TCEQ

Region 4 - DFW Office

Attachment 4

Results of Summa Samples

Investigation No. 844836

CARRIZO OIL & GAS INC

Tarrant County, TX

Date of Investigation: 7/27/2010 - 8 /02/2010

Texas Commission on Environmental Quality

Laboratory and Mobile Monitoring Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results
ACL Number: 091112

ACL Lead: Karen Bachtel Region: T04 Date Received: 11/16/2009

Facility(ies) Sampled	City	County	Facility Type
Carrizo Oil & Gas	Arlington	Tarrant	Natural Gas

Laboratory Procedure(s) Performed:

Analysis: AMOR006
Determination of VOC Canisters by GC/MS Using Modified Method TO-15
Procedure:
Prior to analysis, subatmospheric samples are pressurized to twice the collected volume using a sample dilution system. For analysis, a known volume of a sample is directed from the canister into a multitrap cryogenic concentrator. Internal standards are added to the sample stream prior to the trap. The concentrated sample is thermally desorbed and carried onto a GC column for separation. The analytical strategy involves using a GC with dual columns that are coupled to a mass selective detector (MSD) and a flame ionization detector (FID). Mass spectra for individual peaks in the total ion chromatogram are then used for target compound identification and quantitation. The fragmentation pattern is compared with stored spectra taken under similar conditions in order to identify the compound. For any given compound, the intensity of the quantitation fragment is compared with the system response to the fragment for known amounts of the compound. This establishes the compound concentration in the sample. For non-target compound peaks which are at least one-half the height of the internal standard, a library search is performed in an attempt to identify the compound solely upon fracture patterns. These tentatively identified compounds (TIC's) are reported as a sample specific footnote. Accurate quantitation of TICs is not possible. The FID is used for the quantitation of ethane, ethylene, acetylene, propylene and propane and identification is based on matching retention times of standards containing known analytes.

Sample(s) Received

Field ID Number: F1030 Laboratory Sample Number: 091112-0001 Sampled by: Kara Allen
Sampling Site: UTA Facility Date & Time Sampled: 11/09/09 05:30:00 Valid Sample: Yes
Comments:
Canister #F1030 was used to collect a grab sample at UTA Facility. Note: Deviation from SAMP-008: Sample duration and final canister pressure not recorded on COC. Leak check not performed.

Sample(s) Screening

12/7/2009

Texas Commission on Environmental Quality

Laboratory and Mobile Monitoring Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results

ACL Number: 091112

Sample(s) Screening

As a routine procedure, the data from this (these) sample(s) have been screened. No target compounds were detected at or above the Appropriate Comparison Value. Therefore, the TCEQ's Toxicology Division expects no adverse health effects or odors and will not review the data further. Please note that this analytical technique is not capable of measuring all compounds which might have the potential to cause adverse heath effects or odors. For questions on the analytical procedures please contact the laboratory manager at (512)-239-5853. If further health effects evaluation is desired please contact the Toxicology Division at (512)-239-1795.

Analyst: _____ Date: 12/7/09
Do Hoang

Reviewed By: _____ Date: 12/23/09
Karen Bachtel

Section Manager: _____ Date: 12/28/09
David Manis

Laboratory Analysis Results

ACL Number: 091112

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID			091112-0001					
Field ID			F1030					
Canister ID			F1030					
Analysis Date			12/03/09					
Compound	ESL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
ethane	10000	0.50	5.0	0.50				
ethylene	1200	0.50	0.75	0.50	L			
acetylene	25000	0.50	0.59	0.50	L			
propane	10000	0.50	2.9	0.50				
propylene	68000	0.50	0.15	0.50	J			
dichlorodifluoromethane	10000	0.20	0.57	0.20	L			
methyl chloride	500	0.20	0.60	0.20				
isobutane	2000	0.23	2.2	0.23				
vinyl chloride	50	0.17	ND	0.17				
1-butene	360	0.20	0.15	0.20	J			
1,3-butadiene	50	0.27	ND	0.27				
n-butane	8000	0.20	1.1	0.20	L			
t-2-butene	2100	0.18	ND	0.18				
bromomethane	30	0.27	ND	0.27				
c-2-butene	2100	0.27	ND	0.27				
3-methyl-1-butene	250	0.23	ND	0.23				
isopentane	1200	0.27	0.74	0.27	L			
trichlorofluoromethane	5000	0.29	0.23	0.29	J			
1-pentene	100	0.27	ND	0.27				
n-pentane	1200	0.27	0.38	0.27	L			
isoprene	5.0	0.27	0.18	0.27	J			
t-2-pentene	2600	0.27	0.02	0.27	J			
1,1-dichloroethylene	180	0.18	ND	0.18				
c-2-pentene	2600	0.25	ND	0.25				
methylene chloride	75	0.14	0.08	0.14	J			
2-methyl-2-butene	250	0.23	0.01	0.23	J,A1			
2,2-dimethylbutane	1000	0.21	0.02	0.21	J			
cyclopentene	2900	0.20	ND	0.20				
4-methyl-1-pentene	20	0.22	ND	0.22				
1,1-dichloroethane	1000	0.19	ND	0.19				
cyclopentane	1200	0.27	0.02	0.27	J			
2,3-dimethylbutane	1000	0.28	0.03	0.28	J			
2-methylpentane	83	0.27	0.11	0.27	J			
3-methylpentane	1000	0.23	0.09	0.23	J			
2-methyl-1-pentene + 1-hexene	20	0.20	ND	0.20				
n-hexane	1500	0.20	0.14	0.20	J			
chloroform	20	0.21	0.02	0.21	J			
t-2-hexene	20	0.27	ND	0.27				
c-2-hexene	20	0.27	ND	0.27				
1,2-dichloroethane	40	0.27	ND	0.27				
methylcyclopentane	750	0.27	0.06	0.27	J			
2,4-dimethylpentane	910	0.27	ND	0.27				
1,1,1-trichloroethane	2000	0.26	ND	0.26				
benzene	180	0.27	0.27	0.27	J			
carbon tetrachloride	20	0.27	0.10	0.27	J			
cyclohexane	420	0.24	ND	0.24				
2-methylhexane	750	0.27	ND	0.27				
2,3-dimethylpentane	910	0.26	0.02	0.26	J			

Laboratory Analysis Results

ACL Number: 091112

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID			091112-0001					
Compound	ESL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
3-methylhexane	750	0.20	0.06	0.20	J			
1,2-dichloropropane	250	0.17	ND	0.17				
trichloroethylene	250	0.29	ND	0.29				
2,2,4-trimethylpentane	750	0.24	0.05	0.24	J			
2-chloropentane	190	0.27	ND	0.27				
n-heptane	850	0.25	0.04	0.25	J			
c-1,3-dichloropropylene	10	0.20	ND	0.20				
methylcyclohexane	4000	0.26	ND	0.26				
t-1,3-dichloropropylene	10	0.20	ND	0.20				
1,1,2-trichloroethane	100	0.21	ND	0.21				
2,3,4-trimethylpentane	750	0.24	0.02	0.24	J			
toluene	170	0.27	0.31	0.27	L			
2-methylheptane	750	0.20	0.01	0.20	J			
3-methylheptane	750	0.23	0.01	0.23	J			
1,2-dibromoethane	0.50	0.20	ND	0.20				
n-octane	750	0.19	0.02	0.19	J,A2			
tetrachloroethylene	770	0.24	0.01	0.24	J			
chlorobenzene	100	0.27	ND	0.27				
ethylbenzene	460	0.27	0.05	0.27	J			
m & p-xylene	480	0.27	0.10	0.27	J			
styrene	25	0.27	0.22	0.27	J			
1,1,2,2-tetrachloroethane	10	0.20	ND	0.20				
o-xylene	1000	0.27	0.04	0.27	J			
n-nonane	2000	0.22	0.05	0.22	J			
isopropylbenzene	100	0.24	ND	0.24				
n-propylbenzene	250	0.27	0.02	0.27	J			
m-ethyltoluene	250	0.11	0.03	0.11	J			
p-ethyltoluene	250	0.16	0.02	0.16	J			
1,3,5-trimethylbenzene	250	0.25	0.01	0.25	J			
o-ethyltoluene	250	0.13	0.02	0.13	J			
1,2,4-trimethylbenzene	250	0.27	0.04	0.27	J			
n-decane	1800	0.27	0.05	0.27	J			
1,2,3-trimethylbenzene	250	0.27	0.02	0.27	J			
m-diethylbenzene	460	0.27	ND	0.27				
p-diethylbenzene	460	0.27	ND	0.27				
n-undecane	200	0.27	0.08	0.27	J			

Laboratory Analysis Results

ACL Number: 091112

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

ESL - Effects Screening Level. (Short-term Health and Odor Based in units of ppbv)
LOD - Limit of Detection.
ND - not detected
NQ - concentration can not be quantified.
SDL - Sample Detection Limit (MDL adjusted for dilutions).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.

* SDL is equal to LOD
** Quality control flags explanations are listed on the last page of this report.
# Compound concentration is equal to or greater than the Effects Screening Level.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

Laboratory Analysis Results

ACL Number: 091112

Analysis Code: AMOR006

Quality Control Notes:

Quality control notes for samples 091112-0001,

A1-Not all associated QC data met accuracy specification. Data may be an average 24 percent low with a range of -33 to -5 percent.

