



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	05-045-20182	NAME/DESCRIP :	K28W BENJAMIN FEDERAL 33-4B
LEASE #:	05-045-20182		PRODUCTION CASING
FIELD/AREA:	MAMM CREEK		
PROJECT NO. :	202512128	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JANUARY 07, 2026 14:21
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	DECEMBER 18, 2025
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	127 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-775
LAB PRES:	psig	SAMPLED BY :	KRIS GIBSON
SAMPLE TEMP. :	°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	0.0009	0.0015	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.01	0.02	---	---
NITROGEN	0.12	0.17	---	---
CARBON DIOXIDE	2.73	6.19	---	---
METHANE	86.1029	71.2289	---	---
ETHANE	6.9960	10.8476	1.8653	1.8755
PROPANE	2.2163	5.0395	0.6088	0.6121
I-BUTANE	0.4800	1.4387	0.1569	0.1578
N-BUTANE	0.4679	1.4023	0.1469	0.1477
I-PENTANE	0.2439	0.9066	0.0880	0.0884
N-PENTANE	0.1644	0.6116	0.0590	0.0593
HEXANES PLUS	0.4577	2.1433	0.1800	0.1808
TOTALS	100.00000	100.00000	3.1049	3.1216

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0200	0.0805
TOLUENE	0.0229	0.1088
ETHYLBENZENE	0.0002	0.0011
XYLENES	0.0015	0.0083
TOTAL BTEX	0.0446	0.1987

	<u>CALCULATED VALUES**</u>	
	<u>14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	1011.5 /scf	1017.0 /scf
NET WET REAL :	993.8 /scf	999.3 /scf
HHV GROSS DRY REAL :	1117.9 /scf	1124.0 /scf
GROSS WET REAL :	1098.4 /scf	1104.5 /scf
NET HEATING VALUE (60 °F ideal reaction):		19806.6 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		21897.8 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6688
DENSITY		0.05110 lbm/scf
COMPRESSIBILITY FACTOR :		0.9973
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)

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

PROJECT NO. :	202512128	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JANUARY 07, 2026 14:21
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 18, 2025
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-775
LEASE NO. :	05-045-20182	SAMPLED BY :	KRIS GIBSON
NAME/DESCRIP :	K28W BENJAMIN FEDERAL 33-4B PRODUCTION CASING		

FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	127	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	<i>SPOT</i>		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	2.73	6.19
Nitrogen	0.12	0.17
Methane	86.1029	71.2289
Ethane	6.9960	10.8476
Propane	2.2163	5.0395
Isobutane	0.4800	1.4387
n-Butane	0.4679	1.4023
Isopentane	0.2357	0.8769
n-Pentane	0.1644	0.6116
Cyclopentane	0.0082	0.0297
n-Hexane	0.0763	0.3391
Cyclohexane	0.0336	0.1458
Other Hexanes	0.1564	0.6914
Heptanes	0.0802	0.4126
Methylcyclohexane	0.0444	0.2248
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0200	0.0805
Toluene	0.0229	0.1088
Ethylbenzene	0.0002	0.0011
Xylenes	0.0015	0.0083
C8+ Heavies	0.0222	0.1309
<u>Subtotal</u>	<u>99.98910</u>	<u>99.97850</u>
Oxygen/Argon	0.01	0.02
Alcohols	0.0009	0.0015
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+	Calculated Values	
						Sample	Fraction
	14.65						
LHV	Net Dry Real:	1011.5	4584.4	5668.8	#DIV/0!	Btu/scf	
	Net Wet Real:	993.8	4504.3	5569.7	#DIV/0!	Btu/scf	
HHV	Gross Dry Real:	1117.9	4927.0	6100.1	#DIV/0!	Btu/scf	
	Gross Wet Real:	1098.4	4840.9	5993.5	#DIV/0!	Btu/scf	
Other Calculated Values							
	Regualr Wobbe Index*	1367.4	2767.1	3084.0	#DIV/0!	Btu/scf	
	Net Heating Value (60 °F ideal reaction):	19806.6	19204.4	19967.2	#DIV/0!	Btu/lbm	
	Gross Heating Value (60°F ideal reaction):	21897.8	20641.1	21491.9	#DIV/0!	Btu/lbm	
	Molar Mass (MW):	19.39368	90.783	113.3	#DIV/0!	g/mol	
	Relative Density (AIR=1):	0.6688	3.1344	3.9116	#DIV/0!	SG	
	Density:	0.05110	0.23923	0.29856	#DIV/0!	lbm/scf	
	Compressibility Factor:	0.9973	0.9912	0.9968	#DIV/0!	Z	
	Liquid Volume real gas @:	14.65	18.0892	0.1794	0.008	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: **05-045-20182** NAME/DESCRIP : **K28W BENJAMIN FEDERAL 33-4B**
 LEASE #: **05-045-20182** PRODUCTION CASING
 FIELD/AREA: **MAMM CREEK**

