



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	05-045-07856	NAME/DESCRIP :	Unocal 14-9D
LEASE #:	05-045-07856		U2 Pad
FIELD/AREA:			Casing
PROJECT NO. :	202103019	ANALYSIS NO. :	05
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	MARCH 04, 2021 10:04
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MARCH 1, 2021 09:15
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	114 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-746
LAB PRES:	psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	23 °f	SAMPLING COMPANY:	CAERUS OIL & GAS LLC
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	- ppm
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	0.0046	0.0077	0.0010	0.0010
HELIUM	0.00	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.07	0.10	---	---
CARBON DIOXIDE	3.55	8.21	---	---
METHANE	87.4648	73.7665	---	---
ETHANE	6.1443	9.7128	1.6381	1.6470
PROPANE	1.4804	3.4318	0.4068	0.4090
I-BUTANE	0.3807	1.1633	0.1239	0.1246
N-BUTANE	0.2800	0.8556	0.0880	0.0884
I-PENTANE	0.1786	0.6771	0.0650	0.0653
N-PENTANE	0.0916	0.3474	0.0330	0.0332
HEXANES PLUS	0.3550	1.7278	0.1400	0.1403
TOTALS	100.00000	100.00000	2.4958	2.5088

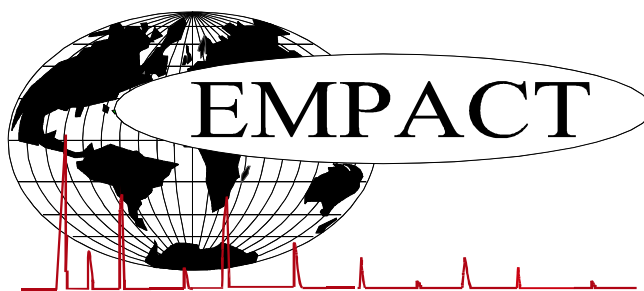
<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>	<u>BTU @ 14.65</u>	<u>14.73</u>
BENZENE	0.0201	0.0825	LHV NET DRY REAL : 974.4 /scf	979.7 /scf
TOLUENE	0.0311	0.1507	NET WET REAL :	957.4 /scf
ETHYLBENZENE	0.0002	0.0011	HHV GROSS DRY REAL : 1078.3 /scf	1084.2 /scf
XYLENES	0.0000	0.0000	GROSS WET REAL :	1059.4 /scf
TOTAL BTEX	0.0514	0.2343	NET HEATING VALUE (60 °F ideal reaction):	19463.6 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):	21537.7 Btu/lbm
			RELATIVE DENSITY (AIR=1):	0.6562
			DENSITY	0.05012 lbm/scf
			COMPRESSIBILITY FACTOR :	0.9974
			REGULAR WOBBE INDEX	1331.9

*(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.



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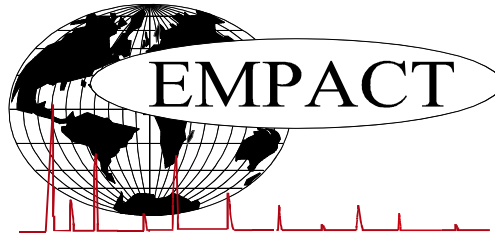
GLYCALC INFORMATION

PROJECT NO. :	202103019	ANALYSIS NO. :	05
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	MARCH 04, 2021 10:04
ACCOUNT NO. :		SAMPLE DATE :	MARCH 1, 2021 09:15
PRODUCER :		CYLINDER NO. :	ECA-746
LEASE NO. :	05-045-07856	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	Unocal 14-9D U2 Pad Casing		
FIELD DATA		SAMPLE TEMP. :	23
SAMPLE PRES. :	114	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	- ppm		
COMMENTS :	<i>SPOT NO PROBE</i>		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.00	0.00
Hydrogen	0.00	0.00
Carbon Dioxide	3.55	8.21
Nitrogen	0.07	0.10
Methane	87.4648	73.7665
Ethane	6.1443	9.7128
Propane	1.4804	3.4318
Isobutane	0.3807	1.1633
n-Butane	0.2800	0.8556
Isopentane	0.1750	0.6638
n-Pentane	0.0916	0.3474
Cyclopentane	0.0036	0.0133
n-Hexane	0.0382	0.1731
Cyclohexane	0.0244	0.1080
Other Hexanes	0.1031	0.4644
Heptanes	0.0618	0.3246
Methylcyclohexane	0.0385	0.1987
2,2,4 Trimethylpentane	0.0003	0.0018
Benzene	0.0201	0.0825
Toluene	0.0311	0.1507
Ethylbenzene	0.0002	0.0011
Xylenes	0.0000	0.0000
C8+ Heavies	0.0373	0.2229
<u>Subtotal</u>	<u>99.99540</u>	<u>99.99230</u>
Oxygen/Argon	0.00	0.00
<u>Alcohols</u>	<u>0.0046</u>	<u>0.0077</u>
Total	100.00000	100.00000

