



EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	05-045-13410	NAME/DESCRIP :	N.PARACHUTE H15 WF11D-14 596
LEASE #:	110167193		PRODUCTION CASING
FIELD/AREA:	WILDCAT - #99999		
PROJECT NO. :	202405044	ANALYSIS NO. :	03
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	MAY 10, 2024 11:24
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MAY 2, 2024 15:00
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	105 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-819
LAB PRES:	psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	61 °f	SAMPLING COMPANY:	CAERUS OIL & GAS LLC
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	- ppm mol
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:			
LAB COMMENTS:	Trace Olefins present.		

<u>COMPONENT</u>	<u>MOLE %</u>	<u>MASS %</u>	<u>GPM @ 14.65</u>	<u>GPM @ 14.73</u>
ALCOHOLS	0.0098	0.0207	0.0010	0.0010
HELIUM	0.00	0.00	---	---
HYDROGEN	1.98	0.21	---	---
OXYGEN/ARGON	0.59	1.00	---	---
NITROGEN	23.79	35.42	---	---
CARBON DIOXIDE	0.03	0.07	---	---
METHANE	73.4689	62.6362	---	---
ETHANE	0.0151	0.0241	0.0040	0.0040
PROPANE	0.0025	0.0059	0.0010	0.0010
I-BUTANE	0.0010	0.0031	0.0000	0.0000
N-BUTANE	0.0024	0.0074	0.0010	0.0010
I-PENTANE	0.0032	0.0122	0.0010	0.0010
N-PENTANE	0.0030	0.0115	0.0010	0.0010
HEXANES PLUS	0.1041	0.5789	0.0320	0.0320
TOTALS	100.00000	100.00000	0.0410	0.0410

<u>BTEX COMPONENTS</u>	<u>MOLE%</u>	<u>WT%</u>	<u>CALCULATED VALUES**</u>	
			<u>BTU @ 14.65</u>	<u>14.73</u>
BENZENE	0.0132	0.0548		
TOLUENE	0.0148	0.0725	LHV NET DRY REAL :	676.8 /scf
ETHYLBENZENE	0.0005	0.0028		680.5 /scf
XYLENES	0.0047	0.0265	NET WET REAL :	665.0 /scf
TOTAL BTEX	0.0332	0.1566	HHV GROSS DRY REAL :	752.6 /scf
				756.7 /scf
			GROSS WET REAL :	739.4 /scf
			NET HEATING VALUE (60 °F ideal reaction):	13704.8 Btu/lbm
			GROSS HEATING VALUE (60°F ideal reaction):	15225.9 Btu/lbm
			RELATIVE DENSITY (AIR=1):	0.6488
			DENSITY	0.04958 lbm/scf
			COMPRESSIBILITY FACTOR :	0.9986
			REGULAR WOBBE INDEX	936.0

*(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.



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

PROJECT NO. :	202405044	ANALYSIS NO. :	03
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	MAY 10, 2024 11:24
ACCOUNT NO. :		SAMPLE DATE :	MAY 2, 2024 15:00
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	ECA-819
LEASE NO. :	110167193	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	N.PARACHUTE H15 WF11D-14 596 PRODUCTION CASING		

FIELD DATA

SAMPLE PRES. :	105	SAMPLE TEMP. :	61
H2S BY STAIN TUBE:	—	AMBIENT TEMP.:	
COMMENTS :	<i>SPOT ppm mol NO PROBE Trace Olefins present.</i>		

