EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:	**05-045-10768**	NAME/DESCRIP :	**NPR I25 WF07B 596**
LEASE #:	**110165160**		**BRAIDEN HEAD**
FIELD/AREA:	**GRAND VALLEY - #31290**		

PROJECT NO. :	**202407080**	ANALYSIS NO. :	**01**
COMPANY NAME :	**CAERUS OIL & GAS LLC**	ANALYSIS DATE:	JULY 26, 2024 11:57
OFFICE / BRANCH:	PARACHUTE, CO	SAMPLE DATE :	JULY 16, 2024 7:30
CUSTOMER REF:		TO:	
PRODUCER :	CAERUS PICEANCE LLC	EFFECTIVE DATE:	

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

SAMPLE CYCLE:			SAMPLE TYPE:	SPOT
SAMPLE PRES. :	309	psig	PROBE :	NO
FLOW PRES. :		psig	CYLINDER NO. :	ECA-731
LAB PRES:		psig	SAMPLED BY :	ALEX GALLEGOS
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:

LAB COMMENTS:

COMPONENT	MOLE %	MASS %	GPM @ 14.65	GPM @ 14.73
ALCOHOLS	0.0007	0.0015	0.0000	0.0000
HELIUM	0.01	0.00	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.01	0.02	---	---
NITROGEN	0.17	0.28	---	---
CARBON DIOXIDE	0.02	0.05	---	---
METHANE	94.8915	88.4690	---	---
ETHANE	3.1142	5.4420	0.8303	0.8348
PROPANE	0.9743	2.4968	0.2678	0.2692
I-BUTANE	0.1943	0.6563	0.0629	0.0633
N-BUTANE	0.2683	0.9062	0.0839	0.0844
I-PENTANE	0.0985	0.4126	0.0360	0.0362
N-PENTANE	0.0720	0.3019	0.0260	0.0261
HEXANES PLUS	0.1762	0.9637	0.0650	0.0650
TOTALS	100.00000	100.00000	1.3719	1.3790

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0110	0.0499
TOLUENE	0.0018	0.0096
ETHYLBENZENE	0.0003	0.0019
XYLENES	0.0005	0.0031
TOTAL BTEX	0.0136	0.0645

**(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 :	962.8	/scf	968.0	/scf
	NET WET REAL :	946.0	/scf	951.2	/scf
HHV	GROSS DRY REAL :	1067.1	/scf	1072.9	/scf
	GROSS WET REAL :	1048.4	/scf	1054.2	/scf

NET HEATING VALUE (60 °F ideal reaction):	21272.3	Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	23576.9	Btu/lbm
RELATIVE DENSITY (AIR=1):	0.5933	
DENSITY	0.04534	lbm/scf
COMPRESSIBILITY FACTOR :	0.9977	
REGULAR WOBBE INDEX	1386.5	

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202407080	ANALYSIS NO. :	01
COMPANY NAME :	CAERUS OIL & GAS LLC	ANALYSIS DATE:	JULY 26, 2024 11:57
ACCOUNT NO. :		SAMPLE DATE :	JULY 16, 2024 7:30
PRODUCER :	CAERUS PICEANCE LLC	CYLINDER NO. :	ECA-731
LEASE NO. :	110165160	SAMPLED BY :	ALEX GALLEGOS
NAME/DESCRIP :	NPR I25 WF07B 596 BRAIDEN HEAD		
FIELD DATA		SAMPLE TEMP. :	76
SAMPLE PRES. :	309	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	0.02	0.05
Nitrogen	0.17	0.28
Methane	94.8915	88.4690
Ethane	3.1142	5.4420
Propane	0.9743	2.4968
Isobutane	0.1943	0.6563
n-Butane	0.2683	0.9062
Isopentane	0.0947	0.3971
n-Pentane	0.0720	0.3019
Cyclopentane	0.0038	0.0155
n-Hexane	0.0240	0.1202
Cyclohexane	0.0111	0.0543
Other Hexanes	0.0534	0.2660
Heptanes	0.0318	0.1842
Methylcyclohexane	0.0168	0.0959
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0110	0.0499
Toluene	0.0018	0.0096
Ethylbenzene	0.0003	0.0019
Xylenes	0.0005	0.0031
C8+ Heavies	0.0255	0.1786
Subtotal	99.98930	99.97850
Oxygen/Argon	0.01	0.02
Alcohols	0.0007	0.0015
Total	100.00000	100.00000

