



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

PROJECT NO. :	202503105	ANALYSIS NO. :	03
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	MARCH 29, 2025 18:16
ACCOUNT NO. :		SAMPLE DATE :	MARCH 25, 2025 12:21
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	1L TEDLAR
LEASE NO. :		SAMPLED BY :	DEREK HORN
NAME/DESCRIP :	CHEV 05-332D		
	CONTAINER #3		

FIELD DATA

SAMPLE PRES. :
H2S BY STAIN TUBE: ppm mol
COMMENTS : SPOT

SAMPLE TEMP. :
AMBIENT TEMP.:

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.02	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	0.15	0.35
Nitrogen	9.28	13.97
Methane	83.6613	72.1338
Ethane	2.7057	4.3726
Propane	0.9416	2.2315
Isobutane	0.1832	0.5723
n-Butane	0.2341	0.7312
Isopentane	0.0824	0.3195
n-Pentane	0.0611	0.2369
Cyclopentane	0.0030	0.0113
n-Hexane	0.0185	0.0857
Cyclohexane	0.0081	0.0367
Other Hexanes	0.0446	0.2055
Heptanes	0.0242	0.1298
Methylcyclohexane	0.0124	0.0655
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0031	0.0130
Toluene	0.0028	0.0139
Ethylbenzene	0.0001	0.0006
Xylenes	0.0012	0.0069
C8+ Heavies	0.0221	0.1420
<u>Subtotal</u>	<u>97.45960</u>	<u>95.62930</u>
Oxygen/Argon	2.54	4.37
Alcohols	0.0004	0.0007
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

	<u>Total</u>	<u>C6+</u>	<u>C8+</u>	<u>C10+</u>
Calculated Values BTU @ <u>14.65</u>	Sample	Fraction	Fraction	Fraction
LHV Net Dry Real:	848.8	4799.3	5930.4	7082.4 Btu/scf
Net Wet Real:	834.0	4715.4	5826.7	6958.6 Btu/scf
HHV Gross Dry Real:	940.9	5165.7	6382.3	7674.2 Btu/scf
Gross Wet Real:	924.5	5075.4	6270.7	7540.0 Btu/scf

Other Calculated Values

Regualr Wobbe Index*	1175.8	2839.3	3152.9	3468.5 Btu/scf
Net Heating Value (60 °F ideal reaction):	17355.8	19324.9	19608.0	19440.3 Btu/lbm
Gross Heating Value (60°F ideal reaction):	19235.5	20796.6	21104.5	21047.0 Btu/lbm
Molar Mass (MW):	18.60794	94.965	118.902	142.533 g/mol
Relative Density (AIR=1):	0.6418	3.2787	4.1056	4.9212 SG
Density:	0.04903	0.25023	0.31335	0.37559 lbm/scf
Compressibility Factor:	0.9980	0.9921	0.9978	0.9995 Z
Liquid Volume real gas @:	<u>14.65</u>	16.5849	0.0508	0.004
				0 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.

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)

DHA COMPONENT LIST

PRIMARY DB KEY: **05-045-11257** NAME/DESCRIP : **CHEV 05-332D**
 LEASE #: CONTAINER #3
 FIELD/AREA:
 PROJECT NO. : **202503105** ANALYSIS NO. : **03**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **MARCH 29, 2025 18:16**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **MARCH 25, 2025 12:21**
 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. : **1L TEDLAR**
 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	---	0.02	0.00	---	---
Oxygen/Argon	---	2.54	4.37	---	---
Nitrogen	---	9.28	13.97	---	---
Carbon Dioxide	---	0.15	0.35	---	---
Methane	P1	83.6613	72.1338	---	---
Ethane	P2	2.7057	4.3726	0.721	0.725
Propane	P3	0.9416	2.2315	0.259	0.260
i-Butane	I4	0.1832	0.5723	0.060	0.060
Methanol	X1	0.0004	0.0007	0.000	0.000
n-Butane	P4	0.2341	0.7312	0.074	0.074
2,2-Dimethylpropane	I5	0.0020	0.0077	0.001	0.001
i-Pentane	I5	0.0804	0.3118	0.029	0.029
n-Pentane	P5	0.0611	0.2369	0.022	0.022
2,2-Dimethylbutane	I6	0.0023	0.0106	0.001	0.001
Cyclopentane	N5	0.0030	0.0113	0.001	0.001
2,3-Dimethylbutane	I6	0.0041	0.0190	0.002	0.002
2-Methylpentane	I6	0.0187	0.0866	0.008	0.008
3-Methylpentane	I6	0.0102	0.0472	0.004	0.004
n-Hexane	P6	0.0185	0.0857	0.008	0.008
2,2-Dimethylpentane	I7	0.0001	0.0005	0.000	0.000
Methylcyclopentane	N6	0.0093	0.0421	0.003	0.003
2,4-Dimethylpentane	I7	0.0009	0.0048	0.000	0.000
2,2,3-Trimethylbutane	I7	0.0002	0.0011	0.000	0.000
Benzene	A6	0.0031	0.0130	0.001	0.001
3,3-Dimethylpentane	I7	0.0003	0.0016	0.000	0.000
Cyclohexane	N6	0.0081	0.0367	0.003	0.003

