



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

**MAIN PAGE**

PRIMARY DB KEY:	<b>05-045-14501</b>	NAME/DESCRIP :	<b>110180266 M8 PUCKETT 41D-25D</b>
LEASE #:	<b>05-045-14501</b>		<b>BRADEN HEAD</b>
FIELD/AREA:	<b>GRAND VALLEY</b>		
PROJECT NO. :	<b>202511015</b>	ANALYSIS NO. :	<b>01</b>
COMPANY NAME :	<b>QB ENERGY OPERATING, LLC</b>	ANALYSIS DATE:	NOVEMBER 19, 2025 06:33
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	OCTOBER 16, 2025
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	366 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-760
LAB PRES:	psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	51 °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	0.0064	0.0149	0.0010	0.0010
HELIUM	0.01	0.00	---	---
HYDROGEN	0.09	0.01	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.06	0.09	---	---
CARBON DIOXIDE	2.50	5.90	---	---
METHANE	88.3512	75.9424	---	---
ETHANE	6.2055	9.9976	1.6541	1.6631
PROPANE	1.6792	3.9673	0.4607	0.4633
I-BUTANE	0.3526	1.0981	0.1149	0.1156
N-BUTANE	0.2920	0.9094	0.0919	0.0925
I-PENTANE	0.1301	0.5026	0.0480	0.0482
N-PENTANE	0.0738	0.2853	0.0270	0.0271
HEXANES PLUS	0.2492	1.2824	0.1010	0.1012
<u>TOTALS</u>	<u>100.0000</u>	<u>100.0000</u>	<u>2.4986</u>	<u>2.5120</u>

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0097	0.0406
TOLUENE	0.0140	0.0691
ETHYLBENZENE	0.0003	0.0017
XYLENES	0.0015	0.0085
<u>TOTAL BTEX</u>	<u>0.0255</u>	<u>0.1199</u>

	<u>BTU @ 14.65</u>	<u>14.73</u>
<b>LHV</b> NET DRY REAL :	980.7 /scf	986.1 /scf
NET WET REAL :	963.6 /scf	969.0 /scf
<b>HHV</b> GROSS DRY REAL :	1085.8 /scf	1091.7 /scf
GROSS WET REAL :	1066.8 /scf	1072.7 /scf
NET HEATING VALUE (60 °F ideal reaction):		19971.7 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		22103.8 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6437
DENSITY		0.04918 lbm/scf
COMPRESSIBILITY FACTOR :		0.9974
REGULAR WOBBE INDEX		1354.1

\*(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. :	202511015	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	NOVEMBER 19, 2025 06:33
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 16, 2025
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	ECA-760
LEASE NO. :	05-045-14501	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	110180266 M8 PUCKETT 41D-25D BRADEN HEAD		

***FIELD DATA***		SAMPLE TEMP. :	51
SAMPLE PRES. :	366	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	<i>SPOT</i>		<i>NO PROBE</i>

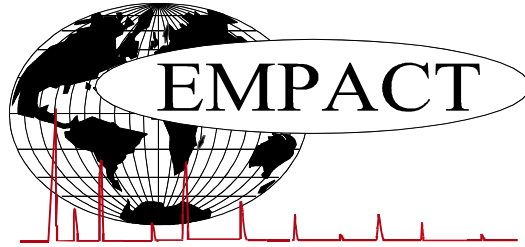
<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.09	0.01
Carbon Dioxide	2.50	5.90
Nitrogen	0.06	0.09
Methane	88.3512	75.9424
Ethane	6.2055	9.9976
Propane	1.6792	3.9673
Isobutane	0.3526	1.0981
n-Butane	0.2920	0.9094
Isopentane	0.1263	0.4883
n-Pentane	0.0738	0.2853
Cyclopentane	0.0038	0.0143
n-Hexane	0.0314	0.1450
Cyclohexane	0.0151	0.0681
Other Hexanes	0.0738	0.3391
Heptanes	0.0426	0.2275
Methylcyclohexane	0.0245	0.1289
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0097	0.0406
Toluene	0.0140	0.0691
Ethylbenzene	0.0003	0.0017
Xylenes	0.0015	0.0085
C8+ Heavies	0.0363	0.2539
<u>Subtotal</u>	<u>99.99360</u>	<u>99.98510</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0064	0.0149
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
LHV	Net Dry Real:	980.7	4841.2	6501.3	10481.7 Btu/scf
	Net Wet Real:	963.6	4756.6	6387.6	10298.5 Btu/scf
HHV	Gross Dry Real:	1085.8	5202.4	7000.5	11293.7 Btu/scf
	Gross Wet Real:	1066.8	5111.5	6878.1	11096.3 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*	1354.1	2843.7	3314.3	4212.0	Btu/scf
Net Heating Value (60 °F ideal reaction):	19971.7	19302.1	19961.3	20217.8	Btu/lbm
Gross Heating Value (60°F ideal reaction):	22103.8	20745.7	21492.1	21777.9	Btu/lbm
Molar Mass (MW):	18.66325	96.066	129.491	209.528	g/mol
Relative Density (AIR=1):	0.6437	3.3172	4.4706	7.2346	SG
Density:	0.04918	0.25316	0.34121	0.55214	lbm/scf
Compressibility Factor:	0.9974	0.9924	0.9979	1.0000	Z
Liquid Volume real gas @:	14.65	17.826	0.1007	0.0159	0.003 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: **05-045-14501** NAME/DESCRIP : **110180266 M8 PUCKETT 41D-25D**  
 LEASE #: **05-045-14501** **BRADEN HEAD**  
 FIELD/AREA: **GRAND VALLEY**

