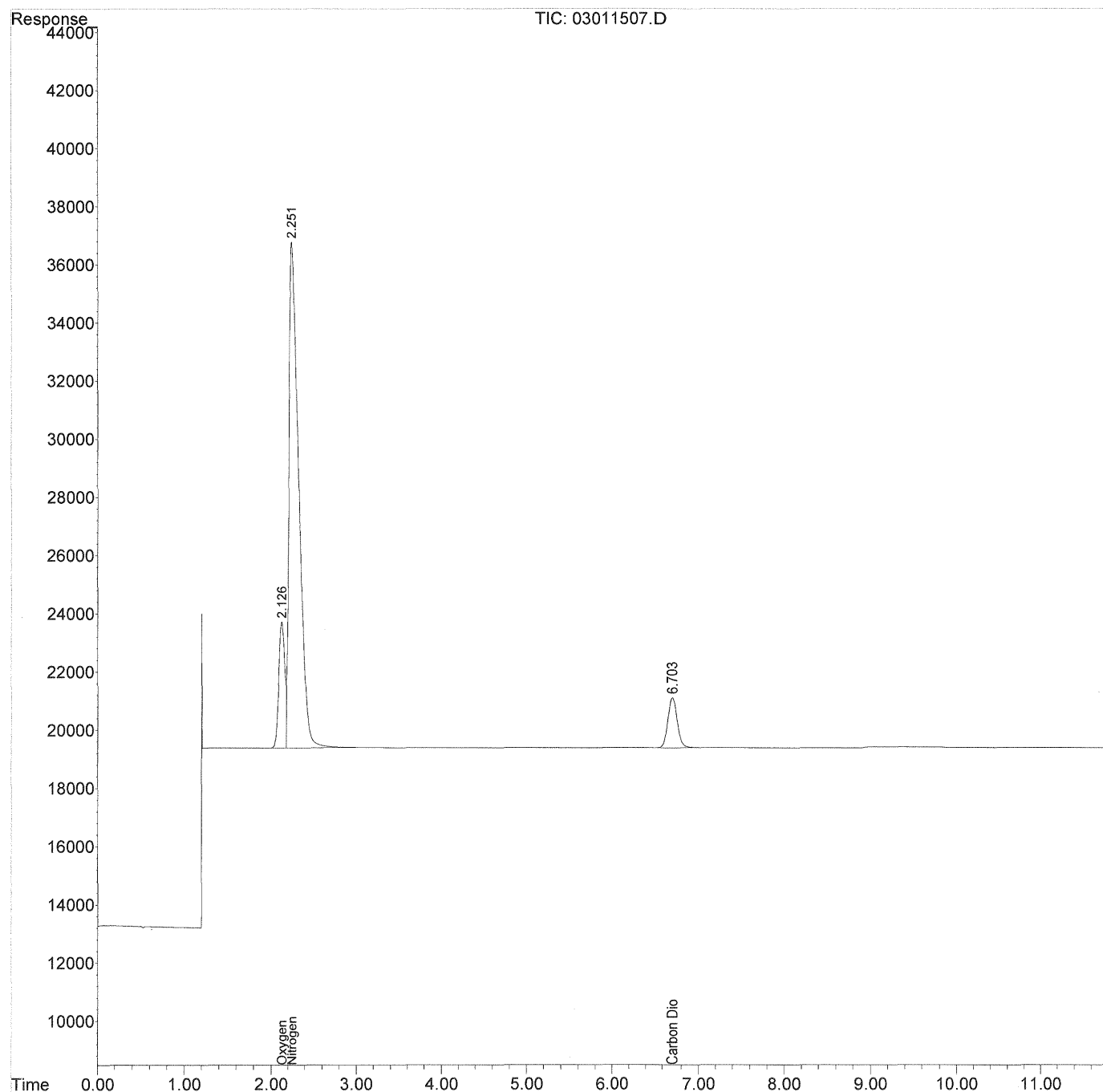
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Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011507.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 4:29 pm
Operator : WH
Sample : 0781-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:14 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
 Data File : 03011508.D
 Signal(s) : TCD1A.CH
 Acq On : 1 Mar 2015 4:44 pm
 Operator : WH
 Sample : 0781-001
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 02 08:47:17 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.124	213093	128948.158	ppm
3) Nitrogen	2.249	1420167	739673.027	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.703	118619	55133.516	ppm

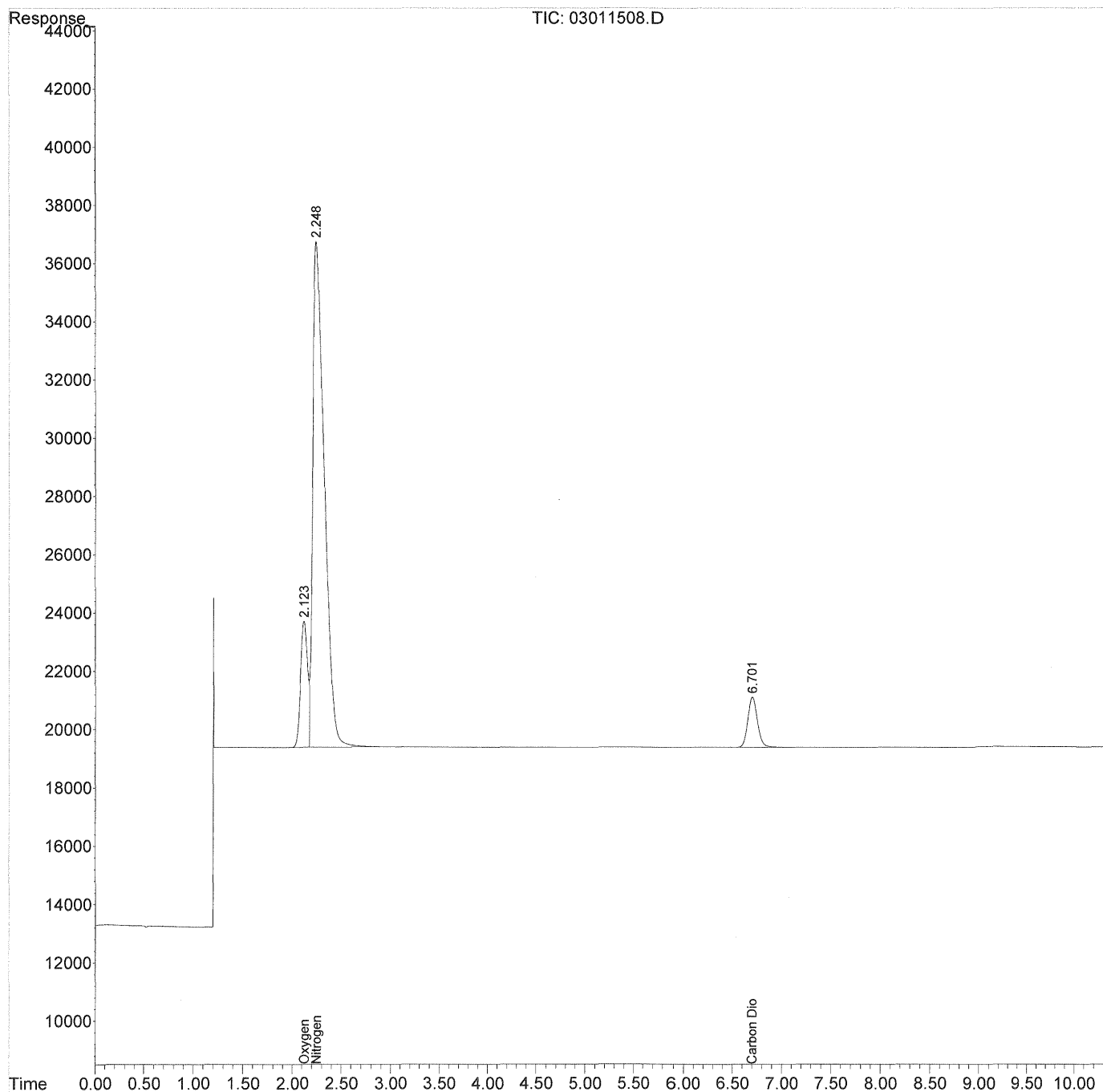
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011508.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 4:44 pm
Operator : WH
Sample : 0781-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:17 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011509.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 4:58 pm
Operator : WH
Sample : 0781-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:20 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.127	212418	128540.064 ppm
3) Nitrogen	2.253	1415178	737074.620 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.704	118085	54885.647 ppm

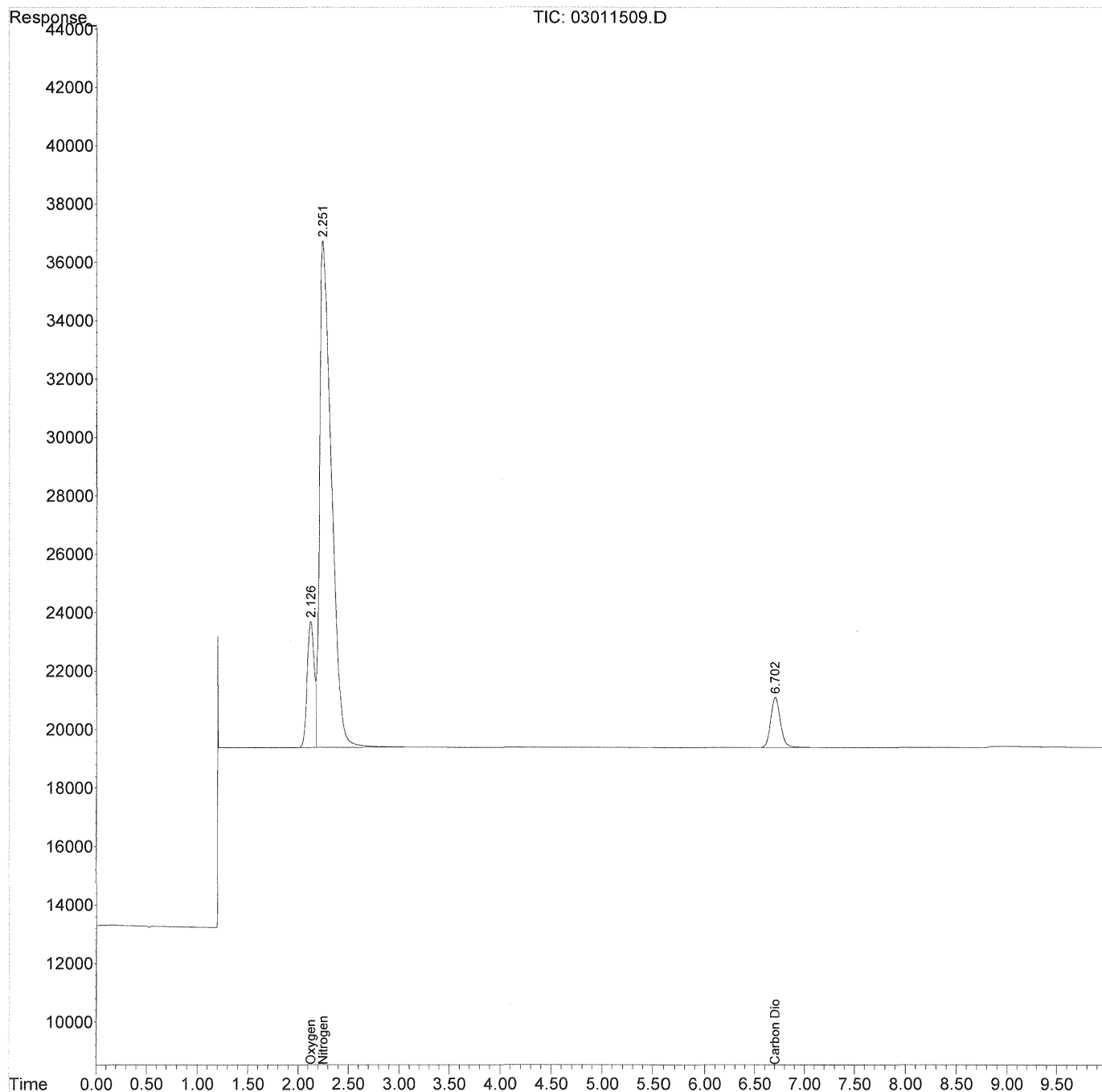
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Data File : 03011509.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 4:58 pm
Operator : WH
Sample : 0781-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:20 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011510.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 5:11 pm
Operator : WH
Sample : 0781-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:23 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.135	224587	135903.918 ppm
3) Nitrogen	2.261	1408506	733599.777 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.707	106725	49605.514 ppm

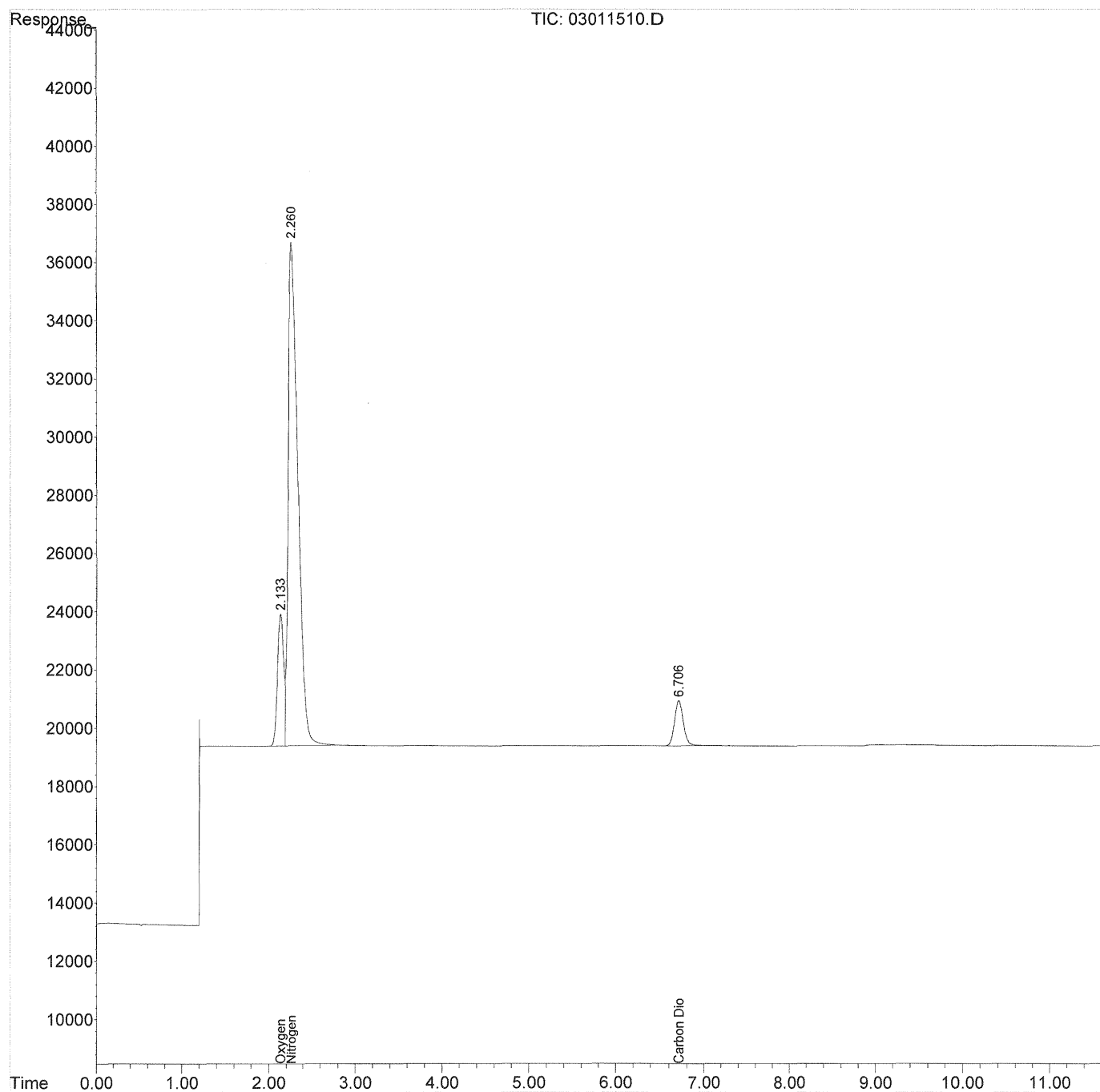
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Data File : 03011510.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 5:11 pm
Operator : WH
Sample : 0781-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:23 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011511.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 5:26 pm
Operator : WH
Sample : 0781-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:26 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.123	224931	136111.972 ppm
3) Nitrogen	2.249	1415168	737069.168 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.705	107076	49768.453 ppm

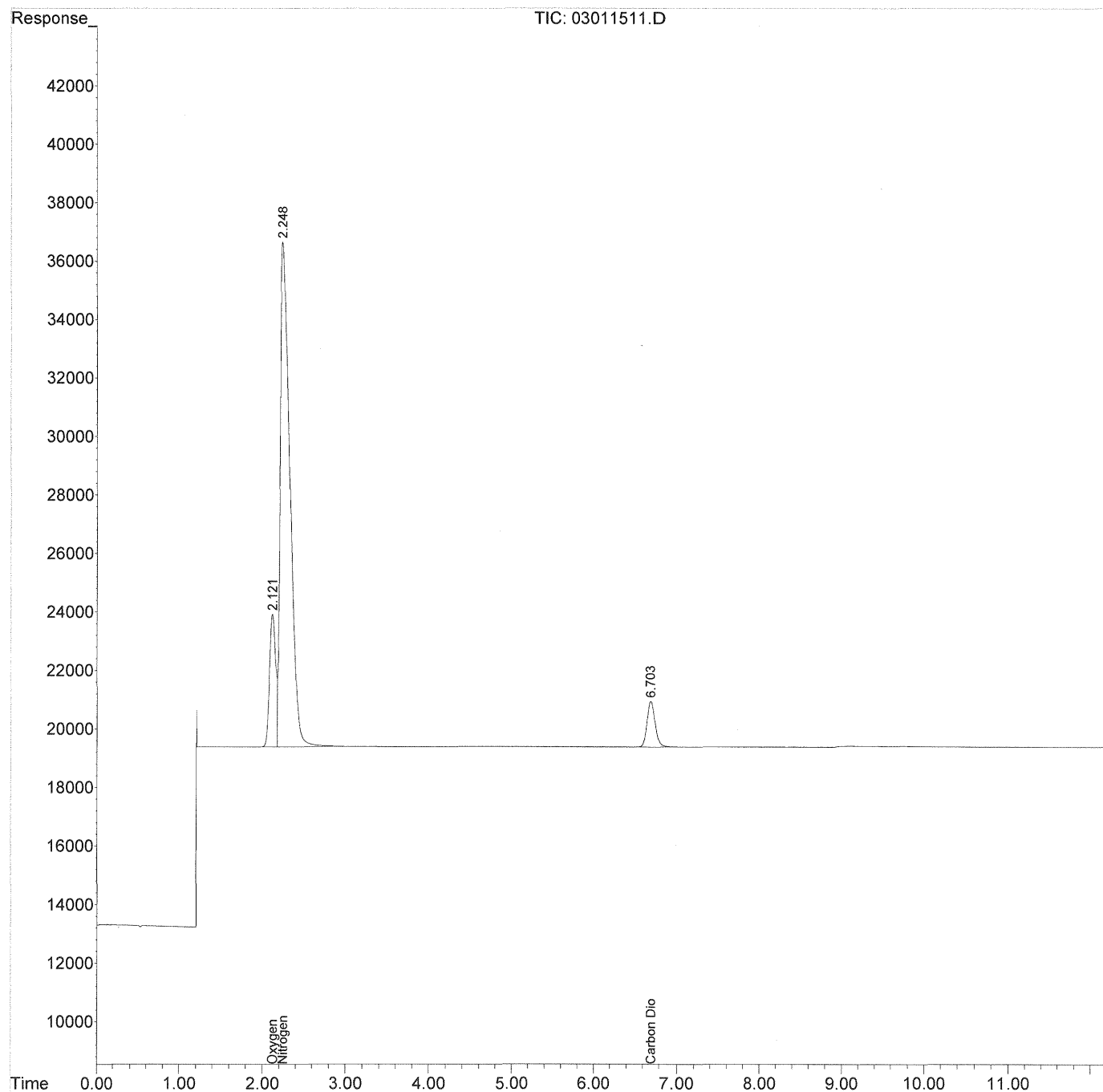
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011511.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 5:26 pm
Operator : WH
Sample : 0781-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:26 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011512.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 5:42 pm
Operator : WH
Sample : 0781-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:30 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.125	225435	136416.826 ppm
3) Nitrogen	2.252	1418013	738551.188 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.705	106956	49712.825 ppm

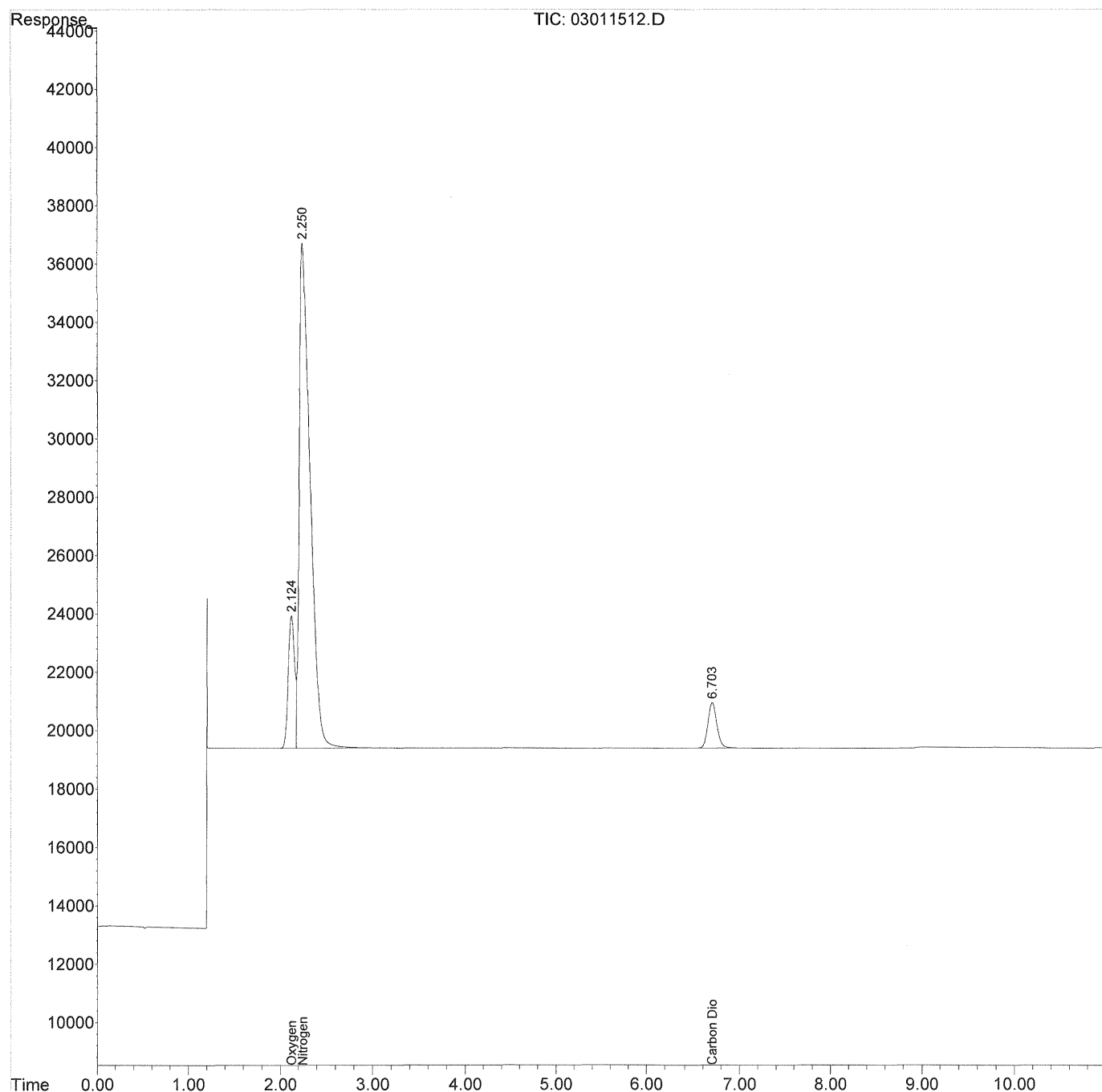
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011512.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 5:42 pm
Operator : WH
Sample : 0781-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:30 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011513.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 5:57 pm
Operator : WH
Sample : 0781-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:34 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.140	234932	142163.900 ppm
3) Nitrogen	2.267	1409441	734086.489 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.708	98183	45635.202 ppm

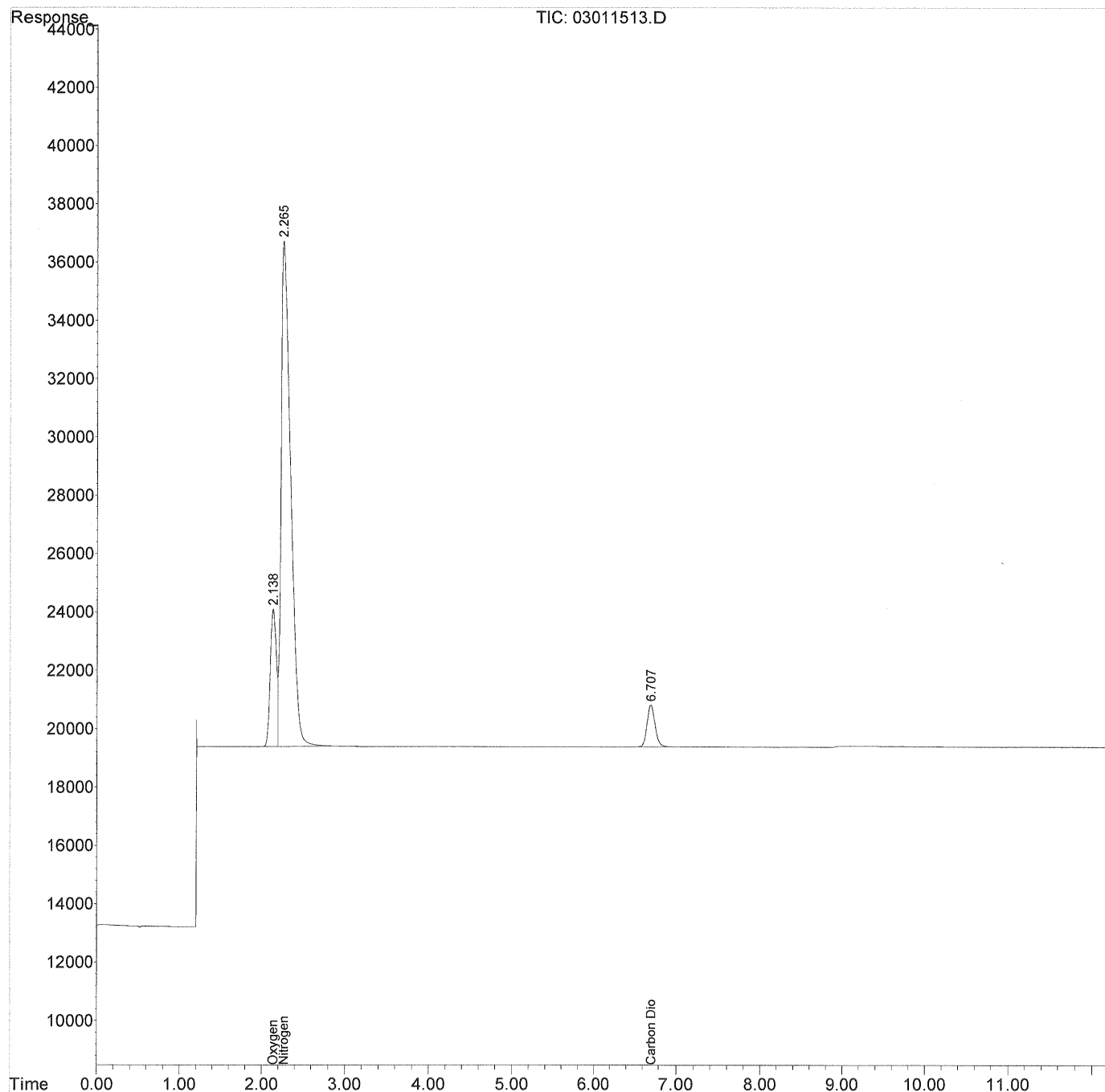
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011513.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 5:57 pm
Operator : WH
Sample : 0781-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:34 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011514.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 6:13 pm
Operator : WH
Sample : 0781-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:37 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.123	234518	141913.334 ppm
3) Nitrogen	2.251	1411495	735156.254 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.705	98345	45710.446 ppm

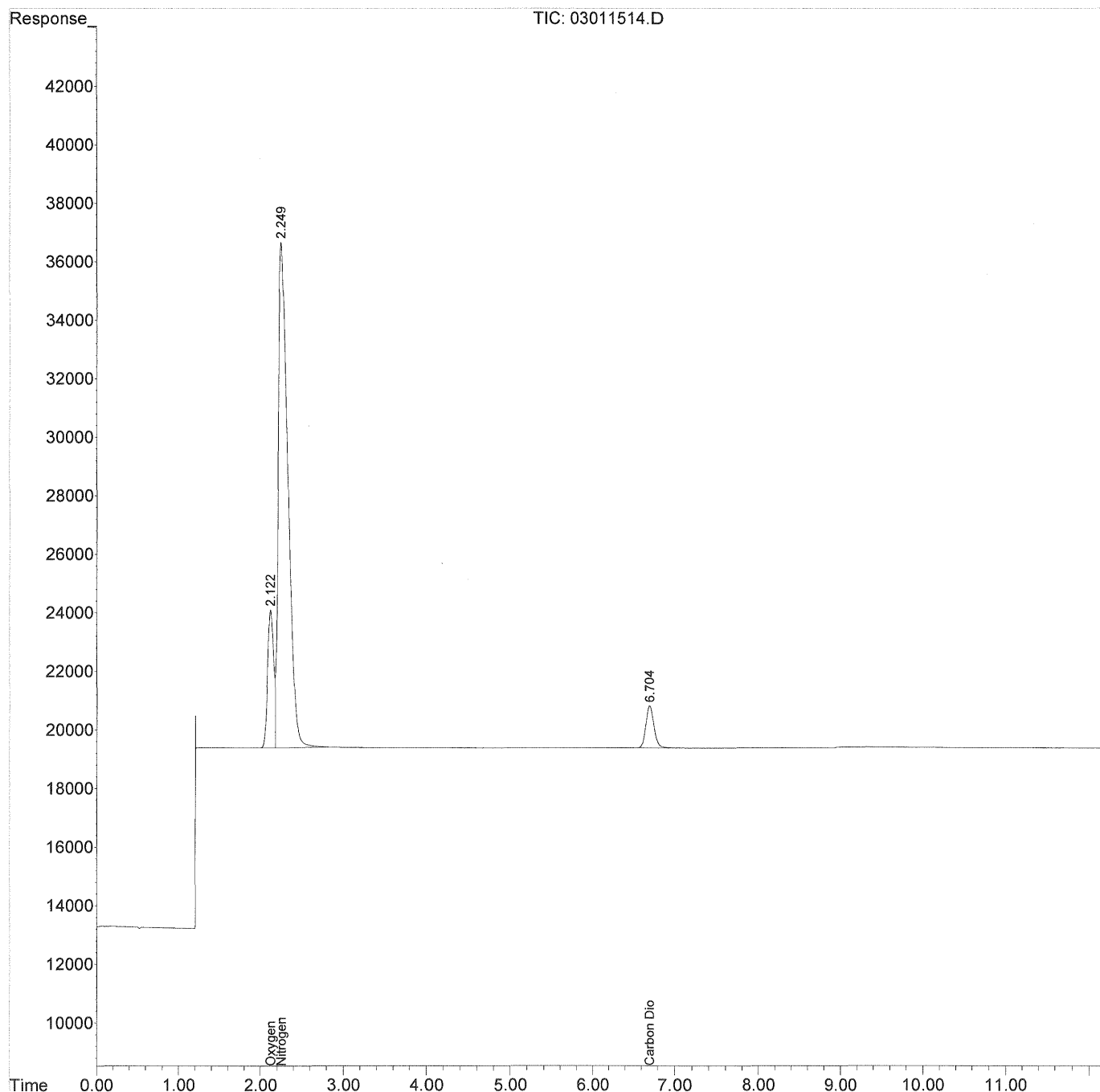
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011514.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 6:13 pm
Operator : WH
Sample : 0781-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:37 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011515.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 6:29 pm
Operator : WH
Sample : 0781-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:40 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.125	234262	141757.993 ppm
3) Nitrogen	2.252	1411047	734923.012 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.706	97879	45493.980 ppm

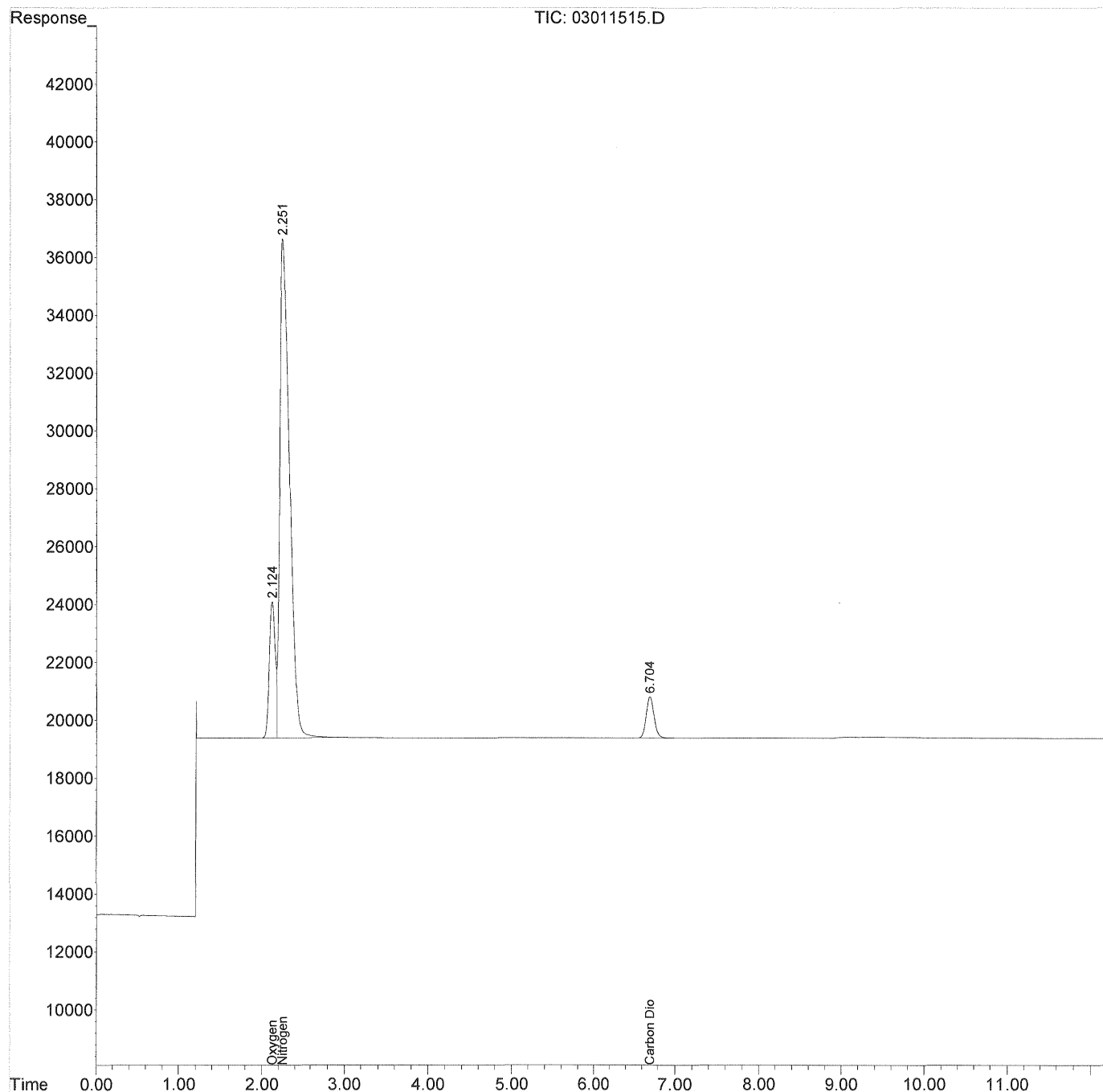
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011515.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 6:29 pm
Operator : WH
Sample : 0781-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:40 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011516.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 6:45 pm
Operator : WH
Sample : 0781-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:43 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.127	244516	147963.169 ppm
3) Nitrogen	2.255	1413708	736309.113 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.706	89876	41773.915 ppm

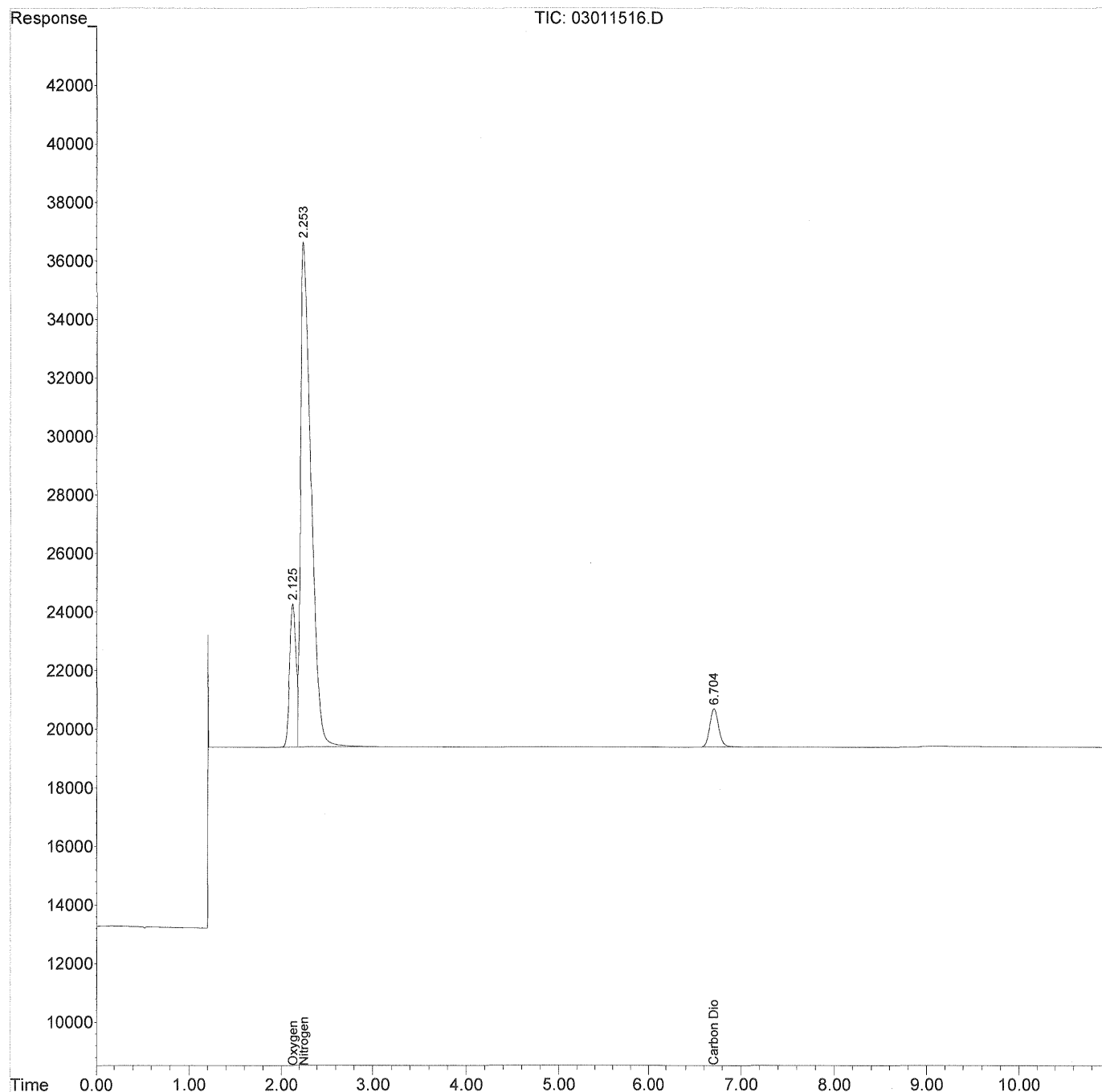
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011516.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 6:45 pm
Operator : WH
Sample : 0781-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:43 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011517.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 6:59 pm
Operator : WH
Sample : 0781-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:46 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.113	244025	147666.172 ppm
3) Nitrogen	2.241	1412260	735554.908 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.704	89569	41631.194 ppm

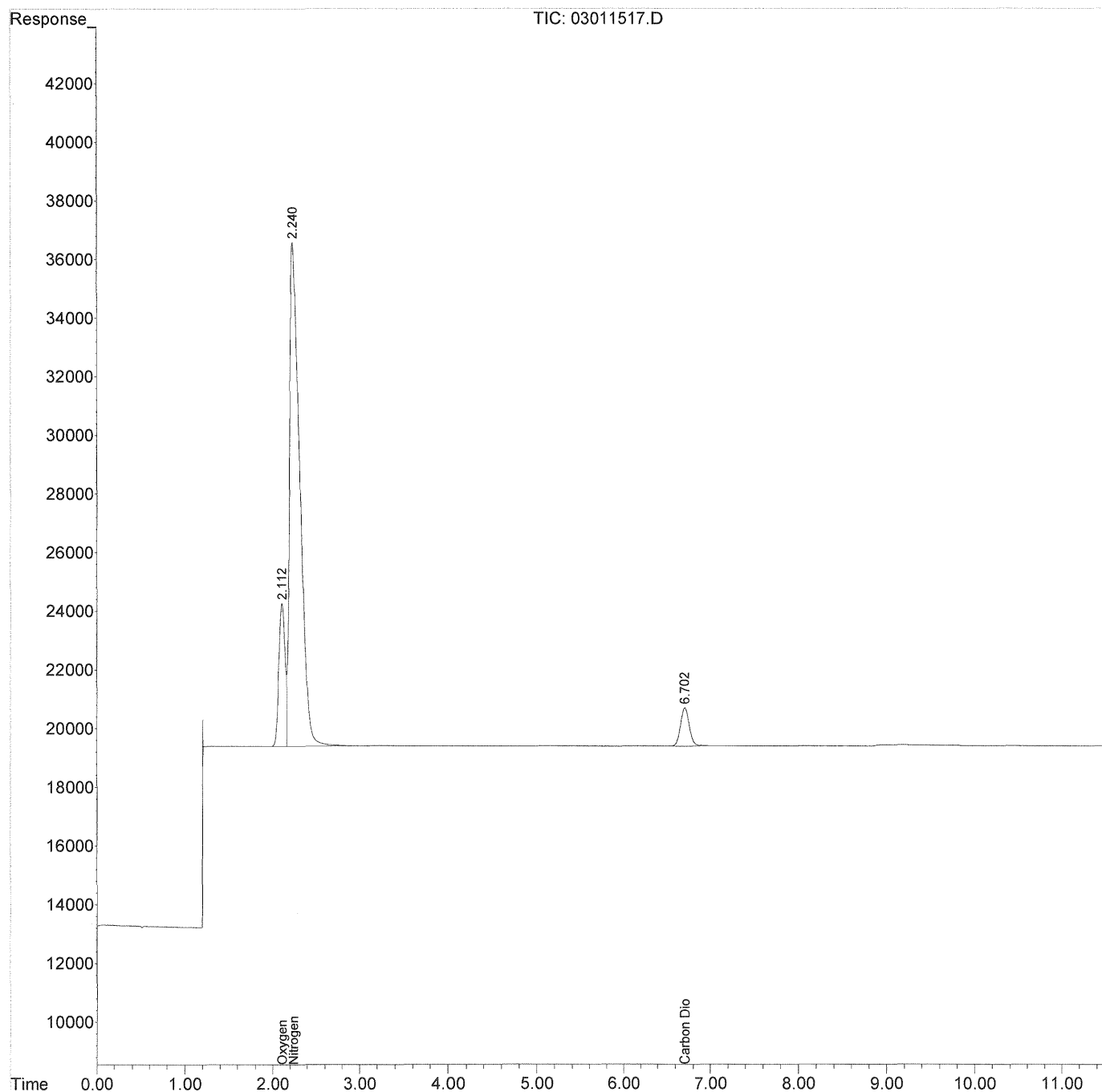
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011517.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 6:59 pm
Operator : WH
Sample : 0781-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:46 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011518.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 7:14 pm
Operator : WH
Sample : 0781-007
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:49 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.140	243165	147145.705 ppm
3) Nitrogen	2.268	1402613	730530.090 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.707	89025	41378.566 ppm

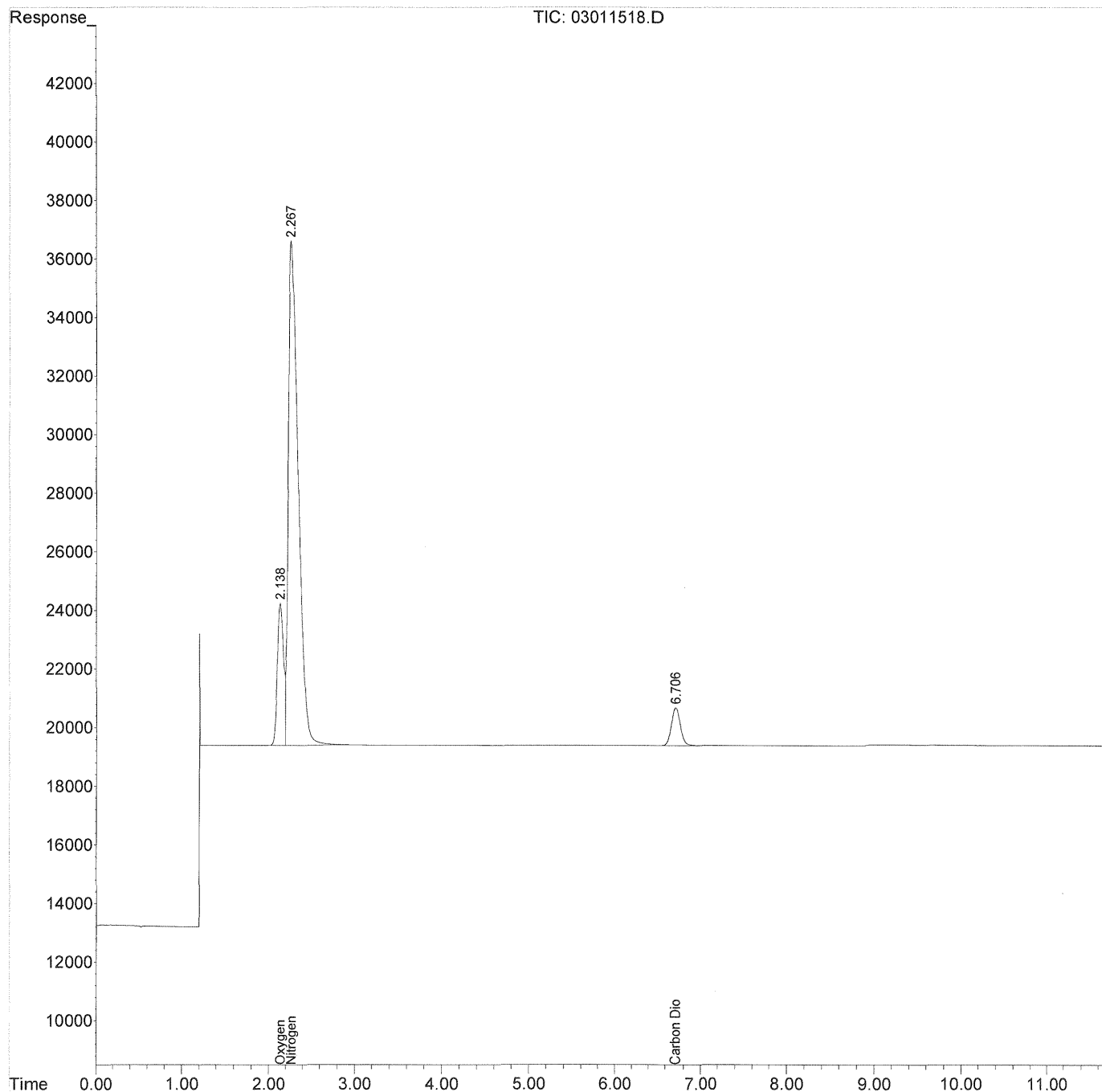
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
 Data File : 03011518.D
 Signal(s) : TCD1A.CH
 Acq On : 1 Mar 2015 7:14 pm
 Operator : WH
 Sample : 0781-007
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 02 08:47:49 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011503.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 3:29 pm
Operator : WH
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:08 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	0.000	0	N.D.	ppm
3) Nitrogen	0.000	0	N.D.	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	0.000	0	N.D.	ppm