2-Methylhexane	I7	0.0037	0.0199	0.002	0.002
2,3-Dimethylpentane	I7	0.0020	0.0108	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0009	0.0047	0.000	0.000
3-Methylhexane	I7	0.0040	0.0216	0.002	0.002
1c,3-Dimethylcyclopentane	N7	0.0012	0.0063	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0011	0.0058	0.001	0.001
3-Ethylpentane	I7	0.0002	0.0011	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0019	0.0101	0.001	0.001
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0067	0.0361	0.003	0.003
1c,2-Dimethylcyclopentane	N7	0.0003	0.0016	0.000	0.000
Methylcyclohexane	N7	0.0124	0.0655	0.005	0.005
2,2-Dimethylhexane	I8	0.0003	0.0018	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
Ethylcyclopentane	N7	0.0005	0.0026	0.000	0.000
2,5-Dimethylhexane	I8	0.0004	0.0025	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0004	0.0025	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0028	0.0139	0.001	0.001
2,3-Dimethylhexane	I8	0.0003	0.0018	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0017	0.0104	0.001	0.001
4-Methylheptane	I8	0.0005	0.0031	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0009	0.0055	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0020	0.0120	0.001	0.001
3-Ethylhexane	I8	0.0002	0.0012	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0008	0.0048	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0003	0.0018	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0006	0.0036	0.000	0.000
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0025	0.0154	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0006	0.0036	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0005	0.0034	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0006	0.0036	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0012	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,5-Dimethylheptane	I9	0.0004	0.0027	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
Ethylbenzene	I8	0.0001	0.0006	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0009	0.0052	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0002	0.0011	0.000	0.000
3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0007	0.000	0.000

4-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0004	0.0027	0.000	0.000
2-Methyloctane	I9	0.0005	0.0034	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0005	0.0034	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0006	0.000	0.000
i-Butylcyclopentane	N9	0.0003	0.0020	0.000	0.000
n-Nonane	P9	0.0013	0.0090	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
2,5-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0002	0.0013	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0002	0.0013	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
5-Methylnonane	I10	0.0001	0.0008	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Ethylcyclohexane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0004	0.0027	0.000	0.000
n-Decane	P10	0.0004	0.0031	0.000	0.000
Sec-Butylcyclohexane	A10	0.0001	0.0008	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0001	0.0008	0.000	0.000
n-Undecane	P11	0.0001	0.0009	0.000	0.000
TOTAL		100.00000	100.00000	1.2177	1.2240

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0031	0.0130	LHV NET DRY REAL :	848.8 /scf	853.5 /scf
TOLUENE	0.0028	0.0139	NET WET REAL :	834.0 /scf	838.7 /scf
ETHYLBENZENE	0.0001	0.0006	HHV GROSS DRY REAL :	940.9 /scf	946.1 /scf
XYLENES	0.0012	0.0069	GROSS WET REAL :	924.5 /scf	929.7 /scf
TOTAL BTEX	0.0072	0.0344	NET HEATING VALUE (60 °F ideal reaction):		17355.8 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		19235.5 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6418
			DENSITY		0.04903 lb/scf
			COMPRESSIBILITY FACTOR :		0.9980
			REGULAR WOBBE INDEX		1175.8

*(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>4776.5</u> /scf	Relative Density - SG (Air=1)	<u>3.2787</u>	C6+ factors
Gross Dry Ideal BTU	<u>5141.1</u> /scf	Z Compressibility Factor	<u>0.99213</u>	<u>0.99137</u>
Net Dry Ideal BTU	<u>19324.9</u> /lb	Density Factor	<u>250.233</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20796.6</u> /lb	Molar Mass or MW	<u>94.965</u> g/mol	
		Volume Liquid Ideal gas	<u>0.051</u> scf/gal	<u>23.2</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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