



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY: 05-045-14060	NAME/DESCRIP: 300115119 20 PAD HYRUP 11-41A
LEASE #:	CASING
FIELD/AREA:	
PROJECT NO. : 202410132	ANALYSIS NO. : 02
COMPANY NAME : QB ENERGY OPERATING, LLC	ANALYSIS DATE: OCTOBER 31, 2024 09:56
OFFICE / BRANCH: PARACHUTE, CO	SAMPLE DATE : OCTOBER 17, 2024
CUSTOMER REF:	TO:
PRODUCER :	EFFECTIVE DATE:

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

SAMPLE CYCLE:	SAMPLE TYPE:	SPOT
SAMPLE PRES. : 1085 psig	PROBE :	NO
FLOW PRES. : psig	CYLINDER NO. :	ECA-775
LAB PRES: psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. : 68 °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 @ 14.65</u>	<u>GPM @ 14.73</u>
ALCOHOLS	0.0043	0.0071	0.0010	0.0010
HELIUM	0.01	0.00	---	---
HYDROGEN	0.04	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.09	0.13	---	---
CARBON DIOXIDE	4.40	10.02	---	---
METHANE	85.9287	71.3021	---	---
ETHANE	6.5269	10.1512	1.7401	1.7496
PROPANE	1.8412	4.1995	0.5057	0.5085
I-BUTANE	0.3477	1.0453	0.1129	0.1136
N-BUTANE	0.3328	1.0005	0.1049	0.1055
I-PENTANE	0.1112	0.4148	0.0400	0.0402
N-PENTANE	0.0897	0.3348	0.0320	0.0322
HEXANES PLUS	0.2775	1.3947	0.1130	0.1133
<u>TOTALS</u>	<u>100.00000</u>	<u>100.00000</u>	<u>2.6496</u>	<u>2.6639</u>

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0047	0.0190
TOLUENE	0.0129	0.0615
ETHYLBENZENE	0.0012	0.0066
XYLENES	0.0016	0.0089
<u>TOTAL BTEX</u>	<u>0.0204</u>	<u>0.0960</u>

	<u>BTU @ 14.65</u>	<u>14.73</u>
LHV NET DRY REAL :	969.8 /scf	975.1 /scf
NET WET REAL :	952.8 /scf	958.1 /scf
HHV GROSS DRY REAL :	1073.3 /scf	1079.1 /scf
GROSS WET REAL :	1054.5 /scf	1060.3 /scf
NET HEATING VALUE (60 °F ideal reaction):		19061.2 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		21090.4 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6670
DENSITY		0.05094 lbm/scf
COMPRESSIBILITY FACTOR :		0.9974
REGULAR WOBBE INDEX		1314.8

*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)

Mod ASTM D6730, GPA 2261 & GPA 2286.

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

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

PROJECT NO. :	202410132	ANALYSIS NO. :	02
COMPANY NAME :	QB ENERGY OPERATING, LLC	ANALYSIS DATE:	OCTOBER 31, 2024 09:56
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 17, 2024
PRODUCER :		CYLINDER NO. :	ECA-775
LEASE NO. :		SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	300115119 2O PAD HYRUP 11-41A CASING		

FIELD DATA		SAMPLE TEMP. :	68
SAMPLE PRES. :	1085	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	0.04	0.00
Carbon Dioxide	4.40	10.02
Nitrogen	0.09	0.13
Methane	85.9287	71.3021
Ethane	6.5269	10.1512
Propane	1.8412	4.1995
Isobutane	0.3477	1.0453
n-Butane	0.3328	1.0005
Isopentane	0.1097	0.4094
n-Pentane	0.0897	0.3348
Cyclopentane	0.0015	0.0054
n-Hexane	0.0384	0.1712
Cyclohexane	0.0181	0.0788
Other Hexanes	0.0591	0.2623
Heptanes	0.0507	0.2619
Methylcyclohexane	0.0369	0.1874
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0047	0.0190
Toluene	0.0129	0.0615
Ethylbenzene	0.0012	0.0066
Xylenes	0.0016	0.0089
C8+ Heavies	0.0538	0.3365
<u>Subtotal</u>	<u>99.99570</u>	<u>99.99290</u>
Oxygen/Argon	0.00	0.00
Alcohols	0.0043	0.0071
Total	100.00000	100.00000