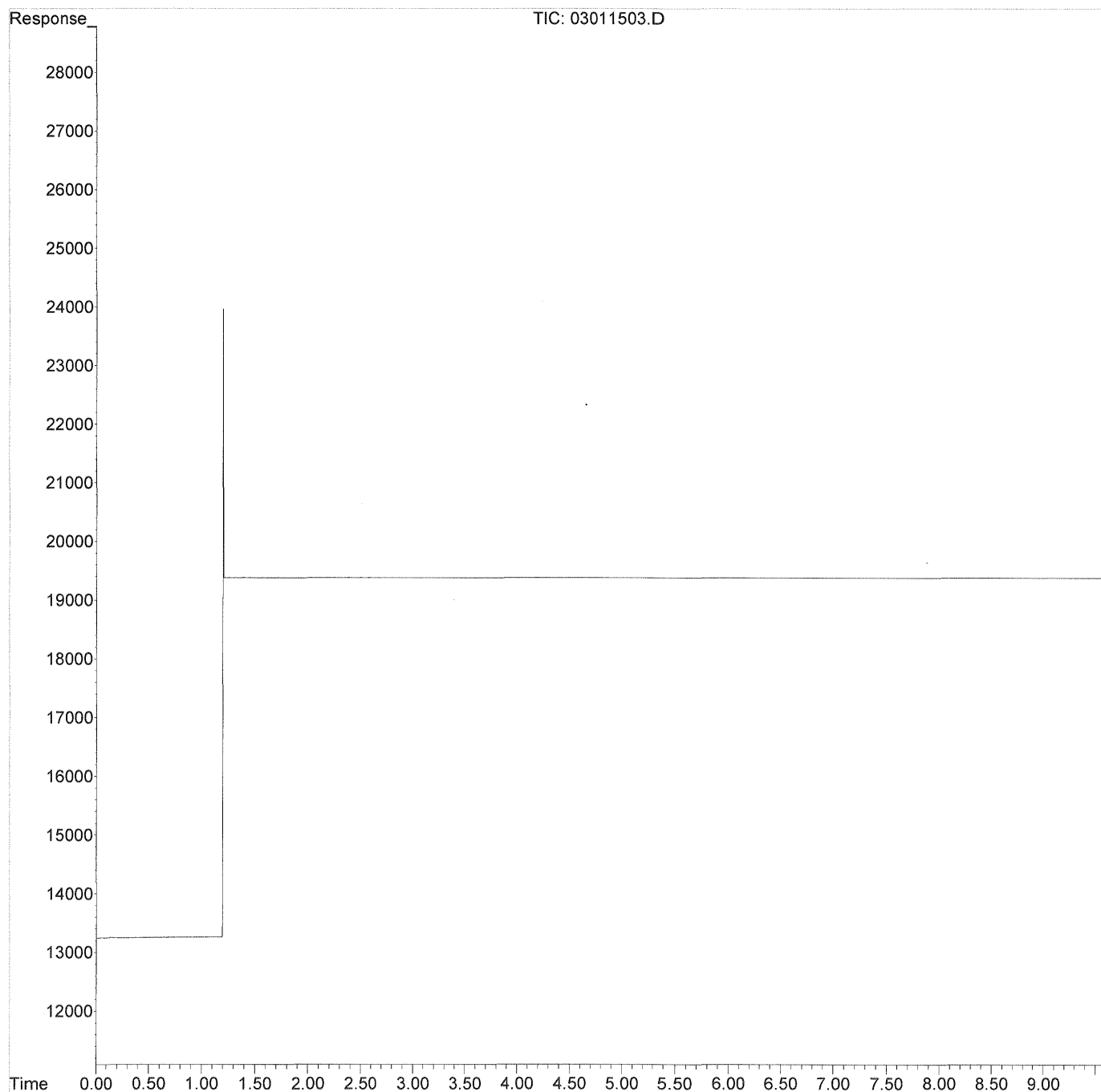
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011503.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 3:29 pm
Operator : WH
Sample : mb
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:08 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



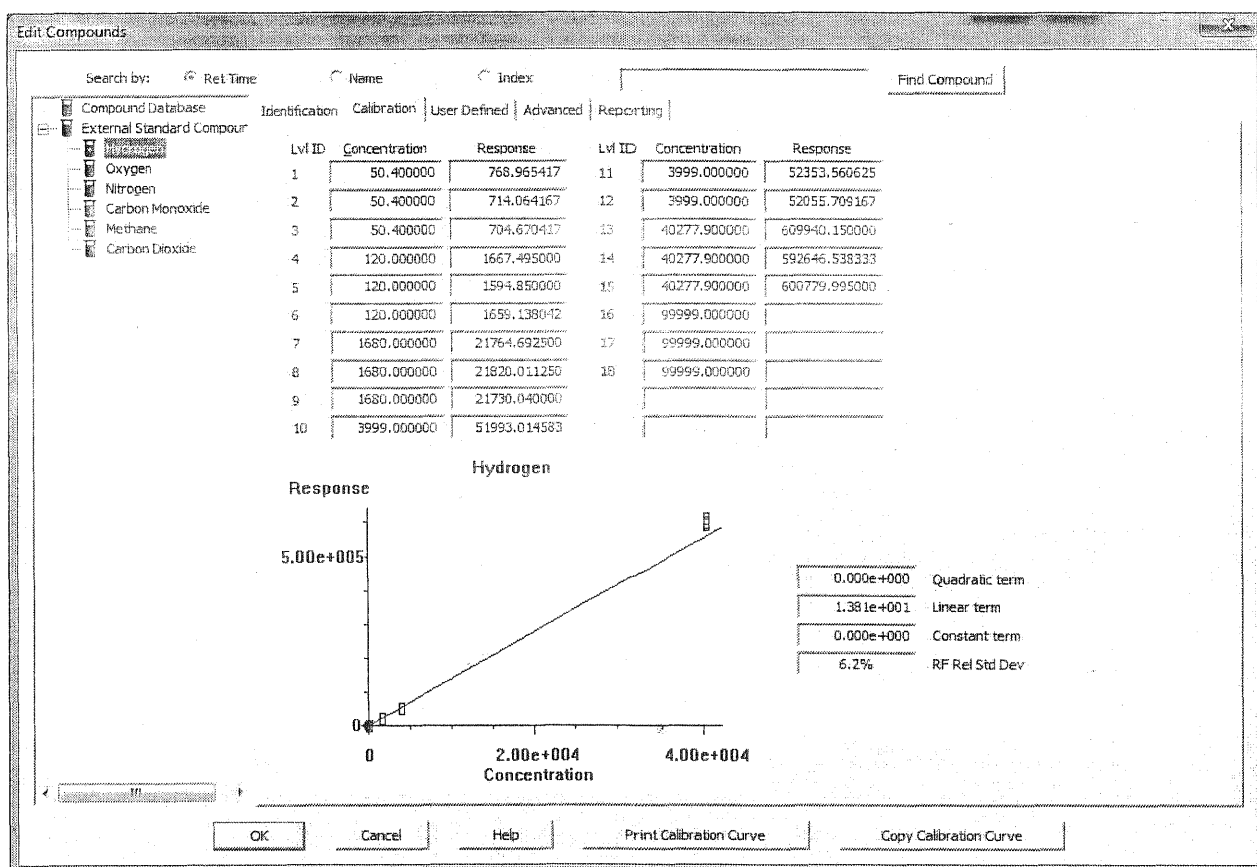
Method Path : J:\GC01\METHODS\
 Method File : TR031014.M
 Title : EPA 3C GC/TCD Analysis for Fixed Gases
 Last Update : Tue Mar 11 11:04:23 2014
 Response Via : Initial Calibration

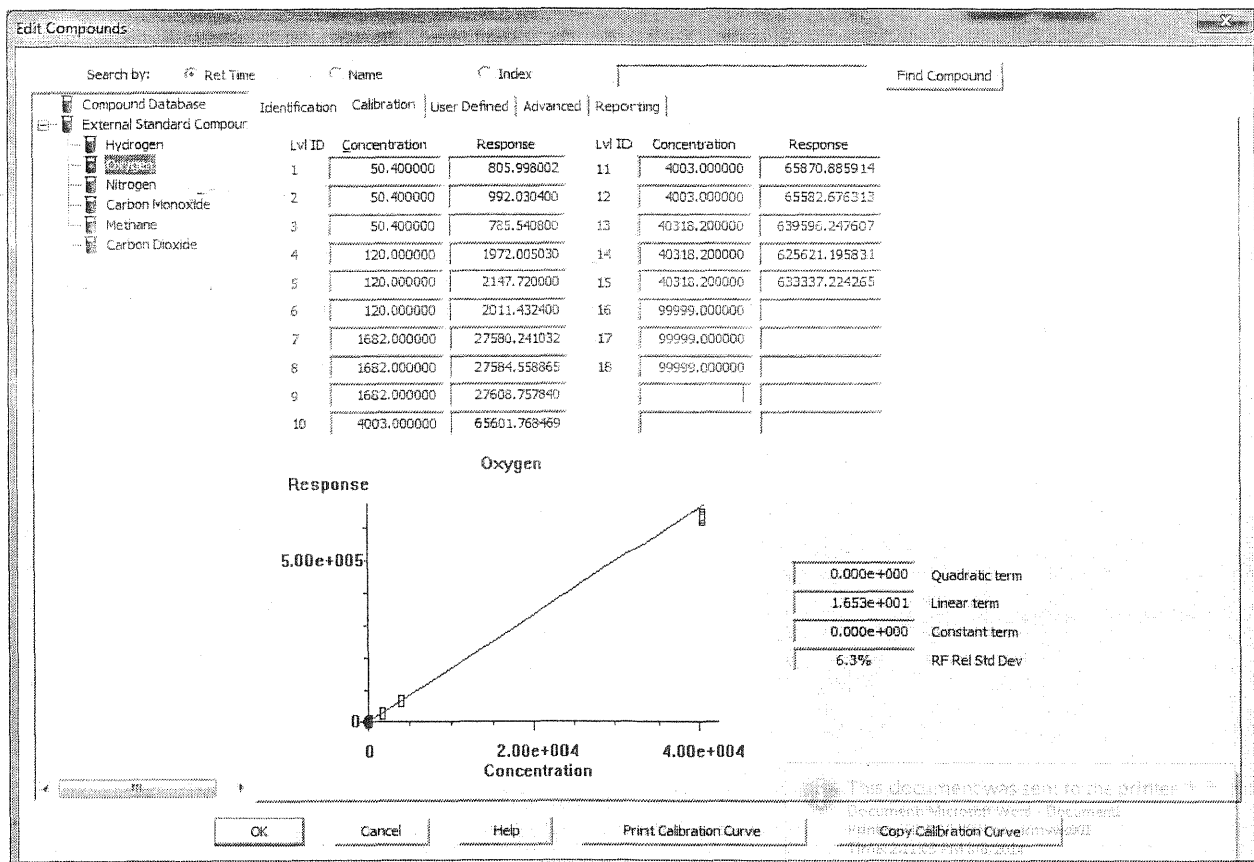
Calibration Files

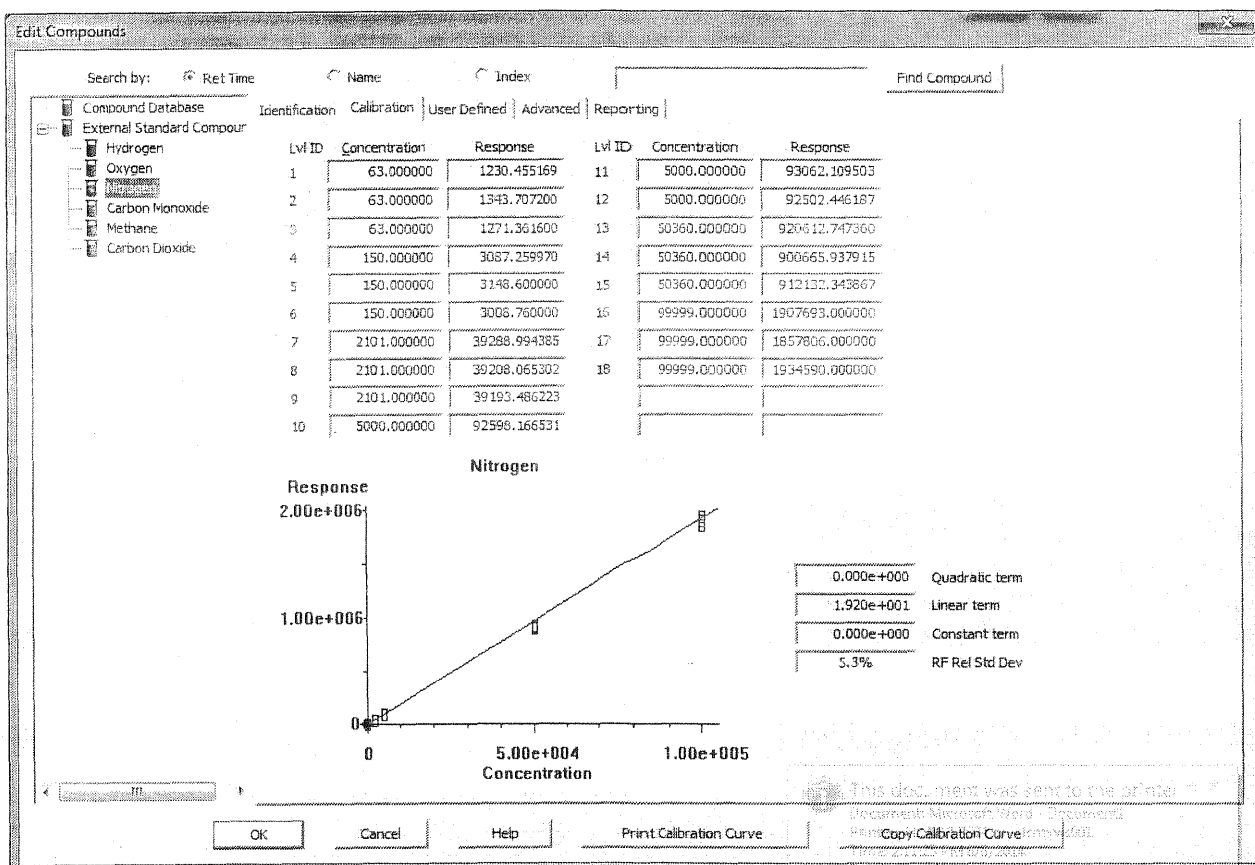
1	=03101403.D	2	=03101404.D	3	=03101405.D
4	=03101406.D	5	=03101407.D	6	=03101408.D

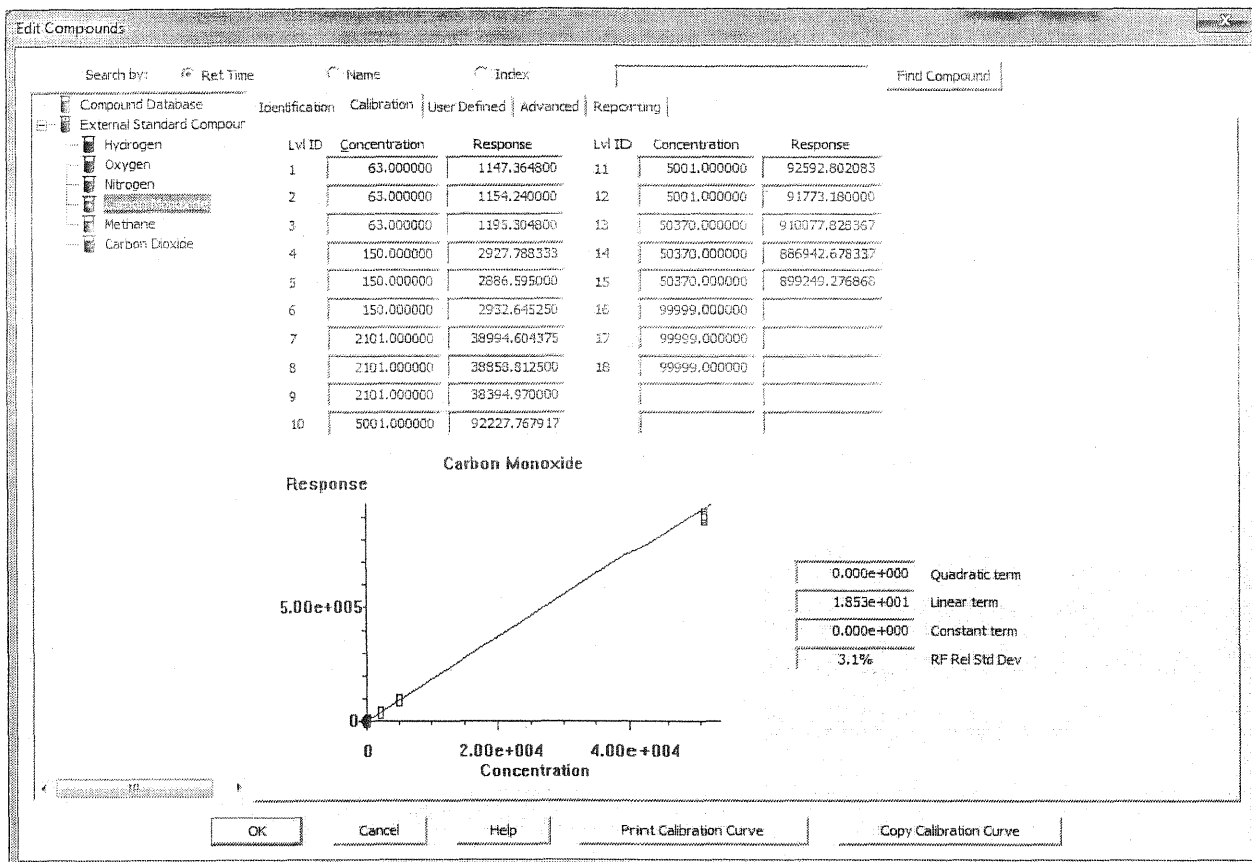
	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Hydrogen	1.526	1.417	1.398	1.390	1.329	1.383	1.381	E1	6.22
2)	Oxygen	1.599	1.968	1.559	1.643	1.790	1.676	1.653	E1	6.33
3)	Nitrogen	1.953	2.133	2.018	2.058	2.099	2.006	1.920	E1	5.33
4)	Carbon Monoxide	1.821	1.832	1.897	1.952	1.924	1.955	1.853	E1	3.06
5)	Methane	1.435	1.340	1.378	1.499	1.440	1.406	1.396	E1	3.12
6)	Carbon Dioxide	2.233	2.138	2.113	2.234	2.287	2.291	2.151	E1	3.66

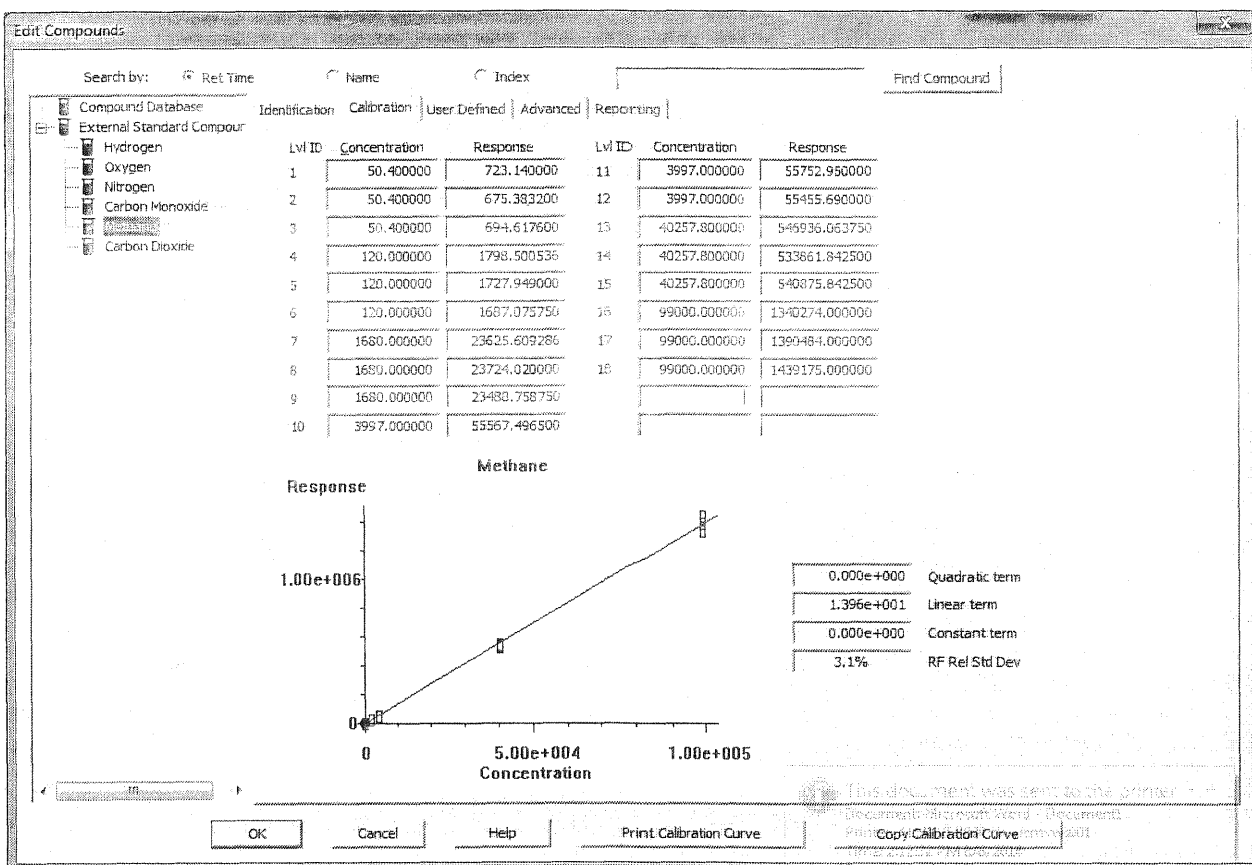
(#) = Out of Range ### Number of calibration levels exceeded format ###

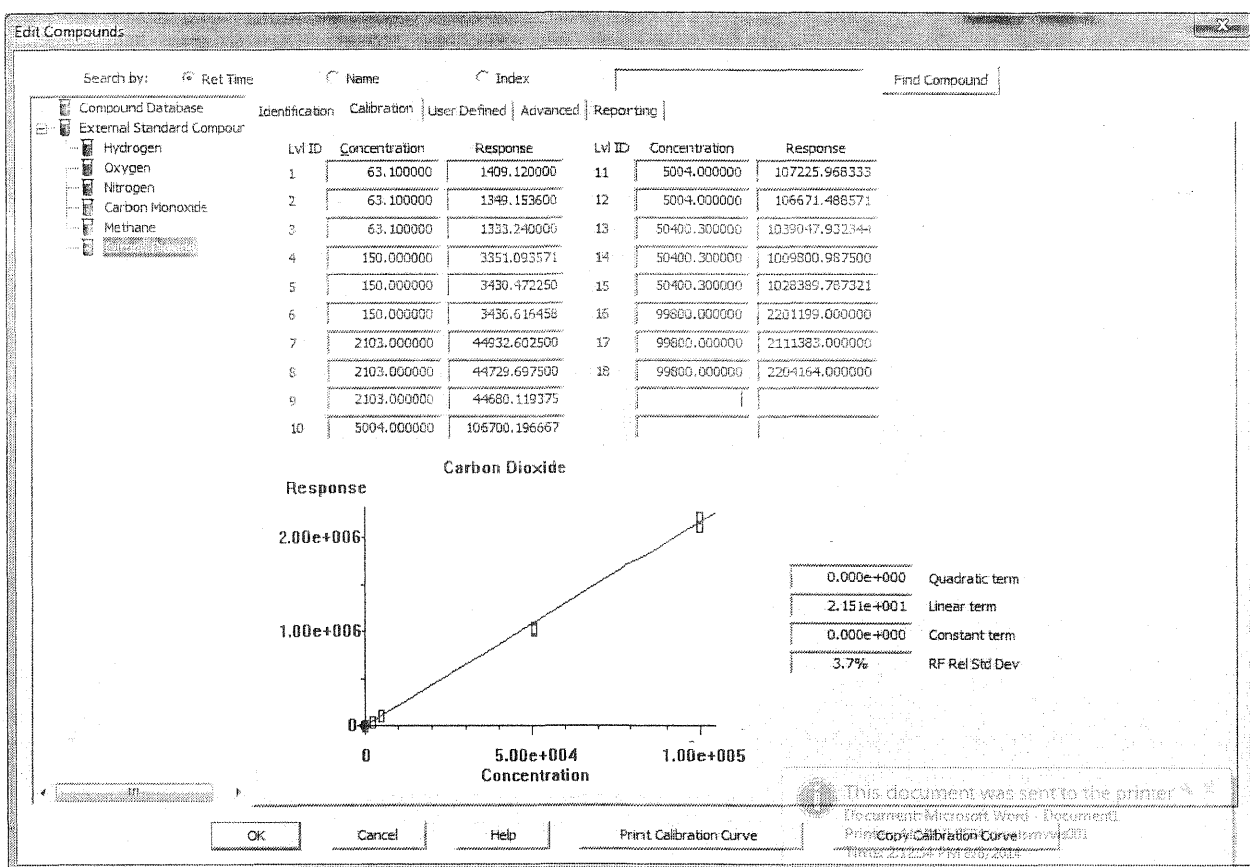








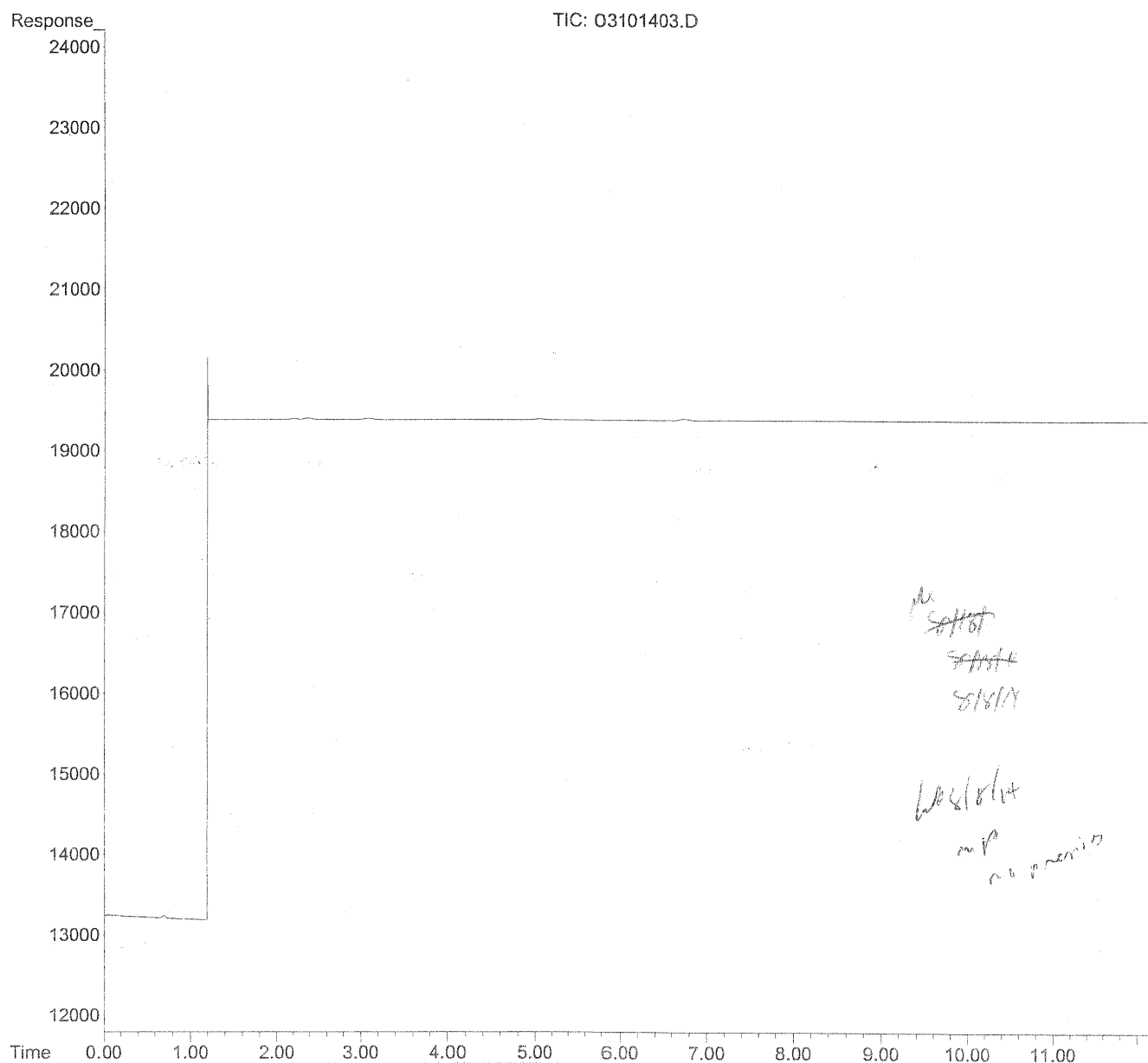




Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101403.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 10:59
Operator : WH
Sample : std 1 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:13:11 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:11:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101403.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 10:59
Operator : WH
Sample : std 1 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:13:11 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:11:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.700	769	NoCal	ppm
2) Oxygen	2.227	806	NoCal	ppm m
3) Nitrogen	2.393	1230	NoCal	ppm m
4) Carbon Monoxide	3.092	1147	NoCal	ppm m
5) Methane	5.085	723	NoCal	ppm m
6) Carbon Dioxide	6.748	1409	NoCal	ppm m

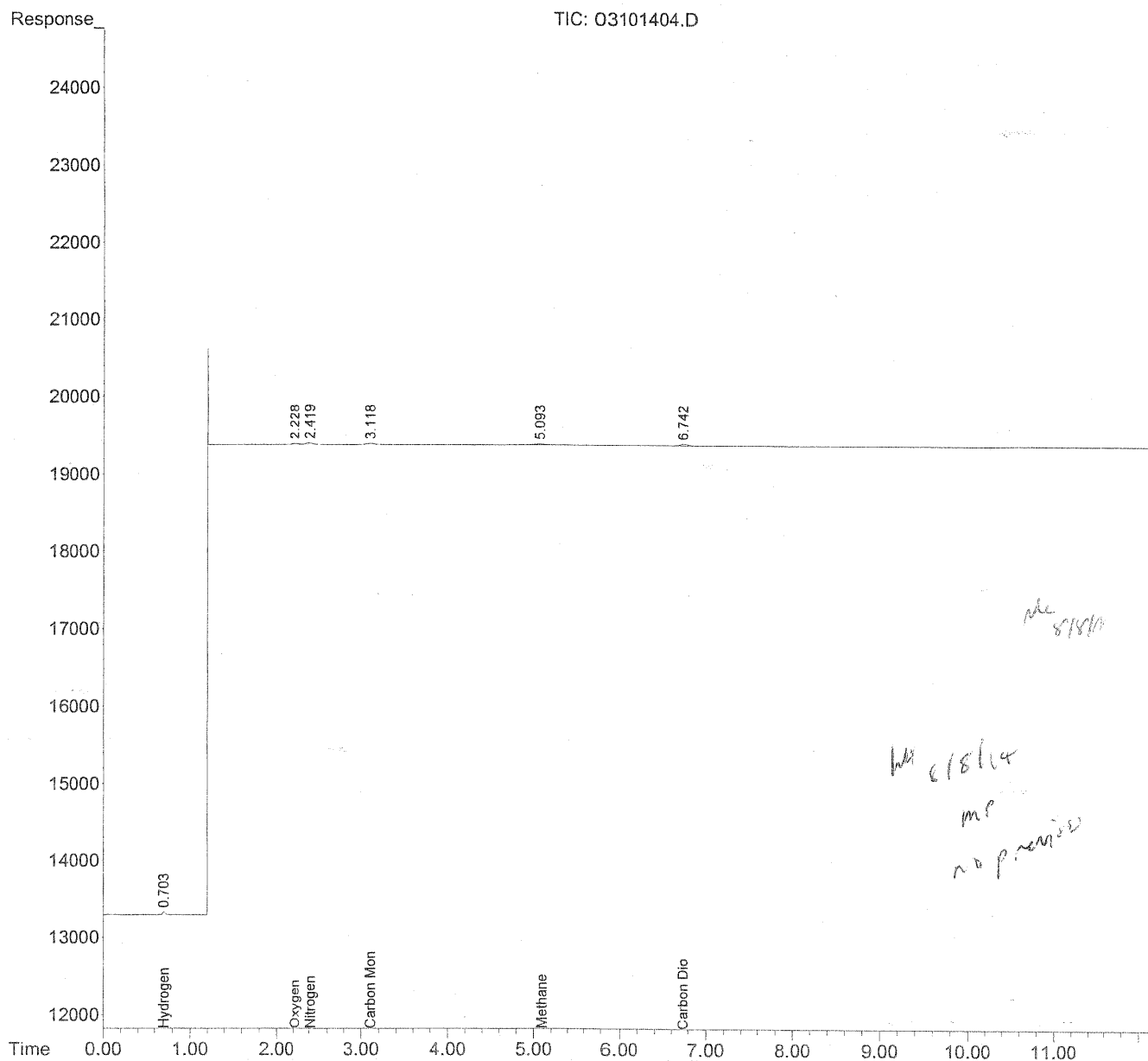
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101404.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:29
Operator : WH
Sample : std 1 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:56:49 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:13:33 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101404.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 11:29
 Operator : WH
 Sample : std 1 2
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 14:56:49 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 13:13:33 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.704	714	468.016	ppm
2) Oxygen	2.228	992	620.328	ppm m
3) Nitrogen	2.419	1344	687.986	ppm m
4) Carbon Monoxide	3.118	1154	633.775	ppm m
5) Methane	5.093	675	470.715	ppm m
6) Carbon Dioxide	6.742	1349	604.147	ppm m

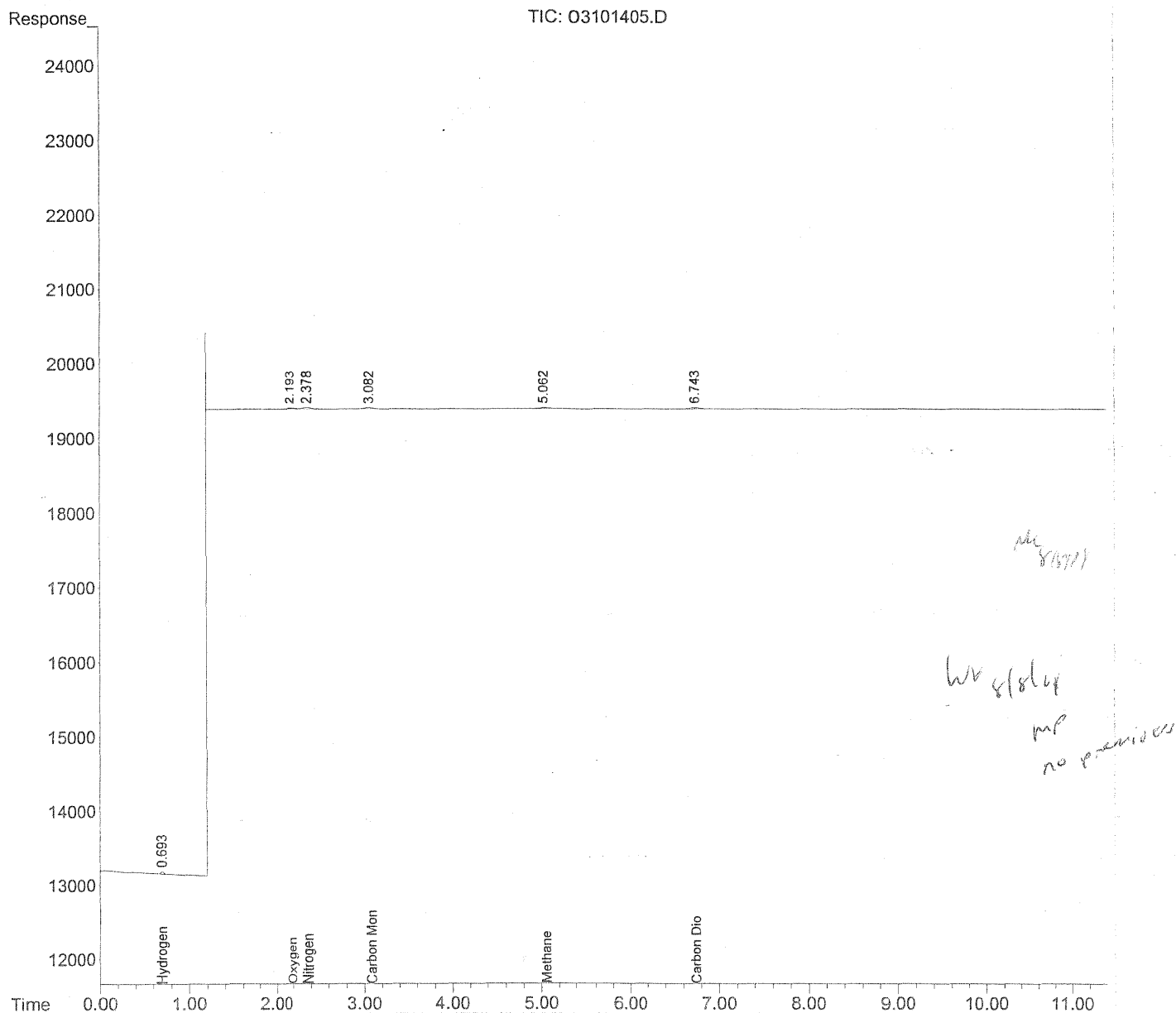
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101405.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 11:44
 Operator : WH
 Sample : std 1 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 13:16:20 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 13:15:04 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101405.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 11:44
 Operator : WH
 Sample : std 1 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 13:16:20 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 13:15:04 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.695	705	478.957	ppm
2) Oxygen	2.193	786	440.385	ppm m
3) Nitrogen	2.378	1271	592.487	ppm m
4) Carbon Monoxide	3.082	1195	654.363	ppm m
5) Methane	5.062	695	500.653	ppm m
6) Carbon Dioxide	6.743	1333	610.001	ppm m

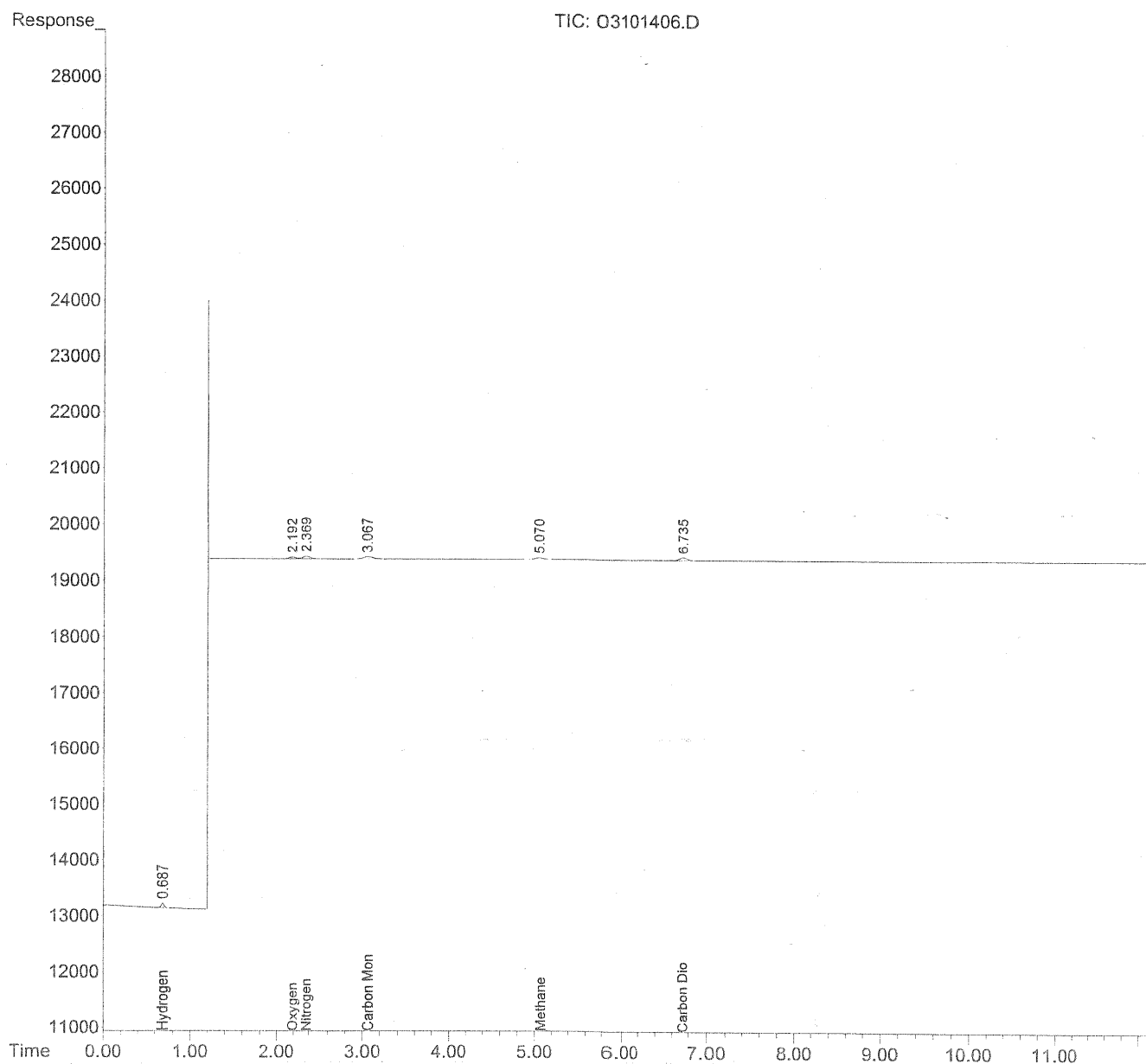
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101406.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:59
Operator : WH
Sample : std 2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:16:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101406.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:59
Operator : WH
Sample : std 2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:16:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.688	1667	1152.467 ppm
2) Oxygen	2.195	1972	1154.090 ppm
3) Nitrogen	2.367	3087	1467.876 ppm
4) Carbon Monoxide	3.067	2928	1582.403 ppm
5) Methane	5.070	1799	1299.164 ppm
6) Carbon Dioxide	6.738	3351	1550.434 ppm

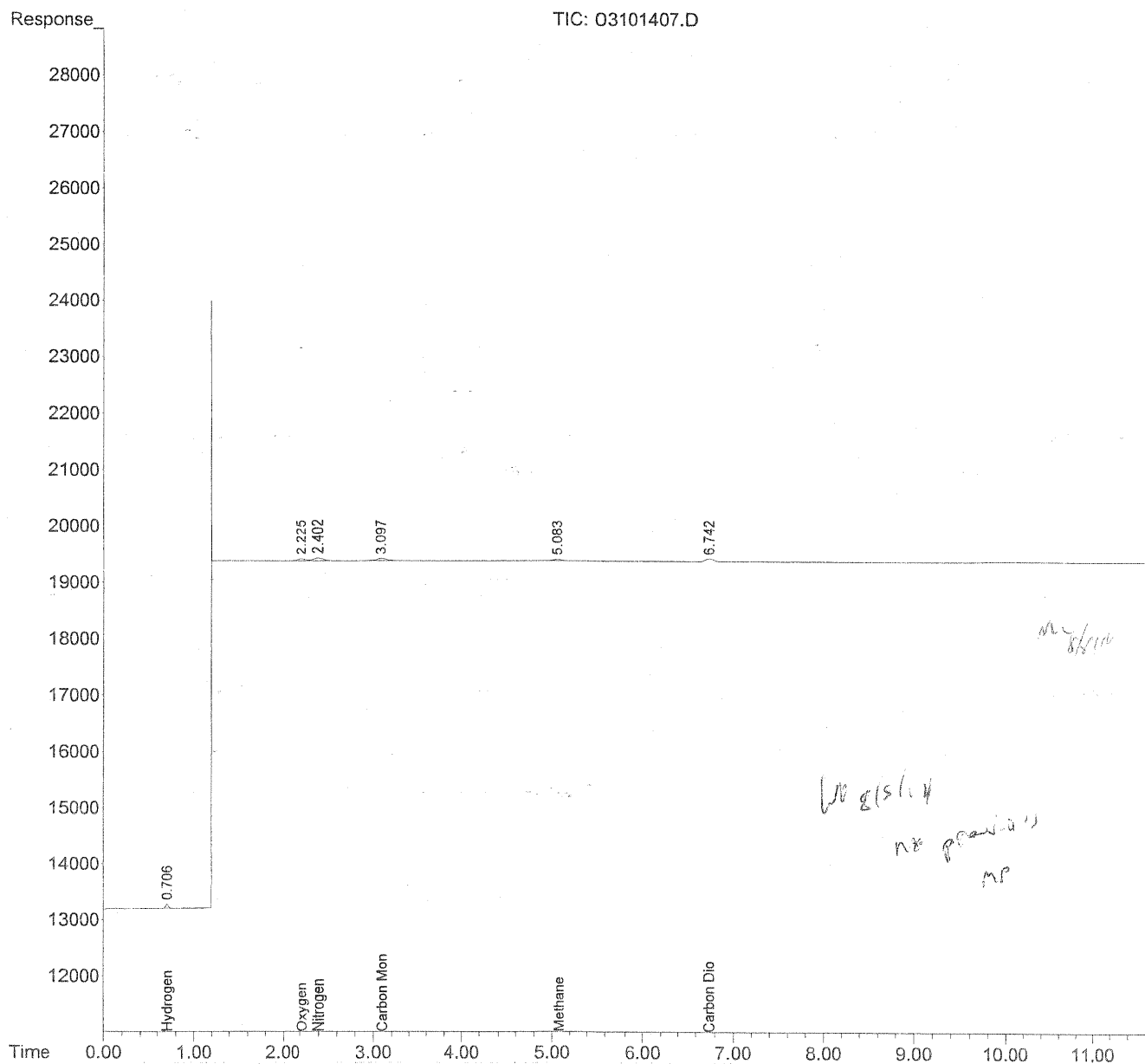
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101407.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:18
Operator : WH
Sample : std 2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:18:19 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:17:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101407.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:18
Operator : WH
Sample : std 2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:18:19 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:17:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.708	1595	1113.284	ppm
2) Oxygen	2.225	2148	1269.063	ppm m
3) Nitrogen	2.402	3149	1505.099	ppm m
4) Carbon Monoxide	3.106	2887	1539.002	ppm
5) Methane	5.082	1728	1222.935	ppm
6) Carbon Dioxide	6.744	3430	1573.930	ppm

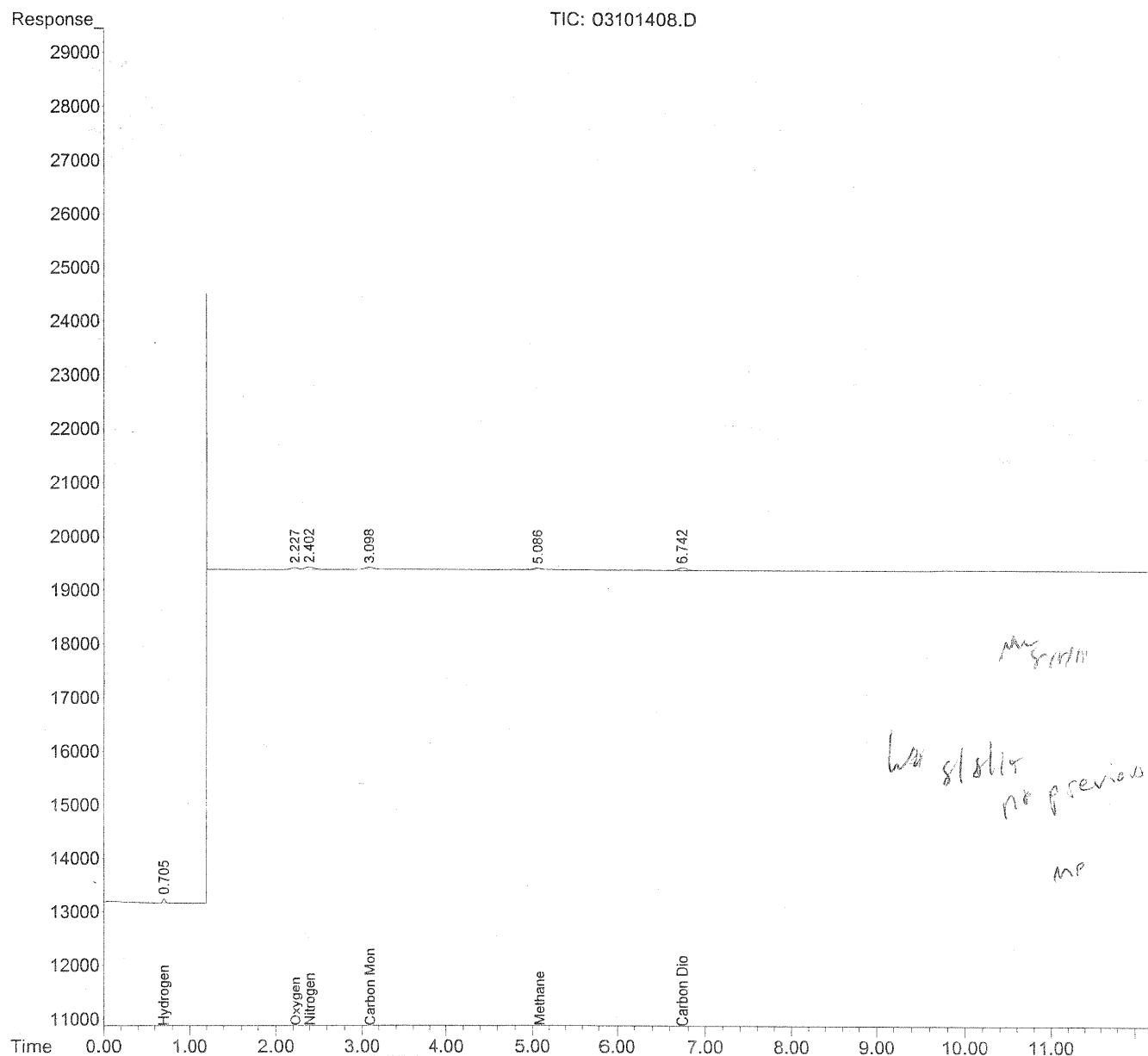
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101408.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:34
Operator : WH
Sample : std 2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:19:15 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:18:37 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101408.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:34
Operator : WH
Sample : std 2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:19:15 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:18:37 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.707	1659	1175.144	ppm
2) Oxygen	2.227	2011	1175.007	ppm m
3) Nitrogen	2.402	3009	1437.275	ppm m
4) Carbon Monoxide	3.103	2933	1555.465	ppm
5) Methane	5.087	1687	1189.461	ppm
6) Carbon Dioxide	6.745	3437	1561.358	ppm

