EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-10362**	NAME/DESCRIP :	**GARFIELD COUNTY #045**
LEASE #:	**300105016, COC 64157**		**TBI FEDERAL #36-12C (PF36-7)**
FIELD/AREA:	**PARACHUTE - #67350**		**CASING**
PROJECT NO. :	**202312092**	ANALYSIS NO. :	**01**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	DECEMBER 27, 2023 00:42
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	DECEMBER 14, 2023 15:20
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	448	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-810
LAB PRES:		psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	43	ºf	SAMPLING COMPANY:	CAERUS OIL
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	0.0011	0.0020	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.10	0.16	---	---
CARBON DIOXIDE	0.41	1.02	---	---
METHANE	92.9435	84.5130	---	---
ETHANE	4.3357	7.3894	1.1562	1.1625
PROPANE	1.2379	3.0939	0.3398	0.3416
I-BUTANE	0.2462	0.8111	0.0799	0.0804
N-BUTANE	0.2683	0.8839	0.0839	0.0844
I-PENTANE	0.1135	0.4636	0.0410	0.0412
N-PENTANE	0.0804	0.3288	0.0290	0.0291
HEXANES PLUS	0.2534	1.3343	0.1010	0.1013
TOTALS	100.00000	100.00000	1.8308	1.8405

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0038	0.0168
TOLUENE	0.0020	0.0104
ETHYLBENZENE	0.0001	0.0006
XYLENES	0.0002	0.0012
TOTAL BTEX	0.0061	0.0290

**(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 :	977.6	/scf	982.9	/scf
	NET WET REAL :	960.5	/scf	965.8	/scf
HHV	GROSS DRY REAL :	1082.4	/scf	1088.3	/scf
	GROSS WET REAL :	1063.5	/scf	1069.4	/scf
	NET HEATING VALUE (60 °F ideal reaction):			21051.3	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):			23316.8	Btu/lbm
	RELATIVE DENSITY (AIR=1):			0.6088	
	DENSITY			0.04649	lbm/scf
	COMPRESSIBILITY FACTOR :			0.9976	
	REGULAR WOBBE INDEX			1388.3	

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202312092	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	DECEMBER 27, 2023 00:42
ACCOUNT NO. :		SAMPLE DATE :	DECEMBER 14, 2023 15:20
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	ECA-810
LEASE NO. :	300105016, COC 64157	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	GARFIELD COUNTY #045 TBI FEDERAL #36-12C (PF36-7) CASING		
FIELD DATA		SAMPLE TEMP. :	43
SAMPLE PRES. :	448	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	0.41	1.02
Nitrogen	0.10	0.16
Methane	92.9435	84.5130
Ethane	4.3357	7.3894
Propane	1.2379	3.0939
Isobutane	0.2462	0.8111
n-Butane	0.2683	0.8839
Isopentane	0.1084	0.4433
n-Pentane	0.0804	0.3288
Cyclopentane	0.0051	0.0203
n-Hexane	0.0359	0.1754
Cyclohexane	0.0209	0.0997
Other Hexanes	0.0750	0.3639
Heptanes	0.0538	0.3041
Methylcyclohexane	0.0397	0.2209
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0038	0.0168
Toluene	0.0020	0.0104
Ethylbenzene	0.0001	0.0006
Xylenes	0.0002	0.0012
C8+ Heavies	0.0220	0.1413
Subtotal	99.99890	99.99800
Oxygen/Argon	0.00	0.00
Alcohols	0.0011	0.0020
Total	100.00000	100.00000

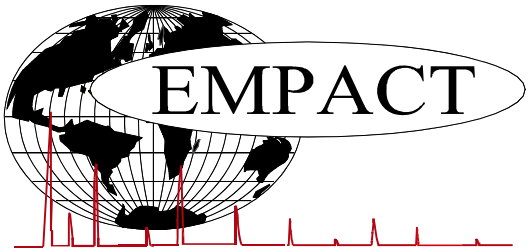
Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	977.6	4710.1	5724.1	#DIV/0!	**Btu/scf**
	Net Wet Real:	960.5	4627.8	5624.0	#DIV/0!	**Btu/scf**
HHV	Gross Dry Real:	1082.4	5070.7	6169.7	#DIV/0!	**Btu/scf**
	Gross Wet Real:	1063.5	4982.1	6061.8	#DIV/0!	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1388.3	2816.7	3116.3	#DIV/0!	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		21051.3	19368.8	20235.5	#DIV/0!	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23316.8	20848.4	21810.0	#DIV/0!	**Btu/lbm**
Molar Mass (MW):		17.64356	92.927	113.446	#DIV/0!	**g/mol**
Relative Density (AIR=1):		0.6088	3.2081	3.9172	#DIV/0!	**SG**
Density:		0.04649	0.24489	0.29896	#DIV/0!	**lbm/scf**
Compressiblity Factor:		0.9976	0.9918	0.9966	#DIV/0!	**Z**
Liquid Volume real gas @:	**14.65**	17.5748	0.1007	0.008	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.