	Total	C6+	C8+	C10+
Calculated Values BTU @	Sample	Fraction	Fraction	Fraction
LHV Net Dry Real:	969.8	4849.9	5799.0	6757.7 Btu/scf
Net Wet Real:	952.8	4765.1	5697.6	6639.6 Btu/scf
HHV Gross Dry Real:	1073.3	5211.5	6225.2	7218.4 Btu/scf
Gross Wet Real:	1054.5	5120.4	6116.4	7092.2 Btu/scf
Other Calculated Values				
Regualr Wobbe Index*	1314.8	2835.8	3061.3	3304.5 Btu/scf
Net Heating Value (60 °F ideal reaction):	19061.2	19017.3	18606.1	18501.7 Btu/lbm
Gross Heating Value (60°F ideal reaction):	21090.4	20437.7	19977.1	19762.3 Btu/lbm
Molar Mass (MW):	19.33364	97.116	120.068	138.941 g/mol
Relative Density (AIR=1):	0.6670	3.3537	4.1460	4.7974 SG
Density:	0.05094	0.25594	0.31639	0.36614 lbm/scf
Compressibility Factor:	0.9974	0.9934	0.9982	0.9996 Z
Liquid Volume real gas @:	17.8888	0.1126	0.0229	0.005 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: **05-045-14060** NAME/DESCRIP : **300115119 20 PAD HYRUP 11-41A**
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*****FIELD DATA*****

SAMPLE CYCLE: SAMPLE TYPE: SPOT
 SAMPLE PRES. : 1085 psig PROBE : NO
 FLOW PRES. : psig CYLINDER NO. : ECA-775
 LAB PRES: psig SAMPLED BY : MIKE KELLEY
 SAMPLE TEMP. : 68 °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	---	---
Hydrogen	---	0.04	0.00	---	---
Nitrogen	---	0.09	0.13	---	---
Carbon Dioxide	---	4.40	10.02	---	---
Methane	P1	85.9287	71.3021	---	---
Ethane	P2	6.5269	10.1512	1.740	1.750
Propane	P3	1.8412	4.1995	0.506	0.509
i-Butane	I4	0.3477	1.0453	0.113	0.114
Methanol	X1	0.0043	0.0071	0.001	0.001
n-Butane	P4	0.3328	1.0005	0.105	0.106
2,2-Dimethylpropane	I5	0.0021	0.0079	0.001	0.001
i-Pentane	I5	0.1076	0.4015	0.039	0.039
n-Pentane	P5	0.0897	0.3348	0.032	0.032
2,2-Dimethylbutane	I6	0.0024	0.0107	0.001	0.001
Cyclopentane	N5	0.0015	0.0054	0.000	0.000
2,3-Dimethylbutane	I6	0.0055	0.0245	0.002	0.002
2-Methylpentane	I6	0.0280	0.1248	0.012	0.012
3-Methylpentane	I6	0.0129	0.0575	0.005	0.005
n-Hexane	P6	0.0384	0.1712	0.016	0.016
2,2-Dimethylpentane	I7	0.0004	0.0021	0.000	0.000
Methylcyclopentane	N6	0.0103	0.0448	0.004	0.004
2,4-Dimethylpentane	I7	0.0016	0.0083	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0003	0.0016	0.000	0.000
Benzene	A6	0.0047	0.0190	0.001	0.001
3,3-Dimethylpentane	I7	0.0005	0.0026	0.000	0.000
Cyclohexane	N6	0.0181	0.0788	0.006	0.006
2-Methylhexane	I7	0.0077	0.0399	0.004	0.004