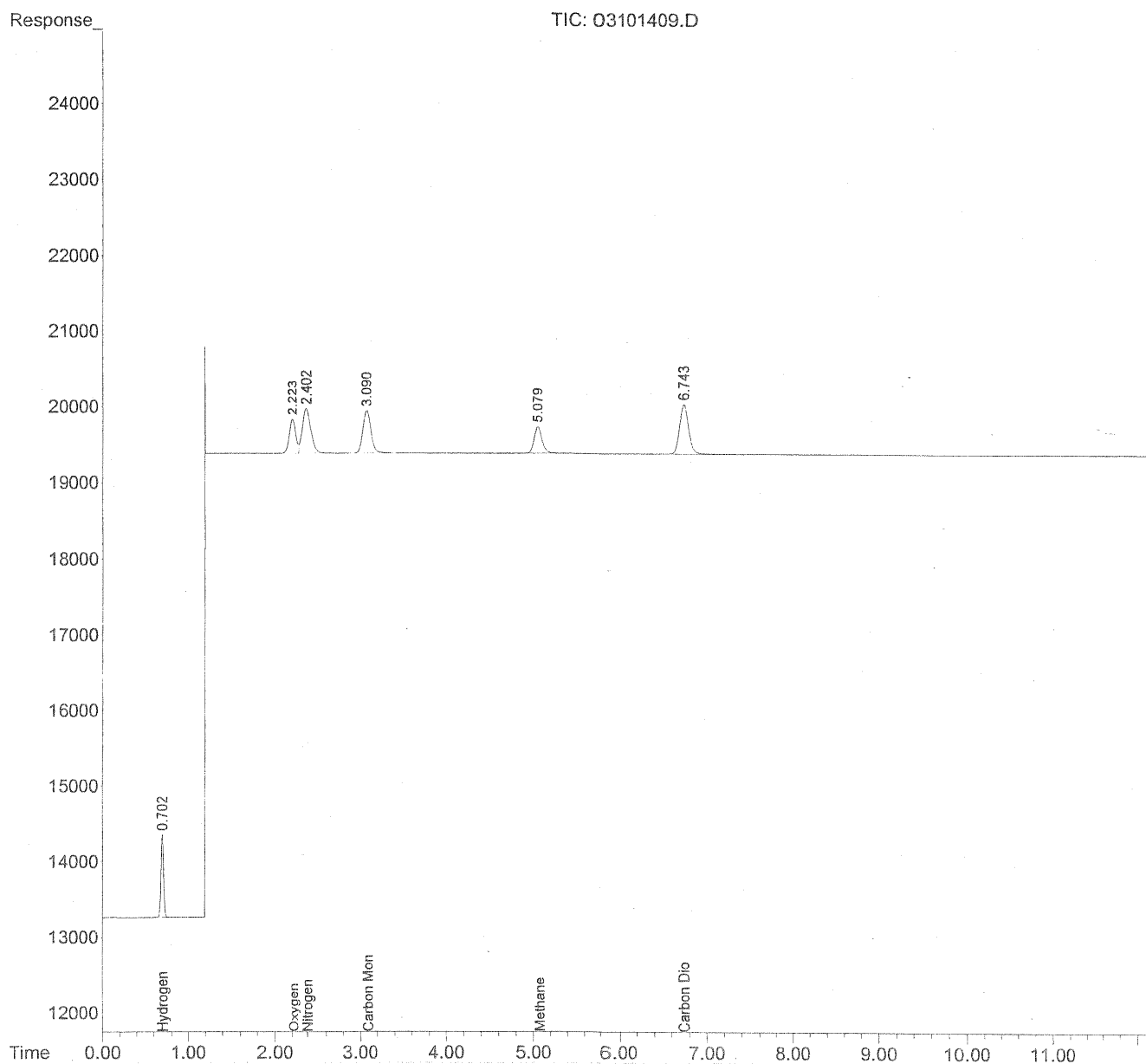
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101409.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:05
Operator : WH
Sample : std 3 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:22:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:19:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101409.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:05
Operator : WH
Sample : std 3 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:22:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:19:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.703	21765	15469.029 ppm
2) Oxygen	2.225	27580	16167.517 ppm
3) Nitrogen	2.402	39289	18899.954 ppm
4) Carbon Monoxide	3.092	38995	20555.928 ppm
5) Methane	5.081	23626	16681.490 ppm
6) Carbon Dioxide	6.744	44933	20275.995 ppm

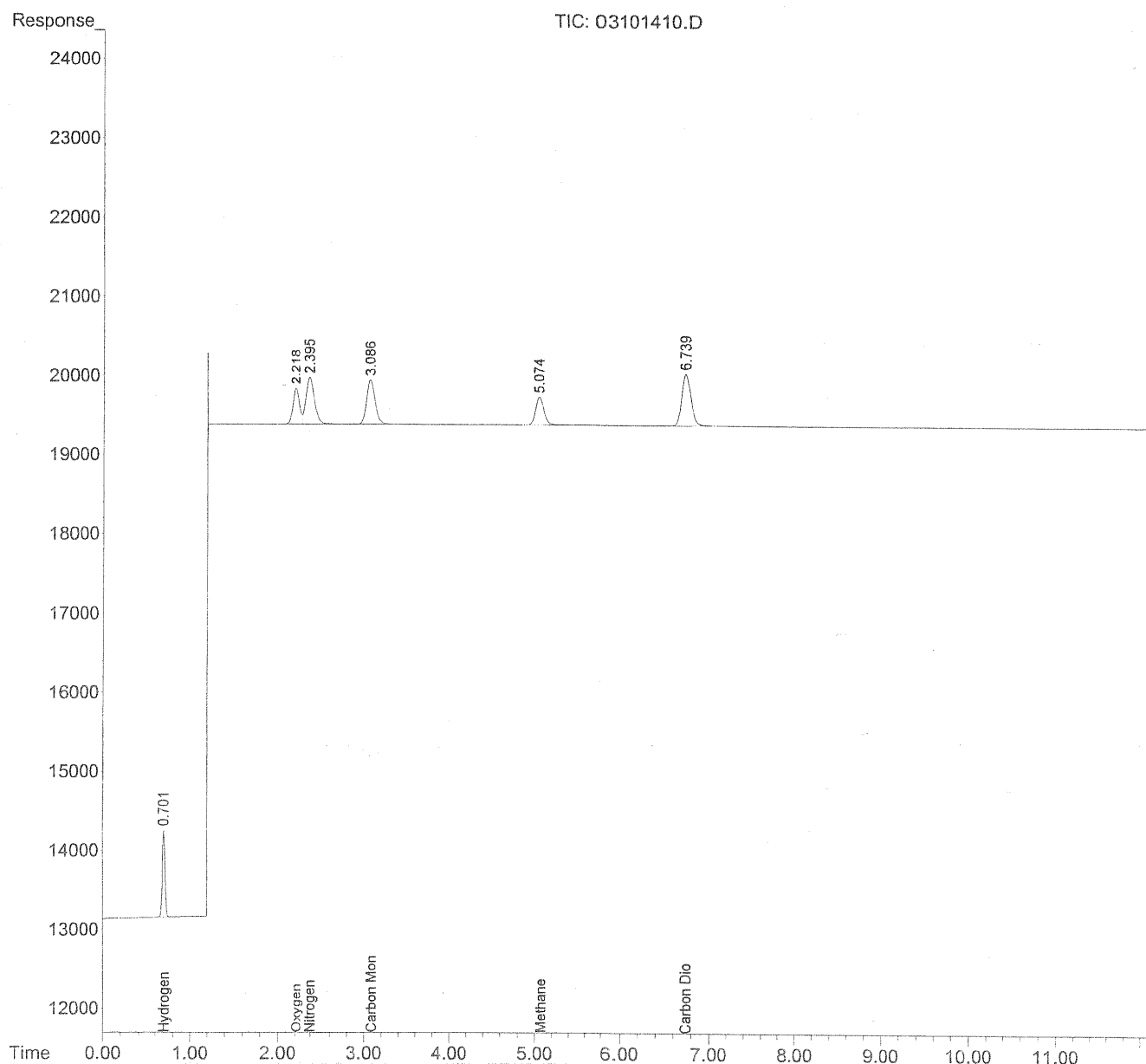
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101410.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:23
Operator : WH
Sample : std 3 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:22:44 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101410.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:23
Operator : WH
Sample : std 3 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:22:44 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	21820	15685.875 ppm
2) Oxygen	2.219	27585	16260.158 ppm
3) Nitrogen	2.397	39208	19135.565 ppm
4) Carbon Monoxide	3.087	38859	20547.786 ppm
5) Methane	5.076	23724	16767.873 ppm
6) Carbon Dioxide	6.740	44730	20288.350 ppm

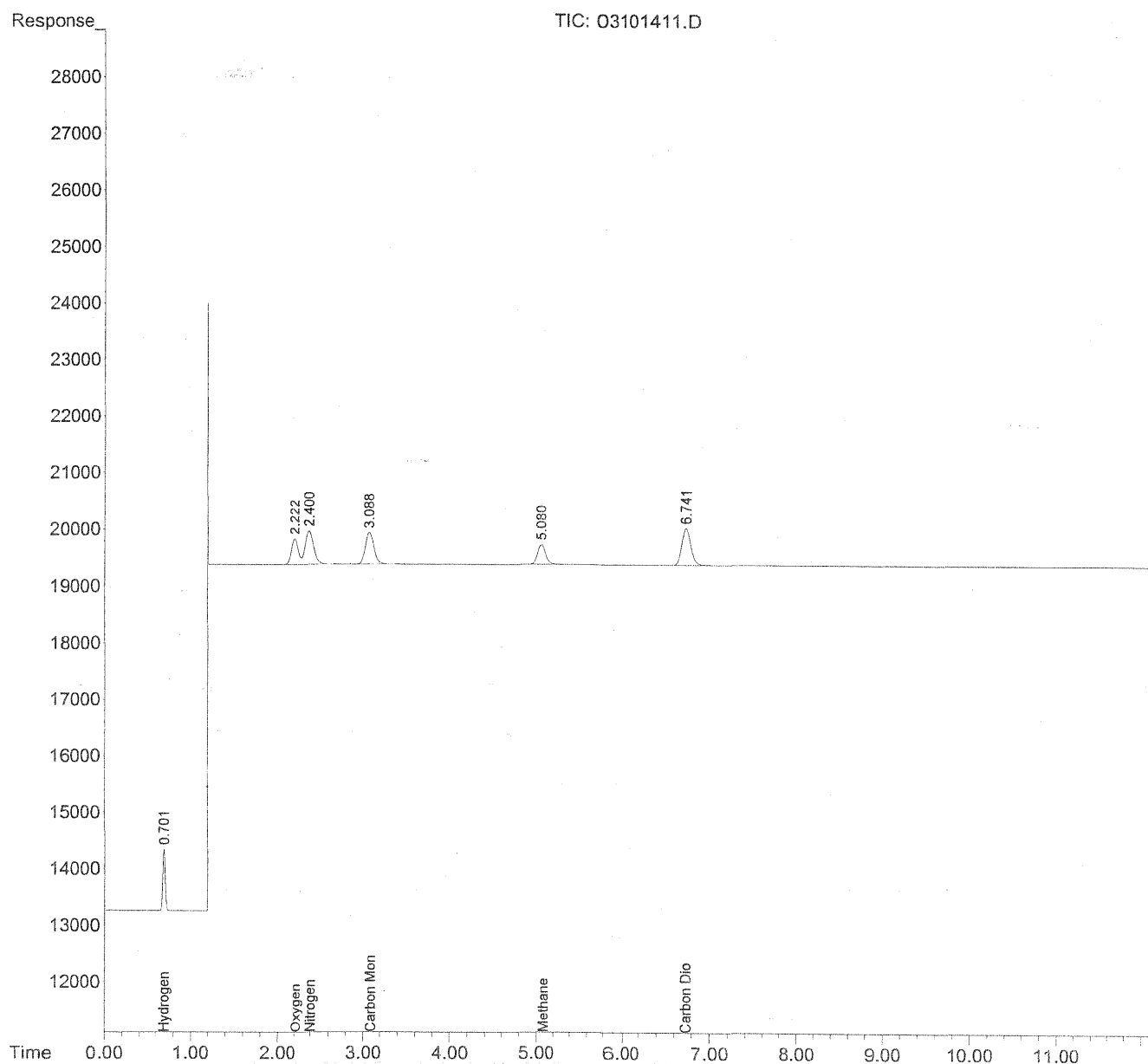
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101411.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:56
Operator : WH
Sample : std 3 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:27 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101411.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:56
Operator : WH
Sample : std 3 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:27 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.703	21730	15751.773 ppm
2) Oxygen	2.224	27609	16342.415 ppm
3) Nitrogen	2.401	39193	19344.177 ppm
4) Carbon Monoxide	3.090	38395	20358.500 ppm
5) Methane	5.081	23489	16605.562 ppm
6) Carbon Dioxide	6.743	44680	20355.596 ppm

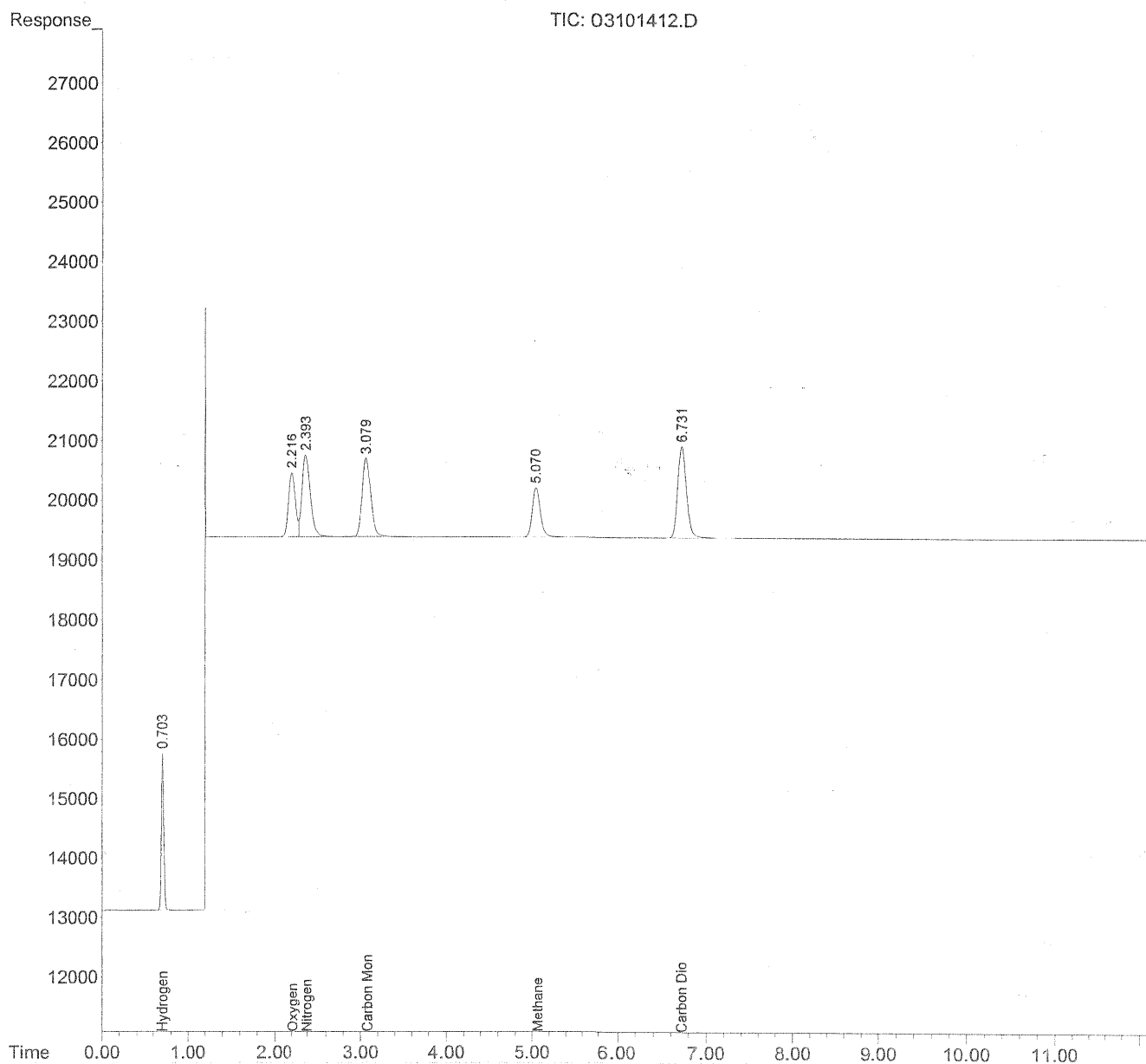
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101412.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:15
Operator : WH
Sample : std 4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:31:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:50 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101412.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:15
Operator : WH
Sample : std 4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:31:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:50 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.705	51993	37952.051 ppm
2) Oxygen	2.217	65602	38954.464 ppm
3) Nitrogen	2.394	92598	46108.575 ppm
4) Carbon Monoxide	3.081	92228	49071.809 ppm
5) Methane	5.072	55567	39334.461 ppm
6) Carbon Dioxide	6.733	106700	48784.847 ppm

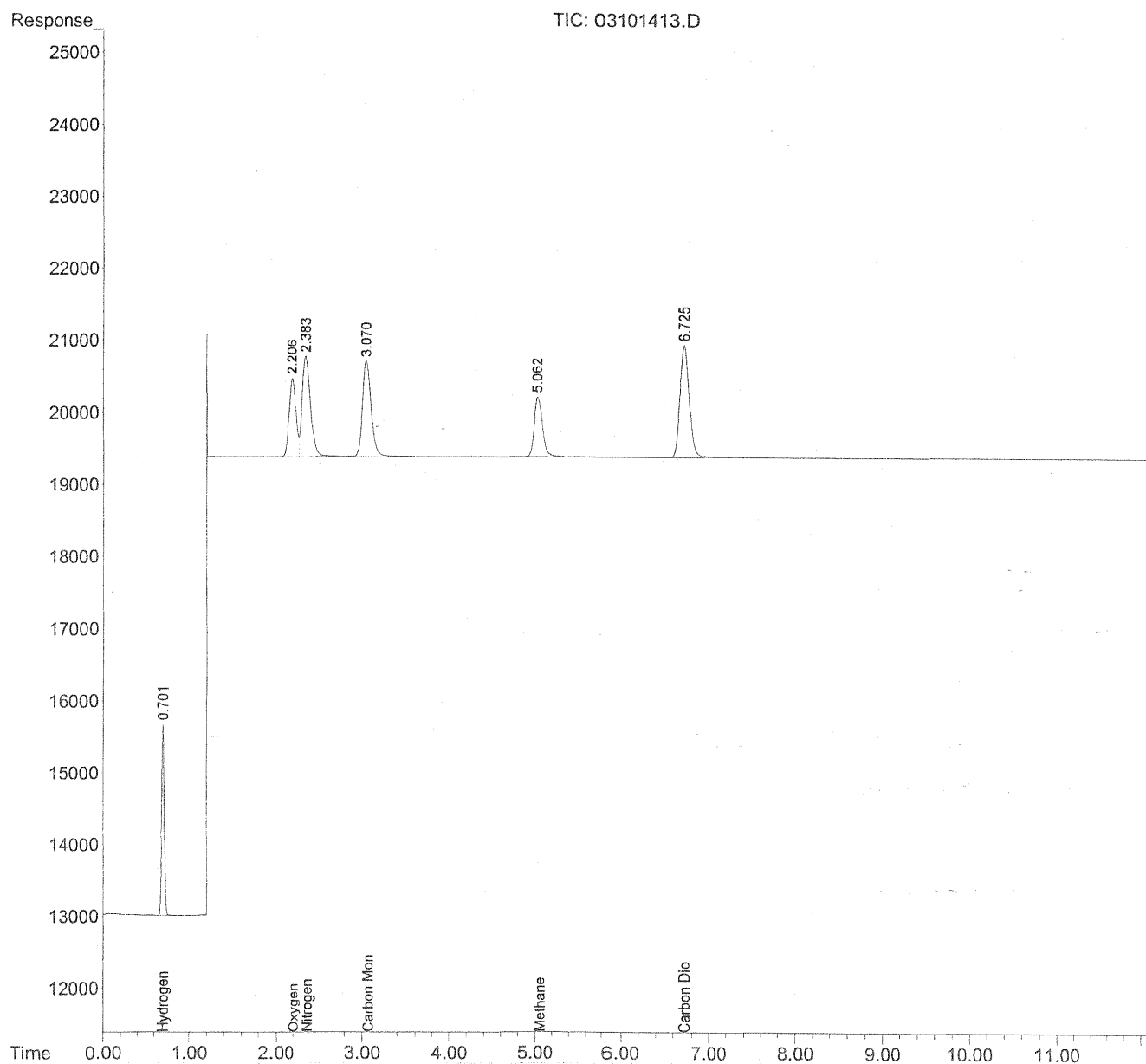
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101413.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:32
Operator : WH
Sample : std 4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:57:23 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:57:03 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101413.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:32
Operator : WH
Sample : std 4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:57:23 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:57:03 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	52354	38549.354 ppm
2) Oxygen	2.208	65871	39291.954 ppm
3) Nitrogen	2.385	93062	47432.408 ppm
4) Carbon Monoxide	3.072	92593	49417.144 ppm
5) Methane	5.064	55753	39568.314 ppm
6) Carbon Dioxide	6.726	107226	49228.245 ppm

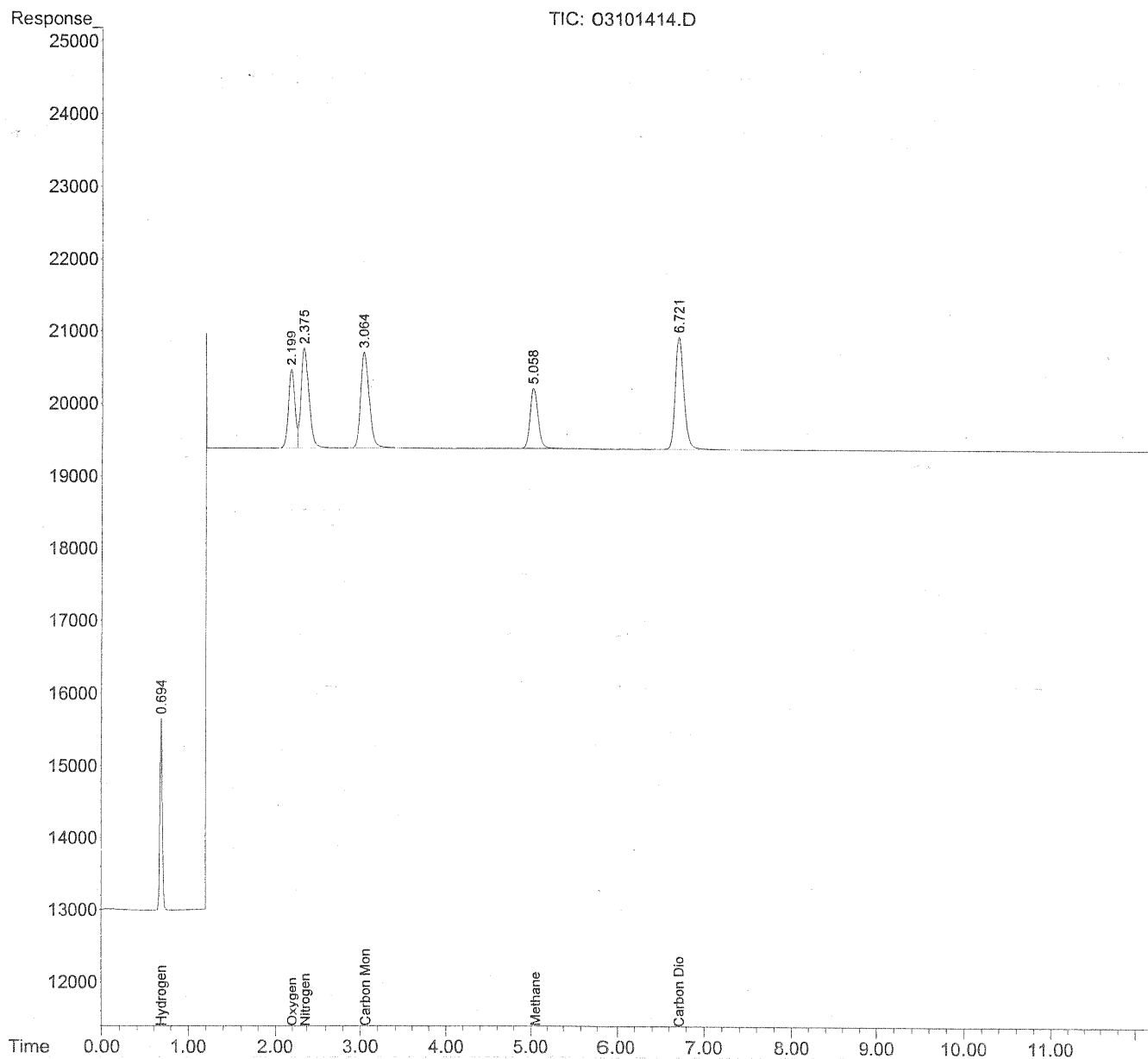
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101414.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:49
Operator : WH
Sample : std 4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:45:17 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:44:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101414.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:49
Operator : WH
Sample : std 4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:45:17 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:44:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.696	52056	37688.686 ppm
2) Oxygen	2.200	65583	39685.849 ppm
3) Nitrogen	2.377	92502	48078.649 ppm
4) Carbon Monoxide	3.065	91773	49520.215 ppm
5) Methane	5.059	55456	39726.222 ppm
6) Carbon Dioxide	6.723	106671	49580.495 ppm

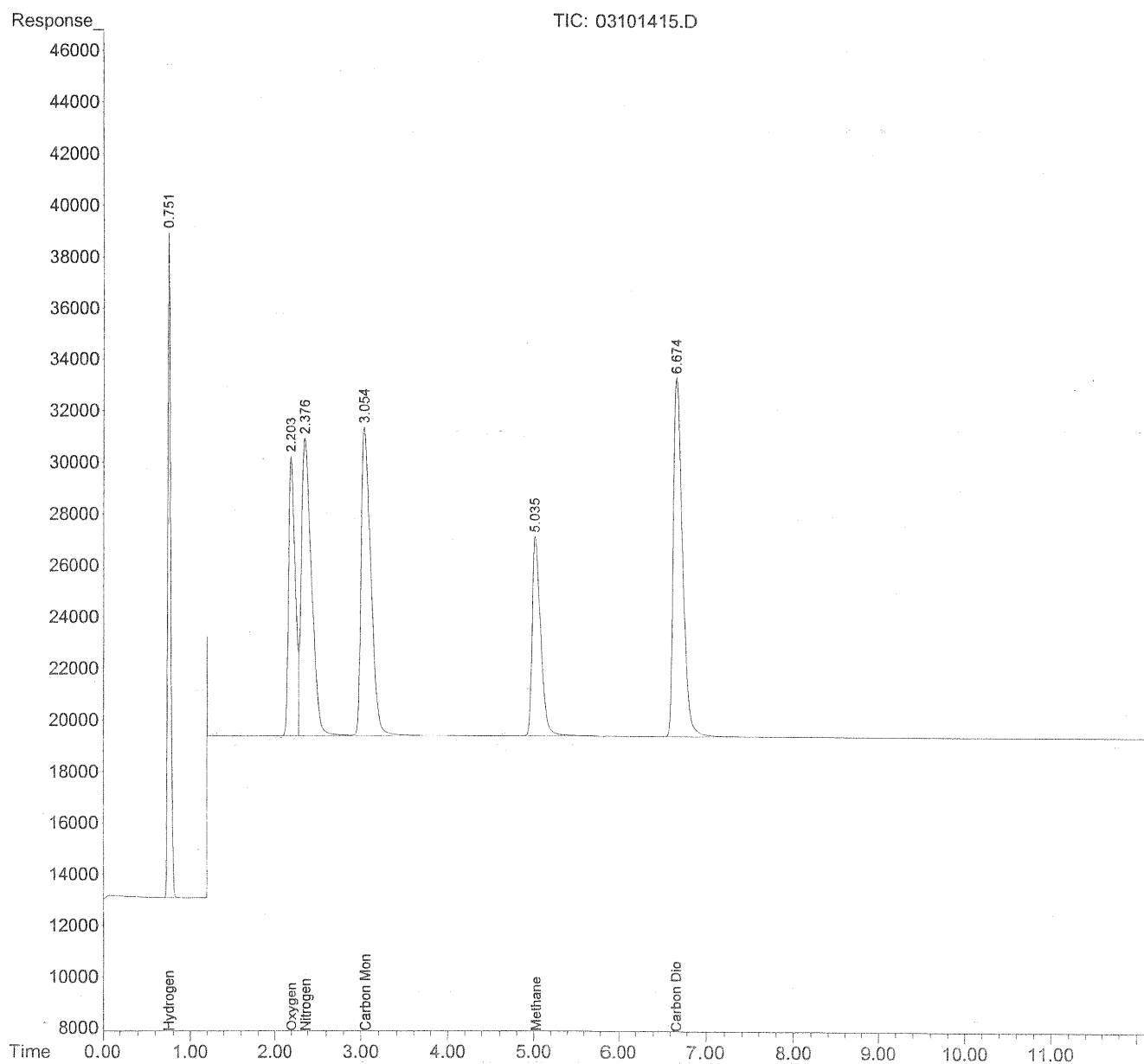
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101415.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:08
Operator : WH
Sample : std 5_1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 15:28:26 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:28:13 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101415.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:08
Operator : WH
Sample : std 5 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 15:28:26 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:28:13 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.753	609940	450674.500 ppm
2) Oxygen	2.204	639596	382242.968 ppm
3) Nitrogen	2.378	920613	471464.666 ppm
4) Carbon Monoxide	3.056	910078	486547.441 ppm
5) Methane	5.037	546936	388661.341 ppm
6) Carbon Dioxide	6.676	1039048	477883.306 ppm

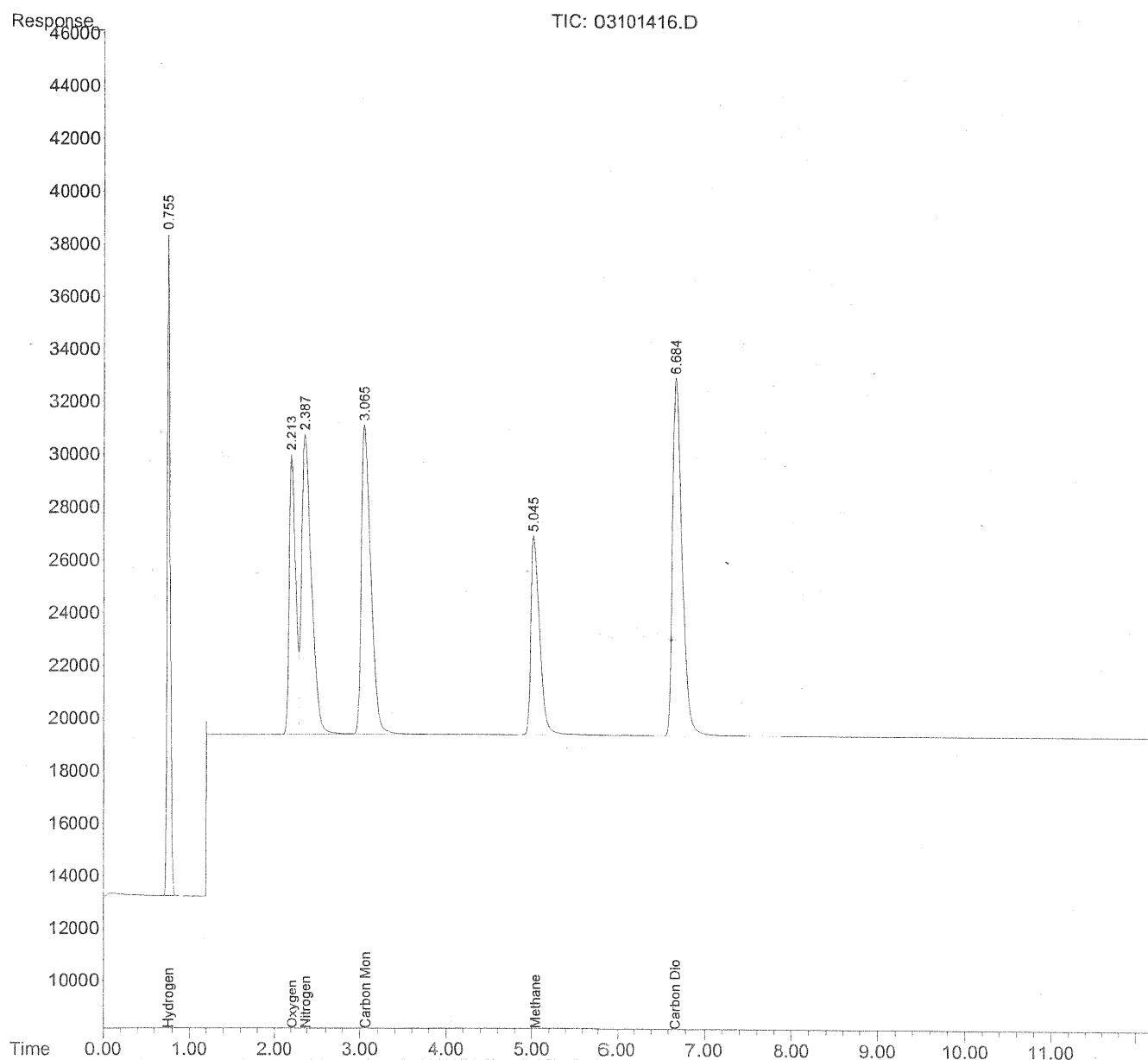
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101416.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:34
Operator : WH
Sample : std 5 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:22 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101416.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:34
Operator : WH
Sample : std 5 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:22 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.757	592647	433927.352 ppm
2) Oxygen	2.215	625621	375390.705 ppm
3) Nitrogen	2.388	900666	463524.733 ppm
4) Carbon Monoxide	3.067	886943	475424.245 ppm
5) Methane	5.047	533862	380382.085 ppm
6) Carbon Dioxide	6.686	1009801	466290.795 ppm

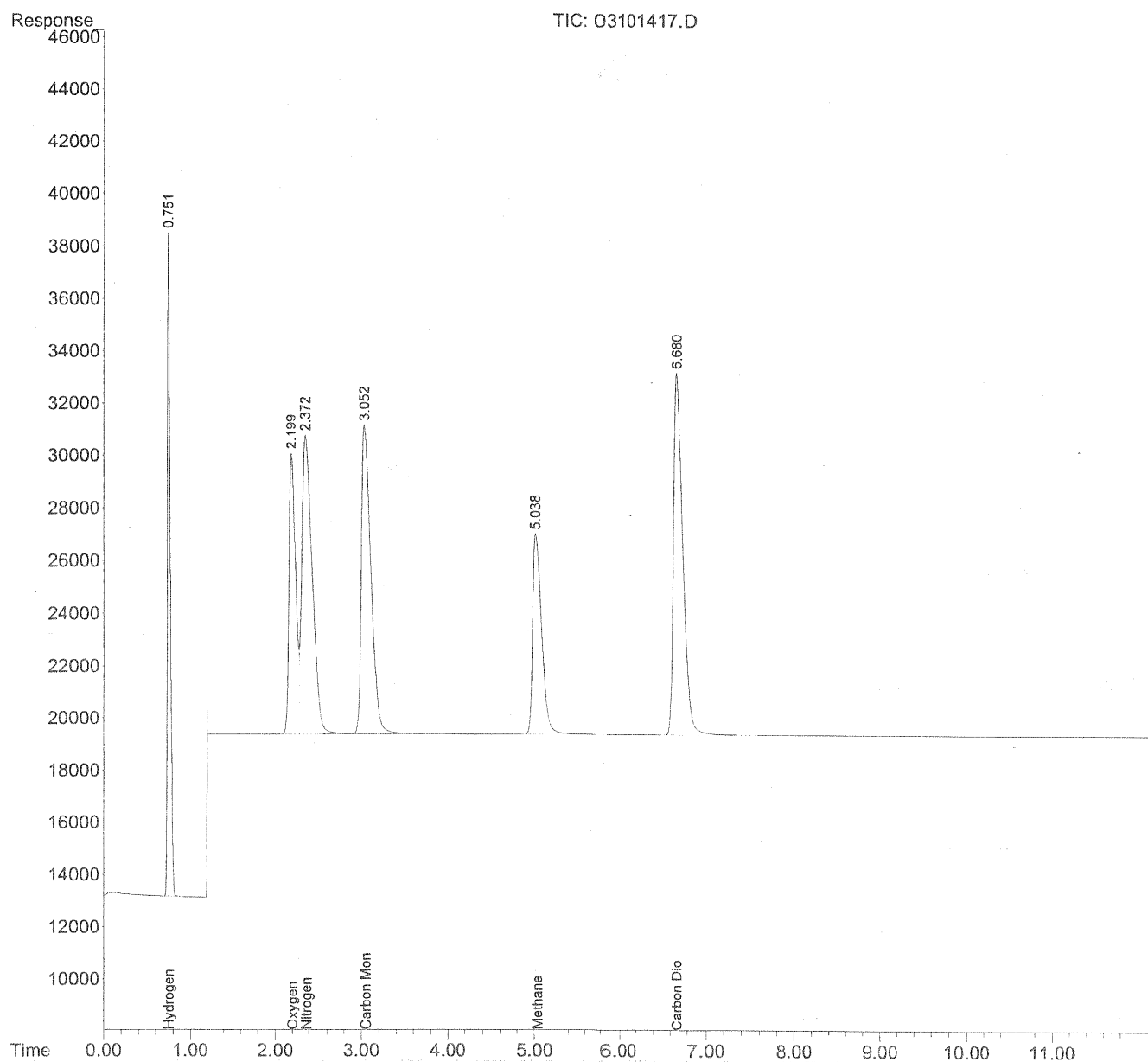
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101417.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:50
Operator : WH
Sample : std 5 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101417.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:50
Operator : WH
Sample : std 5 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.753	600780	437466.065 ppm
2) Oxygen	2.200	633337	381900.857 ppm
3) Nitrogen	2.374	912132	472109.403 ppm
4) Carbon Monoxide	3.054	899249	483961.452 ppm
5) Methane	5.040	540876	386903.325 ppm
6) Carbon Dioxide	6.681	1028390	477426.138 ppm

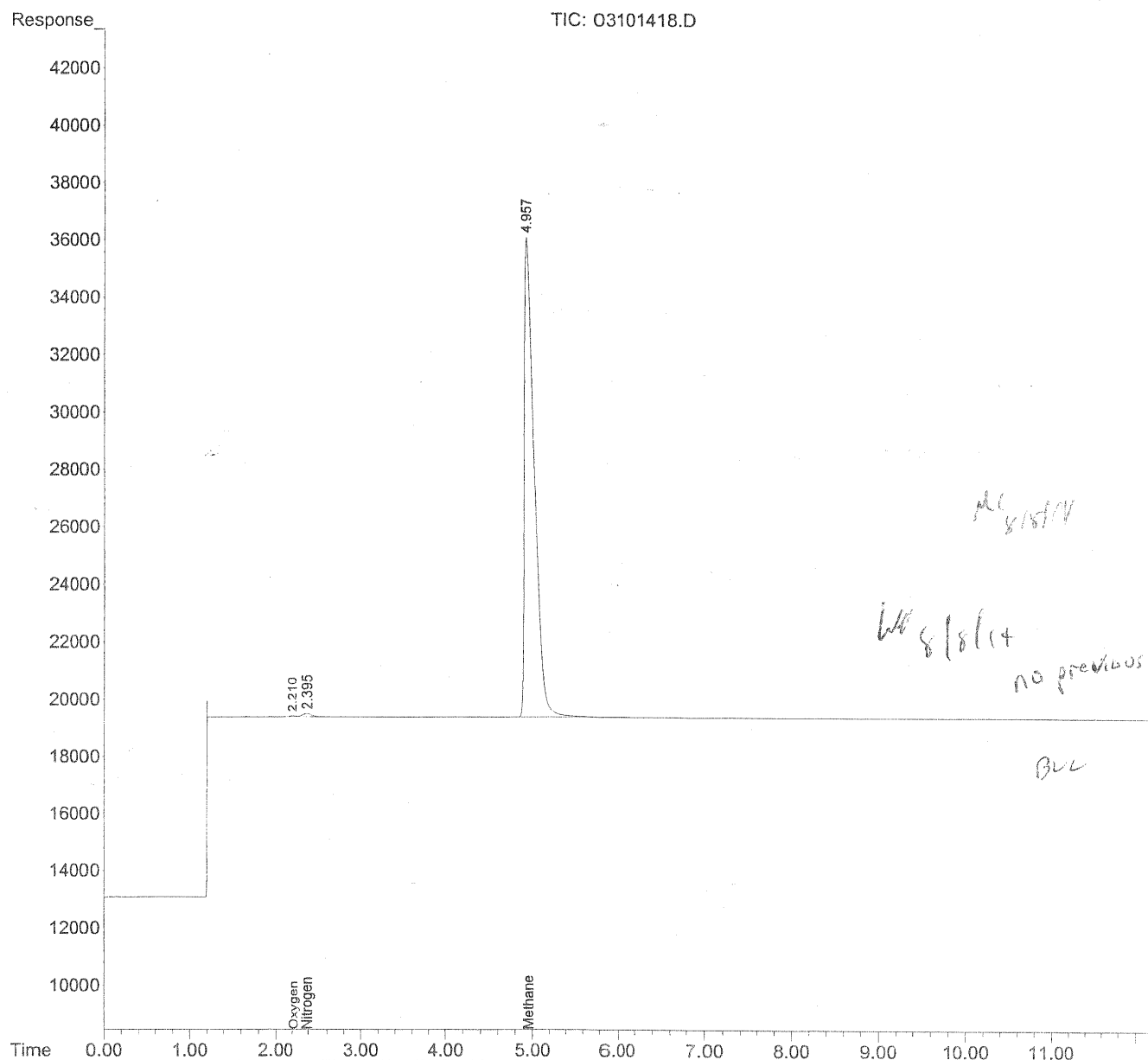
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101418.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 16:55
Operator : WH
Sample : std ch4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:11:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101418.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 16:55
Operator : WH
Sample : std ch4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:11:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.225	1686	1020.031 ppm
3) Nitrogen	2.395	7810	4059.131 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.957	1340274	961229.509 ppm m
6) Carbon Dioxide	0.000	0	N.D. ppm

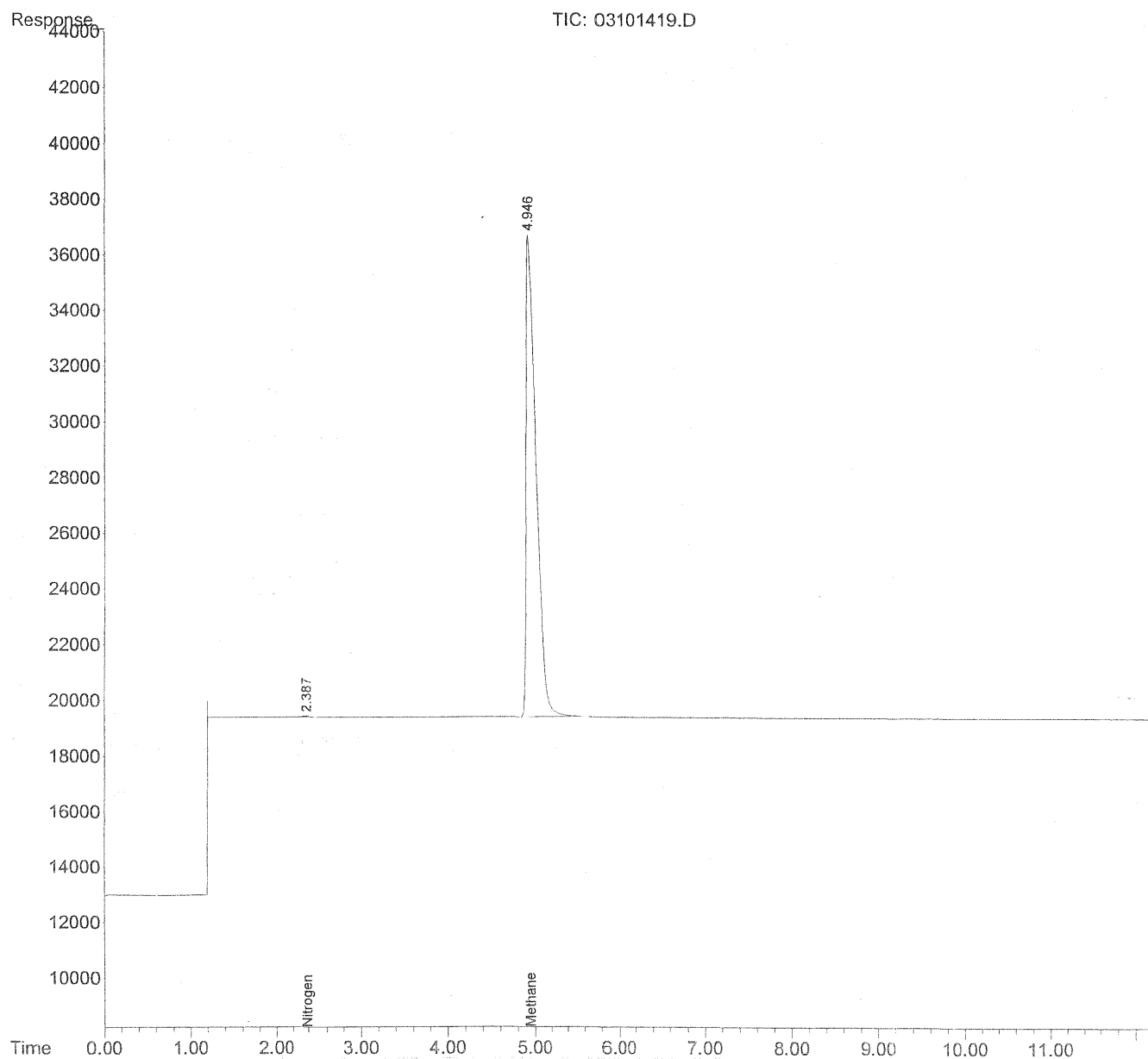
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101419.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:11
Operator : WH
Sample : std ch4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:28:59 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101419.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:11
Operator : WH
Sample : std ch4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:28:59 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis For Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	2.389	2357	1225.098 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.948	1390484	997239.566 ppm
6) Carbon Dioxide	0.000	0	N.D. ppm

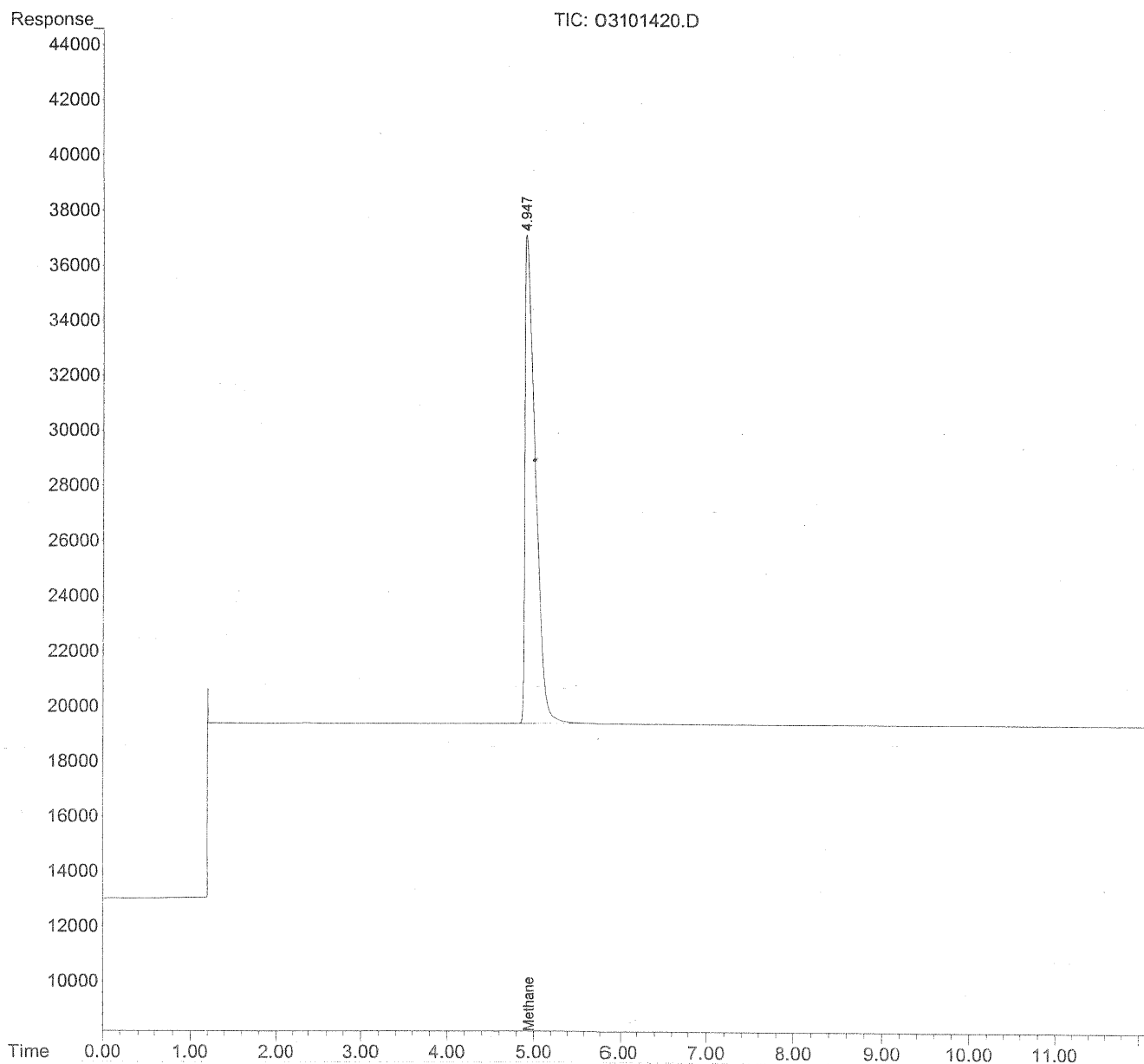
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101420.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:29
Operator : WH
Sample : std ch4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:46:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101420.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:29
Operator : WH
Sample : std ch4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:46:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	0.000	0	N.D.	ppm
3) Nitrogen	0.000	0	N.D.	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	4.949	1439175	1032160.623	ppm
6) Carbon Dioxide	0.000	0	N.D.	ppm

