EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-103-10626**	NAME/DESCRIP :	**PICEANCE CREEK UNIT #T35X-11G6**
LEASE #:	**05-103-10626**		**RIO BLANCO #103**
FIELD/AREA:	**PICEANCE CREEK - #68800**		**BRAIDEN HEAD, INTER-CASING**
PROJECT NO. :	**202307022**	ANALYSIS NO. :	**04**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	JULY 12, 2023 11:50
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	JUNE 20, 2023
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	39	psig	PROBE :	
FLOW PRES. :		psig	CYLINDER NO. :	TBI-567
LAB PRES:		psig	SAMPLED BY :	SHANE COLLETT
SAMPLE TEMP. :	76	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: ***Federal Lease #8920003240***

LAB COMMENTS: ***Low sample volume. Unable to run Isotopic from this cylinder.***

COMPONENT	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
ALCOHOLS	0.0024	0.0050	0.0000	0.0000
HELIUM	0.00	0.00	---	---
HYDROGEN	0.01	0.00	---	---
OXYGEN/ARGON	3.24	5.20	---	---
NITROGEN	11.70	16.42	---	---
CARBON DIOXIDE	0.02	0.04	---	---
METHANE	76.7253	61.6836	---	---
ETHANE	5.3701	8.0920	1.4306	1.4384
PROPANE	1.5110	3.3390	0.4146	0.4169
I-BUTANE	0.3644	1.0614	0.1189	0.1195
N-BUTANE	0.3155	0.9190	0.0989	0.0994
I-PENTANE	0.1642	0.5930	0.0599	0.0602
N-PENTANE	0.1082	0.3912	0.0390	0.0392
HEXANES PLUS	0.4689	2.2558	0.1920	0.1925
TOTALS	100.00000	100.00000	2.3539	2.3661

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0008	0.0031
TOLUENE	0.0012	0.0056
ETHYLBENZENE	0.0002	0.0011
XYLENES	0.0011	0.0059
TOTAL BTEX	0.0033	0.0157

**(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 :	870.6	/scf	875.4	/scf
	NET WET REAL :	855.4	/scf	860.2	/scf
HHV	GROSS DRY REAL :	963.2	/scf	968.5	/scf
	GROSS WET REAL :	946.4	/scf	951.7	/scf
	NET HEATING VALUE (60 °F ideal reaction):			16604.8	Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):			18367.9	Btu/lbm
	RELATIVE DENSITY (AIR=1):			0.6881	
	DENSITY			0.05258	lbm/scf
	COMPRESSIBILITY FACTOR :			0.9979	
	REGULAR WOBBE INDEX			1162.4	

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EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202307022	ANALYSIS NO. :	04
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	JULY 12, 2023 11:50
ACCOUNT NO. :		SAMPLE DATE :	JUNE 20, 2023
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	TBI-567
LEASE NO. :	05-103-10626	SAMPLED BY :	SHANE COLLETT
NAME/DESCRIP :	PICEANCE CREEK UNIT #T35X-11G6 RIO BLANCO #103 BRAIDEN HEAD, INTER-CASING		
FIELD DATA		SAMPLE TEMP. :	76
SAMPLE PRES. :	39	AMBIENT TEMP.:	
H2S BY STAIN TUBE:	_ *ppm mol*		
COMMENTS :	***SPOT*** ***Federal Lease #8920003240***		

Low sample volume. Unable to run Isotopic from this cylinder.

Componet	Mole %	Wt %
Helium	0.00	0.00
Hydrogen	0.01	0.00
Carbon Dioxide	0.02	0.04
Nitrogen	11.70	16.42
Methane	76.7253	61.6836
Ethane	5.3701	8.0920
Propane	1.5110	3.3390
Isobutane	0.3644	1.0614
n-Butane	0.3155	0.9190
Isopentane	0.1572	0.5684
n-Pentane	0.1082	0.3912
Cyclopentane	0.0070	0.0246
n-Hexane	0.0586	0.2531
Cyclohexane	0.0368	0.1552
Other Hexanes	0.1233	0.5293
Heptanes	0.1052	0.5260
Methylcyclohexane	0.0696	0.3425
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0008	0.0031
Toluene	0.0012	0.0056
Ethylbenzene	0.0002	0.0011
Xylenes	0.0011	0.0059
C8+ Heavies	0.0721	0.4340
Subtotal	96.75760	94.79500
Oxygen/Argon	3.24	5.20
Alcohols	0.0024	0.0050
Total	100.00000	100.00000

