



**EXTENDED NATURAL GAS ANALYSIS (\*DHA)**

**MAIN PAGE**

PRIMARY DB KEY:	<b>05-045-13542</b>	NAME/DESCRIP :	<b>300106008 C100U SATTERFIELD 10-2</b>
LEASE #:	<b>COC-86496A</b>		<b>BRADEN HEAD</b>
FIELD/AREA:	<b>GRAND VALLEY</b>		
PROJECT NO. :	<b>202603076</b>	ANALYSIS NO. :	<b>01</b>
COMPANY NAME :	<b>QB ENERGY OPERATING, LLC</b>	ANALYSIS DATE:	<b>APRIL 09, 2026 14:47</b>
OFFICE / BRANCH:	<b>PARACHUTE, CO</b>	SAMPLE DATE :	<b>MARCH 9, 2026</b>
CUSTOMER REF:		TO:	
PRODUCER :	<b>QB ENERGY OPERATING LLC</b>	EFFECTIVE DATE:	

**\*\*\*FIELD DATA\*\*\***

SAMPLE CYCLE:		SAMPLE TYPE:	<b>SPOT</b>
SAMPLE PRES. :	397 psig	PROBE :	<b>NO</b>
FLOW PRES. :	psig	CYLINDER NO. :	<b>ECA-4</b>
LAB PRES:	psig	SAMPLED BY :	<b>MIKE KELLEY</b>
SAMPLE TEMP. :	61 °f	SAMPLING COMPANY:	<b>QB ENERGY</b>
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	<b>- ppm mol</b>
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	<b>- Mol %</b>
FIELD COMMENTS:			
LAB COMMENTS:			

<u>COMPONENT</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>GPM @ 14.65</u>	<u>GPM @ 14.73</u>
ALCOHOLS	0.0001	0.0004	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.13	0.21	---	---
CARBON DIOXIDE	0.03	0.08	---	---
METHANE	94.7270	88.3104	---	---
ETHANE	3.5183	6.1478	0.9382	0.9433
PROPANE	0.8538	2.1879	0.2348	0.2361
I-BUTANE	0.1887	0.6374	0.0619	0.0623
N-BUTANE	0.1808	0.6108	0.0570	0.0573
I-PENTANE	0.0861	0.3606	0.0310	0.0311
N-PENTANE	0.0586	0.2457	0.0210	0.0211
HEXANES PLUS	0.2166	1.2090	0.0860	0.0862
<b>TOTALS</b>	<b>100.00000</b>	<b>100.00000</b>	<b>1.4299</b>	<b>1.4374</b>

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0029	0.0132
TOLUENE	0.0011	0.0059
ETHYLBENZENE	0.0003	0.0019
XYLENES	0.0006	0.0036
<b>TOTAL BTEX</b>	<b>0.0049</b>	<b>0.0246</b>

	<u>BTU @ 14.65</u>	<u>14.73</u>
<b>LHV NET DRY REAL :</b>	<b>963.8 /scf</b>	<b>969.1 /scf</b>
<b>NET WET REAL :</b>	<b>947.0 /scf</b>	<b>952.3 /scf</b>
<b>HHV GROSS DRY REAL :</b>	<b>1068.4 /scf</b>	<b>1074.2 /scf</b>
<b>GROSS WET REAL :</b>	<b>1049.7 /scf</b>	<b>1055.5 /scf</b>
<b>NET HEATING VALUE (60 °F ideal reaction):</b>		<b>21285.9 Btu/lbm</b>
<b>GROSS HEATING VALUE (60°F ideal reaction):</b>		<b>23591.5 Btu/lbm</b>
<b>RELATIVE DENSITY (AIR=1):</b>		<b>0.5936</b>
<b>DENSITY</b>		<b>0.04534 lbm/scf</b>
<b>COMPRESSIBILITY FACTOR :</b>		<b>0.9977</b>
<b>REGULAR WOBBE INDEX</b>		<b>1387.9</b>

\*(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. :	202603076	ANALYSIS NO. :	01
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	APRIL 09, 2026 14:47
ACCOUNT NO. :		SAMPLE DATE :	MARCH 9, 2026
PRODUCER :	QB ENERGY OPERATING LLC	CYLINDER NO. :	ECA-4
LEASE NO. :	COC-86496A	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	300106008 C10OU SATTERFIELD 10-2 BRADEN HEAD		

***FIELD DATA***		SAMPLE TEMP. :	61
SAMPLE PRES. :	397	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	—		
COMMENTS :	<i>SPOT</i>		<i>NO PROBE</i>

