



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

**MAIN PAGE**

PRIMARY DB KEY:	<b>05-045-15099</b>	NAME/DESCRIP :	<b>110165736 NP I30A EF 06A-30 595</b>
LEASE #:	<b>05-045-15099</b>	CASING	
FIELD/AREA:	<b>GRAND VALLEY</b>		
PROJECT NO. :	<b>202512053</b>	ANALYSIS NO. :	<b>01</b>
COMPANY NAME :	<b>QB ENERGY OPERATING, LLC</b>	ANALYSIS DATE:	DECEMBER 22, 2025 07:33
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	NOVEMBER 20, 2025 7:30 AM
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	238 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-782
LAB PRES:	psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	35 °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 @ 14.65</u>	<u>GPM @ 14.73</u>
ALCOHOLS	0.1648	0.3014	0.0210	0.0211
HELIUM	0.01	0.00	---	---
HYDROGEN	0.17	0.02	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.11	0.17	---	---
CARBON DIOXIDE	1.64	4.07	---	---
METHANE	91.6664	82.9958	---	---
ETHANE	4.7040	7.9829	1.2541	1.2609
PROPANE	0.9731	2.4217	0.2668	0.2683
I-BUTANE	0.2225	0.7299	0.0729	0.0733
N-BUTANE	0.1635	0.5363	0.0510	0.0512
I-PENTANE	0.0793	0.3228	0.0290	0.0291
N-PENTANE	0.0386	0.1572	0.0140	0.0141
HEXANES PLUS	0.0578	0.2920	0.0220	0.0220
<u>TOTALS</u>	<u>100.0000</u>	<u>100.0000</u>	<u>1.7308</u>	<u>1.7400</u>

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0000	0.0000
TOLUENE	0.0000	0.0000
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
<u>TOTAL BTEX</u>	<u>0.0000</u>	<u>0.0000</u>

	<u>BTU @ 14.65</u>	<u>14.73</u>
<b>LHV</b> NET DRY REAL :	951.6 /scf	956.8 /scf
NET WET REAL :	935.0 /scf	940.2 /scf
<b>HHV</b> GROSS DRY REAL :	1054.4 /scf	1060.2 /scf
GROSS WET REAL :	1036.0 /scf	1041.8 /scf
NET HEATING VALUE (60 °F ideal reaction):		20403.4 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		22611.4 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6114
DENSITY		0.04669 lbm/scf
COMPRESSIBILITY FACTOR :		0.9976
REGULAR WOBBE INDEX		1349.5

\*(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. :	202512053	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	DECEMBER 22, 2025 07:33
ACCOUNT NO. :		SAMPLE DATE :	NOVEMBER 20, 2025 7:30 AM
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	ECA-782
LEASE NO. :	05-045-15099	SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	110165736 NP I30A EF 06A-30 595 CASING		

***FIELD DATA***		SAMPLE TEMP. :	35
SAMPLE PRES. :	238	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	<i>SPOT</i>		<i>NO PROBE</i>

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.17	0.02
Carbon Dioxide	1.64	4.07
Nitrogen	0.11	0.17
Methane	91.6664	82.9958
Ethane	4.7040	7.9829
Propane	0.9731	2.4217
Isobutane	0.2225	0.7299
n-Butane	0.1635	0.5363
Isopentane	0.0785	0.3196
n-Pentane	0.0386	0.1572
Cyclopentane	0.0008	0.0032
n-Hexane	0.0114	0.0554
Cyclohexane	0.0013	0.0062
Other Hexanes	0.0322	0.1562
Heptanes	0.0104	0.0584
Methylcyclohexane	0.0009	0.0050
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0000	0.0000
Toluene	0.0000	0.0000
Ethylbenzene	0.0000	0.0000
Xylenes	0.0000	0.0000
C8+ Heavies	0.0016	0.0108
<u>Subtotal</u>	<u>99.83520</u>	<u>99.69860</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.1648	0.3014
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

	<b>Total</b>	<b>C6+</b>	<b>C8+</b>	<b>C10+</b>
<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:	951.6	4588.6	5657.0	6578.0 Btu/scf
Net Wet Real:	935.0	4508.4	5558.1	6463.0 Btu/scf
HHV Gross Dry Real:	1054.4	4950.8	6071.5	7017.1 Btu/scf
Gross Wet Real:	1036.0	4864.3	5965.4	6894.4 Btu/scf

<b>Other Calculated Values</b>				
Regualr Wobbe Index*	1349.5	2788.8	2965.3	3219.8 Btu/scf
Net Heating Value (60 °F ideal reaction):	20403.4	19294.2	17709.9	18590.3 Btu/lbm
Gross Heating Value (60°F ideal reaction):	22611.4	20816.6	19006.3	19837.1 Btu/lbm
Molar Mass (MW):	17.72007	89.681	121.725	138.254 g/mol
Relative Density (AIR=1):	0.6114	3.0964	4.2030	4.7736 SG
Density:	0.04669	0.23631	0.32077	0.36432 lbm/scf
Compressibility Factor:	0.9976	0.9881	0.9981	0.9994 Z
Liquid Volume real gas @:	<u>14.65</u>	17.4841	0.0219	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: **05-045-15099** NAME/DESCRIP : **110165736 NP I30A EF 06A-30 595**  
 LEASE #: **05-045-15099** CASING  
 FIELD/AREA: **GRAND VALLEY**