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 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **NOVEMBER 19, 2025 06:33**  
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **OCTOBER 16, 2025**  
 CUSTOMER REF: TO:  
 PRODUCER : **QB ENERGY OPERATING LLC** EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: **SPOT**  
 SAMPLE PRES. : **366** psig PROBE : **NO**  
 FLOW PRES. : psig CYLINDER NO. : **ECA-760**  
 LAB PRES: psig SAMPLED BY : **MIKE KELLEY**  
 SAMPLE TEMP. : **51** °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	---	0.09	0.01	---	---
Nitrogen	---	0.06	0.09	---	---
Carbon Dioxide	---	2.50	5.90	---	---
Methane	P1	88.3512	75.9424	---	---
Ethane	P2	6.2055	9.9976	1.654	1.663
Propane	P3	1.6792	3.9673	0.461	0.463
i-Butane	I4	0.3526	1.0981	0.115	0.116
Methanol	X1	0.0036	0.0062	0.000	0.000
n-Butane	P4	0.2920	0.9094	0.092	0.093
2,2-Dimethylpropane	I5	0.0040	0.0155	0.002	0.002
i-Pentane	I5	0.1223	0.4728	0.045	0.045
Acetone	X3	0.0028	0.0087	0.001	0.001
n-Pentane	P5	0.0738	0.2853	0.027	0.027
2,2-Dimethylbutane	I6	0.0044	0.0203	0.002	0.002
Cyclopentane	N5	0.0038	0.0143	0.001	0.001
2,3-Dimethylbutane	I6	0.0079	0.0365	0.003	0.003
2-Methylpentane	I6	0.0293	0.1353	0.012	0.012
3-Methylpentane	I6	0.0164	0.0757	0.007	0.007
n-Hexane	P6	0.0314	0.1450	0.013	0.013
2,2-Dimethylpentane	I7	0.0011	0.0059	0.001	0.001
Methylcyclopentane	N6	0.0158	0.0713	0.006	0.006
2,4-Dimethylpentane	I7	0.0019	0.0102	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0005	0.0027	0.000	0.000
Benzene	A6	0.0097	0.0406	0.003	0.003
3,3-Dimethylpentane	I7	0.0006	0.0032	0.000	0.000
Cyclohexane	N6	0.0151	0.0681	0.005	0.005

