



**EXTENDED NATURAL GAS ANALYSIS (\*DHA)**

**MAIN PAGE**

PRIMARY DB KEY: <b>05-045-13973</b>	NAME/DESCRIP : <b>110170058 GG7 CHEVRON 33A-7D</b>
LEASE #:	<b>SURFACE GAS</b>
FIELD/AREA:	
PROJECT NO. : <b>202412021</b>	ANALYSIS NO. : <b>01</b>
COMPANY NAME : <b>QB ENERGY OPERATING, LLC</b>	ANALYSIS DATE: <b>DECEMBER 09, 2024 10:21</b>
OFFICE / BRANCH: <b>PARACHUTE, CO</b>	SAMPLE DATE : <b>DECEMBER 2, 2024 15:40</b>
CUSTOMER REF:	TO:
PRODUCER : <b>QB ENERGY OPERATING, LLC</b>	EFFECTIVE DATE:

**\*\*\*FIELD DATA\*\*\***

SAMPLE CYCLE:	SAMPLE TYPE: <b>SPOT</b>
SAMPLE PRES. : <b>psig</b>	PROBE :
FLOW PRES. : <b>psig</b>	CYLINDER NO. : <b>.5L MYLAR</b>
LAB PRES: <b>psig</b>	SAMPLED BY : <b>DEREK HORN</b>
SAMPLE TEMP. : <b>°f</b>	SAMPLING COMPANY: <b>QB ENERGY</b>
AMBIENT TEMP.: <b>°f</b>	H2S BY STAIN TUBE: <b>- ppm mol</b>
H2O BY STAIN TUBE: <b>- #/mmcf</b>	CO2 BY STAIN TUBE: <b>- Mol %</b>
FIELD COMMENTS:	
LAB COMMENTS:	

<u>COMPONENT</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>GPM @ 14.65</u>	<u>GPM @ 14.73</u>
ALCOHOLS	0.0004	0.0006	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	6.09	9.52	---	---
NITROGEN	21.68	29.66	---	---
CARBON DIOXIDE	0.16	0.34	---	---
HYDROGEN SULFIDE (H2S)	0.00000	0.00000	---	---
TOTAL OTHER SULFURS	0.00000	0.00000	---	---
METHANE	68.2046	53.4316	---	---
ETHANE	2.5759	3.7823	0.6860	0.6897
PROPANE	0.7776	1.6744	0.2137	0.2148
I-BUTANE	0.1621	0.4601	0.0529	0.0532
N-BUTANE	0.1781	0.5055	0.0559	0.0562
I-PENTANE	0.0656	0.2309	0.0250	0.0251
N-PENTANE	0.0410	0.1444	0.0150	0.0151
HEXANES PLUS	0.0547	0.2502	0.0220	0.0220
<u>TOTALS</u>	<u>100.00000</u>	<u>100.00000</u>	<u>1.0705</u>	<u>1.0761</u>

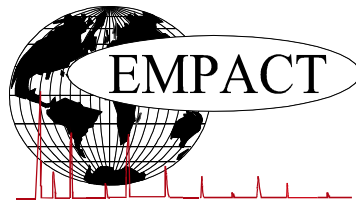
<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0024	0.0091
TOLUENE	0.0003	0.0014
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
<u>TOTAL BTEX</u>	<u>0.0027</u>	<u>0.0105</u>

	<u>BTU @ 14.65</u>	<u>14.73</u>
<b>LHV</b> NET DRY REAL :	695.7 /scf	699.5 /scf
NET WET REAL :	683.5 /scf	687.3 /scf
<b>HHV</b> GROSS DRY REAL :	770.9 /scf	775.1 /scf
GROSS WET REAL :	757.4 /scf	761.6 /scf
NET HEATING VALUE (60 °F ideal reaction):		12913.4 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		14312.3 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.7068
DENSITY		0.05396 lbm/scf
COMPRESSIBILITY FACTOR :		0.9984
REGULAR WOBBE INDEX		918.4

*\*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)  
Mod ASTM D6730, GPA 2261 & GPA 2286.*

*\*\* (CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)*

*The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc. Results of the analysis can be affected by the sampling conditions, therefore, are only warranted through proper lab protocol. EMPACT assumes no responsibility for interpretation or any consequences from application of the reported information and is the sole liability of the user. The reproduction in any media of this reported information may not be made, in portion or as a whole, without the written permission of EMPACT Analytical Systems, Inc.*



**EXTENDED NATURAL GAS ANALYSIS (\*DHA)  
GLYCALC INFORMATION**

PROJECT NO. :	202412021	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	DECEMBER 09, 2024 10:21
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 2, 2024 15:40
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	.5L MYLAR
LEASE NO. :		SAMPLED BY :	DEREK HORN
NAME/DESCRIP :	110170058 GG7 CHEVRON 33A-7D		
	SURFACE GAS		

