EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-11104**	NAME/DESCRIP :	**YCF 27-32-1**
LEASE #:			**SURFACE CASING**
FIELD/AREA:			
PROJECT NO. :	**202508079**	ANALYSIS NO. :	**01**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	AUGUST 22, 2025 15:31
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	AUGUST 08, 2028 08:30
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	
SAMPLE PRES. :	1345 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	QB-1002
LAB PRES:	psig	SAMPLED BY :	NICK CROY
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
GLYCOLS	0.0006	0.0021	0.0000	0.0000
ALCOHOLS	0.3715	0.6710	0.0470	0.0472
HELIUM	0.00	0.00	---	---
HYDROGEN	0.06	0.01	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.16	0.25	---	---
CARBON DIOXIDE	0.12	0.30	---	---
METHANE	90.4717	81.3977	---	---
ETHANE	6.4562	10.8873	1.7210	1.7304
PROPANE	1.6717	4.1341	0.4587	0.4612
I-BUTANE	0.3514	1.1454	0.1149	0.1156
N-BUTANE	0.2430	0.7921	0.0760	0.0764
I-PENTANE	0.0528	0.2136	0.0190	0.0191
N-PENTANE	0.0240	0.0971	0.0090	0.0090
HEXANES PLUS	0.0171	0.0998	0.0050	0.0050
TOTALS	100.00000	100.00000	2.4506	2.4639

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0000	0.0000
TOLUENE	0.0001	0.0005
ETHYLBENZENE	0.0001	0.0006
XYLENES	0.0004	0.0024
TOTAL BTEX	0.0006	0.0035

*(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 :	989.7 /scf	995.1 /scf
	NET WET REAL :	972.4 /scf	977.8 /scf
HHV	GROSS DRY REAL :	1096.3 /scf	1102.2 /scf
	GROSS WET REAL :	1077.1 /scf	1083.0 /scf

NET HEATING VALUE (60 °F ideal reaction):	21084.2 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	23348.4 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6152
DENSITY	0.04698 lbm/scf
COMPRESSIBILITY FACTOR :	0.9975
REGULAR WOBBE INDEX	1398.5

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202508079	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	AUGUST 22, 2025 15:31
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 08, 2028 08:30
PRODUCER :		CYLINDER NO. :	QB-1002
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	YCF 27-32-1 SURFACE CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	1345	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :			

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.06	0.01
Carbon Dioxide	0.12	0.30
Nitrogen	0.16	0.25
Methane	90.4717	81.3977
Ethane	6.4562	10.8873
Propane	1.6717	4.1341
Isobutane	0.3514	1.1454
n-Butane	0.2430	0.7921
Isopentane	0.0527	0.2132
n-Pentane	0.0240	0.0971
Cyclopentane	0.0001	0.0004
n-Hexane	0.0027	0.0131
Cyclohexane	0.0001	0.0004
Other Hexanes	0.0094	0.0454
Heptanes	0.0006	0.0035
Methylcyclohexane	0.0001	0.0006
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0000	0.0000
Toluene	0.0001	0.0005
Ethylbenzene	0.0001	0.0006
Xylenes	0.0004	0.0024
C8+ Heavies	0.0036	0.0333
Subtotal	99.62790	99.32690
Oxygen/Argon	0.00	0.00
Glycols	0.0006	0.0021
Alcohols	0.3715	0.6710
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	989.7	5287.2	7867.5	8644.5	**Btu/scf**
	Net Wet Real:	972.4	5194.8	7730.0	8493.4	**Btu/scf**
HHV	Gross Dry Real:	1096.3	5704.7	8481.2	9351.2	**Btu/scf**
	Gross Wet Real:	1077.1	5605.0	8332.9	9187.7	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1398.5	2992.9	3638.9	3843.0	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		21084.2	19179.9	18924.6	19077.0	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23348.4	20692.6	20393.6	20626.7	**Btu/lbm**
Molar Mass (MW):		17.82996	104.02	158.253	172.532	**g/mol**
Relative Density (AIR=1):		0.6152	3.5914	5.4638	5.9571	**SG**
Density:		0.04698	0.27411	0.41702	0.45465	**lbm/scf**
Compressiblity Factor:		0.9975	0.9911	0.9998	0.9999	**Z**
Liquid Volume real gas @:	**14.65**	17.7373	0.005	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 uderscore) indicates there was no tube pulled for H2S.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