2-Methylhexane	I7	0.0073	0.0392	0.003	0.003
2,3-Dimethylpentane	I7	0.0018	0.0096	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0017	0.0089	0.001	0.001
3-Methylhexane	I7	0.0065	0.0349	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0022	0.0116	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0020	0.0105	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0016	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0031	0.0163	0.001	0.001
n-Heptane	P7	0.0124	0.0666	0.006	0.006
1c,2-Dimethylcyclopentane	N7	0.0003	0.0015	0.000	0.000
Methylcyclohexane	N7	0.0245	0.1289	0.010	0.010
2,2-Dimethylhexane	I8	0.0006	0.0037	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0008	0.0042	0.000	0.000
2,5-Dimethylhexane	I8	0.0007	0.0043	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0006	0.0037	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0004	0.0024	0.000	0.000
3,3-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
Toluene	A7	0.0140	0.0691	0.005	0.005
2,3-Dimethylhexane	I8	0.0006	0.0037	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0034	0.0208	0.002	0.002
4-Methylheptane	I8	0.0012	0.0073	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	0.0030	0.0184	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0042	0.0252	0.002	0.002
3-Ethylhexane	I8	0.0002	0.0012	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0019	0.0114	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0007	0.0042	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	0.0084	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
n-Octane	P8	0.0061	0.0373	0.003	0.003
1c,4-Dimethylcyclohexane	N8	0.0011	0.0066	0.001	0.001
2,3,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0006	0.0041	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0003	0.0018	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0012	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,5-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0003	0.0017	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0010	0.0057	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0004	0.0022	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0006	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0007	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0002	0.0015	0.000	0.000

1,4-Ethyl-i-propylbenzene	A11	0.0002	0.0016	0.000	0.000
1,2-Methyl-n-butylbenzene	A11	0.0001	0.0008	0.000	0.000
sec-Pentylbenzene	A11	0.0003	0.0024	0.000	0.000
n-Dodecane	P12	0.0001	0.0009	0.000	0.000
1,3,5-Triethylbenzene	A12	0.0001	0.0009	0.000	0.000
1,2,4-Triethylbenzene	A12	0.0001	0.0009	0.000	0.000
1,4-Methyl-n-pentylbenzene	A12	0.0002	0.0017	0.000	0.000
n-Hexylbenzene	A12	0.0001	0.0009	0.000	0.000
1-Methylnaphthalene	A11	0.0001	0.0007	0.000	0.000
n-Tridecane	P13	0.0001	0.0010	0.000	0.000
UnknownC13s	U13	0.0002	0.0020	0.000	0.000
n-Tetradecane	P14	0.0001	0.0011	0.000	0.000
UnknownC14s	U14	0.0002	0.0021	0.000	0.000
n-Pentadecane	P15	0.0001	0.0011	0.000	0.000
UnknownC15s	U15	0.0008	0.0091	0.001	0.001
UnknownC16s	U16	0.0011	0.0133	0.001	0.001
n-Heptadecane	P17	0.0002	0.0026	0.000	0.000
UnknownC17s	U17	0.0006	0.0077	0.001	0.001
UnknownC18s	U18	0.0005	0.0068	0.000	0.000
UnknownC19s	U19	0.0001	0.0014	0.000	0.000
UnknownC20s	U20	0.0005	0.0075	0.000	0.000
<b>TOTAL</b>		<b>100.0000</b>	<b>100.0000</b>	<b>2.4986</b>	<b>2.5120</b>

**CALCULATED VALUES\*\***

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0097	0.0406	LHV NET DRY REAL :	980.7 /scf	986.1 /scf
TOLUENE	0.0140	0.0691	NET WET REAL :	963.6 /scf	969.0 /scf
ETHYLBENZENE	0.0003	0.0017	HHV GROSS DRY REAL :	1085.8 /scf	1091.7 /scf
XYLENES	0.0015	0.0085	GROSS WET REAL :	1066.8 /scf	1072.7 /scf
TOTAL BTEX	0.0255	0.1199	NET HEATING VALUE (60 °F ideal reaction):		19971.7 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		22103.8 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6437
			DENSITY		0.04918 lb/scf
			COMPRESSIBILITY FACTOR :		0.9974
			REGULAR WOBBE INDEX		1354.1

\*(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>4819.6</u> /scf	Relative Density - SG (Air=1)	<u>3.3172</u>	<b>C6+ factors</b>
Gross Dry Ideal BTU	<u>5179.2</u> /scf	Z Compressibility Factor	<u>0.99243</u>	<u>0.99154</u>
Net Dry Ideal BTU	<u>19302.1</u> /lb	Density Factor	<u>253.164</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20745.7</u> /lb	Molar Mass or MW	<u>96.066</u> g/mol	
		Volume Liquid Ideal gas	<u>0.101</u> scf/gal	<u>24</u>
<b>This hexanes plus fraction may be applied in place of published C6+ factors. The Z &amp; GPM need additional calc for C6+ factors.</b>				
<b>#DIV/0 or 0 (zero) will appear in this section when there is no hexanes plus in the sample to calculate C6+ factors.</b>				

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