



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

**MAIN PAGE**

PRIMARY DB KEY: **05-045-07292**      NAME/DESCRIP : **300107075 F33 BOULTON 33-6**  
 LEASE #: **COC-56608A**                      **BRADEN HEAD**  
 FIELD/AREA:

PROJECT NO. : **202503051**                      ANALYSIS NO. : **02**  
 COMPANY NAME : **QB ENERGY OPERATING, LLC**      ANALYSIS DATE: **MARCH 14, 2025 11:15**  
 OFFICE / BRANCH: **PARACHUTE, CO**              SAMPLE DATE : **MARCH 10, 2025**  
 CUSTOMER REF:                                      TO:  
 PRODUCER : **QB ENERGY OPERATING, LLC**      EFFECTIVE DATE:

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

SAMPLE CYCLE:                                      SAMPLE TYPE:                      SPOT  
 SAMPLE PRES. :    159                      psig                      PROBE :                                      NO  
 FLOW PRES. :                                      psig                      CYLINDER NO. :                      ECA-754  
 LAB PRES:    psig                      SAMPLED BY :                      TERRY MARTINEZ  
 SAMPLE TEMP. :    50                              °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:

<u>COMPONENT</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>GPM @</u>	<u>GPM @</u>
			<u>14.65</u>	<u>14.73</u>
ALCOHOLS	0.0010	0.0019	0.0000	0.0000
HELIUM	0.08	0.02	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.02	0.04	---	---
NITROGEN	2.39	4.07	---	---
CARBON DIOXIDE	0.02	0.05	---	---
METHANE	96.8495	94.3720	---	---
ETHANE	0.4465	0.8155	0.1189	0.1195
PROPANE	0.1363	0.3650	0.0370	0.0372
I-BUTANE	0.0266	0.0939	0.0090	0.0090
N-BUTANE	0.0135	0.0477	0.0040	0.0040
I-PENTANE	0.0023	0.0101	0.0010	0.0010
N-PENTANE	0.0010	0.0044	0.0000	0.0000
HEXANES PLUS	0.0133	0.1095	0.0000	0.0000
<u>TOTALS</u>	<u>100.00000</u>	<u>100.00000</u>	<u>0.1699</u>	<u>0.1707</u>

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0001	0.0005
TOLUENE	0.0000	0.0000
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0001	0.0007
<u>TOTAL BTEX</u>	<u>0.0002</u>	<u>0.0012</u>

	<u>CALCULATED VALUES**</u>	
	<u>BTU @</u>	<u>BTU @</u>
	<u>14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	891.5 /scf	896.3 /scf
NET WET REAL :	875.9 /scf	880.7 /scf
HHV GROSS DRY REAL :	989.7 /scf	995.2 /scf
GROSS WET REAL :	972.4 /scf	977.9 /scf
NET HEATING VALUE (60 °F ideal reaction):		20591.2 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		22864.1 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.5677
DENSITY		0.04338 lbm/scf
COMPRESSIBILITY FACTOR :		0.9980
REGULAR WOBBE INDEX		1315.1

\*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730,GPA 2261 & GPA 2286.

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

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

PROJECT NO. :	202503051	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	MARCH 14, 2025 11:15
ACCOUNT NO. :		SAMPLE DATE :	MARCH 10, 2025
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-754
LEASE NO. :	COC-56608A	SAMPLED BY :	TERRY MARTINEZ
NAME/DESCRIP :	300107075 F33 BOULTON 33-6 BRADEN HEAD		

***FIELD DATA***		SAMPLE TEMP. :	50
SAMPLE PRES. :	159	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	<i>SPOT</i>		<i>NO PROBE</i>