Calculated Values BTU @ **14.65**		**Total Sample**	**C6+ Fraction**	**C8+ Fraction**	**C10+ Fraction**	
LHV	Net Dry Real:	962.8	4752.1	6005.0	7703.6	**Btu/scf**
	Net Wet Real:	946.0	4669.0	5900.0	7568.9	**Btu/scf**
HHV	Gross Dry Real:	1067.1	5109.6	6462.3	8279.1	**Btu/scf**
	Gross Wet Real:	1048.4	5020.3	6349.3	8134.4	**Btu/scf**
Other Calculated Values						
Regualr Wobbe Index*		1386.5	2820.7	3176.5	3588.1	**Btu/scf**
Net Heating Value (60 °F ideal reaction):		21272.3	19291.6	19671.3	19572.7	**Btu/lbm**
Gross Heating Value (60°F ideal reaction):		23576.9	20744.6	21169.8	21035.1	**Btu/lbm**
Molar Mass (MW):		17.20692	94.138	120.074	155.06	**g/mol**
Relative Density (AIR=1):		0.5933	3.2500	4.1457	5.3536	**SG**
Density:		0.04534	0.24806	0.31641	0.40861	**lbm/scf**
Compressiblity Factor:		0.9977	0.9921	0.9977	0.9997	**Z**
Liquid Volume real gas @:	**14.65**	17.3884	0.0648	0.004	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

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FLOW PRES. :	psig	CYLINDER NO. :	ECA-731
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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:			
LAB COMMENTS:			

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ **14.65**	GPM @ **14.73**
Helium	---	0.01	0.00	---	---
Hydrogen	---	0.00	0.00	---	---
Oxygen/Argon	---	0.01	0.02	---	---
Nitrogen	---	0.17	0.28	---	---
Carbon Dioxide	---	0.02	0.05	---	---
Methane	P1	94.8915	88.4690	---	---
Ethane	P2	3.1142	5.4420	0.830	0.835
Propane	P3	0.9743	2.4968	0.268	0.269
i-Butane	I4	0.1943	0.6563	0.063	0.063
Methanol	X1	0.0006	0.0011	0.000	0.000
n-Butane	P4	0.2682	0.9059	0.084	0.084
2,2-Dimethylpropane	I5	0.0020	0.0084	0.001	0.001
i-Pentane	I5	0.0927	0.3887	0.034	0.034
UnknownC4s	U4	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.0720	0.3019	0.026	0.026
t-Butanol	X4	0.0001	0.0004	0.000	0.000
2,2-Dimethylbutane	I6	0.0025	0.0125	0.001	0.001
Cyclopentane	N5	0.0038	0.0155	0.001	0.001
2,3-Dimethylbutane	I6	0.0044	0.0220	0.002	0.002
2-Methylpentane	I6	0.0227	0.1137	0.009	0.009
3-Methylpentane	I6	0.0124	0.0621	0.005	0.005
n-Hexane	P6	0.0240	0.1202	0.010	0.010
2,2-Dimethylpentane	I7	0.0006	0.0035	0.000	0.000
Methylcyclopentane	N6	0.0114	0.0557	0.004	0.004
2,4-Dimethylpentane	I7	0.0011	0.0064	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0002	0.0012	0.000	0.000
Benzene	A6	0.0110	0.0499	0.003	0.003
3,3-Dimethylpentane	I7	0.0004	0.0023	0.000	0.000
Cyclohexane	N6	0.0111	0.0543	0.004	0.004
2-Methylhexane	I7	0.0059	0.0343	0.003	0.003