***FIELD DATA***	SAMPLE TEMP. :
SAMPLE PRES. :	AMBIENT TEMP.:
H2S BY STAIN TUBE:	
COMMENTS :	

H2S BY STAIN TUBE:            ppm mol  
COMMENTS :            SPOT

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	0.16	0.34
Nitrogen	21.68	29.66
Methane	68.2046	53.4316
Ethane	2.5759	3.7823
Propane	0.7776	1.6744
Isobutane	0.1621	0.4601
n-Butane	0.1781	0.5055
Isopentane	0.0639	0.2251
n-Pentane	0.0410	0.1444
Cyclopentane	0.0017	0.0058
n-Hexane	0.0090	0.0379
Cyclohexane	0.0036	0.0148
Other Hexanes	0.0257	0.1078
Heptanes	0.0084	0.0408
Methylcyclohexane	0.0029	0.0139
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0024	0.0091
Toluene	0.0003	0.0014
Ethylbenzene	0.0000	0.0000
Xylenes	0.0000	0.0000
C8+ Heavies	0.0024	0.0245
<u>Subtotal</u>	<u>93.90960</u>	<u>90.47940</u>
Oxygen/Argon	6.09	9.52
Alcohols	0.0004	0.0006
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

	<u>Total</u>	<u>C6+</u>	<u>C8+</u>	<u>C10+</u>
<b>Calculated Values BTU @ <u>14.65</u></b>	<b>Sample</b>	<b>Fraction</b>	<b>Fraction</b>	<b>Fraction</b>
LHV Net Dry Real:	695.7	4771.3	10675.8	18959.5 Btu/scf
Net Wet Real:	683.5	4687.9	10489.2	18628.1 Btu/scf
HHV Gross Dry Real:	770.9	5136.0	11483.0	20368.2 Btu/scf
Gross Wet Real:	757.4	5046.2	11282.3	20012.1 Btu/scf

<b>Other Calculated Values</b>				
Regualr Wobbe Index*	918.4	2832.7	4234.3	5635.3 Btu/scf
Net Heating Value (60 °F ideal reaction):	12913.4	20254.9	29519.9	33977.4 Btu/lbm
Gross Heating Value (60°F ideal reaction):	14312.3	21802.7	31738.7	36502.1 Btu/lbm
Molar Mass (MW):	20.47801	93.875	213.752	380.74 g/mol
Relative Density (AIR=1):	0.7068	3.2411	7.3801	13.1460 SG
Density:	0.05396	0.24738	0.56327	1.00332 lbm/scf
Compressibility Factor:	0.9984	0.9898	0.9986	1.0000 Z
Liquid Volume real gas @:	<u>14.65</u>	15.5023	0.0219	0.001 gal/1000 scf

\* The Wobbe pressure base in the number considered is based upon the given Pb of the HHV above.  
 #DIV/0 or 0 (zero) will appear in the Calculated Value Section when there is no C6+, C8+ or C10+ in the sample to calculate these factors.  
 BDL - Below Detection Limit. The H2S LOS has a detection limit of 0.25 ppm. A \_ (an underscore) indicates there was no tube pulled for H2S.

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**EXTENDED NATURAL GAS ANALYSIS (\*DHA)**

**DHA COMPONENT LIST**

PRIMARY DB KEY: 05-045-13973 NAME/DESCRIP : 110170058 GG7 CHEVRON 33A-7D  
 LEASE #: SURFACE GAS  
 FIELD/AREA:  
 PROJECT NO. : 202412021 ANALYSIS NO. : 01  
 COMPANY NAME : QB ENERGY OPERATING, LLC ANALYSIS DATE: DECEMBER 09, 2024 10:21  
 OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : DECEMBER 2, 2024 15:40  
 CUSTOMER REF: TO:  
 PRODUCER : QB ENERGY OPERATING, LLC EFFECTIVE DATE:

\*\*\*FIELD DATA\*\*\*

SAMPLE CYCLE: SAMPLE TYPE: SPOT  
 SAMPLE PRES. : psig PROBE :  
 FLOW PRES. : psig CYLINDER NO. : .5L MYLAR  
 LAB PRES: psig SAMPLED BY : DEREK HORN  
 SAMPLE TEMP. : °f SAMPLING COMPANY: QB ENERGY  
 AMBIENT TEMP.: °f H2S BY STAIN TUBE: - ppm mol  
 H2O BY STAIN TUBE: - #/mmcf CO2 BY STAIN TUBE: - Mol %  
 FIELD COMMENTS:  
 LAB COMMENTS:

