



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

**MAIN PAGE**

PRIMARY DB KEY: **05-103-10424**      NAME/DESCRIP : **EUREKA 8814A N11 397**  
 LEASE #:      **SURFACE CASING**  
 FIELD/AREA:

PROJECT NO. : **202509080**      ANALYSIS NO. : **03**  
 COMPANY NAME : **QB ENERGY OPERATING, LLC**      ANALYSIS DATE: **SEPTEMBER 22, 2025 18:54**  
 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. :      0396  
 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:

<u>COMPONENT</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>GPM @</u>	<u>GPM @</u>
			<u>14.65</u>	<u>14.73</u>
ALCOHOLS	0.0001	0.0002	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.29	0.46	---	---
CARBON DIOXIDE	0.01	0.03	---	---
METHANE	93.0716	85.0819	---	---
ETHANE	4.6134	7.9047	1.2301	1.2368
PROPANE	1.0873	2.7321	0.2988	0.3004
I-BUTANE	0.2308	0.7644	0.0749	0.0754
N-BUTANE	0.2076	0.6876	0.0650	0.0653
I-PENTANE	0.1136	0.4667	0.0410	0.0412
N-PENTANE	0.0756	0.3108	0.0270	0.0271
HEXANES PLUS	0.2800	1.5616	0.1040	0.1042
<b>TOTALS</b>	<b>100.00000</b>	<b>100.00000</b>	<b>1.8408</b>	<b>1.8504</b>

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0125	0.0556
TOLUENE	0.0103	0.0541
ETHYLBENZENE	0.0008	0.0048
XYLENES	0.0039	0.0236
<b>TOTAL BTEX</b>	<b>0.0275</b>	<b>0.1381</b>

	<u>CALCULATED VALUES**</u>	
	<u>BTU @</u>	<u>BTU @</u>
	<u>14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	978.0 /scf	983.3 /scf
NET WET REAL :	960.9 /scf	966.2 /scf
HHV GROSS DRY REAL :	1083.4 /scf	1089.3 /scf
GROSS WET REAL :	1064.5 /scf	1070.4 /scf
NET HEATING VALUE (60 °F ideal reaction):		21195.8 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		23477.9 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6046
DENSITY		0.04624 lbm/scf
COMPRESSIBILITY FACTOR :		0.9976
REGULAR WOBBE INDEX		1394.4

*\*(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. :	202509080	ANALYSIS NO. :	03
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	SEPTEMBER 22, 2025 18:54
ACCOUNT NO. :		SAMPLE DATE :	SEPTEMBER 11, 2025
PRODUCER :		CYLINDER NO. :	0396
LEASE NO. :		SAMPLED BY :	NICK CROY
NAME/DESCRIP :	EUREKA 8814A N11 397 SURFACE CASING		

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

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

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.01	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	0.01	0.03
Nitrogen	0.29	0.46
Methane	93.0716	85.0819
Ethane	4.6134	7.9047
Propane	1.0873	2.7321
Isobutane	0.2308	0.7644
n-Butane	0.2076	0.6876
Isopentane	0.1105	0.4543
n-Pentane	0.0756	0.3108
Cyclopentane	0.0031	0.0124
n-Hexane	0.0342	0.1679
Cyclohexane	0.0184	0.0883
Other Hexanes	0.0759	0.3709
Heptanes	0.0467	0.2655
Methylcyclohexane	0.0261	0.1461
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0125	0.0556
Toluene	0.0103	0.0541
Ethylbenzene	0.0008	0.0048
Xylenes	0.0039	0.0236
C8+ Heavies	0.0512	0.3848
<u>Subtotal</u>	<u>99.99990</u>	<u>99.99980</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0001	0.0002
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

Calculated Values BTU @		Total	C6+	C8+	C10+
	LHV Net Dry Real:	978.0	4925.7	6481.1	8253.0 Btu/scf
	Net Wet Real:	960.9	4839.6	6367.8	8108.7 Btu/scf
	HHV Gross Dry Real:	1083.4	5294.0	6967.3	8884.1 Btu/scf
	Gross Wet Real:	1064.5	5201.5	6845.5	8728.8 Btu/scf

**Other Calculated Values**

Regualr Wobbe Index*	1394.4	2867.9	3293.8	3744.8 Btu/scf
Net Heating Value (60 °F ideal reaction):	21195.8	19131.2	19098.1	18676.9 Btu/lbm
Gross Heating Value (60°F ideal reaction):	23477.9	20559.4	20530.9	20100.2 Btu/lbm
Molar Mass (MW):	17.54925	97.937	130.019	163.996 g/mol
Relative Density (AIR=1):	0.6046	3.3818	4.4902	5.6620 SG
Density:	0.04624	0.25806	0.34264	0.43216 lbm/scf
Compressibility Factor:	0.9976	0.9931	0.9986	0.9999 Z
Liquid Volume real gas @:	17.5609	0.1037	0.0159	0.006 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: **05-103-10424**  
 LEASE #:  
 FIELD/AREA:

