EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-103-11070** NAME/DESCRIP : **YELLOW CREEK FEDERAL 34-22-1 SURFACE CASING**
LEASE #:
FIELD/AREA:

PROJECT NO. : **202501050** ANALYSIS NO. : **02**
COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: JANUARY 27, 2025 22:17
OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : DECEMBER 18, 2024 10:35
CUSTOMER REF: TO:
PRODUCER : QB ENERGY OPERATING, LLC EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: SPOT
SAMPLE PRES. : 620 psig PROBE :
FLOW PRES. : psig CYLINDER NO. : ECA-710
LAB PRES: psig SAMPLED BY : ANDREW TERRAZAS
SAMPLE TEMP. : 33 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
HELIUM	0.01	0.00	---	---
HYDROGEN	0.03	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.37	0.58	---	---
CARBON DIOXIDE	0.02	0.05	---	---
METHANE	90.4714	80.9469	---	---
ETHANE	6.1440	10.3036	1.6380	1.6470
PROPANE	2.0368	5.0091	0.5597	0.5627
I-BUTANE	0.3906	1.2662	0.1269	0.1276
N-BUTANE	0.3663	1.1874	0.1149	0.1156
I-PENTANE	0.0960	0.3863	0.0350	0.0352
N-PENTANE	0.0530	0.2133	0.0190	0.0191
HEXANES PLUS	0.0119	0.0572	0.0050	0.0050
TOTALS	100.00000	100.00000	2.4985	2.5122

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0000	0.0000
TOLUENE	0.0000	0.0000
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0000	0.0000

CALCULATED VALUES**

	BTU @	14.65		14.73	
LHV	NET DRY REAL :	997.7	/scf	1003.2	/scf
	NET WET REAL :	980.3	/scf	985.8	/scf
HHV	GROSS DRY REAL :	1104.2	/scf	1110.3	/scf
	GROSS WET REAL :	1084.9	/scf	1091.0	/scf

NET HEATING VALUE (60 °F ideal reaction):	21124.8	Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	23385.7	Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6188	
DENSITY	0.04725	lbm/scf
COMPRESSIBILITY FACTOR :	0.9975	
REGULAR WOBBE INDEX	1404.6	

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993)*
Mod ASTM D6730,GPA 2261 & GPA 2286.

***(CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)*

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202501050	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	JANUARY 27, 2025 22:17
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 18, 2024 10:35
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-710
LEASE NO. :		SAMPLED BY :	ANDREW TERRAZAS
NAME/DESCRIP :	YELLOW CREEK FEDERAL 34-22-1 SURFACE CASING		
FIELD DATA		SAMPLE TEMP. :	33
SAMPLE PRES. :	620	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT*		

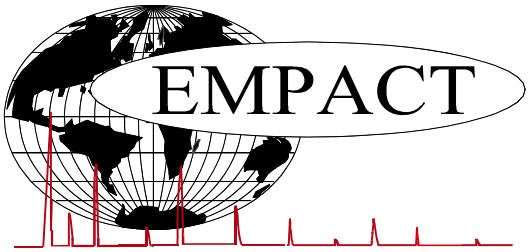
Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.03	0.00
Carbon Dioxide	0.02	0.05
Nitrogen	0.37	0.58
Methane	90.4714	80.9469
Ethane	6.1440	10.3036
Propane	2.0368	5.0091
Isobutane	0.3906	1.2662
n-Butane	0.3663	1.1874
Isopentane	0.0958	0.3855
n-Pentane	0.0530	0.2133
Cyclopentane	0.0002	0.0008
n-Hexane	0.0025	0.0120
Cyclohexane	0.0001	0.0005
Other Hexanes	0.0093	0.0447
Heptanes	0.0000	0.0000
Methylcyclohexane	0.0000	0.0000
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	0.0000	0.0000
Subtotal	100.00000	100.00000
Oxygen/Argon	0.00	0.00
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	997.7	4445.2	#DIV/0!	#DIV/0!	**Btu/scf**
	Net Wet Real:	980.3	4367.5	#DIV/0!	#DIV/0!	**Btu/scf**
HHV	Gross Dry Real:	1104.2	4800.7	#DIV/0!	#DIV/0!	**Btu/scf**
	Gross Wet Real:	1084.9	4716.8	#DIV/0!	#DIV/0!	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1404.6	2750.5	#DIV/0!	#DIV/0!	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		21124.8	19348.8	#DIV/0!	#DIV/0!	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23385.7	20895.7	#DIV/0!	#DIV/0!	**Btu/lbm**
Molar Mass (MW):		17.93057	86.143	#DIV/0!	#DIV/0!	**g/mol**
Relative Density (AIR=1):		0.6188	2.9743	#DIV/0!	#DIV/0!	**SG**
Density:		0.04725	0.22700	#DIV/0!	#DIV/0!	**lbm/scf**
Compressiblity Factor:		0.9975	0.9850	#DIV/0!	#DIV/0!	**Z**
Liquid Volume real gas @:	**14.65**	17.7901	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.