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



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:	**05-045-10362**	NAME/DESCRIP :	**GARFIELD COUNTY #045**
LEASE #:	**300105016, COC 64157**		**TBI FEDERAL #36-12C (PF36-7)**
FIELD/AREA:	**PARACHUTE - #67350**		**CASING**
PROJECT NO. :	**202312092**	ANALYSIS NO. :	**01**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	DECEMBER 27, 2023 00:42
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	DECEMBER 14, 2023 15:20
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	448 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	ECA-810
LAB PRES:	psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	43 ºf	SAMPLING COMPANY:	CAERUS OIL
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	---	0.10	0.16	---	---
Carbon Dioxide	---	0.41	1.02	---	---
Methane	P1	92.9435	84.5130	---	---
Ethane	P2	4.3357	7.3894	1.156	1.163
Propane	P3	1.2379	3.0939	0.340	0.342
i-Butane	I4	0.2462	0.8111	0.080	0.080
Methanol	X1	0.0011	0.0020	0.000	0.000
n-Butane	P4	0.2683	0.8839	0.084	0.084
2,2-Dimethylpropane	I5	0.0039	0.0159	0.001	0.001
i-Pentane	I5	0.1045	0.4274	0.038	0.038
n-Pentane	P5	0.0804	0.3288	0.029	0.029
2,2-Dimethylbutane	I6	0.0041	0.0200	0.002	0.002
Cyclopentane	N5	0.0051	0.0203	0.002	0.002
2,3-Dimethylbutane	I6	0.0067	0.0327	0.003	0.003
2-Methylpentane	I6	0.0284	0.1387	0.012	0.012
3-Methylpentane	I6	0.0155	0.0757	0.006	0.006
n-Hexane	P6	0.0359	0.1754	0.015	0.015
2,2-Dimethylpentane	I7	0.0009	0.0051	0.000	0.000
Methylcyclopentane	N6	0.0203	0.0968	0.007	0.007
2,4-Dimethylpentane	I7	0.0018	0.0102	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0004	0.0023	0.000	0.000
Benzene	A6	0.0038	0.0168	0.001	0.001
3,3-Dimethylpentane	I7	0.0006	0.0034	0.000	0.000
Cyclohexane	N6	0.0209	0.0997	0.007	0.007
2-Methylhexane	I7	0.0083	0.0472	0.004	0.004
2,3-Dimethylpentane	I7	0.0019	0.0108	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0017	0.0095	0.001	0.001

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

3-Methylhexane	I7	0.0074	0.0421	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0030	0.0167	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0027	0.0150	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0017	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0043	0.0239	0.002	0.002
n-Heptane	P7	0.0183	0.1040	0.008	0.008
1c,2-Dimethylcyclopentane	N7	0.0006	0.0033	0.000	0.000
Methylcyclohexane	N7	0.0397	0.2209	0.016	0.016
2,2-Dimethylhexane	I8	0.0009	0.0058	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0015	0.0083	0.001	0.001
2,5-Dimethylhexane	I8	0.0008	0.0052	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0007	0.0045	0.000	0.000
2,4-Dimethylhexane	I8	0.0001	0.0006	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0007	0.0045	0.000	0.000
3,3-Dimethylhexane	I8	0.0002	0.0013	0.000	0.000
Toluene	A7	0.0020	0.0104	0.001	0.001
2,3-Dimethylhexane	I8	0.0006	0.0039	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0030	0.0194	0.002	0.002
4-Methylheptane	I8	0.0009	0.0058	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	0.0019	0.0123	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0045	0.0286	0.002	0.002
3-Ethylhexane	I8	0.0003	0.0019	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0019	0.0121	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0005	0.0032	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0013	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0012	0.0077	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0018	0.0117	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0007	0.0045	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0001	0.0006	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	1.8308	1.8405

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0038	0.0168
TOLUENE	0.0020	0.0104
ETHYLBENZENE	0.0001	0.0006
XYLENES	0.0002	0.0012
TOTAL BTEX	0.0061	0.0290

**(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 :	977.6 /scf	982.9 /scf
	NET WET REAL :	960.5 /scf	965.8 /scf
HHV	GROSS DRY REAL :	1082.4 /scf	1088.3 /scf
	GROSS WET REAL :	1063.5 /scf	1069.4 /scf
	NET HEATING VALUE (60 °F ideal reaction):		21051.3 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		23316.8 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6088
	DENSITY		0.04649 lb/scf
	COMPRESSIBILITY FACTOR :		0.9976
	REGULAR WOBBE INDEX		1388.3

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

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

Net Dry Ideal BTU	4686.2 **/scf**	Relative Density - SG (Air=1)	3.2081		***C6+factors***
Gross Dry Ideal BTU	5045 **/scf**	**Z** Compressiblity Factor	0.99181		0.99121
Net Dry Ideal BTU	19368.8 **/lb**	Density Factor	244.889	**lbm/1000 ft3**	
Gross Dry Ideal BTU	20848.4 **/lb**	Molar Mass or MW	92.927	**g/mol**	
		Volume Liquid Ideal gas	0.101	**scf/gal**	24.3

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.