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.08	0.02
Hydrogen	0.00	0.00
Carbon Dioxide	0.02	0.05
Nitrogen	2.39	4.07
Methane	96.8495	94.3720
Ethane	0.4465	0.8155
Propane	0.1363	0.3650
Isobutane	0.0266	0.0939
n-Butane	0.0135	0.0477
Isopentane	0.0022	0.0097
n-Pentane	0.0010	0.0044
Cyclopentane	0.0001	0.0004
n-Hexane	0.0004	0.0021
Cyclohexane	0.0003	0.0015
Other Hexanes	0.0008	0.0041
Heptanes	0.0013	0.0078
Methylcyclohexane	0.0009	0.0053
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0001	0.0005
Toluene	0.0000	0.0000
Ethylbenzene	0.0000	0.0000
Xylenes	0.0001	0.0007
C8+ Heavies	0.0094	0.0875
<u>Subtotal</u>	<u>99.97900</u>	<u>99.95810</u>
Oxygen/Argon	0.02	0.04
Alcohols	0.0010	0.0019
<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:	891.5	6874.8	7737.8	8858.1 Btu/scf
Net Wet Real:	875.9	6754.6	7602.5	8703.2 Btu/scf
HHV Gross Dry Real:	989.7	7401.1	8332.0	9542.5 Btu/scf
Gross Wet Real:	972.4	7271.7	8186.3	9375.7 Btu/scf

<b>Other Calculated Values</b>				
Regualr Wobbe Index*	1315.1	3420.3	3633.6	3892.4 Btu/scf
Net Heating Value (60 °F ideal reaction):	20591.2	18850.5	18768.5	18434.3 Btu/lbm
Gross Heating Value (60°F ideal reaction):	22864.1	20292.0	20206.6	19855.3 Btu/lbm
Molar Mass (MW):	16.4634	135.989	153.069	175.146 g/mol
Relative Density (AIR=1):	0.5677	4.6954	5.2852	6.0472 SG
Density:	0.04338	0.35836	0.40336	0.46154 lbm/scf
Compressibility Factor:	0.9980	0.9982	0.9994	0.9999 Z
Liquid Volume real gas @:	<u>14.65</u>	16.7693	0	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: **05-045-07292** NAME/DESCRIP : **300107075 F33 BOULTON 33-6**  
 LEASE #: **COC-56608A** **BRADEN HEAD**  
 FIELD/AREA:  
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 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **MARCH 14, 2025 11:15**  
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **MARCH 10, 2025**  
 CUSTOMER REF: **TO:**  
 PRODUCER : **QB ENERGY OPERATING, LLC** EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: **SPOT**  
 SAMPLE PRES. : 159 psig PROBE : **NO**  
 FLOW PRES. : psig CYLINDER NO. : **ECA-754**  
 LAB PRES: psig SAMPLED BY : **TERRY MARTINEZ**  
 SAMPLE TEMP. : 50 °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	---	0.08	0.02	---	---
Oxygen/Argon	---	0.02	0.04	---	---
Nitrogen	---	2.39	4.07	---	---
Carbon Dioxide	---	0.02	0.05	---	---
Methane	P1	96.8495	94.3720	---	---
Ethane	P2	0.4465	0.8155	0.119	0.120
Propane	P3	0.1363	0.3650	0.037	0.037
i-Butane	I4	0.0266	0.0939	0.009	0.009
Methanol	X1	0.0010	0.0019	0.000	0.000
n-Butane	P4	0.0135	0.0477	0.004	0.004
2,2-Dimethylpropane	I5	0.0004	0.0018	0.000	0.000
i-Pentane	I5	0.0018	0.0079	0.001	0.001
n-Pentane	P5	0.0010	0.0044	0.000	0.000
2,2-Dimethylbutane	I6	0.0001	0.0005	0.000	0.000
Cyclopentane	N5	0.0001	0.0004	0.000	0.000
2,3-Dimethylbutane	I6	0.0001	0.0005	0.000	0.000
2-Methylpentane	I6	0.0003	0.0016	0.000	0.000
3-Methylpentane	I6	0.0001	0.0005	0.000	0.000
n-Hexane	P6	0.0004	0.0021	0.000	0.000
Methylcyclopentane	N6	0.0002	0.0010	0.000	0.000
Benzene	A6	0.0001	0.0005	0.000	0.000
Cyclohexane	N6	0.0003	0.0015	0.000	0.000
2-Methylhexane	I7	0.0003	0.0018	0.000	0.000
2,3-Dimethylpentane	I7	0.0001	0.0006	0.000	0.000
3-Methylhexane	I7	0.0003	0.0018	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000