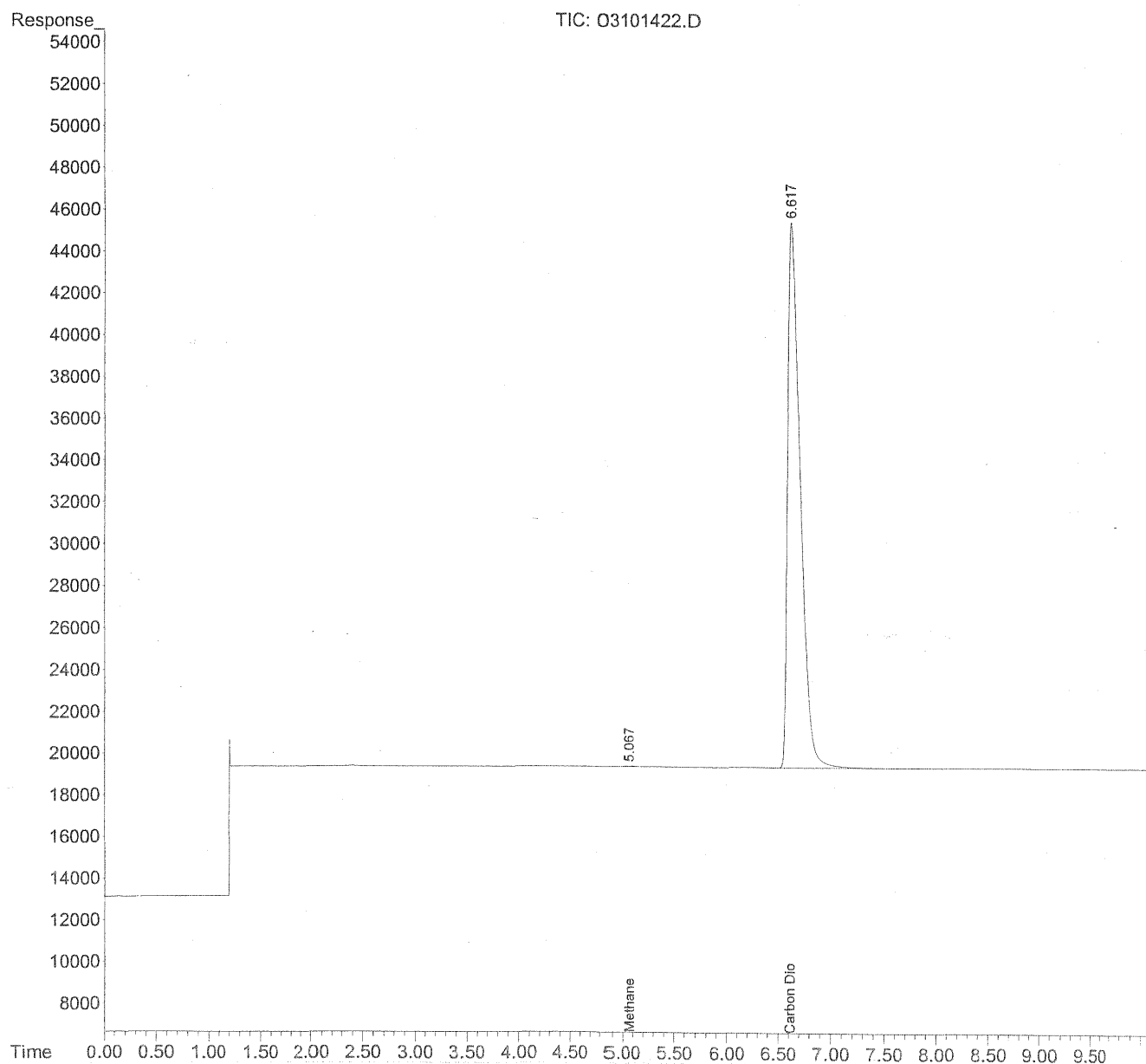
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101422.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:05
Operator : WH
Sample : std c02 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:17:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101422.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:05
Operator : WH
Sample : std c02 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:17:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	0.000	0	N.D. ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.069	1775	1271.240 ppm
6) Carbon Dioxide	6.618	2201199	1025503.777 ppm

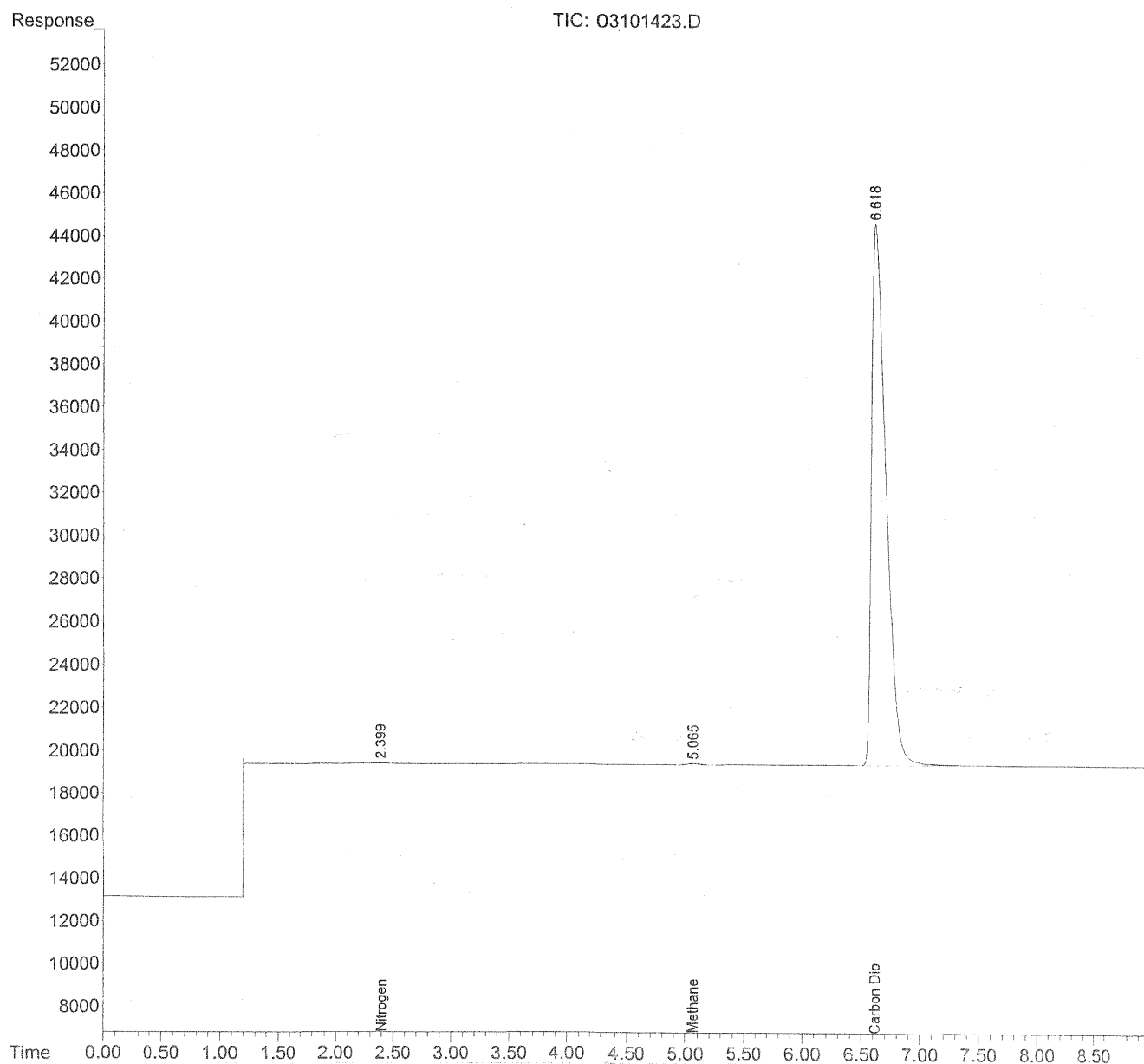
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101423.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:19
Operator : WH
Sample : std c02 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:30:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101423.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:19
Operator : WH
Sample : std c02 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:30:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	2.401	2050	1065.315 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.069	4323	3097.155 ppm
6) Carbon Dioxide	6.619	2111383	983659.786 ppm

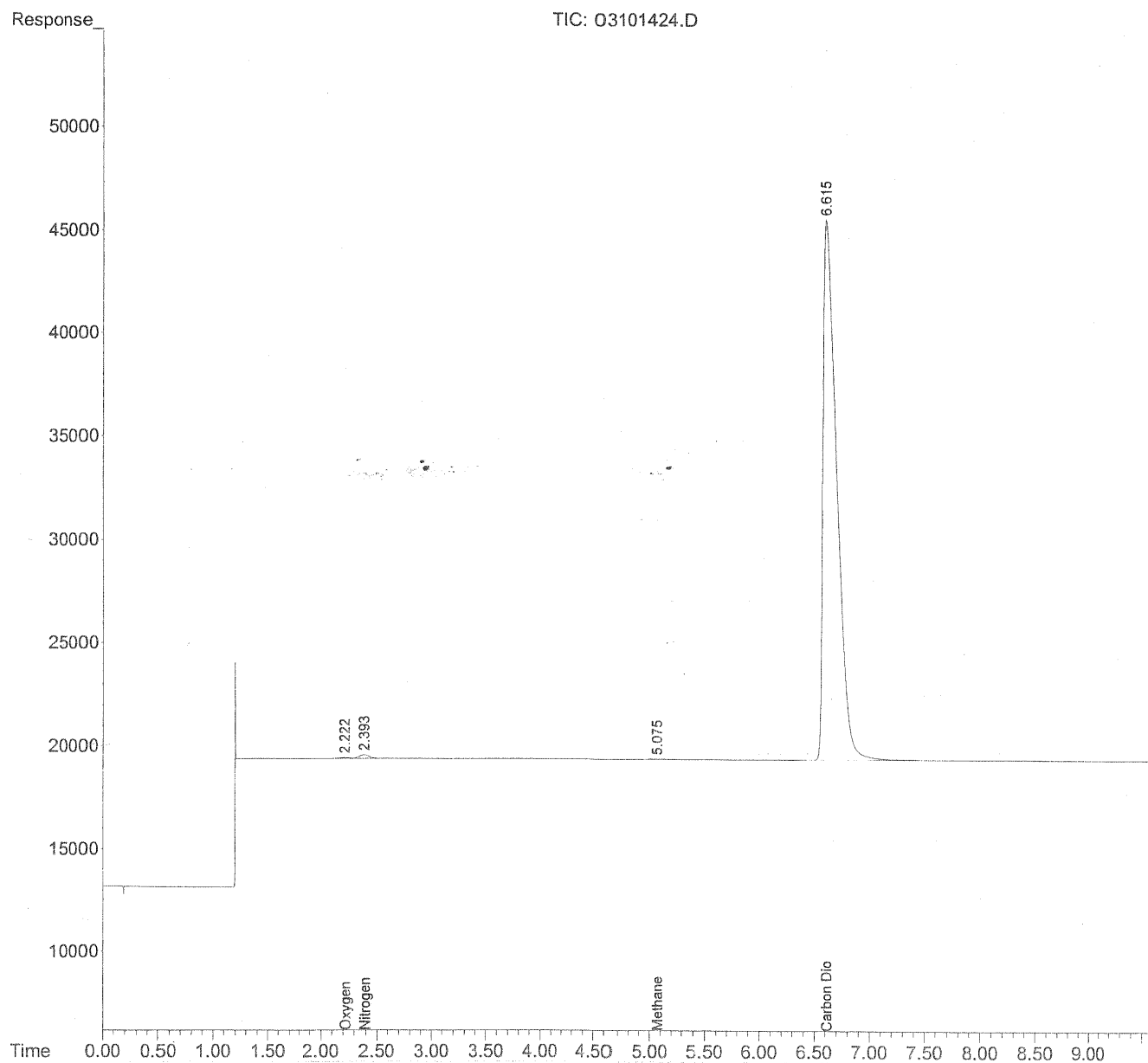
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101424.D
 Signal(s) : TCD1A.CH
 Acq On : 10 Mar 2014 18:32
 Operator : WH
 Sample : std c02 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 10 18:43:57 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:42:24 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101424.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:32
Operator : WH
Sample : std c02 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:43:57 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:42:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.223	2425	1467.619 ppm
3) Nitrogen	2.396	11513	5983.691 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.076	523	374.374 ppm
6) Carbon Dioxide	6.617	2204164	1026088.843 ppm

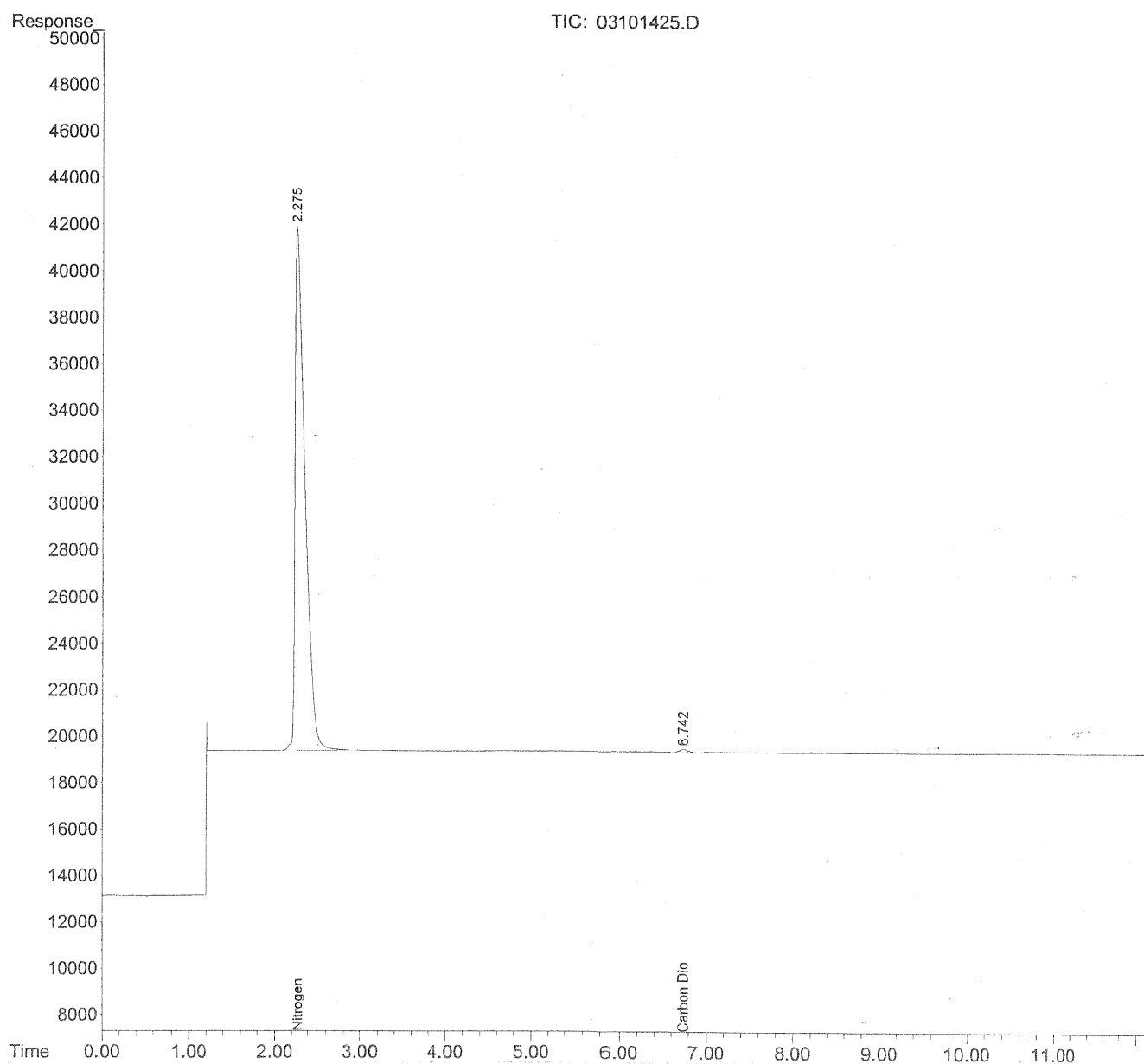
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101425.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:11
Operator : WH
Sample : std n2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:26:33 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101425.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:11
Operator : WH
Sample : std n2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:26:33 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.277	1907693	991533.750 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.744	7551	3509.651 ppm

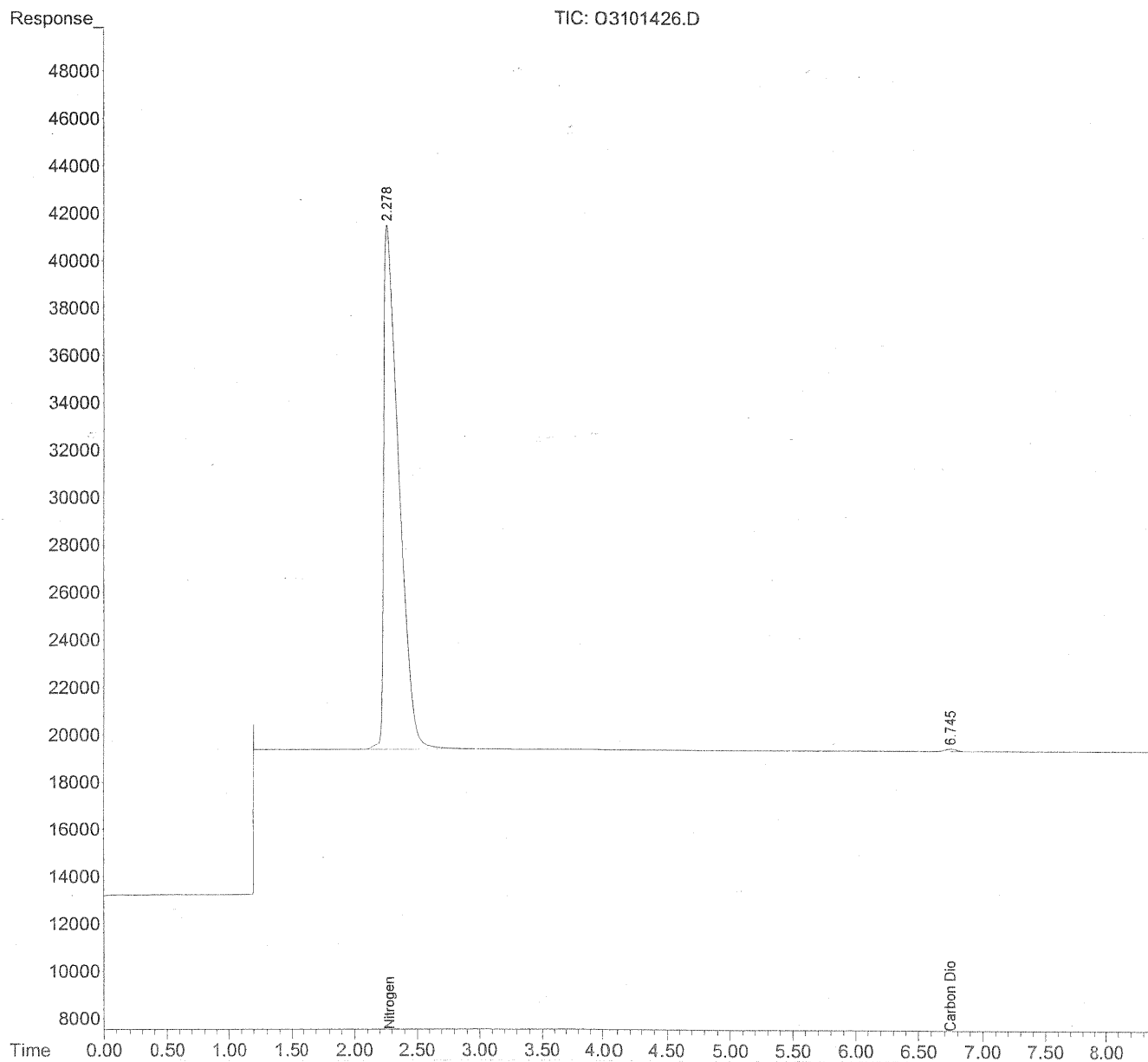
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101426.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:30
Operator : WH
Sample : std n2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:40:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101426.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:30
Operator : WH
Sample : std n2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:40:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.280	1857806	965604.527 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.748	7247	3368.284 ppm

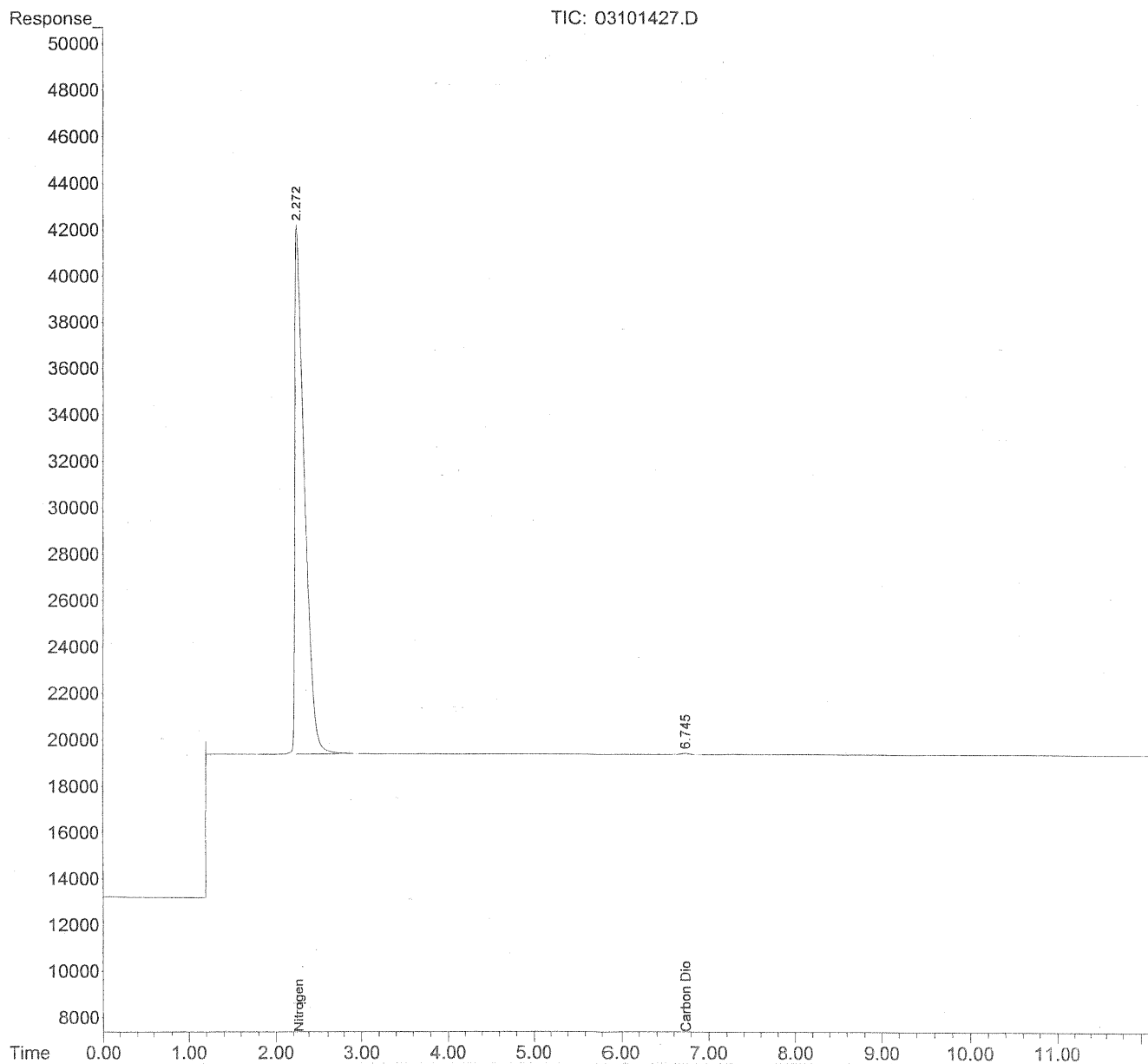
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101427.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:42
 Operator : WH
 Sample : std n2 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 11:02:52 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101427.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 10:42
 Operator : WH
 Sample : std n2 3
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 11:02:52 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Mon Mar 10 18:45:38 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound		R.T.	Response	Conc	Units

Target Compounds					
1)	Hydrogen	0.000	0	N.D.	ppm
2)	Oxygen	0.000	0	N.D.	ppm d
3)	Nitrogen	2.273	1934590	1005513.839	ppm
4)	Carbon Monoxide	0.000	0	N.D.	ppm
5)	Methane	0.000	0	N.D.	ppm
6)	Carbon Dioxide	6.747	3210	1492.185	ppm

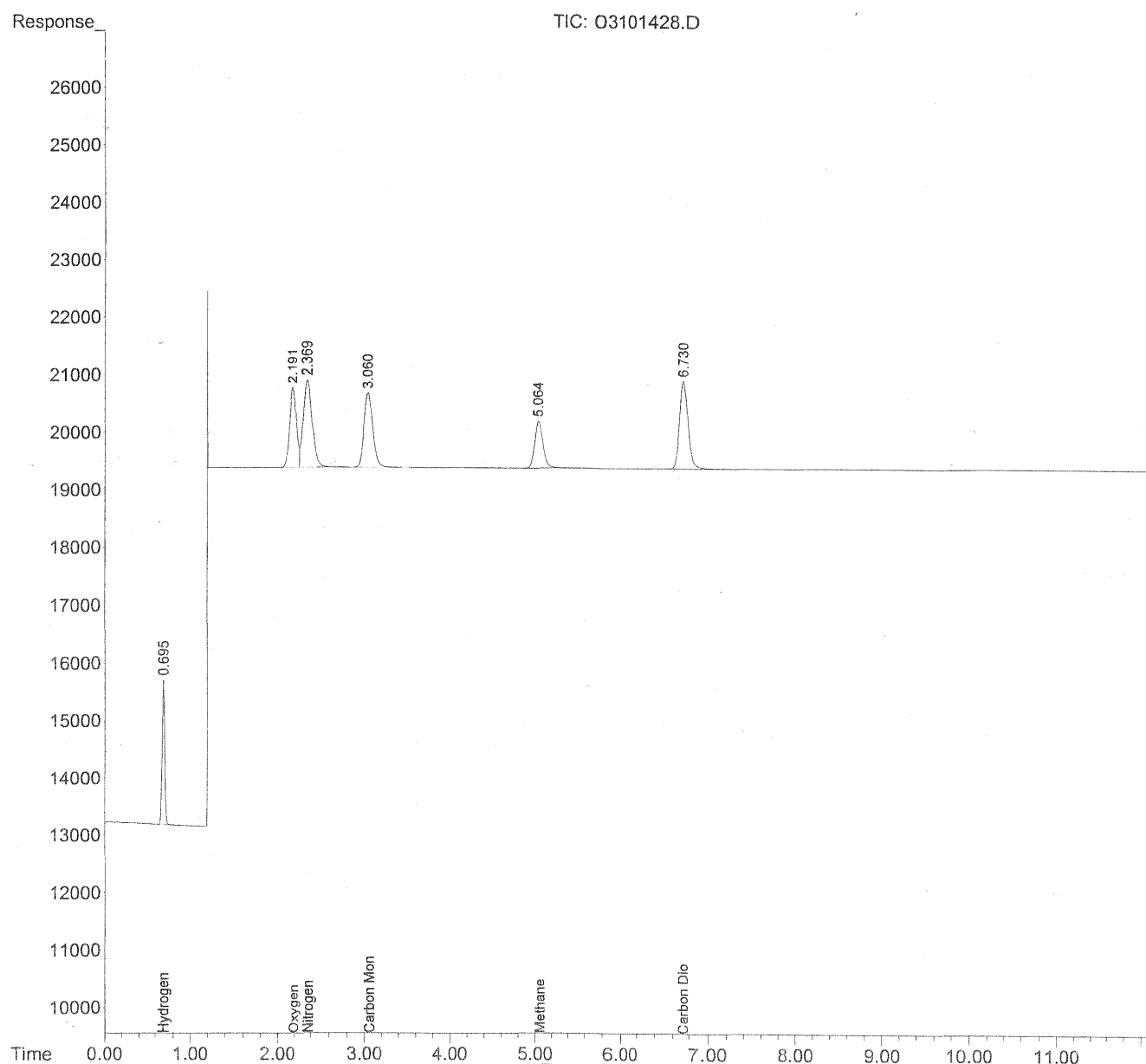
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101428.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 11:20
Operator : WH
Sample : icv s30-02051401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:35:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101428.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 11:20
Operator : WH
Sample : icv s30-02051401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:35:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	Actual ppm	R.T.	Response	Conc Units	% recovery

Target Compounds					
1) Hydrogen	40000	0.696	49944	36159.891 ppm	90.4%
2) Oxygen	50000	2.193	85837	51942.494 ppm	103.9%
3) Nitrogen	50000	2.370	104375	54362.122 ppm	108.7%
4) Carbon Monoxide	50000	3.061	91720	49491.765 ppm	99.0%
5) Methane	40000	5.066	55315	39625.390 ppm	99.1%
6) Carbon Dioxide	50000	6.732	105938	49239.725 ppm	98.5%

(f)=RT Delta > 1/2 Window

(m)=manual int.

WA 8/8/14

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 3/2/2015

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 3/1/2015

PAI Job : P1500781

Sample amount : 100uL

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3/2/15

Sample Result

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Methane	Carbon Dioxide	
STD S30-12161401	41321	42216	51872	52180	41583	52061	
ACTUAL	39990	40030	50000	50010	39970	50040	
% Difference	3.3%	5.5%	3.7%	4.3%	4.0%	4.0%	
Lab Air		204805	719795			402	
MB							
0781-001		129091	0.2%	739655	0.1%	55074	0.1%
0781-001 - 2		128948	0.1%	739673	0.1%	55134	0.2%
0781-001 - 3		128540	0.2%	737075	0.2%	54886	0.3%
0781-001 - Mean		128860		738801		55031	
0781-003		135904	0.2%	733600	0.4%	49606	0.2%
0781-003 - 2		136112	0.0%	737069	0.1%	49768	0.1%
0781-003 - 3		136417	0.2%	738551	0.3%	49713	0.0%
0781-003 - Mean		136144		736407		49696	

ALS Environmental

REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 3/2/2015

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 3/1/2015

PAI Job : P1500781

Sample amount : 100uL

0781-005	142164	0.2%	734086	0.1%	45635	0.0%
0781-005 - 2	141913	0.0%	735156	0.1%	45710	0.2%
0781-005 - 3	141758	0.1%	734923	0.0%	45494	0.3%
0781-005 - Mean	141945		734722		45613	

0781-007	147963	0.3%	736309	0.3%	41774	0.4%
0781-007 - 2	147666	0.1%	735555	0.2%	41631	0.1%
0781-007 - 3	147146	0.3%	730530	0.5%	41379	0.5%
0781-007 - Mean	147592		734131		41594	

STD S30-12161401	40717	42435	53506	51969	41595	51770
ACTUAL	39990	40030	50000	50010	39970	50040
% Difference	1.8%	6.0%	7.0%	3.9%	4.1%	3.5%

1498
3/2/15

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011502.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 3:11 pm
Operator : WH
Sample : std s30-12161401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:05 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.699	57073	41321.300 ppm
2) Oxygen	2.196	69764	42216.364 ppm
3) Nitrogen	2.371	99594	51871.915 ppm
4) Carbon Monoxide	3.058	96702	52179.536 ppm
5) Methane	5.049	58048	41583.104 ppm
6) Carbon Dioxide	6.711	112007	52060.535 ppm

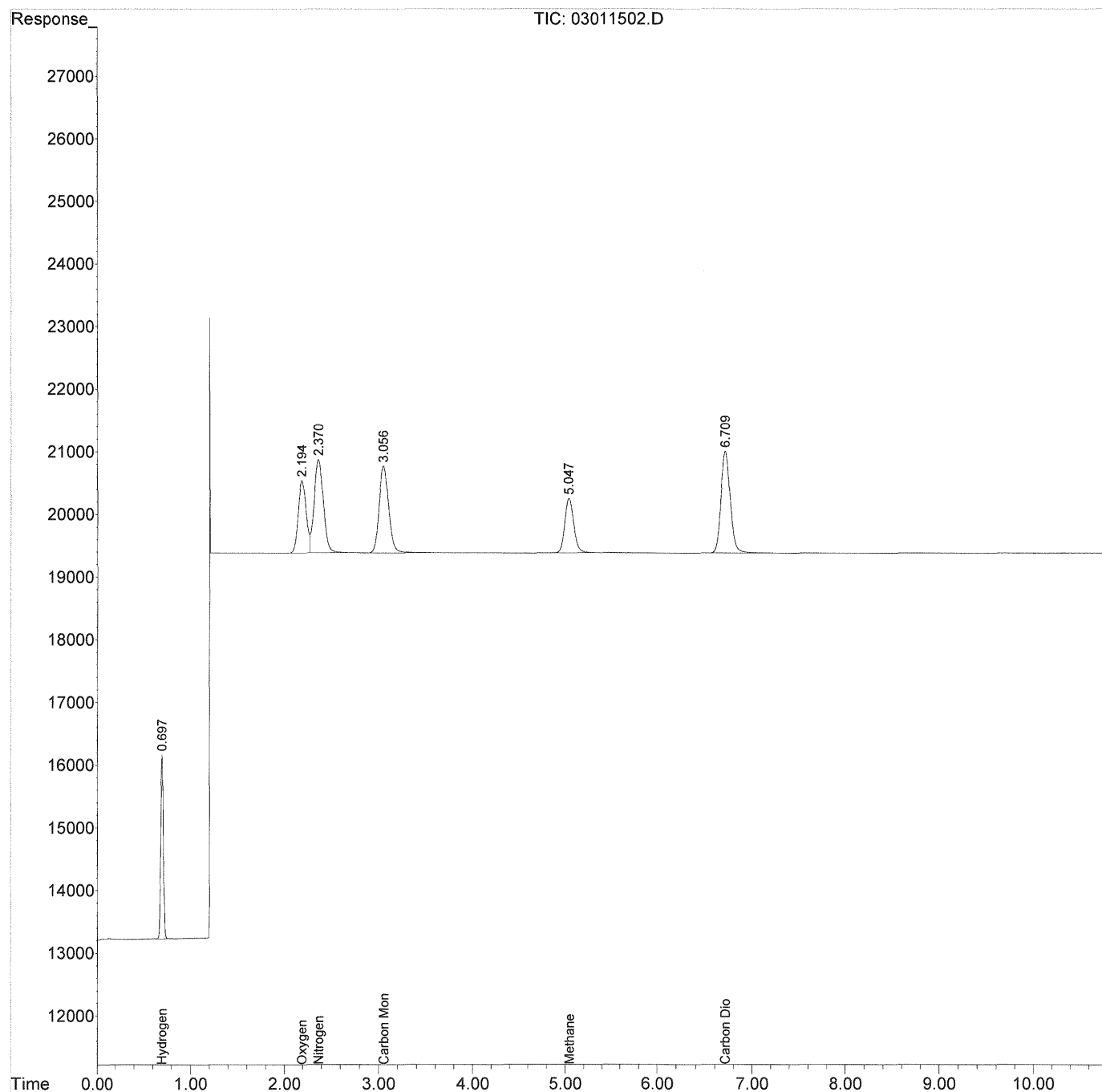
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011502.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 3:11 pm
Operator : WH
Sample : std s30-12161401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:05 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011519.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 7:30 pm
Operator : WH
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:53 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.697	56225	40707.233	ppm
2) Oxygen	2.188	70125	42434.769	ppm
3) Nitrogen	2.363	102731	53505.935	ppm
4) Carbon Monoxide	3.050	96311	51969.012	ppm
5) Methane	5.044	58064	41594.875	ppm
6) Carbon Dioxide	6.707	111382	51769.974	ppm

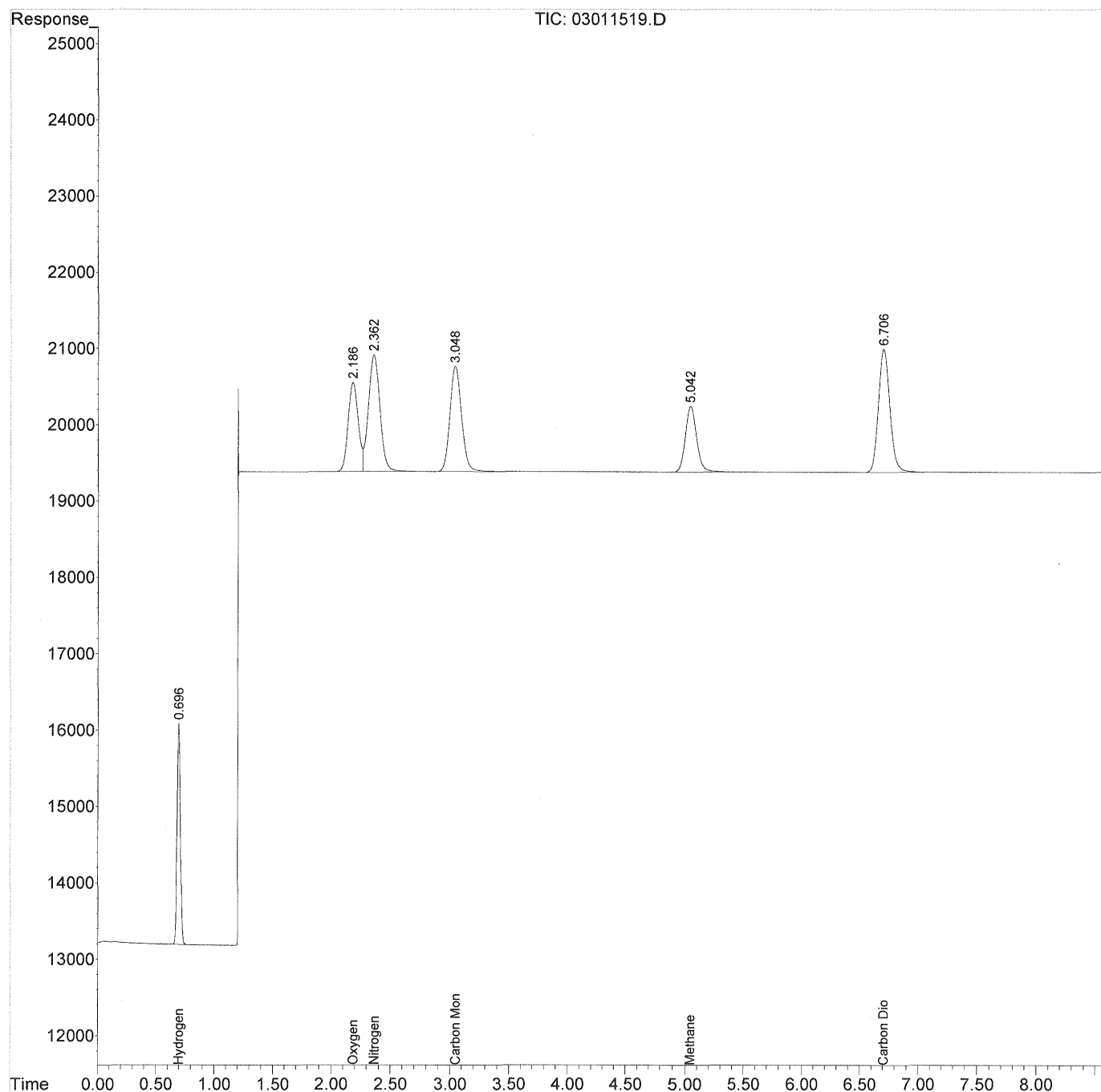
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\01\
Data File : 03011519.D
Signal(s) : TCD1A.CH
Acq On : 1 Mar 2015 7:30 pm
Operator : WH
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 02 08:47:53 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	03101401.d	10.	MB		10 Mar 2014 10:27
2	1	03101402.d	10.	xstd 1 1		10 Mar 2014 10:43
3	1	03101403.d	10.	std 1 1		10 Mar 2014 10:59
4	1	03101404.d	10.	std 1 2		10 Mar 2014 11:29
5	1	03101405.d	10.	std 1 3		10 Mar 2014 11:44
6	1	03101406.d	10.	std 2 1		10 Mar 2014 11:59
7	1	03101407.d	10.	std 2 2		10 Mar 2014 12:18
8	1	03101408.d	10.	std 2 3		10 Mar 2014 12:34
9	1	03101409.d	10.	std 3 1		10 Mar 2014 13:05
10	1	03101410.d	10.	std 3 2		10 Mar 2014 13:23
11	1	03101411.d	10.	std 3 3		10 Mar 2014 13:56
12	1	03101412.d	10.	std 4 1		10 Mar 2014 14:15
13	1	03101413.d	10.	std 4 2		10 Mar 2014 14:32
14	1	03101414.d	10.	std 4 3		10 Mar 2014 14:49
15	1	03101415.d	10.	std 5 1		10 Mar 2014 15:08
16	1	03101416.d	10.	std 5 2		10 Mar 2014 15:34
17	1	03101417.d	10.	std 5 3		10 Mar 2014 15:50
18	1	03101418.d	10.	std ch4 1		10 Mar 2014 16:55
19	1	03101419.d	10.	std ch4 2		10 Mar 2014 17:11
20	1	03101420.d	10.	std ch4 3		10 Mar 2014 17:29
21	1	03101421.d	10.	xstd c02 1		10 Mar 2014 17:47
22	1	03101422.d	10.	std c02 1		10 Mar 2014 18:05
23	1	03101423.d	10.	std c02 2		10 Mar 2014 18:19
24	1	03101424.d	10.	std c02 3		10 Mar 2014 18:32
25	1	03101425.d	10.	std n2 1		11 Mar 2014 10:11
26	1	03101426.d	10.	std n2 2		11 Mar 2014 10:30
27	1	03101427.d	10.	std n2 3		11 Mar 2014 10:42
28	1	03101428.d	10.	lcs		11 Mar 2014 11:20
29	1	03101429.d	10.	lab air		11 Mar 2014 11:37

Injection Log

Directory: I:\GC01\DATA\FXG\2015_03\01

Line	Vial	FileName	Multiplier	SampleName	Misc Info
1	1	03011501.d	10.	xstd	
2	1	03011502.d	10.	std s30-12161401	
3	1	03011503.d	10.	mb	
4	1	03011504.d	10.	lab air	
5	1	03011505.d	10.	lcs	
6	1	03011506.d	10.	lcs	
7	1	03011507.d	10.	0781-001	
8	1	03011508.d	10.	0781-001	
9	1	03011509.d	10.	0781-001	
10	1	03011510.d	10.	0781-003	
11	1	03011511.d	10.	0781-003	
12	1	03011512.d	10.	0781-003	
13	1	03011513.d	10.	0781-005	
14	1	03011514.d	10.	0781-005	
15	1	03011515.d	10.	0781-005	
16	1	03011516.d	10.	0781-007	
17	1	03011517.d	10.	0781-007	
18	1	03011518.d	10.	0781-007	
19	1	03011519.d	10.	std	

LABORATORY REPORT

March 12, 2015

Min Lee
Air Hygiene, Incorporated
1600 West Tacoma Street
Broken Arrow, OK 74012

RE: qti-15-brokenarrow.ok-comp#1

Dear Min:

Enclosed are the results of the samples submitted to our laboratory on March 4, 2015. For your reference, these analyses have been assigned our service request number P1500826.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental



By Kelly Horiuchi at 11:53 am, Mar 13, 2015

Kelly Horiuchi
Laboratory Director

Client: Air Hygiene, Incorporated
Project: qti-15-brokenarrow.ok-comp#1

Service Request No: P1500826

CASE NARRATIVE

The samples were received intact under chain of custody on March 4, 2015 and were stored in accordance with the analytical method requirements. The samples were received past the recommended holding time. The analysis was performed as soon as possible after receipt by the laboratory. The data is flagged to indicate the holding time exceedance. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Fixed Gases Analysis

The samples were analyzed for fixed gases (oxygen/argon, nitrogen, methane and carbon dioxide) according to modified EPA Method 3C (triplicate injection) using a gas chromatograph equipped with a thermal conductivity detector (TCD). This procedure is described in laboratory SOP VOA-EPA3C. This method is not included on the laboratory's NELAP or AIHA-LAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	838341
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-001
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-14-5
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 4-4
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Air Hygiene, Incorporated
Project ID: qti-15-brokenarrow.ok-comp#1

Service Request: P1500826

Date Received: 3/4/2015
Time Received: 12:50

3C Modified - Fxd Gases Bag 2X

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	
R7-70-100-70%-Q250	P1500826-001	Air	2/28/2015	10:22	X
R8-70-100-70%-Q250	P1500826-003	Air	2/28/2015	11:45	X
R9-70-100-70%-Q250	P1500826-005	Air	2/28/2015	13:45	X

P1500822

SAMPLE DESCRIPTION AND CHAIN OF CUSTODY RECORD



Air Hygiene International, Inc.
1600 W Tacoma Street
Broken Arrow, Oklahoma 74012
(888) 461-8778
www.airhygiene.com

Project Number: qti-15-brokenarrow.ok-comp#1		Laboratory Analysis Requested: Methd 3C						
Person Taking Samples: MSL								
Sample Number	Location	Date	Time	Volume (L)	Analysis Method			
					O ₂	CO ₂	Nitrogen	Methane
R7-70-100-70%-Q250	Broken Arrow Rental Facility	28-Feb	10:22	10	X	X	X	X
R7-70-100-70%-Q250-backup	Broken Arrow Rental Facility	28-Feb		5	X	X	X	X
R8-70-100-70%-Q250	Broken Arrow Rental Facility	28-Feb	11:45	10	X	X	X	X
R8-70-100-70%-Q250-backup	Broken Arrow Rental Facility	28-Feb		5	X	X	X	X
R9-70-100-70%-Q250	Broken Arrow Rental Facility	28-Feb	13:45	10	X	X	X	X
R9-70-100-70%-Q250-backup	Broken Arrow Rental Facility	28-Feb		5	X	X	X	X

① ② ③ ④ ⑤ ⑥

Relinquished by: (Signature) <i>[Signature]</i>	Date: 2/28/15	Time: 14:00	Received by: (Signature) <i>[Signature]</i>	Date: 3/4/15	Time: 1250
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature)	Date:	Time:

3-brokenarrow.ok-comp#1-coc-q250

ALS Environmental Sample Acceptance Check Form

Client: Air Hygiene, Incorporated

Work order: P1500826

Project: qti-15-brokenarrow.ok-comp#1

Sample(s) received on: 3/4/15

Date opened: 3/4/15

by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

	<u>Yes</u>	<u>No</u>	<u>N/A</u>
1 Were sample containers properly marked with client sample ID?	☒	☐	☐
2 Container(s) supplied by ALS ?	☐	☒	☐
3 Did sample containers arrive in good condition?	☒	☐	☐
4 Were chain-of-custody papers used and filled out?	☒	☐	☐
5 Did sample container labels and/or tags agree with custody papers?	☒	☐	☐
6 Was sample volume received adequate for analysis?	☒	☐	☐
7 Are samples within specified holding times?	☐	☒	☐
8 Was proper temperature (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9 Was a trip blank received?	☐	☒	☐
10 Were custody seals on outside of cooler/Box?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
Were custody seals on outside of sample container?	☐	☒	☐
Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
Were signature and date included?	☐	☐	☒
Were seals intact?	☐	☐	☒
11 Do containers have appropriate preservation , according to method/SOP or Client specified information?	☐	☐	☒
Is there a client indication that the submitted samples are pH preserved?	☐	☐	☒
Were VOA vials checked for presence/absence of air bubbles?	☐	☐	☒
Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	☐	☐	☒
12 Tubes: Are the tubes capped and intact?	☐	☐	☒
Do they contain moisture?	☐	☐	☒
13 Badges: Are the badges properly capped and intact?	☐	☐	☒
Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1500826-001.01	10 L Tedlar Bag					
P1500826-002.01	5.0 L Tedlar Bag					
P1500826-003.01	10 L Tedlar Bag					
P1500826-004.01	5.0 L Tedlar Bag					
P1500826-005.01	10 L Tedlar Bag					
P1500826-006.01	5.0 L Tedlar Bag					

Explain any discrepancies: (include lab sample ID numbers): _____

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R7-70-100-70%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500826
ALS Sample ID: P1500826-001

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes: H3

Date Collected: 2/28/15
Date Received: 3/4/15
Date Analyzed: 3/6/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.7	0.10	
7727-37-9	Nitrogen	79.9	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.43	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

H3 = Sample was received and analyzed past holding time.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R8-70-100-70%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500826
ALS Sample ID: P1500826-003

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes: H3

Date Collected: 2/28/15
Date Received: 3/4/15
Date Analyzed: 3/6/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.3	0.10	
7727-37-9	Nitrogen	80.0	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.65	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

H3 = Sample was received and analyzed past holding time.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: R9-70-100-70%-Q250
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500826
ALS Sample ID: P1500826-005

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes: H3

Date Collected: 2/28/15
Date Received: 3/4/15
Date Analyzed: 3/6/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	14.3	0.10	
7727-37-9	Nitrogen	80.0	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	5.70	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

H3 = Sample was received and analyzed past holding time.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Air Hygiene, Incorporated
Client Sample ID: Method Blank
Client Project ID: qti-15-brokenarrow.ok-comp#1

