EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-21605**	NAME/DESCRIP :	**300108685 J6SEB 6-12DD**
LEASE #:	**COC-55972E**		**BRADEN HEAD**
FIELD/AREA:	**MAMM CREEK**		

PROJECT NO. :	**202511013**	ANALYSIS NO. :	**01**
COMPANY NAME :	**QB ENERGY OPERATING, LLC**	ANALYSIS DATE:	NOVEMBER 18, 2025 11:34
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	OCTOBER 15, 2025
CUSTOMER REF:		TO:	
PRODUCER :	QB ENERGY OPERATING LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	378	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-806
LAB PRES:		psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	57	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	0.0001	0.0002	0.0000	0.0000
HELIUM	0.02	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.77	1.21	---	---
CARBON DIOXIDE	2.29	5.65	---	---
METHANE	92.2271	82.9673	---	---
ETHANE	3.2441	5.4700	0.8643	0.8690
PROPANE	0.7917	1.9576	0.2178	0.2190
I-BUTANE	0.1742	0.5678	0.0570	0.0573
N-BUTANE	0.1511	0.4925	0.0480	0.0482
I-PENTANE	0.0730	0.2950	0.0270	0.0271
N-PENTANE	0.0420	0.1699	0.0150	0.0151
HEXANES PLUS	0.2167	1.2197	0.0890	0.0890
TOTALS	100.00000	100.00000	1.3181	1.3247

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0058	0.0254
TOLUENE	0.0115	0.0594
ETHYLBENZENE	0.0014	0.0084
XYLENES	0.0120	0.0715
TOTAL BTEX	0.0307	0.1647

**(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 :	932.8	/scf	937.9	/scf
	NET WET REAL :	916.5	/scf	921.6	/scf
HHV	GROSS DRY REAL :	1034.2	/scf	1039.9	/scf
	GROSS WET REAL :	1016.1	/scf	1021.8	/scf
	NET HEATING VALUE (60 °F ideal reaction):			19886.5	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):			22041.8	Btu/lbm
	RELATIVE DENSITY (AIR=1):			0.6152	
	DENSITY			0.04699	lbm/scf
	COMPRESSIBILITY FACTOR :			0.9977	
	REGULAR WOBBE INDEX			1319.7	

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202511013	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	NOVEMBER 18, 2025 11:34
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 15, 2025
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	ECA-806
LEASE NO. :	COC-55972E	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	300108685 J6SEB 6-12DD BRADEN HEAD		
FIELD DATA		SAMPLE TEMP. :	57
SAMPLE PRES. :	378	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT* *NO PROBE*		

