

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: **05-045-21942** NAME/DESCRIP : **300108685 HMU 6-12DD (J6SEB)**
 LEASE #: **COC-55972E** CASING
 FIELD/AREA:

PROJECT NO. : **202504078** ANALYSIS NO. : **01**
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **APRIL 26, 2025 15:00**
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **APRIL 11, 2025**
 CUSTOMER REF: TO:
 PRODUCER : **QB ENERGY OPERATING LLC** EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: SPOT
 SAMPLE PRES. : 101 psig PROBE :
 FLOW PRES. : psig CYLINDER NO. : ECA-733
 LAB PRES: psig SAMPLED BY : MIKE KELLEY
 SAMPLE TEMP. : 42 °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	0.4110	0.8112	0.0680	0.0683
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.08	0.12	---	---
CARBON DIOXIDE	3.05	7.20	---	---
METHANE	90.0641	77.5026	---	---
ETHANE	3.9242	6.3294	1.0463	1.0520
PROPANE	1.1259	2.6631	0.3088	0.3105
I-BUTANE	0.2663	0.8302	0.0869	0.0874
N-BUTANE	0.2623	0.8177	0.0819	0.0824
I-PENTANE	0.1549	0.5988	0.0560	0.0563
N-PENTANE	0.1037	0.4013	0.0370	0.0372
HEXANES PLUS	0.5476	2.7257	0.2220	0.2228
TOTALS	100.00000	100.00000	1.9069	1.9169

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0219	0.0918
TOLUENE	0.0324	0.1601
ETHYLBENZENE	0.0003	0.0017
XYLENES	0.0028	0.0159
TOTAL BTEX	0.0574	0.2695

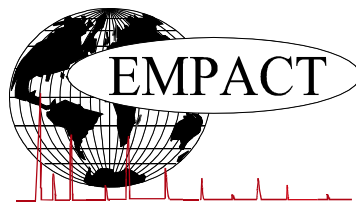
	CALCULATED VALUES**	
	14.65	14.73
BTU @		
LHV NET DRY REAL :	963.7 /scf	968.9 /scf
NET WET REAL :	946.9 /scf	952.1 /scf
HHV GROSS DRY REAL :	1067.2 /scf	1073.0 /scf
GROSS WET REAL :	1048.5 /scf	1054.3 /scf
NET HEATING VALUE (60 °F ideal reaction):		19644.7 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		21749.4 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6429
DENSITY		0.04912 lbm/scf
COMPRESSIBILITY FACTOR :		0.9975
REGULAR WOBBE INDEX		1331.9

*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730,GPA 2261 & GPA 2286.

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

The data presented herein has been acquired by means of current analytical techniques and represents the judicious conclusion EMPACT Analytical Systems, Inc. Results of the analysis can be affected by the sampling conditions, therefore, are only warranted through proper lab protocol. EMPACT assumes no responsibility for interpretation or any consequences from application of the reported information and is the sole liability of the user. The reproduction in any media of this reported information may not be made, in portion or as a whole, without the written permission of EMPACT Analytical Systems, Inc.



**EXTENDED NATURAL GAS ANALYSIS (*DHA)
GLYCALC INFORMATION**

PROJECT NO. :	202504078	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	APRIL 26, 2025 15:00
ACCOUNT NO. :		SAMPLE DATE :	APRIL 11, 2025
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	ECA-733
LEASE NO. :	COC-55972E	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	300108685 HMU 6-12DD (J6SEB) CASING		

