EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-103-10649** NAME/DESCRIP : **PICEANCE CREEK UNIT T35X-2G6**
LEASE #: **PRODUCTION CASING**
FIELD/AREA:

PROJECT NO. : **202412022** ANALYSIS NO. : **01**
COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: DECEMBER 09, 2024 16:35
OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : DECEMBER 3, 2024
CUSTOMER REF: TO:
PRODUCER : QB ENERGY OPERATING, LLC EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: SPOT
SAMPLE PRES. : 1211 psig PROBE :
FLOW PRES. : psig CYLINDER NO. : ECA-702
LAB PRES: psig SAMPLED BY : SHANE COLLETT
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	0.1884	0.3506	0.0240	0.0241
HELIUM	0.01	0.00	---	---
HYDROGEN	0.03	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.17	0.28	---	---
CARBON DIOXIDE	0.08	0.20	---	---
METHANE	93.7749	87.3792	---	---
ETHANE	4.2994	7.5089	1.1461	1.1524
PROPANE	0.9332	2.3901	0.2558	0.2572
I-BUTANE	0.2382	0.8042	0.0779	0.0784
N-BUTANE	0.1478	0.4989	0.0460	0.0462
I-PENTANE	0.0606	0.2539	0.0220	0.0221
N-PENTANE	0.0236	0.0989	0.0090	0.0090
HEXANES PLUS	0.0439	0.2353	0.0180	0.0180
TOTALS	100.00000	100.00000	1.5988	1.6074

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0001	0.0005
TOLUENE	0.0002	0.0011
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0001	0.0006
TOTAL BTEX	0.0004	0.0022

**(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 :	961.2 /scf	966.5 /scf
	NET WET REAL :	944.4 /scf	949.7 /scf
HHV	GROSS DRY REAL :	1065.4 /scf	1071.2 /scf
	GROSS WET REAL :	1046.8 /scf	1052.6 /scf

NET HEATING VALUE (60 °F ideal reaction):	21207.9 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	23507.7 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.5942
DENSITY	0.04537 **lbm/scf**
COMPRESSIBILITY FACTOR :	0.9977
REGULAR WOBBE INDEX	1383.2

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202412022	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	DECEMBER 09, 2024 16:35
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 3, 2024
PRODUCER :	QB ENERGY OPERATING, LLC	CYLINDER NO. :	ECA-702
LEASE NO. :		SAMPLED BY :	SHANE COLLETT
NAME/DESCRIP :	PICEANCE CREEK UNIT T35X-2G6 PRODUCTION CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	1211	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	0.08	0.20
Nitrogen	0.17	0.28
Methane	93.7749	87.3792
Ethane	4.2994	7.5089
Propane	0.9332	2.3901
Isobutane	0.2382	0.8042
n-Butane	0.1478	0.4989
Isopentane	0.0604	0.2531
n-Pentane	0.0236	0.0989
Cyclopentane	0.0002	0.0008
n-Hexane	0.0096	0.0480
Cyclohexane	0.0017	0.0083
Other Hexanes	0.0190	0.0948
Heptanes	0.0101	0.0587
Methylcyclohexane	0.0014	0.0080
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0001	0.0005
Toluene	0.0002	0.0011
Ethylbenzene	0.0000	0.0000
Xylenes	0.0001	0.0006
C8+ Heavies	0.0017	0.0153
Subtotal	99.81160	99.64940
Oxygen/Argon	0.00	0.00
Alcohols	0.1884	0.3506
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	961.2	4720.2	7629.1	8807.9	**Btu/scf**
	Net Wet Real:	944.4	4637.7	7495.7	8653.9	**Btu/scf**
HHV	Gross Dry Real:	1065.4	5089.4	8195.1	9478.2	**Btu/scf**
	Gross Wet Real:	1046.8	5000.4	8051.8	9312.5	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1383.2	2830.3	3578.2	3863.0	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		21207.9	19373.4	19406.5	19555.7	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23507.7	20890.1	20847.2	21044.1	**Btu/lbm**
Molar Mass (MW):		17.21791	92.286	152.741	175.438	**g/mol**
Relative Density (AIR=1):		0.5942	3.1865	5.2740	6.0575	**SG**
Density:		0.04537	0.24319	0.40250	0.46231	**lbm/scf**
Compressiblity Factor:		0.9977	0.9896	0.9996	1.0000	**Z**
Liquid Volume real gas @:	**14.65**	17.4392	0.0179	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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PRODUCER :	QB ENERGY OPERATING, LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	1211 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	ECA-702
LAB PRES:	psig	SAMPLED BY :	SHANE COLLETT
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	---	0.01	0.00	---	---
Hydrogen	---	0.03	0.00	---	---
Nitrogen	---	0.17	0.28	---	---
Carbon Dioxide	---	0.08	0.20	---	---
Methane	P1	93.7749	87.3792	---	---
Ethane	P2	4.2994	7.5089	1.146	1.152
Propane	P3	0.9332	2.3901	0.256	0.257
i-Butane	I4	0.2382	0.8042	0.078	0.078
Methanol	X1	0.1884	0.3506	0.024	0.024
n-Butane	P4	0.1478	0.4989	0.046	0.046
2,2-Dimethylpropane	I5	0.0029	0.0121	0.001	0.001
i-Pentane	I5	0.0575	0.2410	0.021	0.021
n-Pentane	P5	0.0236	0.0989	0.009	0.009
2,2-Dimethylbutane	I6	0.0015	0.0075	0.001	0.001
Cyclopentane	N5	0.0002	0.0008	0.000	0.000
2,3-Dimethylbutane	I6	0.0019	0.0095	0.001	0.001
2-Methylpentane	I6	0.0099	0.0495	0.004	0.004
3-Methylpentane	I6	0.0038	0.0190	0.002	0.002
n-Hexane	P6	0.0096	0.0480	0.004	0.004
2,2-Dimethylpentane	I7	0.0004	0.0023	0.000	0.000
Methylcyclopentane	N6	0.0019	0.0093	0.001	0.001
2,4-Dimethylpentane	I7	0.0008	0.0047	0.000	0.000
2,2,3-Trimethylbutane	I7	0.0001	0.0006	0.000	0.000
Benzene	A6	0.0001	0.0005	0.000	0.000
3,3-Dimethylpentane	I7	0.0001	0.0006	0.000	0.000
Cyclohexane	N6	0.0017	0.0083	0.001	0.001
2-Methylhexane	I7	0.0024	0.0139	0.001	0.001
2,3-Dimethylpentane	I7	0.0004	0.0023	0.000	0.000