Calculated Values BTU @	**14.65**	**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	870.6	4863.8	6015.5	8090.1	**Btu/scf**
	Net Wet Real:	855.4	4778.8	5910.3	7948.7	**Btu/scf**
HHV	Gross Dry Real:	963.2	5238.2	6481.1	8745.5	**Btu/scf**
	Gross Wet Real:	946.4	5146.6	6367.8	8592.6	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1162.4	2865.8	3191.8	3734.2	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		16604.8	19383.7	19698.1	18550.5	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		18367.9	20875.7	21226.8	20053.1	**Btu/lbm**
Molar Mass (MW):		19.95543	95.947	119.571	159.821	**g/mol**
Relative Density (AIR=1):		0.6881	3.3121	4.1286	5.5179	**SG**
Density:		0.05258	0.25282	0.31505	0.42115	**lbm/scf**
Compressiblity Factor:		0.9979	0.9926	0.9975	0.9999	**Z**
Liquid Volume real gas @:	**14.65**	16.8521	0.1914	0.0319	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

PRIMARY DB KEY:	**05-103-10626**	NAME/DESCRIP :	**PICEANCE CREEK UNIT #T35X-11G6**
LEASE #:	**05-103-10626**		**RIO BLANCO #103**
FIELD/AREA:	**PICEANCE CREEK - #68800**		**BRAIDEN HEAD, INTER-CASING**
PROJECT NO. :	**202307022**	ANALYSIS NO. :	**04**
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OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	JUNE 20, 2023
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PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	
FIELD DATA			
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SAMPLE PRES. :	39 psig	PROBE :	
FLOW PRES. :	psig	CYLINDER NO. :	TBI-567
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SAMPLE TEMP. :	76 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:	***Federal Lease #8920003240***		
LAB COMMENTS:	***Low sample volume. Unable to run Isotopic from this cylinder.***		

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ **14.65**	GPM @ **14.73**
Helium	---	0.00	0.00	---	---
Hydrogen	---	0.01	0.00	---	---
Oxygen/Argon	---	3.24	5.20	---	---
Nitrogen	---	11.70	16.42	---	---
Carbon Dioxide	---	0.02	0.04	---	---
Methane	P1	76.7253	61.6836	---	---
Ethane	P2	5.3701	8.0920	1.431	1.438
Propane	P3	1.5110	3.3390	0.415	0.417
i-Butane	I4	0.3644	1.0614	0.119	0.120
Methanol	X1	0.0015	0.0024	0.000	0.000
n-Butane	P4	0.3143	0.9155	0.099	0.099
2,2-Dimethylpropane	I5	0.0046	0.0166	0.002	0.002
i-Pentane	I5	0.1526	0.5518	0.056	0.056
Acetone	X3	0.0009	0.0026	0.000	0.000
UnknownC4s	U4	0.0012	0.0035	0.000	0.000
n-Pentane	P5	0.1082	0.3912	0.039	0.039
2,2-Dimethylbutane	I6	0.0072	0.0311	0.003	0.003
Cyclopentane	N5	0.0070	0.0246	0.002	0.002
2,3-Dimethylbutane	I6	0.0116	0.0501	0.005	0.005
2-Methylpentane	I6	0.0461	0.1991	0.019	0.019
3-Methylpentane	I6	0.0267	0.1153	0.011	0.011
n-Hexane	P6	0.0586	0.2531	0.024	0.024
2,2-Dimethylpentane	I7	0.0003	0.0015	0.000	0.000
Methylcyclopentane	N6	0.0317	0.1337	0.011	0.011
2,4-Dimethylpentane	I7	0.0038	0.0191	0.002	0.002
2,2,3-Trimethylbutane	I7	0.0008	0.0040	0.000	0.000
Benzene	A6	0.0008	0.0031	0.000	0.000
3,3-Dimethylpentane	I7	0.0014	0.0070	0.001	0.001
Cyclohexane	N6	0.0368	0.1552	0.012	0.012
2-Methylhexane	I7	0.0160	0.0803	0.007	0.007