<u>Componet</u>	<u>Mole %</u>	<u>Wt %</u>
Helium	0.00	0.00
Hydrogen	1.98	0.21
Carbon Dioxide	0.03	0.07
Nitrogen	23.79	35.42
Methane	73.4689	62.6362
Ethane	0.0151	0.0241
Propane	0.0025	0.0059
Isobutane	0.0010	0.0031
n-Butane	0.0024	0.0074
Isopentane	0.0030	0.0115
n-Pentane	0.0030	0.0115
Cyclopentane	0.0002	0.0007
n-Hexane	0.0042	0.0192
Cyclohexane	0.0032	0.0143
Other Hexanes	0.0095	0.0432
Heptanes	0.0149	0.0790
Methylcyclohexane	0.0089	0.0465
2,2,4 Trimethylpentane	0.0001	0.0006
Benzene	0.0132	0.0548
Toluene	0.0148	0.0725
Ethylbenzene	0.0005	0.0028
Xylenes	0.0047	0.0265
C8+ Heavies	0.0301	0.2195
<u>Subtotal</u>	<u>99.40020</u>	<u>98.97930</u>
Oxygen/Argon	0.59	1.00
Alcohols	0.0098	0.0207
<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 @ <u>14.65</u>	Sample	Fraction	Fraction	Fraction
LHV Net Dry Real:	676.8	5165.6	6609.1	8480.6 Btu/scf
Net Wet Real:	665.0	5075.3	6493.6	8332.3 Btu/scf
HHV Gross Dry Real:	752.6	5522.4	7101.0	9137.6 Btu/scf
Gross Wet Real:	739.4	5425.9	6976.9	8977.9 Btu/scf
Other Calculated Values				
Regualr Wobbe Index*	936.0	2901.8	3323.9	3803.9 Btu/scf
Net Heating Value (60 °F ideal reaction):	13704.8	18794.1	19009.3	18686.6 Btu/lbm
Gross Heating Value (60°F ideal reaction):	15225.9	20094.1	20422.0	20133.4 Btu/lbm
Molar Mass (MW):	18.8175	104.678	132.7	168.15 g/mol
Relative Density (AIR=1):	0.6488	3.6146	4.5816	5.8057 SG
Density:	0.04958	0.27584	0.34968	0.44310 lbm/scf
Compressibility Factor:	0.9986	0.9959	0.9988	0.9999 Z
Liquid Volume real gas @: <u>14.65</u>	15.2621	0.0319	0.009	0.003 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.

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.



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY: 05-045-13410 NAME/DESCRIP : N.PARACHUTE H15 WF11D-14 596
 LEASE #: 110167193 PRODUCTION CASING
 FIELD/AREA: WILDCAT - #99999

PROJECT NO. : 202405044 ANALYSIS NO. : 03
 COMPANY NAME : CAERUS OIL & GAS LLC ANALYSIS DATE: MAY 10, 2024 11:24
 OFFICE / BRANCH: PARACHUTE, CO SAMPLE DATE : MAY 2, 2024 15:00
 CUSTOMER REF: TO:
 PRODUCER : CAERUS PICEANCE LLC EFFECTIVE DATE:

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

SAMPLE CYCLE: SAMPLE TYPE: SPOT
 SAMPLE PRES. : 105 psig PROBE : NO
 FLOW PRES. : psig CYLINDER NO. : ECA-819
 LAB PRES: psig SAMPLED BY : MIKE KELLEY
 SAMPLE TEMP. : 61 °f SAMPLING COMPANY: CAERUS OIL & GAS LLC
 AMBIENT TEMP.: °f H2S BY STAIN TUBE: - ppm mol
 H2O BY STAIN TUBE: - #/mmcf CO2 BY STAIN TUBE: - Mol %
 FIELD COMMENTS:
 LAB COMMENTS: *Trace Olefins present.*