ALS Project ID: P1500826
ALS Sample ID: P150306-MB

Test Code: EPA Method 3C Modified
Instrument ID: HP5890 II/GC1/TCD
Analyst: Nalini Lall
Sample Type: 10 L Tedlar Bag
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/06/15
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result %, v/v	MRL %, v/v	Data Qualifier
7782-44-7	Oxygen +			
7440-37-1	Argon	ND	0.10	
7727-37-9	Nitrogen	ND	0.10	
74-82-8	Methane	ND	0.10	
124-38-9	Carbon Dioxide	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
Data File : 03061507.D
Signal(s) : TCD1A.CH
Acq On : 6 Mar 2015 11:59 am
Operator : NL
Sample : 0826-001
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 09 13:44:12 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.157	226893	137299.257 ppm
3) Nitrogen	2.283	1435738	747783.009 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.717	109591	50937.380 ppm

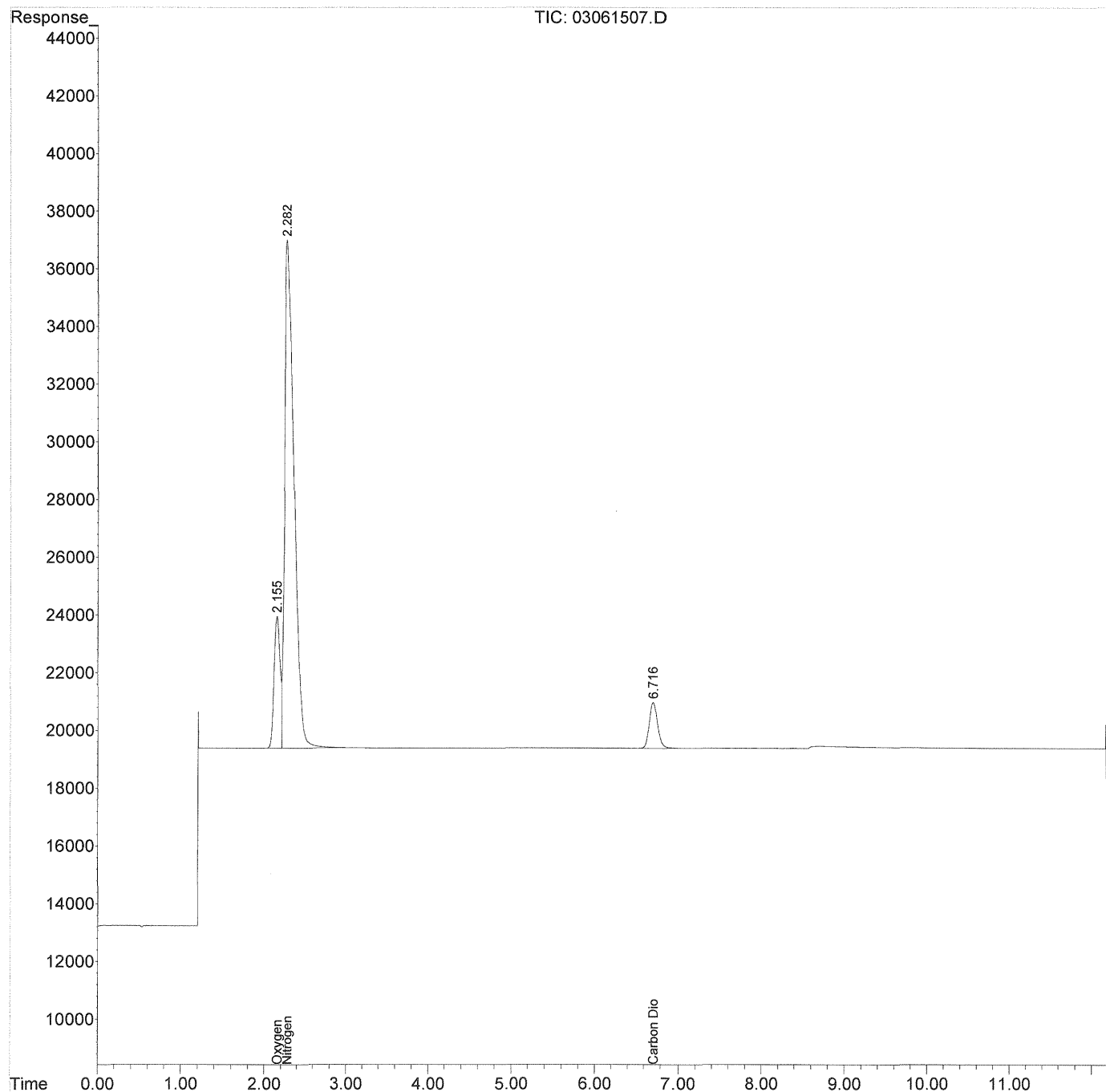
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(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061507.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 11:59 am
 Operator : NL
 Sample : 0826-001
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:12 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061508.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 12:33 pm
 Operator : NL
 Sample : 0826-001
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:15 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.156	227045	137390.987 ppm
3) Nitrogen	2.283	1435169	747486.499 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.718	109489	50890.157 ppm

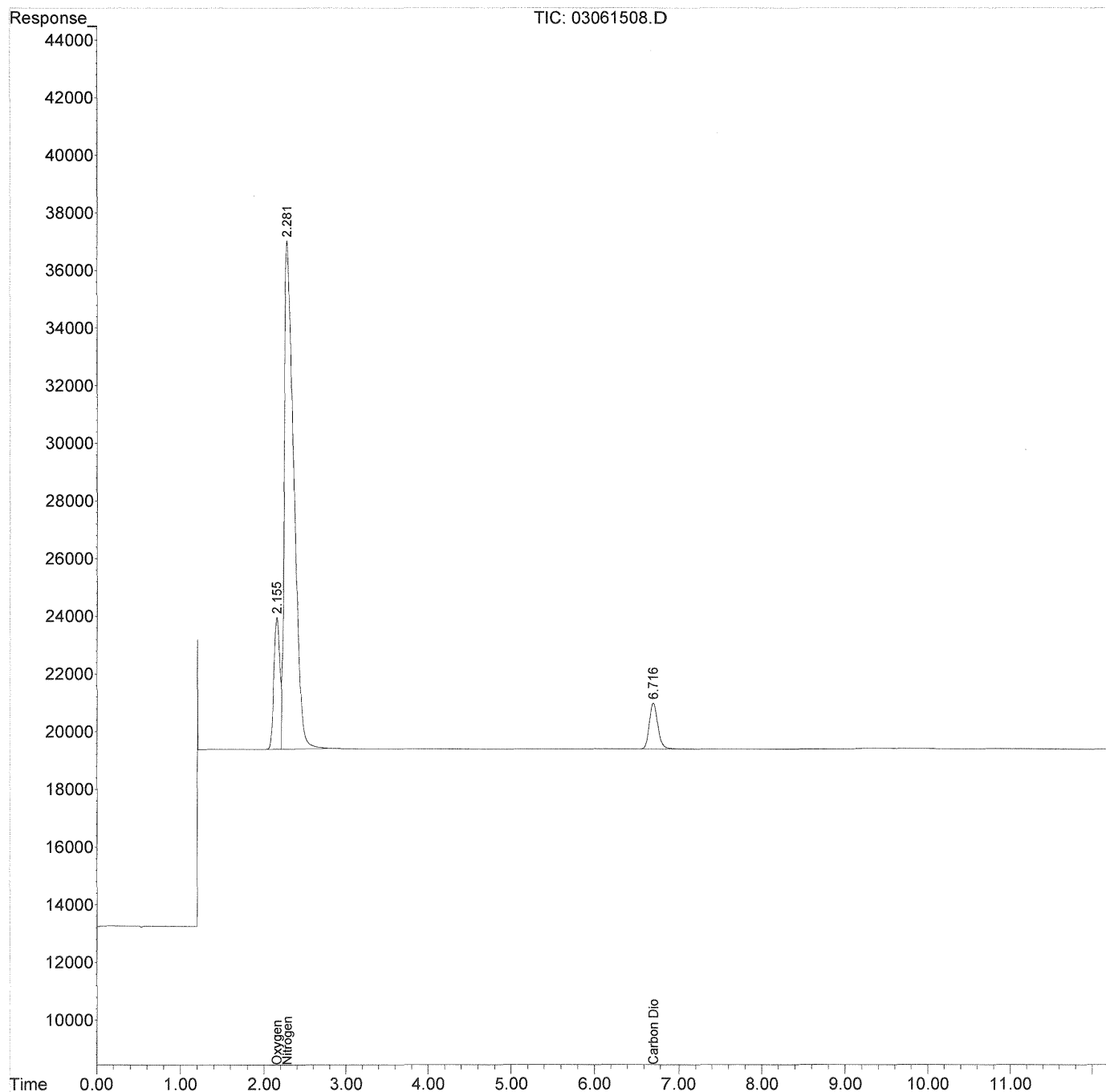
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061508.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 12:33 pm
 Operator : NL
 Sample : 0826-001
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:15 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061509.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 12:53 pm
 Operator : NL
 Sample : 0826-001
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:18 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.156	227194	137481.053	ppm
3) Nitrogen	2.283	1439352	749665.191	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.717	109506	50898.129	ppm

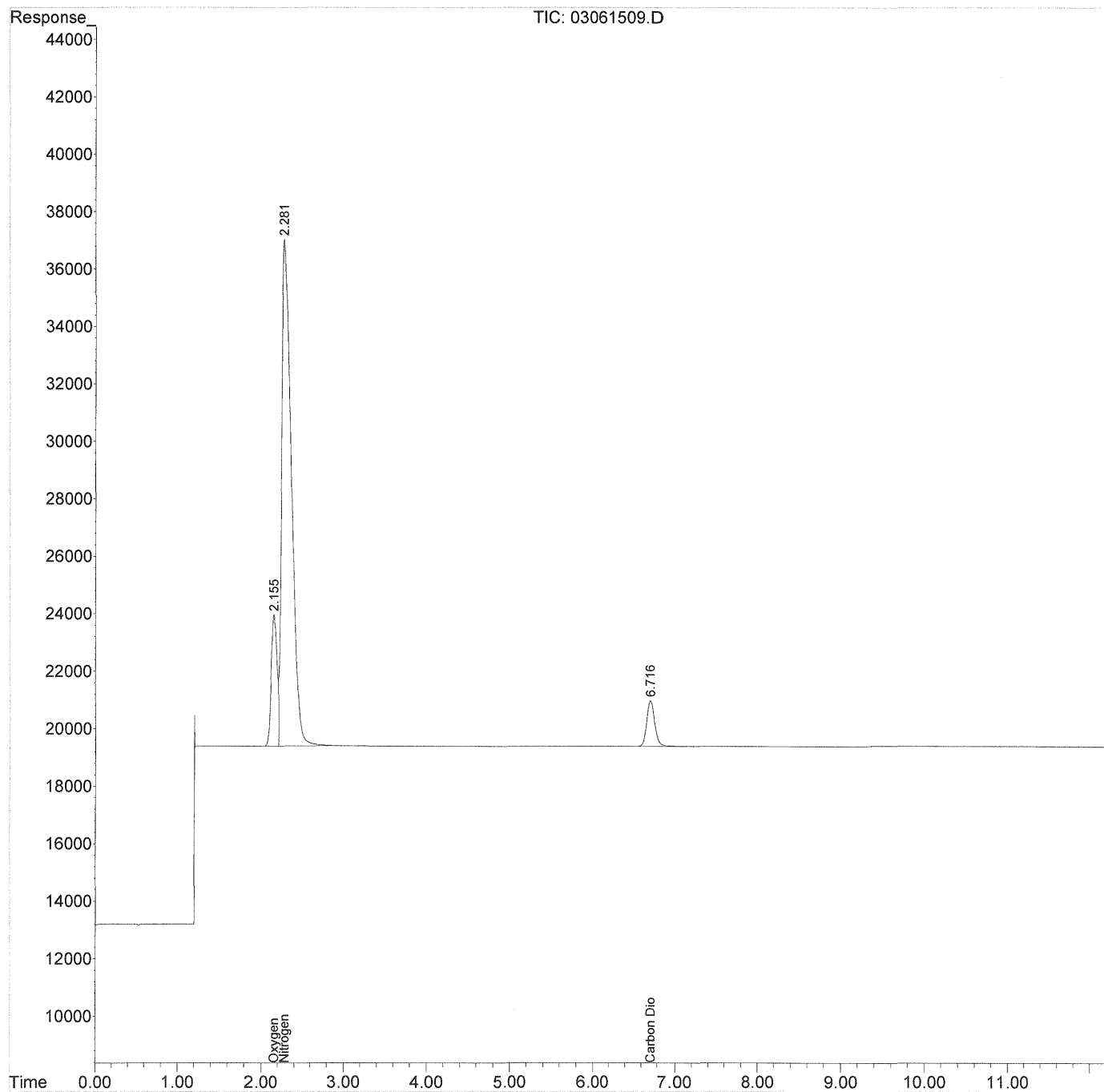
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061509.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 12:53 pm
 Operator : NL
 Sample : 0826-001
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:18 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\06\
Data File : 03061510.D
Signal(s) : TCD1A.CH
Acq On : 6 Mar 2015 1:40 pm
Operator : NL
Sample : 0826-003
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 09 13:44:22 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.161	221335	133935.607 ppm
3) Nitrogen	2.287	1435398	747605.856 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.721	113175	52603.138 ppm

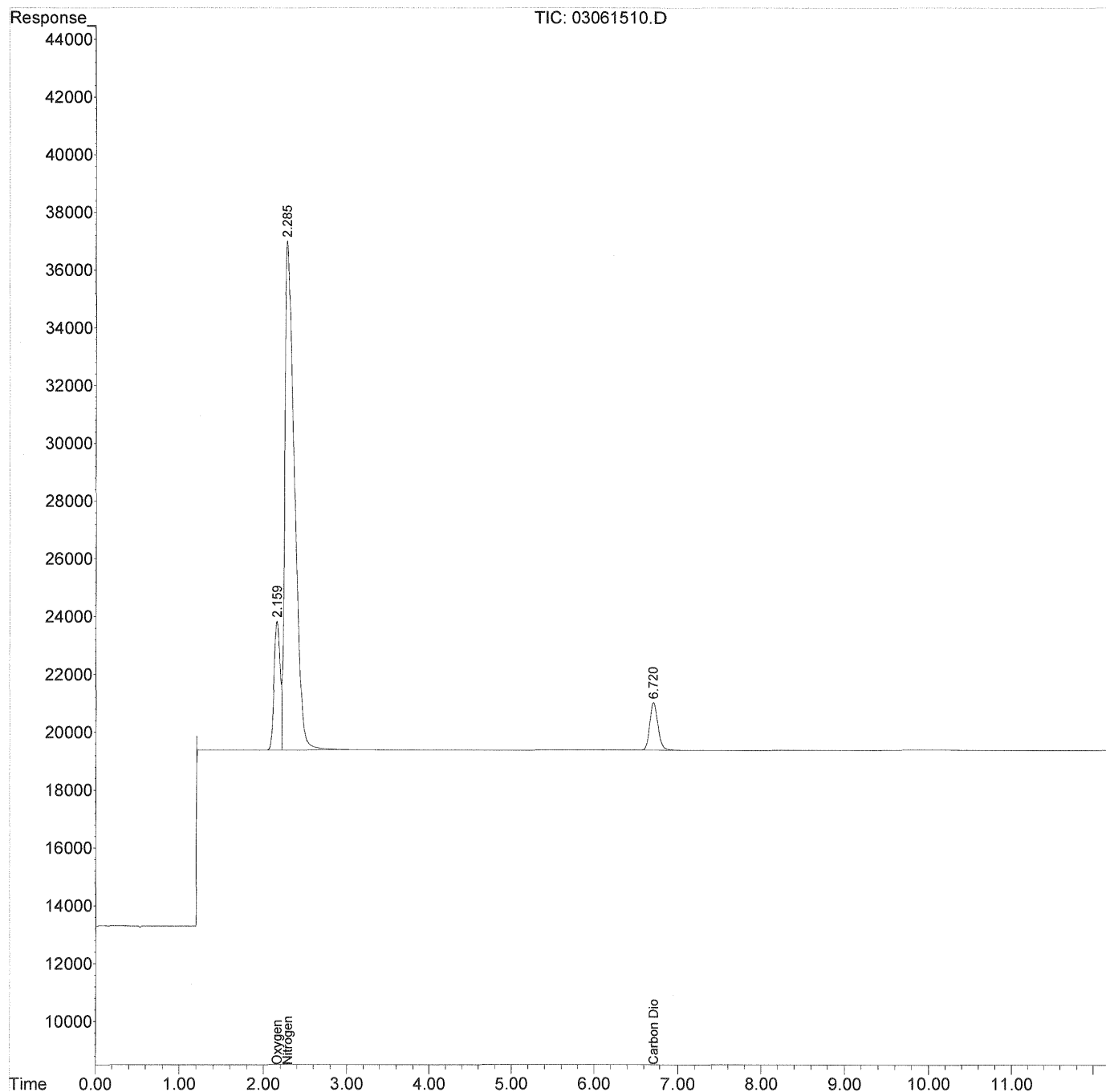
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061510.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 1:40 pm
 Operator : NL
 Sample : 0826-003
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:22 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061511.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 2:13 pm
 Operator : NL
 Sample : 0826-003
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:25 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.159	220942	133698.058 ppm
3) Nitrogen	2.285	1432619	746158.466 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.719	113202	52615.994 ppm

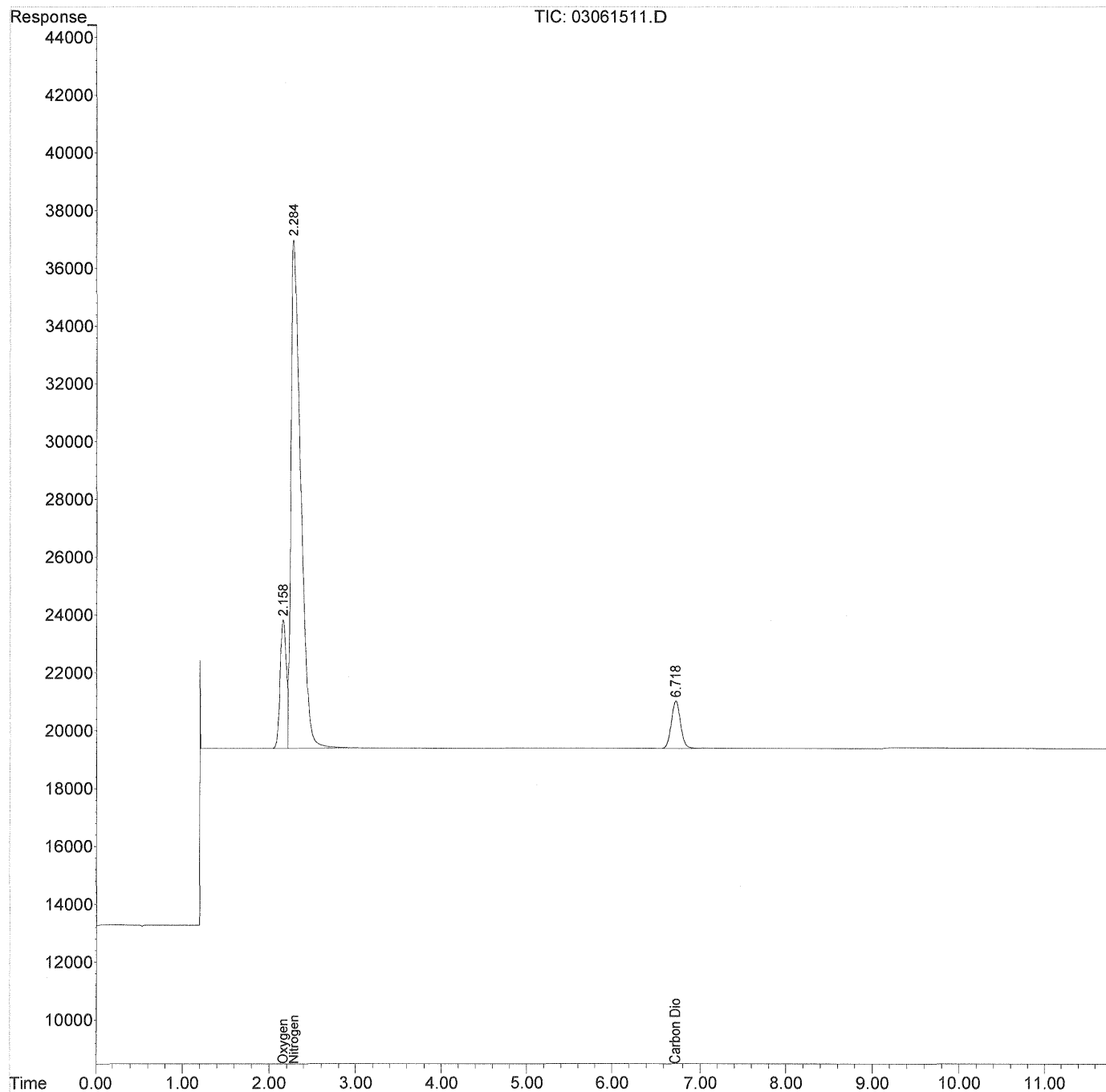
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061511.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 2:13 pm
 Operator : NL
 Sample : 0826-003
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:25 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061512.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 2:35 pm
 Operator : NL
 Sample : 0826-003
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:28 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.159	222454	134612.702 ppm
3) Nitrogen	2.285	1443965	752067.816 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.721	114770	53344.479 ppm

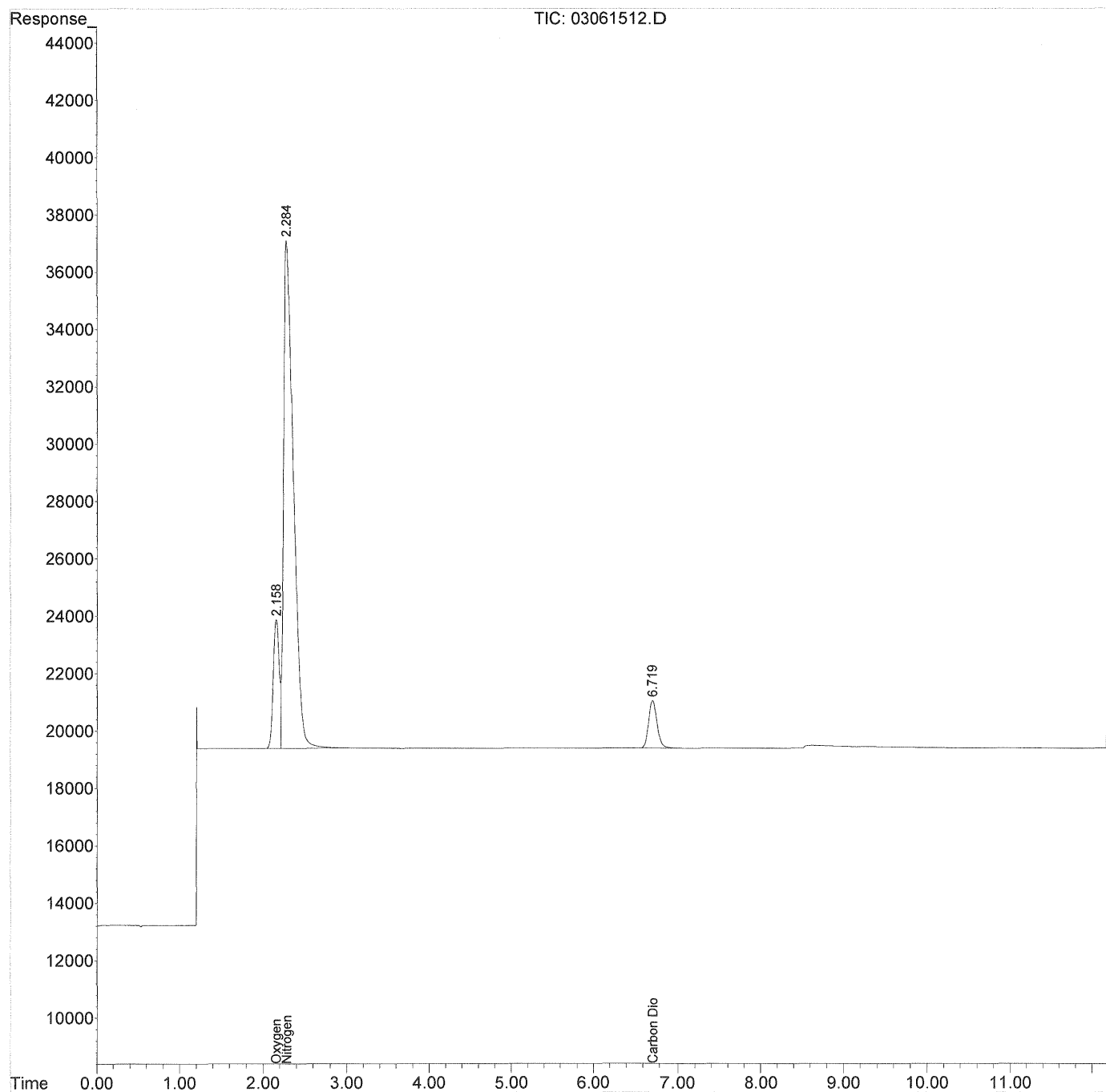
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061512.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 2:35 pm
 Operator : NL
 Sample : 0826-003
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:28 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\06\
Data File : 03061514.D
Signal(s) : TCD1A.CH
Acq On : 6 Mar 2015 3:21 pm
Operator : NL
Sample : 0826-005
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 09 13:44:31 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.158	220629	133508.408	ppm
3) Nitrogen	2.284	1437789	748851.280	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	6.718	114621	53275.363	ppm

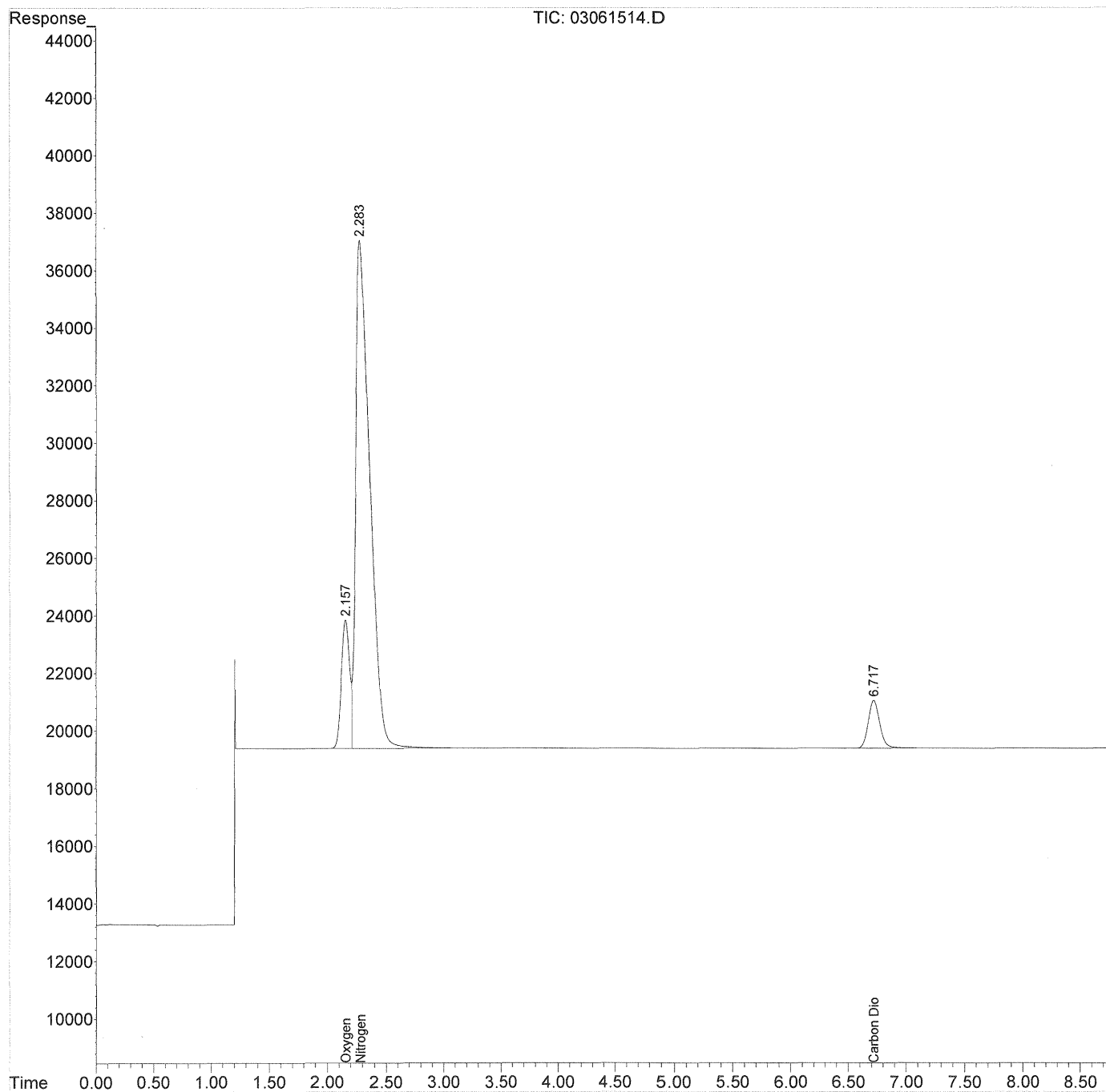
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061514.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 3:21 pm
 Operator : NL
 Sample : 0826-005
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:31 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061515.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 3:36 pm
 Operator : NL
 Sample : 0826-005
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:34 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.157	221458	134010.090 ppm
3) Nitrogen	2.283	1443756	751959.001 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.717	115051	53475.442 ppm

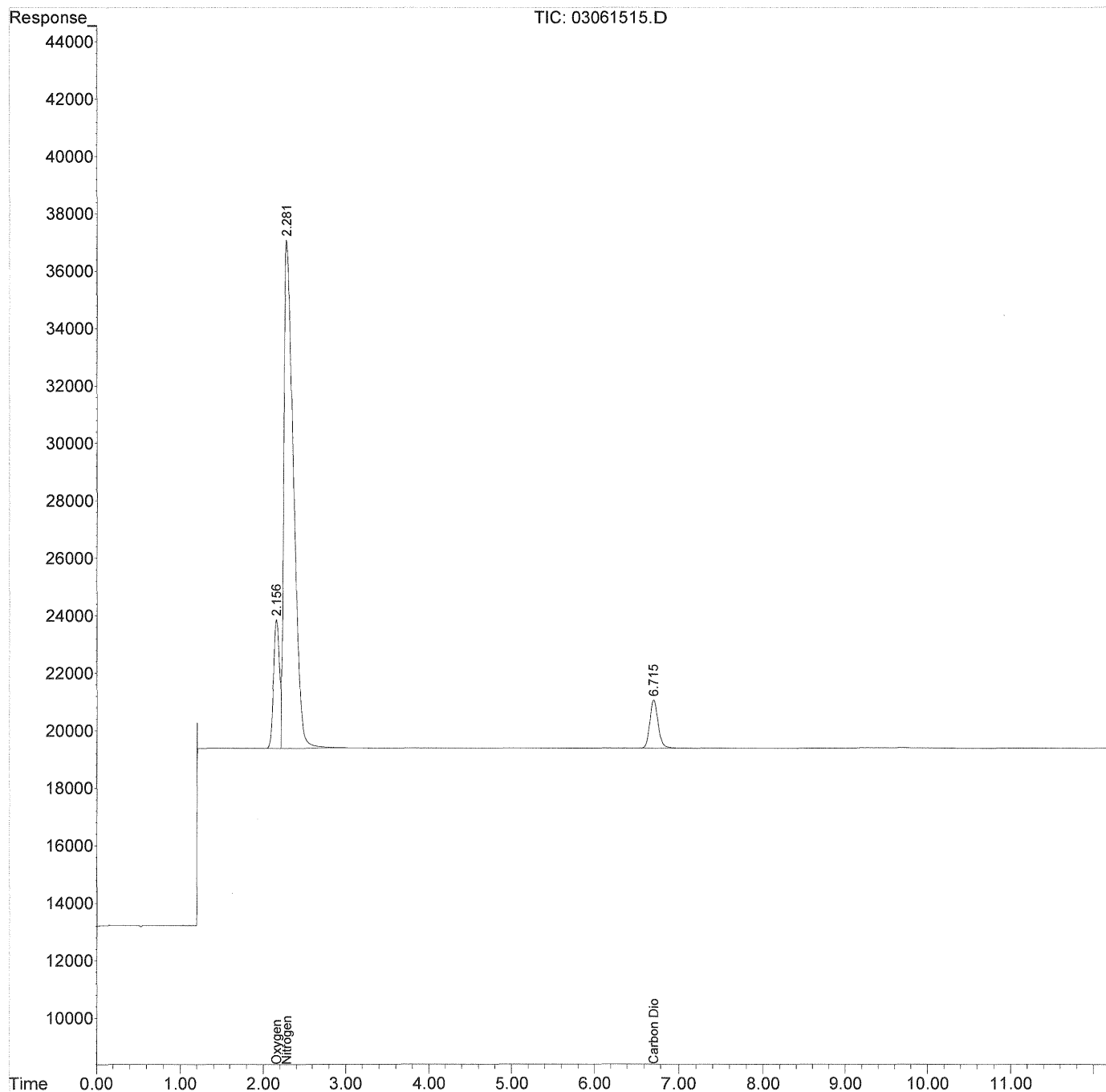
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061515.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 3:36 pm
 Operator : NL
 Sample : 0826-005
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:34 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061516.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 4:04 pm
 Operator : NL
 Sample : 0826-005
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:37 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.158	221564	134074.211 ppm
3) Nitrogen	2.284	1444324	752254.775 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.718	115372	53624.436 ppm

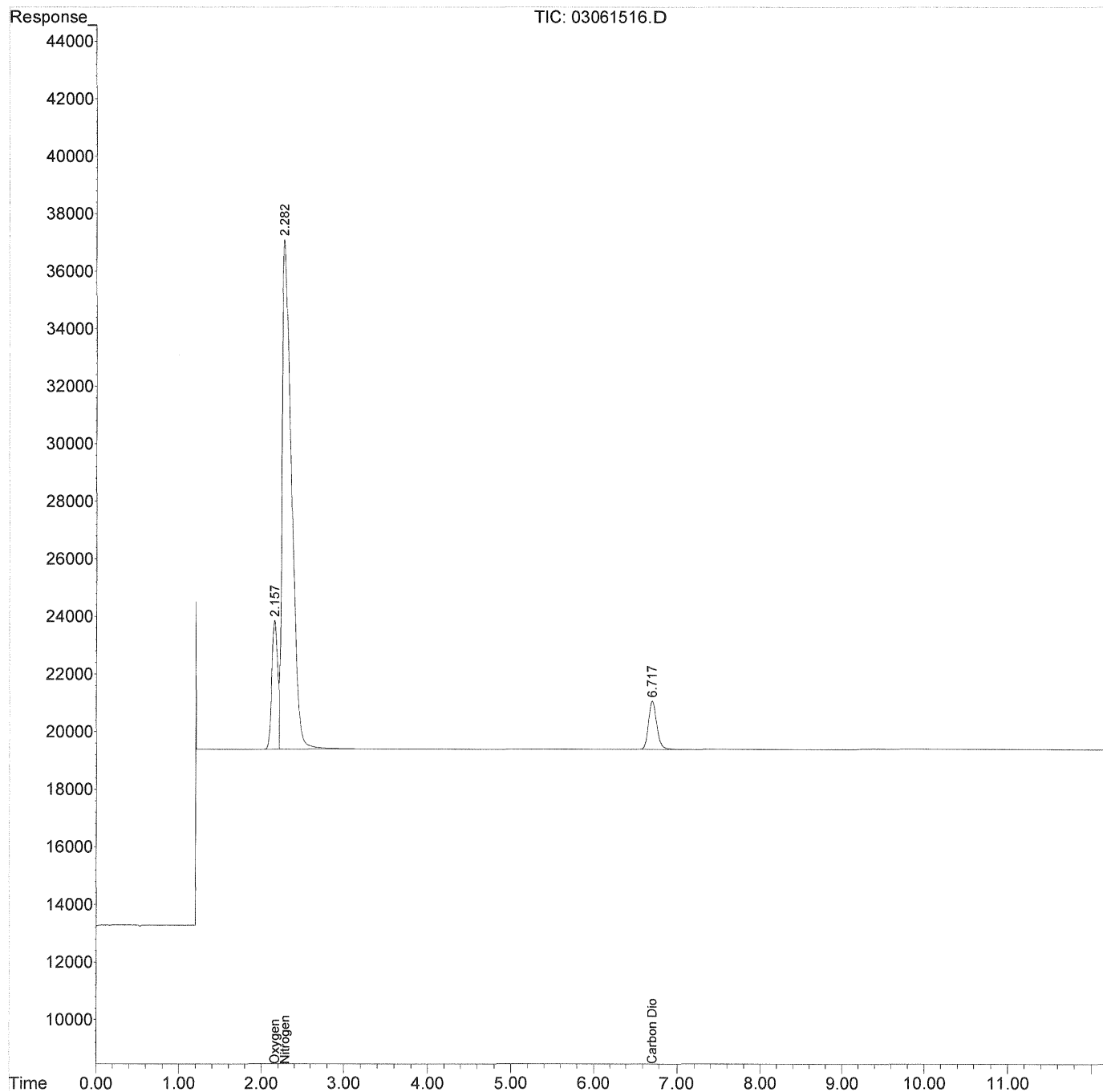
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061516.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 4:04 pm
 Operator : NL
 Sample : 0826-005
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:37 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061502.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 8:00 am
 Operator : MC
 Sample : mb
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:06 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	0.000	0	N.D.	ppm
3) Nitrogen	0.000	0	N.D.	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	0.000	0	N.D.	ppm
6) Carbon Dioxide	0.000	0	N.D.	ppm

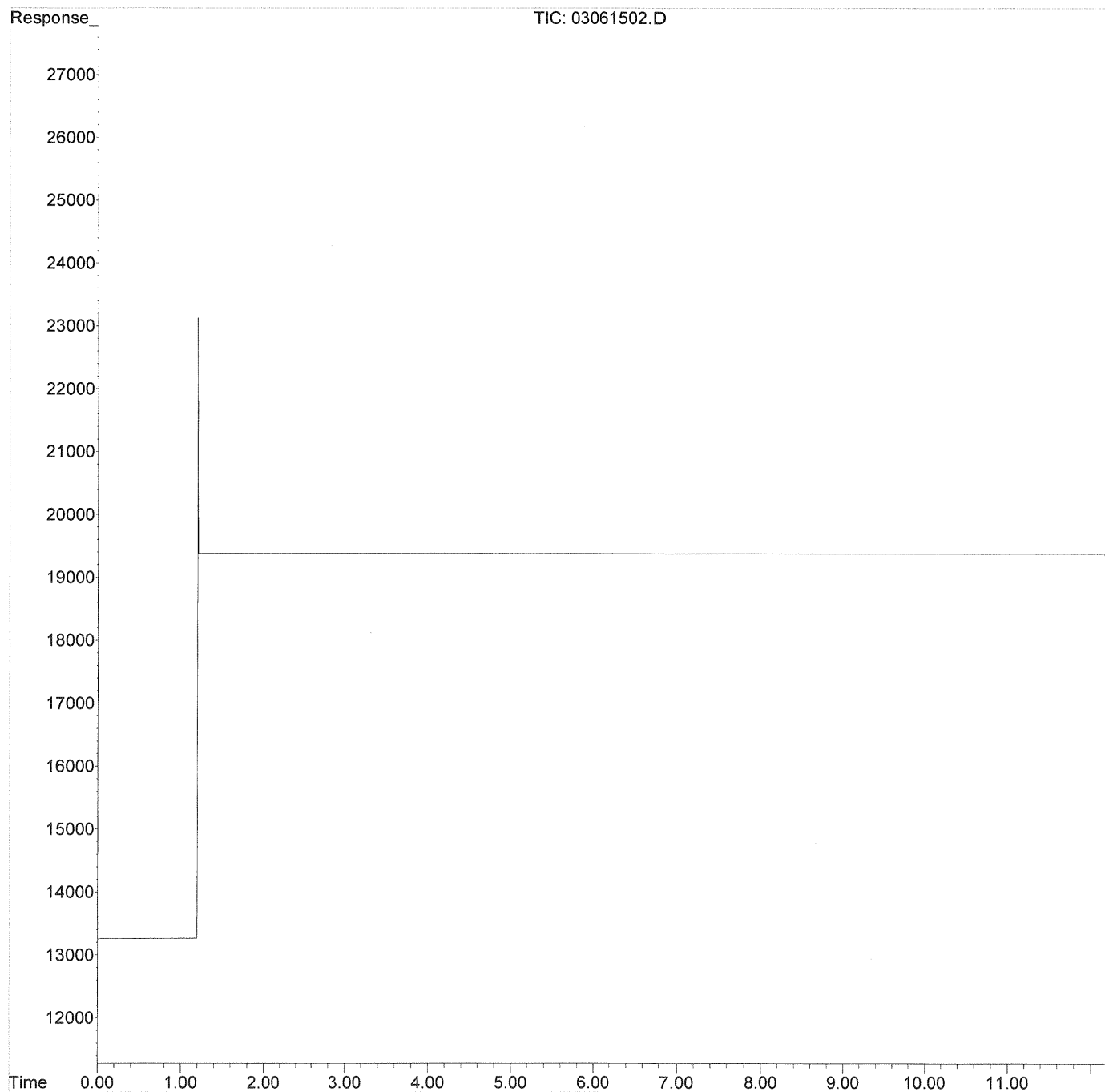
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061502.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 8:00 am
 Operator : MC
 Sample : mb
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:06 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



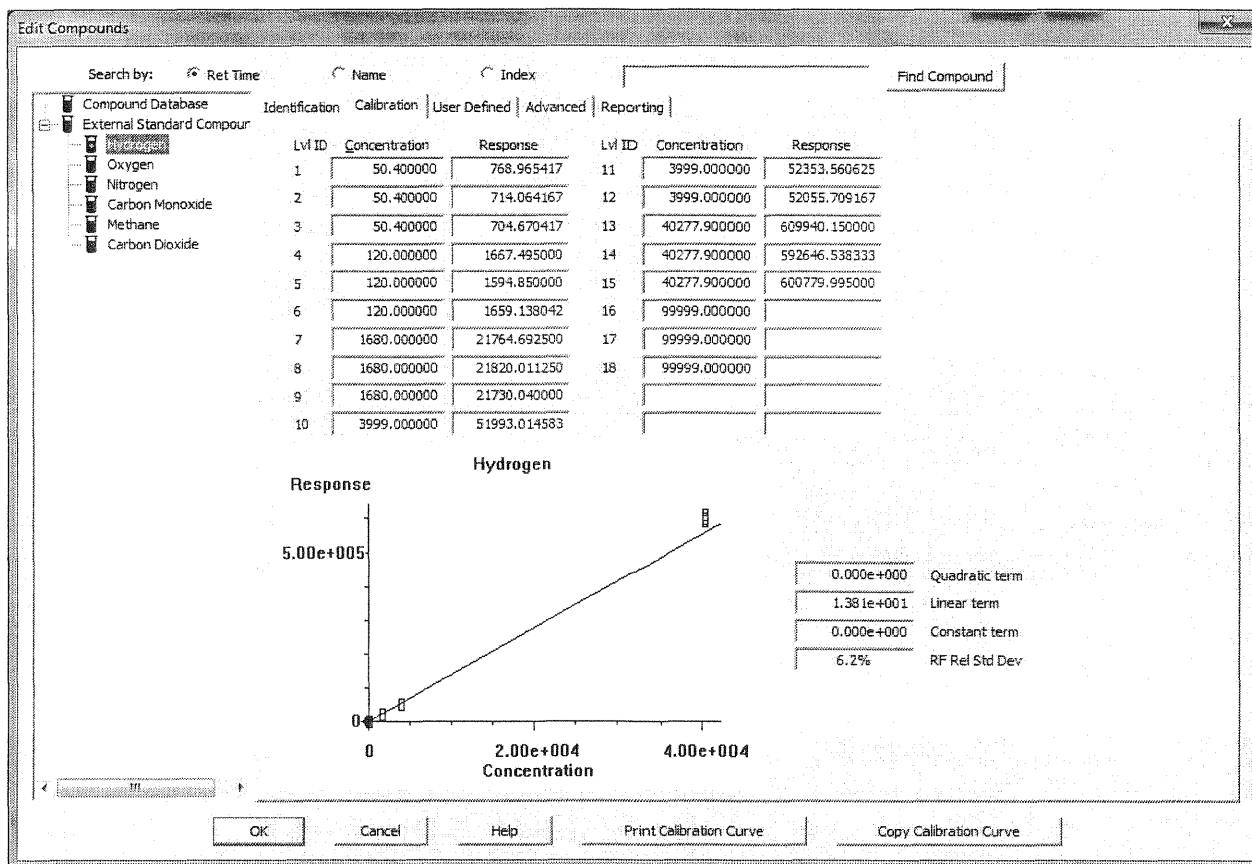
Method Path : J:\GC01\METHODS\
Method File : TR031014.M
Title : EPA 3C GC/TCD Analysis for Fixed Gases
Last Update : Tue Mar 11 11:04:23 2014
Response Via : Initial Calibration

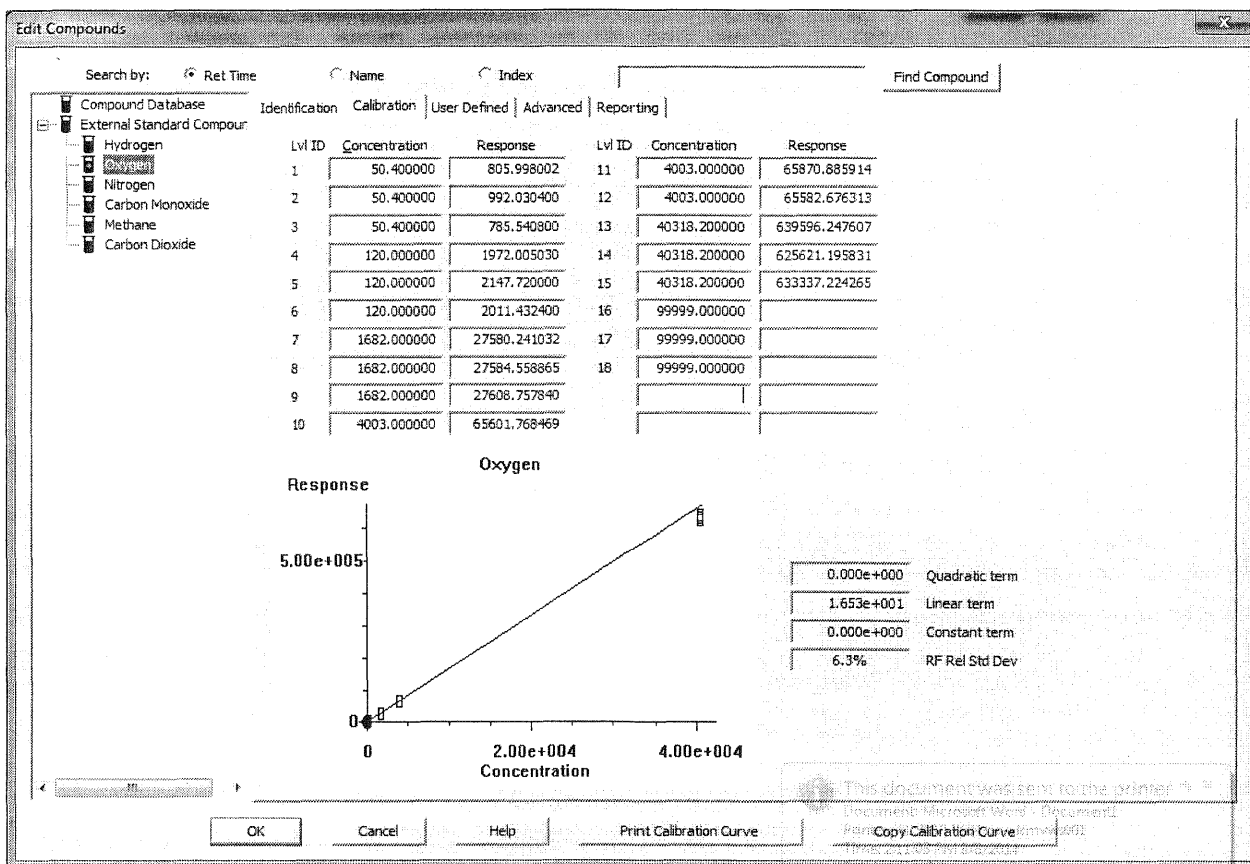
Calibration Files

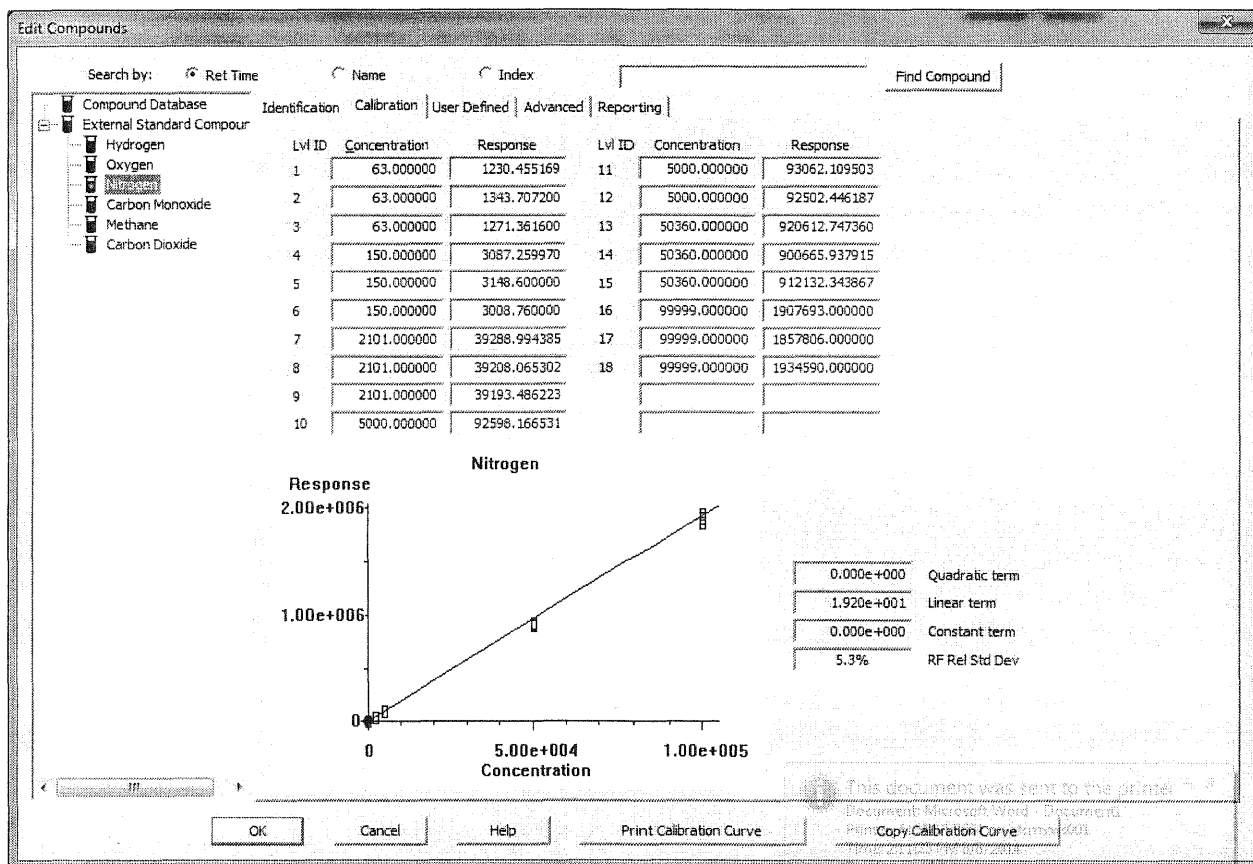
1	=03101403.D	2	=03101404.D	3	=03101405.D
4	=03101406.D	5	=03101407.D	6	=03101408.D

