

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	05-045-15092	NAME/DESCRIP :	110250216 DWU E34 #CP08B-33
LEASE #:	05-045-15092		FEDERAL LEASE # COC-65556
FIELD/AREA:	GRAND VALLEY - #31290		CASING
PROJECT NO. :	202304096	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	APRIL 22, 2023 12:16
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	APRIL 10, 2023 10:35
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC - 10456	EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	179 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-821
LAB PRES:	psig	SAMPLED BY :	MIKE KELLY
SAMPLE TEMP. :	50 °f	SAMPLING COMPANY:	CAERUS
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>
GLYCOLS	0.0001	0.0003	0.0000	0.0000
ALCOHOLS	0.2234	0.4004	0.0280	0.0281
HELIUM	0.00	0.00	---	---
HYDROGEN	0.04	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.08	0.12	---	---
CARBON DIOXIDE	1.48	3.62	---	---
METHANE	91.8327	81.9137	---	---
ETHANE	4.2336	7.0780	1.1282	1.1344
PROPANE	0.9981	2.4471	0.2738	0.2753
I-BUTANE	0.2788	0.9010	0.0909	0.0914
N-BUTANE	0.2302	0.7439	0.0719	0.0723
I-PENTANE	0.1596	0.6396	0.0580	0.0583
N-PENTANE	0.0933	0.3742	0.0340	0.0342
HEXANES PLUS	0.3502	1.7618	0.1350	0.1354
TOTALS	100.00000	100.00000	1.8198	1.8294

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>
BENZENE	0.0216	0.0938
TOLUENE	0.0201	0.1030
ETHYLBENZENE	0.0000	0.0000
XYLENES	0.0002	0.0012
TOTAL BTEX	0.0419	0.1980

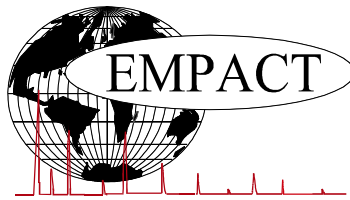
	<u>BTU @ 14.65</u>	<u>BTU @ 14.73</u>
LHV NET DRY REAL :	968.4 /scf	973.7 /scf
NET WET REAL :	951.5 /scf	956.8 /scf
HHV GROSS DRY REAL :	1072.3 /scf	1078.2 /scf
GROSS WET REAL :	1053.6 /scf	1059.5 /scf
NET HEATING VALUE (60 °F ideal reaction):		20448.4 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		22649.0 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6208
DENSITY		0.04740 lbm/scf
COMPRESSIBILITY FACTOR :		0.9976
REGULAR WOBBE INDEX		1362.0

*(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. :	202304096	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	APRIL 22, 2023 12:16
ACCOUNT NO. :		SAMPLE DATE :	APRIL 10, 2023 10:35
PRODUCER :	CAERUS PICEANCE LLC - 10456	CYLINDER NO. :	ECA-821
LEASE NO. :	05-045-15092	SAMPLED BY :	MIKE KELLY
NAME/DESCRIP :	110250216 DWU E34 #CP08B-33 FEDERAL LEASE # COC-65556 CASING		

FIELD DATA		SAMPLE TEMP. :	50
SAMPLE PRES. :	179	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	-		
COMMENTS :	<i>SPOT</i> <i>ppm mol</i> <i>NO PROBE</i>		

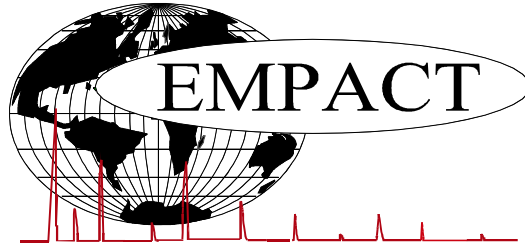
<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.00	0.00
Hydrogen	0.04	0.00
Carbon Dioxide	1.48	3.62
Nitrogen	0.08	0.12
Methane	91.8327	81.9137
Ethane	4.2336	7.0780
Propane	0.9981	2.4471
Isobutane	0.2788	0.9010
n-Butane	0.2302	0.7439
Isopentane	0.1541	0.6181
n-Pentane	0.0933	0.3742
Cyclopentane	0.0055	0.0215
n-Hexane	0.0461	0.2209
Cyclohexane	0.0239	0.1118
Other Hexanes	0.1218	0.5803
Heptanes	0.0684	0.3793
Methylcyclohexane	0.0377	0.2058
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0216	0.0938
Toluene	0.0201	0.1030
Ethylbenzene	0.0000	0.0000
Xylenes	0.0002	0.0012
C8+ Heavies	0.0104	0.0657
<u>Subtotal</u>	<u>99.77650</u>	<u>99.59930</u>
Oxygen/Argon	0.00	0.00
Glycols	0.0001	0.0003
Alcohols	0.2234	0.4004
<u>Total</u>	<u>100.00000</u>	<u>100.00000</u>