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2,3-Dimethylpentane	I7	0.0017	0.0099	0.001	0.001
1,1-Dimethylcyclopentane	N7	0.0010	0.0057	0.000	0.000
3-Methylhexane	I7	0.0055	0.0320	0.003	0.003
1c,3-Dimethylcyclopentane	N7	0.0017	0.0097	0.001	0.001
1t,3-Dimethylcyclopentane	N7	0.0016	0.0091	0.001	0.001
3-Ethylpentane	I7	0.0003	0.0017	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0027	0.0154	0.001	0.001
n-Heptane	P7	0.0082	0.0478	0.004	0.004
1c,2-Dimethylcyclopentane	N7	0.0002	0.0012	0.000	0.000
Methylcyclohexane	N7	0.0168	0.0959	0.007	0.007
2,2-Dimethylhexane	I8	0.0006	0.0040	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0001	0.0006	0.000	0.000
Ethylcyclopentane	N7	0.0006	0.0034	0.000	0.000
2,5-Dimethylhexane	I8	0.0005	0.0033	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0005	0.0033	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0005	0.0032	0.000	0.000
3,3-Dimethylhexane	I8	0.0002	0.0013	0.000	0.000
2,3,3-Trimethylpentane	I8	0.0001	0.0006	0.000	0.000
Toluene	A7	0.0018	0.0096	0.001	0.001
2,3-Dimethylhexane	I8	0.0005	0.0033	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0006	0.000	0.000
2-Methylheptane	I8	0.0025	0.0166	0.001	0.001
4-Methylheptane	I8	0.0007	0.0046	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	0.0017	0.0113	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0022	0.0143	0.001	0.001
3-Ethylhexane	I8	0.0001	0.0006	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0009	0.0059	0.000	0.000
1,1-Dimethylcyclohexane	N8	0.0003	0.0020	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	0.0007	0.0046	0.000	0.000
n-Octane	P8	0.0026	0.0173	0.001	0.001
1c,4-Dimethylcyclohexane	N8	0.0004	0.0026	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
2,2-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0008	0.0059	0.000	0.000
2,2,3-Trimethylhexane	I9	0.0001	0.0008	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
Ethylcyclohexane	N8	0.0007	0.0046	0.000	0.000
n-Propylcyclopentane	N8	0.0002	0.0013	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
2,5-Dimethylheptane	I9	0.0005	0.0037	0.000	0.000
3,3-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000
3,5-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
2,6-Dimethylheptane	I9	0.0002	0.0015	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0008	0.000	0.000
Ethylbenzene	I8	0.0003	0.0019	0.000	0.000
2,3-Dimethylheptane	I9	0.0001	0.0008	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0003	0.0019	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0001	0.0006	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0008	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0008	0.000	0.000
4-Methyloctane	I9	0.0003	0.0022	0.000	0.000
2-Methyloctane	I9	0.0004	0.0030	0.000	0.000
3-Methyloctane	I9	0.0001	0.0008	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0005	0.0037	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0001	0.0006	0.000	0.000
i-Butylcyclopentane	N9	0.0002	0.0014	0.000	0.000
n-Nonane	P9	0.0008	0.0060	0.000	0.000
1,1-Methylethylcyclohexane	N9	0.0001	0.0008	0.000	0.000

i-Propylbenzene	A9	0.0001	0.0007	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0008	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Butylcyclopentane	N9	0.0002	0.0014	0.000	0.000
3,3-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
n-Propylbenzene	A9	0.0003	0.0021	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0008	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0008	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0001	0.0007	0.000	0.000
5-Methylnonane	I10	0.0001	0.0008	0.000	0.000
2-Methylnonane	I10	0.0001	0.0008	0.000	0.000
3-Methylnonane	I10	0.0001	0.0008	0.000	0.000
t-Butylbenzene	A10	0.0001	0.0008	0.000	0.000
i-Butylcyclohexane	N10	0.0001	0.0008	0.000	0.000
UnknownC9s	U9	0.0008	0.0060	0.000	0.000
n-Decane	P10	0.0001	0.0008	0.000	0.000
1,4-Methyl-i-propylbenzene	A10	0.0001	0.0008	0.000	0.000
UnknownC10s	U10	0.0005	0.0041	0.000	0.000
1,2,4,5-Tetramethylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC11s	U11	0.0001	0.0009	0.000	0.000
n-Hexadecane	P16	0.0001	0.0013	0.000	0.000
n-Heptadecane	P17	0.0002	0.0028	0.000	0.000
TOTAL		100.00000	100.00000	1.3719	1.3790

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0110	0.0499
TOLUENE	0.0018	0.0096
ETHYLBENZENE	0.0003	0.0019
XYLENES	0.0005	0.0031
TOTAL BTEX	0.0136	0.0645

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	NET WET REAL :	946.0 /scf	951.2 /scf
HHV	GROSS DRY REAL :	1067.1 /scf	1072.9 /scf
	GROSS WET REAL :	1048.4 /scf	1054.2 /scf
	NET HEATING VALUE (60 °F ideal reaction):		21272.3 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		23576.9 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.5933
	DENSITY		0.04534 lb/scf
	COMPRESSIBILITY FACTOR :		0.9977
	REGULAR WOBBE INDEX		1386.5

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

Net Dry Ideal BTU	4729.3 /scf	Relative Density - SG (Air=1)	3.25		C6+factors
Gross Dry Ideal BTU	5085 /scf	Z Compressiblity Factor	0.99208		0.99142
Net Dry Ideal BTU	19291.6 /lb	Density Factor	248.06	lbm/1000 ft3	
Gross Dry Ideal BTU	20744.6 /lb	Molar Mass or MW	94.138	g/mol	
		Volume Liquid Ideal gas	0.065	scf/gal	23.8

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.

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