EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-20182**	NAME/DESCRIP :	**K28W BENJAMIN FEDERAL 33-4B**
LEASE #:	**05-045-20182**		**SURFACE CASING**
FIELD/AREA:	**MAMM CREEK**		
PROJECT NO. :	**202512128**	ANALYSIS NO. :	**02**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	JANUARY 08, 2026 07:42
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-737	
LAB PRES:		psig	SAMPLED BY :	KRIS GIBSON	
SAMPLE TEMP. :		ºf	SAMPLING COMPANY:	QB ENERGY	
AMBIENT TEMP.:		ºf	H2S BY STAIN TUBE:	_	ppm mol
H2O BY STAIN TUBE:	-	#/mmcf	CO2 BY STAIN TUBE:	-	Mol %

FIELD COMMENTS:

LAB COMMENTS:

COMPONENT	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
ALCOHOLS	0.0006	0.0010	0.0000	0.0000
HELIUM	0.02	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.10	0.15	---	---
CARBON DIOXIDE	3.32	7.59	---	---
METHANE	86.7421	72.2374	---	---
ETHANE	6.2834	9.8079	1.6752	1.6844
PROPANE	1.9289	4.4154	0.5298	0.5326
I-BUTANE	0.4280	1.2914	0.1399	0.1407
N-BUTANE	0.4098	1.2364	0.1289	0.1296
I-PENTANE	0.2114	0.7910	0.0770	0.0774
N-PENTANE	0.1474	0.5521	0.0530	0.0533
HEXANES PLUS	0.4084	1.9274	0.1590	0.1595
TOTALS	100.00000	100.00000	2.7628	2.7775

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0186	0.0754
TOLUENE	0.0167	0.0799
ETHYLBENZENE	0.0003	0.0017
XYLENES	0.0029	0.0160
TOTAL BTEX	0.0385	0.1730

**(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 :	991.2	/scf	996.7	/scf
	NET WET REAL :	973.9	/scf	979.4	/scf
HHV	GROSS DRY REAL :	1096.4	/scf	1102.4	/scf
	GROSS WET REAL :	1077.2	/scf	1083.2	/scf
	NET HEATING VALUE (60 °F ideal reaction):			19550.1	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):			21623.2	Btu/lbm
	RELATIVE DENSITY (AIR=1):			0.6646	
	DENSITY			0.05076	lbm/scf
	COMPRESSIBILITY FACTOR :			0.9973	
	REGULAR WOBBE INDEX			1345.5	

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202512128	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JANUARY 08, 2026 07:42
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 18, 2025
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-737
LEASE NO. :	05-045-20182	SAMPLED BY :	KRIS GIBSON
NAME/DESCRIP :	K28W BENJAMIN FEDERAL 33-4B SURFACE CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	127	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT*		

Componet	Mole %	Wt %
Helium	0.02	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	3.32	7.59
Nitrogen	0.10	0.15
Methane	86.7421	72.2374
Ethane	6.2834	9.8079
Propane	1.9289	4.4154
Isobutane	0.4280	1.2914
n-Butane	0.4098	1.2364
Isopentane	0.2040	0.7641
n-Pentane	0.1474	0.5521
Cyclopentane	0.0074	0.0269
n-Hexane	0.0692	0.3096
Cyclohexane	0.0308	0.1346
Other Hexanes	0.1414	0.6295
Heptanes	0.0716	0.3705
Methylcyclohexane	0.0371	0.1891
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0186	0.0754
Toluene	0.0167	0.0799
Ethylbenzene	0.0003	0.0017
Xylenes	0.0029	0.0160
C8+ Heavies	0.0198	0.1211
Subtotal	99.99940	99.99900
Oxygen/Argon	0.00	0.00
Alcohols	0.0006	0.0010
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	991.2	4591.2	5768.6	7975.8	**Btu/scf**
	Net Wet Real:	973.9	4510.9	5667.8	7836.4	**Btu/scf**
HHV	Gross Dry Real:	1096.4	4934.3	6197.7	8573.2	**Btu/scf**
	Gross Wet Real:	1077.2	4848.0	6089.4	8423.3	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1345.5	2769.1	3099.6	3665.2	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		19550.1	19202.5	19657.0	19041.7	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		21623.2	20641.3	21120.0	20466.6	**Btu/lbm**
Molar Mass (MW):		19.26248	90.892	115.925	159.404	**g/mol**
Relative Density (AIR=1):		0.6646	3.1388	4.0023	5.5038	**SG**
Density:		0.05076	0.23953	0.30546	0.42005	**lbm/scf**
Compressiblity Factor:		0.9973	0.9912	0.9974	0.9998	**Z**
Liquid Volume real gas @:	**14.65**	17.9536	0.1585	0.006	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 uderscore) 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**		**SURFACE CASING**
FIELD/AREA:	**MAMM CREEK**		
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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-737
LAB PRES:	psig	SAMPLED BY :	KRIS GIBSON
SAMPLE TEMP. :	ºf	SAMPLING COMPANY:	QB ENERGY
AMBIENT TEMP.:	ºf	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	---	0.02	0.00	---	---
Nitrogen	---	0.10	0.15	---	---
Carbon Dioxide	---	3.32	7.59	---	---
Methane	P1	86.7421	72.2374	---	---
Ethane	P2	6.2834	9.8079	1.675	1.684
Propane	P3	1.9289	4.4154	0.530	0.533
i-Butane	I4	0.4280	1.2914	0.140	0.141
Methanol	X1	0.0006	0.0010	0.000	0.000
n-Butane	P4	0.4098	1.2364	0.129	0.130
2,2-Dimethylpropane	I5	0.0052	0.0195	0.002	0.002
i-Pentane	I5	0.1988	0.7446	0.073	0.073
n-Pentane	P5	0.1474	0.5521	0.053	0.053
2,2-Dimethylbutane	I6	0.0077	0.0345	0.003	0.003
Cyclopentane	N5	0.0074	0.0269	0.002	0.002
2,3-Dimethylbutane	I6	0.0135	0.0604	0.006	0.006
2-Methylpentane	I6	0.0576	0.2577	0.024	0.024
3-Methylpentane	I6	0.0314	0.1405	0.013	0.013
n-Hexane	P6	0.0692	0.3096	0.028	0.028
2,2-Dimethylpentane	I7	0.0019	0.0099	0.001	0.001
Methylcyclopentane	N6	0.0311	0.1359	0.011	0.011
2,4-Dimethylpentane	I7	0.0032	0.0167	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0007	0.0036	0.000	0.000
Benzene	A6	0.0186	0.0754	0.005	0.005
3,3-Dimethylpentane	I7	0.0010	0.0052	0.000	0.000
Cyclohexane	N6	0.0308	0.1346	0.010	0.010
2-Methylhexane	I7	0.0122	0.0634	0.006	0.006
2,3-Dimethylpentane	I7	0.0036	0.0187	0.002	0.002