NAME/DESCRIP : **EUREKA 8814A N11 397**  
**SURFACE CASING**

PROJECT NO. : **202509080**  
 COMPANY NAME : **QB ENERGY OPERATING, LLC**  
 OFFICE / BRANCH: **PARACHUTE, CO**  
 CUSTOMER REF:  
 PRODUCER :

ANALYSIS NO. : **03**  
 ANALYSIS DATE: **SEPTEMBER 22, 2025 18:54**  
 SAMPLE DATE : **SEPTEMBER 11, 2025**  
 TO:  
 EFFECTIVE DATE:

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

SAMPLE CYCLE:  
 SAMPLE PRES. : **psig**  
 FLOW PRES. : **psig**  
 LAB PRES: **psig**  
 SAMPLE TEMP. : **°f**  
 AMBIENT TEMP.: **°f**  
 H2O BY STAIN TUBE: **- #/mmcf**  
 FIELD COMMENTS:  
 LAB COMMENTS:

SAMPLE TYPE:  
 PROBE :  
 CYLINDER NO. : **0396**  
 SAMPLED BY : **NICK CROY**  
 SAMPLING COMPANY: **QB ENERGY**  
 H2S BY STAIN TUBE: **- ppm mol**  
 CO2 BY STAIN TUBE: **- Mol %**

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.01	0.00	---	---
Nitrogen	---	0.29	0.46	---	---
Carbon Dioxide	---	0.01	0.03	---	---
Methane	P1	93.0716	85.0819	---	---
Ethane	P2	4.6134	7.9047	1.230	1.237
Propane	P3	1.0873	2.7321	0.299	0.300
i-Butane	I4	0.2308	0.7644	0.075	0.075
Methanol	X1	0.0001	0.0002	0.000	0.000
n-Butane	P4	0.2076	0.6876	0.065	0.065
2,2-Dimethylpropane	I5	0.0037	0.0152	0.001	0.001
i-Pentane	I5	0.1068	0.4391	0.039	0.039
n-Pentane	P5	0.0756	0.3108	0.027	0.027
2,2-Dimethylbutane	I6	0.0050	0.0246	0.002	0.002
Cyclopentane	N5	0.0031	0.0124	0.001	0.001
2,3-Dimethylbutane	I6	0.0076	0.0373	0.003	0.003
2-Methylpentane	I6	0.0303	0.1488	0.013	0.013
3-Methylpentane	I6	0.0162	0.0796	0.007	0.007
n-Hexane	P6	0.0342	0.1679	0.014	0.014
2,2-Dimethylpentane	I7	0.0014	0.0080	0.001	0.001
Methylcyclopentane	N6	0.0168	0.0806	0.006	0.006
2,4-Dimethylpentane	I7	0.0021	0.0120	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0006	0.0034	0.000	0.000
Benzene	A6	0.0125	0.0556	0.003	0.003
3,3-Dimethylpentane	I7	0.0007	0.0040	0.000	0.000
Cyclohexane	N6	0.0184	0.0883	0.006	0.006
2-Methylhexane	I7	0.0076	0.0434	0.004	0.004
2,3-Dimethylpentane	I7	0.0022	0.0125	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0014	0.0078	0.001	0.001

3-Methylhexane	I7	0.0067	0.0382	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0023	0.0129	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0021	0.0117	0.001	0.001
3-Ethylpentane	I7	0.0004	0.0023	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0032	0.0179	0.001	0.001
n-Heptane	P7	0.0144	0.0822	0.007	0.007
1c,2-Dimethylcyclopentane	N7	0.0005	0.0028	0.000	0.000
Methylcyclohexane	N7	0.0261	0.1461	0.010	0.010
2,2-Dimethylhexane	I8	0.0007	0.0046	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0013	0.000	0.000
Ethylcyclopentane	N7	0.0008	0.0045	0.000	0.000
2,5-Dimethylhexane	I8	0.0008	0.0052	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0007	0.0046	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0004	0.0026	0.000	0.000
3,3-Dimethylhexane	I8	0.0003	0.0019	0.000	0.000
Toluene	A7	0.0103	0.0541	0.003	0.003
2,3-Dimethylhexane	I8	0.0005	0.0033	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0028	0.0182	0.001	0.001
4-Methylheptane	I8	0.0009	0.0059	0.000	0.000
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	0.0020	0.0130	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0029	0.0185	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0012	0.0077	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0004	0.0026	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	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	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0009	0.0058	0.000	0.000
1t,3-Dimethylcyclohexane	N8	0.0002	0.0013	0.000	0.000
UnknownC7s	U7	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0061	0.0397	0.003	0.003
1c,4-Dimethylcyclohexane	N8	0.0006	0.0038	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0003	0.0022	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0009	0.0065	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0003	0.0022	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0008	0.0051	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0013	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0002	0.0014	0.000	0.000
2,5-Dimethylheptane	I9	0.0006	0.0044	0.000	0.000
3,3-Dimethylheptane	I9	0.0002	0.0015	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	0.0008	0.0048	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0026	0.0157	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0007	0.0042	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-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0005	0.0037	0.000	0.000
2-Methyloctane	I9	0.0007	0.0051	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0006	0.0043	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0006	0.0037	0.000	0.000
i-Butylcyclopentane	N9	0.0003	0.0022	0.000	0.000