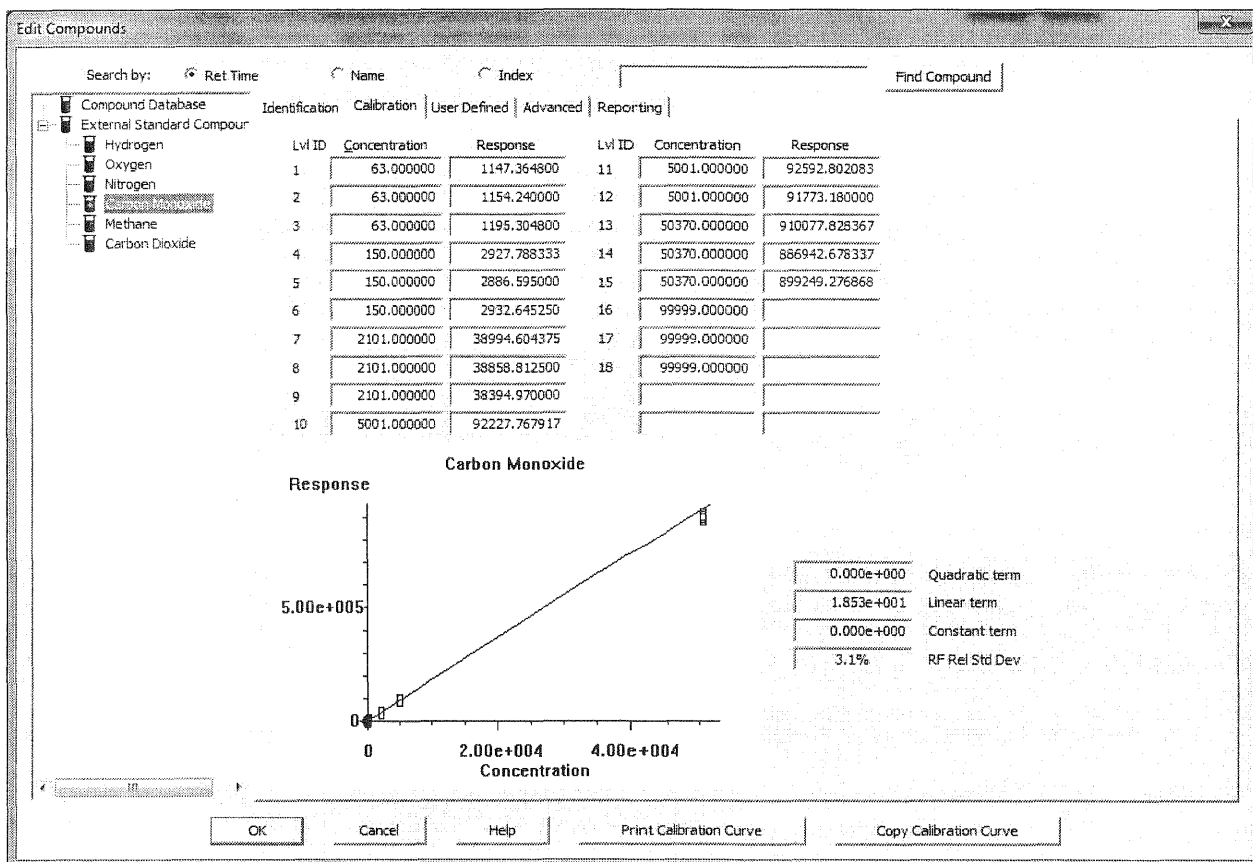
	Compound	1	2	3	4	5	6	Avg		%RSD
1)	Hydrogen	1.526	1.417	1.398	1.390	1.329	1.383	1.381	E1	6.22
2)	Oxygen	1.599	1.968	1.559	1.643	1.790	1.676	1.653	E1	6.33
3)	Nitrogen	1.953	2.133	2.018	2.058	2.099	2.006	1.920	E1	5.33
4)	Carbon Monoxide	1.821	1.832	1.897	1.952	1.924	1.955	1.853	E1	3.06
5)	Methane	1.435	1.340	1.378	1.499	1.440	1.406	1.396	E1	3.12
6)	Carbon Dioxide	2.233	2.138	2.113	2.234	2.287	2.291	2.151	E1	3.66

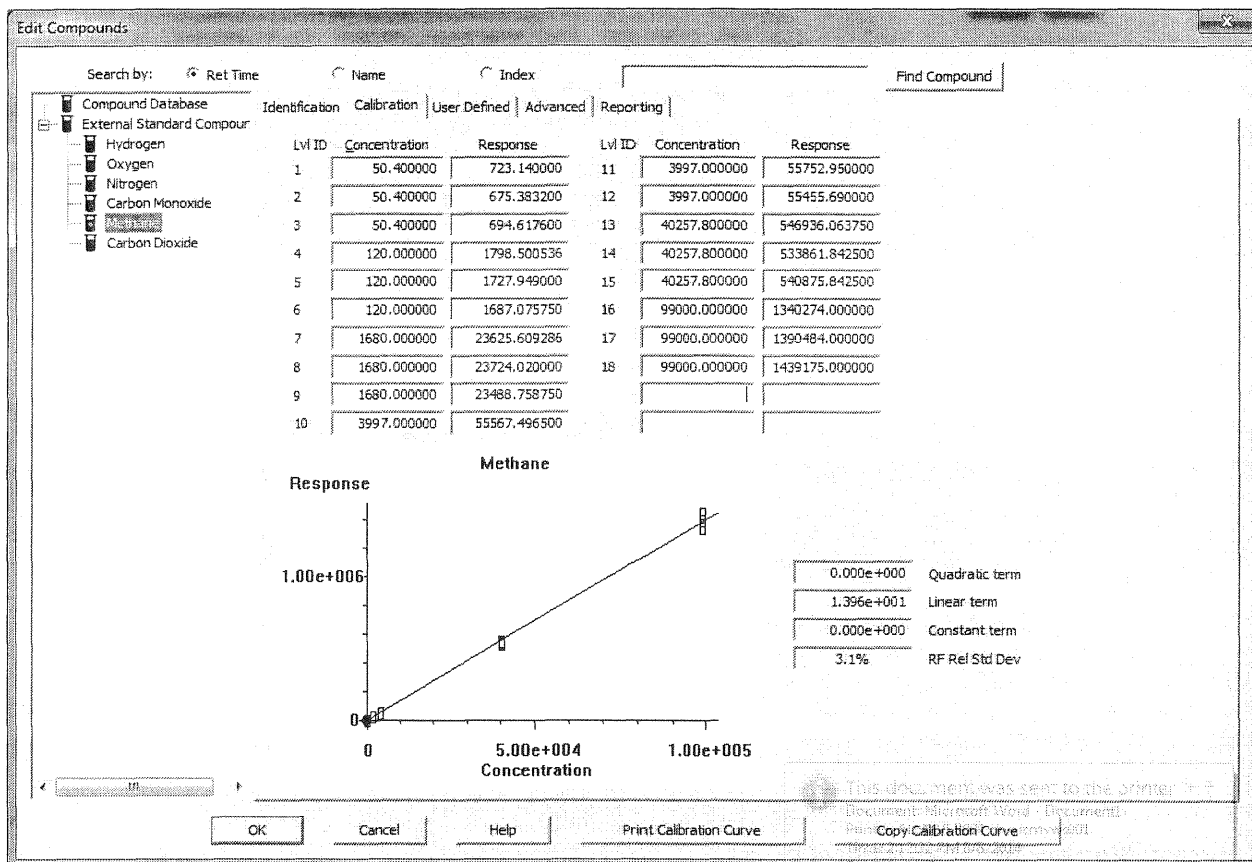
(#) = Out of Range ### Number of calibration levels exceeded format ###

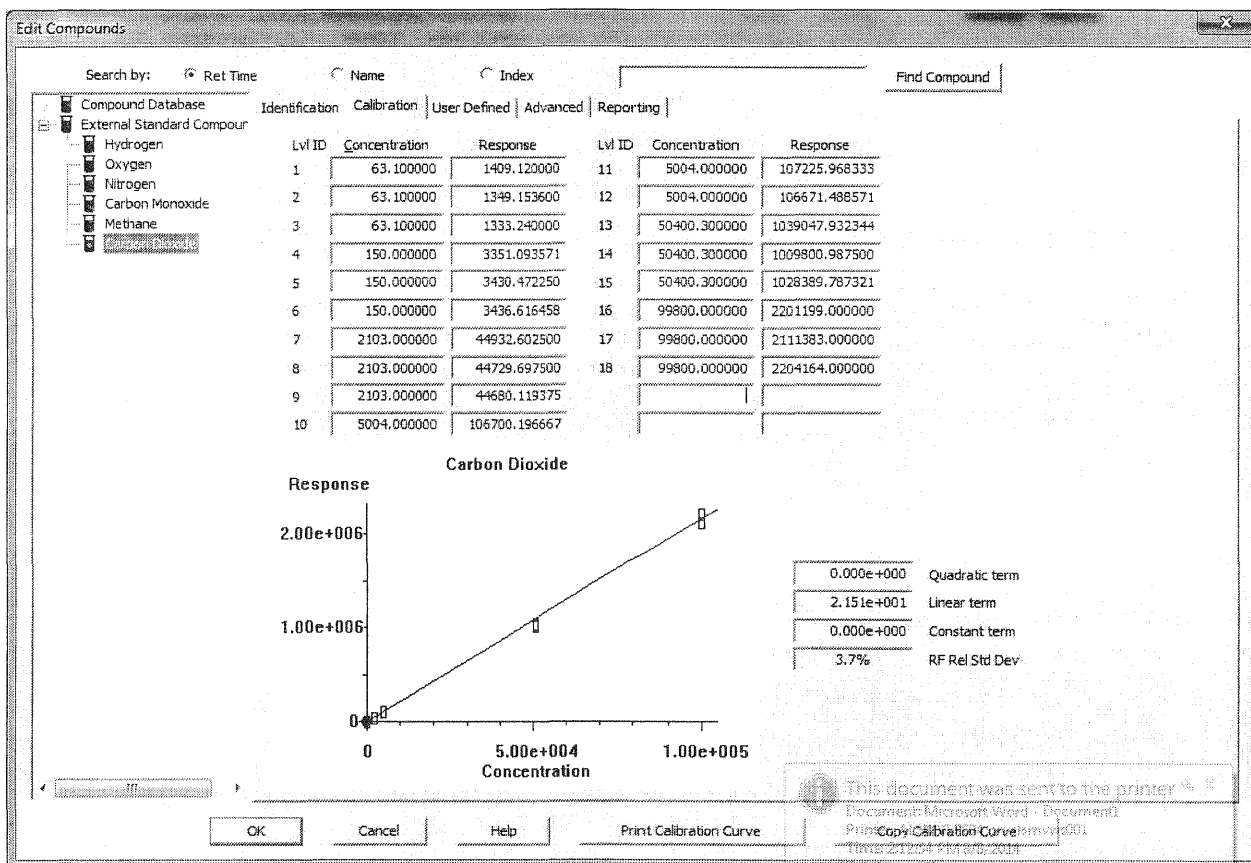








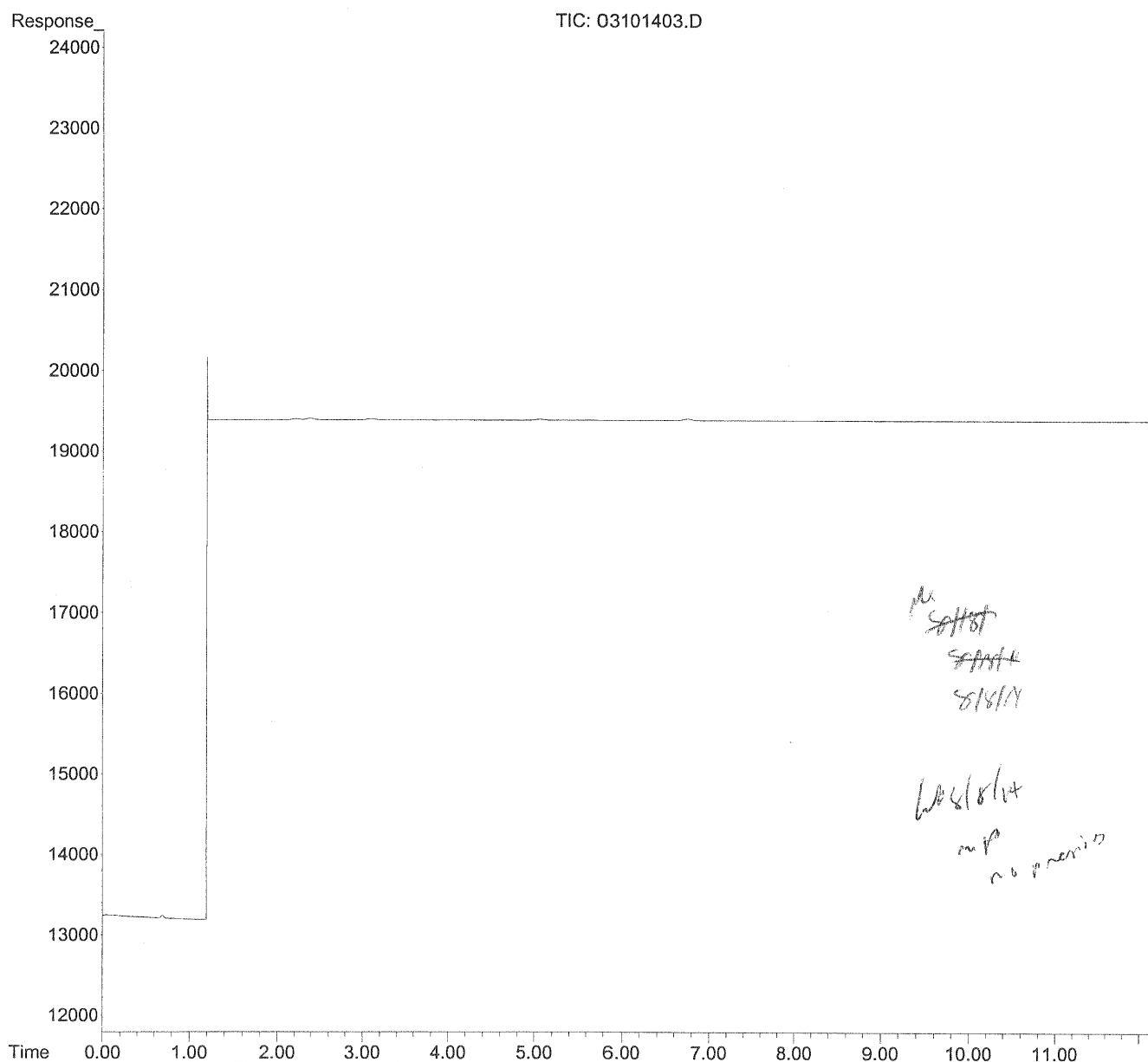




Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101403.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 10:59
Operator : WH
Sample : std 1 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:13:11 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:11:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101403.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 10:59
Operator : WH
Sample : std 1 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:13:11 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:11:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.700	769	NoCal	ppm
2) Oxygen	2.227	806	NoCal	ppm m
3) Nitrogen	2.393	1230	NoCal	ppm m
4) Carbon Monoxide	3.092	1147	NoCal	ppm m
5) Methane	5.085	723	NoCal	ppm m
6) Carbon Dioxide	6.748	1409	NoCal	ppm m

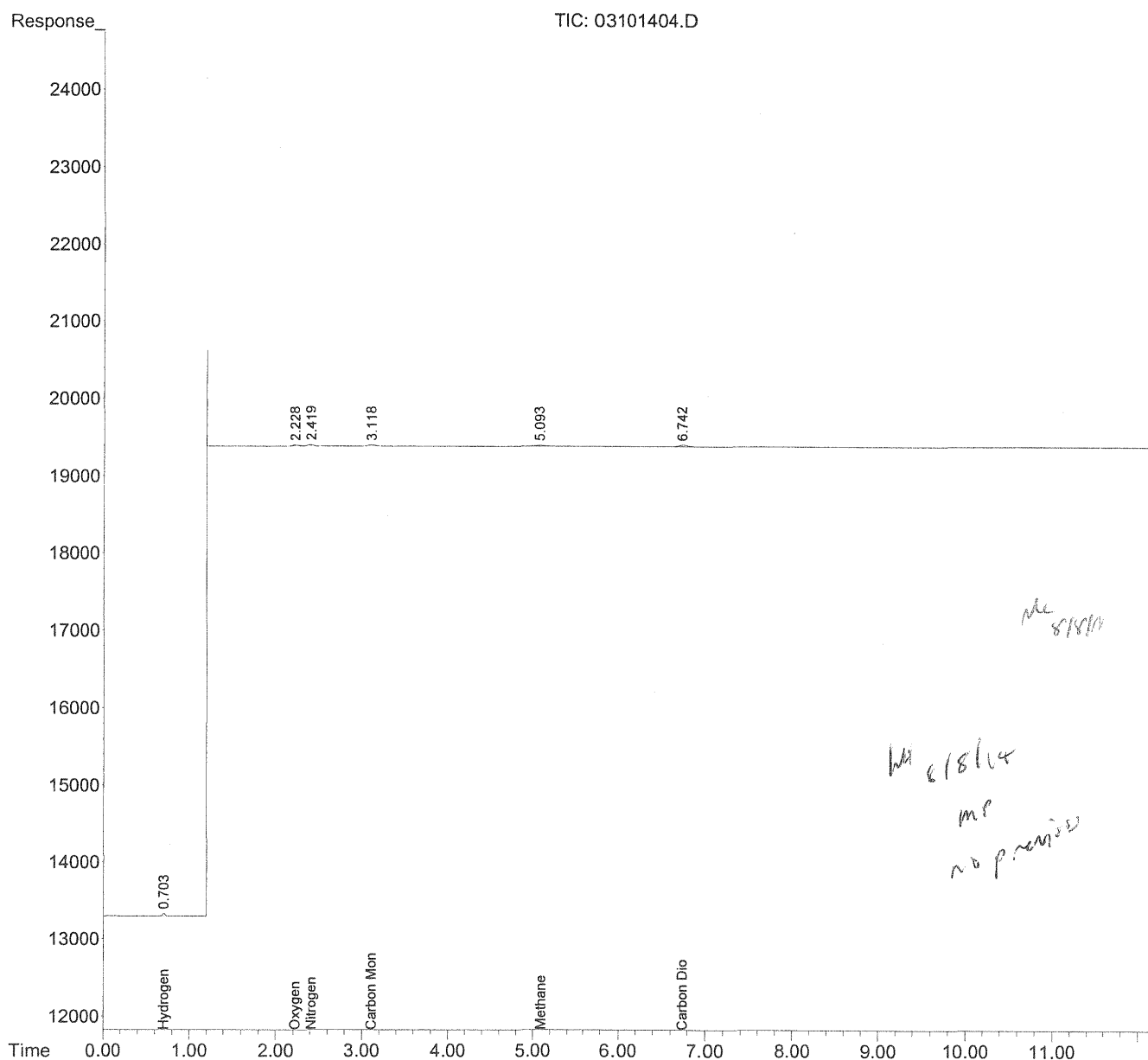
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101404.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:29
Operator : WH
Sample : std 1 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:56:49 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:13:33 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101404.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:29
Operator : WH
Sample : std 1 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:56:49 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:13:33 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.704	714	468.016	ppm
2) Oxygen	2.228	992	620.328	ppm m
3) Nitrogen	2.419	1344	687.986	ppm m
4) Carbon Monoxide	3.118	1154	633.775	ppm m
5) Methane	5.093	675	470.715	ppm m
6) Carbon Dioxide	6.742	1349	604.147	ppm m

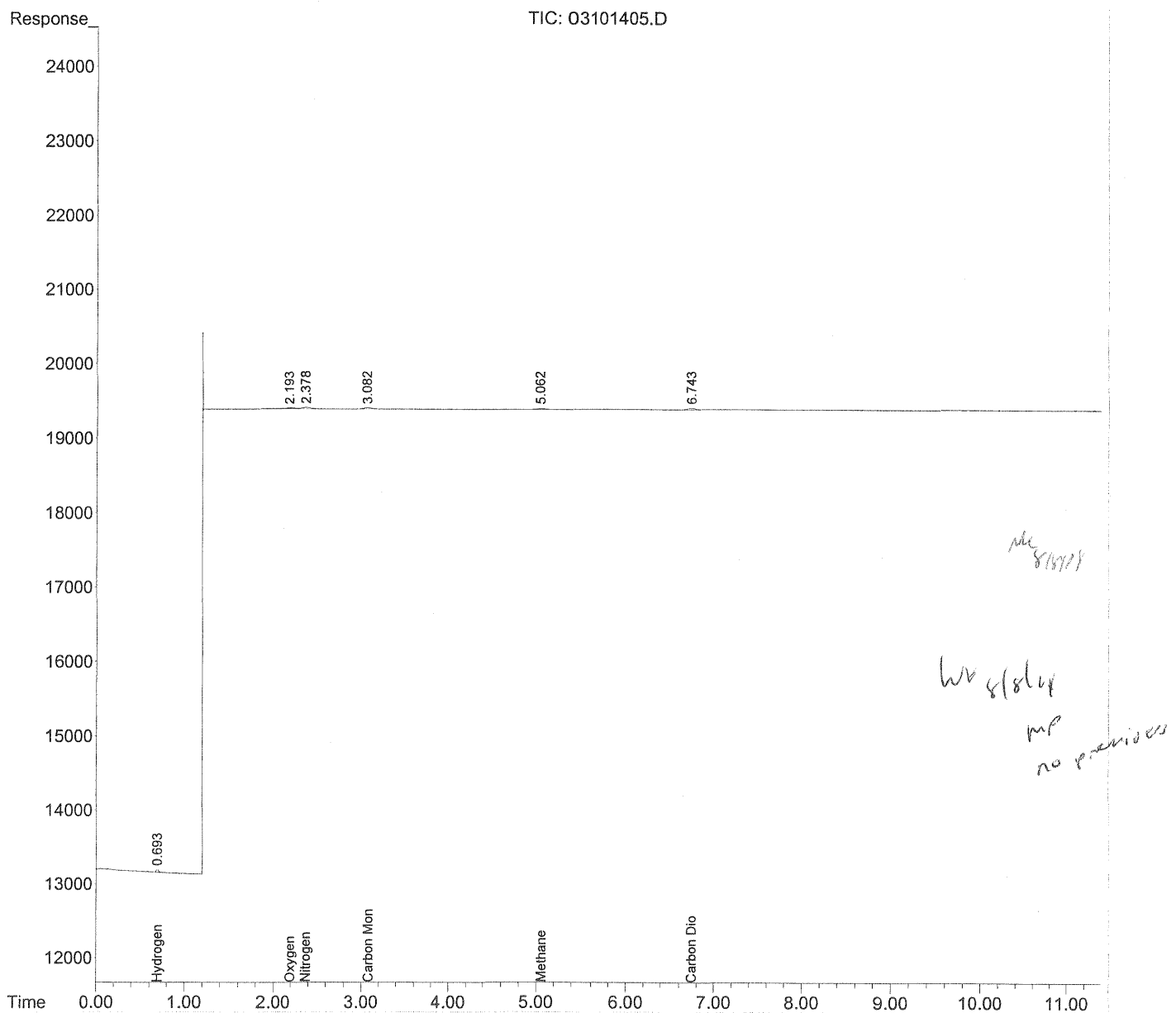
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101405.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:44
Operator : WH
Sample : std 1 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:20 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:15:04 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101405.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:44
Operator : WH
Sample : std 1 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:20 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:15:04 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.695	705	478.957	ppm
2) Oxygen	2.193	786	440.385	ppm m
3) Nitrogen	2.378	1271	592.487	ppm m
4) Carbon Monoxide	3.082	1195	654.363	ppm m
5) Methane	5.062	695	500.653	ppm m
6) Carbon Dioxide	6.743	1333	610.001	ppm m

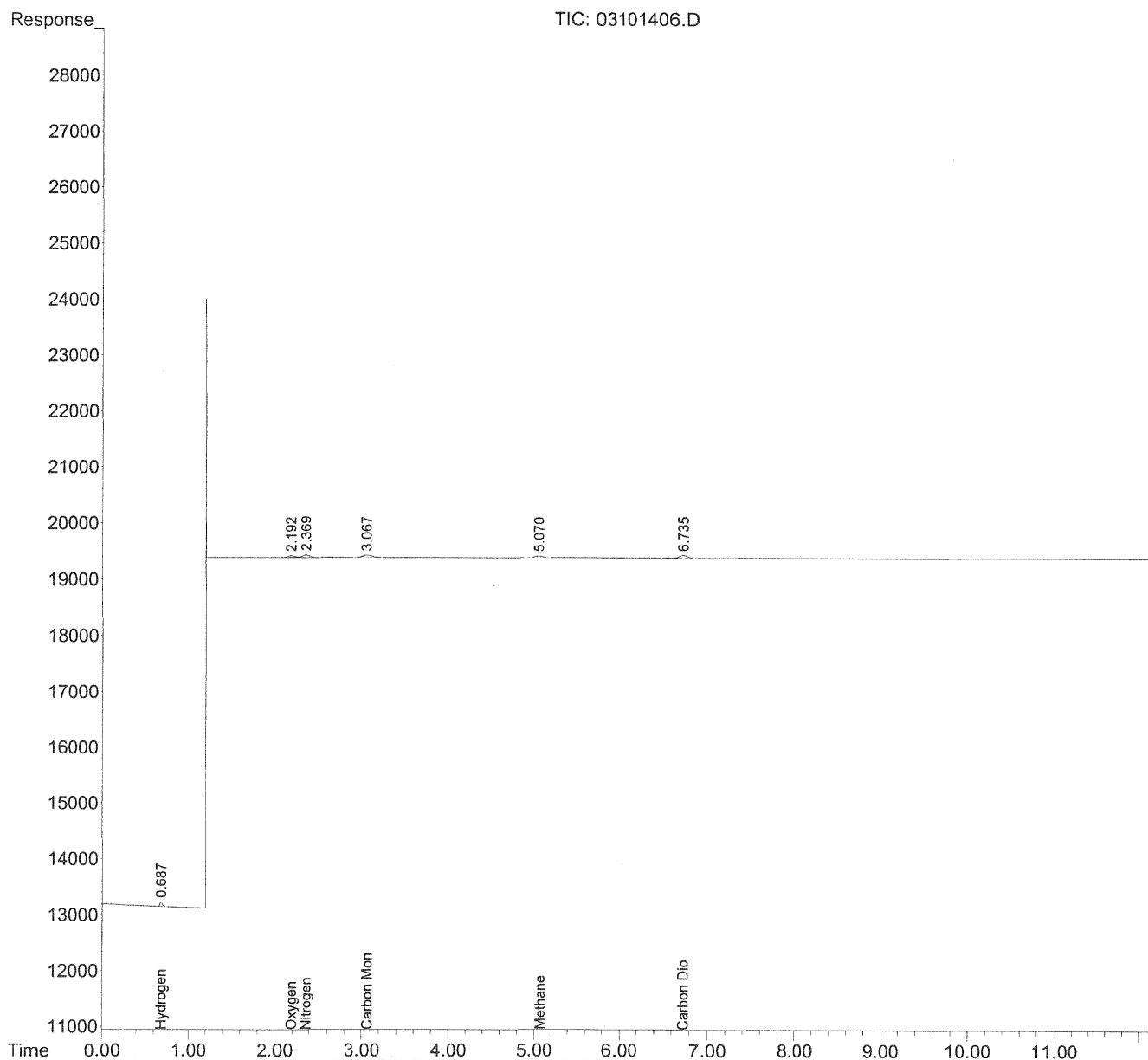
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101406.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:59
Operator : WH
Sample : std 2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:16:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101406.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 11:59
Operator : WH
Sample : std 2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:16:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:16:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.688	1667	1152.467 ppm
2) Oxygen	2.195	1972	1154.090 ppm
3) Nitrogen	2.367	3087	1467.876 ppm
4) Carbon Monoxide	3.067	2928	1582.403 ppm
5) Methane	5.070	1799	1299.164 ppm
6) Carbon Dioxide	6.738	3351	1550.434 ppm

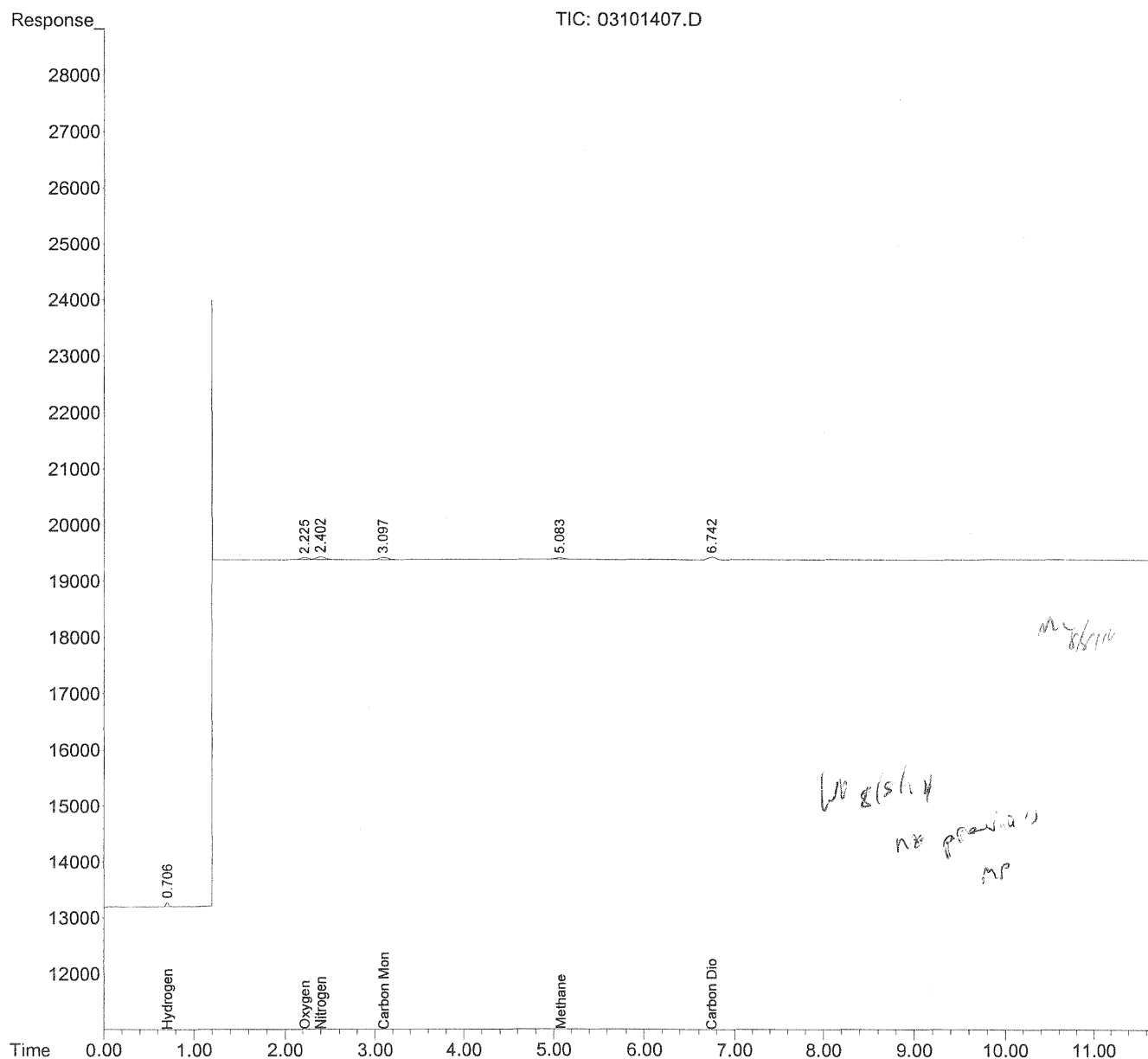
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101407.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:18
Operator : WH
Sample : std 2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:18:19 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:17:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101407.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:18
Operator : WH
Sample : std 2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:18:19 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:17:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.708	1595	1113.284	ppm
2) Oxygen	2.225	2148	1269.063	ppm m
3) Nitrogen	2.402	3149	1505.099	ppm m
4) Carbon Monoxide	3.106	2887	1539.002	ppm
5) Methane	5.082	1728	1222.935	ppm
6) Carbon Dioxide	6.744	3430	1573.930	ppm

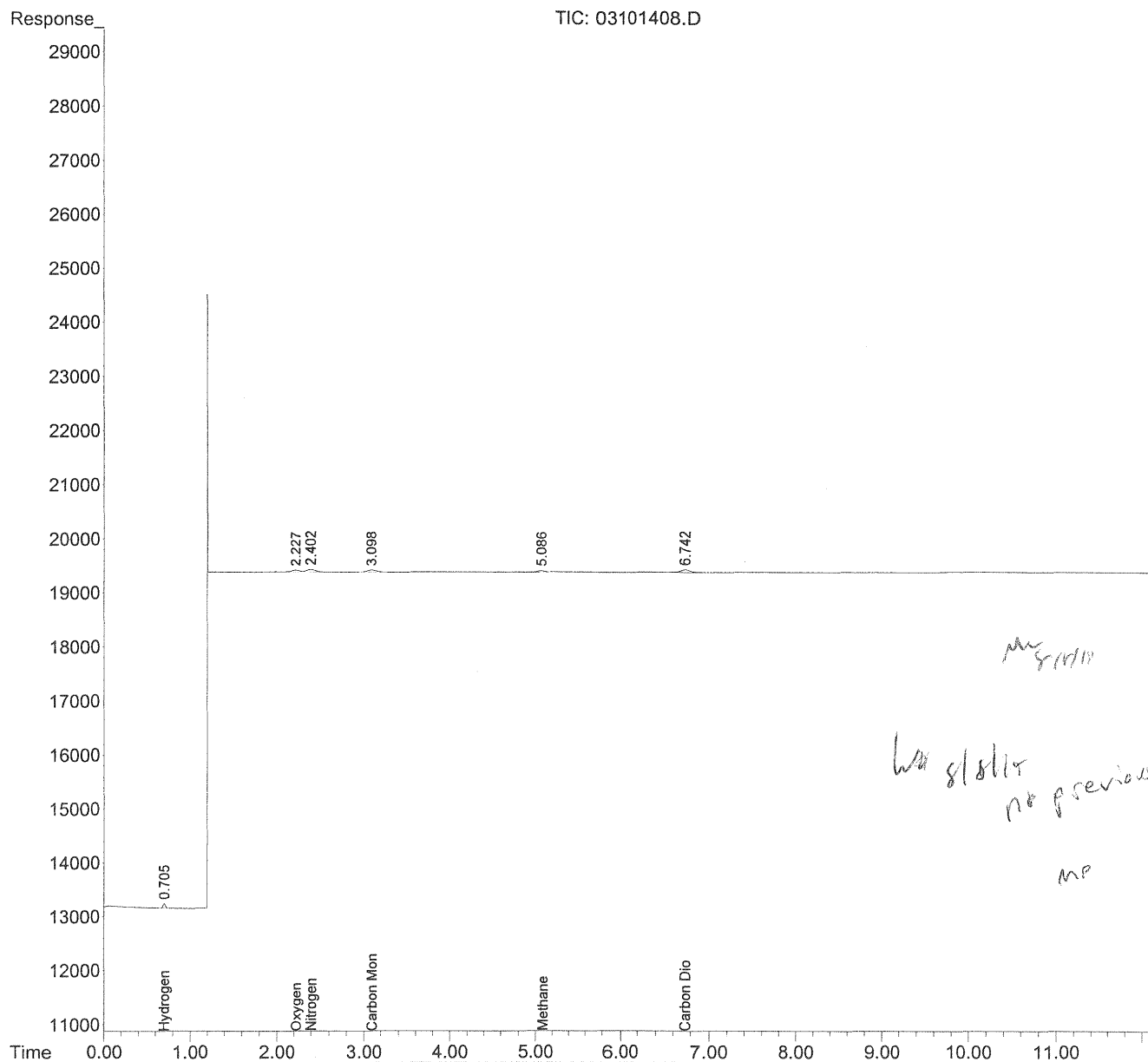
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101408.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:34
Operator : WH
Sample : std 2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:19:15 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:18:37 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101408.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 12:34
Operator : WH
Sample : std 2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:19:15 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:18:37 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.707	1659	1175.144 ppm
2) Oxygen	2.227	2011	1175.007 ppm m
3) Nitrogen	2.402	3009	1437.275 ppm m
4) Carbon Monoxide	3.103	2933	1555.465 ppm
5) Methane	5.087	1687	1189.461 ppm
6) Carbon Dioxide	6.745	3437	1561.358 ppm

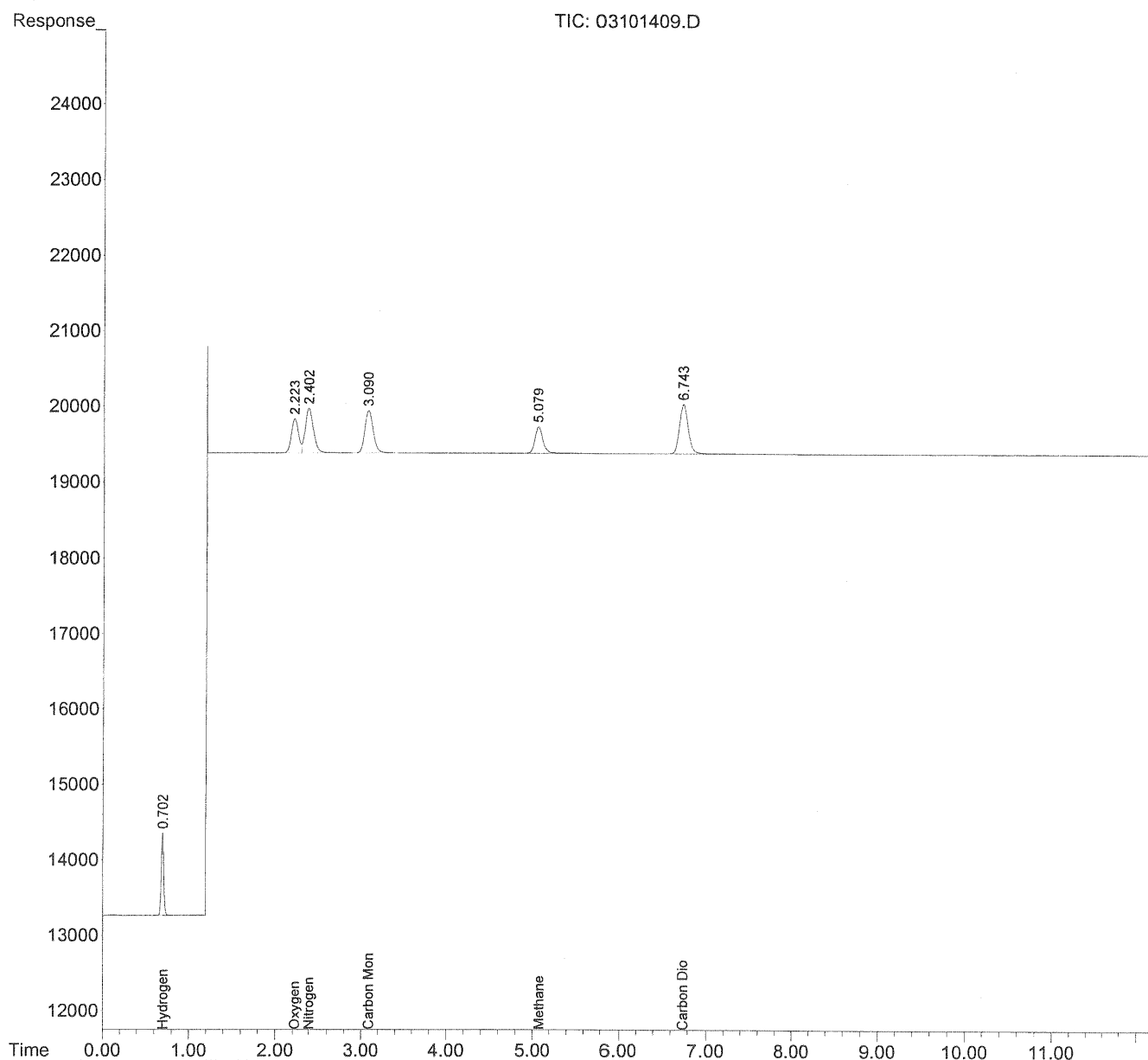
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101409.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:05
Operator : WH
Sample : std 3 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:22:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:19:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101409.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:05
Operator : WH
Sample : std 3 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 13:22:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:19:31 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.703	21765	15469.029 ppm
2) Oxygen	2.225	27580	16167.517 ppm
3) Nitrogen	2.402	39289	18899.954 ppm
4) Carbon Monoxide	3.092	38995	20555.928 ppm
5) Methane	5.081	23626	16681.490 ppm
6) Carbon Dioxide	6.744	44933	20275.995 ppm

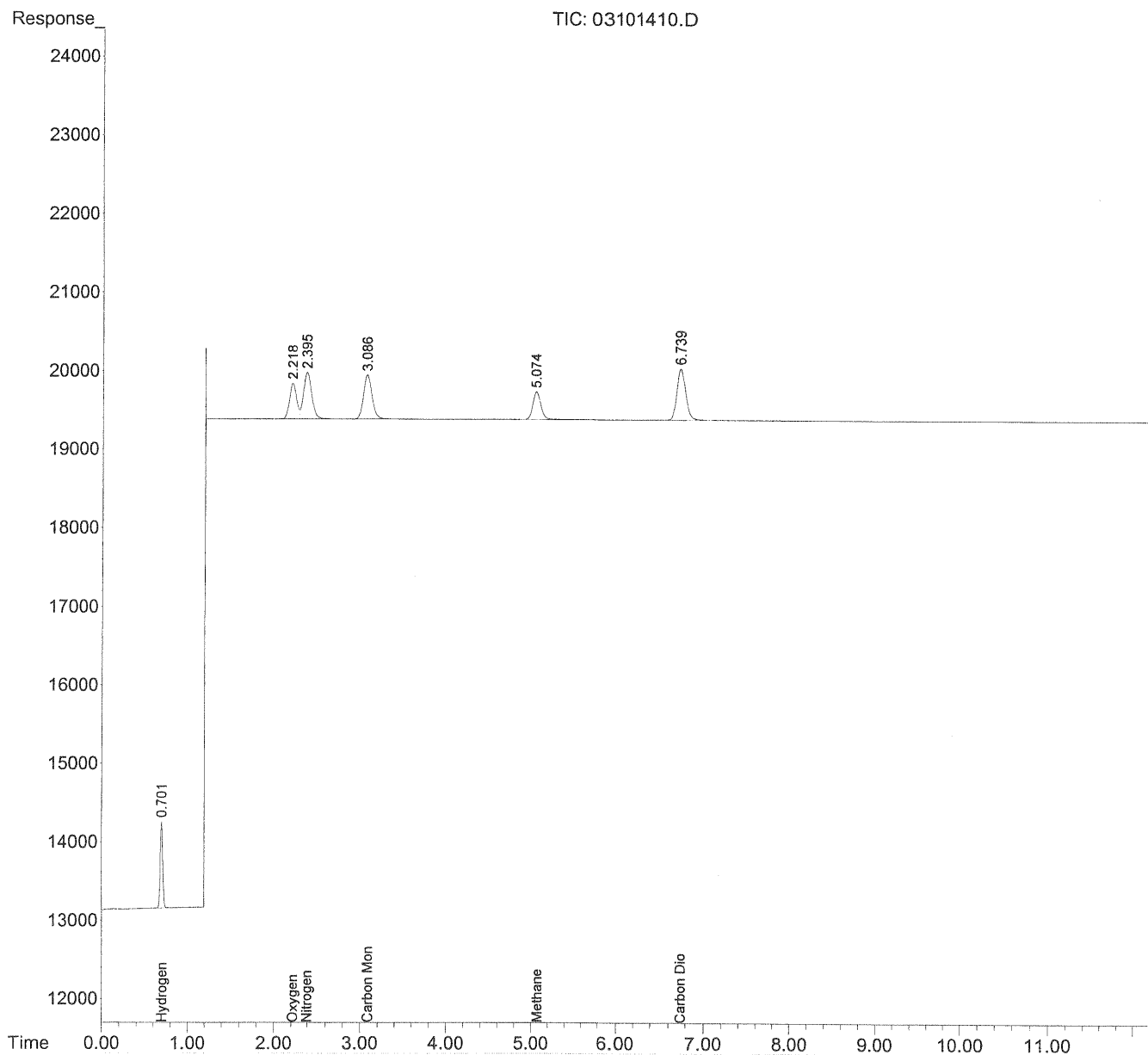
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101410.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:23
Operator : WH
Sample : std 3 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:22:44 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101410.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:23
Operator : WH
Sample : std 3 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:14 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 13:22:44 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	21820	15685.875 ppm
2) Oxygen	2.219	27585	16260.158 ppm
3) Nitrogen	2.397	39208	19135.565 ppm
4) Carbon Monoxide	3.087	38859	20547.786 ppm
5) Methane	5.076	23724	16767.873 ppm
6) Carbon Dioxide	6.740	44730	20288.350 ppm

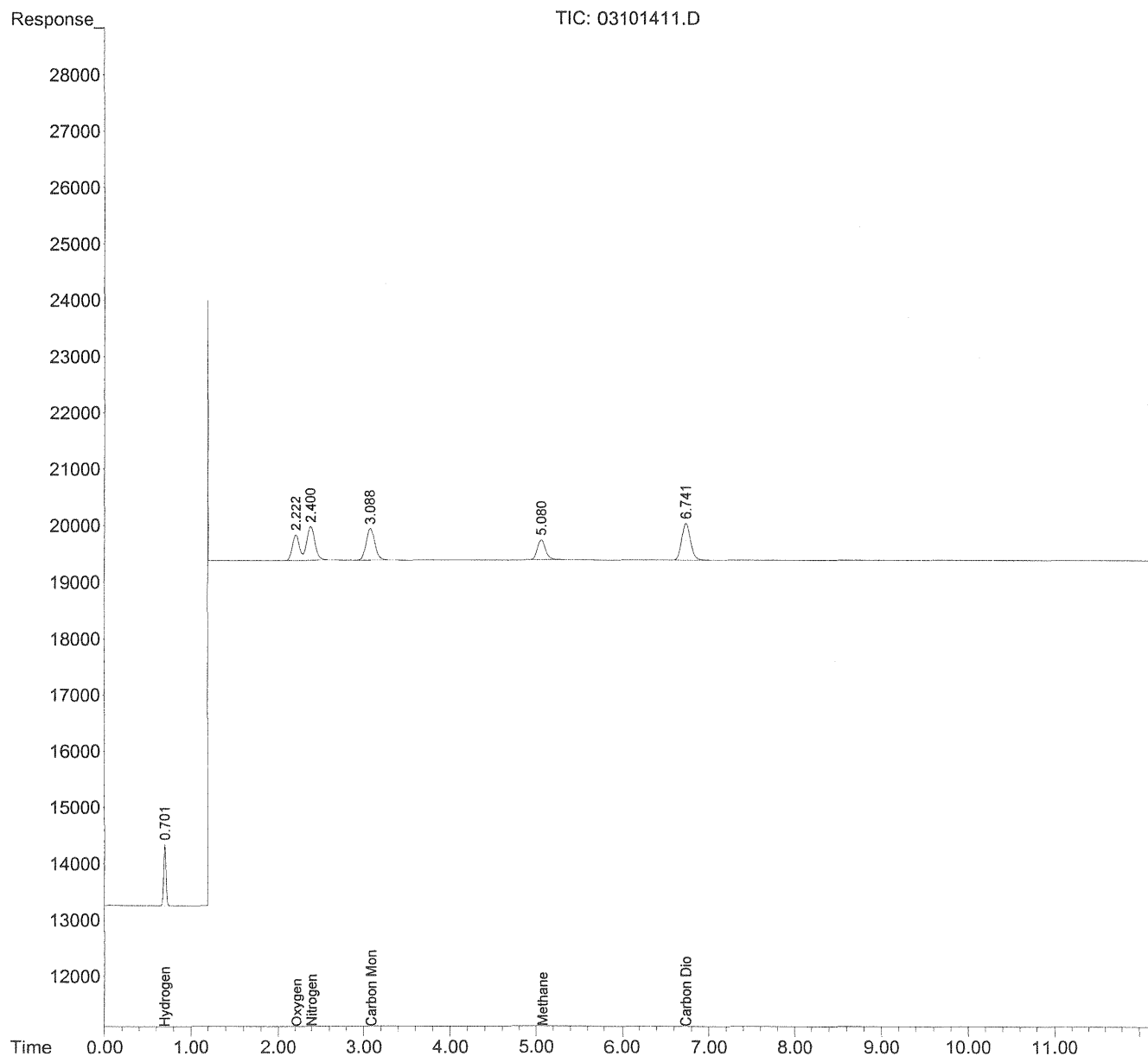
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101411.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:56
Operator : WH
Sample : std 3 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:27 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101411.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 13:56
Operator : WH
Sample : std 3 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:12:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:27 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.703	21730	15751.773 ppm
2) Oxygen	2.224	27609	16342.415 ppm
3) Nitrogen	2.401	39193	19344.177 ppm
4) Carbon Monoxide	3.090	38395	20358.500 ppm
5) Methane	5.081	23489	16605.562 ppm
6) Carbon Dioxide	6.743	44680	20355.596 ppm

