



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

**MAIN PAGE**

PRIMARY DB KEY:	<b>05-045-11253</b>	NAME/DESCRIP :	<b>110165219 NP I30 EF 01D 595</b>
LEASE #:	<b>05-045-11253</b>	CASING	
FIELD/AREA:	<b>GRAND VALLEY</b>		
PROJECT NO. :	<b>202512048</b>	ANALYSIS NO. :	<b>01</b>
COMPANY NAME :	<b>QB ENERGY OPERATING, LLC</b>	ANALYSIS DATE:	DECEMBER 20, 2025 15:43
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	NOVEMBER 20, 2025 8:30 AM
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	291 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	TBI/CO-605
LAB PRES:	psig	SAMPLED BY :	ALEX GALLEGOS
SAMPLE TEMP. :	37 °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	0.1279	0.2423	0.0160	0.0161
HELIUM	0.01	0.00	---	---
HYDROGEN	0.59	0.07	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.21	0.35	---	---
CARBON DIOXIDE	0.36	0.93	---	---
METHANE	93.6359	88.5062	---	---
ETHANE	4.2050	7.4498	1.1210	1.1271
PROPANE	0.6451	1.6760	0.1768	0.1778
I-BUTANE	0.1270	0.4349	0.0410	0.0412
N-BUTANE	0.0605	0.2072	0.0190	0.0191
I-PENTANE	0.0161	0.0684	0.0060	0.0060
N-PENTANE	0.0061	0.0259	0.0020	0.0020
HEXANES PLUS	0.0064	0.0393	0.0010	0.0010
<u>TOTALS</u>	<u>100.0000</u>	<u>100.0000</u>	<u>1.3828</u>	<u>1.3903</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 :	942.8 /scf	947.9 /scf
NET WET REAL :	926.3 /scf	931.4 /scf
<b>HHV</b> GROSS DRY REAL :	1045.6 /scf	1051.3 /scf
GROSS WET REAL :	1027.3 /scf	1033.0 /scf
NET HEATING VALUE (60 °F ideal reaction):		21104.7 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		23404.7 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.5857
DENSITY		0.04472 lbm/scf
COMPRESSIBILITY FACTOR :		0.9978
REGULAR WOBBE INDEX		1367.4

\*(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. :	202512048	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	DECEMBER 20, 2025 15:43
ACCOUNT NO. :		SAMPLE DATE :	NOVEMBER 20, 2025 8:30 AM
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	TBI/CO-605
LEASE NO. :	05-045-11253	SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	110165219 NP I30 EF 01D 595 CASING		

***FIELD DATA***		SAMPLE TEMP. :	37
SAMPLE PRES. :	291	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	0.59	0.07
Carbon Dioxide	0.36	0.93
Nitrogen	0.21	0.35
Methane	93.6359	88.5062
Ethane	4.2050	7.4498
Propane	0.6451	1.6760
Isobutane	0.1270	0.4349
n-Butane	0.0605	0.2072
Isopentane	0.0161	0.0684
n-Pentane	0.0061	0.0259
Cyclopentane	0.0000	0.0000
n-Hexane	0.0013	0.0066
Cyclohexane	0.0001	0.0005
Other Hexanes	0.0025	0.0126
Heptanes	0.0009	0.0054
Methylcyclohexane	0.0002	0.0012
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	0.0014	0.0130
<u>Subtotal</u>	<u>99.87210</u>	<u>99.75770</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.1279	0.2423
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
LHV	Net Dry Real:	942.8	5213.2	7516.8	8984.6 Btu/scf
	Net Wet Real:	926.3	5122.1	7385.4	8827.5 Btu/scf
HHV	Gross Dry Real:	1045.6	5626.0	8115.4	9720.1 Btu/scf
	Gross Wet Real:	1027.3	5527.7	7973.5	9550.2 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*		1367.4	2949.9	3476.2	3902.1 Btu/scf
Net Heating Value (60 °F ideal reaction):		21104.7	19255.7	19170.0	20671.1 Btu/lbm
Gross Heating Value (60°F ideal reaction):		23404.7	20778.5	20688.2	22347.9 Btu/lbm
Molar Mass (MW):		16.97272	104.299	158.716	180.779 g/mol
Relative Density (AIR=1):		0.5857	3.6012	5.4800	6.2419 SG
Density:		0.04472	0.27484	0.41824	0.47638 lbm/scf
Compressibility Factor:		0.9978	0.9919	0.9996	0.9998 Z
Liquid Volume real gas @:	<b>14.65</b>	17.3007	0.001	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: **05-045-11253** NAME/DESCRIP : **110165219 NP I30 EF 01D 595**  
 LEASE #: **05-045-11253** CASING  
 FIELD/AREA: **GRAND VALLEY**