Componet	Mole %	Wt %
Helium	0.02	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	2.29	5.65
Nitrogen	0.77	1.21
Methane	92.2271	82.9673
Ethane	3.2441	5.4700
Propane	0.7917	1.9576
Isobutane	0.1742	0.5678
n-Butane	0.1511	0.4925
Isopentane	0.0708	0.2864
n-Pentane	0.0420	0.1699
Cyclopentane	0.0022	0.0086
n-Hexane	0.0185	0.0894
Cyclohexane	0.0102	0.0481
Other Hexanes	0.0437	0.2100
Heptanes	0.0325	0.1816
Methylcyclohexane	0.0210	0.1156
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0058	0.0254
Toluene	0.0115	0.0594
Ethylbenzene	0.0014	0.0084
Xylenes	0.0120	0.0715
C8+ Heavies	0.0601	0.4103
Subtotal	99.99990	99.99980
Oxygen/Argon	0.00	0.00
Alcohols	0.0001	0.0002
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**	**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV Net Dry Real:	932.8	5017.9	5885.1	7031.2	**Btu/scf**
Net Wet Real:	916.5	4930.2	5782.2	6908.3	**Btu/scf**
HHV Gross Dry Real:	1034.2	5384.9	6310.9	7562.1	**Btu/scf**
Gross Wet Real:	1016.1	5290.8	6200.6	7429.9	**Btu/scf**
Other Calculated Values					
Regualr Wobbe Index*	1319.7	2885.3	3118.0	3427.6	**Btu/scf**
Net Heating Value (60 °F ideal reaction):	19886.5	19160.9	19229.1	19094.1	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):	22041.8	20565.1	20624.4	20534.9	**Btu/lbm**
Molar Mass (MW):	17.83405	100.419	118.992	141.72	**g/mol**
Relative Density (AIR=1):	0.6152	3.4664	4.1082	4.8934	**SG**
Density:	0.04699	0.26462	0.31354	0.37346	**lbm/scf**
Compressiblity Factor:	0.9977	0.9945	0.9983	0.9995	**Z**
Liquid Volume real gas @: **14.65**	17.3366	0.0887	0.0329	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.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:	**05-045-21942**	NAME/DESCRIP :	**300108685 J6SEB 6-12DD**
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PRODUCER :	QB ENERGY OPERATING LLC	EFFECTIVE DATE:	
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FLOW PRES. :	psig	CYLINDER NO. :	ECA-806
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SAMPLE TEMP. :	57 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	---	---
Nitrogen	---	0.77	1.21	---	---
Carbon Dioxide	---	2.29	5.65	---	---
Methane	P1	92.2271	82.9673	---	---
Ethane	P2	3.2441	5.4700	0.864	0.869
Propane	P3	0.7917	1.9576	0.218	0.219
i-Butane	I4	0.1742	0.5678	0.057	0.057
Methanol	X1	0.0001	0.0002	0.000	0.000
n-Butane	P4	0.1511	0.4925	0.048	0.048
2,2-Dimethylpropane	I5	0.0027	0.0109	0.001	0.001
i-Pentane	I5	0.0681	0.2755	0.025	0.025
n-Pentane	P5	0.0420	0.1699	0.015	0.015
2,2-Dimethylbutane	I6	0.0028	0.0135	0.001	0.001
Cyclopentane	N5	0.0022	0.0086	0.001	0.001
2,3-Dimethylbutane	I6	0.0046	0.0222	0.002	0.002
2-Methylpentane	I6	0.0168	0.0812	0.007	0.007
3-Methylpentane	I6	0.0096	0.0464	0.004	0.004
n-Hexane	P6	0.0185	0.0894	0.008	0.008
2,2-Dimethylpentane	I7	0.0007	0.0039	0.000	0.000
Methylcyclopentane	N6	0.0099	0.0467	0.003	0.003
2,4-Dimethylpentane	I7	0.0012	0.0067	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0003	0.0017	0.000	0.000
Benzene	A6	0.0058	0.0254	0.002	0.002
3,3-Dimethylpentane	I7	0.0004	0.0022	0.000	0.000
Cyclohexane	N6	0.0102	0.0481	0.003	0.003
2-Methylhexane	I7	0.0052	0.0292	0.002	0.002

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2,3-Dimethylpentane	I7	0.0015	0.0084	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0011	0.0061	0.000	0.000
3-Methylhexane	I7	0.0048	0.0270	0.002	0.002
1c,3-Dimethylcyclopentane	N7	0.0017	0.0094	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0015	0.0082	0.001	0.001
3-Ethylpentane	I7	0.0002	0.0011	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0024	0.0132	0.001	0.001
n-Heptane	P7	0.0104	0.0584	0.005	0.005
1c,2-Dimethylcyclopentane	N7	0.0002	0.0011	0.000	0.000
Methylcyclohexane	N7	0.0210	0.1156	0.008	0.008
2,2-Dimethylhexane	I8	0.0006	0.0039	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0008	0.0044	0.000	0.000
2,5-Dimethylhexane	I8	0.0007	0.0045	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0006	0.0039	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0005	0.0031	0.000	0.000
3,3-Dimethylhexane	I8	0.0002	0.0013	0.000	0.000
Toluene	A7	0.0115	0.0594	0.004	0.004
2,3-Dimethylhexane	I8	0.0005	0.0032	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0032	0.0205	0.002	0.002
4-Methylheptane	I8	0.0010	0.0064	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0025	0.0160	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0040	0.0252	0.002	0.002
3-Ethylhexane	I8	0.0002	0.0013	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0018	0.0113	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0006	0.0038	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0006	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	0.0013	0.0082	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0003	0.0019	0.000	0.000
n-Octane	P8	0.0077	0.0493	0.004	0.004
1c,4-Dimethylcyclohexane	N8	0.0010	0.0063	0.001	0.001
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0002	0.0015	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0004	0.0029	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0013	0.0092	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0004	0.0029	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0013	0.0082	0.001	0.001
n-Propylcyclopentane	N8	0.0005	0.0031	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0004	0.0028	0.000	0.000
2,5-Dimethylheptane	I9	0.0010	0.0072	0.001	0.001
3,3-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0014	0.0084	0.001	0.001
2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0080	0.0476	0.003	0.003
1,4-Dimethylbenzene (p-Xylene)	A8	0.0026	0.0155	0.001	0.001