A2-Not all associated QC data met accuracy specification. Data may be an average 22 percent low with a range of -31 to -9 percent.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

1/20/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results
ACL Number: 100106

ACL Lead: Karen Bachtel Region: T04 Date Received: 1/8/2010

Facility(ies) Sampled	City	County	Facility Type
Exterrom Energy Solutions - UTA	Arlington	Tarrant	

Laboratory Procedure(s) Performed:

Analysis: AMOR006
Determination of VOC Canisters by GC/MS Using Modified Method TO-15
Procedure:
Prior to analysis, subatmospheric samples are pressurized to twice the collected volume using a sample dilution system. For analysis, a known volume of a sample is directed from the canister into a multitrap cryogenic concentrator. Internal standards are added to the sample stream prior to the trap. The concentrated sample is thermally desorbed and carried onto a GC column for separation. The analytical strategy involves using a GC with dual columns that are coupled to a mass selective detector (MSD) and a flame ionization detector (FID). Mass spectra for individual peaks in the total ion chromatogram are then used for target compound identification and quantitation. The fragmentation pattern is compared with stored spectra taken under similar conditions in order to identify the compound. For any given compound, the intensity of the quantitation fragment is compared with the system response to the fragment for known amounts of the compound. This establishes the compound concentration in the sample. For non-target compound peaks which are at least one-half the height of the internal standard, a library search is performed in an attempt to identify the compound solely upon fracture patterns. These tentatively identified compounds (TIC's) are reported as a sample specific footnote. Accurate quantitation of TICs is not possible. The FID is used for the quantitation of ethane, ethylene, acetylene, propylene and propane and identification is based on matching retention times of standards containing known analytes.

Sample(s) Received

Field ID Number: 20231 Laboratory Sample Number: 100106-0001 Sampled by: Luke Jones
Sampling Site: Approximately 250 feet West at the Exterrom U Date & Time Sampled: 01/05/10 11:14:00 Valid Sample: Yes
Comments:

Canister #20231 was used to collect a grab sample 250 feet West/Southwest of the UTA Compressor Station located just south of the intersection of Pecan and Mitchell St. in Arglinton. Temperature was at 36° F. Humidity at 59°. Winds were East/Northeast at 0-8 mph.

Sample(s) Screening

1/20/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results

ACL Number: 100106

Sample(s) Screening

As a routine procedure, the data from this (these) sample(s) have been screened. No target compounds were detected at or above the Appropriate Comparison Value. Therefore, the TCEQ's Toxicology Division expects no adverse health effects or odors and will not review the data further. Please note that this analytical technique is not capable of measuring all compounds which might have the potential to cause adverse heath effects or odors. For questions on the analytical procedures please contact the laboratory manager at (512)-239-5853. If further health effects evaluation is desired please contact the Toxicology Division at (512)-239-1795.

Analyst: Qian-ping Loh Date: 1/20/10
J.P. Loh

Reviewed By: Date: 1/20/10
Karen Bachtel

Section Manager: for SS Date: 1/21/10
Steve Stubbs

Laboratory Analysis Results

ACL Number: 100106

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID			100106-0001					
Field ID			20231					
Canister ID			20231					
Analysis Date			01/11/10					
Compound	ESL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
ethane	10000	0.50	8.8	1.0				
ethylene	1200	0.50	1.9	1.0	L			
acetylene	25000	0.50	1.5	1.0	L			
propane	10000	0.50	4.6	1.0				
propylene	68000	0.50	0.34	1.0	J			
dichlorodifluoromethane	10000	0.20	0.60	0.40	L			
methyl chloride	500	0.20	0.55	0.40	L			
isobutane	2000	0.23	1.7	0.46	L			
vinyl chloride	50	0.17	ND	0.34				
1-butene	360	0.20	0.34	0.40	J			
1,3-butadiene	50	0.27	ND	0.54				
n-butane	8000	0.20	2.2	0.40	L			
t-2-butene	2100	0.18	0.04	0.36	J			
bromomethane	30	0.27	ND	0.54				
c-2-butene	2100	0.27	ND	0.54				
3-methyl-1-butene	250	0.23	ND	0.46				
isopentane	1200	0.27	0.81	0.54	L			
trichlorofluoromethane	5000	0.29	0.25	0.58	J			
1-pentene	100	0.27	ND	0.54				
n-pentane	1200	0.27	0.52	0.54	J			
isoprene	5.0	0.27	ND	0.54				
t-2-pentene	2600	0.27	ND	0.54				
1,1-dichloroethylene	180	0.18	ND	0.36				
c-2-pentene	2600	0.25	ND	0.50				
methylene chloride	75	0.14	0.21	0.28	J			
2-methyl-2-butene	250	0.23	ND	0.46				
2,2-dimethylbutane	1000	0.21	0.03	0.42	J			
cyclopentene	2900	0.20	ND	0.40				
4-methyl-1-pentene	20	0.22	ND	0.44				
1,1-dichloroethane	1000	0.19	ND	0.38				
cyclopentane	1200	0.27	ND	0.54				
2,3-dimethylbutane	1000	0.28	0.05	0.56	J			
2-methylpentane	83	0.27	0.16	0.54	J			
3-methylpentane	1000	0.23	0.11	0.46	J			
2-methyl-1-pentene + 1-hexene	20	0.20	ND	0.40				
n-hexane	1500	0.20	0.18	0.40	J			
chloroform	20	0.21	0.02	0.42	J			
t-2-hexene	20	0.27	ND	0.54				
c-2-hexene	20	0.27	ND	0.54				
1,2-dichloroethane	40	0.27	ND	0.54				
methylcyclopentane	750	0.27	0.12	0.54	J			
2,4-dimethylpentane	910	0.27	ND	0.54				
1,1,1-trichloroethane	2000	0.26	ND	0.52				
benzene	180	0.27	0.29	0.54	J			
carbon tetrachloride	20	0.27	0.09	0.54	J			
cyclohexane	420	0.24	ND	0.48				
2-methylhexane	750	0.27	ND	0.54				
2,3-dimethylpentane	910	0.26	0.04	0.52	J			

Laboratory Analysis Results

ACL Number: 100106

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)								
Lab ID			100106-0001					
Compound	ESL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
3-methylhexane	750	0.20	0.12	0.40	J			
1,2-dichloropropane	250	0.17	ND	0.34				
trichloroethylene	250	0.29	ND	0.58				
2,2,4-trimethylpentane	750	0.24	0.09	0.48	J			
2-chloropentane	190	0.27	ND	0.54				
n-heptane	850	0.25	0.08	0.50	J			
c-1,3-dichloropropylene	10	0.20	ND	0.40				
methylcyclohexane	4000	0.26	ND	0.52				
t-1,3-dichloropropylene	10	0.20	ND	0.40				
1,1,2-trichloroethane	100	0.21	ND	0.42				
2,3,4-trimethylpentane	750	0.24	0.03	0.48	J			
toluene	170	0.27	1.8	0.54				
2-methylheptane	750	0.20	ND	0.40				
3-methylheptane	750	0.23	ND	0.46				
1,2-dibromoethane	0.50	0.20	ND	0.40				
n-octane	750	0.19	0.04	0.38	J			
tetrachloroethylene	770	0.24	0.02	0.48	J			
chlorobenzene	100	0.27	ND	0.54				
ethylbenzene	460	0.27	0.19	0.54	J			
m & p-xylene	480	0.27	0.51	0.54	J			
styrene	25	0.27	ND	0.54				
1,1,2,2-tetrachloroethane	10	0.20	ND	0.40				
o-xylene	1000	0.27	0.17	0.54	J			
n-nonane	2000	0.22	ND	0.44				
isopropylbenzene	100	0.24	ND	0.48				
n-propylbenzene	250	0.27	0.05	0.54	J			
m-ethyltoluene	250	0.11	0.15	0.22	J			
p-ethyltoluene	250	0.16	0.05	0.32	J			
1,3,5-trimethylbenzene	250	0.25	0.06	0.50	J			
o-ethyltoluene	250	0.13	0.06	0.26	J			
1,2,4-trimethylbenzene	250	0.27	0.26	0.54	J			
n-decane	1800	0.27	ND	0.54				
1,2,3-trimethylbenzene	250	0.27	0.06	0.54	J			
m-diethylbenzene	460	0.27	ND	0.54				
p-diethylbenzene	460	0.27	ND	0.54				
n-undecane	200	0.27	0.06	0.54	J			

Laboratory Analysis Results

ACL Number: 100106

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

ESL - Effects Screening Level. (Short-term Health and Odor Based in units of ppbv)
LOD - Limit of Detection.
ND - not detected
NQ - concentration can not be quantified.
SDL - Sample Detection Limit (MDL adjusted for dilutions).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.