2,3-Dimethylpentane	I7	0.0021	0.0109	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0014	0.0071	0.001	0.001
3-Methylhexane	I7	0.0064	0.0332	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0020	0.0101	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0018	0.0092	0.001	0.001
3-Ethylpentane	I7	0.0002	0.0010	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0033	0.0168	0.002	0.002
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0210	0.1088	0.010	0.010
1c,2-Dimethylcyclopentane	N7	0.0009	0.0046	0.000	0.000
Methylcyclohexane	N7	0.0369	0.1874	0.015	0.015
2,2-Dimethylhexane	I8	0.0010	0.0059	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0010	0.0051	0.000	0.000
2,5-Dimethylhexane	I8	0.0009	0.0053	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0007	0.0041	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0008	0.0047	0.000	0.000
3,3-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
2,3,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0129	0.0615	0.004	0.004
2,3-Dimethylhexane	I8	0.0007	0.0041	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0002	0.0012	0.000	0.000
2-Methylheptane	I8	0.0039	0.0231	0.002	0.002
4-Methylheptane	I8	0.0010	0.0059	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	0.0021	0.0124	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0052	0.0302	0.003	0.003
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0019	0.0110	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0006	0.0035	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0013	0.0076	0.001	0.001
n-Octane	P8	0.0059	0.0349	0.003	0.003
1c,4-Dimethylcyclohexane	N8	0.0007	0.0041	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0008	0.0052	0.000	0.000
Ethylcyclohexane	N8	0.0008	0.0047	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,5-Dimethylheptane	I9	0.0003	0.0020	0.000	0.000
Ethylbenzene	I8	0.0012	0.0066	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0009	0.0050	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0003	0.0017	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	0.0004	0.0022	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
n-Nonane	P9	0.0002	0.0013	0.000	0.000
i-Propylbenzene	A9	0.0003	0.0019	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
3,6-Dimethyloctane	I10	0.0013	0.0096	0.001	0.001
1,3-Methylethylbenzene	A9	0.0048	0.0298	0.003	0.003
1,4-Methylethylbenzene	A9	0.0022	0.0137	0.001	0.001
1,3,5-Trimethylbenzene	A9	0.0021	0.0130	0.001	0.001

2-Methylnonane	I10	0.0018	0.0132	0.001	0.001
3-Ethyl-octane	I10	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0053	0.0368	0.003	0.003
i-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
sec-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Decane	P10	0.0005	0.0037	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0018	0.0112	0.001	0.001
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Diethylbenzene	A10	0.0003	0.0021	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Butylbenzene	A10	0.0003	0.0021	0.000	0.000
t-Decahydronaphthalene	A9	0.0001	0.0008	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0001	0.0008	0.000	0.000
n-Pentylbenzene	A11	0.0003	0.0023	0.000	0.000
UnknownC11s	U11	0.0005	0.0040	0.000	0.000
n-Tetradecane	P14	0.0001	0.0010	0.000	0.000
TOTAL		100.00000	100.00000	2.6496	2.6639

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0047	0.0190	LHV NET DRY REAL :	969.8 /scf	975.1 /scf
TOLUENE	0.0129	0.0615	NET WET REAL :	952.8 /scf	958.1 /scf
ETHYLBENZENE	0.0012	0.0066	HHV GROSS DRY REAL :	1073.3 /scf	1079.1 /scf
XYLENES	0.0016	0.0089	GROSS WET REAL :	1054.5 /scf	1060.3 /scf
TOTAL BTEX	0.0204	0.0960	NET HEATING VALUE (60 °F ideal reaction):		19061.2 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		21090.4 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6670
			DENSITY		0.05094 lb/scf
			COMPRESSIBILITY FACTOR :		0.9974
			REGULAR WOBBE INDEX		1314.8

*(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>4832.8 /scf</u>	Relative Density - SG (Air=1)	<u>3.3537</u>	C6+factors
Gross Dry Ideal BTU	<u>5193.2 /scf</u>	Z Compressibility Factor	<u>0.99336</u>	<u>0.9925</u>
Net Dry Ideal BTU	<u>19017.3 /lb</u>	Density Factor	<u>255.937 lbm/1000 ft3</u>	
Gross Dry Ideal BTU	<u>20437.7 /lb</u>	Molar Mass or MW	<u>97.116 g/mol</u>	
		Volume Liquid Ideal gas	<u>0.113 scf/gal</u>	<u>23.5</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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