PROJECT NO. : **202512048** ANALYSIS NO. : **01**  
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **DECEMBER 20, 2025 15:43**  
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **NOVEMBER 20, 2025 8:30 AM**  
 CUSTOMER REF: TO:  
 PRODUCER : **QB ENERGY OPERATING LLC** EFFECTIVE DATE:

**\*\*\*FIELD DATA\*\*\***  
 SAMPLE CYCLE: SAMPLE TYPE: **SPOT**  
 SAMPLE PRES. : **291** psig PROBE : **NO**  
 FLOW PRES. : psig CYLINDER NO. : **TBI/CO-605**  
 LAB PRES: psig SAMPLED BY : **ALEX GALLEGOS**  
 SAMPLE TEMP. : **37** °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	---	0.59	0.07	---	---
Nitrogen	---	0.21	0.35	---	---
Carbon Dioxide	---	0.36	0.93	---	---
Methane	P1	93.6359	88.5062	---	---
Ethane	P2	4.2050	7.4498	1.121	1.127
Propane	P3	0.6451	1.6760	0.177	0.178
i-Butane	I4	0.1270	0.4349	0.041	0.041
Methanol	X1	0.1275	0.2407	0.016	0.016
n-Butane	P4	0.0605	0.2072	0.019	0.019
2,2-Dimethylpropane	I5	0.0020	0.0085	0.001	0.001
i-Pentane	I5	0.0141	0.0599	0.005	0.005
i-Propanol	X3	0.0002	0.0007	0.000	0.000
n-Pentane	P5	0.0061	0.0259	0.002	0.002
t-Butanol	X4	0.0002	0.0009	0.000	0.000
2,2-Dimethylbutane	I6	0.0004	0.0020	0.000	0.000
2,3-Dimethylbutane	I6	0.0003	0.0015	0.000	0.000
2-Methylpentane	I6	0.0011	0.0056	0.000	0.000
3-Methylpentane	I6	0.0005	0.0025	0.000	0.000
n-Hexane	P6	0.0013	0.0066	0.001	0.001
Methylcyclopentane	N6	0.0002	0.0010	0.000	0.000
2,4-Dimethylpentane	I7	0.0001	0.0006	0.000	0.000
Cyclohexane	N6	0.0001	0.0005	0.000	0.000
2-Methylhexane	I7	0.0002	0.0012	0.000	0.000
2,3-Dimethylpentane	I7	0.0001	0.0006	0.000	0.000
3-Methylhexane	I7	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0004	0.0024	0.000	0.000

Methylcyclohexane	N7	0.0002	0.0012	0.000	0.000
n-Octane	P8	0.0001	0.0007	0.000	0.000
3,6-Dimethyloctane	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	0.0016	0.000	0.000
1,2-Methyl-n-butylbenzene	A11	0.0001	0.0009	0.000	0.000
1,3-Di-n-propylbenzene	A12	0.0001	0.0009	0.000	0.000
UnknownC18s	U18	0.0003	0.0045	0.000	0.000
<b>TOTAL</b>		<b>100.0000</b>	<b>100.0000</b>	<b>1.3828</b>	<b>1.3903</b>

**CALCULATED VALUES\*\***

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0000	0.0000	LHV NET DRY REAL :	942.8 /scf	947.9 /scf
TOLUENE	0.0000	0.0000	NET WET REAL :	926.3 /scf	931.4 /scf
ETHYLBENZENE	0.0000	0.0000	HHV GROSS DRY REAL :	1045.6 /scf	1051.3 /scf
XYLENES	0.0000	0.0000	GROSS WET REAL :	1027.3 /scf	1033.0 /scf
TOTAL BTEX	0.0000	0.0000	NET HEATING VALUE (60 °F ideal reaction):		21104.7 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		23404.7 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.5857
			DENSITY		0.04472 lb/scf
			COMPRESSIBILITY FACTOR :		0.9978
			REGULAR WOBBE INDEX		1367.4

\*(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>5187.3</u> /scf	Relative Density - SG (Air=1)	<u>3.6012</u>	<b>C6+ factors</b>
Gross Dry Ideal BTU	<u>5598</u> /scf	Z Compressibility Factor	<u>0.99191</u>	<u>0.99018</u>
Net Dry Ideal BTU	<u>19255.7</u> /lb	Density Factor	<u>274.844</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20778.5</u> /lb	Molar Mass or MW	<u>104.299</u> g/mol	
		Volume Liquid Ideal gas	<u>0.001</u> scf/gal	<u>22.6</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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