* SDL is equal to LOD
** Quality control flags explanations are listed on the last page of this report.
# Compound concentration is equal to or greater than the Effects Screening Level.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

Laboratory Analysis Results

ACL Number: 100106

Analysis Code: AMOR006

Quality Control Notes:

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

1/22/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results

ACL Number: 100117

ACL Lead: Karen Bachtel Region: T04 Date Received: 1/20/2010

Facility(ies) Sampled	City	County	Facility Type
Carrizo Oil & Gas	Arlington	Tarrant	Natural Gas

Laboratory Procedure(s) Performed:

Analysis: AMOR006
Determination of VOC Canisters by GC/MS Using Modified Method TO-15
Procedure:
Prior to analysis, subatmospheric samples are pressurized to twice the collected volume using a sample dilution system. For analysis, a known volume of a sample is directed from the canister into a multitrap cryogenic concentrator. Internal standards are added to the sample stream prior to the trap. The concentrated sample is thermally desorbed and carried onto a GC column for separation. The analytical strategy involves using a GC with dual columns that are coupled to a mass selective detector (MSD) and a flame ionization detector (FID). Mass spectra for individual peaks in the total ion chromatogram are then used for target compound identification and quantitation. The fragmentation pattern is compared with stored spectra taken under similar conditions in order to identify the compound. For any given compound, the intensity of the quantitation fragment is compared with the system response to the fragment for known amounts of the compound. This establishes the compound concentration in the sample. For non-target compound peaks which are at least one-half the height of the internal standard, a library search is performed in an attempt to identify the compound solely upon fracture patterns. These tentatively identified compounds (TIC's) are reported as a sample specific footnote. Accurate quantitation of TICs is not possible. The FID is used for the quantitation of ethane, ethylene, acetylene, propylene and propane and identification is based on matching retention times of standards containing known analytes.

Sample(s) Received

Field ID Number: 20308 Laboratory Sample Number: 100117-0001 Sampled by: Complainant
Sampling Site: Complainant's property Date & Time Sampled: 01/17/10 09:32:00 Valid Sample: Yes
Comments:
Canister #20308 was used as grab sample. Sample No.1

Sample(s) Screening

1/22/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results

ACL Number: 100117

Sample(s) Screening

As a routine procedure, the data from this (these) sample(s) have been screened. No target compounds were detected at or above the Appropriate Comparison Value. Therefore, the TCEQ's Toxicology Division expects no adverse health effects or odors and will not review the data further. Please note that this analytical technique is not capable of measuring all compounds which might have the potential to cause adverse heath effects or odors. For questions on the analytical procedures please contact the laboratory manager at (512)-239-5853. If further health effects evaluation is desired please contact the Toxicology Division at (512)-239-1795.

Analyst: Jiangping Loh Date: 1/25/10
JP Loh

Reviewed By: Karen Bachtel Date: 1/25/10
Karen Bachtel

Section Manager: for SS Date: 1/26/10
Steve Stubbs

Laboratory Analysis Results

ACL Number: 100117

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID			100117-0001					
Field ID			20308					
Canister ID			20308					
Analysis Date			01/23/10					
Compound	ESL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
ethane	10000	0.50	45	0.51				
ethylene	1200	0.50	1.5	0.51				
acetylene	25000	0.50	1.3	0.51				
propane	10000	0.50	20	0.51				
propylene	68000	0.50	0.37	0.51	J			
dichlorodifluoromethane	10000	0.20	0.69	0.20				
methyl chloride	500	0.20	0.47	0.20	L			
isobutane	2000	0.23	4.4	0.23				
vinyl chloride	50	0.17	ND	0.17				
1-butene	360	0.20	0.42	0.20	L			
1,3-butadiene	50	0.27	ND	0.27				
n-butane	8000	0.20	7.2	0.20				
t-2-butene	2100	0.18	0.05	0.18	J			
bromomethane	30	0.27	ND	0.27				
c-2-butene	2100	0.27	0.04	0.27	J			
3-methyl-1-butene	250	0.23	ND	0.23				
isopentane	1200	0.27	2.2	0.27				
trichlorofluoromethane	5000	0.29	0.23	0.29	J			
1-pentene	100	0.27	ND	0.27				
n-pentane	1200	0.27	1.7	0.27				
isoprene	5.0	0.27	0.12	0.27	J			
t-2-pentene	2600	0.27	0.06	0.27	J			
1,1-dichloroethylene	180	0.18	ND	0.18				
c-2-pentene	2600	0.25	0.03	0.25	J			
methylene chloride	75	0.14	0.08	0.14	J			
2-methyl-2-butene	250	0.23	0.06	0.23	J			
2,2-dimethylbutane	1000	0.21	0.06	0.21	J			
cyclopentene	2900	0.20	ND	0.20				
4-methyl-1-pentene	20	0.22	ND	0.22				
1,1-dichloroethane	1000	0.19	ND	0.19				
cyclopentane	1200	0.27	0.09	0.27	J			
2,3-dimethylbutane	1000	0.28	0.07	0.28	J			
2-methylpentane	83	0.27	0.40	0.27	L			
3-methylpentane	1000	0.23	0.27	0.23	L			
2-methyl-1-pentene + 1-hexene	20	0.20	ND	0.20				
n-hexane	1500	0.20	0.51	0.20	L			
chloroform	20	0.21	0.02	0.21	J			
t-2-hexene	20	0.27	ND	0.27				
c-2-hexene	20	0.27	ND	0.27				
1,2-dichloroethane	40	0.27	ND	0.27				
methylcyclopentane	750	0.27	0.24	0.27	J			
2,4-dimethylpentane	910	0.27	ND	0.27				
1,1,1-trichloroethane	2000	0.26	ND	0.26				
benzene	180	0.27	0.35	0.27	L			
carbon tetrachloride	20	0.27	0.10	0.27	J			
cyclohexane	420	0.24	0.21	0.24	J			
2-methylhexane	750	0.27	ND	0.27				
2,3-dimethylpentane	910	0.26	ND	0.26				

Laboratory Analysis Results

ACL Number: 100117

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)								
Lab ID			100117-0001					
Compound	ESL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
3-methylhexane	750	0.20	0.16	0.20	J			
1,2-dichloropropane	250	0.17	ND	0.17				
trichloroethylene	250	0.29	0.03	0.29	J			
2,2,4-trimethylpentane	750	0.24	0.30	0.24	L			
2-chloropentane	190	0.27	ND	0.27				
n-heptane	850	0.25	0.13	0.25	J,A1			
c-1,3-dichloropropylene	10	0.20	ND	0.20				
methylcyclohexane	4000	0.26	ND	0.26				
t-1,3-dichloropropylene	10	0.20	ND	0.20				
1,1,2-trichloroethane	100	0.21	ND	0.21				
2,3,4-trimethylpentane	750	0.24	0.03	0.24	J			
toluene	170	0.27	0.46	0.27	L			
2-methylheptane	750	0.20	0.03	0.20	J			
3-methylheptane	750	0.23	0.04	0.23	J			
1,2-dibromoethane	0.50	0.20	ND	0.20				
n-octane	750	0.19	0.06	0.19	J,A2			
tetrachloroethylene	770	0.24	0.01	0.24	J			
chlorobenzene	100	0.27	ND	0.27				
ethylbenzene	460	0.27	0.17	0.27	J			
m & p-xylene	480	0.27	0.44	0.27	L			
styrene	25	0.27	ND	0.27				
1,1,2,2-tetrachloroethane	10	0.20	ND	0.20				
o-xylene	1000	0.27	0.18	0.27	J			
n-nonane	2000	0.22	0.14	0.22	J			
isopropylbenzene	100	0.24	0.03	0.24	J			
n-propylbenzene	250	0.27	0.06	0.27	J			
m-ethyltoluene	250	0.11	0.15	0.11	L			
p-ethyltoluene	250	0.16	0.05	0.16	J			
1,3,5-trimethylbenzene	250	0.25	0.05	0.25	J			
o-ethyltoluene	250	0.13	0.07	0.13	J			
1,2,4-trimethylbenzene	250	0.27	0.22	0.27	J			
n-decane	1800	0.27	0.09	0.27	J			
1,2,3-trimethylbenzene	250	0.27	0.08	0.27	J			
m-diethylbenzene	460	0.27	ND	0.27				
p-diethylbenzene	460	0.27	ND	0.27				
n-undecane	200	0.27	0.11	0.27	J			

Laboratory Analysis Results

ACL Number: 100117

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

ESL - Effects Screening Level. (Short-term Health and Odor Based in units of ppbv)
LOD - Limit of Detection.
ND - not detected
NQ - concentration can not be quantified.
SDL - Sample Detection Limit (MDL adjusted for dilutions).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.