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-Ethylheptane	I9	0.0002	0.0015	0.000	0.000
4-Methyloctane	I9	0.0010	0.0072	0.001	0.001
2-Methyloctane	I9	0.0016	0.0115	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	0.0015	0.0106	0.001	0.001
1,1,2-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0014	0.0084	0.001	0.001
i-Butylcyclopentane	N9	0.0010	0.0071	0.001	0.001
n-Nonane	P9	0.0069	0.0496	0.004	0.004
1,1-Methylethylcyclohexane	N9	0.0005	0.0035	0.000	0.000
i-Propylbenzene	A9	0.0002	0.0014	0.000	0.000
i-Propylcyclohexane	N9	0.0002	0.0014	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
2,5-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0006	0.0043	0.000	0.000
3,3-Dimethyloctane	I10	0.0003	0.0024	0.000	0.000
n-Propylbenzene	A9	0.0008	0.0054	0.000	0.000
3,6-Dimethyloctane	I10	0.0002	0.0016	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0008	0.0054	0.000	0.000
1,4-Methylethylbenzene	A9	0.0003	0.0020	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0011	0.0074	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
5-Methylnonane	I10	0.0003	0.0024	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	0.0003	0.0024	0.000	0.000
t-Butylbenzene	A10	0.0008	0.0060	0.000	0.000
i-Butylcyclohexane	N10	0.0002	0.0016	0.000	0.000
UnknownC9s	U9	0.0011	0.0079	0.001	0.001
n-Decane	P10	0.0009	0.0072	0.001	0.001
1,3-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0022	0.0176	0.001	0.001
n-Undecane	P11	0.0001	0.0009	0.000	0.000
1,2-Methyl-n-butylbenzene	A11	0.0001	0.0008	0.000	0.000
sec-Pentylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC11s	U11	0.0002	0.0017	0.000	0.000
TOTAL		100.00000	100.00000	1.3181	1.3247

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0058	0.0254
TOLUENE	0.0115	0.0594
ETHYLBENZENE	0.0014	0.0084
XYLENES	0.0120	0.0715
TOTAL BTEX	0.0307	0.1647

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Mod ASTM D6730,GPA 2261 & GPA 2286.

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	NET HEATING VALUE (60 °F ideal reaction):			19886.5	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):			22041.8	Btu/lbm
	RELATIVE DENSITY (AIR=1):			0.6152	
	DENSITY			0.04699	lb/scf
	COMPRESSIBILITY FACTOR :			0.9977	
	REGULAR WOBBE INDEX			1319.7	

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

Net Dry Ideal BTU	5005.9 **/scf**	Relative Density - SG (Air=1)	3.4664		***C6+factors***
Gross Dry Ideal BTU	5372 **/scf**	**Z** Compressiblity Factor	0.99448		0.99342
Net Dry Ideal BTU	19160.9 **/lb**	Density Factor	264.616	**lbm/1000 ft3**	
Gross Dry Ideal BTU	20565.1 **/lb**	Molar Mass or MW	100.419	**g/mol**	
		Volume Liquid Ideal gas	0.089	**scf/gal**	23.3

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.