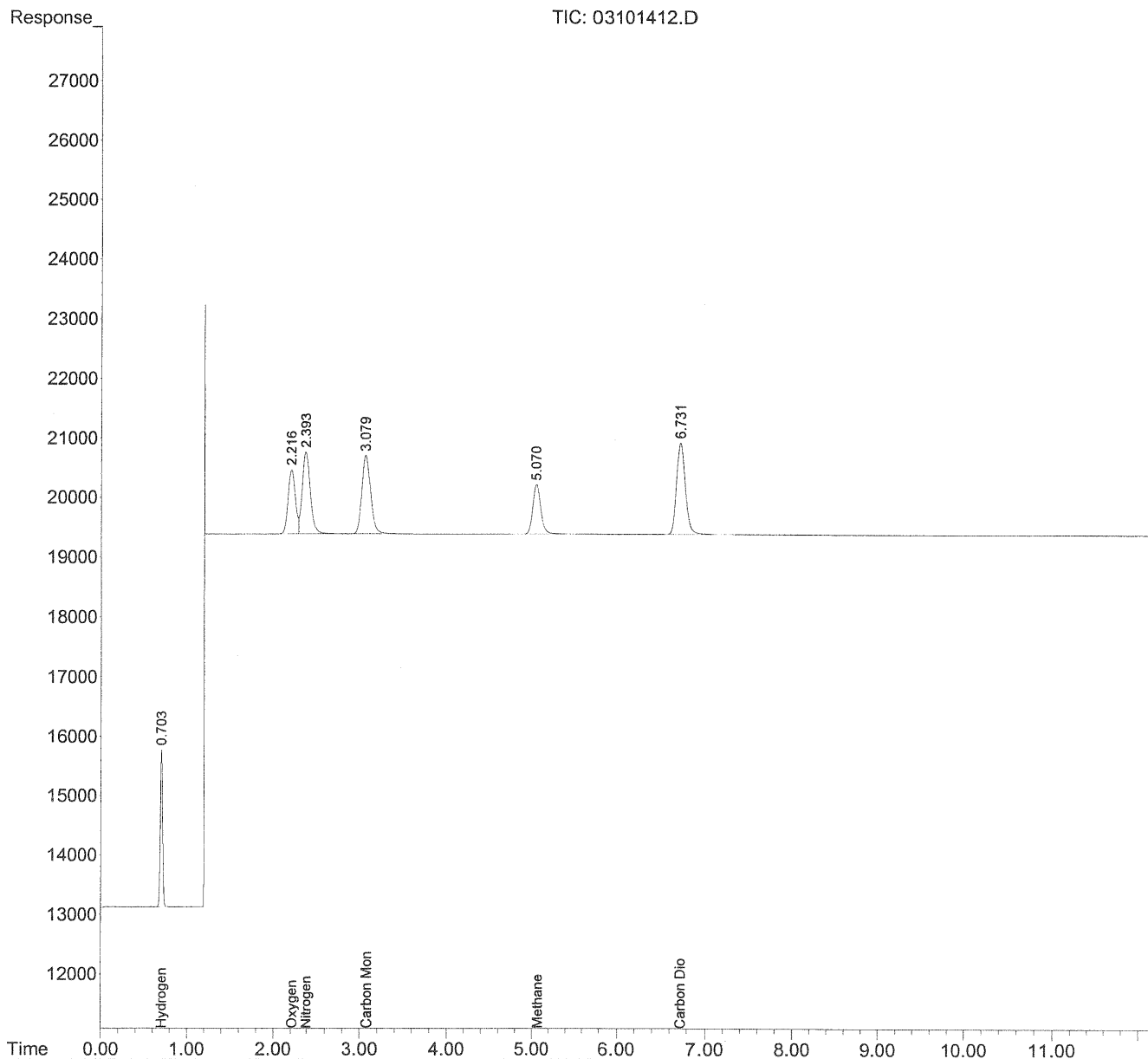
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101412.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:15
Operator : WH
Sample : std 4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:31:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:50 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101412.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:15
Operator : WH
Sample : std 4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:31:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:12:50 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.705	51993	37952.051 ppm
2) Oxygen	2.217	65602	38954.464 ppm
3) Nitrogen	2.394	92598	46108.575 ppm
4) Carbon Monoxide	3.081	92228	49071.809 ppm
5) Methane	5.072	55567	39334.461 ppm
6) Carbon Dioxide	6.733	106700	48784.847 ppm

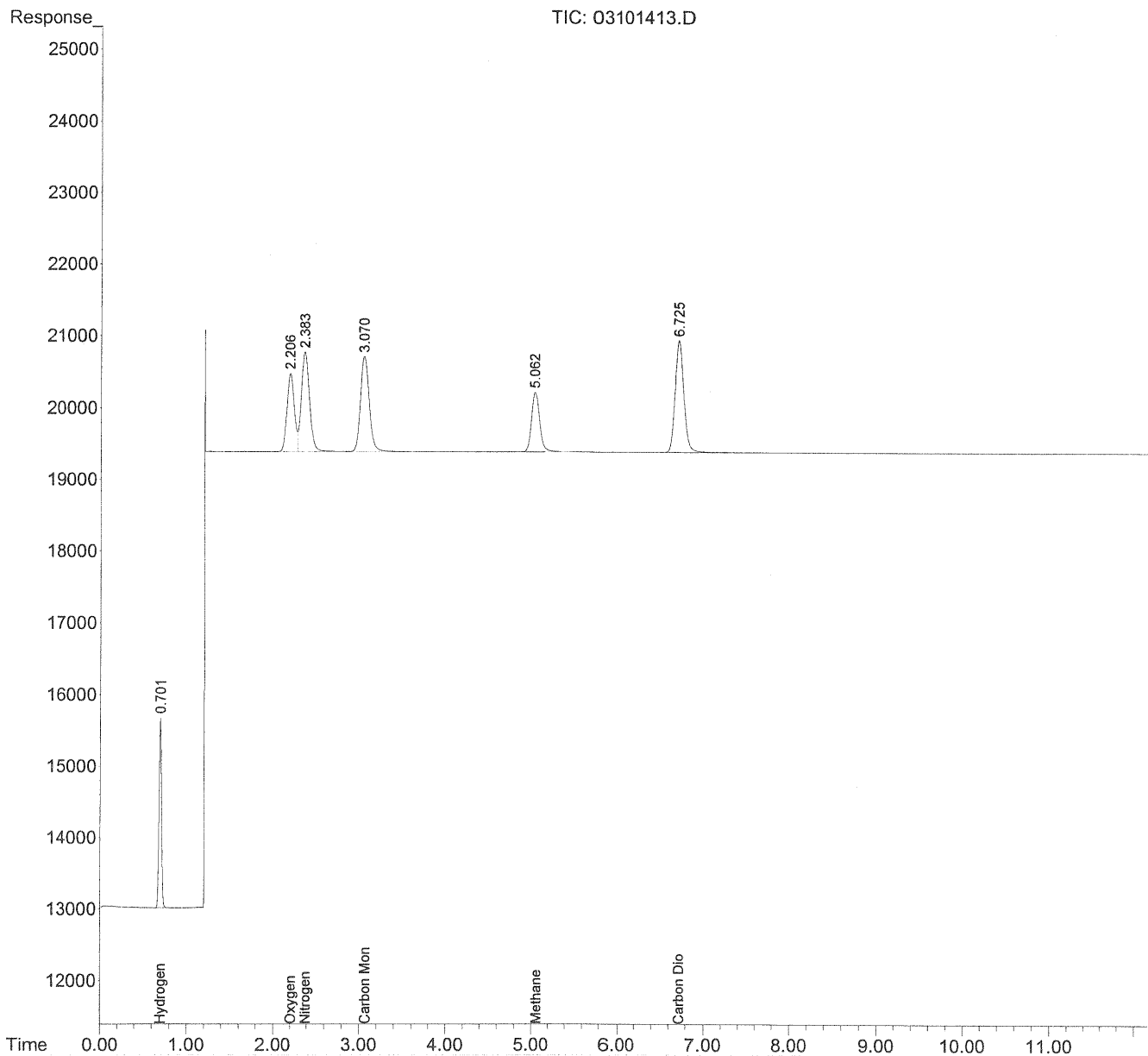
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101413.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:32
Operator : WH
Sample : std 4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:57:23 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:57:03 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101413.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:32
Operator : WH
Sample : std 4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 14:57:23 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 14:57:03 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	52354	38549.354 ppm
2) Oxygen	2.208	65871	39291.954 ppm
3) Nitrogen	2.385	93062	47432.408 ppm
4) Carbon Monoxide	3.072	92593	49417.144 ppm
5) Methane	5.064	55753	39568.314 ppm
6) Carbon Dioxide	6.726	107226	49228.245 ppm

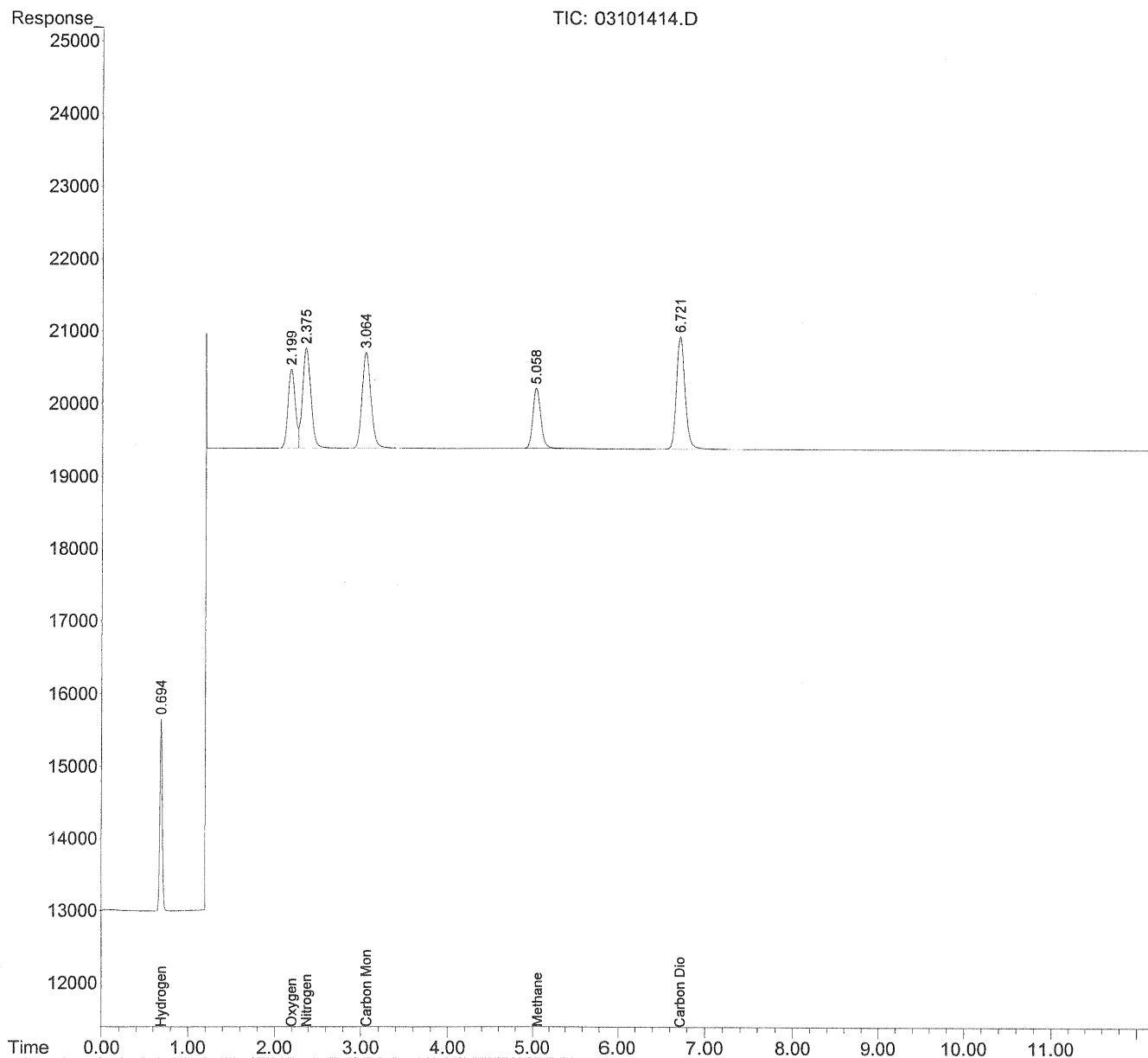
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101414.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:49
Operator : WH
Sample : std 4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:45:17 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:44:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101414.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 14:49
Operator : WH
Sample : std 4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:45:17 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:44:30 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.696	52056	37688.686 ppm
2) Oxygen	2.200	65583	39685.849 ppm
3) Nitrogen	2.377	92502	48078.649 ppm
4) Carbon Monoxide	3.065	91773	49520.215 ppm
5) Methane	5.059	55456	39726.222 ppm
6) Carbon Dioxide	6.723	106671	49580.495 ppm

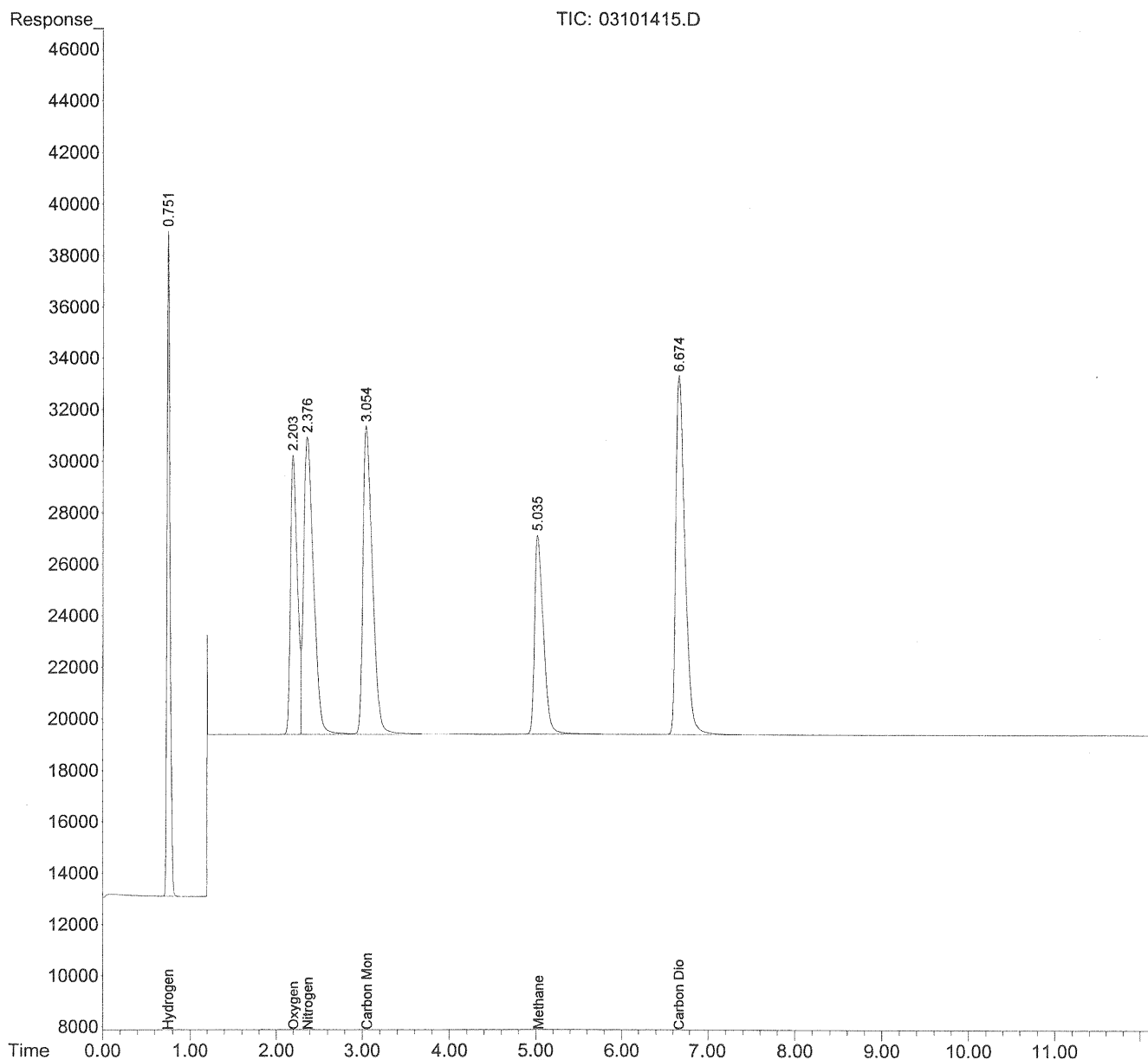
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101415.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:08
Operator : WH
Sample : std 5 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 15:28:26 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:28:13 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101415.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:08
Operator : WH
Sample : std 5 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 15:28:26 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:28:13 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.753	609940	450674.500 ppm
2) Oxygen	2.204	639596	382242.968 ppm
3) Nitrogen	2.378	920613	471464.666 ppm
4) Carbon Monoxide	3.056	910078	486547.441 ppm
5) Methane	5.037	546936	388661.341 ppm
6) Carbon Dioxide	6.676	1039048	477883.306 ppm

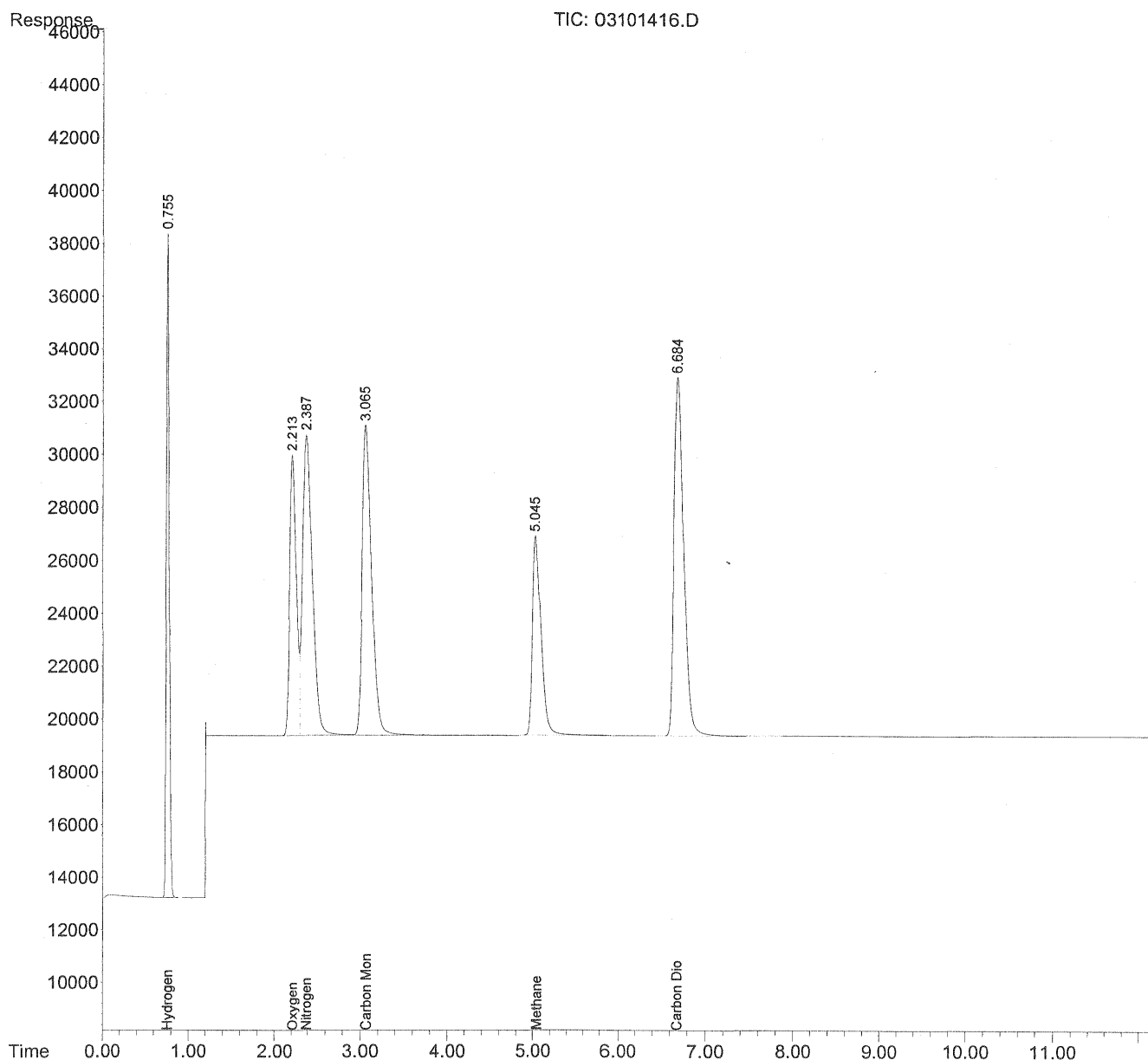
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101416.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:34
Operator : WH
Sample : std 5 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:22 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101416.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:34
Operator : WH
Sample : std 5 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:22 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.757	592647	433927.352	ppm
2) Oxygen	2.215	625621	375390.705	ppm
3) Nitrogen	2.388	900666	463524.733	ppm
4) Carbon Monoxide	3.067	886943	475424.245	ppm
5) Methane	5.047	533862	380382.085	ppm
6) Carbon Dioxide	6.686	1009801	466290.795	ppm

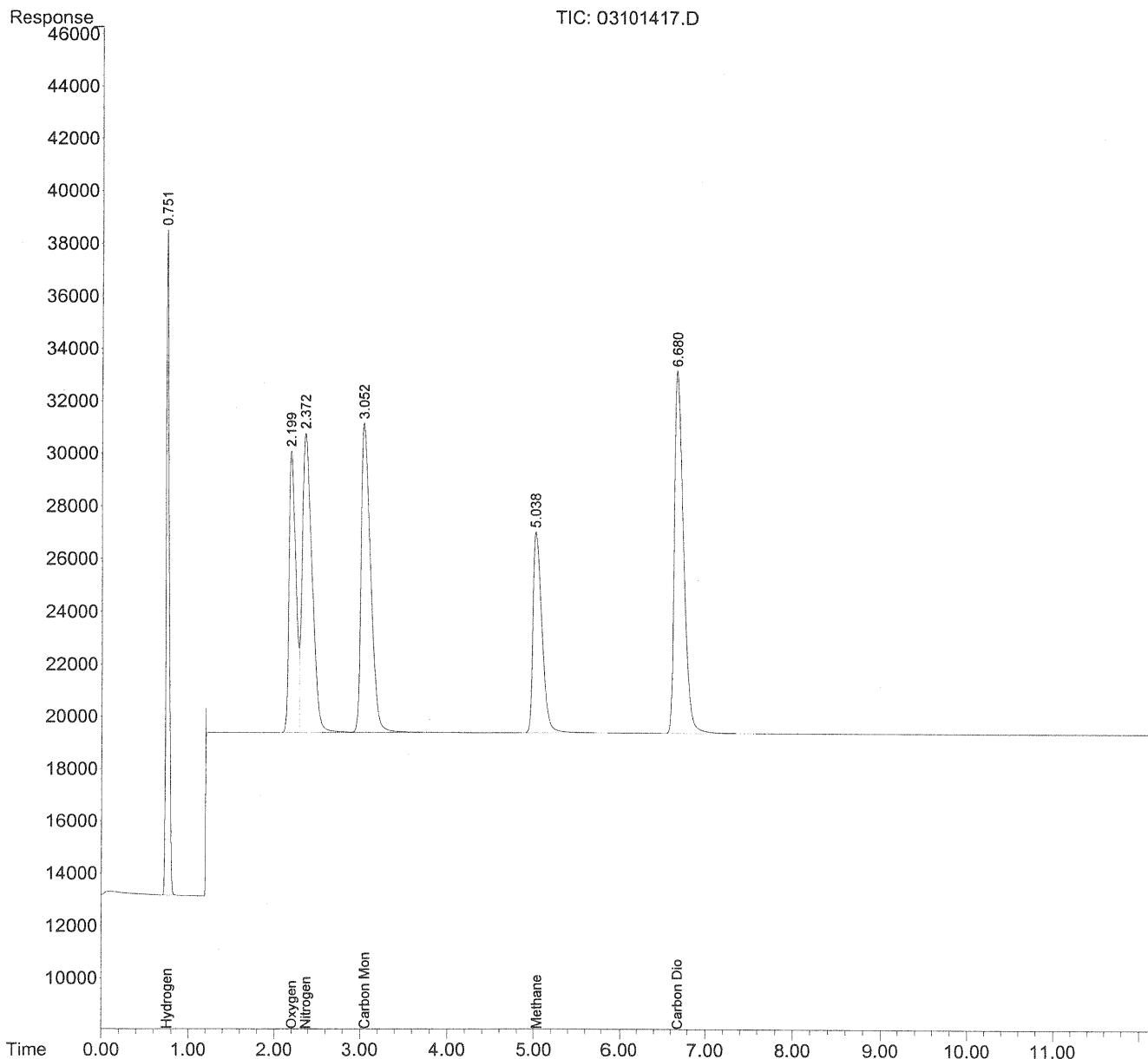
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101417.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:50
Operator : WH
Sample : std 5 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101417.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 15:50
Operator : WH
Sample : std 5 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 16:09:37 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 15:37:00 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.753	600780	437466.065 ppm
2) Oxygen	2.200	633337	381900.857 ppm
3) Nitrogen	2.374	912132	472109.403 ppm
4) Carbon Monoxide	3.054	899249	483961.452 ppm
5) Methane	5.040	540876	386903.325 ppm
6) Carbon Dioxide	6.681	1028390	477426.138 ppm

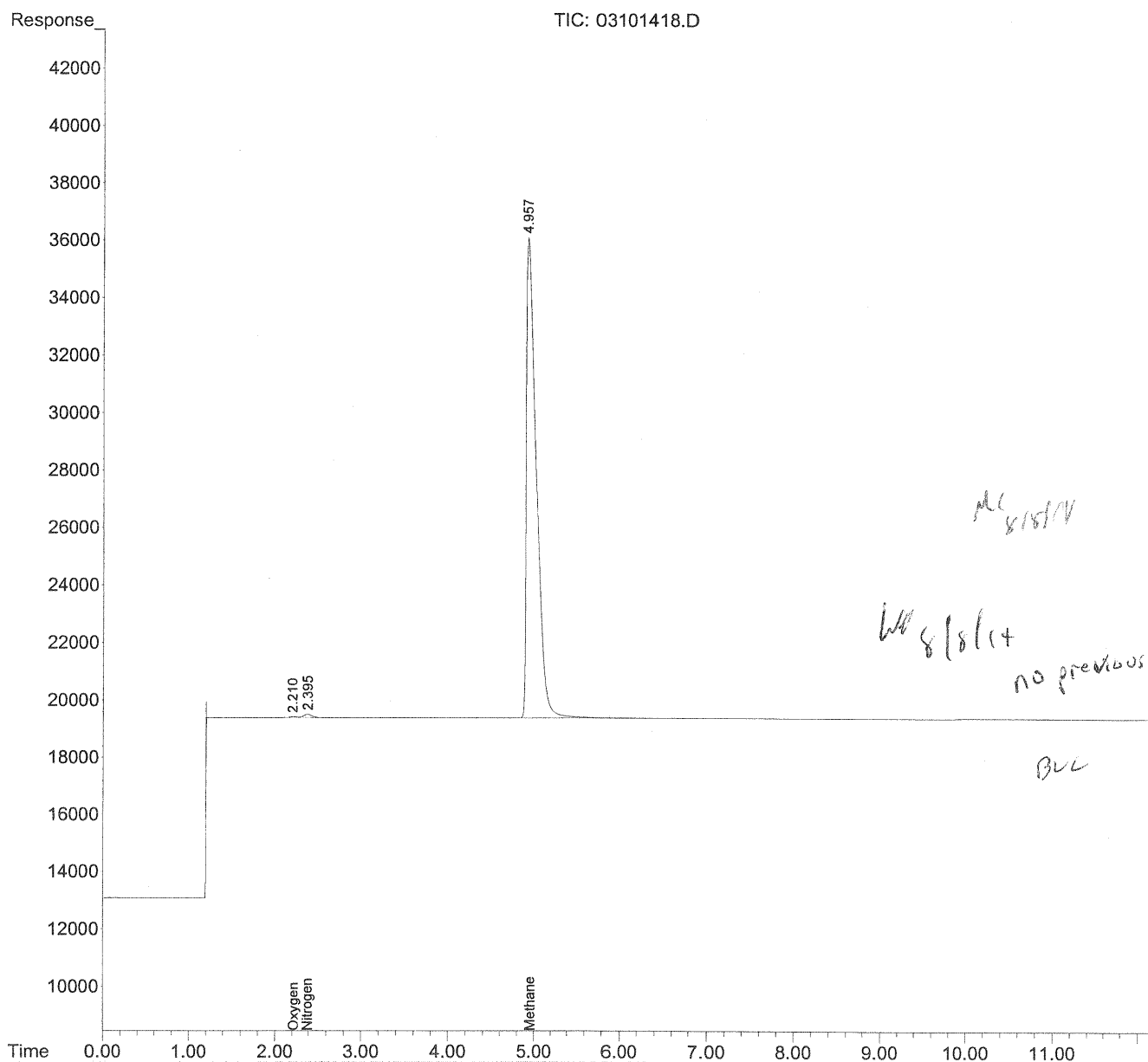
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101418.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 16:55
Operator : WH
Sample : std ch4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:11:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101418.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 16:55
Operator : WH
Sample : std ch4 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:11:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.000	0	N.D.	ppm
2) Oxygen	2.225	1686	1020.031	ppm
3) Nitrogen	2.395	7810	4059.131	ppm
4) Carbon Monoxide	0.000	0	N.D.	ppm
5) Methane	4.957	1340274	961229.509	ppm m
6) Carbon Dioxide	0.000	0	N.D.	ppm

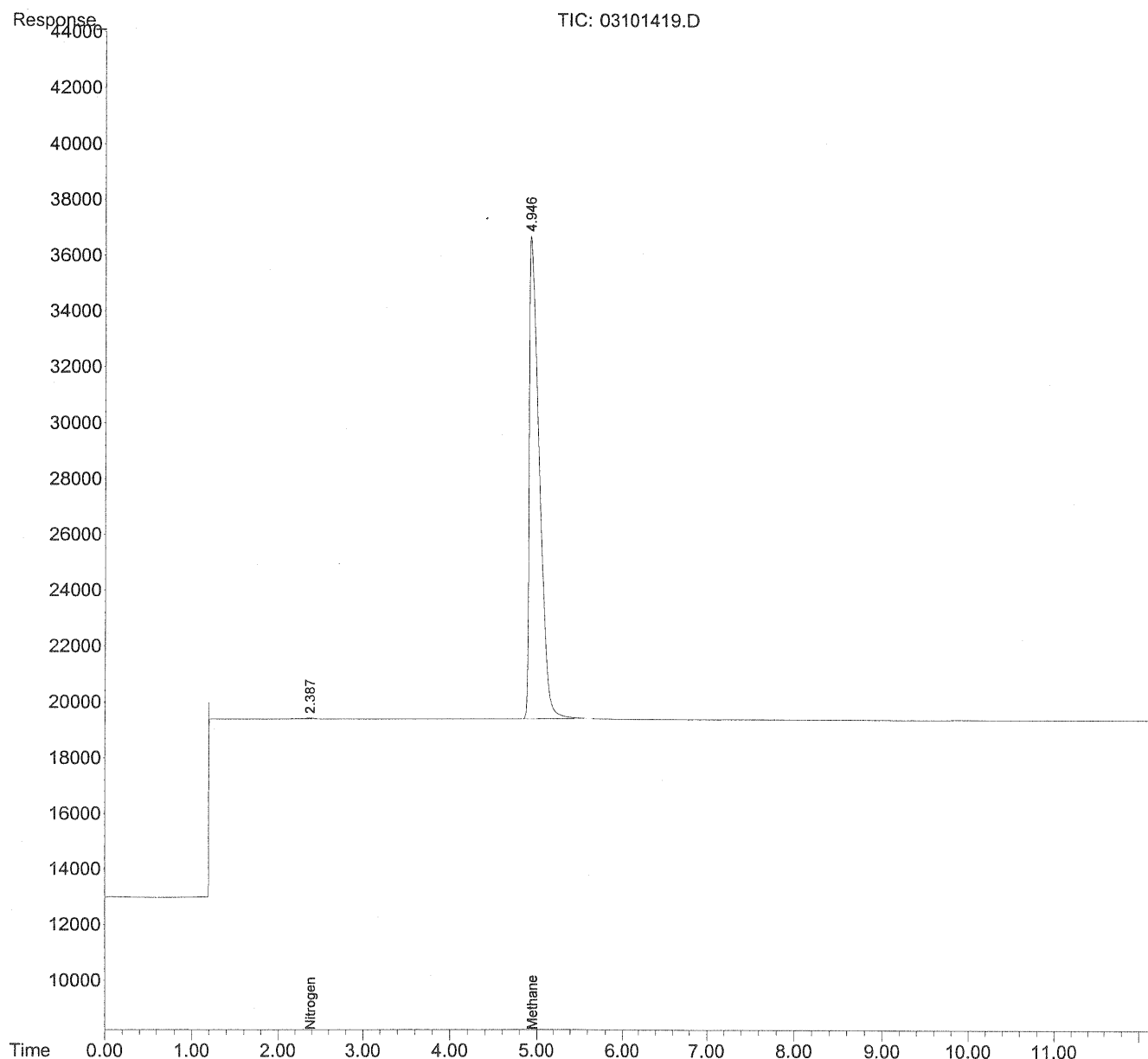
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101419.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:11
Operator : WH
Sample : std ch4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:28:59 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101419.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:11
Operator : WH
Sample : std ch4 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:28:59 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	2.389	2357	1225.098 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.948	1390484	997239.566 ppm
6) Carbon Dioxide	0.000	0	N.D. ppm

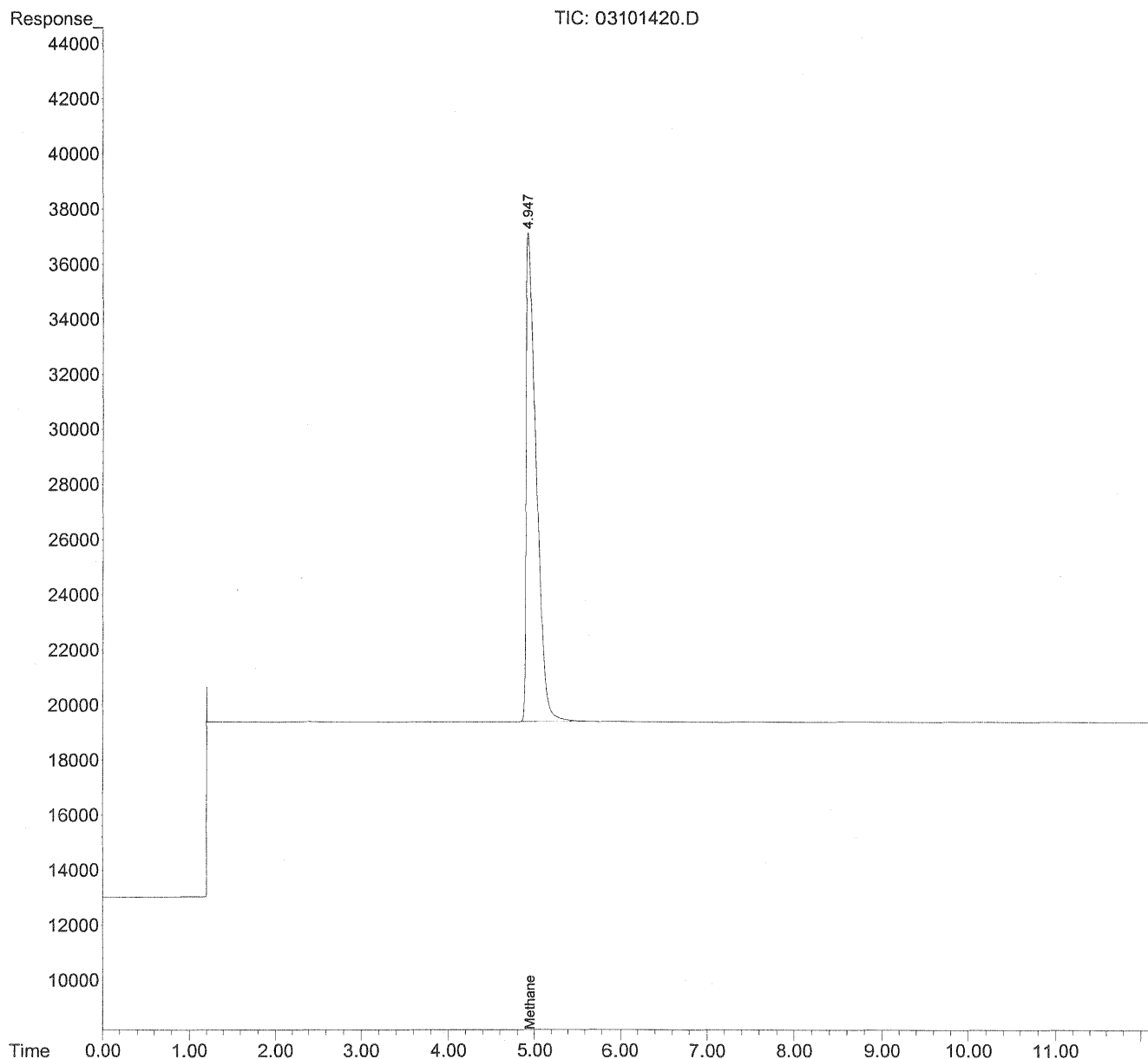
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101420.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:29
Operator : WH
Sample : std ch4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:46:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101420.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 17:29
Operator : WH
Sample : std ch4 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 17:46:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 16:09:42 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	0.000	0	N.D. ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	4.949	1439175	1032160.623 ppm
6) Carbon Dioxide	0.000	0	N.D. ppm

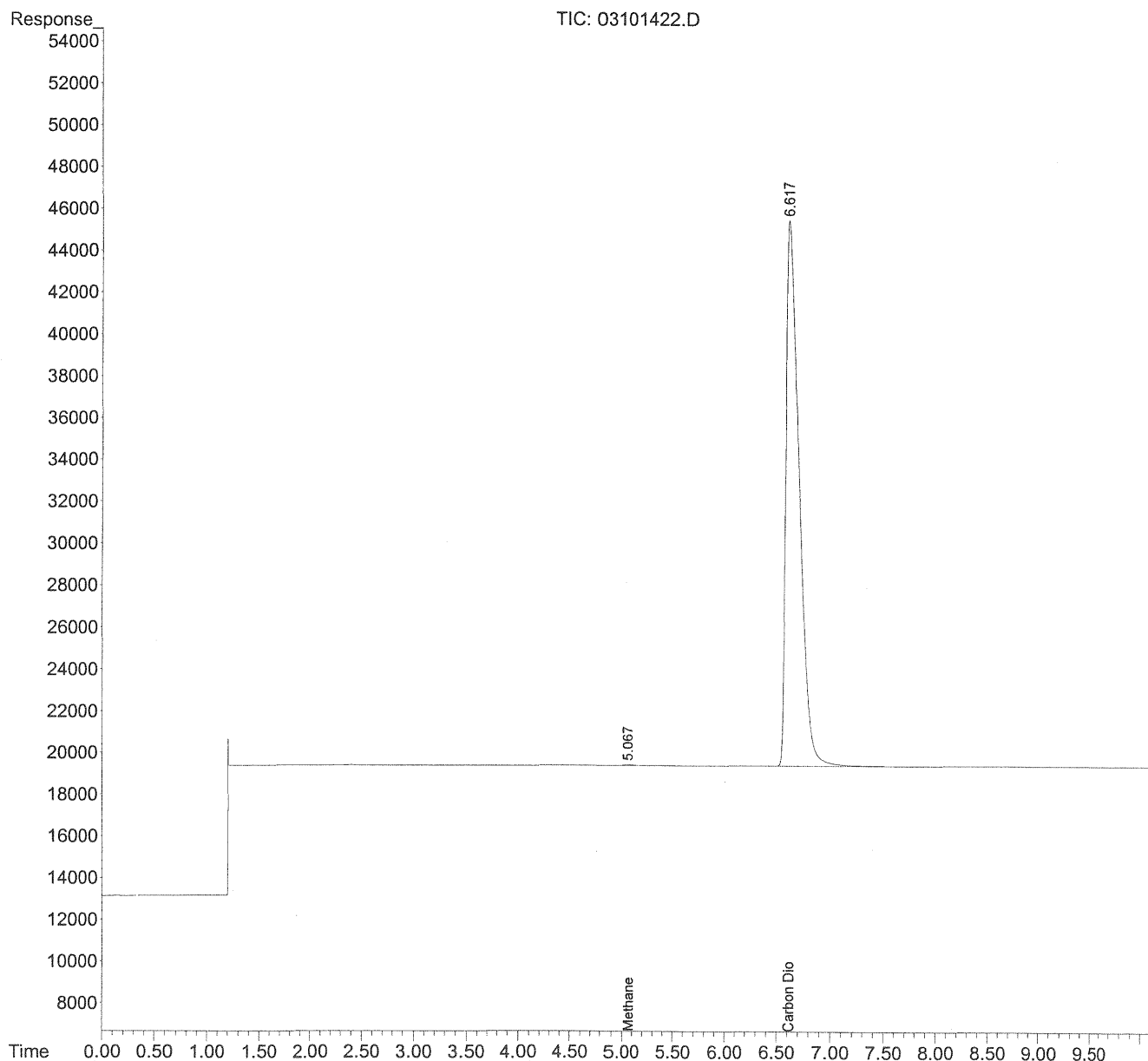
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101422.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:05
Operator : WH
Sample : std c02 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:17:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101422.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:05
Operator : WH
Sample : std c02 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:17:25 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	0.000	0	N.D. ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.069	1775	1271.240 ppm
6) Carbon Dioxide	6.618	2201199	1025503.777 ppm

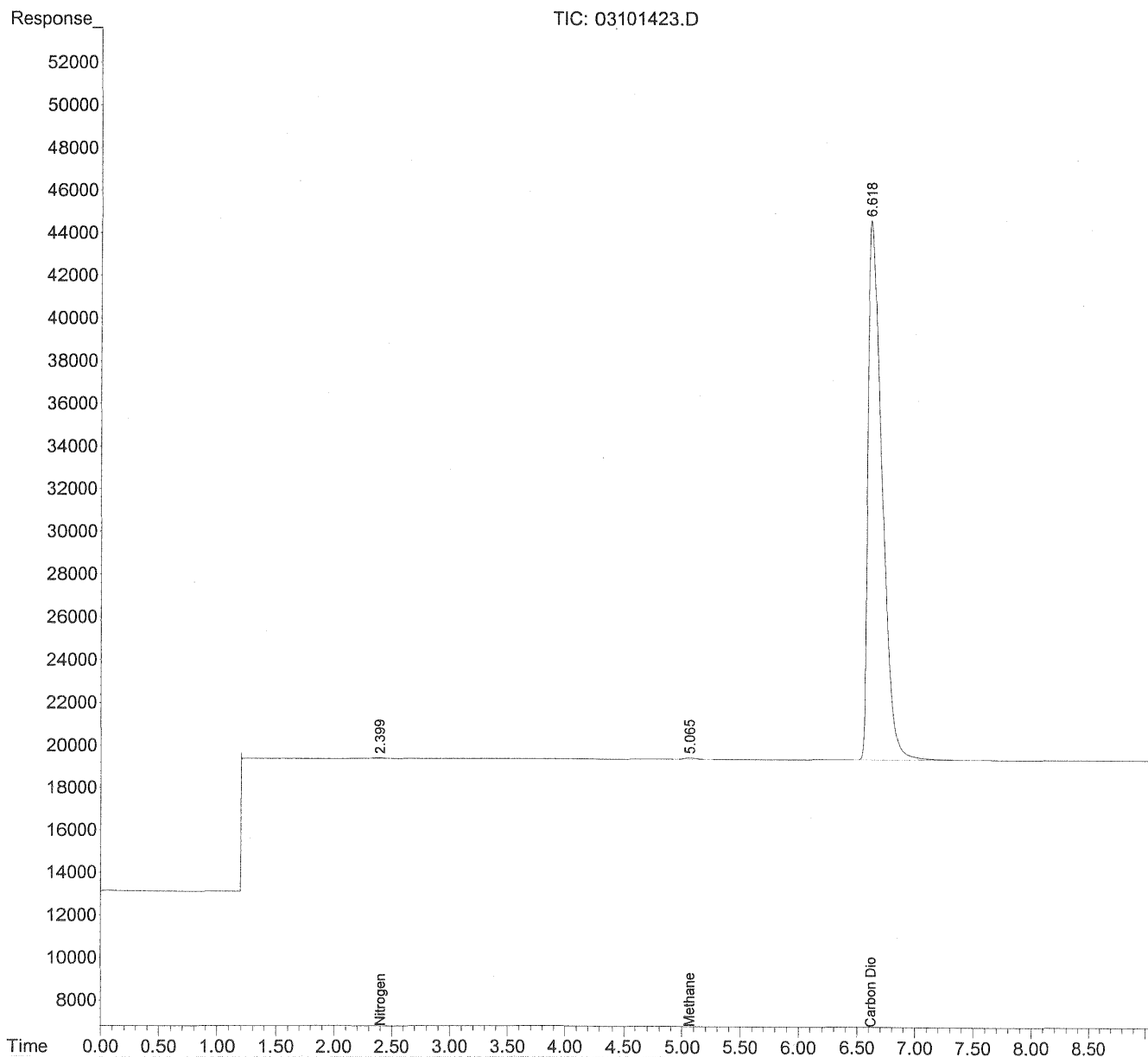
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101423.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:19
Operator : WH
Sample : std c02 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:30:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101423.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:19
Operator : WH
Sample : std c02 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:30:24 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 17:51:34 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm
3) Nitrogen	2.401	2050	1065.315 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.069	4323	3097.155 ppm
6) Carbon Dioxide	6.619	2111383	983659.786 ppm