* SDL is equal to LOD
** Quality control flags explanations are listed on the last page of this report.
# Compound concentration is equal to or greater than the Effects Screening Level.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

Laboratory Analysis Results

ACL Number: 100117

Analysis Code: AMOR006

Quality Control Notes:

Quality control notes for samples 100117-0001,
A1-Not all associated QC data met accuracy specification. Data may be an average 18 percent low with a range of -31 to +5 percent.
A2-Not all associated QC data met accuracy specification. Data may be an average 22 percent low with a range of -34 to -4 percent.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

5/21/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results

ACL Number: 100124

ACL Lead: Karen Bachtel Region: T04 Date Received: 1/22/2010

Project(s): Barnett Shale

Facility(ies) Sampled	City	County	Facility Type
Carrizo Oil & Gas	Arlington	Tarrant	Natural Gas

Laboratory Procedure(s) Performed:

Analysis: AMOR006

Determination of VOC Canisters by GC/MS Using Modified Method TO-15

Procedure:

Prior to analysis, subatmospheric samples are pressurized to twice the collected volume using a sample dilution system. For analysis, a known volume of a sample is directed from the canister into a multitrap cryogenic concentrator. Internal standards are added to the sample stream prior to the trap. The concentrated sample is thermally desorbed and carried onto a GC column for separation. The analytical strategy involves using a GC with dual columns that are coupled to a mass selective detector (MSD) and a flame ionization detector (FID). Mass spectra for individual peaks in the total ion chromatogram are then used for target compound identification and quantitation. The fragmentation pattern is compared with stored spectra taken under similar conditions in order to identify the compound. For any given compound, the intensity of the quantitation fragment is compared with the system response to the fragment for known amounts of the compound. This establishes the compound concentration in the sample. For non-target compound peaks which are at least one-half the height of the internal standard, a library search is performed in an attempt to identify the compound solely upon fracture patterns. These tentatively identified compounds (TIC's) are reported as a sample specific footnote. Accurate quantitation of TICs is not possible. The FID is used for the quantitation of ethane, ethylene, acetylene, propylene and propane and identification is based on matching retention times of standards containing known analytes.

Sample(s) Received

Field ID Number: 12000 Laboratory Sample Number: 100124-0001 Sampled by: Complainant

Sampling Site: Complainant's property Date & Time Sampled: 01/21/10 02:26:00 Valid Sample: Yes

Comments:

Canister #12000 was used as a grab sample. Carrizo sample.
This ACL was reissued to add the D flag for the dilution.

Sample(s) Screening

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results
ACL Number: 100124

Sample(s) Screening

As a routine procedure, the data from this (these) sample(s) have been screened. No target compounds were detected at or above the Appropriate Comparison Value. Therefore, the TCEQ's Toxicology Division expects no adverse health effects or odors and will not review the data further. Please note that this analytical technique is not capable of measuring all compounds which might have the potential to cause adverse heath effects or odors. For questions on the analytical procedures please contact the laboratory manager at (512)-239-5853. If further health effects evaluation is desired please contact the Toxicology Division at (512)-239-1795.

Analyst: Jian-ping Loh Date: 5/21/10
J.P. Loh

Reviewed By: Date: 5/21/2010
Karen Bachtel

Technical Specialist: Date: 5/25/10
David Manis

Laboratory Analysis Results

ACL Number: 100124

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID			100124-0001					
Field ID			12000					
Canister ID			12000					
Analysis Date			01/25/10					
Compound	ESL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
ethane	10000	0.50	6.7	1.0	D1,T			
ethylene	1200	0.50	ND	1.0	D1,T			
acetylene	25000	0.50	0.52	1.0	J,D1,T			
propane	10000	0.50	3.2	1.0	D1,T			
propylene	5000	0.50	ND	1.0	D1,T			
dichlorodifluoromethane	10000	0.20	0.56	0.40	L,D1			
methyl chloride	500	0.20	0.54	0.40	L,D1			
isobutane	2000	0.23	0.74	0.46	L,D1			
vinyl chloride	26000	0.17	ND	0.34	D1			
1-butene	360	0.20	0.16	0.40	J,D1			
1,3-butadiene	230	0.27	ND	0.55	D1			
n-butane	8000	0.20	1.5	0.40	L,D1			
t-2-butene	2100	0.18	ND	0.36	D1			
bromomethane	30	0.27	ND	0.55	D1			
c-2-butene	2100	0.27	ND	0.55	D1			
3-methyl-1-butene	250	0.23	ND	0.46	D1			
isopentane	1200	0.27	0.50	0.55	J,D1			
trichlorofluoromethane	5000	0.29	0.24	0.59	J,D1			
1-pentene	100	0.27	ND	0.55	D1			
n-pentane	1200	0.27	0.35	0.55	J,D1			
isoprene	5.0	0.27	ND	0.55	D1			
t-2-pentene	2600	0.27	ND	0.55	D1			
1,1-dichloroethylene	180	0.18	ND	0.36	D1			
c-2-pentene	2600	0.25	ND	0.51	D1			
methylene chloride	75	0.14	0.07	0.28	J,D1			
2-methyl-2-butene	250	0.23	ND	0.46	D1			
2,2-dimethylbutane	1000	0.21	ND	0.42	D1			
cyclopentene	2900	0.20	ND	0.40	D1			
4-methyl-1-pentene	20	0.22	ND	0.44	D1			
1,1-dichloroethane	1000	0.19	ND	0.38	D1			
cyclopentane	1200	0.27	ND	0.55	D1			
2,3-dimethylbutane	990	0.28	ND	0.57	D1			
2-methylpentane	83	0.27	0.11	0.55	J,D1			
3-methylpentane	1000	0.23	0.08	0.46	J,D1			
2-methyl-1-pentene + 1-hexene	20	0.20	ND	0.40	D1			
n-hexane	1500	0.20	ND	0.40	D1			
chloroform	20	0.21	0.02	0.42	J,D1			
t-2-hexene	500	0.27	ND	0.55	D1			
c-2-hexene	500	0.27	ND	0.55	D1			
1,2-dichloroethane	40	0.27	ND	0.55	D1			
methylcyclopentane	750	0.27	0.09	0.55	J,D1			
2,4-dimethylpentane	850	0.27	ND	0.55	D1			
1,1,1-trichloroethane	2000	0.26	ND	0.53	D1			
benzene	180	0.27	0.15	0.55	J,D1			
carbon tetrachloride	20	0.27	0.10	0.55	J,D1			
cyclohexane	420	0.24	ND	0.48	D1			
2-methylhexane	750	0.27	ND	0.55	D1			
2,3-dimethylpentane	850	0.26	ND	0.53	D1			

Laboratory Analysis Results

ACL Number: 100124

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID			100124-0001					
Compound	ESL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
3-methylhexane	750	0.20	0.07	0.40	J,D1			
1,2-dichloropropane	100	0.17	ND	0.34	D1			
trichloroethylene	100	0.29	ND	0.59	D1			
2,2,4-trimethylpentane	750	0.24	0.02	0.48	J,D1			
2-chloropentane	190	0.27	ND	0.55	D1			
n-heptane	670	0.25	0.06	0.51	J,D1			
c-1,3-dichloropropylene	10	0.20	ND	0.40	D1			
methylcyclohexane	150	0.26	ND	0.53	D1			
t-1,3-dichloropropylene	10	0.20	ND	0.40	D1			
1,1,2-trichloroethane	100	0.21	ND	0.42	D1			
2,3,4-trimethylpentane	750	0.24	ND	0.48	D1			
toluene	170	0.27	0.20	0.55	J,D1			
2-methylheptane	750	0.20	ND	0.40	D1			
3-methylheptane	750	0.23	0.02	0.46	J,D1			
1,2-dibromoethane	0.50	0.20	ND	0.40	D1			
n-octane	750	0.19	0.04	0.38	J,D1,A1			
tetrachloroethylene	770	0.24	ND	0.48	D1			
chlorobenzene	100	0.27	ND	0.55	D1			
ethylbenzene	460	0.27	0.06	0.55	J,D1			
m & p-xylene	80	0.27	0.17	0.55	J,D1			
styrene	25	0.27	ND	0.55	D1			
1,1,2,2-tetrachloroethane	10	0.20	ND	0.40	D1			
o-xylene	380	0.27	0.05	0.55	J,D1			
n-nonane	2000	0.22	ND	0.44	D1			
isopropylbenzene	100	0.24	ND	0.48	D1			
n-propylbenzene	3.8	0.27	ND	0.55	D1			
m-ethyltoluene	18	0.11	ND	0.22	D1			
p-ethyltoluene	8.3	0.16	ND	0.32	D1			
1,3,5-trimethylbenzene	250	0.25	ND	0.51	D1			
o-ethyltoluene	250	0.13	ND	0.26	D1			
1,2,4-trimethylbenzene	250	0.27	0.06	0.55	J,D1			
n-decane	620	0.27	ND	0.55	D1			
1,2,3-trimethylbenzene	250	0.27	ND	0.55	D1			
m-diethylbenzene	70	0.27	ND	0.55	D1			
p-diethylbenzene	0.39	0.27	ND	0.55	D1			
n-undecane	550	0.27	ND	0.55	D1			

Laboratory Analysis Results

ACL Number: 100124

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

ESL - Effects Screening Level. (Short-term Health and Odor Based in units of ppbv)
LOD - Limit of Detection.
ND - not detected
NQ - concentration can not be quantified.
SDL - Sample Detection Limit (LOD adjusted for dilutions).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.
T- Data was not confirmed by a confirmational analysis. Data is tentatively identified.

* SDL is equal to LOD
** Quality control flags explanations are listed on the last page of this report.
# Compound concentration is equal to or greater than the Effects Screening Level.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

Laboratory Analysis Results

ACL Number: 100124

Analysis Code: AMOR006

Quality Control Notes:

Quality control notes for samples 100124-0001,
AI-Not all associated QC data met accuracy specification. Data may be an average 21 percent low with a range of -31 to -1 percent.