	<u>Total</u>	<u>C6+</u>	<u>C8+</u>	<u>C10+</u>	
Calculated Values BTU @ 14.65	Sample	Fraction	Fraction	Fraction	
LHV Net Dry Real:	968.4	4558.0	5660.9	#DIV/0!	Btu/scf
Net Wet Real:	951.5	4478.3	5561.9	#DIV/0!	Btu/scf
HHV Gross Dry Real:	1072.3	4894.7	6100.8	#DIV/0!	Btu/scf
Gross Wet Real:	1053.6	4809.1	5994.2	#DIV/0!	Btu/scf

Other Calculated Values					
Regualr Wobbe Index*	1362.0	2753.7	3081.0	#DIV/0!	Btu/scf
Net Heating Value (60 °F ideal reaction):	20448.4	19149.0	19890.5	#DIV/0!	Btu/lbm
Gross Heating Value (60°F ideal reaction):	22649.0	20567.0	21437.0	#DIV/0!	Btu/lbm
Molar Mass (MW):	17.9871	90.486	113.433	#DIV/0!	g/mol
Relative Density (AIR=1):	0.6208	3.1242	3.9166	#DIV/0!	SG
Density:	0.04740	0.23845	0.29891	#DIV/0!	lbm/scf
Compressibility Factor:	0.9976	0.9913	0.9963	#DIV/0!	Z
Liquid Volume real gas @:	14.65	17.5599	0.1346	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 underscore) indicates there was no tube pulled for H2S.

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY: **05-045-15092** NAME/DESCRIP : **110250216 DWU E34 #CP08B-33**
 LEASE #: **05-045-15092** FEDERAL LEASE # **COC-65556**
 FIELD/AREA: **GRAND VALLEY - #31290** CASING

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 CUSTOMER REF: TO:
 PRODUCER : **CAERUS PICEANCE LLC - 10456** EFFECTIVE DATE:
*****FIELD DATA*****
 SAMPLE CYCLE: SAMPLE TYPE: **SPOT**
 SAMPLE PRES. : **179** psig PROBE : **NO**
 FLOW PRES. : psig CYLINDER NO. : **ECA-821**
 LAB PRES: psig SAMPLED BY : **MIKE KELLY**
 SAMPLE TEMP. : **50** °f SAMPLING COMPANY: **CAERUS**
 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
Hydrogen	---	0.04	0.00	---	---
Nitrogen	---	0.08	0.12	---	---
Carbon Dioxide	---	1.48	3.62	---	---
Methane	P1	91.8327	81.9137	---	---
Ethane	P2	4.2336	7.0780	1.128	1.134
Propane	P3	0.9981	2.4471	0.274	0.275
i-Butane	I4	0.2788	0.9010	0.091	0.091
Methanol	X1	0.2219	0.3953	0.028	0.028
n-Butane	P4	0.2302	0.7439	0.072	0.072
2,2-Dimethylpropane	I5	0.0053	0.0212	0.002	0.002
i-Pentane	I5	0.1488	0.5969	0.054	0.054
Acetone	X3	0.0003	0.0010	0.000	0.000
i-Propanol	X3	0.0011	0.0037	0.000	0.000
n-Pentane	P5	0.0933	0.3742	0.034	0.034
t-Butanol	X4	0.0001	0.0004	0.000	0.000
2,2-Dimethylbutane	I6	0.0088	0.0421	0.004	0.004
Cyclopentane	N5	0.0055	0.0215	0.002	0.002
2,3-Dimethylbutane	I6	0.0126	0.0604	0.005	0.005
2-Methylpentane	I6	0.0455	0.2180	0.019	0.019
3-Methylpentane	I6	0.0261	0.1250	0.011	0.011
n-Hexane	P6	0.0461	0.2209	0.019	0.019
2,2-Dimethylpentane	I7	0.0004	0.0022	0.000	0.000
Methylcyclopentane	N6	0.0288	0.1348	0.010	0.010
2,4-Dimethylpentane	I7	0.0030	0.0167	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0008	0.0045	0.000	0.000
Benzene	A6	0.0216	0.0938	0.006	0.006
3,3-Dimethylpentane	I7	0.0011	0.0061	0.000	0.000
Cyclohexane	N6	0.0239	0.1118	0.008	0.008
2-Methylhexane	I7	0.0116	0.0646	0.005	0.005
2,3-Dimethylpentane	I7	0.0038	0.0212	0.002	0.002

