EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-21920**	NAME/DESCRIP :	**E34 PAD STORY GULCH SG 8508E-33 E34 496**
LEASE #:	**74105A**		**BRAIDEN HEAD**
FIELD/AREA:	**COC 65556**		

PROJECT NO. :	**202108112**	ANALYSIS NO. :	**01**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	AUGUST 20, 2021 16:04
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	AUGUST 18, 2021
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS OIL & GAS LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	53	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-804
LAB PRES:		psig	SAMPLED BY :	JESSE "DUSTY" LATHAM
SAMPLE TEMP. :	60	ºf	SAMPLING COMPANY:	CAERUS OIL & GAS LLC
AMBIENT TEMP.:		ºf	H2S BY STAIN TUBE:	- ppm
H2O BY STAIN TUBE:	-	#/mmcf	CO2 BY STAIN TUBE:	- Mol %

FIELD COMMENTS:

LAB COMMENTS:

COMPONENT	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
GLYCOLS	0.0001	0.0009	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.17	0.02	---	---
OXYGEN/ARGON	0.02	0.04	---	---
NITROGEN	2.06	3.45	---	---
CARBON DIOXIDE	0.02	0.05	---	---
METHANE	95.7568	91.7964	---	---
ETHANE	1.2152	2.1835	0.3237	0.3254
PROPANE	0.4095	1.0790	0.1129	0.1135
I-BUTANE	0.0849	0.2949	0.0280	0.0281
N-BUTANE	0.1133	0.3935	0.0360	0.0362
I-PENTANE	0.0471	0.2029	0.0160	0.0161
N-PENTANE	0.0263	0.1134	0.0100	0.0100
HEXANES PLUS	0.0668	0.3755	0.0220	0.0220
TOTALS	100.00000	100.00000	0.5486	0.5513

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0037	0.0173
TOLUENE	0.0061	0.0336
ETHYLBENZENE	0.0002	0.0013
XYLENES	0.0029	0.0184
TOTAL BTEX	0.0129	0.0706

**(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 :	910.5 /scf	915.5 /scf
	NET WET REAL :	894.6 /scf	899.6 /scf
HHV	GROSS DRY REAL :	1010.4 /scf	1015.9 /scf
	GROSS WET REAL :	992.7 /scf	998.2 /scf
	NET HEATING VALUE (60 °F ideal reaction):		20686.4 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		22955.6 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.5773
	DENSITY		0.04409 lbm/scf
	COMPRESSIBILITY FACTOR :		0.9979
	REGULAR WOBBE INDEX		1331.3

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202108112	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	AUGUST 20, 2021 16:04
ACCOUNT NO. :		SAMPLE DATE :	AUGUST 18, 2021
PRODUCER :	CAERUS OIL & GAS LLC	CYLINDER NO. :	ECA-804
LEASE NO. :	74105A	SAMPLED BY :	JESSE "DUSTY" LATHAM
NAME/DESCRIP :	E34 PAD STORY GULCH SG 8508E-33 E34 496 BRAIDEN HEAD		
FIELD DATA		SAMPLE TEMP. :	60
SAMPLE PRES. :	53	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm*		
COMMENTS :	***SPOT*** ***NO PROBE***		