DI - sample was diluted 4.04 times to determine the compound concentrations.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

1/29/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results

ACL Number: 100130

ACL Lead: Karen Bachtel Region: T04 Date Received: 1/26/2010
Project(s): Barnett Shale

Facility(ies) Sampled	City	County	Facility Type
DFW Midstream Services, LLC	Arlington	Tarrant	

Laboratory Procedure(s) Performed:

Analysis: AMOR006
Determination of VOC Canisters by GC/MS Using Modified Method TO-15
Procedure:
Prior to analysis, subatmospheric samples are pressurized to twice the collected volume using a sample dilution system. For analysis, a known volume of a sample is directed from the canister into a multitrap cryogenic concentrator. Internal standards are added to the sample stream prior to the trap. The concentrated sample is thermally desorbed and carried onto a GC column for separation. The analytical strategy involves using a GC with dual columns that are coupled to a mass selective detector (MSD) and a flame ionization detector (FID). Mass spectra for individual peaks in the total ion chromatogram are then used for target compound identification and quantitation. The fragmentation pattern is compared with stored spectra taken under similar conditions in order to identify the compound. For any given compound, the intensity of the quantitation fragment is compared with the system response to the fragment for known amounts of the compound. This establishes the compound concentration in the sample. For non-target compound peaks which are at least one-half the height of the internal standard, a library search is performed in an attempt to identify the compound solely upon fracture patterns. These tentatively identified compounds (TIC's) are reported as a sample specific footnote. Accurate quantitation of TICs is not possible. The FID is used for the quantitation of ethane, ethylene, acetylene, propylene and propane and identification is based on matching retention times of standards containing known analytes.

Sample(s) Received

Field ID Number: N1950 Laboratory Sample Number: 100130-0001 Sampled by: Xin Rao
Sampling Site: 200 feet downwind of vent stack Date & Time Sampled: 01/22/10 11:30:00 Valid Sample: Yes
Comments:
Canister #N1950 was used as a grab sample.

Sample(s) Screening

1/29/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results

ACL Number: 100130

Sample(s) Screening

As a routine procedure, the data from this (these) sample(s) have been screened. No target compounds were detected at or above the Appropriate Comparison Value. Therefore, the TCEQ's Toxicology Division expects no adverse health effects or odors and will not review the data further. Please note that this analytical technique is not capable of measuring all compounds which might have the potential to cause adverse heath effects or odors. For questions on the analytical procedures please contact the laboratory manager at (512)-239-5853. If further health effects evaluation is desired please contact the Toxicology Division at (512)-239-1795.

Analyst: Jaydeep Patel Date: 01/29/10
Jaydeep Patel

Reviewed By: Date: 1/29/10
Karen Bachtel

Section Manager: for SS Date: 1/29/10
Steve Stubbs

Laboratory Analysis Results

ACL Number: 100130

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID			100130-0001					
Field ID			N1950					
Canister ID			N1950					
Analysis Date			01/28/10					
Compound	ESL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
ethane	10000	0.50	91	1.0	D1			
ethylene	1200	0.50	0.56	1.0	J,D1			
acetylene	25000	0.50	ND	1.0	D1			
propane	10000	0.50	7.5	1.0	D1			
propylene	5000	0.50	ND	1.0	D1			
dichlorodifluoromethane	10000	0.20	0.53	0.40	L,D1			
methyl chloride	500	0.20	0.62	0.40	L,D1			
isobutane	2000	0.23	0.97	0.46	L,D1			
vinyl chloride	26000	0.17	ND	0.34	D1			
1-butene	360	0.20	0.19	0.40	J,D1			
1,3-butadiene	230	0.27	ND	0.54	D1			
n-butane	8000	0.20	1.7	0.40	L,D1			
t-2-butene	2100	0.18	ND	0.36	D1			
bromomethane	30	0.27	ND	0.54	D1			
c-2-butene	2100	0.27	ND	0.54	D1			
3-methyl-1-butene	250	0.23	ND	0.46	D1			
isopentene	1200	0.27	0.67	0.54	L,D1			
trichlorofluoromethane	5000	0.29	0.26	0.58	J,D1			
1-pentene	100	0.27	ND	0.54	D1			
n-pentane	1200	0.27	0.38	0.54	J,D1			
isoprene	5.0	0.27	ND	0.54	D1			
t-2-pentene	2600	0.27	ND	0.54	D1			
1,1-dichloroethylene	180	0.18	ND	0.36	D1			
c-2-pentene	2600	0.25	ND	0.50	D1			
methylene chloride	75	0.14	0.09	0.28	J,D1			
2-methyl-2-butene	250	0.23	ND	0.46	D1			
2,2-dimethylbutane	1000	0.21	ND	0.42	D1			
cyclopentene	2900	0.20	ND	0.40	D1			
4-methyl-1-pentene	20	0.22	ND	0.44	D1			
1,1-dichloroethane	1000	0.19	ND	0.38	D1			
cyclopentane	1200	0.27	ND	0.54	D1			
2,3-dimethylbutane	990	0.28	ND	0.56	D1			
2-methylpentane	83	0.27	0.10	0.54	J,D1			
3-methylpentane	1000	0.23	0.06	0.46	J,D1			
2-methyl-1-pentene + 1-hexene	20	0.20	ND	0.40	D1			
n-hexane	1500	0.20	ND	0.40	D1			
chloroform	20	0.21	0.02	0.42	J,D1			
t-2-hexene	500	0.27	ND	0.54	D1			
c-2-hexene	500	0.27	ND	0.54	D1			
1,2-dichloroethane	40	0.27	ND	0.54	D1			
methylcyclopentane	750	0.27	0.06	0.54	J,D1			
2,4-dimethylpentane	850	0.27	ND	0.54	D1			
1,1,1-trichloroethane	2000	0.26	ND	0.52	D1			
benzene	180	0.27	0.28	0.54	J,D1			
carbon tetrachloride	20	0.27	0.14	0.54	J,D1			
cyclohexane	420	0.24	ND	0.48	D1			
2-methylhexane	750	0.27	0.06	0.54	J,D1			
2,3-dimethylpentane	850	0.26	ND	0.52	D1			

Laboratory Analysis Results

ACL Number: 100130

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)								
Lab ID			100130-0001					
Compound	ESL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
3-methylhexane	750	0.20	0.06	0.40	J,D1			
1,2-dichloropropane	100	0.17	ND	0.34	D1			
trichloroethylene	100	0.29	ND	0.58	D1			
2,2,4-trimethylpentane	750	0.24	0.03	0.48	J,D1			
2-chloropentane	190	0.27	ND	0.54	D1			
n-heptane	670	0.25	0.04	0.50	J,D1			
c-1,3-dichloropropylene	10	0.20	ND	0.40	D1			
methylcyclohexane	150	0.26	0.03	0.52	J,D1			
t-1,3-dichloropropylene	10	0.20	ND	0.40	D1			
1,1,2-trichloroethane	100	0.21	ND	0.42	D1			
2,3,4-trimethylpentane	750	0.24	ND	0.48	D1			
toluene	170	0.27	0.19	0.54	J,D1			
2-methylheptane	750	0.20	0.01	0.40	J,D1			
3-methylheptane	750	0.23	ND	0.46	D1			
1,2-dibromoethane	0.50	0.20	ND	0.40	D1			
n-octane	750	0.19	ND	0.38	D1			
tetrachloroethylene	770	0.24	ND	0.48	D1			
chlorobenzene	100	0.27	ND	0.54	D1			
ethylbenzene	460	0.27	0.02	0.54	J,D1			
m & p-xylene	80	0.27	0.05	0.54	J,D1			
styrene	25	0.27	ND	0.54	D1			
1,1,2,2-tetrachloroethane	10	0.20	ND	0.40	D1			
o-xylene	380	0.27	ND	0.54	D1			
n-nonane	2000	0.22	ND	0.44	D1			
isopropylbenzene	100	0.24	ND	0.48	D1			
n-propylbenzene	3.8	0.27	ND	0.54	D1			
m-ethyltoluene	18	0.11	ND	0.22	D1			
p-ethyltoluene	8.3	0.16	ND	0.32	D1			
1,3,5-trimethylbenzene	250	0.25	ND	0.50	D1			
o-ethyltoluene	250	0.13	ND	0.26	D1			
1,2,4-trimethylbenzene	250	0.27	ND	0.54	D1			
n-decane	620	0.27	ND	0.54	D1			
1,2,3-trimethylbenzene	250	0.27	ND	0.54	D1			
m-diethylbenzene	70	0.27	ND	0.54	D1			
p-diethylbenzene	0.39	0.27	ND	0.54	D1			
n-undecane	550	0.27	ND	0.54	D1			

Laboratory Analysis Results

ACL Number: 100130

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

ESL - Effects Screening Level. (Short-term Health and Odor Based in units of ppbv)
LOD - Limit of Detection.
ND - not detected
NQ - concentration can not be quantified.
SDL - Sample Detection Limit (MDL adjusted for dilutions).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.

* SDL is equal to LOD
** Quality control flags explanations are listed on the last page of this report.
# Compound concentration is equal to or greater than the Effects Screening Level.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us.

