EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-15688**	NAME/DESCRIP :	**PARACHUTE RANCH #26-34D**
LEASE #:	**300115073**		**GARFIELD COUNTY #045**
FIELD/AREA:	**GRAND VALLEY - #31290**		**CASING**

PROJECT NO. :	**202312018**	ANALYSIS NO. :	**01**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	DECEMBER 17, 2023 22:25
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	NOVEMBER 22, 2023 13:45
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	700	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-706
LAB PRES:		psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	41	ºf	SAMPLING COMPANY:	CAERUS OIL & GAS LLC
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
ALCOHOLS	0.0449	0.0814	0.0060	0.0060
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.09	0.14	---	---
CARBON DIOXIDE	0.83	2.03	---	---
METHANE	91.5059	81.6022	---	---
ETHANE	4.9953	8.3495	1.3321	1.3394
PROPANE	1.4359	3.5196	0.3947	0.3969
I-BUTANE	0.2915	0.9418	0.0949	0.0955
N-BUTANE	0.2915	0.9418	0.0919	0.0924
I-PENTANE	0.1279	0.5123	0.0460	0.0462
N-PENTANE	0.0879	0.3525	0.0320	0.0322
HEXANES PLUS	0.2892	1.5289	0.1150	0.1153
TOTALS	100.00000	100.00000	2.1126	2.1239

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0052	0.0226
TOLUENE	0.0030	0.0153
ETHYLBENZENE	0.0011	0.0065
XYLENES	0.0041	0.0242
TOTAL BTEX	0.0134	0.0686

**(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 :	984.8	/scf	990.2	/scf
	NET WET REAL :	967.6	/scf	973.0	/scf
HHV	GROSS DRY REAL :	1090.5	/scf	1096.4	/scf
	GROSS WET REAL :	1071.4	/scf	1077.3	/scf
	NET HEATING VALUE (60 °F ideal reaction):			20801.8	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):			23032.3	Btu/lbm
	RELATIVE DENSITY (AIR=1):			0.6202	
	DENSITY			0.04740	lbm/scf
	COMPRESSIBILITY FACTOR :			0.9975	
	REGULAR WOBBE INDEX			1385.6	

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202312018	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	DECEMBER 17, 2023 22:25
ACCOUNT NO. :		SAMPLE DATE :	NOVEMBER 22, 2023 13:45
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	ECA-706
LEASE NO. :	300115073	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	PARACHUTE RANCH #26-34D GARFIELD COUNTY #045 CASING		
FIELD DATA		SAMPLE TEMP. :	41
SAMPLE PRES. :	700	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	0.83	2.03
Nitrogen	0.09	0.14
Methane	91.5059	81.6022
Ethane	4.9953	8.3495
Propane	1.4359	3.5196
Isobutane	0.2915	0.9418
n-Butane	0.2915	0.9418
Isopentane	0.1228	0.4924
n-Pentane	0.0879	0.3525
Cyclopentane	0.0051	0.0199
n-Hexane	0.0394	0.1887
Cyclohexane	0.0187	0.0875
Other Hexanes	0.0799	0.3806
Heptanes	0.0568	0.3148
Methylcyclohexane	0.0355	0.1938
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0052	0.0226
Toluene	0.0030	0.0153
Ethylbenzene	0.0011	0.0065
Xylenes	0.0041	0.0242
C8+ Heavies	0.0455	0.2949
Subtotal	99.95510	99.91860
Oxygen/Argon	0.00	0.00
Alcohols	0.0449	0.0814
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	984.8	4805.2	5747.9	6611.8	**Btu/scf**
	Net Wet Real:	967.6	4721.2	5647.4	6496.2	**Btu/scf**
HHV	Gross Dry Real:	1090.5	5171.1	6178.0	7029.9	**Btu/scf**
	Gross Wet Real:	1071.4	5080.7	6070.0	6907.0	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1385.6	2840.8	3094.7	3241.9	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		20801.8	19337.5	19584.5	18376.6	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23032.3	20807.8	21052.1	19539.0	**Btu/lbm**
Molar Mass (MW):		17.9901	95.116	115.56	136.909	**g/mol**
Relative Density (AIR=1):		0.6202	3.2841	3.9901	4.7271	**SG**
Density:		0.04740	0.25065	0.30451	0.36078	**lbm/scf**
Compressiblity Factor:		0.9975	0.9924	0.9975	0.9995	**Z**
Liquid Volume real gas @:	**14.65**	17.6835	0.1146	0.0189	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