n-Nonane	P9	0.0032	0.0234	0.002	0.002
1,1-Methylethylcyclohexane	N9	0.0002	0.0014	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
2,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0004	0.0029	0.000	0.000
n-Propylbenzene	A9	0.0004	0.0027	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	0.0007	0.0048	0.000	0.000
1,4-Methylethylbenzene	A9	0.0003	0.0021	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0005	0.0034	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
5-Methylnonane	I10	0.0002	0.0016	0.000	0.000
1,2-Methylethylbenzene	A9	0.0003	0.0021	0.000	0.000
2-Methylnonane	I10	0.0002	0.0016	0.000	0.000
3-Methylnonane	I10	0.0002	0.0016	0.000	0.000
t-Butylbenzene	A10	0.0009	0.0069	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0004	0.0029	0.000	0.000
n-Decane	P10	0.0020	0.0162	0.001	0.001
1,3-Methyl-i-propylbenzene	A10	0.0002	0.0015	0.000	0.000
3-Ethylnonane	I10	0.0001	0.0009	0.000	0.000
1,3-Diethylbenzene	A10	0.0003	0.0023	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0002	0.0015	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC10s	U10	0.0008	0.0065	0.000	0.000
n-Undecane	P11	0.0015	0.0133	0.001	0.001
1,2,3,5-Tetramethylbenzene	A11	0.0001	0.0007	0.000	0.000
sec-Pentylbenzene	A11	0.0001	0.0009	0.000	0.000
n-Pentylbenzene	A11	0.0001	0.0009	0.000	0.000
1,2-Di-n-propylbenzene	A11	0.0001	0.0009	0.000	0.000
Naphthalene	A10	0.0001	0.0007	0.000	0.000
UnknownC11s	U11	0.0003	0.0027	0.000	0.000
n-Dodecane	P12	0.0013	0.0126	0.001	0.001
1,3,5-Triethylbenzene	A12	0.0003	0.0028	0.000	0.000
1,4-Methyl-n-pentylbenzene	A12	0.0001	0.0009	0.000	0.000
n-Hexylbenzene	A12	0.0002	0.0018	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0004	0.0034	0.000	0.000
2-Methylnaphthalene	A11	0.0001	0.0008	0.000	0.000
UnknownC12s	U12	0.0003	0.0027	0.000	0.000
n-Tridecane	P13	0.0012	0.0126	0.001	0.001
UnknownC13s	U13	0.0003	0.0031	0.000	0.000
n-Tetradecane	P14	0.0008	0.0091	0.001	0.001
UnknownC14s	U14	0.0004	0.0045	0.000	0.000
n-Pentadecane	P15	0.0004	0.0048	0.000	0.000
UnknownC15s	U15	0.0001	0.0012	0.000	0.000
n-Hexadecane	P16	0.0002	0.0026	0.000	0.000
UnknownC16s	U16	0.0007	0.0091	0.001	0.001
UnknownC17s	U17	0.0004	0.0055	0.000	0.000
<u>TOTAL</u>		<u>100.0000</u>	<u>100.0000</u>	<u>1.8408</u>	<u>1.8504</u>

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0125	0.0556
TOLUENE	0.0103	0.0541
ETHYLBENZENE	0.0008	0.0048
XYLENES	0.0039	0.0236
TOTAL BTEX	0.0275	0.1381

\*(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 :	978.0 /scf	983.3 /scf
NET WET REAL :	960.9 /scf	966.2 /scf
HHV GROSS DRY REAL :	1083.4 /scf	1089.3 /scf
GROSS WET REAL :	1064.5 /scf	1070.4 /scf
NET HEATING VALUE (60 °F ideal reaction):		21195.8 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		23477.9 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6046
DENSITY		0.04624 lb/scf
COMPRESSIBILITY FACTOR :		0.9976
REGULAR WOBBE INDEX		1394.4

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

Net Dry Ideal BTU	4907.1 /scf	Relative Density - SG (Air=1)	3.3818	<b>C6+ factors</b>
Gross Dry Ideal BTU	5274 /scf	Z Compressibility Factor	0.9931	0.9922
Net Dry Ideal BTU	19131.2 /lb	Density Factor	258.062 lbm/1000 ft3	
Gross Dry Ideal BTU	20559.4 /lb	Molar Mass or MW	97.937 g/mol	
		Volume Liquid Ideal gas	0.104 scf/gal	23.1

**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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