



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-045-15354** NAME/DESCRIP : **110166026 NP I30 EF05D-29 595**
 LEASE #: **PRODUCTION CASING**
 FIELD/AREA:

PROJECT NO. : **202508031** ANALYSIS NO. : **01**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **AUGUST 11, 2025 14:22**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **JULY 31, 2025 13:30**
 CUSTOMER REF: TO:
 PRODUCER : EFFECTIVE DATE:

*****FIELD DATA*****

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	288 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	TBI-551
LAB PRES:	psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	75 °f	SAMPLING COMPANY:	QB ENERGY OPERATING LLC
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	— ppm mol
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

<u>COMPONENT</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>GPM @ 14.65</u>	<u>GPM @ 14.73</u>
ALCOHOLS	0.2537	0.4463	0.0320	0.0322
HELIUM	0.00	0.00	---	---
HYDROGEN	0.15	0.02	---	---
OXYGEN/ARGON	0.12	0.21	---	---
NITROGEN	0.58	0.89	---	---
CARBON DIOXIDE	1.92	4.61	---	---
METHANE	89.4727	78.2681	---	---
ETHANE	5.2953	8.6822	1.4121	1.4198
PROPANE	1.1700	2.8132	0.3218	0.3235
I-BUTANE	0.3126	0.9907	0.1019	0.1025
N-BUTANE	0.2157	0.6836	0.0680	0.0683
I-PENTANE	0.1410	0.5544	0.0510	0.0512
N-PENTANE	0.0671	0.2640	0.0240	0.0241
HEXANES PLUS	0.3019	1.5681	0.1150	0.1153
TOTALS	100.0000	100.0000	2.1258	2.1369

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0089	0.0379
TOLUENE	0.0103	0.0517
ETHYLBENZENE	0.0006	0.0035
XYLENES	0.0031	0.0179
TOTAL BTEX	0.0229	0.1110

	<u>BTU @ 14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	965.3 /scf	970.5 /scf
NET WET REAL :	948.4 /scf	953.6 /scf
HHV GROSS DRY REAL :	1069.1 /scf	1074.9 /scf
GROSS WET REAL :	1050.4 /scf	1056.2 /scf
NET HEATING VALUE (60 °F ideal reaction):		20012.9 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		22160.8 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6321
DENSITY		0.04832 lbm/scf
COMPRESSIBILITY FACTOR :		0.9975
REGULAR WOBBE INDEX		1345.6

**(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. :	202508031	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 11, 2025 14:22
ACCOUNT NO. :		SAMPLE DATE :	JULY 31, 2025 13:30
PRODUCER :		CYLINDER NO. :	TBI-551
LEASE NO. :		SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	110166026 NP I30 EF05D-29 595 PRODUCTION CASING		

FIELD DATA		SAMPLE TEMP. :	75
SAMPLE PRES. :	288	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	—		

— *ppm mol*
SPOT *NO PROBE*

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.00	0.00
Hydrogen	0.15	0.02
Carbon Dioxide	1.92	4.61
Nitrogen	0.58	0.89
Methane	89.4727	78.2681
Ethane	5.2953	8.6822
Propane	1.1700	2.8132
Isobutane	0.3126	0.9907
n-Butane	0.2157	0.6836
Isopentane	0.1381	0.5433
n-Pentane	0.0671	0.2640
Cyclopentane	0.0029	0.0111
n-Hexane	0.0316	0.1485
Cyclohexane	0.0155	0.0711
Other Hexanes	0.0894	0.4181
Heptanes	0.0690	0.3749
Methylcyclohexane	0.0285	0.1526
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0089	0.0379
Toluene	0.0103	0.0517
Ethylbenzene	0.0006	0.0035
Xylenes	0.0031	0.0179
C8+ Heavies	0.0449	0.2913
<u>Subtotal</u>	<u>99.62630</u>	<u>99.34370</u>
Oxygen/Argon	0.12	0.21
Alcohols	0.2537	0.4463
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
	14.65				
LHV	Net Dry Real:	965.3	4809.9	5883.0	8661.7 Btu/scf
	Net Wet Real:	948.4	4725.8	5780.2	8510.3 Btu/scf
HHV	Gross Dry Real:	1069.1	5173.7	6328.1	9304.9 Btu/scf
	Gross Wet Real:	1050.4	5083.3	6217.5	9142.2 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*		1345.6	2838.9	3134.9	3779.4 Btu/scf
Net Heating Value (60 °F ideal reaction):		20012.9	19322.0	19752.7	20552.2 Btu/lbm
Gross Heating Value (60 °F ideal reaction):		22160.8	20780.1	21247.3	22082.6 Btu/lbm
Molar Mass (MW):		18.33741	95.31	118.171	176.604 g/mol
Relative Density (AIR=1):		0.6321	3.2911	4.0805	6.0977 SG
Density:		0.04832	0.25117	0.31140	0.46538 lbm/scf
Compressibility Factor:		0.9975	0.9923	0.9976	0.9998 Z
Liquid Volume real gas @:	14.65	17.6157	0.1146	0.0169	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.