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1,1-Dimethylcyclopentane	N7	0.0026	0.0132	0.001	0.001
3-Methylhexane	I7	0.0107	0.0556	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0037	0.0188	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0034	0.0173	0.002	0.002
3-Ethylpentane	I7	0.0005	0.0026	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0053	0.0270	0.002	0.002
UnknownC6s	U6	0.0001	0.0005	0.000	0.000
n-Heptane	P7	0.0209	0.1087	0.010	0.010
1c,2-Dimethylcyclopentane	N7	0.0006	0.0031	0.000	0.000
Methylcyclohexane	N7	0.0371	0.1891	0.015	0.015
2,2-Dimethylhexane	I8	0.0008	0.0047	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0011	0.000	0.000
Ethylcyclopentane	N7	0.0011	0.0056	0.000	0.000
2,5-Dimethylhexane	I8	0.0007	0.0041	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0006	0.0036	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0006	0.0035	0.000	0.000
3,3-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
Toluene	A7	0.0167	0.0799	0.006	0.006
2,3-Dimethylhexane	I8	0.0004	0.0024	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0021	0.0125	0.001	0.001
4-Methylheptane	I8	0.0006	0.0036	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	0.0013	0.0077	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0029	0.0169	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0013	0.0076	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0004	0.0023	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
1t,2-Dimethylcyclohexane	N8	0.0008	0.0047	0.000	0.000
n-Octane	P8	0.0025	0.0148	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0001	0.0006	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	0.0003	0.0018	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,5-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	0.0019	0.0105	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0007	0.0038	0.000	0.000
4-Methyloctane	I9	0.0001	0.0007	0.000	0.000
2-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0003	0.0017	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
n-Nonane	P9	0.0003	0.0020	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0006	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0006	0.0040	0.000	0.000
n-Decane	P10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0001	0.0007	0.000	0.000

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n-Undecane	P11	0.0005	0.0040	0.000	0.000
n-Dodecane	P12	0.0001	0.0009	0.000	0.000
n-Tridecane	P13	0.0001	0.0009	0.000	0.000
n-Tetradecane	P14	0.0001	0.0010	0.000	0.000
TOTAL		100.00000	100.00000	2.7628	2.7775

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0186	0.0754
TOLUENE	0.0167	0.0799
ETHYLBENZENE	0.0003	0.0017
XYLENES	0.0029	0.0160
TOTAL BTEX	0.0385	0.1730

*(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 :	991.2 /scf	996.7 /scf
	NET WET REAL :	973.9 /scf	979.4 /scf
HHV	GROSS DRY REAL :	1096.4 /scf	1102.4 /scf
	GROSS WET REAL :	1077.2 /scf	1083.2 /scf

NET HEATING VALUE (60 °F ideal reaction):	19550.1 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	21623.2 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6646
DENSITY	0.05076 lb/scf
COMPRESSIBILITY FACTOR :	0.9973
REGULAR WOBBE INDEX	1345.5

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

Net Dry Ideal BTU	4564.9 /scf	Relative Density - SG (Air=1)	3.1388		C6+factors
Gross Dry Ideal BTU	4906 /scf	Z Compressiblity Factor	0.99115		0.99044
Net Dry Ideal BTU	19202.5 /lb	Density Factor	239.529	lbm/1000 ft3	
Gross Dry Ideal BTU	20641.3 /lb	Molar Mass or MW	90.892	g/mol	
		Volume Liquid Ideal gas	0.159	scf/gal	24.7

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.