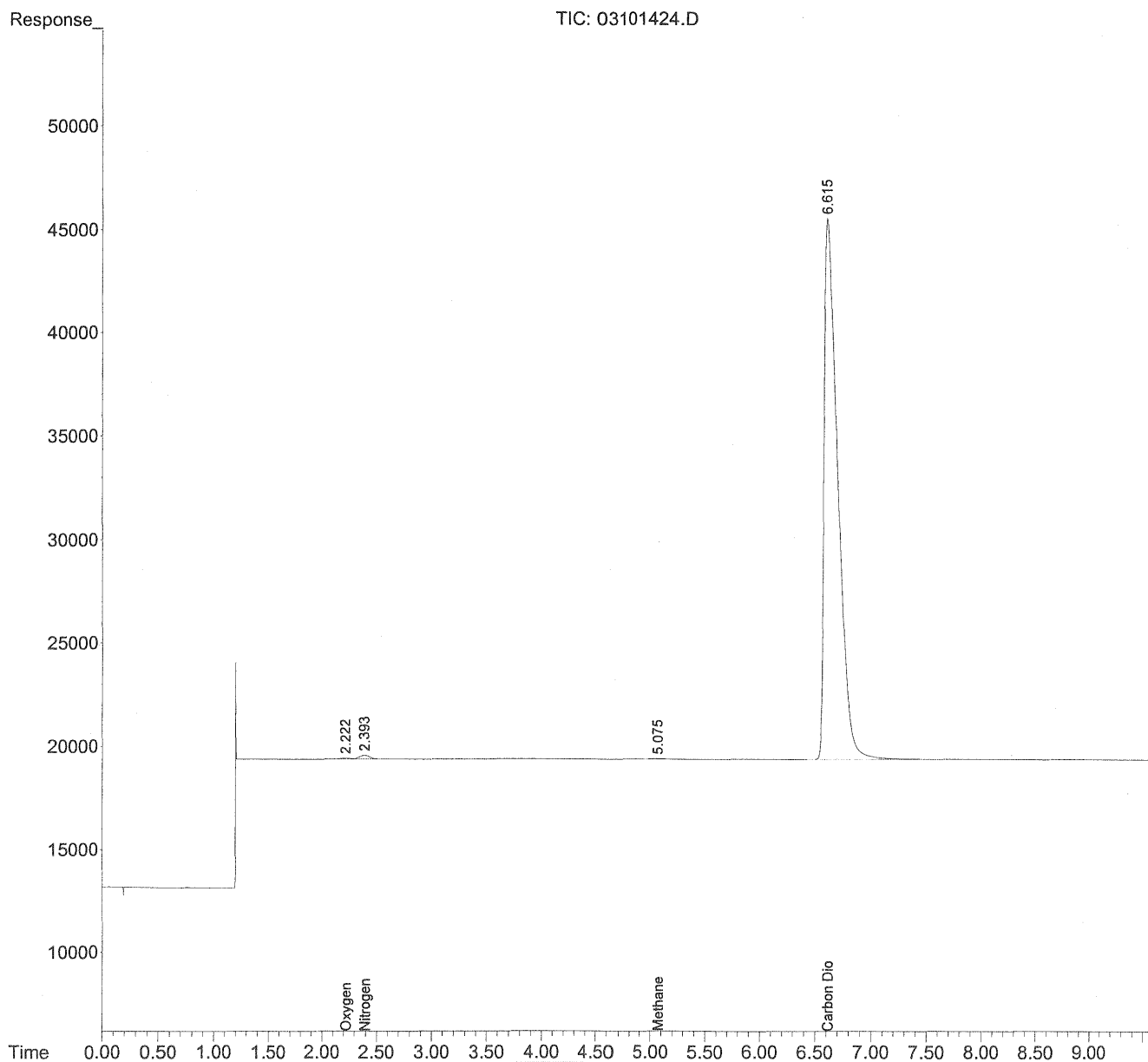
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101424.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:32
Operator : WH
Sample : std c02 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:43:57 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:42:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101424.D
Signal(s) : TCD1A.CH
Acq On : 10 Mar 2014 18:32
Operator : WH
Sample : std c02 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 10 18:43:57 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:42:24 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	2.223	2425	1467.619 ppm
3) Nitrogen	2.396	11513	5983.691 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	5.076	523	374.374 ppm
6) Carbon Dioxide	6.617	2204164	1026088.843 ppm

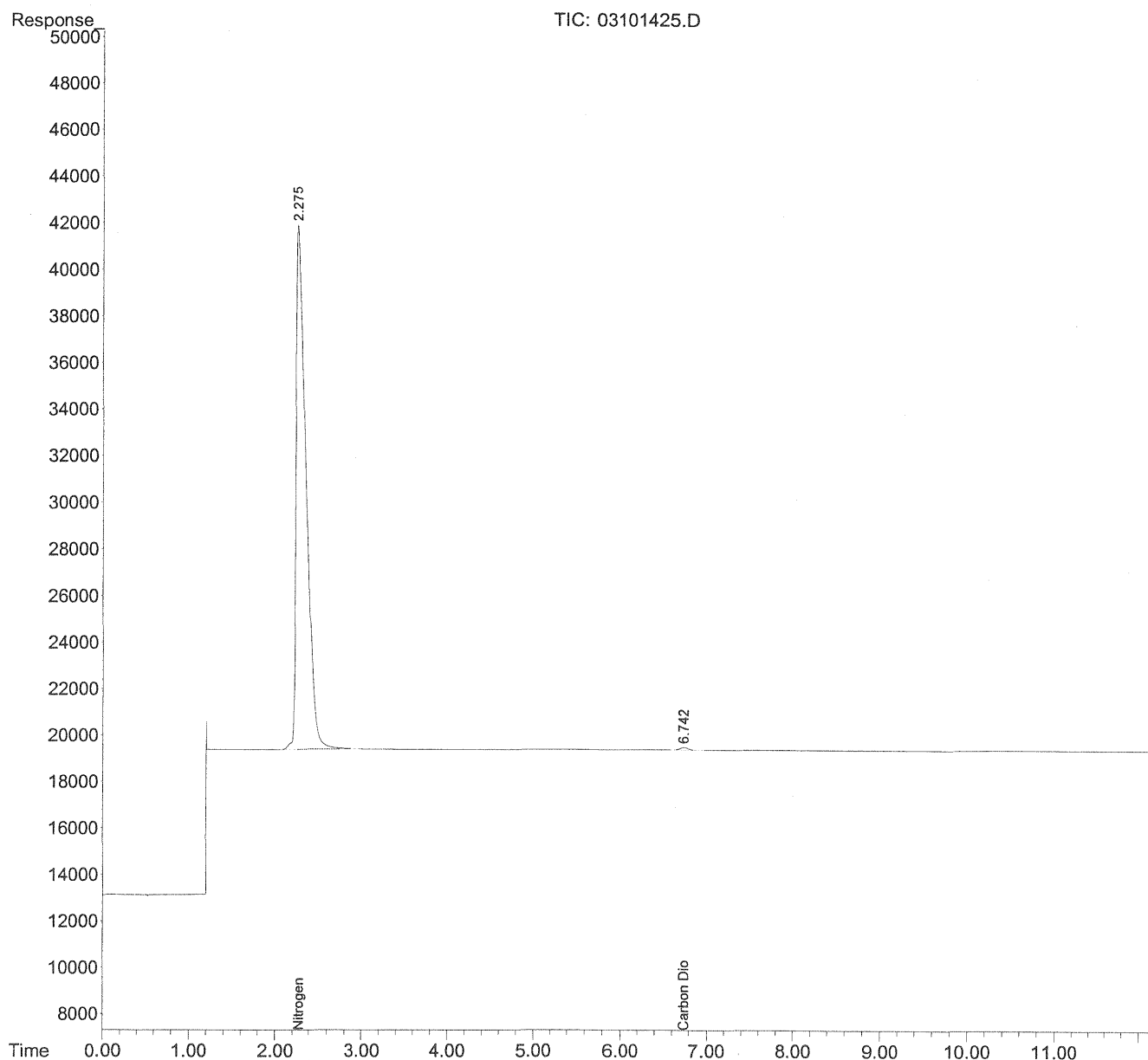
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101425.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:11
Operator : WH
Sample : std n2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:26:33 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101425.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:11
Operator : WH
Sample : std n2 1
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:26:33 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.277	1907693	991533.750 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.744	7551	3509.651 ppm

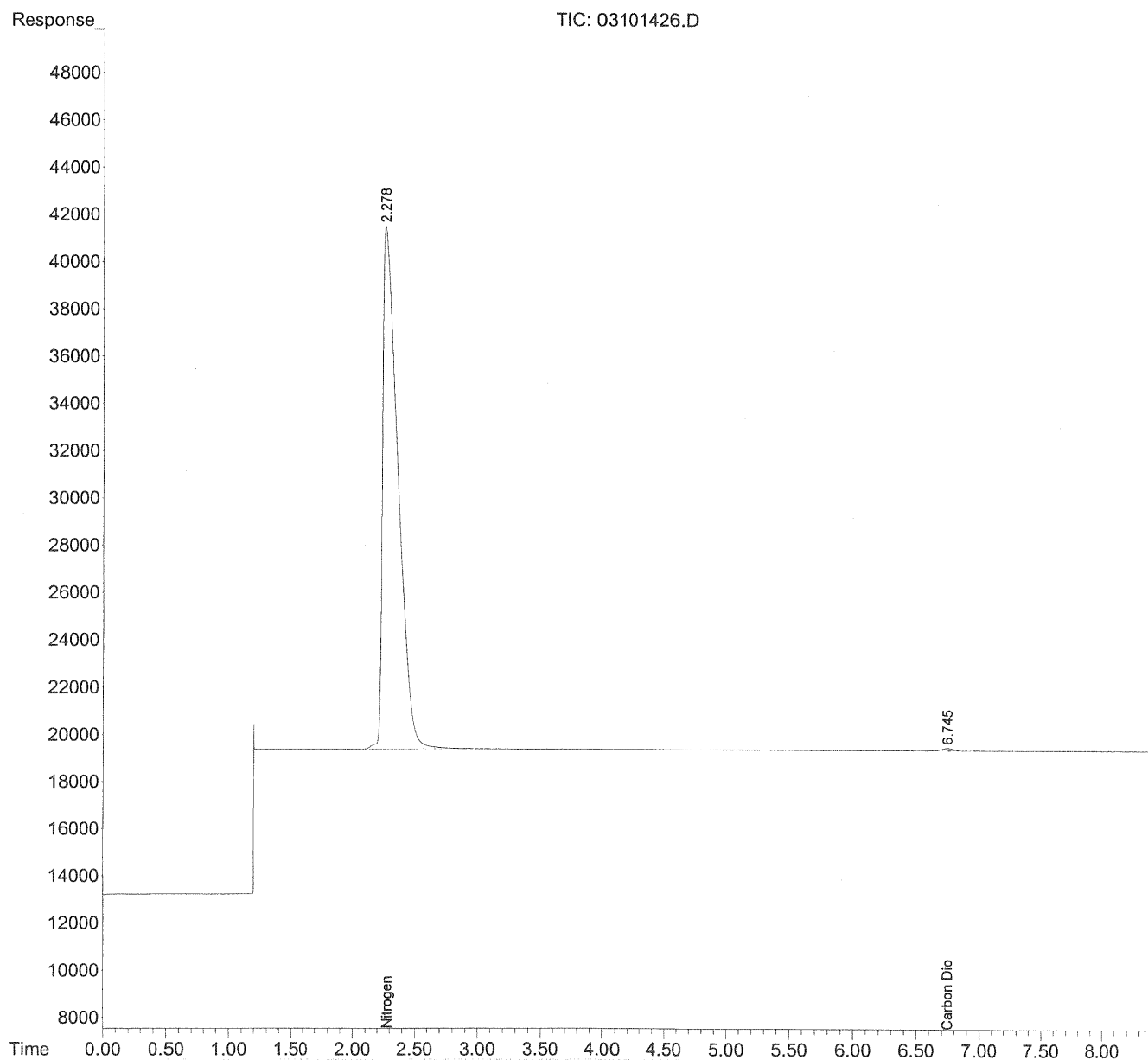
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101426.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:30
Operator : WH
Sample : std n2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:40:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101426.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:30
Operator : WH
Sample : std n2 2
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 10:40:12 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.280	1857806	965604.527 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.748	7247	3368.284 ppm

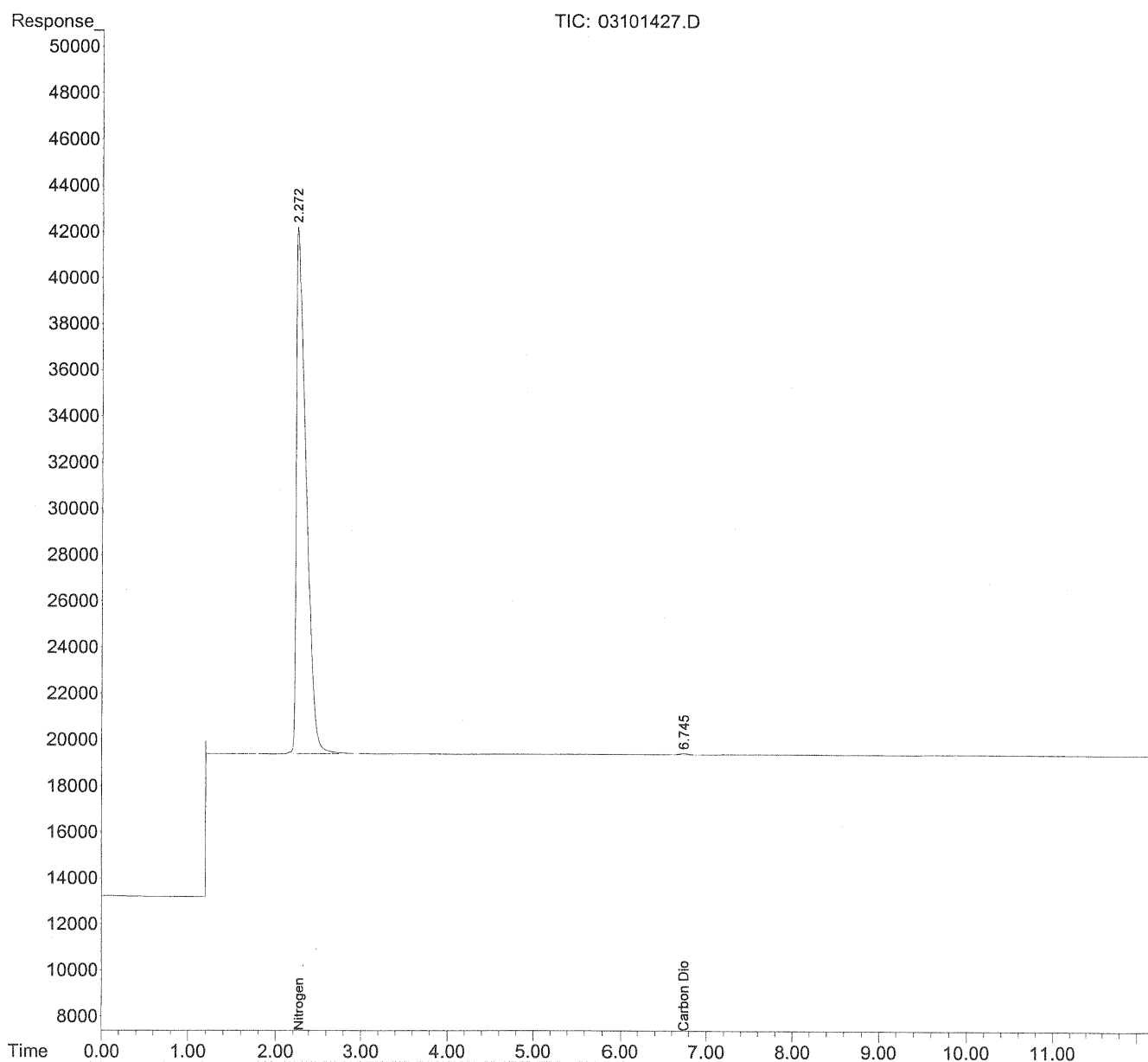
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101427.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:42
Operator : WH
Sample : std n2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:02:52 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101427.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 10:42
Operator : WH
Sample : std n2 3
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:02:52 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Mon Mar 10 18:45:38 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.000	0	N.D. ppm
2) Oxygen	0.000	0	N.D. ppm d
3) Nitrogen	2.273	1934590	1005513.839 ppm
4) Carbon Monoxide	0.000	0	N.D. ppm
5) Methane	0.000	0	N.D. ppm
6) Carbon Dioxide	6.747	3210	1492.185 ppm

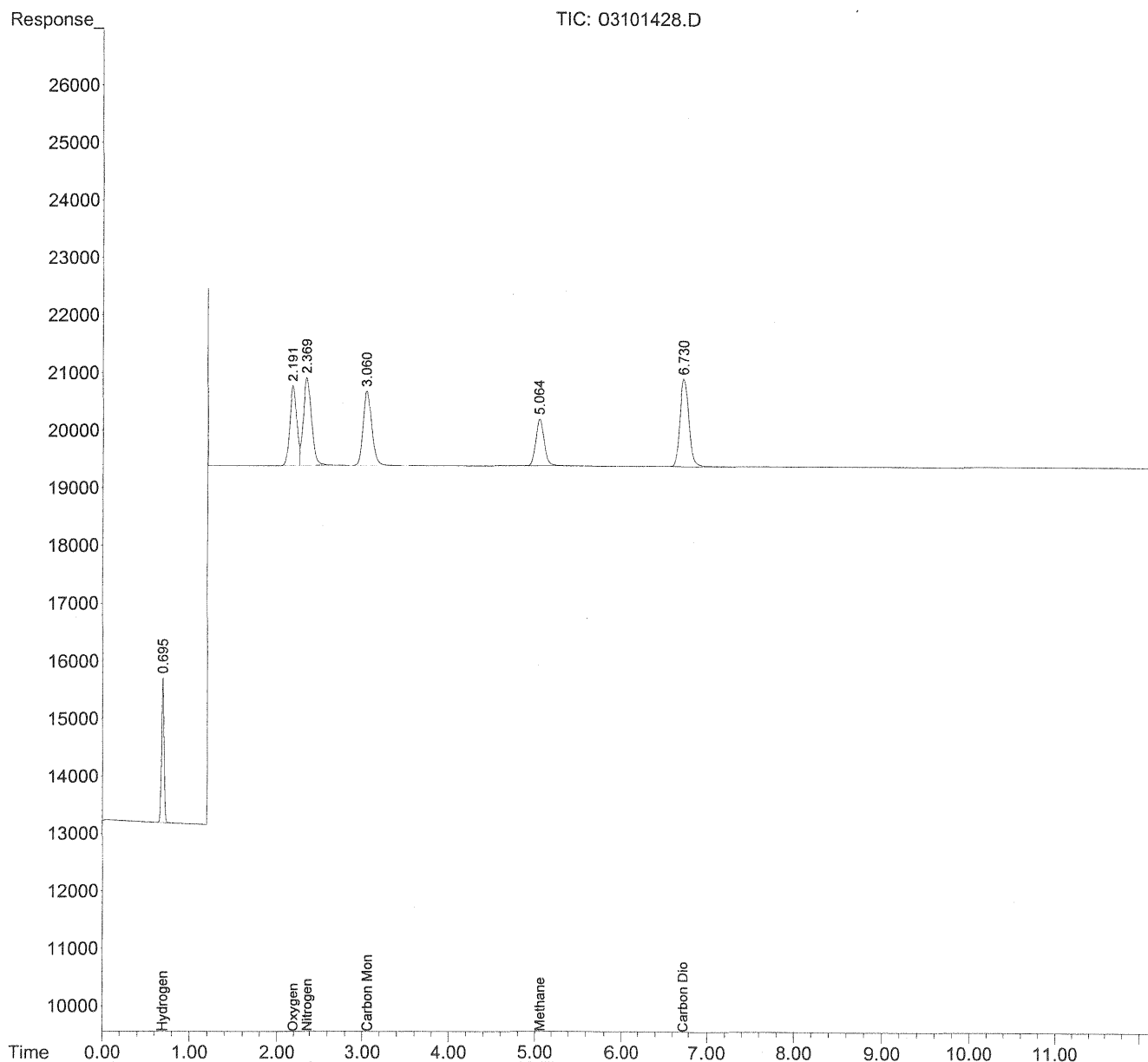
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : J:\GC01\DATA\FXG\2014_03\10\
Data File : 03101428.D
Signal(s) : TCD1A.CH
Acq On : 11 Mar 2014 11:20
Operator : WH
Sample : icv s30-02051401
Misc :
ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
Quant Time: Mar 11 11:35:58 2014
Quant Method : J:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :



Data Path : J:\GC01\DATA\FXG\2014_03\10\
 Data File : 03101428.D
 Signal(s) : TCD1A.CH
 Acq On : 11 Mar 2014 11:20
 Operator : WH
 Sample : icv s30-02051401
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 11 11:35:58 2014
 Quant Method : J:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	Actual ppm	R.T.	Response	Conc Units	% recovery

Target Compounds					
1) Hydrogen	40000	0.696	49944	36159.891 ppm	90.4%
2) Oxygen	50000	2.193	85837	51942.494 ppm	103.9%
3) Nitrogen	50000	2.370	104375	54362.122 ppm	108.7%
4) Carbon Monoxide	50000	3.061	91720	49491.765 ppm	99.0%
5) Methane	40000	5.066	55315	39625.390 ppm	99.1%
6) Carbon Dioxide	50000	6.732	105938	49239.725 ppm	98.5%

(f)=RT Delta > 1/2 Window

(m)=manual int.

WA 8/8/14

ALS Environmental

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REPORT SUMMARYS FIXED GASES BY GC/TCD

Printed : 3/9/2015

CLIENT : Air Hygiene, Incorporated

Instrument : GC #1 / TCD #1

Analyst : NL

Date analyzed : 3/6/2015

PAI Job : P1500826

Sample amount : 100uL

Sample Result

Sample ID	Hydrogen	Oxygen	Nitrogen	Carbon Monoxide	Carbon Methane	Carbon Dioxide	
STD S30-12161401	38419	40430	50670	49765	39651	49727	
ACTUAL	39990	40030	50000	50010	39970	50040	
% Difference	3.9%	1.0%	1.3%	0.5%	0.8%	0.6%	
Lab Air		209344	738248			411	
MB							
0826-001		137299	0.1%	747783	0.1%	50937	0.1%
0826-001 - 2		137391	0.0%	747486	0.1%	50890	0.0%
0826-001 - 3		137481	0.1%	749665	0.2%	50898	0.0%
0826-001 - Mean		137390		748312		50909	
0826-003		133936	0.1%	747606	0.1%	52603	0.5%
0826-003 - 2		133698	0.3%	746158	0.3%	52615	0.5%
0826-003 - 3		134613	0.4%	752067	0.5%	53345	0.9%
0826-003 - Mean		134082		748610		52854	
0826-005		133508	0.3%	748851	0.3%	53275	0.3%
0826-005 - 2		134010	0.1%	751959	0.1%	53475	0.0%
0826-005 - 3		134074	0.2%	752255	0.2%	53624	0.3%
0826-005 - Mean		133864		751022		53458	
STD S30-12161401	39540	42059	54080	50625	40498	50475	
ACTUAL	39990	40030	50000	50010	39970	50040	
% Difference	1.1%	5.1%	8.2%	1.2%	1.3%	0.9%	

Data Path : I:\GC01\DATA\FXG\2015_03\06\
Data File : 03061501.D
Signal(s) : TCD1A.CH
Acq On : 6 Mar 2015 7:38 am
Operator : MC
Sample : std
Misc :
ALS Vial : 1 Sample Multiplier: 10

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3/9/15

Integration File: autoint1.e
Quant Time: Mar 09 13:44:03 2015
Quant Method : I:\GC01\METHODS\TR031014.M
Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
QLast Update : Tue Mar 11 11:04:23 2014
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 100ul
Signal Phase : CarboSieve Packed Column
Signal Info :

Compound	R.T.	Response	Conc Units

Target Compounds			
1) Hydrogen	0.702	53064	38418.876 ppm
2) Oxygen	2.205	66813	40430.288 ppm
3) Nitrogen	2.381	97286	50670.214 ppm
4) Carbon Monoxide	3.067	92227	49765.207 ppm
5) Methane	5.057	55351	39650.970 ppm
6) Carbon Dioxide	6.718	106988	49727.476 ppm

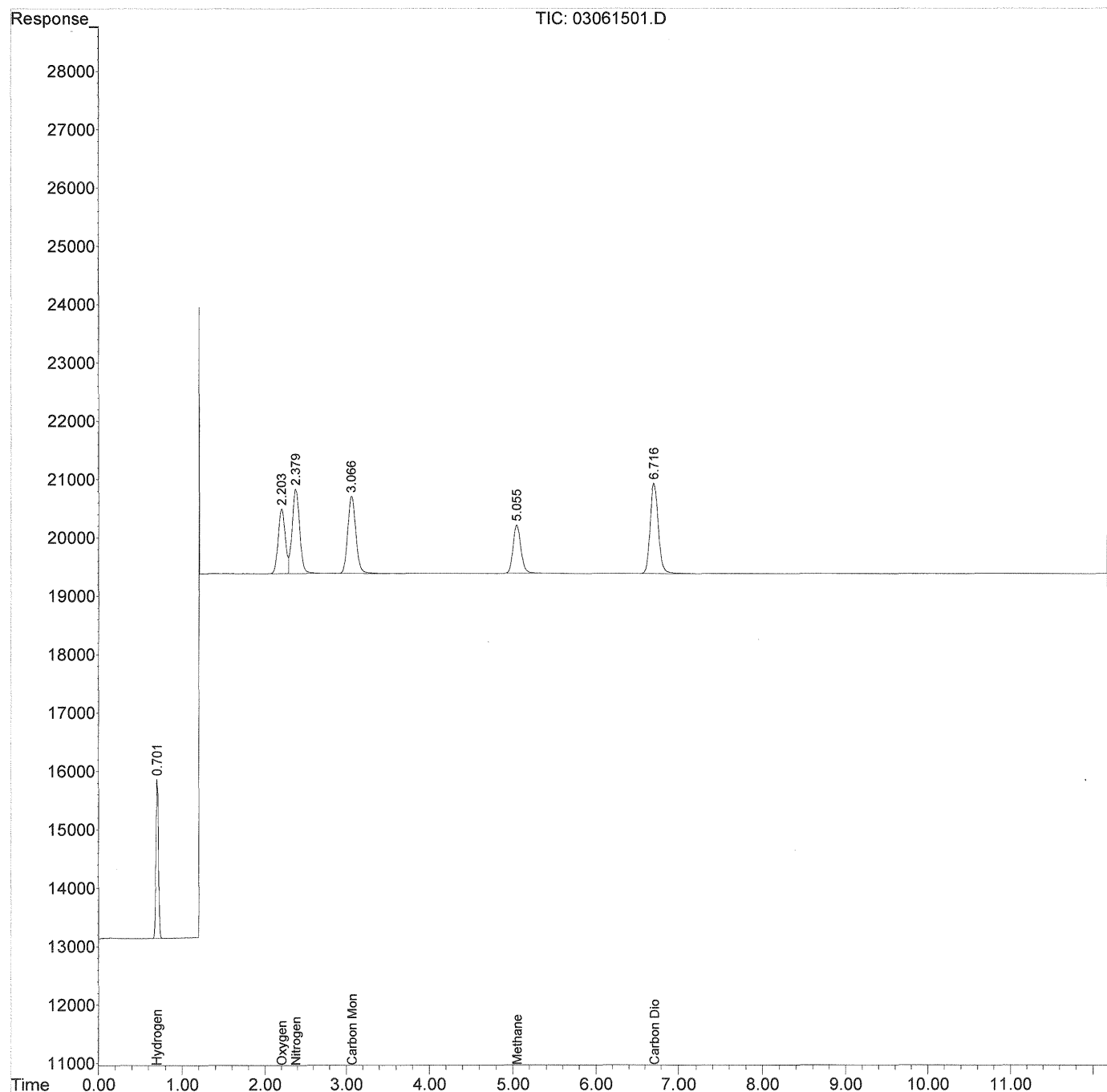
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061501.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 7:38 am
 Operator : MC
 Sample : std
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:03 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061518.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 4:55 pm
 Operator : NL
 Sample : std s30-12161401
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:39 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :

Compound	R.T.	Response	Conc	Units

Target Compounds				
1) Hydrogen	0.700	54613	39539.830	ppm
2) Oxygen	2.203	69505	42059.468	ppm
3) Nitrogen	2.379	103833	54079.677	ppm
4) Carbon Monoxide	3.065	93820	50624.877	ppm
5) Methane	5.057	56533	40498.215	ppm
6) Carbon Dioxide	6.719	108595	50474.538	ppm

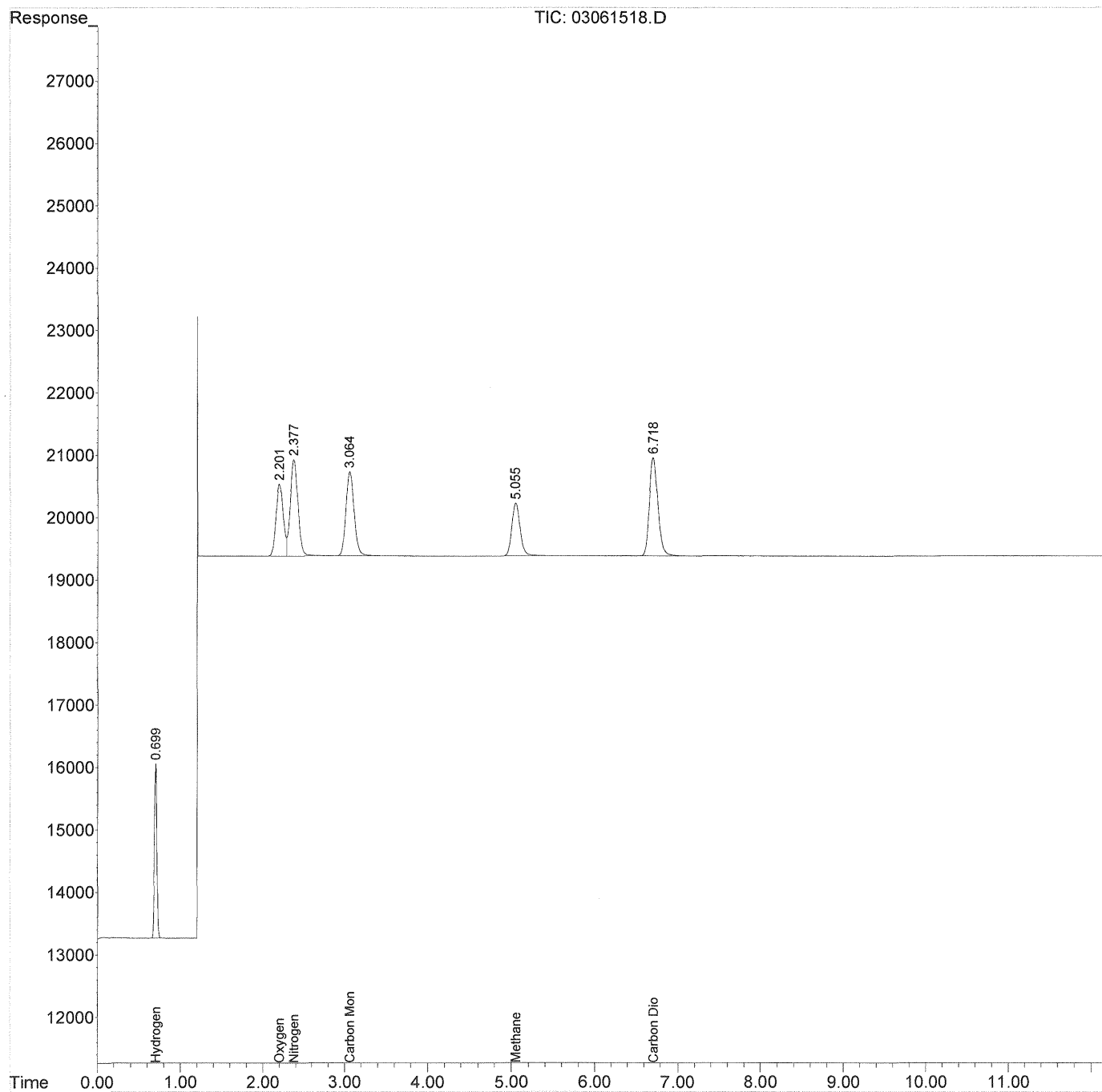
(f)=RT Delta > 1/2 Window

(m)=manual int.

Data Path : I:\GC01\DATA\FXG\2015_03\06\
 Data File : 03061518.D
 Signal(s) : TCD1A.CH
 Acq On : 6 Mar 2015 4:55 pm
 Operator : NL
 Sample : std s30-12161401
 Misc :
 ALS Vial : 1 Sample Multiplier: 10

Integration File: autoint1.e
 Quant Time: Mar 09 13:44:39 2015
 Quant Method : I:\GC01\METHODS\TR031014.M
 Quant Title : EPA 3C GC/TCD Analysis for Fixed Gases
 QLast Update : Tue Mar 11 11:04:23 2014
 Response via : Initial Calibration
 Integrator: ChemStation

Volume Inj. : 100ul
 Signal Phase : CarboSieve Packed Column
 Signal Info :



Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	03101401.d	10.	MB		10 Mar 2014 10:27
2	1	03101402.d	10.	xstd 1 1		10 Mar 2014 10:43
3	1	03101403.d	10.	std 1 1		10 Mar 2014 10:59
4	1	03101404.d	10.	std 1 2		10 Mar 2014 11:29
5	1	03101405.d	10.	std 1 3		10 Mar 2014 11:44
6	1	03101406.d	10.	std 2 1		10 Mar 2014 11:59
7	1	03101407.d	10.	std 2 2		10 Mar 2014 12:18
8	1	03101408.d	10.	std 2 3		10 Mar 2014 12:34
9	1	03101409.d	10.	std 3 1		10 Mar 2014 13:05
10	1	03101410.d	10.	std 3 2		10 Mar 2014 13:23
11	1	03101411.d	10.	std 3 3		10 Mar 2014 13:56
12	1	03101412.d	10.	std 4 1		10 Mar 2014 14:15
13	1	03101413.d	10.	std 4 2		10 Mar 2014 14:32
14	1	03101414.d	10.	std 4 3		10 Mar 2014 14:49
15	1	03101415.d	10.	std 5 1		10 Mar 2014 15:08
16	1	03101416.d	10.	std 5 2		10 Mar 2014 15:34
17	1	03101417.d	10.	std 5 3		10 Mar 2014 15:50
18	1	03101418.d	10.	std ch4 1		10 Mar 2014 16:55
19	1	03101419.d	10.	std ch4 2		10 Mar 2014 17:11
20	1	03101420.d	10.	std ch4 3		10 Mar 2014 17:29
21	1	03101421.d	10.	xstd c02 1		10 Mar 2014 17:47
22	1	03101422.d	10.	std c02 1		10 Mar 2014 18:05
23	1	03101423.d	10.	std c02 2		10 Mar 2014 18:19
24	1	03101424.d	10.	std c02 3		10 Mar 2014 18:32
25	1	03101425.d	10.	std n2 1		11 Mar 2014 10:11
26	1	03101426.d	10.	std n2 2		11 Mar 2014 10:30
27	1	03101427.d	10.	std n2 3		11 Mar 2014 10:42
28	1	03101428.d	10.	lcs		11 Mar 2014 11:20
29	1	03101429.d	10.	lab air		11 Mar 2014 11:37

Injection Log

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	03061501.d	10.	std		6 Mar 2015 07:38
2	1	03061502.d	10.	mb		6 Mar 2015 08:00
3	1	03061503.d	10.	lab air		6 Mar 2015 08:17
4	1	03061504.d	10.	lcs		6 Mar 2015 08:35
5	1	03061505.d	10.	lcsd		6 Mar 2015 09:00
6	1	03061506.d	10.	lcsd		6 Mar 2015 09:22
7	1	03061507.d	10.	0826-001		6 Mar 2015 11:59
8	1	03061508.d	10.	0826-001		6 Mar 2015 12:33
9	1	03061509.d	10.	0826-001		6 Mar 2015 12:53
10	1	03061510.d	10.	0826-003		6 Mar 2015 13:40
11	1	03061511.d	10.	0826-003		6 Mar 2015 14:13
12	1	03061512.d	10.	0826-003		6 Mar 2015 14:35
13	1	03061513.d	10.	x0826-005		6 Mar 2015 14:52
14	1	03061514.d	10.	0826-005		6 Mar 2015 15:21
15	1	03061515.d	10.	0826-005		6 Mar 2015 15:36
16	1	03061516.d	10.	0826-005		6 Mar 2015 16:04
17	1	03061517.d	10.	xstd s30-12161401		6 Mar 2015 16:27
18	1	03061518.d	10.	std s30-12161401		6 Mar 2015 16:55

APPENDIX G

Field Data Sheets

RATA - FIELD DATA SHEET

AIR HYGIENE



Company:	Questor Technology Inc		
Location:	Breiden Ave		
Date:	2/25/15		
Unit Make and Model:	Q250		
Unit Number:			
Serial Number:	MSL		
Data Recorded By:	MSL		
Tested With AHI Units:	Trucks(s):	156	Trailers(s):
LDEQ Warmup/Cal Req:	On (Day/Time):	< 24hr	Cal (Day/Time):

CYLINDER SERIAL NUMBERS	O ₂			THC			CO			CO ₂		
	Low			Mid			High			Low		
	Mid			High			Low			Mid		
	High			Low			Mid			High		
	C6113372			ALM053142			ALM053124			AAL061120		

RUN INFORMATION	Run #1		Run #2		Run #3		Run #4		Run #5		Run #6		Run #7		Run #8		Run #9		Run #10		Run #11		Run #12	
	Load (%)	90-100%	10-50%	70-100%	0-30-0%																			
Time Start (hh:mm:ss)	8:44:25	10:14:25	10:14:25	13:37:25	16:50:08																			
Time Stop (hh:mm:ss)	9:54:55	11:25:15	14:58:55	19:00:38	21:49:49																			
Barometric Pressure (in. Hg)	29.84	29.91	29.80	29.84	29.84																			
Ambient Temperature (°F)	35	39	54	55	55																			
Relative Humidity (%)	55.5	46.4	36.7	30.6																				

CALIBRATION	O ₂		CO		THC		CO ₂	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	0.01	0	0.03	0	0.10	0	0.51
Low Gas					3.02	3.09		
Mid Gas	12.1	11.93	9.02	9.03	5.01	5.08	9.36	9.44
High Gas	20.62	20.70	17.3	17.32	8.48	8.42	18.73	18.68

REPORT INFORMATION		
INSTRUMENT		SERIAL #
O ₂		
NOX		
CO		
THC		
CO ₂		
SO ₂		

BIAS	O ₂		CO		THC		CO ₂	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Run #1	0.13	11.93	0.07	9.07	-0.09	3.14	0.01	9.43
Run #1 / Run #2	0.15	11.93	0.16	9.08	0.05	2.99	0.06	9.42
Run #2 / Run #3	0.11	12.02	0.18	9.50	0.13	3.09	0.07	9.41
Run #3 / Run #4	0.10	12.01	0.06	9.33	-0.07	3.10	0.03	9.34
Run #4 / Run #5	0.10	11.96	0.04	9.03	-0.01	3.04	0.05	9.27
Run #5 / Run #6								
Run #6 / Run #7								
Run #7 / Run #8								
Run #8 / Run #9								
Run #9 / Run #10								
Run #10 / Run #11								
Run #11 / Run #12								
Run #12 Final								

Bias Gas Actual Conc.

RATA - FIELD DATA SHEET

AIR HYGIENE



Company:	Quanter Technology		
Location:	Baker Avenue		
Date:	2/26/15		
Unit Make and Model:	Q250		
Unit Number:			
Serial Number:	MSL		
Data Recorded By:	MSL		
Trucks:	156	Trailers:	701
Tested With AHJ Units:			
LDEQ Warmup/Cal Req:	On (Day/Time):	Cal (Day/Time):	6:00

CYLINDER SERIAL NUMBERS	O ₂			THC			CO			CO ₂		
	Low											
	Mid											
	High											
				C2115576			ALM63324			ALM63324		
				ALM63326			ALM63326			ALM63326		

RUN INFORMATION	Run #1		Run #2		Run #3		Run #4		Run #5		Run #6		Run #7		Run #8		Run #9		Run #10		Run #11		Run #12	
	Load (%)		Load (%)		Load (%)		Load (%)		Load (%)		Load (%)		Load (%)		Load (%)		Load (%)		Load (%)		Load (%)		Load (%)	
Time Start (hh:mm:ss)	07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00	
Time Stop (hh:mm:ss)	07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00		07:00:00	
Barometric Pressure (in. Hg)	30.41		30.41		30.41		30.41		30.41		30.41		30.41		30.41		30.41		30.41		30.41		30.41	
Ambient Temperature (°F)	30.0		30.0		30.0		30.0		30.0		30.0		30.0		30.0		30.0		30.0		30.0		30.0	
Relative Humidity (%)	38.2		38.2		38.2		38.2		38.2		38.2		38.2		38.2		38.2		38.2		38.2		38.2	

CALIBRATION	O ₂		CO		THC		CO ₂	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	0.03	0	-0.06	0	-0.16	0	0.04
Low Gas	12.1	12.23	9.02	8.91	3.02	3.04	9.36	9.28
Mid Gas	20.63	20.63	17.3	17.34	8.48	8.45	18.73	18.75
High Gas								

REPORT INFORMATION		
INSTRUMENT	SERIAL #	
O ₂	56101446	02-0011
CO	THC/CO 486	CO-00009
THC	THC/CO 51141	THC-00009
CO ₂	THC/CO 1446	CO2-00003
SO ₂		

BIAS	O ₂		CO		THC		CO ₂	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Run #1	0.11	12.00	-0.07	9.13	-0.25	3.16	0.09	9.14
Run #1 / Run #2	0.10	12.02	0.07	9.12	0.13	3.05	-0.07	9.17
Run #2 / Run #3								
Run #3 / Run #4								
Run #4 / Run #5								
Run #5 / Run #6								
Run #6 / Run #7								
Run #7 / Run #8								
Run #8 / Run #9								
Run #9 / Run #10								
Run #10 / Run #11								
Run #11 / Run #12								
Run #12 Final								

Bias Gas Actual Conc.

Handwritten signature/initials

RATA - FIELD DATA SHEET

AIR HYGIENE



Company:	Quester Technology		
Location:	Boiler Room		
Date:	2/27/15		
Unit Make and Model:	Q250		
Unit Number:			
Serial Number:	M3L		
Data Recorded By:			
Tested With AHI Unit(s):	Trucks:	156	Trailer(s): 701
LDEQ Warmup/Cal Req:	On (Day/Time):	< 24hr	Cal (Day/Time): 5:45am

CYLINDER SERIAL NUMBERS	O ₂				THC				CO				CO ₂			
	Low															
	Mid															
	High															
	E60032315															

RUN INFORMATION	Run #1	Run #4	Run #5	Run #6	Run #7	Run #8	Run #9	Run #10	Run #11	Run #12
Load (%)	7.1	30	70-30	20-100-40						
Time Start (hh:mm:ss)	0:42:28	10:41:08	12:20:08	13:49:08	15:33:08					
Time Stop (hh:mm:ss)	4:50:58	1:57:38	3:20:38	14:59:38	16:47:37					
Barometric Pressure (in. Hg)	30.61	30.62	30.59	30.55						
Ambient Temperature (°F)	29	26	21	25						
Relative Humidity (%)	40.2	43.8	51.4	42.6						

CALIBRATION	O ₂		CO		THC		CO ₂	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	0.01	0	-0.12	0	0.09	0	0.00
Low Gas					2.27	2.99		
Mid Gas	11.78	11.91	9.02	9.11	5.01	5.07	9.11	9.15
High Gas	20.63	20.71	17.3	17.41	8.08	8.33	18.73	18.83

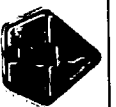
REPORT INFORMATION		
INSTRUMENT		SERIAL #
O ₂		
NOX		
CO		
THC		
CO ₂		
SO ₂		

BIAS	O ₂		CO		THC		CO ₂	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Run #1	0.07	11.80	-0.09	9.16	-0.03	5.07	0.09	9.03
Run #1 / Run #2	0.07	11.86	0.02	9.15	0.23	5.01	0.10	9.05
Run #2 / Run #3	0.11	11.84	0.07	9.22	0.21	4.99	0.12	9.08
Run #3 / Run #4	0.14	11.74	0.20	9.15	0.15	5.04	0.12	9.07
Run #4 / Run #5	0.15	11.78	0.21	9.26	-0.01	5.08	0.12	9.03
Run #5 / Run #6								
Run #6 / Run #7								
Run #7 / Run #8								
Run #8 / Run #9								
Run #9 / Run #10								
Run #10 / Run #11								
Run #11 / Run #12								
Run #12 Final								

Bias Gas Actual Conc.

RATA - FIELD DATA SHEET

AIR HYGIENE



Company:	August Technology Inc		
Location:	Broken Arrow		
Date:	2/28/15		
Unit Make and Model:	A250		
Unit Number:			
Serial Number:	MSL		
Data Recorded By:	MSL		
Trucks:	156	Trailer(s):	211
Tested With AHI Units:	Trucks:	Cal (Day/Time):	5:50
LDEQ Warmup/Cal Req:	On (Day/Time):	Cal (Day/Time):	5:50

CYLINDER SERIAL NUMBERS	O ₂				THC				CO				CO ₂			
	Low															
	Mid															
	High															

RUN INFORMATION	Run #1		Run #2		Run #3		Run #4		Run #5		Run #6		Run #7		Run #8		Run #9		Run #10		Run #11		Run #12	
	Load (%)																							
Time Start (hh:mm:ss)	9:01:07	10:31:43	12:22:19																					
Time Stop (hh:mm:ss)	10:11:37	11:41:47	13:37:32																					
Barometric Pressure (in. Hg)	30.248	30.447	30.43																					
Ambient Temperature (°F)	26	25	24																					
Relative Humidity (%)	87	83	88																					

CALIBRATION	O ₂		CO		THC		CO ₂	
	Conc.	Actual	Conc.	Actual	Conc.	Actual	Conc.	Actual
Zero Gas	0	0.07	0	0.11	0	0.11	0	0.09
Low Gas								
Mid Gas	11.83	11.99	9.02	9.05	5.01	5.03	9.11	9.11
High Gas	20.62	20.61	17.3	17.32	8.47	8.41	18.33	18.72

REPORT INFORMATION		
	INSTRUMENT	SERIAL #
O ₂		
NOX		
CO		
THC		
CO ₂		
SO ₂		

BIAS	O ₂		CO		THC		CO ₂	
	Zero	Mid	Zero	Mid	Zero	Mid	Zero	Mid
Initial Run #1	0.59	12.01	0.03	8.99	0.08	5.01	0.10	9.07
Run #1 / Run #2	0.09	11.89	0.08	9.13	0.04	5.02	0.15	9.06
Run #2 / Run #3	0.10	11.92	0.20	9.18	-0.03	5.04	0.10	8.99
Run #3 / Run #4	0.11	11.86	0.18	9.24	-0.01	5.02	0.20	9.00
Run #4 / Run #5								
Run #5 / Run #6								
Run #6 / Run #7								
Run #7 / Run #8								
Run #8 / Run #9								
Run #9 / Run #10								
Run #10 / Run #11								
Run #11 / Run #12								
Run #12 Final								

Bias Gas Actual Conc.

AIR HYGIENE

MOISTURE (EPA METHOD 4) DATA SHEET


Site Info.

Plant Name..... BRICKEN ARROW
 Sampling Location..... STACK
 Unit #..... 6350
 Date.....

Console Info.

Console..... 6P-007
 Meter Calibration Factor..... 1.002
 Orifice Meter Coefficient..... 1.872

Run	Load	Box #						
<u>10</u>	<u>90-100%</u>							
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)			
Contents		H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)	<u>743.8</u>	<u>714.70</u>	<u>581.4</u>	<u>809.8</u>			
Final Value	(Vf),(Wf)	<u>756.8</u>	<u>733.1</u>	<u>591.7</u>	<u>835.</u>			

Run	Load	Box #						
<u>11</u>	<u>90-100</u>							
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)			
Contents		H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)	<u>756.8</u>	<u>733.1</u>	<u>591.7</u>	<u>835.</u>			
Final Value	(Vf),(Wf)	<u>777.8</u>	<u>747.5</u>	<u>594</u>	<u>841.4</u>			

Run	Load	Box #						
<u>12</u>	<u>90-100</u>							
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)			
Contents		H ₂ O	H ₂ O	<u>596.8</u>	Sil Gel			
Initial Value	(Vi),(Wi)	<u>71.8</u>	<u>747.5</u>	<u>596.8</u>	<u>798.1</u>	<u>784.4</u>		
Final Value	(Vf),(Wf)	<u>801.7</u>	<u>760.8</u>	<u>596.8</u>	<u>814.4</u>	<u>798.1</u>		

Run	Load	Box #						
<u>1</u>	<u>0-30-0</u>							
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)			
Contents		H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)	<u>801.7</u>	<u>760.8</u>	<u>596.8</u>	<u>798.1</u>			
Final Value	(Vf),(Wf)	<u>821.7</u>	<u>772.4</u>	<u>599</u>	<u>814.4</u>			

Run	Load	Box #						
<u>2</u>	<u>0-30-0</u>							
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)			
Contents		H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)	<u>795.3</u>	<u>756.6</u>	<u>594.4</u>	<u>868.5</u>			
Final Value	(Vf),(Wf)	<u>807.8</u>	<u>768.5</u>	<u>597.1</u>	<u>881.4</u>			

Run	Load	Box #						
<u>3</u>	<u>0-30-0</u>							
		Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
		(g)	(g)	(g)	(g)			
Contents		H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)	<u>802.8</u>	<u>768.5</u>	<u>597.1</u>	<u>758.1</u>			
Final Value	(Vf),(Wf)	<u>823.9</u>	<u>776.7</u>	<u>598.5</u>	<u>767.1</u>			

AIR HYGIENE

MOISTURE (EPA METHOD 4) DATA SHEET


Site Info.

Plant Name.
 Sampling Location.
 Unit #
 Date.

Console Info.

Console.
 Meter Calibration Factor
 Orifice Meter Coefficient

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
12	30-70-30		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		823.9	776.7	598.5	817.4			
Final Value	(Vf),(Wf)		839.8	787	600.4	828.4			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
5	30-70-30		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		839.8	787	600.4	828.4			
Final Value	(Vf),(Wf)		855.4	798	603.4	839			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
6	30-70-30		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		855.4	798	603.4	839			
Final Value	(Vf),(Wf)		870.7	807.9	606.1	917.8			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
7	70-100-70		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		870.7	807.9	606.1	917.8			
Final Value	(Vf),(Wf)		840.5	826.4	610.0	827			
			807.9	812	607.2	813.8			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
8	70-100-70		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		754.5	772.7	616.1	827			
Final Value	(Vf),(Wf)		788.3	787.4	613.0	841.4			

Run	Load	Box #	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7
9	70-100-70		(g)	(g)	(g)	(g)			
Contents			H ₂ O	H ₂ O	-	Sil Gel			
Initial Value	(Vi),(Wi)		726.2	787.3	613	836.2			
Final Value	(Vf),(Wf)		754.5	800.9	616.5	852.4			

210.7
 80.3
 78.9
 107
 25.2
 30.47
 2
 83.9%

Questor Tel

Quarter 2/25/15
90-100% R10 - 29.09

R11 - 29.13

R12 - 11.12

End - 5.79

0-30-0%

R1 - 29.02

R2 - 19.70

R3 - 10.30

End - 3.97

30-70-30%

R4 - 29.79

R5 - 18.23

R6 - 9.95

End - 4.12

2/28/15

70-100-70

R7 - 29.70

R8 - 18.00

R9 - 9.33

End - 2.1

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end of report**