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**EXTENDED NATURAL GAS ANALYSIS (*DHA)
DHA COMPONENT LIST**

PRIMARY DB KEY: 05-045-15354 NAME/DESCRIP : 110166026 NP I30 EF05D-29 595
 LEASE #: PRODUCTION CASING
 FIELD/AREA:
 PROJECT NO. : 202508031 ANALYSIS NO. : 01
 COMPANY NAME : QB ENERGY OPERATING, LLC ANALYSIS DATE: AUGUST 11, 2025 14:22
 OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : JULY 31, 2025 13:30
 CUSTOMER REF: TO:
 PRODUCER : EFFECTIVE DATE:

FIELD DATA

SAMPLE CYCLE: SAMPLE TYPE: SPOT
 SAMPLE PRES. : 288 psig PROBE : NO
 FLOW PRES. : psig CYLINDER NO. : TBI-551
 LAB PRES: psig SAMPLED BY : ALEX GALLEGOS
 SAMPLE TEMP. : 75 °f SAMPLING COMPANY: QB ENERGY OPERATING LLC
 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
Hydrogen	---	0.15	0.02	---	---
Oxygen/Argon	---	0.12	0.21	---	---
Nitrogen	---	0.58	0.89	---	---
Carbon Dioxide	---	1.92	4.61	---	---
Methane	P1	89.4727	78.2681	---	---
Ethane	P2	5.2953	8.6822	1.412	1.420
Propane	P3	1.1700	2.8132	0.322	0.324
i-Butane	I4	0.3126	0.9907	0.102	0.103
Methanol	X1	0.2521	0.4405	0.032	0.032
n-Butane	P4	0.2157	0.6836	0.068	0.068
2,2-Dimethylpropane	I5	0.0060	0.0236	0.002	0.002
i-Pentane	I5	0.1321	0.5197	0.048	0.048
i-Propanol	X3	0.0008	0.0026	0.000	0.000
n-Pentane	P5	0.0671	0.2640	0.024	0.024
t-Butanol	X4	0.0008	0.0032	0.000	0.000
2,2-Dimethylbutane	I6	0.0081	0.0381	0.003	0.003
Cyclopentane	N5	0.0029	0.0111	0.001	0.001
2,3-Dimethylbutane	I6	0.0096	0.0451	0.004	0.004
2-Methylpentane	I6	0.0348	0.1635	0.014	0.014
3-Methylpentane	I6	0.0195	0.0916	0.008	0.008
n-Hexane	P6	0.0316	0.1485	0.013	0.013
2,2-Dimethylpentane	I7	0.0021	0.0114	0.001	0.001
Methylcyclopentane	N6	0.0174	0.0798	0.006	0.006
2,4-Dimethylpentane	I7	0.0030	0.0164	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0010	0.0054	0.000	0.000
Benzene	A6	0.0089	0.0379	0.002	0.002
3,3-Dimethylpentane	I7	0.0012	0.0065	0.001	0.001
Cyclohexane	N6	0.0155	0.0711	0.005	0.005
2-Methylhexane	I7	0.0117	0.0639	0.005	0.005