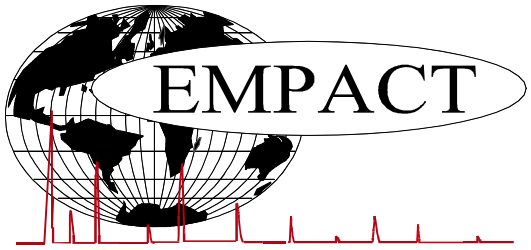
Componet	Mole %	Wt %
Helium	0.01	0.00
Hydrogen	0.17	0.02
Carbon Dioxide	0.02	0.05
Nitrogen	2.06	3.45
Methane	95.7568	91.7964
Ethane	1.2152	2.1835
Propane	0.4095	1.0790
Isobutane	0.0849	0.2949
n-Butane	0.1133	0.3935
Isopentane	0.0456	0.1966
n-Pentane	0.0263	0.1134
Cyclopentane	0.0015	0.0063
n-Hexane	0.0062	0.0319
Cyclohexane	0.0033	0.0166
Other Hexanes	0.0217	0.1112
Heptanes	0.0111	0.0661
Methylcyclohexane	0.0040	0.0235
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0037	0.0173
Toluene	0.0061	0.0336
Ethylbenzene	0.0002	0.0013
Xylenes	0.0029	0.0184
C8+ Heavies	0.0076	0.0556
Subtotal	99.97990	99.95910
Oxygen/Argon	0.02	0.04
Glycols	0.0001	0.0009
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	910.5	4690.5	5692.9	7297.5	**Btu/scf**
	Net Wet Real:	894.6	4608.5	5593.4	7169.9	**Btu/scf**
HHV	Gross Dry Real:	1010.4	5027.4	6086.8	7838.3	**Btu/scf**
	Gross Wet Real:	992.7	4939.5	5980.4	7701.3	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1331.3	2778.3	3024.4	3507.9	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		20686.4	19092.5	18855.7	19282.0	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		22955.6	20466.6	20165.1	20711.0	**Btu/lbm**
Molar Mass (MW):		16.7349	94.059	117.639	145.42	**g/mol**
Relative Density (AIR=1):		0.5773	3.2475	4.0616	5.0209	**SG**
Density:		0.04409	0.24784	0.30999	0.38321	**lbm/scf**
Compressiblity Factor:		0.9979	0.9928	0.9982	0.9997	**Z**
Liquid Volume real gas @:	**14.65**	16.9348	0.0219	0.001	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.



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:	**05-045-21920**	NAME/DESCRIP :	**E34 PAD STORY GULCH SG 8508E-33 E34 496**
LEASE #:	**74105A**		**BRAIDEN HEAD**
FIELD/AREA:	**COC 65556**		
PROJECT NO. :	**202108112**	ANALYSIS NO. :	**01**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	AUGUST 20, 2021 16:04
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	AUGUST 18, 2021
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS OIL & GAS LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	53 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-804
LAB PRES:	psig	SAMPLED BY :	JESSE "DUSTY" LATHAM
SAMPLE TEMP. :	60 ºf	SAMPLING COMPANY:	CAERUS OIL & GAS LLC
AMBIENT TEMP.:	ºf	H2S BY STAIN TUBE:	- ppm
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	---	0.17	0.02	---	---
Oxygen/Argon	---	0.02	0.04	---	---
Nitrogen	---	2.06	3.45	---	---
Carbon Dioxide	---	0.02	0.05	---	---
Methane	P1	95.7568	91.7964	---	---
Ethane	P2	1.2152	2.1835	0.324	0.325
Propane	P3	0.4095	1.0790	0.113	0.114
i-Butane	I4	0.0849	0.2949	0.028	0.028
n-Butane	P4	0.1132	0.3931	0.036	0.036
2,2-Dimethylpropane	I5	0.0011	0.0047	0.000	0.000
i-Pentane	I5	0.0445	0.1919	0.016	0.016
UnknownC4s	U4	0.0001	0.0004	0.000	0.000
n-Pentane	P5	0.0263	0.1134	0.010	0.010
2,2-Dimethylbutane	I6	0.0009	0.0047	0.000	0.000
Cyclopentane	N5	0.0015	0.0063	0.000	0.000
2,3-Dimethylbutane	I6	0.0016	0.0083	0.001	0.001
2-Methylpentane	I6	0.0084	0.0433	0.003	0.003
3-Methylpentane	I6	0.0052	0.0268	0.002	0.002
n-Hexane	P6	0.0062	0.0319	0.003	0.003
Methylcyclopentane	N6	0.0056	0.0281	0.002	0.002
2,4-Dimethylpentane	I7	0.0003	0.0018	0.000	0.000
2,2,3-Trimethylbutane	I7	0.0001	0.0006	0.000	0.000
Benzene	A6	0.0037	0.0173	0.001	0.001
3,3-Dimethylpentane	I7	0.0001	0.0006	0.000	0.000
Cyclohexane	N6	0.0033	0.0166	0.001	0.001
2-Methylhexane	I7	0.0018	0.0108	0.001	0.001