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	0.03	0.08
Nitrogen	0.13	0.21
Methane	94.7270	88.3104
Ethane	3.5183	6.1478
Propane	0.8538	2.1879
Isobutane	0.1887	0.6374
n-Butane	0.1808	0.6108
Isopentane	0.0835	0.3500
n-Pentane	0.0586	0.2457
Cyclopentane	0.0026	0.0106
n-Hexane	0.0263	0.1317
Cyclohexane	0.0149	0.0729
Other Hexanes	0.0543	0.2706
Heptanes	0.0467	0.2708
Methylcyclohexane	0.0292	0.1666
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0029	0.0132
Toluene	0.0011	0.0059
Ethylbenzene	0.0003	0.0019
Xylenes	0.0006	0.0036
C8+ Heavies	0.0402	0.2712
<u>Subtotal</u>	<u>99.99990</u>	<u>99.99960</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0001	0.0004
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

	<u>Total</u>	<u>C6+</u>	<u>C8+</u>	<u>C10+</u>
<b>Calculated Values BTU @</b> <b>14.65</b>	<b>Sample</b>	<b>Fraction</b>	<b>Fraction</b>	<b>Fraction</b>
LHV Net Dry Real:	963.8	4864.5	5828.5	7167.7 Btu/scf
Net Wet Real:	947.0	4779.5	5726.6	7042.4 Btu/scf
HHV Gross Dry Real:	1068.4	5236.9	6277.7	7719.4 Btu/scf
Gross Wet Real:	1049.7	5145.4	6168.0	7584.5 Btu/scf
<b>Other Calculated Values</b>				
Regualr Wobbe Index*	1387.9	2863.7	3140.9	3492.1 Btu/scf
Net Heating Value (60 °F ideal reaction):	21285.9	19389.1	19798.8	19168.4 Btu/lbm
Gross Heating Value (60°F ideal reaction):	23591.5	20875.1	21325.5	20643.6 Btu/lbm
Molar Mass (MW):	17.20818	96.034	115.789	142.284 g/mol
Relative Density (AIR=1):	0.5936	3.3159	3.9978	4.9127 SG
Density:	0.04534	0.25307	0.30514	0.37494 lbm/scf
Compressibility Factor:	0.9977	0.9927	0.9973	0.9996 Z
Liquid Volume real gas @:	<b>14.65</b>	17.4143	0.0857	0.0159
				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**

PRIMARY DB KEY: **05-045-13542** NAME/DESCRIP : **300106008 C10OU SATTERFIELD 10-2**  
 LEASE #: **COC-86496A** **BRADEN HEAD**  
 FIELD/AREA: **GRAND VALLEY**

PROJECT NO. : **202603076** ANALYSIS NO. : **01**  
 COMPANY NAME : **QB ENERGY OPERATING, LLC** ANALYSIS DATE: **APRIL 09, 2026 14:47**  
 OFFICE / BRANCH: **PARACHUTE, CO** SAMPLE DATE : **MARCH 9, 2026**  
 CUSTOMER REF: **TO:**  
 PRODUCER : **QB ENERGY OPERATING LLC** EFFECTIVE DATE:

**\*\*\*FIELD DATA\*\*\***

SAMPLE CYCLE: SAMPLE TYPE: **SPOT**  
 SAMPLE PRES. : **397** **psig** PROBE : **NO**  
 FLOW PRES. : **psig** CYLINDER NO. : **ECA-4**  
 LAB PRES: **psig** SAMPLED BY : **MIKE KELLEY**  
 SAMPLE TEMP. : **61** **°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	---	0.13	0.21	---	---
Carbon Dioxide	---	0.03	0.08	---	---
Methane	P1	94.7270	88.3104	---	---
Ethane	P2	3.5183	6.1478	0.938	0.943
Propane	P3	0.8538	2.1879	0.235	0.236
i-Butane	I4	0.1887	0.6374	0.062	0.062
n-Butane	P4	0.1807	0.6104	0.057	0.057
2,2-Dimethylpropane	I5	0.0038	0.0159	0.001	0.001
i-Pentane	I5	0.0797	0.3341	0.029	0.029
UnknownC4s	U4	0.0001	0.0004	0.000	0.000
n-Pentane	P5	0.0585	0.2453	0.021	0.021
t-Butanol	X4	0.0001	0.0004	0.000	0.000
2,2-Dimethylbutane	I6	0.0038	0.0190	0.002	0.002
Cyclopentane	N5	0.0026	0.0106	0.001	0.001
2,3-Dimethylbutane	I6	0.0053	0.0266	0.002	0.002
2-Methylpentane	I6	0.0213	0.1067	0.009	0.009
3-Methylpentane	I6	0.0119	0.0596	0.005	0.005
UnknownC5s	U5	0.0001	0.0004	0.000	0.000
n-Hexane	P6	0.0263	0.1317	0.011	0.011
2,2-Dimethylpentane	I7	0.0010	0.0058	0.000	0.000
Methylcyclopentane	N6	0.0120	0.0587	0.004	0.004
2,4-Dimethylpentane	I7	0.0016	0.0093	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0005	0.0029	0.000	0.000
Benzene	A6	0.0029	0.0132	0.001	0.001
3,3-Dimethylpentane	I7	0.0006	0.0035	0.000	0.000
Cyclohexane	N6	0.0149	0.0729	0.005	0.005