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SAMPLE PRES. :	1345 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	QB-1002
LAB PRES:	psig	SAMPLED BY :	NICK CROY
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**
Hydrogen	---	0.06	0.01	---	---
Nitrogen	---	0.16	0.25	---	---
Carbon Dioxide	---	0.12	0.30	---	---
Methane	P1	90.4717	81.3977	---	---
Ethane	P2	6.4562	10.8873	1.721	1.730
Propane	P3	1.6717	4.1341	0.459	0.461
i-Butane	I4	0.3514	1.1454	0.115	0.116
Methanol	X1	0.3700	0.6649	0.047	0.047
n-Butane	P4	0.2430	0.7921	0.076	0.076
2,2-Dimethylpropane	I5	0.0026	0.0105	0.001	0.001
i-Pentane	I5	0.0501	0.2027	0.018	0.018
Acetone	X3	0.0002	0.0007	0.000	0.000
n-Pentane	P5	0.0240	0.0971	0.009	0.009
t-Butanol	X4	0.0007	0.0029	0.000	0.000
2,2-Dimethylbutane	I6	0.0013	0.0063	0.001	0.001
Cyclopentane	N5	0.0001	0.0004	0.000	0.000
2,3-Dimethylbutane	I6	0.0011	0.0053	0.000	0.000
2-Methylpentane	I6	0.0049	0.0237	0.002	0.002
3-Methylpentane	I6	0.0018	0.0087	0.001	0.001
n-Hexane	P6	0.0027	0.0131	0.001	0.001
2-Butanol	X4	0.0006	0.0025	0.000	0.000
2,2-Dimethylpentane	I7	0.0001	0.0006	0.000	0.000
Methylcyclopentane	N6	0.0002	0.0009	0.000	0.000
2,4-Dimethylpentane	I7	0.0001	0.0006	0.000	0.000
Cyclohexane	N6	0.0001	0.0004	0.000	0.000
2-Methylhexane	I7	0.0001	0.0006	0.000	0.000
3-Methylhexane	I7	0.0001	0.0006	0.000	0.000
Ethylene glycol	GL2	0.0006	0.0021	0.000	0.000

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UnknownC6s	U6	0.0001	0.0005	0.000	0.000
n-Heptane	P7	0.0002	0.0011	0.000	0.000
Methylcyclohexane	N7	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0001	0.0005	0.000	0.000
n-Octane	P8	0.0001	0.0006	0.000	0.000
Ethylbenzene	I8	0.0001	0.0006	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0002	0.0012	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0006	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
n-Nonane	P9	0.0001	0.0007	0.000	0.000
n-Propylbenzene	A9	0.0002	0.0013	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0004	0.0032	0.000	0.000
n-Decane	P10	0.0001	0.0008	0.000	0.000
n-Undecane	P11	0.0006	0.0053	0.000	0.000
1,4-Ethyl-i-propylbenzene	A11	0.0001	0.0008	0.000	0.000
1,2-Methyl-n-butylbenzene	A11	0.0001	0.0008	0.000	0.000
n-Dodecane	P12	0.0003	0.0029	0.000	0.000
UnknownC12s	U12	0.0001	0.0009	0.000	0.000
n-Tridecane	P13	0.0006	0.0062	0.000	0.000
n-Tetradecane	P14	0.0001	0.0011	0.000	0.000
n-Pentadecane	P15	0.0005	0.0059	0.000	0.000
UnknownC16s	U16	0.0001	0.0013	0.000	0.000
TOTAL		100.00000	100.00000	2.4506	2.4639

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0000	0.0000
TOLUENE	0.0001	0.0005
ETHYLBENZENE	0.0001	0.0006
XYLENES	0.0004	0.0024
TOTAL BTEX	0.0006	0.0035

(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 :	989.7 /scf	995.1 /scf
	NET WET REAL :	972.4 /scf	977.8 /scf
HHV	GROSS DRY REAL :	1096.3 /scf	1102.2 /scf
	GROSS WET REAL :	1077.1 /scf	1083.0 /scf

NET HEATING VALUE (60 °F ideal reaction):	21084.2 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	23348.4 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6152
DENSITY	0.04698 lb/scf
COMPRESSIBILITY FACTOR :	0.9975
REGULAR WOBBE INDEX	1398.5

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

Net Dry Ideal BTU	5256.8 /scf	Relative Density - SG (Air=1)	3.5914		***C6+factors***
Gross Dry Ideal BTU	5671.9 /scf	**Z** Compressiblity Factor	0.99114		0.98898
Net Dry Ideal BTU	19179.9 /lb	Density Factor	274.113	lbm/1000 ft3	
Gross Dry Ideal BTU	20692.6 /lb	Molar Mass or MW	104.02	g/mol	
		Volume Liquid Ideal gas	0.005	scf/gal	22.4

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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