n-Heptane	P7	0.0005	0.0030	0.000	0.000
Methylcyclohexane	N7	0.0009	0.0053	0.000	0.000
2,2-Dimethylhexane	I8	0.0001	0.0007	0.000	0.000
2,5-Dimethylhexane	I8	0.0001	0.0007	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0001	0.0007	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0001	0.0007	0.000	0.000
2,3-Dimethylhexane	I8	0.0001	0.0007	0.000	0.000
2-Methylheptane	I8	0.0003	0.0021	0.000	0.000
4-Methylheptane	I8	0.0001	0.0007	0.000	0.000
3-Methylheptane	I8	0.0002	0.0014	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0004	0.0027	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
n-Octane	P8	0.0002	0.0014	0.000	0.000
1c,4-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
Ethylcyclohexane	N8	0.0002	0.0013	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0007	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
2,5-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0008	0.000	0.000
n-Nonane	P9	0.0001	0.0008	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0007	0.000	0.000
5-Methylnonane	I10	0.0001	0.0008	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0001	0.0008	0.000	0.000
n-Decane	P10	0.0002	0.0017	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0002	0.0015	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0003	0.0024	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0010	0.000	0.000
UnknownC10s	U10	0.0001	0.0008	0.000	0.000
n-Undecane	P11	0.0004	0.0038	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0002	0.0016	0.000	0.000
1,2-Methyl-n-butylbenzene	A11	0.0001	0.0009	0.000	0.000
1,2,3,5-Tetramethylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC11s	U11	0.0002	0.0019	0.000	0.000
n-Dodecane	P12	0.0003	0.0031	0.000	0.000
1,3,5-Triethylbenzene	A12	0.0002	0.0019	0.000	0.000
1,4-Methyl-n-pentylbenzene	A12	0.0001	0.0010	0.000	0.000
n-Hexylbenzene	A12	0.0001	0.0010	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0003	0.0027	0.000	0.000
2-Methylnaphthalene	A11	0.0001	0.0008	0.000	0.000
UnknownC12s	U12	0.0005	0.0047	0.000	0.000
n-Tridecane	P13	0.0004	0.0045	0.000	0.000
UnknownC13s	U13	0.0004	0.0045	0.000	0.000
n-Tetradecane	P14	0.0002	0.0024	0.000	0.000
UnknownC14s	U14	0.0003	0.0036	0.000	0.000
n-Pentadecane	P15	0.0001	0.0013	0.000	0.000
UnknownC15s	U15	0.0002	0.0025	0.000	0.000
n-Hexadecane	P16	0.0001	0.0014	0.000	0.000
UnknownC16s	U16	0.0002	0.0027	0.000	0.000
n-Heptadecane	P17	0.0001	0.0015	0.000	0.000
UnknownC17s	U17	0.0002	0.0029	0.000	0.000
UnknownC19s	U19	0.0001	0.0016	0.000	0.000
UnknownC20s	U20	0.0001	0.0017	0.000	0.000
<b>TOTAL</b>		<b>100.0000</b>	<b>100.0000</b>	<b>0.1699</b>	<b>0.1707</b>

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0001	0.0005
TOLUENE	0.0000	0.0000
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0001	0.0007
TOTAL BTEX	0.0002	0.0012

\*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730, GPA 2261 & GPA 2286.

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

**CALCULATED VALUES\*\***

BTU @	14.65	14.73
LHV NET DRY REAL :	891.5 /scf	896.3 /scf
NET WET REAL :	875.9 /scf	880.7 /scf
HHV GROSS DRY REAL :	989.7 /scf	995.2 /scf
GROSS WET REAL :	972.4 /scf	977.9 /scf
NET HEATING VALUE (60 °F ideal reaction):		20591.2 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		22864.1 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.5677
DENSITY		0.04338 lb/scf
COMPRESSIBILITY FACTOR :		0.9980
REGULAR WOBBE INDEX		1315.1

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

Net Dry Ideal BTU	<u>6884.2</u> /scf	Relative Density - SG (Air=1)	<u>4.6954</u>	<b>C6+ factors</b>
Gross Dry Ideal BTU	<u>7411.3</u> /scf	Z Compressibility Factor	<u>0.99824</u>	<u>0.99695</u>
Net Dry Ideal BTU	<u>18850.5</u> /lb	Density Factor	<u>358.358</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20292</u> /lb	Molar Mass or MW	<u>135.989</u> g/mol	
		Volume Liquid Ideal gas	<u>0</u> scf/gal	<u>18.5</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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