EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-11737**	NAME/DESCRIP :	**CHEVRON #8C-5D**
LEASE #:	**05-045-11737**		**GARFIELD COUNTY #045**
FIELD/AREA:	**GRAND VALLEY - #31290**		**CASING**

PROJECT NO. :	**202306012**	ANALYSIS NO. :	**02**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	JUNE 12, 2023 13:11
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	MAY 31, 2023 15:10
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	255	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-823
LAB PRES:		psig	SAMPLED BY :	MIKE KELLEY
SAMPLE TEMP. :	67	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	0.0079	0.0133	0.0010	0.0010
HELIUM	0.00	0.00	---	---
HYDROGEN	0.09	0.01	---	---
OXYGEN/ARGON	0.00	0.00	---	---
NITROGEN	0.09	0.13	---	---
CARBON DIOXIDE	2.39	5.51	---	---
METHANE	87.6482	73.7104	---	---
ETHANE	6.2563	9.8617	1.6682	1.6773
PROPANE	1.6987	3.9267	0.4668	0.4693
I-BUTANE	0.4513	1.3751	0.1469	0.1477
N-BUTANE	0.4304	1.3114	0.1349	0.1357
I-PENTANE	0.2581	0.9756	0.0940	0.0944
N-PENTANE	0.1461	0.5526	0.0530	0.0533
HEXANES PLUS	0.5330	2.6232	0.2180	0.2186
TOTALS	100.00000	100.00000	2.7828	2.7973

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0214	0.0877
TOLUENE	0.0303	0.1464
ETHYLBENZENE	0.0013	0.0072
XYLENES	0.0078	0.0434
TOTAL BTEX	0.0608	0.2847

**(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 :	1003.9 /scf	1009.4 /scf
	NET WET REAL :	986.4 /scf	991.9 /scf
HHV	GROSS DRY REAL :	1110.3 /scf	1116.3 /scf
	GROSS WET REAL :	1090.9 /scf	1096.9 /scf
	NET HEATING VALUE (60 °F ideal reaction):		19985.4 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		22102.0 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6582
	DENSITY		0.05027 lbm/scf
	COMPRESSIBILITY FACTOR :		0.9974
	REGULAR WOBBE INDEX		1369.2

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202306012	ANALYSIS NO. :	02
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	JUNE 12, 2023 13:11
ACCOUNT NO. :		SAMPLE DATE :	MAY 31, 2023 15:10
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	ECA-823
LEASE NO. :	05-045-11737	SAMPLED BY :	MIKE KELLEY
NAME/DESCRIP :	CHEVRON #8C-5D GARFIELD COUNTY #045 CASING		
FIELD DATA		SAMPLE TEMP. :	67
SAMPLE PRES. :	255	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	*SPOT* *NO PROBE*		