PROJECT NO. : **202512128** ANALYSIS NO. : **01**
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 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **DECEMBER 18, 2025**
 CUSTOMER REF: TO:
 PRODUCER : **QB ENERGY OPERATING, LLC** EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: **SPOT**
 SAMPLE PRES. : **127** psig PROBE :
 FLOW PRES. : psig CYLINDER NO. : **ECA-775**
 LAB PRES: psig SAMPLED BY : **KRIS GIBSON**
 SAMPLE TEMP. : °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	---	---
Oxygen/Argon	---	0.01	0.02	---	---
Nitrogen	---	0.12	0.17	---	---
Carbon Dioxide	---	2.73	6.19	---	---
Methane	P1	86.1029	71.2289	---	---
Ethane	P2	6.9960	10.8476	1.865	1.876
Propane	P3	2.2163	5.0395	0.609	0.612
i-Butane	I4	0.4800	1.4387	0.157	0.158
Methanol	X1	0.0009	0.0015	0.000	0.000
n-Butane	P4	0.4679	1.4023	0.147	0.148
2,2-Dimethylpropane	I5	0.0058	0.0216	0.002	0.002
i-Pentane	I5	0.2299	0.8553	0.084	0.084
n-Pentane	P5	0.1644	0.6116	0.059	0.059
2,2-Dimethylbutane	I6	0.0084	0.0373	0.003	0.003
Cyclopentane	N5	0.0082	0.0297	0.002	0.002
2,3-Dimethylbutane	I6	0.0149	0.0662	0.006	0.006
2-Methylpentane	I6	0.0640	0.2844	0.026	0.026
3-Methylpentane	I6	0.0348	0.1546	0.014	0.014
n-Hexane	P6	0.0763	0.3391	0.031	0.031
2,2-Dimethylpentane	I7	0.0020	0.0103	0.001	0.001
Methylcyclopentane	N6	0.0342	0.1484	0.012	0.012
2,4-Dimethylpentane	I7	0.0035	0.0181	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0007	0.0036	0.000	0.000
Benzene	A6	0.0200	0.0805	0.006	0.006
3,3-Dimethylpentane	I7	0.0010	0.0052	0.000	0.000
Cyclohexane	N6	0.0336	0.1458	0.011	0.011
2-Methylhexane	I7	0.0132	0.0682	0.006	0.006

2,3-Dimethylpentane	I7	0.0039	0.0202	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0028	0.0142	0.001	0.001
3-Methylhexane	I7	0.0117	0.0604	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0041	0.0208	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0037	0.0187	0.002	0.002
3-Ethylpentane	I7	0.0005	0.0026	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0059	0.0299	0.003	0.003
UnknownC6s	U6	0.0001	0.0005	0.000	0.000
n-Heptane	P7	0.0247	0.1276	0.011	0.011
1c,2-Dimethylcyclopentane	N7	0.0011	0.0056	0.001	0.001
Methylcyclohexane	N7	0.0444	0.2248	0.018	0.018
2,2-Dimethylhexane	I8	0.0012	0.0071	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0013	0.0066	0.001	0.001
2,5-Dimethylhexane	I8	0.0009	0.0053	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0008	0.0047	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0008	0.0046	0.000	0.000
3,3-Dimethylhexane	I8	0.0003	0.0018	0.000	0.000
Toluene	A7	0.0229	0.1088	0.008	0.008
2,3-Dimethylhexane	I8	0.0006	0.0036	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0028	0.0165	0.001	0.001
4-Methylheptane	I8	0.0008	0.0047	0.000	0.000
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	0.0017	0.0100	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0040	0.0232	0.002	0.002
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0017	0.0099	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0005	0.0029	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0011	0.0063	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0025	0.0148	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0007	0.0041	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0004	0.0026	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0006	0.000	0.000
Ethylbenzene	I8	0.0002	0.0011	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0010	0.0055	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
n-Nonane	P9	0.0001	0.0007	0.000	0.000
TOTAL		100.0000	100.0000	3.1049	3.1216

BTEX COMPONENTS	MOLE%	WT%	CALCULATED VALUES**		
			BTU @	14.65	14.73
BENZENE	0.0200	0.0805	LHV NET DRY REAL :	1011.5 /scf	1017.0 /scf
TOLUENE	0.0229	0.1088	NET WET REAL :	993.8 /scf	999.3 /scf
ETHYLBENZENE	0.0002	0.0011	HHV GROSS DRY REAL :	1117.9 /scf	1124.0 /scf
XYLENES	0.0015	0.0083	GROSS WET REAL :	1098.4 /scf	1104.5 /scf
TOTAL BTEX	0.0446	0.1987	NET HEATING VALUE (60 °F ideal reaction):		19806.6 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		21897.8 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6688
			DENSITY		0.05110 lb/scf
			COMPRESSIBILITY FACTOR :		0.9973
			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>4558.2</u> /scf	Relative Density - SG (Air=1)	<u>3.1344</u>	C6+ factors
Gross Dry Ideal BTU	<u>4898.9</u> /scf	Z Compressibility Factor	<u>0.99118</u>	<u>0.99064</u>
Net Dry Ideal BTU	<u>19204.4</u> /lb	Density Factor	<u>239.227</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20641.1</u> /lb	Molar Mass or MW	<u>90.783</u> g/mol	
		Volume Liquid Ideal gas	<u>0.18</u> scf/gal	<u>25.1</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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