2,3-Dimethylpentane	I7	0.0031	0.0170	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0021	0.0112	0.001	0.001
3-Methylhexane	I7	0.0104	0.0568	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0029	0.0155	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0027	0.0144	0.001	0.001
3-Ethylpentane	I7	0.0006	0.0033	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0042	0.0225	0.002	0.002
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0176	0.0962	0.008	0.008
1c,2-Dimethylcyclopentane	N7	0.0047	0.0251	0.002	0.002
Methylcyclohexane	N7	0.0285	0.1526	0.011	0.011
2,2-Dimethylhexane	I8	0.0010	0.0062	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0003	0.0018	0.000	0.000
Ethylcyclopentane	N7	0.0011	0.0059	0.000	0.000
2,5-Dimethylhexane	I8	0.0014	0.0087	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0011	0.0069	0.001	0.001
2,4-Dimethylhexane	I8	0.0004	0.0025	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0006	0.0036	0.000	0.000
3,3-Dimethylhexane	I8	0.0004	0.0025	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0103	0.0517	0.003	0.003
2,3-Dimethylhexane	I8	0.0008	0.0050	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0043	0.0268	0.002	0.002
4-Methylheptane	I8	0.0014	0.0087	0.001	0.001
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	0.0035	0.0218	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0038	0.0232	0.002	0.002
3-Ethylhexane	I8	0.0006	0.0038	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0018	0.0110	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0008	0.0049	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0011	0.0067	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0022	0.0135	0.001	0.001
UnknownC7s	U7	0.0003	0.0016	0.000	0.000
n-Octane	P8	0.0053	0.0330	0.003	0.003
1c,4-Dimethylcyclohexane	N8	0.0008	0.0049	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0004	0.0028	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0009	0.0062	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0003	0.0021	0.000	0.000
2,4-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0011	0.0067	0.000	0.000
n-Propylcyclopentane	N8	0.0004	0.0024	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0004	0.0027	0.000	0.000
2,5-Dimethylheptane	I9	0.0009	0.0063	0.001	0.001
3,3-Dimethylheptane	I9	0.0003	0.0021	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0006	0.0035	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0021	0.0122	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0007	0.0040	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	0.0002	0.0014	0.000	0.000
4-Methyloctane	I9	0.0006	0.0042	0.000	0.000
2-Methyloctane	I9	0.0006	0.0042	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
3-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0005	0.0034	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0003	0.0017	0.000	0.000
i-Butylcyclopentane	N9	0.0002	0.0014	0.000	0.000
n-Nonane	P9	0.0003	0.0021	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0003	0.0020	0.000	0.000
1,4-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
t-Butylbenzene	A10	0.0007	0.0051	0.000	0.000
UnknownC9s	U9	0.0002	0.0014	0.000	0.000
n-Decane	P10	0.0001	0.0008	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC10s	U10	0.0001	0.0008	0.000	0.000
UnknownC11s	U11	0.0001	0.0009	0.000	0.000
n-Dodecane	P12	0.0001	0.0009	0.000	0.000
n-Tridecane	P13	0.0001	0.0010	0.000	0.000
n-Tetradecane	P14	0.0002	0.0022	0.000	0.000
n-Pentadecane	P15	0.0001	0.0011	0.000	0.000
n-Hexadecane	P16	0.0001	0.0012	0.000	0.000
n-Heneicosane	P21	0.0003	0.0048	0.000	0.000
TOTAL		100.00000	100.00000	2.1258	2.1369

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0089	0.0379	LHV NET DRY REAL :	965.3 /scf	970.5 /scf
TOLUENE	0.0103	0.0517	NET WET REAL :	948.4 /scf	953.6 /scf
ETHYLBENZENE	0.0006	0.0035	HHV GROSS DRY REAL :	1069.1 /scf	1074.9 /scf
XYLENES	0.0031	0.0179	GROSS WET REAL :	1050.4 /scf	1056.2 /scf
TOTAL BTEX	0.0229	0.1110	NET HEATING VALUE (60 °F ideal reaction):		20012.9 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		22160.8 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6321
			DENSITY		0.04832 lb/scf
			COMPRESSIBILITY FACTOR :		0.9975
			REGULAR WOBBE INDEX		1345.6

*(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	4788 /scf	Relative Density - SG (Air=1)	3.2911	C6+ factors
Gross Dry Ideal BTU	5150.1 /scf	Z Compressibility Factor	0.99233	0.99149
Net Dry Ideal BTU	19322 /lb	Density Factor	251.175 lbm/1000 ft3	
Gross Dry Ideal BTU	20780.1 /lb	Molar Mass or MW	95.31 g/mol	
		Volume Liquid Ideal gas	0.115 scf/gal	23.6

**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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