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.09	0.01
Carbon Dioxide	2.39	5.51
Nitrogen	0.09	0.13
Methane	87.6482	73.7104
Ethane	6.2563	9.8617
Propane	1.6987	3.9267
Isobutane	0.4513	1.3751
n-Butane	0.4304	1.3114
Isopentane	0.2512	0.9502
n-Pentane	0.1461	0.5526
Cyclopentane	0.0069	0.0254
n-Hexane	0.0645	0.2914
Cyclohexane	0.0287	0.1266
Other Hexanes	0.1706	0.7670
Heptanes	0.0931	0.4871
Methylcyclohexane	0.0506	0.2604
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0214	0.0877
Toluene	0.0303	0.1464
Ethylbenzene	0.0013	0.0072
Xylenes	0.0078	0.0434
C8+ Heavies	0.0647	0.4060
Subtotal	99.99210	99.98670
Oxygen/Argon	0.00	0.00
Alcohols	0.0079	0.0133
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	1003.9	4712.1	5784.1	6869.2	**Btu/scf**
	Net Wet Real:	986.4	4629.7	5683.0	6749.1	**Btu/scf**
HHV	Gross Dry Real:	1110.3	5061.7	6208.7	7311.3	**Btu/scf**
	Gross Wet Real:	1090.9	4973.2	6100.2	7183.5	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1369.2	2798.4	3079.8	3315.7	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		19985.4	19120.8	19094.6	18431.1	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		22102.0	20539.8	20500.3	19616.2	**Btu/lbm**
Molar Mass (MW):		19.07681	93.865	117.943	141.602	**g/mol**
Relative Density (AIR=1):		0.6582	3.2409	4.0717	4.8890	**SG**
Density:		0.05027	0.24736	0.31079	0.37314	**lbm/scf**
Compressiblity Factor:		0.9974	0.9922	0.9978	0.9996	**Z**
Liquid Volume real gas @:	**14.65**	17.9736	0.2173	0.0359	0.001	**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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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	---	0.00	0.00	---	---
Hydrogen	---	0.09	0.01	---	---
Oxygen/Argon	---	0.00	0.00	---	---
Nitrogen	---	0.09	0.13	---	---
Carbon Dioxide	---	2.39	5.51	---	---
Methane	P1	87.6482	73.7104	---	---
Ethane	P2	6.2563	9.8617	1.668	1.677
Propane	P3	1.6987	3.9267	0.467	0.469
i-Butane	I4	0.4513	1.3751	0.147	0.148
Methanol	X1	0.0079	0.0133	0.001	0.001
n-Butane	P4	0.4304	1.3114	0.135	0.136
2,2-Dimethylpropane	I5	0.0077	0.0292	0.003	0.003
i-Pentane	I5	0.2435	0.9210	0.089	0.089
n-Pentane	P5	0.1461	0.5526	0.053	0.053
2,2-Dimethylbutane	I6	0.0125	0.0565	0.005	0.005
Cyclopentane	N5	0.0069	0.0254	0.002	0.002
2,3-Dimethylbutane	I6	0.0183	0.0827	0.007	0.007
2-Methylpentane	I6	0.0664	0.3000	0.027	0.027
3-Methylpentane	I6	0.0373	0.1685	0.015	0.015
n-Hexane	P6	0.0645	0.2914	0.026	0.026
2,2-Dimethylpentane	I7	0.0016	0.0084	0.001	0.001
Methylcyclopentane	N6	0.0361	0.1593	0.013	0.013
2,4-Dimethylpentane	I7	0.0046	0.0242	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0014	0.0073	0.001	0.001
Benzene	A6	0.0214	0.0877	0.006	0.006
3,3-Dimethylpentane	I7	0.0016	0.0084	0.001	0.001
Cyclohexane	N6	0.0287	0.1266	0.010	0.010
2-Methylhexane	I7	0.0141	0.0741	0.007	0.007
2,3-Dimethylpentane	I7	0.0070	0.0368	0.003	0.003
1,1-Dimethylcyclopentane	N7	0.0032	0.0165	0.001	0.001