Laboratory Analysis Results

ACL Number: 100130

Analysis Code: AMOR006

Quality Control Notes:

D1 - sample was diluted 4.02 times to determine the compound concentrations.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

4/6/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results
ACL Number: 100332

ACL Lead: Karen Bachtel Region: T04 Date Received: 3/29/2010
Project(s): Barnett Shale

Facility(ies) Sampled	City	County	Facility Type
Carrizo Oil & Gas	Arlington	Tarrant	Natural Gas

Laboratory Procedure(s) Performed:

Analysis: AMOR006
Determination of VOC Canisters by GC/MS Using Modified Method TO-15
Procedure:
Prior to analysis, subatmospheric samples are pressurized to twice the collected volume using a sample dilution system. For analysis, a known volume of a sample is directed from the canister into a multitrap cryogenic concentrator. Internal standards are added to the sample stream prior to the trap. The concentrated sample is thermally desorbed and carried onto a GC column for separation. The analytical strategy involves using a GC with dual columns that are coupled to a mass selective detector (MSD) and a flame ionization detector (FID). Mass spectra for individual peaks in the total ion chromatogram are then used for target compound identification and quantitation. The fragmentation pattern is compared with stored spectra taken under similar conditions in order to identify the compound. For any given compound, the intensity of the quantitation fragment is compared with the system response to the fragment for known amounts of the compound. This establishes the compound concentration in the sample. For non-target compound peaks which are at least one-half the height of the internal standard, a library search is performed in an attempt to identify the compound solely upon fracture patterns. These tentatively identified compounds (TIC's) are reported as a sample specific footnote. Accurate quantitation of TICs is not possible. The FID is used for the quantitation of ethane, ethylene, acetylene, propylene and propane and identification is based on matching retention times of standards containing known analytes.

Sample(s) Received

Field ID Number: M0423 Laboratory Sample Number: 100332-0001 Sampled by: Damon Armstrong
Sampling Site: N 32.72446, W 97.10606 Date & Time Sampled: 03/25/10 11:07:00 Valid Sample: Yes
Comments:
Canister #M0423 was used to collect a 30 minute CO (Critical Orifice) sample. Downwind from UTA facilities.

Sample(s) Screening

4/6/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results

ACL Number: 100332

Sample(s) Screening

As a routine procedure, the data from this (these) sample(s) have been screened. No target compounds were detected at or above the Appropriate Comparison Value. Therefore, the TCEQ's Toxicology Division expects no adverse health effects or odors and will not review the data further. Please note that this analytical technique is not capable of measuring all compounds which might have the potential to cause adverse heath effects or odors. For questions on the analytical procedures please contact the laboratory manager at (512)-239-5853. If further health effects evaluation is desired please contact the Toxicology Division at (512)-239-1795.

Analyst: Jian Ping Loh Date: 4/6/10
J.P. Loh

Reviewed By: Date: 4/6/2010
Karen Bachtel

Technical Specialist: Date: 4/7/10
David Manis

Laboratory Analysis Results

ACL Number: 100332

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID			100332-0001					
Field ID			M0423					
Canister ID			M0423					
Analysis Date			04/01/10					
Compound	BSL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
ethane	10000	0.50	9.8	1.0	D1			
ethylene	1200	0.50	1.9	1.0	J,D1			
acetylene	25000	0.50	1.0	1.0	J,D1			
propane	10000	0.50	3.8	1.0	D1			
propylene	5000	0.50	0.45	1.0	J,D1			
dichlorodifluoromethane	10000	0.20	0.56	0.40	L,D1			
methyl chloride	500	0.20	0.51	0.40	L,D1			
isobutane	2000	0.23	0.80	0.46	L,D1			
vinyl chloride	26000	0.17	ND	0.34	D1			
1-butene	360	0.20	0.19	0.40	J,D1			
1,3-butadiene	230	0.27	0.06	0.54	J,D1			
n-butane	8000	0.20	1.5	0.40	L,D1			
t-2-butene	2100	0.18	ND	0.36	D1			
bromomethane	30	0.27	0.02	0.54	J,D1			
c-2-butene	2100	0.27	0.04	0.54	J,D1			
3-methyl-1-butene	250	0.23	ND	0.46	D1			
isopentane	1200	0.27	0.62	0.54	L,D1			
trichlorofluoromethane	5000	0.29	0.27	0.58	J,D1			
1-pentene	100	0.27	ND	0.54	D1			
n-pentane	1200	0.27	0.38	0.54	J,D1			
isoprene	5.0	0.27	ND	0.54	D1			
t-2-pentene	2600	0.27	ND	0.54	D1			
1,1-dichloroethylene	180	0.18	0.01	0.36	J,D1			
c-2-pentene	2600	0.25	0.03	0.50	J,D1			
methylene chloride	75	0.14	0.10	0.28	J,D1			
2-methyl-2-butene	250	0.23	0.04	0.46	J,D1			
2,2-dimethylbutane	1000	0.21	0.03	0.42	J,D1			
cyclopentene	2900	0.20	ND	0.40	D1			
4-methyl-1-pentene	20	0.22	ND	0.44	D1			
1,1-dichloroethane	1000	0.19	ND	0.38	D1			
cyclopentane	1200	0.27	0.06	0.54	J,D1			
2,3-dimethylbutane	990	0.28	0.07	0.56	J,D1			
2-methylpentane	83	0.27	0.19	0.54	J,D1			
3-methylpentane	1000	0.23	0.14	0.46	J,D1			
2-methyl-1-pentene + 1-hexene	20	0.20	ND	0.40	D1			
n-hexane	1500	0.20	ND	0.40	D1			
chloroform	20	0.21	0.02	0.42	J,D1			
t-2-hexene	500	0.27	0.01	0.54	J,D1			
c-2-hexene	500	0.27	ND	0.54	D1			
1,2-dichloroethane	40	0.27	0.02	0.54	J,D1			
methylcyclopentane	750	0.27	0.13	0.54	J,D1			
2,4-dimethylpentane	850	0.27	0.03	0.54	J,D1			
1,1,1-trichloroethane	2000	0.25	ND	0.52	D1			
benzene	180	0.27	0.27	0.54	J,D1			
carbon tetrachloride	20	0.27	0.12	0.54	J,D1			
cyclohexane	420	0.24	ND	0.48	D1			
2-methylhexane	750	0.27	0.22	0.54	J,D1			
2,3-dimethylpentane	850	0.26	0.07	0.52	J,D1			

Laboratory Analysis Results

ACL Number: 100332

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID			100332-0001					
Compound	BSL	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
3-methylhexane	750	0.20	0.24	0.40	J,D1			
1,2-dichloropropane	100	0.17	ND	0.34	D1			
trichloroethylene	100	0.29	ND	0.58	D1			
2,2,4-trimethylpentane	750	0.24	0.05	0.48	J,D1			
2-chloropentane	190	0.27	ND	0.54	D1			
n-heptane	670	0.25	ND	0.50	D1			
c-1,3-dichloropropylene	10	0.20	ND	0.40	D1			
methylcyclohexane	150	0.26	0.12	0.52	J,D1			
t-1,2-dichloropropylene	10	0.20	ND	0.40	D1			
1,1,2-trichloroethane	100	0.21	ND	0.42	D1			
2,3,4-trimethylpentane	750	0.24	ND	0.48	D1			
toluene	170	0.27	0.34	0.54	J,D1			
2-methylheptane	750	0.20	ND	0.40	D1			
3-methylheptane	750	0.23	0.03	0.46	J,D1			
1,2-dibromoethane	0.50	0.20	ND	0.40	D1			
n-octane	750	0.19	0.04	0.38	J,D1			
tetrachloroethylene	770	0.24	ND	0.48	D1			
chlorobenzene	100	0.27	ND	0.54	D1			
ethylbenzene	460	0.27	0.06	0.54	J,D1			
m,& p-xylene	80	0.27	0.17	0.54	J,D1			
styrene	25	0.27	0.04	0.54	J,D1			
1,1,2,2-tetrachloroethane	10	0.20	ND	0.40	D1			
o-xylene	580	0.27	0.08	0.54	J,D1			
n-nonane	2000	0.22	ND	0.44	D1			
isopropylbenzene	100	0.24	0.01	0.48	J,D1			
n-propylbenzene	3.8	0.27	ND	0.54	D1			
m-ethyltoluene	18	0.11	0.05	0.22	J,D1			
p-ethyltoluene	8.3	0.16	0.03	0.32	J,D1			
1,3,5-trimethylbenzene	250	0.25	0.02	0.50	J,D1			
o-ethyltoluene	250	0.13	0.02	0.26	J,D1			
1,2,4-trimethylbenzene	250	0.27	0.05	0.54	J,D1			
n-decane	620	0.27	0.05	0.54	J,D1			
1,2,3-trimethylbenzene	250	0.27	0.02	0.54	J,D1			
m-diethylbenzene	70	0.27	ND	0.54	D1,A1			
p-diethylbenzene	0.39	0.27	ND	0.54	D1			
n-undecane	550	0.27	0.06	0.54	J,D1			

Laboratory Analysis Results

ACL Number: 100332

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

ESL – Effects Screening Level. (Short-term Health and Odor Based in units of ppbv)
LOD – Limit of Detection.
ND – not detected
NQ – concentration can not be quantified.
SDL – Sample Detection Limit (LOD adjusted for dilutions).
INV – Invalid.
J – Reported concentration is below SDL.
L – Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E – Reported concentration exceeds the upper limit of instrument calibration.
M – Result modified from previous result.
T- Data was not confirmed by a confirmational analysis. Data is tentatively identified.