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:	**05-103-11070**	NAME/DESCRIP :	**YELLOW CREEK FEDERAL 34-22-1**
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PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	620 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-710
LAB PRES:	psig	SAMPLED BY :	ANDREW TERRAZAS
SAMPLE TEMP. :	33 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	---	0.01	0.00	---	---
Hydrogen	---	0.03	0.00	---	---
Nitrogen	---	0.37	0.58	---	---
Carbon Dioxide	---	0.02	0.05	---	---
Methane	P1	90.4714	80.9469	---	---
Ethane	P2	6.1440	10.3036	1.638	1.647
Propane	P3	2.0368	5.0091	0.560	0.563
i-Butane	I4	0.3906	1.2662	0.127	0.128
n-Butane	P4	0.3662	1.1871	0.115	0.116
2,2-Dimethylpropane	I5	0.0050	0.0201	0.002	0.002
i-Pentane	I5	0.0908	0.3654	0.033	0.033
UnknownC4s	U4	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.0530	0.2133	0.019	0.019
2,2-Dimethylbutane	I6	0.0015	0.0072	0.001	0.001
Cyclopentane	N5	0.0002	0.0008	0.000	0.000
2,3-Dimethylbutane	I6	0.0011	0.0053	0.000	0.000
2-Methylpentane	I6	0.0050	0.0240	0.002	0.002
3-Methylpentane	I6	0.0016	0.0077	0.001	0.001
n-Hexane	P6	0.0025	0.0120	0.001	0.001
Methylcyclopentane	N6	0.0001	0.0005	0.000	0.000
Cyclohexane	N6	0.0001	0.0005	0.000	0.000
TOTAL		100.00000	100.00000	2.4985	2.5122

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0000	0.0000
TOLUENE	0.0000	0.0000
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0000	0.0000

*(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**

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	NET WET REAL :	980.3 /scf	985.8 /scf
HHV	GROSS DRY REAL :	1104.2 /scf	1110.3 /scf
	GROSS WET REAL :	1084.9 /scf	1091.0 /scf

NET HEATING VALUE (60 °F ideal reaction):	21124.8 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	23385.7 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.6188
DENSITY	0.04725 lb/scf
COMPRESSIBILITY FACTOR :	0.9975
REGULAR WOBBE INDEX	1404.6

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

					C6+factors
Net Dry Ideal BTU	4392.3 /scf	Relative Density - SG (Air=1)	2.9743		0.98489
Gross Dry Ideal BTU	4743.6 /scf	Z Compressiblity Factor	0.98501		
Net Dry Ideal BTU	19348.8 /lb	Density Factor	227.003	lbm/1000 ft3	
Gross Dry Ideal BTU	20895.7 /lb	Molar Mass or MW	86.143	g/mol	
		Volume Liquid Ideal gas	0.005	scf/gal	24.2

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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