



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-045-15105** NAME/DESCRIP : **110165731 NP I30A EFO1C-31 595**
 LEASE #: **BRADEN HEAD**
 FIELD/AREA:

PROJECT NO. : **202508032** ANALYSIS NO. : **02**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **AUGUST 12, 2025 06:35**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **JULY 31, 2025 11:30**
 CUSTOMER REF: TO:
 PRODUCER : EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: SPOT
 SAMPLE PRES. : 268 psig PROBE : NO
 FLOW PRES. : psig CYLINDER NO. : TBI/CO-604
 LAB PRES: psig SAMPLED BY : ALEX GALLEGOS
 SAMPLE TEMP. : 72 °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 @</u>	<u>GPM @</u>
			<u>14.65</u>	<u>14.73</u>
HELIUM	0.00	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.11	0.17	---	---
CARBON DIOXIDE	1.64	3.94	---	---
METHANE	90.4406	79.1963	---	---
ETHANE	5.1231	8.4085	1.3661	1.3736
PROPANE	1.4748	3.5497	0.4047	0.4070
I-BUTANE	0.2958	0.9385	0.0969	0.0975
N-BUTANE	0.3354	1.0641	0.1049	0.1055
I-PENTANE	0.1392	0.5477	0.0500	0.0502
N-PENTANE	0.0933	0.3674	0.0340	0.0342
HEXANES PLUS	0.3476	1.8179	0.1430	0.1433
TOTALS	100.00000	100.00000	2.1996	2.2113

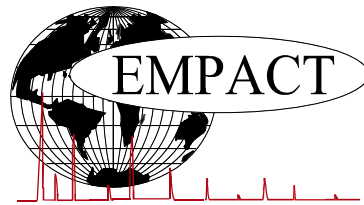
<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0204	0.0870
TOLUENE	0.0229	0.1152
ETHYLBENZENE	0.0017	0.0098
XYLENES	0.0101	0.0585
TOTAL BTEX	0.0551	0.2705

	<u>CALCULATED VALUES**</u>	
	<u>BTU @</u>	<u>BTU @</u>
	<u>14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	982.6 /scf	987.9 /scf
NET WET REAL :	965.4 /scf	970.7 /scf
HHV GROSS DRY REAL :	1087.5 /scf	1093.4 /scf
GROSS WET REAL :	1068.5 /scf	1074.4 /scf
NET HEATING VALUE (60 °F ideal reaction):		20380.2 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		22560.3 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6316
DENSITY		0.04827 lbm/scf
COMPRESSIBILITY FACTOR :		0.9975
REGULAR WOBBE INDEX		1369.3

**(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. :	202508032	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE :	AUGUST 12, 2025 06:35
ACCOUNT NO. :		SAMPLE DATE :	JULY 31, 2025 11:30
PRODUCER :		CYLINDER NO. :	TBI/CO-604
LEASE NO. :		SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	110165731 NP I30A EFO1C-31 595 BRADEN HEAD		

FIELD DATA		SAMPLE TEMP. :	72
SAMPLE PRES. :	268	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	—		

ppm mol
SPOT NO PROBE

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	1.64	3.94
Nitrogen	0.11	0.17
Methane	90.4406	79.1963
Ethane	5.1231	8.4085
Propane	1.4748	3.5497
Isobutane	0.2958	0.9385
n-Butane	0.3354	1.0641
Isopentane	0.1343	0.5289
n-Pentane	0.0933	0.3674
Cyclopentane	0.0049	0.0188
n-Hexane	0.0351	0.1651
Cyclohexane	0.0197	0.0905
Other Hexanes	0.0813	0.3802
Heptanes	0.0604	0.3289
Methylcyclohexane	0.0355	0.1903
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0204	0.0870
Toluene	0.0229	0.1152
Ethylbenzene	0.0017	0.0098
Xylenes	0.0101	0.0585
C8+ Heavies	0.0605	0.3924
<u>Subtotal</u>	<u>100.00000</u>	<u>100.00000</u>
<u>Oxygen/Argon</u>	<u>0.00</u>	<u>0.00</u>
Total	100.00000	100.00000