EMPACT Analytical Systems, Inc 365 S. Main Street, Brighton, CO 80601 303-637-0150

2,3-Dimethylpentane	I7	0.0005	0.0030	0.000	0.000
1,1-Dimethylcyclopentane	N7	0.0004	0.0023	0.000	0.000
3-Methylhexane	I7	0.0019	0.0114	0.001	0.001
1c,3-Dimethylcyclopentane	N7	0.0009	0.0053	0.000	0.000
1t,3-Dimethylcyclopentane	N7	0.0008	0.0047	0.000	0.000
3-Ethylpentane	I7	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0019	0.0112	0.001	0.001
n-Heptane	P7	0.0020	0.0120	0.001	0.001
1c,2-Dimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Methylcyclohexane	N7	0.0040	0.0235	0.002	0.002
2,2-Dimethylhexane	I8	0.0003	0.0020	0.000	0.000
Ethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
2,5-Dimethylhexane	I8	0.0002	0.0014	0.000	0.000
2,4-Dimethylhexane	I8	0.0002	0.0014	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0003	0.0020	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0004	0.0027	0.000	0.000
Toluene	A7	0.0061	0.0336	0.002	0.002
2,3-Dimethylhexane	I8	0.0001	0.0007	0.000	0.000
4-Methylheptane	I8	0.0002	0.0014	0.000	0.000
3-Methylheptane	I8	0.0003	0.0020	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0004	0.0027	0.000	0.000
3-Ethylhexane	I8	0.0001	0.0007	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0002	0.0013	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0002	0.0013	0.000	0.000
n-Octane	P8	0.0006	0.0041	0.000	0.000
1c,4-Dimethylcyclohexane	N8	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0002	0.0015	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
Ethylcyclohexane	N8	0.0003	0.0020	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0002	0.0013	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0019	0.0121	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0006	0.0038	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
3-Methyloctane	I9	0.0001	0.0008	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0004	0.0025	0.000	0.000
i-Butylcyclopentane	N9	0.0001	0.0008	0.000	0.000
n-Nonane	P9	0.0005	0.0038	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0007	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-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0002	0.0014	0.000	0.000
5-Methylnonane	I10	0.0001	0.0008	0.000	0.000
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0001	0.0008	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0016	0.000	0.000
n-Decane	P10	0.0005	0.0042	0.000	0.000
Sec-Butylcyclohexane	A10	0.0001	0.0008	0.000	0.000
n-Undecane	P11	0.0001	0.0010	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0001	0.0010	0.000	0.000
Triethylene Glycol	GL6	0.0001	0.0009	0.000	0.000
n-Dodecane	P12	0.0001	0.0010	0.000	0.000
TOTAL		100.00000	100.00000	0.5486	0.5513

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0037	0.0173
TOLUENE	0.0061	0.0336
ETHYLBENZENE	0.0002	0.0013
XYLENES	0.0029	0.0184
TOTAL BTEX	0.0129	0.0706

**(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 :	910.5 /scf	915.5 /scf
	NET WET REAL :	894.6 /scf	899.6 /scf
HHV	GROSS DRY REAL :	1010.4 /scf	1015.9 /scf
	GROSS WET REAL :	992.7 /scf	998.2 /scf

NET HEATING VALUE (60 °F ideal reaction):	20686.4 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	22955.6 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.5773
DENSITY	0.04409 lb/scf
COMPRESSIBILITY FACTOR :	0.9979
REGULAR WOBBE INDEX	1331.3

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

Net Dry Ideal BTU	4671.3 /scf	Relative Density - SG (Air=1)	3.2475	***C6+factors***
Gross Dry Ideal BTU	5006.8 /scf	**Z** Compressiblity Factor	0.99278	0.99184
Net Dry Ideal BTU	19092.5 /lb	Density Factor	247.842 lbm/1000 ft3	
Gross Dry Ideal BTU	20466.6 /lb	Molar Mass or MW	94.059 g/mol	
		Volume Liquid Ideal gas	0.022 scf/gal	24.7

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.