FIELD DATA

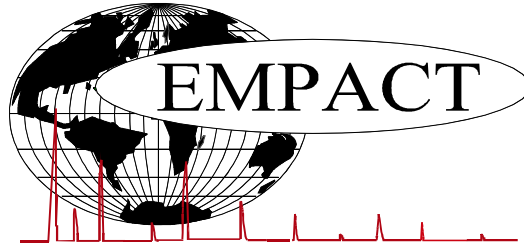
SAMPLE PRES. :	101	SAMPLE TEMP. :	42
H2S BY STAIN TUBE:	— ppm mol	AMBIENT TEMP.:	
COMMENTS :	SPOT		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	3.05	7.20
Nitrogen	0.08	0.12
Methane	90.0641	77.5026
Ethane	3.9242	6.3294
Propane	1.1259	2.6631
Isobutane	0.2663	0.8302
n-Butane	0.2623	0.8177
Isopentane	0.1481	0.5732
n-Pentane	0.1037	0.4013
Cyclopentane	0.0068	0.0256
n-Hexane	0.0666	0.3078
Cyclohexane	0.0416	0.1878
Other Hexanes	0.1458	0.6695
Heptanes	0.1187	0.6355
Methylcyclohexane	0.0752	0.3961
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0219	0.0918
Toluene	0.0324	0.1601
Ethylbenzene	0.0003	0.0017
Xylenes	0.0028	0.0159
C8+ Heavies	0.0422	0.2589
Subtotal	99.58900	99.18880
Oxygen/Argon	0.00	0.00
Alcohols	0.4110	0.8112
Total	100.00000	100.00000

Calculated Values BTU @		Total	C6+	C8+	C10+		
						Sample	Fraction
LHV	Net Dry Real:	963.7	4669.5	5703.3	#DIV/0!	Btu/scf	
	Net Wet Real:	946.9	4587.9	5603.6	#DIV/0!	Btu/scf	
HHV	Gross Dry Real:	1067.2	5015.5	6138.4	#DIV/0!	Btu/scf	
	Gross Wet Real:	1048.5	4927.8	6031.1	#DIV/0!	Btu/scf	
Other Calculated Values	Regualr Wobbe Index*	1331.9	2789.7	3097.3	#DIV/0!	Btu/scf	
	Net Heating Value (60 °F ideal reaction):	19644.7	19227.0	19983.3	#DIV/0!	Btu/lbm	
	Gross Heating Value (60°F ideal reaction):	21749.4	20654.6	21508.8	#DIV/0!	Btu/lbm	
	Molar Mass (MW):	18.64308	92.782	113.759	#DIV/0!	g/mol	
	Relative Density (AIR=1):	0.6429	3.2031	3.9280	#DIV/0!	SG	
	Density:	0.04912	0.24451	0.29976	#DIV/0!	lbm/scf	
	Compressibility Factor:	0.9975	0.9923	0.9969	#DIV/0!	Z	
	Liquid Volume real gas @:	14.65	17.6107	0.2213	0.0209		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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DHA COMPONENT LIST

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 FLOW PRES. : psig CYLINDER NO. : **ECA-733**
 LAB PRES: psig SAMPLED BY : **MIKE KELLEY**
 SAMPLE TEMP. : **42** °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
Helium	---	0.01	0.00	---	---
Nitrogen	---	0.08	0.12	---	---
Carbon Dioxide	---	3.05	7.20	---	---
Methane	P1	90.0641	77.5026	---	---
Ethane	P2	3.9242	6.3294	1.046	1.052
Propane	P3	1.1259	2.6631	0.309	0.311
i-Butane	I4	0.2663	0.8302	0.087	0.087
Methanol	X1	0.3412	0.5865	0.043	0.043
n-Butane	P4	0.2623	0.8177	0.082	0.082
2,2-Dimethylpropane	I5	0.0035	0.0136	0.001	0.001
Ethanol	X2	0.0002	0.0005	0.000	0.000
i-Pentane	I5	0.1446	0.5596	0.053	0.053
Acetone	X3	0.0019	0.0059	0.001	0.001
i-Propanol	X3	0.0677	0.2183	0.024	0.024
n-Pentane	P5	0.1037	0.4013	0.037	0.037
2,2-Dimethylbutane	I6	0.0065	0.0300	0.003	0.003
Cyclopentane	N5	0.0068	0.0256	0.002	0.002
2,3-Dimethylbutane	I6	0.0132	0.0610	0.005	0.005
2-Methylpentane	I6	0.0533	0.2464	0.022	0.022
3-Methylpentane	I6	0.0313	0.1447	0.013	0.013
n-Hexane	P6	0.0666	0.3078	0.027	0.027
2,2-Dimethylpentane	I7	0.0014	0.0075	0.001	0.001
Methylcyclopentane	N6	0.0415	0.1874	0.015	0.015
2,4-Dimethylpentane	I7	0.0042	0.0226	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0011	0.0059	0.001	0.001
Benzene	A6	0.0219	0.0918	0.006	0.006
3,3-Dimethylpentane	I7	0.0014	0.0075	0.001	0.001
Cyclohexane	N6	0.0416	0.1878	0.014	0.014
2-Methylhexane	I7	0.0165	0.0887	0.008	0.008
2,3-Dimethylpentane	I7	0.0085	0.0457	0.004	0.004