	Total	C6+	C8+	C10+
Calculated Values BTU @	Sample	Fraction	Fraction	Fraction
LHV Net Dry Real:	982.6	4794.3	5791.6	7155.9 Btu/scf
Net Wet Real:	965.4	4710.5	5690.4	7030.8 Btu/scf
HHV Gross Dry Real:	1087.5	5143.2	6218.5	7716.7 Btu/scf
Gross Wet Real:	1068.5	5053.3	6109.8	7581.8 Btu/scf
Other Calculated Values				
Regualr Wobbe Index*	1369.3	2818.0	3100.8	3460.7 Btu/scf
Net Heating Value (60 °F ideal reaction):	20380.2	19141.0	19397.7	19130.5 Btu/lbm
Gross Heating Value (60°F ideal reaction):	22560.3	20538.4	20828.5	20623.5 Btu/lbm
Molar Mass (MW):	18.31991	95.808	116.712	144.78 g/mol
Relative Density (AIR=1):	0.6316	3.3076	4.0295	4.9989 SG
Density:	0.04827	0.25246	0.30755	0.38152 lbm/scf
Compressibility Factor:	0.9975	0.9933	0.9978	0.9996 Z
Liquid Volume real gas @:	17.7293	0.1426	0.0349	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

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 CUSTOMER REF: **TO:**
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*****FIELD DATA*****

SAMPLE CYCLE: SAMPLE TYPE: **SPOT**
 SAMPLE PRES. : **268** psig PROBE : **NO**
 FLOW PRES. : psig CYLINDER NO. : **TBI/CO-604**
 LAB PRES: psig SAMPLED BY : **ALEX GALLEGOS**
 SAMPLE TEMP. : **72** °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
Nitrogen	---	0.11	0.17	---	---
Carbon Dioxide	---	1.64	3.94	---	---
Methane	P1	90.4406	79.1963	---	---
Ethane	P2	5.1231	8.4085	1.366	1.374
Propane	P3	1.4748	3.5497	0.405	0.407
i-Butane	I4	0.2958	0.9385	0.097	0.098
n-Butane	P4	0.3354	1.0641	0.105	0.106
2,2-Dimethylpropane	I5	0.0043	0.0169	0.002	0.002
i-Pentane	I5	0.1300	0.5120	0.047	0.047
n-Pentane	P5	0.0933	0.3674	0.034	0.034
2,2-Dimethylbutane	I6	0.0050	0.0235	0.002	0.002
Cyclopentane	N5	0.0049	0.0188	0.001	0.001
2,3-Dimethylbutane	I6	0.0073	0.0343	0.003	0.003
2-Methylpentane	I6	0.0315	0.1482	0.013	0.013
3-Methylpentane	I6	0.0175	0.0823	0.007	0.007
n-Hexane	P6	0.0351	0.1651	0.014	0.014
2,2-Dimethylpentane	I7	0.0013	0.0071	0.001	0.001
Methylcyclopentane	N6	0.0200	0.0919	0.007	0.007
2,4-Dimethylpentane	I7	0.0020	0.0109	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0006	0.0033	0.000	0.000
Benzene	A6	0.0204	0.0870	0.006	0.006
3,3-Dimethylpentane	I7	0.0008	0.0044	0.000	0.000
Cyclohexane	N6	0.0197	0.0905	0.007	0.007
2-Methylhexane	I7	0.0098	0.0536	0.005	0.005
2,3-Dimethylpentane	I7	0.0028	0.0153	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0019	0.0102	0.001	0.001
3-Methylhexane	I7	0.0092	0.0503	0.004	0.004
1c,3-Dimethylcyclopentane	N7	0.0030	0.0161	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0028	0.0150	0.001	0.001

