EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-103-10519** NAME/DESCRIP : **FF UNIT 8010D J11 498**
LEASE #: **SURFACE CASING**
FIELD/AREA:

PROJECT NO. : **202509082** ANALYSIS NO. : **02**
COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: SEPTEMBER 23, 2025 01:43
OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : SEPTEMBER 11, 2025
CUSTOMER REF: TO:
PRODUCER : EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE:
SAMPLE PRES. : psig PROBE :
FLOW PRES. : psig CYLINDER NO. : 1839
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
ALCOHOLS	0.0171	0.0308	0.0020	0.0020
HELIUM	0.02	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.01	0.02	---	---
NITROGEN	0.60	0.94	---	---
CARBON DIOXIDE	0.40	0.98	---	---
METHANE	93.2694	83.3900	---	---
ETHANE	2.6389	4.4223	0.7035	0.7073
PROPANE	1.3074	3.2130	0.3587	0.3607
I-BUTANE	0.3043	0.9857	0.0989	0.0995
N-BUTANE	0.4940	1.6002	0.1549	0.1557
I-PENTANE	0.2213	0.8891	0.0799	0.0804
N-PENTANE	0.1989	0.7998	0.0719	0.0723
HEXANES PLUS	0.5087	2.7291	0.2140	0.2146
TOTALS	100.00000	100.00000	1.6838	1.6925

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0104	0.0453
TOLUENE	0.0023	0.0118
ETHYLBENZENE	0.0011	0.0065
XYLENES	0.0021	0.0124
TOTAL BTEX	0.0159	0.0760

**(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 :	984.1 **/scf**	989.5 **/scf**
	NET WET REAL :	966.9 **/scf**	972.3 **/scf**
HHV	GROSS DRY REAL :	1089.4 **/scf**	1095.4 **/scf**
	GROSS WET REAL :	1070.4 **/scf**	1076.4 **/scf**

NET HEATING VALUE (60 °F ideal reaction):	20849.5 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	23083.6 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.6187
DENSITY	0.04728 **lbm/scf**
COMPRESSIBILITY FACTOR :	0.9976
REGULAR WOBBE INDEX	1386.0

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202509082	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	SEPTEMBER 23, 2025 01:43
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 11, 2025
PRODUCER :		CYLINDER NO. :	1839
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	FF UNIT 8010D J11 498 SURFACE CASING		
FIELD DATA		SAMPLE TEMP. :	
SAMPLE PRES. :		AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :			

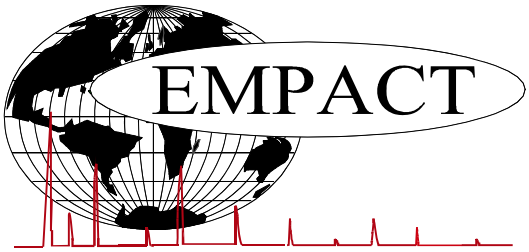
Componet	Mole %	Wt %
Helium	0.02	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	0.40	0.98
Nitrogen	0.60	0.94
Methane	93.2694	83.3900
Ethane	2.6389	4.4223
Propane	1.3074	3.2130
Isobutane	0.3043	0.9857
n-Butane	0.4940	1.6002
Isopentane	0.2151	0.8649
n-Pentane	0.1989	0.7998
Cyclopentane	0.0062	0.0242
n-Hexane	0.0816	0.3919
Cyclohexane	0.0224	0.1051
Other Hexanes	0.1402	0.6708
Heptanes	0.1098	0.6113
Methylcyclohexane	0.0435	0.2380
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0104	0.0453
Toluene	0.0023	0.0118
Ethylbenzene	0.0011	0.0065
Xylenes	0.0021	0.0124
C8+ Heavies	0.0952	0.6354
Subtotal	99.97290	99.94920
Oxygen/Argon	0.01	0.02
Alcohols	0.0171	0.0308
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	984.1	4878.1	5967.1	7272.0	**Btu/scf**
	Net Wet Real:	966.9	4792.8	5862.8	7144.9	**Btu/scf**
HHV	Gross Dry Real:	1089.4	5252.9	6421.7	7834.5	**Btu/scf**
	Gross Wet Real:	1070.4	5161.1	6309.4	7697.5	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1386.0	2868.4	3167.5	3502.0	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		20849.5	19344.9	19470.0	18407.8	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23083.6	20833.4	20957.1	19831.1	**Btu/lbm**
Molar Mass (MW):		17.9432	96.246	119.26	145.748	**g/mol**
Relative Density (AIR=1):		0.6187	3.3233	4.1180	5.0323	**SG**
Density:		0.04728	0.25364	0.31428	0.38407	**lbm/scf**
Compressiblity Factor:		0.9976	0.9924	0.9978	0.9996	**Z**
Liquid Volume real gas @:	**14.65**	17.5389	0.2133	0.0459	0.002	**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: **05-103-10519** NAME/DESCRIP : **FF UNIT 8010D J11 498**
LEASE #: **SURFACE CASING**
FIELD/AREA:

PROJECT NO. : **202509082** ANALYSIS NO. : **02**
COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: SEPTEMBER 23, 2025 01:43
OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : SEPTEMBER 11, 2025
CUSTOMER REF: TO:
PRODUCER : EFFECTIVE DATE:

FIELD DATA

SAMPLE CYCLE: SAMPLE TYPE:
SAMPLE PRES. : psig PROBE :
FLOW PRES. : psig CYLINDER NO. : 1839
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**
Helium	---	0.02	0.00	---	---
Hydrogen	---	0.01	0.00	---	---
Oxygen/Argon	---	0.01	0.02	---	---
Nitrogen	---	0.60	0.94	---	---
Carbon Dioxide	---	0.40	0.98	---	---
Methane	P1	93.2694	83.3900	---	---
Ethane	P2	2.6389	4.4223	0.704	0.707
Propane	P3	1.3074	3.2130	0.359	0.361
i-Butane	I4	0.3043	0.9857	0.099	0.100
Methanol	X1	0.0170	0.0304	0.002	0.002
n-Butane	P4	0.4940	1.6002	0.155	0.156
2,2-Dimethylpropane	I5	0.0032	0.0129	0.001	0.001
i-Pentane	I5	0.2119	0.8520	0.077	0.077
n-Pentane	P5	0.1988	0.7994	0.072	0.072
t-Butanol	X4	0.0001	0.0004	0.000	0.000
2,2-Dimethylbutane	I6	0.0034	0.0163	0.001	0.001
Cyclopentane	N5	0.0062	0.0242	0.002	0.002
2,3-Dimethylbutane	I6	0.0103	0.0495	0.004	0.004
2-Methylpentane	I6	0.0675	0.3242	0.028	0.028
3-Methylpentane	I6	0.0363	0.1743	0.015	0.015
UnknownC5s	U5	0.0001	0.0004	0.000	0.000
n-Hexane	P6	0.0816	0.3919	0.033	0.033
2,2-Dimethylpentane	I7	0.0014	0.0078	0.001	0.001
Methylcyclopentane	N6	0.0227	0.1065	0.008	0.008
2,4-Dimethylpentane	I7	0.0032	0.0179	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0005	0.0028	0.000	0.000
Benzene	A6	0.0104	0.0453	0.003	0.003
3,3-Dimethylpentane	I7	0.0007	0.0039	0.000	0.000

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

Cyclohexane	N6	0.0224	0.1051	0.008	0.008
2-Methylhexane	I7	0.0185	0.1033	0.009	0.009
2,3-Dimethylpentane	I7	0.0064	0.0357	0.003	0.003
1,1-Dimethylcyclopentane	N7	0.0023	0.0126	0.001	0.001
3-Methylhexane	I7	0.0184	0.1028	0.008	0.008
1c,3-Dimethylcyclopentane	N7	0.0042	0.0230	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0038	0.0208	0.002	0.002
3-Ethylpentane	I7	0.0014	0.0078	0.001	0.001
1t,2-Dimethylcyclopentane	N7	0.0073	0.0400	0.003	0.003
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0392	0.2189	0.018	0.018
1c,2-Dimethylcyclopentane	N7	0.0003	0.0016	0.000	0.000
Methylcyclohexane	N7	0.0435	0.2380	0.017	0.017
2,2-Dimethylhexane	I8	0.0017	0.0108	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0004	0.0025	0.000	0.000
Ethylcyclopentane	N7	0.0018	0.0099	0.001	0.001
2,5-Dimethylhexane	I8	0.0014	0.0089	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0015	0.0095	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0016	0.0100	0.001	0.001
3,3-Dimethylhexane	I8	0.0004	0.0026	0.000	0.000
2,3,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0023	0.0118	0.001	0.001
2,3-Dimethylhexane	I8	0.0016	0.0102	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0007	0.0045	0.000	0.000
2-Methylheptane	I8	0.0097	0.0618	0.005	0.005
4-Methylheptane	I8	0.0023	0.0147	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0003	0.0019	0.000	0.000
3,4-Dimethylhexane	I8	0.0004	0.0026	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0051	0.0325	0.003	0.003
1c,2t,3-Trimethylcyclopentane	N8	0.0057	0.0357	0.003	0.003
3-Ethylhexane	I8	0.0002	0.0013	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0024	0.0150	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0007	0.0044	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0005	0.0031	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0004	0.0025	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0010	0.0062	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0023	0.0144	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
n-Octane	P8	0.0153	0.0974	0.008	0.008
1c,4-Dimethylcyclohexane	N8	0.0011	0.0069	0.001	0.001
i-Propylcyclopentane	I8	0.0002	0.0012	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0015	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0001	0.0007	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
2,2-Dimethylheptane	I9	0.0008	0.0057	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0028	0.0197	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0007	0.0050	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0034	0.0213	0.002	0.002
n-Propylcyclopentane	N8	0.0012	0.0075	0.001	0.001
1c,3c,5-Trimethylcyclohexane	N9	0.0004	0.0028	0.000	0.000
2,5-Dimethylheptane	I9	0.0011	0.0079	0.001	0.001
3,3-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000