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
Helium	---	0.00	0.00	---	---
Hydrogen	---	1.98	0.21	---	---
Oxygen/Argon	---	0.59	1.00	---	---
Nitrogen	---	23.79	35.42	---	---
Carbon Dioxide	---	0.03	0.07	---	---
Methane	P1	73.4689	62.6362	---	---
Ethane	P2	0.0151	0.0241	0.004	0.004
Propane	P3	0.0020	0.0047	0.001	0.001
i-Butane	I4	0.0010	0.0031	0.000	0.000
Methanol	X1	0.0062	0.0106	0.001	0.001
UnknownC3s	U3	0.0005	0.0012	0.000	0.000
n-Butane	P4	0.0020	0.0062	0.001	0.001
Ethanol	X2	0.0016	0.0039	0.000	0.000
i-Pentane	I5	0.0030	0.0115	0.001	0.001
Acetone	X3	0.0013	0.0040	0.000	0.000
i-Propanol	X3	0.0007	0.0022	0.000	0.000
UnknownC4s	U4	0.0004	0.0012	0.000	0.000
n-Pentane	P5	0.0030	0.0115	0.001	0.001
2,2-Dimethylbutane	I6	0.0004	0.0018	0.000	0.000
Cyclopentane	N5	0.0002	0.0007	0.000	0.000
2,3-Dimethylbutane	I6	0.0008	0.0037	0.000	0.000
2-Methylpentane	I6	0.0034	0.0156	0.001	0.001
3-Methylpentane	I6	0.0021	0.0096	0.001	0.001
n-Hexane	P6	0.0042	0.0192	0.002	0.002
2,2-Dimethylpentane	I7	0.0003	0.0016	0.000	0.000
Methylcyclopentane	N6	0.0028	0.0125	0.001	0.001
2,4-Dimethylpentane	I7	0.0005	0.0027	0.000	0.000
2,2,3-Trimethylbutane	I7	0.0001	0.0005	0.000	0.000
Benzene	A6	0.0132	0.0548	0.004	0.004
3,3-Dimethylpentane	I7	0.0002	0.0011	0.000	0.000

Cyclohexane	N6	0.0032	0.0143	0.001	0.001
2-Methylhexane	I7	0.0026	0.0139	0.001	0.001
2,3-Dimethylpentane	I7	0.0007	0.0037	0.000	0.000
1,1-Dimethylcyclopentane	N7	0.0005	0.0026	0.000	0.000
3-Methylhexane	I7	0.0024	0.0128	0.001	0.001
1c,3-Dimethylcyclopentane	N7	0.0007	0.0037	0.000	0.000
1t,3-Dimethylcyclopentane	N7	0.0006	0.0031	0.000	0.000
3-Ethylpentane	I7	0.0001	0.0005	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0010	0.0052	0.000	0.000
2,2,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
n-Heptane	P7	0.0045	0.0240	0.002	0.002
1c,2-Dimethylcyclopentane	N7	0.0003	0.0015	0.000	0.000
Methylcyclohexane	N7	0.0089	0.0465	0.004	0.004
2,2-Dimethylhexane	I8	0.0003	0.0018	0.000	0.000
Ethylcyclopentane	N7	0.0004	0.0021	0.000	0.000
2,5-Dimethylhexane	I8	0.0004	0.0024	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0004	0.0024	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
3,3-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
2,3,4-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0148	0.0725	0.005	0.005
2,3-Dimethylhexane	I8	0.0003	0.0018	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0015	0.0091	0.001	0.001
4-Methylheptane	I8	0.0004	0.0024	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0013	0.0079	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0015	0.0089	0.001	0.001
3-Ethylhexane	I8	0.0002	0.0012	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0006	0.0036	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0002	0.0012	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0005	0.0030	0.000	0.000
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0029	0.0176	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0005	0.0030	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0005	0.0034	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0003	0.0018	0.000	0.000
n-Propylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,5-Dimethylheptane	I9	0.0004	0.0027	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0005	0.0028	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0031	0.0175	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0010	0.0056	0.000	0.000
4-Methyloctane	I9	0.0003	0.0020	0.000	0.000
2-Methyloctane	I9	0.0004	0.0027	0.000	0.000
3-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0004	0.0027	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0006	0.0034	0.000	0.000
i-Butylcyclopentane	N9	0.0002	0.0013	0.000	0.000
n-Nonane	P9	0.0015	0.0102	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000