3-Ethylpentane	I7	0.0006	0.0033	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0043	0.0230	0.002	0.002
n-Heptane	P7	0.0191	0.1045	0.009	0.009
1c,2-Dimethylcyclopentane	N7	0.0008	0.0043	0.000	0.000
Methylcyclohexane	N7	0.0355	0.1903	0.014	0.014
2,2-Dimethylhexane	I8	0.0012	0.0075	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0013	0.0070	0.001	0.001
2,5-Dimethylhexane	I8	0.0013	0.0081	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0012	0.0075	0.001	0.001
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0008	0.0049	0.000	0.000
3,3-Dimethylhexane	I8	0.0004	0.0025	0.000	0.000
2,3,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0229	0.1152	0.008	0.008
2,3-Dimethylhexane	I8	0.0010	0.0062	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0002	0.0013	0.000	0.000
2-Methylheptane	I8	0.0055	0.0343	0.003	0.003
4-Methylheptane	I8	0.0017	0.0106	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0002	0.0013	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0042	0.0262	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0048	0.0294	0.002	0.002
3-Ethylhexane	I8	0.0002	0.0013	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0021	0.0129	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0008	0.0049	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	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	0.0002	0.0012	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0014	0.0086	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0004	0.0025	0.000	0.000
n-Octane	P8	0.0095	0.0592	0.005	0.005
1c,4-Dimethylcyclohexane	N8	0.0009	0.0055	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0006	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	0.0006	0.0042	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0011	0.0076	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0006	0.0042	0.000	0.000
Ethylcyclohexane	N8	0.0016	0.0098	0.001	0.001
n-Propylcyclopentane	N8	0.0006	0.0037	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0005	0.0034	0.000	0.000
2,5-Dimethylheptane	I9	0.0010	0.0070	0.001	0.001
3,3-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
Ethylbenzene	I8	0.0017	0.0098	0.001	0.001
2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0067	0.0388	0.003	0.003
1,4-Dimethylbenzene (p-Xylene)	A8	0.0019	0.0110	0.001	0.001
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	0.0010	0.0070	0.001	0.001
2-Methyloctane	I9	0.0014	0.0098	0.001	0.001
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	0.0002	0.0014	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0013	0.0089	0.001	0.001

1,1,2-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0015	0.0087	0.001	0.001
i-Butylcyclopentane	N9	0.0006	0.0041	0.000	0.000
n-Nonane	P9	0.0032	0.0224	0.002	0.002
1,1-Methylethylcyclohexane	N9	0.0003	0.0021	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0007	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
n-Butylcyclopentane	N9	0.0004	0.0027	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0003	0.0020	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0002	0.0015	0.000	0.000
1,3-Methylethylbenzene	A9	0.0004	0.0026	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0003	0.0020	0.000	0.000
5-Methylnonane	I10	0.0001	0.0008	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0001	0.0008	0.000	0.000
t-Butylbenzene	A10	0.0003	0.0022	0.000	0.000
UnknownC9s	U9	0.0009	0.0063	0.001	0.001
n-Decane	P10	0.0005	0.0039	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0009	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0009	0.0070	0.001	0.001
n-Undecane	P11	0.0002	0.0017	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
TOTAL		100.00000	100.00000	2.1996	2.2113

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0204	0.0870	LHV NET DRY REAL :	982.6 /scf	987.9 /scf
TOLUENE	0.0229	0.1152	NET WET REAL :	965.4 /scf	970.7 /scf
ETHYLBENZENE	0.0017	0.0098	HHV GROSS DRY REAL :	1087.5 /scf	1093.4 /scf
XYLENES	0.0101	0.0585	GROSS WET REAL :	1068.5 /scf	1074.4 /scf
TOTAL BTEX	0.0551	0.2705	NET HEATING VALUE (60 °F ideal reaction):		20380.2 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		22560.3 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6316
			DENSITY		0.04827 lb/scf
			COMPRESSIBILITY FACTOR :		0.9975
			REGULAR WOBBE INDEX		1369.3

*(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	4777.3 /scf	Relative Density - SG (Air=1)	3.3076	C6+ factors
Gross Dry Ideal BTU	5125 /scf	Z Compressibility Factor	0.99334	0.99259
Net Dry Ideal BTU	19141 /lb	Density Factor	252.459 lbm/1000 ft3	
Gross Dry Ideal BTU	20538.4 /lb	Molar Mass or MW	95.808 g/mol	
		Volume Liquid Ideal gas	0.143 scf/gal	24.4

**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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