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3-Methylhexane	I7	0.0148	0.0777	0.007	0.007
1c,3-Dimethylcyclopentane	N7	0.0043	0.0221	0.002	0.002
1t,3-Dimethylcyclopentane	N7	0.0039	0.0201	0.002	0.002
3-Ethylpentane	I7	0.0005	0.0026	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0064	0.0329	0.003	0.003
n-Heptane	P7	0.0267	0.1402	0.012	0.012
1c,2-Dimethylcyclopentane	N7	0.0007	0.0036	0.000	0.000
Methylcyclohexane	N7	0.0506	0.2604	0.020	0.020
2,2-Dimethylhexane	I8	0.0022	0.0132	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0004	0.0024	0.000	0.000
Ethylcyclopentane	N7	0.0019	0.0098	0.001	0.001
2,5-Dimethylhexane	I8	0.0046	0.0275	0.002	0.002
2,2,3-Trimethylpentane	I8	0.0045	0.0269	0.002	0.002
1c,2t,4-Trimethylcyclopentane	N8	0.0016	0.0094	0.001	0.001
3,3-Dimethylhexane	I8	0.0017	0.0102	0.001	0.001
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	0.0303	0.1464	0.010	0.010
2,3-Dimethylhexane	I8	0.0010	0.0060	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0002	0.0012	0.000	0.000
1,1,2-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0040	0.0240	0.002	0.002
4-Methylheptane	I8	0.0012	0.0072	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0003	0.0018	0.000	0.000
3,4-Dimethylhexane	I8	0.0002	0.0012	0.000	0.000
3-Methylheptane	I8	0.0027	0.0162	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0026	0.0153	0.001	0.001
3-Ethylhexane	I8	0.0004	0.0024	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0011	0.0065	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0004	0.0024	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
3t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0006	0.0035	0.000	0.000
n-Octane	P8	0.0069	0.0413	0.004	0.004
1c,4-Dimethylcyclohexane	N8	0.0011	0.0065	0.001	0.001
2,3,5-Trimethylhexane	I9	0.0002	0.0014	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0005	0.0034	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0012	0.0079	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylcyclohexane	N8	0.0007	0.0041	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0012	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
2,5-Dimethylheptane	I9	0.0010	0.0067	0.001	0.001
3,3-Dimethylheptane	I9	0.0003	0.0020	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
Ethylbenzene	I8	0.0013	0.0072	0.001	0.001
1,3-Dimethylbenzene (m-Xylene)	A8	0.0048	0.0267	0.002	0.002
1,4-Dimethylbenzene (p-Xylene)	A8	0.0016	0.0089	0.001	0.001
3,4-Dimethylheptane	I9	0.0001	0.0007	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0007	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0014	0.000	0.000
4-Methyloctane	I9	0.0017	0.0114	0.001	0.001
2-Methyloctane	I9	0.0027	0.0181	0.002	0.002
3-Ethylheptane	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	0.0028	0.0185	0.002	0.002
1,1,2-Trimethylcyclohexane	N9	0.0001	0.0007	0.000	0.000

3,3-Diethylpentane	I9	0.0001	0.0007	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0014	0.0078	0.001	0.001
i-Butylcyclopentane	N9	0.0009	0.0060	0.000	0.000
n-Nonane	P9	0.0015	0.0101	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0002	0.0013	0.000	0.000
i-Propylbenzene	A9	0.0004	0.0025	0.000	0.000
3,6-Dimethyloctane	I10	0.0007	0.0052	0.000	0.000
1,3-Methylethylbenzene	A9	0.0021	0.0132	0.001	0.001
1,4-Methylethylbenzene	A9	0.0010	0.0063	0.001	0.001
1,3,5-Trimethylbenzene	A9	0.0009	0.0057	0.000	0.000
1,2-Methylethylbenzene	A9	0.0008	0.0050	0.000	0.000
3-Methylnonane	I10	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0023	0.0162	0.001	0.001
UnknownC9s	U9	0.0011	0.0074	0.001	0.001
1,2,3-Trimethylbenzene	A9	0.0004	0.0025	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0007	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0004	0.0028	0.000	0.000
UnknownC10s	U10	0.0002	0.0015	0.000	0.000
UnknownC11s	U11	0.0002	0.0016	0.000	0.000
n-Tridecane	P13	0.0001	0.0009	0.000	0.000
n-Tetradecane	P14	0.0001	0.0011	0.000	0.000
n-Pentadecane	P15	0.0001	0.0011	0.000	0.000
TOTAL		100.00000	100.00000	2.7828	2.7973

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0214	0.0877
TOLUENE	0.0303	0.1464
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	GROSS WET REAL :	1090.9 /scf	1096.9 /scf
	NET HEATING VALUE (60 °F ideal reaction):		19985.4 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		22102.0 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6582
	DENSITY		0.05027 lb/scf
	COMPRESSIBILITY FACTOR :		0.9974
	REGULAR WOBBE INDEX		1369.2

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

Net Dry Ideal BTU	4689.8 /scf	Relative Density - SG (Air=1)	3.2409		***C6+factors***
Gross Dry Ideal BTU	5037.8 /scf	**Z** Compressiblity Factor	0.99216		0.99137
Net Dry Ideal BTU	19120.8 /lb	Density Factor	247.359	lbm/1000 ft3	
Gross Dry Ideal BTU	20539.8 /lb	Molar Mass or MW	93.865	g/mol	
		Volume Liquid Ideal gas	0.218	scf/gal	24.5

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.