* SDL is equal to LOD
** Quality control flags explanations are listed on the last page of this report.
# Compound concentration is equal to or greater than the Effects Screening Level.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

Laboratory Analysis Results

ACL Number: 100332

Analysis Code: AMOR006

Quality Control Notes:

Quality control notes for samples 100332-0001,
A1-Not all associated QC data met accuracy specification. Data may be an average 23 percent high with a range of +7 to +51 percent.

D1 - sample was diluted 4.02 times to determine the compound concentrations.

8/16/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results

ACL Number: 100807

ACL Lead: Karen Bachtel Region: T04 Date Received: 8/9/2010

Project(s): Barnett Shale

Facility(ies) Sampled	City	County	Facility Type
Carrizo Oil & Gas	Arlington	Tarrant	Natural Gas

Laboratory Procedure(s) Performed:

Analysis: AMOR006
Determination of VOC Canisters by GC/MS Using Modified Method TO-15

Procedure:
Prior to analysis, subatmospheric samples are pressurized to twice the collected volume using a sample dilution system. For analysis, a known volume of a sample is directed from the canister into a multitrap cryogenic concentrator. Internal standards are added to the sample stream prior to the trap. The concentrated sample is thermally desorbed and carried onto a GC column for separation. The analytical strategy involves using a GC with dual columns that are coupled to a mass selective detector (MSD) and a flame ionization detector (FID). Mass spectra for individual peaks in the total ion chromatogram are then used for target compound identification and quantitation. The fragmentation pattern is compared with stored spectra taken under similar conditions in order to identify the compound. For any given compound, the intensity of the quantitation fragment is compared with the system response to the fragment for known amounts of the compound. This establishes the compound concentration in the sample. For non-target compound peaks which are at least one-half the height of the internal standard, a library search is performed in an attempt to identify the compound solely upon fracture patterns. These tentatively identified compounds (TIC's) are reported as a sample specific footnote. Accurate quantitation of TICs is not possible. The FID is used for the quantitation of ethane, ethylene, acetylene, propylene and propane and identification is based on matching retention times of standards containing known analytes.

Sample(s) Received

Field ID Number: 00437 Laboratory Sample Number: 100807-0001 Sampled by: John Malik
Sampling Site: Summa-Citizen's home Date & Time Sampled: 08/02/10 09:27:00 Valid Sample: Yes
Comments:
Canister 00437 was used to collect a 30-minute sample using critical orifice CO-42.

Please note that this analytical technique is not capable of measuring all compounds which might have adverse heath effects. For questions on the analytical procedures please contact the laboratory manager at (512)-239-4894. For an update on the health effects evaluation of these data, please contact the Toxicology Division at (512) 239-1795.

Analyst: Jaydeep Patel Date: 08/16/10
Jaydeep Patel

Reviewed By: Date: 8/16/2010
Karen Bachtel

Technical Specialist: Date: 8/17/10
David Manis

Laboratory Analysis Results

ACL Number: 100807

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID		100807-0001					
Field ID		00437					
Canister ID		00437					
Analysis Date		08/10/10					
Compound	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
ethane	0.50	16	1.0	D1,T			
ethylene	0.50	1.4	1.0	L,D1,T			
acetylene	0.50	ND	1.0	D1,T			
propane	0.50	4.4	1.0	D1,T			
propylene	0.50	ND	1.0	D1,T			
dichlorodifluoromethane	0.20	0.53	0.41	L,D1			
methyl chloride	0.20	0.59	0.41	L,D1			
isobutane	0.23	0.63	0.47	L,D1			
vinyl chloride	0.17	ND	0.35	D1			
1-butene	0.20	0.23	0.41	J,D1			
1,3-butadiene	0.27	ND	0.55	D1			
n-butane	0.20	0.92	0.41	L,D1			
t-2-butene	0.18	ND	0.37	D1			
bromomethane	0.27	0.02	0.55	J,D1			
c-2-butene	0.27	ND	0.55	D1			
3-methyl-1-butene	0.23	ND	0.47	D1			
isopentane	0.27	0.61	0.55	L,D1			
trichlorofluoromethane	0.29	0.26	0.59	J,D1			
1-pentene	0.27	ND	0.55	D1			
n-pentane	0.27	0.37	0.55	J,D1			
isoprene	0.27	1.2	0.55	L,D1			
t-2-pentene	0.27	ND	0.55	D1			
1,1-dichloroethylene	0.18	ND	0.37	D1			
c-2-pentene	0.25	ND	0.51	D1			
methylene chloride	0.14	0.05	0.28	J,D1			
2-methyl-2-butene	0.23	ND	0.47	D1			
2,2-dimethylbutane	0.21	0.03	0.43	J,D1			
cyclopentene	0.20	ND	0.41	D1			
4-methyl-1-pentene	0.22	ND	0.45	D1			
1,1-dichloroethane	0.19	ND	0.39	D1			
cyclopentane	0.27	ND	0.55	D1			
2,3-dimethylbutane	0.28	0.05	0.57	J,D1			
2-methylpentane	0.27	0.22	0.55	J,D1			
3-methylpentane	0.23	0.16	0.47	J,D1			
n-hexane	0.20	0.30	0.41	J,D1			
chloroform	0.21	0.02	0.43	J,D1			
t-2-hexene	0.27	ND	0.55	D1			
c-2-hexene	0.27	ND	0.55	D1			
1,2-dichloroethane	0.27	ND	0.55	D1			
methylcyclopentane	0.27	0.12	0.55	J,D1			
2,4-dimethylpentane	0.27	ND	0.55	D1			
1,1,1-trichloroethane	0.26	ND	0.53	D1			
benzene	0.27	0.17	0.55	J,D1			
carbon tetrachloride	0.27	0.09	0.55	J,D1			
cyclohexane	0.24	0.09	0.49	J,D1			
2-methylhexane	0.27	0.09	0.55	J,D1			
2,3-dimethylpentane	0.26	0.03	0.53	J,D1			
3-methylhexane	0.20	0.09	0.41	J,D1			

Laboratory Analysis Results

ACL Number: 100807

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)							
Lab ID		100807-0001					
Compound	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
1,2-dichloropropane	0.17	ND	0.35	D1			
trichloroethylene	0.29	ND	0.59	D1			
2,2,4-trimethylpentane	0.24	0.15	0.49	J,D1			
2-chloropentane	0.27	ND	0.55	D1			
n-heptane	0.25	0.13	0.51	J,D1			
c-1,3-dichloropropylene	0.20	ND	0.41	D1			
methylcyclohexane	0.26	0.09	0.53	J,D1			
t-1,3-dichloropropylene	0.20	ND	0.41	D1			
1,1,2-trichloroethane	0.21	ND	0.43	D1			
2,3,4-trimethylpentane	0.24	0.06	0.49	J,D1			
toluene	0.27	0.36	0.55	J,D1			
2-methylheptane	0.20	0.03	0.41	J,D1			
3-methylheptane	0.23	ND	0.47	D1			
1,2-dibromoethane	0.20	ND	0.41	D1			
n-octane	0.19	ND	0.39	D1			
tetrachloroethylene	0.24	0.04	0.49	J,D1			
chlorobenzene	0.27	ND	0.55	D1			
ethylbenzene	0.27	0.05	0.55	J,D1			
m & p-xylene	0.27	0.13	0.55	J,D1			
styrene	0.27	ND	0.55	D1			
1,1,2,2-tetrachloroethane	0.20	ND	0.41	D1			
o-xylene	0.27	0.03	0.55	J,D1			
n-nonane	0.22	ND	0.45	D1			
isopropylbenzene	0.24	ND	0.49	D1			
n-propylbenzene	0.27	ND	0.55	D1			
m-ethyltoluene	0.11	ND	0.22	D1			
p-ethyltoluene	0.16	0.01	0.32	J,D1			
1,3,5-trimethylbenzene	0.25	ND	0.51	D1			
o-ethyltoluene	0.13	ND	0.26	D1			
1,2,4-trimethylbenzene	0.27	ND	0.55	D1			
n-decane	0.27	ND	0.55	D1			
1,2,3-trimethylbenzene	0.27	ND	0.55	D1			
m-diethylbenzene	0.27	ND	0.55	D1,A1			
p-diethylbenzene	0.27	ND	0.55	D1,A2			
n-undecane	0.27	ND	0.55	D1			
2-methyl-1-pentene + 1-hexene	0.20	ND	0.41	D1			

Laboratory Analysis Results

ACL Number: 100807

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

LOD - Limit of Detection.
ND - not detected
NQ - concentration can not be quantified.
SDL - Sample Detection Limit (LOD adjusted for dilutions).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.
T- Data was not confirmed by a confirmational analysis. Data is tentatively identified.

* SDL is equal to LOD
** Quality control flags explanations are listed on the last page of this report.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

Laboratory Analysis Results

ACL Number: 100807

Analysis Code: AMOR006

Quality Control Notes:

Quality control notes for samples 100807-0001,
A1-Not all associated QC data met accuracy specification. Data may be an average 26 percent high with a range of +12 to +37 percent.
A2-Not all associated QC data met accuracy specification. Data may be an average 34 percent high with a range of +14 to +50 percent.

