



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-103-09997** NAME/DESCRIP : **PCU 8-1 4602**
 LEASE #: **PRODUCTION CSG**
 FIELD/AREA:

PROJECT NO. : **202505077** ANALYSIS NO. : **02**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **MAY 19, 2025 20:19**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **MAY 1, 2025**
 CUSTOMER REF: **TO:**
 PRODUCER : **QB ENERGY OPERATING LLC** EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE:
 SAMPLE PRES. : 543 psig PROBE :
 FLOW PRES. : psig CYLINDER NO. : **ECA-754**
 LAB PRES: psig SAMPLED BY : **NICK CROY**
 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	MOLE %	MASS %	GPM @	
			14.65	14.73
ALCOHOLS	0.1173	0.1960	0.0150	0.0151
HELIUM	0.00	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.09	0.13	---	---
CARBON DIOXIDE	4.14	9.50	---	---
METHANE	86.7486	72.5599	---	---
ETHANE	6.0724	9.5201	1.6192	1.6280
PROPANE	1.5893	3.6540	0.4368	0.4392
I-BUTANE	0.3819	1.1573	0.1249	0.1256
N-BUTANE	0.2927	0.8870	0.0920	0.0925
I-PENTANE	0.1617	0.6078	0.0580	0.0583
N-PENTANE	0.0935	0.3517	0.0340	0.0342
HEXANES PLUS	0.3026	1.4362	0.1220	0.1224
TOTALS	100.00000	100.00000	2.5019	2.5153

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0044	0.0179
TOLUENE	0.0015	0.0072
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0000	0.0000
TOTAL BTEX	0.0059	0.0251

	CALCULATED VALUES**	
	14.65	14.73
BTU @		
LHV NET DRY REAL :	968.2 /scf	973.5 /scf
NET WET REAL :	951.3 /scf	956.6 /scf
HHV GROSS DRY REAL :	1070.9 /scf	1076.8 /scf
GROSS WET REAL :	1052.2 /scf	1058.1 /scf
NET HEATING VALUE (60 °F ideal reaction):		19163.7 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		21208.4 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6618
DENSITY		0.05054 lbm/scf
COMPRESSIBILITY FACTOR :		0.9974
REGULAR WOBBE INDEX		1317.1

*(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. :	202505077	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	MAY 19, 2025 20:19
ACCOUNT NO. :		SAMPLE DATE :	MAY 1, 2025
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	ECA-754
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	PCU 8-1 4602 PRODUCTION CSG		

FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :	543	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	—		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.00	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	4.14	9.50
Nitrogen	0.09	0.13
Methane	86.7486	72.5599
Ethane	6.0724	9.5201
Propane	1.5893	3.6540
Isobutane	0.3819	1.1573
n-Butane	0.2927	0.8870
Isopentane	0.1569	0.5902
n-Pentane	0.0935	0.3517
Cyclopentane	0.0048	0.0176
n-Hexane	0.0489	0.2197
Cyclohexane	0.0211	0.0926
Other Hexanes	0.1098	0.4909
Heptanes	0.0800	0.4164
Methylcyclohexane	0.0347	0.1776
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0044	0.0179
Toluene	0.0015	0.0072
Ethylbenzene	0.0000	0.0000
Xylenes	0.0000	0.0000
C8+ Heavies	0.0021	0.0133
<u>Subtotal</u>	<u>99.88270</u>	<u>99.80400</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.1173	0.1960
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
			Sample	Fraction	Fraction
LHV	Net Dry Real:	968.2	4630.5	5919.1	7689.3 Btu/scf
	Net Wet Real:	951.3	4549.6	5815.6	7554.9 Btu/scf
HHV	Gross Dry Real:	1070.9	4987.6	6414.7	8464.6 Btu/scf
	Gross Wet Real:	1052.2	4900.4	6302.6	8316.6 Btu/scf

Other Calculated Values					
Regualr Wobbe Index*		1317.1	2795.8	3145.7	3727.0 Btu/scf
Net Heating Value (60 °F ideal reaction):		19163.7	19308.4	19381.7	18765.0 Btu/lbm
Gross Heating Value (60°F ideal reaction):		21208.4	20797.9	20987.1	20611.7 Btu/lbm
Molar Mass (MW):		19.1801	91.03	120.418	150.282 g/mol
Relative Density (AIR=1):		0.6618	3.1428	4.1578	5.1888 SG
Density:		0.05054	0.23987	0.31732	0.39601 lbm/scf
Compressibility Factor:		0.9974	0.9906	0.9968	0.9998 Z
Liquid Volume real gas @:	14.65	17.832	0.1216	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 underscore) indicates there was no tube pulled for H2S.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