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2,3-Dimethylpentane	I7	0.0055	0.0276	0.002	0.002
1,1-Dimethylcyclopentane	N7	0.0038	0.0187	0.002	0.002
3-Methylhexane	I7	0.0156	0.0783	0.007	0.007
1c,3-Dimethylcyclopentane	N7	0.0057	0.0281	0.003	0.003
1t,3-Dimethylcyclopentane	N7	0.0049	0.0241	0.002	0.002
3-Ethylpentane	I7	0.0004	0.0020	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0080	0.0394	0.004	0.004
n-Heptane	P7	0.0356	0.1788	0.016	0.016
1c,2-Dimethylcyclopentane	N7	0.0008	0.0040	0.000	0.000
Methylcyclohexane	N7	0.0696	0.3425	0.028	0.028
2,2-Dimethylhexane	I8	0.0020	0.0114	0.001	0.001
1,1,3-Trimethylcyclopentane	N7	0.0004	0.0023	0.000	0.000
Ethylcyclopentane	N7	0.0022	0.0108	0.001	0.001
2,5-Dimethylhexane	I8	0.0020	0.0114	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0019	0.0109	0.001	0.001
1c,2t,4-Trimethylcyclopentane	N8	0.0012	0.0068	0.001	0.001
3,3-Dimethylhexane	I8	0.0006	0.0035	0.000	0.000
Toluene	A7	0.0012	0.0056	0.000	0.000
2,3-Dimethylhexane	I8	0.0013	0.0075	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	0.0069	0.0395	0.004	0.004
4-Methylheptane	I8	0.0020	0.0114	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0004	0.0023	0.000	0.000
3,4-Dimethylhexane	I8	0.0003	0.0017	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0006	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
3-Methylheptane	I8	0.0046	0.0263	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0076	0.0428	0.004	0.004
3-Ethylhexane	I8	0.0008	0.0046	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0034	0.0191	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0012	0.0068	0.001	0.001
2,2,5-Trimethylhexane	I9	0.0002	0.0013	0.000	0.000
3c-Ethylmethylcyclopentane	N8	0.0003	0.0017	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0003	0.0017	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0020	0.0112	0.001	0.001
1t,3-Dimethylcyclohexane	N8	0.0001	0.0006	0.000	0.000
n-Octane	P8	0.0111	0.0635	0.006	0.006
1c,4-Dimethylcyclohexane	N8	0.0016	0.0090	0.001	0.001
i-Propylcyclopentane	I8	0.0001	0.0006	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0007	0.000	0.000
2,2-Dimethylheptane	I9	0.0005	0.0032	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0015	0.0095	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0002	0.0013	0.000	0.000
2,4-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
4,4-Dimethylheptane	I9	0.0003	0.0019	0.000	0.000
Ethylcyclohexane	N8	0.0015	0.0084	0.001	0.001
n-Propylcyclopentane	N8	0.0006	0.0034	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0003	0.0019	0.000	0.000
2,5-Dimethylheptane	I9	0.0011	0.0071	0.001	0.001
3,3-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
3,5-Dimethylheptane	I9	0.0003	0.0019	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
Ethylbenzene	I8	0.0002	0.0011	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0006	0.0032	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0004	0.0021	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0003	0.0019	0.000	0.000
4-Ethylheptane	I9	0.0002	0.0013	0.000	0.000
4-Methyloctane	I9	0.0005	0.0032	0.000	0.000
2-Methyloctane	I9	0.0008	0.0052	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0002	0.0013	0.000	0.000