D1-sample concentration was calculated using a dilution factor of 4.06.

8/16/2010

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087
Austin, Texas 78711
(512) 239-1716

Laboratory Analysis Results
ACL Number: 100808

ACL Lead: Karen Bachtel Region: T04 Date Received: 8/9/2010
Project(s): Barnett Shale

Facility(ies) Sampled	City	County	Facility Type
Carrizo Oil & Gas	Arlington	Tarrant	Natural Gas

Laboratory Procedure(s) Performed:

Analysis: AMOR006
Determination of VOC Canisters by GC/MS Using Modified Method TO-15
Procedure:
Prior to analysis, subatmospheric samples are pressurized to twice the collected volume using a sample dilution system. For analysis, a known volume of a sample is directed from the canister into a multitrap cryogenic concentrator. Internal standards are added to the sample stream prior to the trap. The concentrated sample is thermally desorbed and carried onto a GC column for separation. The analytical strategy involves using a GC with dual columns that are coupled to a mass selective detector (MSD) and a flame ionization detector (FID). Mass spectra for individual peaks in the total ion chromatogram are then used for target compound identification and quantitation. The fragmentation pattern is compared with stored spectra taken under similar conditions in order to identify the compound. For any given compound, the intensity of the quantitation fragment is compared with the system response to the fragment for known amounts of the compound. This establishes the compound concentration in the sample. For non-target compound peaks which are at least one-half the height of the internal standard, a library search is performed in an attempt to identify the compound solely upon fracture patterns. These tentatively identified compounds (TIC's) are reported as a sample specific footnote. Accurate quantitation of TICs is not possible. The FID is used for the quantitation of ethane, ethylene, acetylene, propylene and propane and identification is based on matching retention times of standards containing known analytes.

Sample(s) Received

Field ID Number: 00256 Laboratory Sample Number: 100808-0001 Sampled by: John Malik
Sampling Site: Approximately 100 yards NE from facility. Date & Time Sampled: 08/02/10 16:35:00 Valid Sample: Yes
Comments:
Canister 00256 was used to collect 30-minute downwind sample using critical orifice CO-51.

Please note that this analytical technique is not capable of measuring all compounds which might have adverse heath effects. For questions on the analytical procedures please contact the laboratory manager at (512)-239-4894. For an update on the health effects evaluation of these data, please contact the Toxicology Division at (512) 239-1795.

Analyst: Jaydeep Patel Date: 08/16/10
Jaydeep Patel

Reviewed By: Date: 8/16/2010
Karen Bachtel

Technical Specialist: Date: 8/17/10
David Manis

Laboratory Analysis Results

ACL Number: 100808

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID		100808-0001					
Field ID		00256					
Canister ID		00256					
Analysis Date		08/10/10					
Compound	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
ethane	0.50	2.5	1.0	L,D1,T			
ethylene	0.50	0.68	1.0	J,D1,T			
acetylene	0.50	ND	1.0	D1,T			
propane	0.50	0.54	1.0	J,D1,T			
propylene	0.50	ND	1.0	D1,T			
dichlorodifluoromethane	0.20	0.56	0.41	L,D1			
methyl chloride	0.20	0.60	0.41	L,D1			
isobutane	0.23	0.08	0.47	J,D1			
vinyl chloride	0.17	ND	0.35	D1			
1-butene	0.20	0.15	0.41	J,D1			
1,3-butadiene	0.27	ND	0.55	D1			
n-butane	0.20	0.21	0.41	J,D1			
t-2-butene	0.18	ND	0.37	D1			
bromomethane	0.27	ND	0.55	D1			
c-2-butene	0.27	ND	0.55	D1			
3-methyl-1-butene	0.23	ND	0.47	D1			
isopentane	0.27	0.17	0.55	J,D1			
trichlorofluoromethane	0.29	0.27	0.59	J,D1			
1-pentene	0.27	ND	0.55	D1			
n-pentane	0.27	ND	0.55	D1			
isoprene	0.27	2.3	0.55	D1			
t-2-pentene	0.27	ND	0.55	D1			
1,1-dichloroethylene	0.18	ND	0.37	D1			
c-2-pentene	0.25	ND	0.51	D1			
methylene chloride	0.14	0.03	0.28	J,D1			
2-methyl-2-butene	0.23	ND	0.47	D1			
2,2-dimethylbutane	0.21	ND	0.43	D1			
cyclopentene	0.20	ND	0.41	D1			
4-methyl-1-pentene	0.22	ND	0.45	D1			
1,1-dichloroethane	0.19	ND	0.39	D1			
cyclopentane	0.27	ND	0.55	D1			
2,3-dimethylbutane	0.28	ND	0.57	D1			
2-methylpentane	0.27	0.06	0.55	J,D1			
3-methylpentane	0.23	0.05	0.47	J,D1			
2-methyl-1-pentene + 1-hexene	0.20	ND	0.41	D1			
n-hexane	0.20	ND	0.41	D1			
chloroform	0.21	0.01	0.43	J,D1			
t-2-hexene	0.27	ND	0.55	D1			
c-2-hexene	0.27	ND	0.55	D1			
1,2-dichloroethane	0.27	ND	0.55	D1			
methylcyclopentane	0.27	ND	0.55	D1			
2,4-dimethylpentane	0.27	ND	0.55	D1			
1,1,1-trichloroethane	0.26	ND	0.53	D1			
benzene	0.27	0.07	0.55	J,D1			
carbon tetrachloride	0.27	0.08	0.55	J,D1			
cyclohexane	0.24	ND	0.49	D1			
2-methylhexane	0.27	0.02	0.55	J,D1			
2,3-dimethylpentane	0.26	ND	0.53	D1			

Laboratory Analysis Results

ACL Number: 100808

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

Lab ID		100808-0001					
Compound	LOD	Concentration	SDL	Flags**	Concentration	SDL	Flags**
3-methylhexane	0.20	0.03	0.41	J,D1			
1,2-dichloropropane	0.17	ND	0.35	D1			
trichloroethylene	0.29	ND	0.59	D1			
2,2,4-trimethylpentane	0.24	0.04	0.49	J,D1			
2-chloropentane	0.27	ND	0.55	D1			
n-heptane	0.25	0.05	0.51	J,D1			
c-1,3-dichloropropylene	0.20	ND	0.41	D1			
methylcyclohexane	0.26	ND	0.53	D1			
t-1,3-dichloropropylene	0.20	ND	0.41	D1			
1,1,2-trichloroethane	0.21	ND	0.43	D1			
2,3,4-trimethylpentane	0.24	ND	0.49	D1			
toluene	0.27	0.13	0.55	J,D1			
2-methylheptane	0.20	0.01	0.41	J,D1			
3-methylheptane	0.23	ND	0.47	D1			
1,2-dibromoethane	0.20	ND	0.41	D1			
n-octane	0.19	ND	0.39	D1			
tetrachloroethylene	0.24	ND	0.49	D1			
chlorobenzene	0.27	ND	0.55	D1			
ethylbenzene	0.27	0.03	0.55	J,D1			
m & p-xylene	0.27	0.06	0.55	J,D1			
styrene	0.27	ND	0.55	D1			
1,1,2,2-tetrachloroethane	0.20	ND	0.41	D1			
o-xylene	0.27	ND	0.55	D1			
n-nonane	0.22	ND	0.45	D1			
isopropylbenzene	0.24	ND	0.49	D1			
n-propylbenzene	0.27	ND	0.55	D1			
m-ethyltoluene	0.11	ND	0.22	D1			
p-ethyltoluene	0.16	ND	0.32	D1			
1,3,5-trimethylbenzene	0.25	ND	0.51	D1			
o-ethyltoluene	0.13	ND	0.26	D1			
1,2,4-trimethylbenzene	0.27	ND	0.55	D1			
n-decane	0.27	ND	0.55	D1			
1,2,3-trimethylbenzene	0.27	ND	0.55	D1			
m-diethylbenzene	0.27	ND	0.55	D1,A1			
p-diethylbenzene	0.27	ND	0.55	D1,A2			
n-undecane	0.27	ND	0.55	D1			

Laboratory Analysis Results

ACL Number: 100808

Analysis Code: AMOR006

Note: Results are reported in units of parts per billion by volume (ppbv)

LOD - Limit of Detection.
ND - not detected
NQ - concentration can not be quantified.
SDL - Sample Detection Limit (LOD adjusted for dilutions).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.
T- Data was not confirmed by a confirmational analysis. Data is tentatively identified.

* SDL is equal to LOD
** Quality control flags explanations are listed on the last page of this report.

TCEQ laboratory customer support may be reached at kbachtel@tceq.state.tx.us

Laboratory Analysis Results

ACL Number: 100808

Analysis Code: AMOR006

Quality Control Notes:

Quality control notes for samples 100808-0001,
A1-Not all associated QC data met accuracy specification. Data may be an average 26 percent high with a range of +12 to +37 percent.
A2-Not all associated QC data met accuracy specification. Data may be an average 34 percent high with a range of +14 to +50 percent.

D1-sample concentration was calculated using a dilution factor of 4.06.