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
Helium	---	0.01	0.00	---	---
Oxygen/Argon	---	6.09	9.52	---	---
Nitrogen	---	21.68	29.66	---	---
Carbon Dioxide	---	0.16	0.34	---	---
Methane	P1	68.2046	53.4316	---	---
Ethane	P2	2.5759	3.7823	0.686	0.690
Propane	P3	0.7776	1.6744	0.214	0.215
i-Butane	I4	0.1621	0.4601	0.053	0.053
Methanol	X1	0.0004	0.0006	0.000	0.000
n-Butane	P4	0.1781	0.5055	0.056	0.056
2,2-Dimethylpropane	I5	0.0019	0.0067	0.001	0.001
i-Pentane	I5	0.0620	0.2184	0.023	0.023
n-Pentane	P5	0.0410	0.1444	0.015	0.015
2,2-Dimethylbutane	I6	0.0017	0.0072	0.001	0.001
Cyclopentane	N5	0.0017	0.0058	0.001	0.001
2,3-Dimethylbutane	I6	0.0026	0.0109	0.001	0.001
2-Methylpentane	I6	0.0113	0.0476	0.005	0.005
3-Methylpentane	I6	0.0058	0.0244	0.002	0.002
n-Hexane	P6	0.0090	0.0379	0.004	0.004
2,2-Dimethylpentane	I7	0.0003	0.0015	0.000	0.000
Methylcyclopentane	N6	0.0043	0.0177	0.002	0.002
2,4-Dimethylpentane	I7	0.0005	0.0024	0.000	0.000
2,2,3-Trimethylbutane	I7	0.0002	0.0010	0.000	0.000
Benzene	A6	0.0024	0.0091	0.001	0.001
3,3-Dimethylpentane	I7	0.0001	0.0005	0.000	0.000
Cyclohexane	N6	0.0036	0.0148	0.001	0.001
2-Methylhexane	I7	0.0016	0.0078	0.001	0.001
2,3-Dimethylpentane	I7	0.0005	0.0024	0.000	0.000

1,1-Dimethylcyclopentane	N7	0.0004	0.0019	0.000	0.000
3-Methylhexane	I7	0.0014	0.0068	0.001	0.001
1c,3-Dimethylcyclopentane	N7	0.0004	0.0019	0.000	0.000
1t,3-Dimethylcyclopentane	N7	0.0004	0.0019	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0006	0.0029	0.000	0.000
n-Heptane	P7	0.0017	0.0083	0.001	0.001
1c,2-Dimethylcyclopentane	N7	0.0002	0.0010	0.000	0.000
Methylcyclohexane	N7	0.0029	0.0139	0.001	0.001
2,2-Dimethylhexane	I8	0.0001	0.0005	0.000	0.000
Ethylcyclopentane	N7	0.0001	0.0005	0.000	0.000
2,5-Dimethylhexane	I8	0.0001	0.0005	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0001	0.0005	0.000	0.000
Toluene	A7	0.0003	0.0014	0.000	0.000
2,3-Dimethylhexane	I8	0.0001	0.0005	0.000	0.000
2-Methylheptane	I8	0.0002	0.0011	0.000	0.000
4-Methylheptane	I8	0.0001	0.0005	0.000	0.000
3-Methylheptane	I8	0.0001	0.0005	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0001	0.0005	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0001	0.0005	0.000	0.000
n-Octane	P8	0.0002	0.0011	0.000	0.000
UnknownC27s	U27	0.0009	0.0167	0.001	0.001
<b>TOTAL</b>		<b>100.00000</b>	<b>100.00000</b>	<b>1.0705</b>	<b>1.0761</b>

**CALCULATED VALUES\*\***

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0024	0.0091	LHV NET DRY REAL :	695.7 /scf	699.5 /scf
TOLUENE	0.0003	0.0014	NET WET REAL :	683.5 /scf	687.3 /scf
ETHYLBENZENE	0.0000	0.0000	HHV GROSS DRY REAL :	770.9 /scf	775.1 /scf
XYLENES	0.0000	0.0000	GROSS WET REAL :	757.4 /scf	761.6 /scf
<b>TOTAL BTEX</b>	<b>0.0027</b>	<b>0.0105</b>	NET HEATING VALUE (60 °F ideal reaction):		12913.4 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		14312.3 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.7068
			DENSITY		0.05396 lb/scf
			COMPRESSIBILITY FACTOR :		0.9984
			REGULAR WOBBE INDEX		918.4

\*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730, GPA 2261 & GPA 2286.

\*\* (CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

**C6+ Fraction of DHA Gas Analysis @60°F, 14.696 psia**

Net Dry Ideal BTU	<u>4737.7 /scf</u>	Relative Density - SG (Air=1)	<u>3.2411</u>	<b>C6+ factors</b>
Gross Dry Ideal BTU	<u>5099.8 /scf</u>	Z Compressibility Factor	<u>0.98984</u>	<u>0.98916</u>
Net Dry Ideal BTU	<u>20254.9 /lb</u>	Density Factor	<u>247.379 lbm/1000 ft3</u>	
Gross Dry Ideal BTU	<u>21802.7 /lb</u>	Molar Mass or MW	<u>93.875 g/mol</u>	
		Volume Liquid Ideal gas	<u>0.022 scf/gal</u>	<u>24.6</u>

**This hexanes plus fraction may be applied in place of published C6+ factors. The Z & GPM need additional calc for C6+ factors.  
#DIV/0 or 0 (zero) will appear in this section when there is no hexanes plus in the sample to calculate C6+ factors.**

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