3,5-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000
2,6-Dimethylheptane	I9	0.0003	0.0021	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0004	0.0028	0.000	0.000
Ethylbenzene	I8	0.0011	0.0065	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0017	0.0100	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0006	0.000	0.000
3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0002	0.0015	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0015	0.000	0.000
4-Methyloctane	I9	0.0009	0.0064	0.001	0.001
2-Methyloctane	I9	0.0016	0.0114	0.001	0.001
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
3-Methyloctane	I9	0.0002	0.0015	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0017	0.0120	0.001	0.001
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0003	0.0018	0.000	0.000
i-Butylcyclopentane	N9	0.0009	0.0064	0.000	0.000
n-Nonane	P9	0.0063	0.0450	0.004	0.004
1,1-Methylethylcyclohexane	N9	0.0005	0.0035	0.000	0.000
i-Propylbenzene	A9	0.0004	0.0027	0.000	0.000
i-Propylcyclohexane	N9	0.0003	0.0021	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
2,4-Dimethyloctane	I10	0.0002	0.0016	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0010	0.0070	0.001	0.001
3,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0010	0.0067	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0006	0.0047	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0002	0.0013	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
5-Methylnonane	I10	0.0004	0.0032	0.000	0.000
1,2-Methylethylbenzene	A9	0.0004	0.0027	0.000	0.000
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Ethyloctane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0002	0.0016	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0015	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0017	0.0122	0.001	0.001
n-Decane	P10	0.0014	0.0111	0.001	0.001
3-Ethylnonane	I10	0.0001	0.0009	0.000	0.000
1,3-Diethylbenzene	A10	0.0003	0.0022	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0018	0.0143	0.001	0.001
n-Undecane	P11	0.0004	0.0035	0.000	0.000
UnknownC11s	U11	0.0001	0.0009	0.000	0.000
n-Dodecane	P12	0.0002	0.0019	0.000	0.000
1,4-Methyl-n-pentylbenzene	A12	0.0003	0.0027	0.000	0.000
n-Hexylbenzene	A12	0.0001	0.0009	0.000	0.000
n-Tridecane	P13	0.0001	0.0010	0.000	0.000
UnknownC14s	U14	0.0001	0.0011	0.000	0.000
TOTAL		100.00000	100.00000	1.6838	1.6925

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0104	0.0453
TOLUENE	0.0023	0.0118
ETHYLBENZENE	0.0011	0.0065
XYLENES	0.0021	0.0124
TOTAL BTEX	0.0159	0.0760

**(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 :	984.1 /scf	989.5 /scf
	NET WET REAL :	966.9 /scf	972.3 /scf
HHV	GROSS DRY REAL :	1089.4 /scf	1095.4 /scf
	GROSS WET REAL :	1070.4 /scf	1076.4 /scf
	NET HEATING VALUE (60 °F ideal reaction):		20849.5 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		23083.6 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6187
	DENSITY		0.04728 lb/scf
	COMPRESSIBILITY FACTOR :		0.9976
	REGULAR WOBBE INDEX		1386.0

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

					C6+factors
Net Dry Ideal BTU	4856 /scf	Relative Density - SG (Air=1)	3.3233		0.99165
Gross Dry Ideal BTU	5229.1 /scf	**Z** Compressiblity Factor	0.99235		
Net Dry Ideal BTU	19344.9 /lb	Density Factor	253.637	lbm/1000 ft3	
Gross Dry Ideal BTU	20833.4 /lb	Molar Mass or MW	96.246	g/mol	
		Volume Liquid Ideal gas	0.214	scf/gal	23.2

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.

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