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 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **DECEMBER 22, 2025 07:33**  
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **NOVEMBER 20, 2025 7:30 AM**  
 CUSTOMER REF: TO:  
 PRODUCER : **QB ENERGY OPERATING LLC** EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: **SPOT**  
 SAMPLE PRES. : **238** psig PROBE : **NO**  
 FLOW PRES. : psig CYLINDER NO. : **ECA-782**  
 LAB PRES: psig SAMPLED BY : **ALEX GALLEGOS**  
 SAMPLE TEMP. : **35** °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	---	---
Hydrogen	---	0.17	0.02	---	---
Nitrogen	---	0.11	0.17	---	---
Carbon Dioxide	---	1.64	4.07	---	---
Methane	P1	91.6664	82.9958	---	---
Ethane	P2	4.7040	7.9829	1.254	1.261
Propane	P3	0.9731	2.4217	0.267	0.268
i-Butane	I4	0.2225	0.7299	0.073	0.073
Methanol	X1	0.1633	0.2953	0.021	0.021
n-Butane	P4	0.1635	0.5363	0.051	0.051
2,2-Dimethylpropane	I5	0.0043	0.0175	0.002	0.002
i-Pentane	I5	0.0742	0.3021	0.027	0.027
i-Propanol	X3	0.0002	0.0007	0.000	0.000
n-Pentane	P5	0.0386	0.1572	0.014	0.014
t-Butanol	X4	0.0013	0.0054	0.000	0.000
2,2-Dimethylbutane	I6	0.0038	0.0185	0.002	0.002
Cyclopentane	N5	0.0008	0.0032	0.000	0.000
2,3-Dimethylbutane	I6	0.0039	0.0190	0.002	0.002
2-Methylpentane	I6	0.0144	0.0700	0.006	0.006
3-Methylpentane	I6	0.0071	0.0345	0.003	0.003
n-Hexane	P6	0.0114	0.0554	0.005	0.005
2,2-Dimethylpentane	I7	0.0007	0.0040	0.000	0.000
Methylcyclopentane	N6	0.0030	0.0142	0.001	0.001
2,4-Dimethylpentane	I7	0.0009	0.0051	0.000	0.000
2,2,3-Trimethylbutane	I7	0.0002	0.0011	0.000	0.000
3,3-Dimethylpentane	I7	0.0002	0.0011	0.000	0.000
Cyclohexane	N6	0.0013	0.0062	0.000	0.000

2-Methylhexane	I7	0.0023	0.0130	0.001	0.001
2,3-Dimethylpentane	I7	0.0006	0.0034	0.000	0.000
1,1-Dimethylcyclopentane	N7	0.0003	0.0016	0.000	0.000
3-Methylhexane	I7	0.0017	0.0096	0.001	0.001
1c,3-Dimethylcyclopentane	N7	0.0003	0.0016	0.000	0.000
1t,3-Dimethylcyclopentane	N7	0.0003	0.0016	0.000	0.000
3-Ethylpentane	I7	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0003	0.0016	0.000	0.000
n-Heptane	P7	0.0024	0.0135	0.001	0.001
1c,2-Dimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Methylcyclohexane	N7	0.0009	0.0050	0.000	0.000
2,2-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
2,5-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0002	0.0013	0.000	0.000
4-Methylheptane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0001	0.0006	0.000	0.000
n-Octane	P8	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	0.0002	0.0014	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0007	0.000	0.000
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0015	0.000	0.000
<b>TOTAL</b>		<b>100.00000</b>	<b>100.00000</b>	<b>1.7308</b>	<b>1.7400</b>

**CALCULATED VALUES\*\***

<b>BTEX COMPONENTS</b>	<b>MOLE%</b>	<b>WT%</b>	<b>BTU @</b>	<b>14.65</b>	<b>14.73</b>
BENZENE	0.0000	0.0000	<b>LHV NET DRY REAL :</b>	951.6 /scf	956.8 /scf
TOLUENE	0.0000	0.0000	<b>NET WET REAL :</b>	935.0 /scf	940.2 /scf
ETHYLBENZENE	0.0000	0.0000	<b>HHV GROSS DRY REAL :</b>	1054.4 /scf	1060.2 /scf
XYLENES	0.0000	0.0000	<b>GROSS WET REAL :</b>	1036.0 /scf	1041.8 /scf
<b>TOTAL BTEX</b>	<b>0.0000</b>	<b>0.0000</b>	<b>NET HEATING VALUE (60 °F ideal reaction):</b>		<b>20403.4 Btu/lbm</b>
			<b>GROSS HEATING VALUE (60°F ideal reaction):</b>		<b>22611.4 Btu/lbm</b>
			<b>RELATIVE DENSITY (AIR=1):</b>		<b>0.6114</b>
			<b>DENSITY</b>		<b>0.04669 lb/scf</b>
			<b>COMPRESSIBILITY FACTOR :</b>		<b>0.9976</b>
			<b>REGULAR WOBBE INDEX</b>		<b>1349.5</b>

\*(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	4548.3 /scf	Relative Density - SG (Air=1)	3.0964	<b>C6+ factors</b>
Gross Dry Ideal BTU	4907.3 /scf	Z Compressibility Factor	0.98812	0.98761
Net Dry Ideal BTU	19294.2 /lb	Density Factor	236.313 lbm/1000 ft3	
Gross Dry Ideal BTU	20816.6 /lb	Molar Mass or MW	89.681 g/mol	
		Volume Liquid Ideal gas	0.022 scf/gal	23.8

**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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