2-Methylhexane	I7	0.0073	0.0425	0.003	0.003
2,3-Dimethylpentane	I7	0.0020	0.0116	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0014	0.0080	0.001	0.001
3-Methylhexane	I7	0.0072	0.0419	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0021	0.0120	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0019	0.0109	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0017	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0029	0.0166	0.001	0.001
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0161	0.0937	0.007	0.007
1c,2-Dimethylcyclopentane	N7	0.0006	0.0034	0.000	0.000
Methylcyclohexane	N7	0.0292	0.1666	0.012	0.012
2,2-Dimethylhexane	I8	0.0008	0.0053	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0013	0.000	0.000
Ethylcyclopentane	N7	0.0009	0.0051	0.000	0.000
2,5-Dimethylhexane	I8	0.0010	0.0066	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0008	0.0053	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0007	0.0046	0.000	0.000
3,3-Dimethylhexane	I8	0.0003	0.0020	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0011	0.0059	0.000	0.000
2,3-Dimethylhexane	I8	0.0012	0.0080	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0002	0.0013	0.000	0.000
2-Methylheptane	I8	0.0042	0.0279	0.002	0.002
4-Methylheptane	I8	0.0012	0.0080	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0002	0.0013	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0029	0.0192	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0044	0.0287	0.002	0.002
3-Ethylhexane	I8	0.0003	0.0020	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0018	0.0117	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0006	0.0039	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0013	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0012	0.0079	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0004	0.0026	0.000	0.000
UnknownC7s	U7	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0075	0.0498	0.004	0.004
1c,4-Dimethylcyclohexane	N8	0.0011	0.0072	0.001	0.001
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
2,2-Dimethylheptane	I9	0.0003	0.0022	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0009	0.0066	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0002	0.0015	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
Ethylcyclohexane	N8	0.0010	0.0065	0.000	0.000
n-Propylcyclopentane	N8	0.0004	0.0026	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
2,5-Dimethylheptane	I9	0.0008	0.0060	0.000	0.000
3,3-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000
Ethylbenzene	I8	0.0003	0.0019	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0004	0.0024	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0006	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0008	0.000	0.000
4-Methyloctane	I9	0.0004	0.0030	0.000	0.000
2-Methyloctane	I9	0.0006	0.0045	0.000	0.000

3-Methyloctane	I9	0.0001	0.0008	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0005	0.0037	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0006	0.000	0.000
i-Butylcyclopentane	N9	0.0002	0.0015	0.000	0.000
UnknownC8s	U8	0.0001	0.0006	0.000	0.000
n-Nonane	P9	0.0013	0.0097	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
3-Methylnonane	I10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0003	0.0022	0.000	0.000
n-Decane	P10	0.0001	0.0008	0.000	0.000
<b>TOTAL</b>		<b>100.00000</b>	<b>100.00000</b>	<b>1.4299</b>	<b>1.4374</b>

**CALCULATED VALUES\*\***

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0029	0.0132	LHV NET DRY REAL :	963.8 /scf	969.1 /scf
TOLUENE	0.0011	0.0059	NET WET REAL :	947.0 /scf	952.3 /scf
ETHYLBENZENE	0.0003	0.0019	HHV GROSS DRY REAL :	1068.4 /scf	1074.2 /scf
XYLENES	0.0006	0.0036	GROSS WET REAL :	1049.7 /scf	1055.5 /scf
TOTAL BTEX	0.0049	0.0246	NET HEATING VALUE (60 °F ideal reaction):		21285.9 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		23591.5 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.5936
			DENSITY		0.04534 lb/scf
			COMPRESSIBILITY FACTOR :		0.9977
			REGULAR WOBBE INDEX		1387.9

\*(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	4843.9 /scf	Relative Density - SG (Air=1)	3.3159	<b>C6+ factors</b>
Gross Dry Ideal BTU	5214.7 /scf	Z Compressibility Factor	0.99265	0.99196
Net Dry Ideal BTU	19389.1 /lb	Density Factor	253.066 lbm/1000 ft3	
Gross Dry Ideal BTU	20875.1 /lb	Molar Mass or MW	96.034 g/mol	
		Volume Liquid Ideal gas	0.086 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.**

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