3-Methyloctane	I9	0.0001	0.0007	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0005	0.0032	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0006	0.000	0.000
UnknownC8s	U8	0.0001	0.0006	0.000	0.000
n-Nonane	P9	0.0017	0.0109	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0001	0.0007	0.000	0.000
n-Propylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3-Methylethylbenzene	A9	0.0001	0.0006	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0004	0.0024	0.000	0.000
5-Methylnonane	I10	0.0001	0.0007	0.000	0.000
1,2-Methylethylbenzene	A9	0.0005	0.0030	0.000	0.000
2-Methylnonane	I10	0.0001	0.0007	0.000	0.000
3-Methylnonane	I10	0.0001	0.0007	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0007	0.000	0.000
UnknownC9s	U9	0.0001	0.0007	0.000	0.000
n-Decane	P10	0.0009	0.0064	0.001	0.001
1,4-Methyl-i-propylbenzene	A10	0.0002	0.0014	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
1,2-Methyl-n-propylbenzene	A10	0.0002	0.0014	0.000	0.000
1,3-Dimethyl-4-ethylbenzene	A10	0.0002	0.0014	0.000	0.000
1,2-Dimethyl-4-ethylbenzene	A10	0.0002	0.0014	0.000	0.000
1,3-Dimethyl-2-ethylbenzene	A10	0.0001	0.0007	0.000	0.000
n-Undecane	P11	0.0006	0.0047	0.000	0.000
1,4-Ethyl-i-propylbenzene	A11	0.0001	0.0008	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0003	0.0020	0.000	0.000
1,2-Di-n-propylbenzene	A11	0.0001	0.0008	0.000	0.000
1,3-Di-n-propylbenzene	A12	0.0002	0.0016	0.000	0.000
UnknownC11s	U11	0.0003	0.0024	0.000	0.000
n-Dodecane	P12	0.0004	0.0034	0.000	0.000
1,3,5-Triethylbenzene	A12	0.0001	0.0008	0.000	0.000
1,4-Methyl-n-pentylbenzene	A12	0.0001	0.0008	0.000	0.000
n-Hexylbenzene	A12	0.0001	0.0008	0.000	0.000
1,2,3,4,5-Pentamethylbenzene	A13	0.0001	0.0008	0.000	0.000
2-Methylnaphthalene	A11	0.0001	0.0007	0.000	0.000
UnknownC12s	U12	0.0002	0.0016	0.000	0.000
n-Tridecane	P13	0.0004	0.0037	0.000	0.000
UnknownC13s	U13	0.0003	0.0028	0.000	0.000
n-Tetradecane	P14	0.0003	0.0030	0.000	0.000
n-Pentadecane	P15	0.0002	0.0021	0.000	0.000
UnknownC15s	U15	0.0003	0.0032	0.000	0.000
UnknownC16s	U16	0.0001	0.0012	0.000	0.000
TOTAL		100.00000	100.00000	2.3539	2.3661

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0008	0.0031
TOLUENE	0.0012	0.0056
ETHYLBENZENE	0.0002	0.0011
XYLENES	0.0011	0.0059
TOTAL BTEX	0.0033	0.0157

**(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 :	870.6 /scf	875.4 /scf
	NET WET REAL :	855.4 /scf	860.2 /scf
HHV	GROSS DRY REAL :	963.2 /scf	968.5 /scf
	GROSS WET REAL :	946.4 /scf	951.7 /scf
	NET HEATING VALUE (60 °F ideal reaction):		16604.8 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		18367.9 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.6881
	DENSITY		0.05258 lb/scf
	COMPRESSIBILITY FACTOR :		0.9979
	REGULAR WOBBE INDEX		1162.4

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

Net Dry Ideal BTU	4842.8 **/scf**	Relative Density - SG (Air=1)	3.3121		***C6+factors***
Gross Dry Ideal BTU	5215.6 **/scf**	**Z** Compressiblity Factor	0.99257		0.9918
Net Dry Ideal BTU	19383.7 **/lb**	Density Factor	252.819	**lbm/1000 ft3**	
Gross Dry Ideal BTU	20875.7 **/lb**	Molar Mass or MW	95.947	**g/mol**	
		Volume Liquid Ideal gas	0.192	**scf/gal**	23.3

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.