EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-09419**	NAME/DESCRIP :	**YOUBERG #2-342D**
LEASE #:	**COC-60679**		**BRAIDEN HEAD**
FIELD/AREA:	**RULISON - #75400**		
PROJECT NO. :	**202311019**	ANALYSIS NO. :	**01**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	NOVEMBER 07, 2023 14:42
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	OCTOBER 26, 2023 8:00
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	450	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-748
LAB PRES:		psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	37	ºf	SAMPLING COMPANY:	CAERUS OIL & GAS
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
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.23	0.38	---	---
CARBON DIOXIDE	0.01	0.03	---	---
METHANE	94.6352	88.5112	---	---
ETHANE	3.5891	6.2918	0.9562	0.9614
PROPANE	0.8897	2.2872	0.2438	0.2451
I-BUTANE	0.1946	0.6594	0.0639	0.0643
N-BUTANE	0.1844	0.6249	0.0580	0.0583
I-PENTANE	0.0847	0.3560	0.0310	0.0311
N-PENTANE	0.0547	0.2301	0.0200	0.0201
HEXANES PLUS	0.1176	0.6294	0.0460	0.0460
TOTALS	100.00000	100.00000	1.4189	1.4263

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0007	0.0032
TOLUENE	0.0006	0.0032
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0004	0.0024
TOTAL BTEX	0.0017	0.0088

CALCULATED VALUES**

	BTU @	14.65		14.73	
LHV	NET DRY REAL :	959.9	/scf	965.1	/scf
	NET WET REAL :	943.1	/scf	948.3	/scf
HHV	GROSS DRY REAL :	1064.2	/scf	1070.0	/scf
	GROSS WET REAL :	1045.6	/scf	1051.4	/scf
	NET HEATING VALUE (60 °F ideal reaction):			21269.0	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):			23575.1	Btu/lbm
	RELATIVE DENSITY (AIR=1):			0.5916	
	DENSITY			0.04519	lbm/scf
	COMPRESSIBILITY FACTOR :			0.9977	
	REGULAR WOBBE INDEX			1384.8	

**(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. :	202311019	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	NOVEMBER 07, 2023 14:42
ACCOUNT NO. :		SAMPLE DATE :	OCTOBER 26, 2023 8:00
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	ECA-748
LEASE NO. :	COC-60679	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	YOUBERG #2-342D BRAIDEN HEAD		
FIELD DATA		SAMPLE TEMP. :	37
SAMPLE PRES. :	450	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT* *NO PROBE*		

Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	0.01	0.03
Nitrogen	0.23	0.38
Methane	94.6352	88.5112
Ethane	3.5891	6.2918
Propane	0.8897	2.2872
Isobutane	0.1946	0.6594
n-Butane	0.1844	0.6249
Isopentane	0.0829	0.3487
n-Pentane	0.0547	0.2301
Cyclopentane	0.0018	0.0073
n-Hexane	0.0215	0.1080
Cyclohexane	0.0076	0.0373
Other Hexanes	0.0452	0.2261
Heptanes	0.0241	0.1401
Methylcyclohexane	0.0092	0.0526
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0007	0.0032
Toluene	0.0006	0.0032
Ethylbenzene	0.0000	0.0000
Xylenes	0.0004	0.0024
C8+ Heavies	0.0083	0.0565
Subtotal	100.00000	100.00000
Oxygen/Argon	0.00	0.00
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	959.9	4678.5	5830.3	7516.5	**Btu/scf**
	Net Wet Real:	943.1	4596.7	5728.4	7385.1	**Btu/scf**
HHV	Gross Dry Real:	1064.2	5041.0	6275.6	8093.2	**Btu/scf**
	Gross Wet Real:	1045.6	4952.9	6165.9	7951.7	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1384.8	2812.1	3131.5	3574.8	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		21269.0	19343.5	19639.0	19159.3	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23575.1	20842.5	21140.6	20629.3	**Btu/lbm**
Molar Mass (MW):		17.15146	91.872	116.436	149.297	**g/mol**
Relative Density (AIR=1):		0.5916	3.1727	4.0199	5.1548	**SG**
Density:		0.04519	0.24212	0.30682	0.39342	**lbm/scf**
Compressiblity Factor:		0.9977	0.9905	0.9973	0.9997	**Z**
Liquid Volume real gas @:	**14.65**	17.3954	0.0459	0.002	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 uderscore) indicates there was no tube pulled for H2S.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:	**05-045-09419**	NAME/DESCRIP :	**YOUBERG #2-342D**
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PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	
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FLOW PRES. :	psig	CYLINDER NO. :	ECA-748
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SAMPLE TEMP. :	37 ºf	SAMPLING COMPANY:	CAERUS OIL & GAS
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	---	0.01	0.00	---	---
Hydrogen	---	0.00	0.00	---	---
Oxygen/Argon	---	0.00	0.00	---	---
Nitrogen	---	0.23	0.38	---	---
Carbon Dioxide	---	0.01	0.03	---	---
Methane	P1	94.6352	88.5112	---	---
Ethane	P2	3.5891	6.2918	0.956	0.961
Propane	P3	0.8897	2.2872	0.244	0.245
i-Butane	I4	0.1946	0.6594	0.064	0.064
n-Butane	P4	0.1844	0.6249	0.058	0.058
2,2-Dimethylpropane	I5	0.0039	0.0164	0.001	0.001
i-Pentane	I5	0.0790	0.3323	0.029	0.029
n-Pentane	P5	0.0547	0.2301	0.020	0.020
2,2-Dimethylbutane	I6	0.0034	0.0171	0.001	0.001
Cyclopentane	N5	0.0018	0.0073	0.001	0.001
2,3-Dimethylbutane	I6	0.0047	0.0236	0.002	0.002
2-Methylpentane	I6	0.0190	0.0954	0.008	0.008
3-Methylpentane	I6	0.0103	0.0518	0.004	0.004
n-Hexane	P6	0.0215	0.1080	0.009	0.009
2,2-Dimethylpentane	I7	0.0007	0.0041	0.000	0.000
Methylcyclopentane	N6	0.0078	0.0382	0.003	0.003
2,4-Dimethylpentane	I7	0.0012	0.0070	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0004	0.0023	0.000	0.000
Benzene	A6	0.0007	0.0032	0.000	0.000
3,3-Dimethylpentane	I7	0.0003	0.0017	0.000	0.000
Cyclohexane	N6	0.0076	0.0373	0.003	0.003
2-Methylhexane	I7	0.0044	0.0257	0.002	0.002
2,3-Dimethylpentane	I7	0.0012	0.0070	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0008	0.0046	0.000	0.000
3-Methylhexane	I7	0.0036	0.0210	0.002	0.002