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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	---	0.09	0.14	---	---
Carbon Dioxide	---	0.83	2.03	---	---
Methane	P1	91.5059	81.6022	---	---
Ethane	P2	4.9953	8.3495	1.332	1.339
Propane	P3	1.4359	3.5196	0.395	0.397
i-Butane	I4	0.2915	0.9418	0.095	0.096
Methanol	X1	0.0440	0.0784	0.006	0.006
n-Butane	P4	0.2915	0.9418	0.092	0.092
2,2-Dimethylpropane	I5	0.0039	0.0156	0.001	0.001
i-Pentane	I5	0.1189	0.4768	0.043	0.043
i-Propanol	X3	0.0009	0.0030	0.000	0.000
n-Pentane	P5	0.0879	0.3525	0.032	0.032
2,2-Dimethylbutane	I6	0.0040	0.0192	0.002	0.002
Cyclopentane	N5	0.0051	0.0199	0.002	0.002
2,3-Dimethylbutane	I6	0.0075	0.0359	0.003	0.003
2-Methylpentane	I6	0.0319	0.1528	0.013	0.013
3-Methylpentane	I6	0.0173	0.0829	0.007	0.007
n-Hexane	P6	0.0394	0.1887	0.016	0.016
2,2-Dimethylpentane	I7	0.0011	0.0061	0.001	0.001
Methylcyclopentane	N6	0.0192	0.0898	0.007	0.007
2,4-Dimethylpentane	I7	0.0022	0.0122	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0005	0.0028	0.000	0.000
Benzene	A6	0.0052	0.0226	0.001	0.001
3,3-Dimethylpentane	I7	0.0006	0.0033	0.000	0.000
Cyclohexane	N6	0.0187	0.0875	0.006	0.006
2-Methylhexane	I7	0.0091	0.0507	0.004	0.004
2,3-Dimethylpentane	I7	0.0022	0.0122	0.001	0.001

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1,1-Dimethylcyclopentane	N7	0.0017	0.0093	0.001	0.001
3-Methylhexane	I7	0.0080	0.0446	0.004	0.004
1c,3-Dimethylcyclopentane	N7	0.0031	0.0169	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0028	0.0153	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0017	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0044	0.0240	0.002	0.002
n-Heptane	P7	0.0180	0.1003	0.008	0.008
1c,2-Dimethylcyclopentane	N7	0.0013	0.0071	0.001	0.001
Methylcyclohexane	N7	0.0355	0.1938	0.014	0.014
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	0.0013	0.0071	0.001	0.001
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	0.0007	0.0044	0.000	0.000
3,3-Dimethylhexane	I8	0.0003	0.0019	0.000	0.000
Toluene	A7	0.0030	0.0153	0.001	0.001
2,3-Dimethylhexane	I8	0.0007	0.0045	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0039	0.0248	0.002	0.002
4-Methylheptane	I8	0.0012	0.0076	0.001	0.001
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	0.0028	0.0178	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0057	0.0356	0.003	0.003
3-Ethylhexane	I8	0.0002	0.0013	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0023	0.0143	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0007	0.0044	0.000	0.000
2,2,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0012	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0017	0.0106	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0080	0.0508	0.004	0.004
1c,4-Dimethylcyclohexane	N8	0.0012	0.0075	0.001	0.001
2,3,5-Trimethylhexane	I9	0.0002	0.0015	0.000	0.000
2,2-Dimethylheptane	I9	0.0006	0.0043	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0017	0.0120	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0005	0.0036	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
4,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0013	0.0081	0.001	0.001
n-Propylcyclopentane	N8	0.0006	0.0037	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0002	0.0014	0.000	0.000
2,5-Dimethylheptane	I9	0.0011	0.0078	0.001	0.001
3,3-Dimethylheptane	I9	0.0003	0.0021	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000
Ethylbenzene	I8	0.0011	0.0065	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0020	0.0118	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0013	0.0077	0.001	0.001
3,4-Dimethylheptane (2)	I9	0.0001	0.0007	0.000	0.000
4-Methyloctane	I9	0.0004	0.0028	0.000	0.000
2-Methyloctane	I9	0.0005	0.0036	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0007	0.000	0.000
3-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0005	0.0035	0.000	0.000
3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0008	0.0047	0.000	0.000
i-Butylcyclopentane	N9	0.0003	0.0021	0.000	0.000

n-Nonane	P9	0.0008	0.0057	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0001	0.0007	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
1,3-Methylethylbenzene	A9	0.0003	0.0020	0.000	0.000
1,4-Methylethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0002	0.0013	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0004	0.0030	0.000	0.000
UnknownC9s	U9	0.0005	0.0036	0.000	0.000
n-Decane	P10	0.0001	0.0008	0.000	0.000
TOTAL		100.00000	100.00000	2.1126	2.1239

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0052	0.0226
TOLUENE	0.0030	0.0153
ETHYLBENZENE	0.0011	0.0065
XYLENES	0.0041	0.0242
TOTAL BTEX	0.0134	0.0686

**(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 :	984.8	/scf	990.2	/scf
	NET WET REAL :	967.6	/scf	973.0	/scf
HHV	GROSS DRY REAL :	1090.5	/scf	1096.4	/scf
	GROSS WET REAL :	1071.4	/scf	1077.3	/scf
	NET HEATING VALUE (60 °F ideal reaction):			20801.8	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):			23032.3	Btu/lbm
	RELATIVE DENSITY (AIR=1):			0.6202	
	DENSITY			0.04740	lb/scf
	COMPRESSIBILITY FACTOR :			0.9975	
	REGULAR WOBBE INDEX			1385.6	

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

Net Dry Ideal BTU	4783.8 /scf	Relative Density - SG (Air=1)	3.2841	***C6+factors***
Gross Dry Ideal BTU	5148.1 /scf	**Z** Compressiblity Factor	0.99244	0.99181
Net Dry Ideal BTU	19337.5 /lb	Density Factor	250.65 lbm/1000 ft3	
Gross Dry Ideal BTU	20807.8 /lb	Molar Mass or MW	95.116 g/mol	
		Volume Liquid Ideal gas	0.115 scf/gal	23.6

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.