n-Propylbenzene	A9	0.0002	0.0013	0.000	0.000
1,3-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0003	0.0019	0.000	0.000
2,3-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
5-Methylnonane	I10	0.0001	0.0007	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
2-Methylnonane	I10	0.0002	0.0015	0.000	0.000
3-Methylnonane	I10	0.0002	0.0015	0.000	0.000
t-Butylbenzene	A10	0.0004	0.0029	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0003	0.0020	0.000	0.000
n-Decane	P10	0.0010	0.0076	0.001	0.001
1,3-Methyl-i-propylbenzene	A10	0.0002	0.0014	0.000	0.000
1,4-Methyl-i-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,4-Diethylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,3-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
UnknownC10s	U10	0.0001	0.0007	0.000	0.000
n-Undecane	P11	0.0006	0.0050	0.000	0.000
1,4-Ethyl-i-propylbenzene	A11	0.0001	0.0008	0.000	0.000
sec-Pentylbenzene	A11	0.0001	0.0008	0.000	0.000
n-Pentylbenzene	A11	0.0002	0.0016	0.000	0.000
Tetrahydronaphthalene	A10	0.0001	0.0007	0.000	0.000
UnknownC11s	U11	0.0003	0.0025	0.000	0.000
n-Dodecane	P12	0.0019	0.0172	0.001	0.001
1,3,5-Triethylbenzene	A12	0.0002	0.0017	0.000	0.000
1,4-Methyl-n-pentylbenzene	A12	0.0001	0.0009	0.000	0.000
n-Hexylbenzene	A12	0.0001	0.0009	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0002	0.0016	0.000	0.000
2-Methylnaphthalene	A11	0.0001	0.0007	0.000	0.000
UnknownC12s	U12	0.0005	0.0042	0.000	0.000
n-Tridecane	P13	0.0006	0.0059	0.000	0.000
UnknownC13s	U13	0.0002	0.0020	0.000	0.000
n-Tetradecane	P14	0.0014	0.0148	0.001	0.001
UnknownC14s	U14	0.0003	0.0032	0.000	0.000
n-Pentadecane	P15	0.0005	0.0056	0.000	0.000
UnknownC15s	U15	0.0003	0.0034	0.000	0.000
n-Hexadecane	P16	0.0003	0.0036	0.000	0.000
n-Heptadecane	P17	0.0002	0.0026	0.000	0.000
TOTAL		100.00000	100.00000	0.0410	0.0410

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0132	0.0548
TOLUENE	0.0148	0.0725
ETHYLBENZENE	0.0005	0.0028
XYLENES	0.0047	0.0265
TOTAL BTEX	0.0332	0.1566

*(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 :	676.8 /scf	680.5 /scf
NET WET REAL :	665.0 /scf	668.7 /scf
HHV GROSS DRY REAL :	752.6 /scf	756.7 /scf
GROSS WET REAL :	739.4 /scf	743.5 /scf
NET HEATING VALUE (60 °F ideal reaction):		13704.8 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):		15225.9 Btu/lbm
RELATIVE DENSITY (AIR=1):		0.6488
DENSITY		0.04958 lb/scf
COMPRESSIBILITY FACTOR :		0.9986
REGULAR WOBBE INDEX		936.0

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

Net Dry Ideal BTU	<u>5160.6</u> /scf	Relative Density - SG (Air=1)	<u>3.6146</u>	C6+ factors
Gross Dry Ideal BTU	<u>5517</u> /scf	Z Compressibility Factor	<u>0.9959</u>	<u>0.99506</u>
Net Dry Ideal BTU	<u>18794.1</u> /lb	Density Factor	<u>275.835</u> lbm/1000 ft3	
Gross Dry Ideal BTU	<u>20094.1</u> /lb	Molar Mass or MW	<u>104.678</u> g/mol	
		Volume Liquid Ideal gas	<u>0.032</u> scf/gal	<u>23.8</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.**

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.