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

SAMPLE CYCLE: SAMPLE TYPE:
 SAMPLE PRES. : 543 psig PROBE :
 FLOW PRES. : psig CYLINDER NO. : ECA-754
 LAB PRES: psig SAMPLED BY : NICK CROY
 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
Hydrogen	---	0.01	0.00	---	---
Nitrogen	---	0.09	0.13	---	---
Carbon Dioxide	---	4.14	9.50	---	---
Methane	P1	86.7486	72.5599	---	---
Ethane	P2	6.0724	9.5201	1.619	1.628
Propane	P3	1.5893	3.6540	0.437	0.439
i-Butane	I4	0.3819	1.1573	0.125	0.126
Methanol	X1	0.1173	0.1960	0.015	0.015
n-Butane	P4	0.2927	0.8870	0.092	0.093
2,2-Dimethylpropane	I5	0.0051	0.0192	0.002	0.002
i-Pentane	I5	0.1518	0.5710	0.055	0.055
n-Pentane	P5	0.0933	0.3510	0.034	0.034
2,2-Dimethylbutane	I6	0.0080	0.0359	0.003	0.003
Cyclopentane	N5	0.0048	0.0176	0.001	0.001
2,3-Dimethylbutane	I6	0.0110	0.0494	0.004	0.004
2-Methylpentane	I6	0.0434	0.1950	0.018	0.018
3-Methylpentane	I6	0.0245	0.1101	0.010	0.010
UnknownC5s	U5	0.0002	0.0007	0.000	0.000
n-Hexane	P6	0.0489	0.2197	0.020	0.020
2,2-Dimethylpentane	I7	0.0011	0.0057	0.001	0.001
Methylcyclopentane	N6	0.0229	0.1005	0.008	0.008
2,4-Dimethylpentane	I7	0.0032	0.0167	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0008	0.0042	0.000	0.000
Benzene	A6	0.0044	0.0179	0.001	0.001
3,3-Dimethylpentane	I7	0.0012	0.0063	0.001	0.001
Cyclohexane	N6	0.0211	0.0926	0.007	0.007
2-Methylhexane	I7	0.0116	0.0606	0.005	0.005

2,3-Dimethylpentane	I7	0.0062	0.0324	0.003	0.003
1,1-Dimethylcyclopentane	N7	0.0028	0.0143	0.001	0.001
3-Methylhexane	I7	0.0128	0.0669	0.006	0.006
1c,3-Dimethylcyclopentane	N7	0.0037	0.0189	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0033	0.0169	0.002	0.002
3-Ethylpentane	I7	0.0009	0.0047	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0049	0.0251	0.002	0.002
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0261	0.1363	0.012	0.012
1c,2-Dimethylcyclopentane	N7	0.0004	0.0020	0.000	0.000
Methylcyclohexane	N7	0.0347	0.1776	0.014	0.014
2,2-Dimethylhexane	I8	0.0004	0.0024	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0003	0.0018	0.000	0.000
Ethylcyclopentane	N7	0.0007	0.0036	0.000	0.000
2,5-Dimethylhexane	I8	0.0003	0.0018	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0002	0.0012	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0015	0.0072	0.001	0.001
2-Methylheptane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0001	0.0006	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0001	0.0006	0.000	0.000
UnknownC10s	U10	0.0002	0.0015	0.000	0.000
2-Methylindan	A11	0.0001	0.0007	0.000	0.000
UnknownC13s	U13	0.0001	0.0009	0.000	0.000
TOTAL		100.0000	100.0000	2.5019	2.5153

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0044	0.0179	LHV NET DRY REAL :	968.2 /scf	973.5 /scf
TOLUENE	0.0015	0.0072	NET WET REAL :	951.3 /scf	956.6 /scf
ETHYLBENZENE	0.0000	0.0000	HHV GROSS DRY REAL :	1070.9 /scf	1076.8 /scf
XYLENES	0.0000	0.0000	GROSS WET REAL :	1052.2 /scf	1058.1 /scf
TOTAL BTEX	0.0059	0.0251	NET HEATING VALUE (60 °F ideal reaction):		19163.7 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		21208.4 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6618
			DENSITY		0.05054 lb/scf
			COMPRESSIBILITY FACTOR :		0.9974
			REGULAR WOBBE INDEX		1317.1

*(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>4601.6</u> /scf	Relative Density - SG (Air=1)	<u>3.1428</u>	C6+ factors
Gross Dry Ideal BTU	<u>4956.4</u> /scf	Z Compressibility Factor	<u>0.99064</u>	<u>0.99013</u>
Net Dry Ideal BTU	<u>19308.4</u> /lb	Density Factor	<u>239.867</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20797.9</u> /lb	Molar Mass or MW	<u>91.03</u> g/mol	
		Volume Liquid Ideal gas	<u>0.122</u> scf/gal	<u>24.5</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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