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:	05-045-07856	NAME/DESCRIP :	Unocal 14-9D
LEASE #:	05-045-07856		U2 Pad
FIELD/AREA:			Casing
PROJECT NO. :	202103019	ANALYSIS NO. :	05
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	MARCH 04, 2021 10:04
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MARCH 1, 2021 09:15
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	114 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-746
LAB PRES:	psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	23 °f	SAMPLING COMPANY:	CAERUS OIL & GAS LLC
AMBIENT TEMP.:	°f	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
Nitrogen	---	0.07	0.10	---	---
Carbon Dioxide	---	3.55	8.21	---	---
Methane	P1	87.4648	73.7665	---	---
Ethane	P2	6.1443	9.7128	1.638	1.647
Propane	P3	1.4804	3.4318	0.407	0.409
i-Butane	I4	0.3807	1.1633	0.124	0.125
Methanol	X1	0.0046	0.0077	0.001	0.001
n-Butane	P4	0.2800	0.8556	0.088	0.088
2,2-Dimethylpropane	I5	0.0048	0.0182	0.002	0.002
i-Pentane	I5	0.1702	0.6456	0.062	0.062
n-Pentane	P5	0.0916	0.3474	0.033	0.033
2,2-Dimethylbutane	I6	0.0065	0.0294	0.003	0.003
Cyclopentane	N5	0.0036	0.0133	0.001	0.001
2,3-Dimethylbutane	I6	0.0102	0.0462	0.004	0.004
2-Methylpentane	I6	0.0399	0.1807	0.017	0.017
3-Methylpentane	I6	0.0224	0.1015	0.009	0.009
n-Hexane	P6	0.0382	0.1731	0.016	0.016
Methylcyclopentane	N6	0.0241	0.1066	0.009	0.009
2,4-Dimethylpentane	I7	0.0032	0.0169	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0012	0.0063	0.001	0.001
Benzene	A6	0.0201	0.0825	0.006	0.006
3,3-Dimethylpentane	I7	0.0007	0.0037	0.000	0.000
Cyclohexane	N6	0.0244	0.1080	0.008	0.008
2-Methylhexane	I7	0.0049	0.0258	0.002	0.002
2,3-Dimethylpentane	I7	0.0080	0.0422	0.004	0.004
1,1-Dimethylcyclopentane	N7	0.0042	0.0217	0.002	0.002
3-Methylhexane	I7	0.0099	0.0522	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0029	0.0150	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0023	0.0119	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0016	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0044	0.0227	0.002	0.002
2,2,4-Trimethylpentane	I8	0.0003	0.0018	0.000	0.000

n-Heptane	P7	0.0175	0.0922	0.008	0.008
1c,2-Dimethylcyclopentane	N7	0.0003	0.0015	0.000	0.000
Methylcyclohexane	N7	0.0385	0.1987	0.015	0.015
2,2-Dimethylhexane	I8	0.0006	0.0036	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0008	0.0047	0.000	0.000
Ethylcyclopentane	N7	0.0012	0.0062	0.000	0.000
2,5-Dimethylhexane	I8	0.0011	0.0066	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0008	0.0048	0.000	0.000
2,4-Dimethylhexane	I8	0.0005	0.0030	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0004	0.0024	0.000	0.000
3,3-Dimethylhexane	I8	0.0004	0.0024	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0006	0.0035	0.000	0.000
Toluene	A7	0.0311	0.1507	0.010	0.010
2,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0007	0.0042	0.000	0.000
1,1,2-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0046	0.0276	0.002	0.002
4-Methylheptane	I8	0.0020	0.0120	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0017	0.0102	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0074	0.0436	0.004	0.004
3-Ethylhexane	I8	0.0007	0.0042	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0029	0.0171	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0009	0.0053	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0003	0.0018	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0018	0.0106	0.001	0.001
n-Octane	P8	0.0070	0.0421	0.004	0.004
1c,4-Dimethylcyclohexane	N8	0.0012	0.0071	0.001	0.001
2,4,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
Ethylbenzene	I8	0.0002	0.0011	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
2-Methylnonane	I10	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0014	0.000	0.000
TOTAL		100.0000	100.0000	2.4958	2.5088

BTEX COMPONENTS	MOLE%	WT%	BTU @	14.65	14.73
BENZENE	0.0201	0.0825	LHV NET DRY REAL :	974.4 /scf	979.7 /scf
TOLUENE	0.0311	0.1507	NET WET REAL :	957.4 /scf	962.7 /scf
ETHYLBENZENE	0.0002	0.0011	HHV GROSS DRY REAL :	1078.3 /scf	1084.2 /scf
XYLENES	0.0000	0.0000	GROSS WET REAL :	1059.4 /scf	1065.3 /scf
TOTAL BTEX	0.0514	0.2343	NET HEATING VALUE (60 °F ideal reaction):		19463.6 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):		21537.7 Btu/lbm
			RELATIVE DENSITY (AIR=1):		0.6562
			DENSITY		0.05012 lb/scf
			COMPRESSIBILITY FACTOR :		0.9974
			REGULAR WOBBE INDEX		1331.9

*(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>4624.7</u> /scf	Relative Density - SG (Air=1)	<u>3.1969</u>	C6+ factors
Gross Dry Ideal BTU	<u>4964.2</u> /scf	Z Compressibility Factor	<u>0.99227</u>	<u>0.99158</u>
Net Dry Ideal BTU	<u>19174.5</u> /lb	Density Factor	<u>243.97</u> lbm/1000 ft ³	
Gross Dry Ideal BTU	<u>20579.4</u> /lb	Molar Mass or MW	<u>92.583</u> g/mol	
		Volume Liquid Ideal gas	<u>0.14</u> scf/gal	<u>24.8</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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