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1c,3-Dimethylcyclopentane	N7	0.0010	0.0057	0.000	0.000
1t,3-Dimethylcyclopentane	N7	0.0009	0.0051	0.000	0.000
3-Ethylpentane	I7	0.0002	0.0012	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0014	0.0080	0.001	0.001
n-Heptane	P7	0.0075	0.0438	0.003	0.003
1c,2-Dimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Methylcyclohexane	N7	0.0092	0.0526	0.004	0.004
2,2-Dimethylhexane	I8	0.0003	0.0020	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0003	0.0017	0.000	0.000
2,5-Dimethylhexane	I8	0.0003	0.0020	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0003	0.0020	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0002	0.0013	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0006	0.0032	0.000	0.000
2,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0010	0.0066	0.001	0.001
4-Methylheptane	I8	0.0003	0.0020	0.000	0.000
3-Methylheptane	I8	0.0007	0.0047	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0008	0.0052	0.000	0.000
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0004	0.0026	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0002	0.0013	0.000	0.000
n-Octane	P8	0.0013	0.0086	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
Ethylcyclohexane	N8	0.0002	0.0013	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,5-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0002	0.0012	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0006	0.000	0.000
4-Methyloctane	I9	0.0001	0.0008	0.000	0.000
2-Methyloctane	I9	0.0001	0.0008	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0008	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0006	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0008	0.000	0.000
n-Nonane	P9	0.0004	0.0030	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
n-Decane	P10	0.0001	0.0008	0.000	0.000
n-Undecane	P11	0.0001	0.0009	0.000	0.000
TOTAL		100.00000	100.00000	1.4189	1.4263

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0007	0.0032
TOLUENE	0.0006	0.0032
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0004	0.0024
TOTAL BTEX	0.0017	0.0088

**(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 :	959.9 **/scf**	965.1 **/scf**
	NET WET REAL :	943.1 **/scf**	948.3 **/scf**
HHV	GROSS DRY REAL :	1064.2 **/scf**	1070.0 **/scf**
	GROSS WET REAL :	1045.6 **/scf**	1051.4 **/scf**

NET HEATING VALUE (60 °F ideal reaction):	21269.0 **Btu/lbm**
GROSS HEATING VALUE (60°F ideal reaction):	23575.1 **Btu/lbm**
RELATIVE DENSITY (AIR=1):	0.5916
DENSITY	0.04519 **lb/scf**
COMPRESSIBILITY FACTOR :	0.9977
REGULAR WOBBE INDEX	1384.8

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

Net Dry Ideal BTU	4648.7 **/scf**	Relative Density - SG (Air=1)	3.1727		***C6+factors***
Gross Dry Ideal BTU	5008.9 **/scf**	**Z** Compressiblity Factor	0.99053		0.98993
Net Dry Ideal BTU	19343.5 **/lb**	Density Factor	242.121	**lbm/1000 ft3**	
Gross Dry Ideal BTU	20842.5 **/lb**	Molar Mass or MW	91.872	**g/mol**	
		Volume Liquid Ideal gas	0.046	**scf/gal**	24.2

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.