1,1-Dimethylcyclopentane	N7	0.0027	0.0147	0.001	0.001
3-Methylhexane	I7	0.0110	0.0613	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0037	0.0202	0.002	0.002
Ethylene glycol	GL2	0.0001	0.0003	0.000	0.000
1t,3-Dimethylcyclopentane	N7	0.0033	0.0180	0.002	0.002
3-Ethylpentane	I7	0.0004	0.0022	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0054	0.0295	0.002	0.002
n-Heptane	P7	0.0194	0.1081	0.009	0.009
1c,2-Dimethylcyclopentane	N7	0.0004	0.0022	0.000	0.000
Methylcyclohexane	N7	0.0377	0.2058	0.015	0.015
2,2-Dimethylhexane	I8	0.0009	0.0057	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
Ethylcyclopentane	N7	0.0012	0.0066	0.000	0.000
2,5-Dimethylhexane	I8	0.0009	0.0057	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0009	0.0057	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0005	0.0031	0.000	0.000
3,3-Dimethylhexane	I8	0.0002	0.0013	0.000	0.000
Toluene	A7	0.0201	0.1030	0.007	0.007
2,3-Dimethylhexane	I8	0.0004	0.0026	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0014	0.0089	0.001	0.001
4-Methylheptane	I8	0.0004	0.0026	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	0.0009	0.0057	0.000	0.000
1c,2t,3-Trimethylcyclopentane	N8	0.0014	0.0087	0.001	0.001
3-Ethylhexane	I8	0.0002	0.0013	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0007	0.0044	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0003	0.0019	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0003	0.0019	0.000	0.000
n-Octane	P8	0.0005	0.0032	0.000	0.000
1c,4-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0001	0.0006	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0006	0.000	0.000
TOTAL		100.00000	100.00000	1.8198	1.8294

CALCULATED VALUES**

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0216	0.0938	LHV NET DRY REAL :	968.4 /scf	973.7 /scf
TOLUENE	0.0201	0.1030	NET WET REAL :	951.5 /scf	956.8 /scf
ETHYLBENZENE	0.0000	0.0000	HHV GROSS DRY REAL :	1072.3 /scf	1078.2 /scf
XYLENES	0.0002	0.0012	GROSS WET REAL :	1053.6 /scf	1059.5 /scf
TOTAL BTEX	0.0419	0.1980	NET HEATING VALUE (60 °F ideal reaction):		20448.4 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		22649.0 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6208
			DENSITY		0.04740 lb/scf
			COMPRESSIBILITY FACTOR :		0.9976
			REGULAR WOBBE INDEX		1362.0

*(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	4532.4 /scf	Relative Density - SG (Air=1)	3.1242	C6+ factors
Gross Dry Ideal BTU	4867.3 /scf	Z Compressibility Factor	0.99128	0.99071
Net Dry Ideal BTU	19149 /lb	Density Factor	238.451 lbm/1000 ft3	
Gross Dry Ideal BTU	20567 /lb	Molar Mass or MW	90.486 g/mol	
		Volume Liquid Ideal gas	0.135 scf/gal	25.2

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.

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