1,1-Dimethylcyclopentane	N7	0.0043	0.0226	0.002	0.002
3-Methylhexane	I7	0.0179	0.0962	0.008	0.008
1c,3-Dimethylcyclopentane	N7	0.0066	0.0348	0.003	0.003
1t,3-Dimethylcyclopentane	N7	0.0060	0.0316	0.003	0.003
3-Ethylpentane	I7	0.0007	0.0038	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0096	0.0506	0.004	0.004
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0362	0.1946	0.017	0.017
1c,2-Dimethylcyclopentane	N7	0.0010	0.0053	0.000	0.000
Methylcyclohexane	N7	0.0752	0.3961	0.030	0.030
2,2-Dimethylhexane	I8	0.0012	0.0074	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0009	0.0054	0.000	0.000
Ethylcyclopentane	N7	0.0024	0.0127	0.001	0.001
2,5-Dimethylhexane	I8	0.0016	0.0098	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0016	0.0098	0.001	0.001
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0012	0.0072	0.001	0.001
3,3-Dimethylhexane	I8	0.0005	0.0031	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	0.0324	0.1601	0.011	0.011
2,3-Dimethylhexane	I8	0.0009	0.0055	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0003	0.0018	0.000	0.000
2-Methylheptane	I8	0.0050	0.0306	0.003	0.003
4-Methylheptane	I8	0.0015	0.0092	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0002	0.0012	0.000	0.000
3,4-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0021	0.0129	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0070	0.0421	0.004	0.004
3-Ethylhexane	I8	0.0012	0.0074	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0031	0.0187	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0010	0.0060	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
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	0.0017	0.0103	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0062	0.0380	0.003	0.003
1c,4-Dimethylcyclohexane	N8	0.0009	0.0054	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,2-Dimethylheptane	I9	0.0002	0.0014	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0008	0.0054	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0004	0.0024	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0012	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,5-Dimethylheptane	I9	0.0003	0.0020	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0003	0.0017	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0019	0.0108	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0007	0.0040	0.000	0.000
3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0001	0.0007	0.000	0.000
2-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0002	0.0011	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
UnknownC9s	U9	0.0001	0.0007	0.000	0.000
TOTAL		100.00000	100.00000	1.9069	1.9169

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0219	0.0918	LHV NET DRY REAL :	963.7 /scf	968.9 /scf
TOLUENE	0.0324	0.1601	NET WET REAL :	946.9 /scf	952.1 /scf
ETHYLBENZENE	0.0003	0.0017	HHV GROSS DRY REAL :	1067.2 /scf	1073.0 /scf
XYLENES	0.0028	0.0159	GROSS WET REAL :	1048.5 /scf	1054.3 /scf
TOTAL BTEX	0.0574	0.2695	NET HEATING VALUE (60 °F ideal reaction):		19644.7 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		21749.4 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6429
			DENSITY		0.04912 lb/scf
			COMPRESSIBILITY FACTOR :		0.9975
			REGULAR WOBBE INDEX		1331.9

*(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>4648.2</u> /scf	Relative Density - SG (Air=1)	<u>3.2031</u>	C6+ factors
Gross Dry Ideal BTU	<u>4992.7</u> /scf	Z Compressibility Factor	<u>0.99233</u>	<u>0.99175</u>
Net Dry Ideal BTU	<u>19227</u> /lb	Density Factor	<u>244.514</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20654.6</u> /lb	Molar Mass or MW	<u>92.782</u> g/mol	
		Volume Liquid Ideal gas	<u>0.222</u> scf/gal	<u>24.6</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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