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1,1-Dimethylcyclopentane	N7	0.0003	0.0017	0.000	0.000
3-Methylhexane	I7	0.0017	0.0099	0.001	0.001
1c,3-Dimethylcyclopentane	N7	0.0004	0.0023	0.000	0.000
1t,3-Dimethylcyclopentane	N7	0.0003	0.0017	0.000	0.000
3-Ethylpentane	I7	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0005	0.0029	0.000	0.000
n-Heptane	P7	0.0025	0.0146	0.001	0.001
1c,2-Dimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Methylcyclohexane	N7	0.0014	0.0080	0.001	0.001
Toluene	A7	0.0002	0.0011	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0001	0.0006	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
Ethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0001	0.0006	0.000	0.000
n-Nonane	P9	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
3-Ethyloctane	I10	0.0002	0.0016	0.000	0.000
n-Undecane	P11	0.0002	0.0018	0.000	0.000
n-Dodecane	P12	0.0001	0.0010	0.000	0.000
n-Tridecane	P13	0.0004	0.0043	0.000	0.000
n-Tetradecane	P14	0.0001	0.0012	0.000	0.000
UnknownC16s	U16	0.0001	0.0013	0.000	0.000
TOTAL		100.00000	100.00000	1.5988	1.6074

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0001	0.0005
TOLUENE	0.0002	0.0011
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0001	0.0006
TOTAL BTEX	0.0004	0.0022

**(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 :	961.2 /scf	966.5 /scf
NET WET REAL :	944.4 /scf	949.7 /scf
HHV GROSS DRY REAL :	1065.4 /scf	1071.2 /scf
GROSS WET REAL :	1046.8 /scf	1052.6 /scf
NET HEATING VALUE (60 °F ideal reaction):		21207.9 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		23507.7 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.5942
DENSITY		0.04537 lb/scf
COMPRESSIBILITY FACTOR :		0.9977
REGULAR WOBBE INDEX		1383.2

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

Net Dry Ideal BTU	4685.8 /scf	Relative Density - SG (Air=1)	3.1865	***C6+factors***
Gross Dry Ideal BTU	5052.3 /scf	**Z** Compressiblity Factor	0.98961	0.98892
Net Dry Ideal BTU	19373.4 /lb	Density Factor	243.193 lbm/1000 ft3	
Gross Dry Ideal BTU	20890.1 /lb	Molar Mass or MW	92.286 g/mol	
		Volume Liquid Ideal gas	0.018 scf/gal	23.5

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.