Doc# 1310534

EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:
LEASE #:
FIELD/AREA:

NAME/DESCRIP : **JOHN CRAIG 1-2**

PROJECT NO. :	**202103107**	ANALYSIS NO. :	**02**
COMPANY NAME :	**JWC ENERGY**	ANALYSIS DATE:	MARCH 19, 2021 12:36
OFFICE / BRANCH:	LIMON, CO	SAMPLE DATE :	MARCH 17, 2021 11:10
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	23 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	0381
LAB PRES:	psig	SAMPLED BY :	JOHN MOSER
SAMPLE TEMP. :	47 °f	SAMPLING COMPANY:	EMPACT
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	1.75 ppm
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %

FIELD COMMENTS:
LAB COMMENTS:

COMPONENT	MOLE %	MASS %	GPM @ 14.73	GPM @ 14.65
ALCOHOLS	0.0035	0.0040	0.0000	0.0000
HELIUM	0.58	0.08	---	---
HYDROGEN	0.00	0.00	---	---
OXYGEN/ARGON	0.15	0.17	---	---
NITROGEN	32.25	32.54	---	---
CARBON DIOXIDE	1.62	2.57	---	---
METHANE	37.8074	21.8516	---	---
ETHANE	10.3820	11.2459	2.7850	2.7698
PROPANE	11.1817	17.7623	3.0907	3.0739
I-BUTANE	1.3215	2.7670	0.4335	0.4311
N-BUTANE	3.0918	6.4737	0.9776	0.9723
I-PENTANE	0.5763	1.4957	0.2092	0.2081
N-PENTANE	0.5231	1.3596	0.1901	0.1891
HEXANES PLUS	0.5127	1.6802	0.2019	0.2010
TOTALS	100.00000	100.00000	7.8880	7.8453

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0158	0.0445
TOLUENE	0.0107	0.0355
ETHYLBENZENE	0.0010	0.0038
XYLENES	0.0031	0.0118
TOTAL BTEX	0.0306	0.0956

BTU @		14.73	14.65
LHV	NET DRY REAL :	972.5 /scf	967.2 /scf
	NET WET REAL :	955.6 /scf	950.3 /scf
HHV	GROSS DRY REAL :	1065.2 /scf	1059.4 /scf
	GROSS WET REAL :	1046.7 /scf	1040.9 /scf

NET HEATING VALUE (60 °F ideal reaction):	13232.0 Btu/lbm
GROSS HEATING VALUE (60°F ideal reaction):	14494.4 Btu/lbm
RELATIVE DENSITY (AIR=1):	0.9577
DENSITY	0.07315 lbm/scf
COMPRESSIBILITY FACTOR :	0.9966
REGULAR WOBBE INDEX	1082.2

*(DETAILED HYDROCARBON ANALYSIS/NJ 1993)
Mod ASTM D6730,GPA 2261 & GPA 2286.
(CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	202103107	ANALYSIS NO. :	02
COMPANY NAME :	JWC ENERGY	ANALYSIS DATE:	MARCH 19, 2021 12:36
ACCOUNT NO. :		SAMPLE DATE :	MARCH 17, 2021 11:10
PRODUCER :		CYLINDER NO. :	0381
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	JOHN CRAIG 1-2		

FIELD DATA					
SAMPLE PRES. :	23			SAMPLE TEMP. :	47
H2S BY STAIN TUBE:	1.75	*ppm*		AMBIENT TEMP.:	
COMMENTS :	*SPOT*	*NO PROBE*			

Componet	Mole %	Wt %
Helium	0.58	0.08
Hydrogen	0.00	0.00
Carbon Dioxide	1.62	2.57
Nitrogen	32.25	32.54
Methane	37.8074	21.8516
Ethane	10.3820	11.2459
Propane	11.1817	17.7623
Isobutane	1.3215	2.7670
n-Butane	3.0918	6.4737
Isopentane	0.5466	1.4207
n-Pentane	0.5231	1.3596
Cyclopentane	0.0297	0.0750
n-Hexane	0.0937	0.2909
Cyclohexane	0.0461	0.1398
Other Hexanes	0.1923	0.5934
Heptanes	0.0793	0.2854
Methylcyclohexane	0.0358	0.1266
2,2,4 Trimethylpentane	0.0000	0.0000
Benzene	0.0158	0.0445
Toluene	0.0107	0.0355
Ethylbenzene	0.0010	0.0038
Xylenes	0.0031	0.0118
C8+ Heavies	0.0349	0.1485
Subtotal	99.84650	99.82600
Oxygen/Argon	0.15	0.17
Alcohols	0.0035	0.0040
Total	100.00000	100.00000

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:
LEASE #:
FIELD/AREA:

NAME/DESCRIP : **JOHN CRAIG 1-2**

PROJECT NO. : **202103107**
COMPANY NAME : **JWC ENERGY**
OFFICE / BRANCH: LIMON, CO
CUSTOMER REF:
PRODUCER :
FIELD DATA
SAMPLE CYCLE:
SAMPLE PRES. : 23 psig
FLOW PRES. : psig
LAB PRES: psig
SAMPLE TEMP. : 47 °f
AMBIENT TEMP.: °f
H2O BY STAIN TUBE: - #/mmcf
FIELD COMMENTS:
LAB COMMENTS:

ANALYSIS NO. : **02**
ANALYSIS DATE: MARCH 19, 2021 12:36
SAMPLE DATE : MARCH 17, 2021 11:10
TO:
EFFECTIVE DATE:

SAMPLE TYPE: SPOT
PROBE : NO
CYLINDER NO. : 0381
SAMPLED BY : JOHN MOSER
SAMPLING COMPANY: EMPACT
H2S BY STAIN TUBE: **1.75** ppm
CO2 BY STAIN TUBE: - Mol %

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ **14.73**	GPM @ **14.65**
Helium	---	0.58	0.08	---	---
Oxygen/Argon	---	0.15	0.17	---	---
Nitrogen	---	32.25	32.54	---	---
Carbon Dioxide	---	1.62	2.57	---	---
Methane	P1	37.8074	21.8516	---	---
Ethane	P2	10.3820	11.2459	2.785	2.770
Propane	P3	11.1817	17.7623	3.091	3.074
i-Butane	I4	1.3215	2.7670	0.434	0.431
Methanol	X1	0.0035	0.0040	0.000	0.000
n-Butane	P4	3.0918	6.4737	0.978	0.972
2,2-Dimethylpropane	I5	0.0058	0.0151	0.002	0.002
i-Pentane	I5	0.5408	1.4056	0.198	0.197
n-Pentane	P5	0.5228	1.3588	0.190	0.189
2,2-Dimethylbutane	I6	0.0036	0.0112	0.001	0.001
Cyclopentane	N5	0.0297	0.0750	0.009	0.009
2,3-Dimethylbutane	I6	0.0130	0.0403	0.005	0.005
2-Methylpentane	I6	0.0831	0.2580	0.034	0.034
3-Methylpentane	I6	0.0425	0.1320	0.017	0.017
UnknownC5s	U5	0.0003	0.0008	0.000	0.000
n-Hexane	P6	0.0937	0.2909	0.038	0.038
2,2-Dimethylpentane	I7	0.0010	0.0036	0.000	0.000
Methylcyclopentane	N6	0.0500	0.1516	0.018	0.018
2,4-Dimethylpentane	I7	0.0024	0.0087	0.001	0.001
2,2,3-Trimethylbutane	I7	0.0002	0.0007	0.000	0.000
Benzene	A6	0.0158	0.0445	0.004	0.004
3,3-Dimethylpentane	I7	0.0004	0.0014	0.000	0.000
Cyclohexane	N6	0.0461	0.1398	0.016	0.016
2-Methylhexane	I7	0.0099	0.0357	0.005	0.005
2,3-Dimethylpentane	I7	0.0032	0.0116	0.001	0.001

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1,1-Dimethylcyclopentane	N7	0.0035	0.0124	0.001	0.001
3-Methylhexane	I7	0.0104	0.0375	0.005	0.005
1c,3-Dimethylcyclopentane	N7	0.0055	0.0195	0.003	0.003
1t,3-Dimethylcyclopentane	N7	0.0061	0.0216	0.003	0.003
3-Ethylpentane	I7	0.0006	0.0022	0.000	0.000
1t,2-Dimethylcyclopentane	N7	0.0088	0.0311	0.004	0.004
UnknownC6s	U6	0.0001	0.0003	0.000	0.000
n-Heptane	P7	0.0216	0.0780	0.010	0.010
1c,2-Dimethylcyclopentane	N7	0.0019	0.0067	0.001	0.001
Methylcyclohexane	N7	0.0358	0.1266	0.014	0.014
2,2-Dimethylhexane	I8	0.0004	0.0017	0.000	0.000
1,1,3-Trimethylcyclopentane	N7	0.0025	0.0101	0.001	0.001
Ethylcyclopentane	N7	0.0013	0.0046	0.001	0.001
2,5-Dimethylhexane	I8	0.0005	0.0021	0.000	0.000
2,2,3-Trimethylpentane	I8	0.0001	0.0004	0.000	0.000
2,4-Dimethylhexane	I8	0.0007	0.0029	0.000	0.000
1c,2t,4-Trimethylcyclopentane	N8	0.0016	0.0065	0.001	0.001
3,3-Dimethylhexane	I8	0.0002	0.0008	0.000	0.000
Toluene	A7	0.0107	0.0355	0.004	0.004
2,3-Dimethylhexane	I8	0.0008	0.0033	0.000	0.000
2-Methyl-3-ethylpentane	I8	0.0001	0.0004	0.000	0.000
2-Methylheptane	I8	0.0035	0.0144	0.002	0.002
4-Methylheptane	I8	0.0009	0.0037	0.000	0.000
3-Methyl-3-ethylpentane	I8	0.0001	0.0004	0.000	0.000
3,4-Dimethylhexane	I8	0.0001	0.0004	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0001	0.0004	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0001	0.0004	0.000	0.000
3-Methylheptane	I8	0.0018	0.0074	0.001	0.001
1c,2t,3-Trimethylcyclopentane	N8	0.0031	0.0125	0.002	0.002
3-Ethylhexane	I8	0.0003	0.0012	0.000	0.000
1t,4-Dimethylcyclohexane	N8	0.0013	0.0053	0.001	0.001
1,1-Dimethylcyclohexane	N8	0.0004	0.0016	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0002	0.0008	0.000	0.000
2t-Ethylmethylcyclopentane	N8	0.0002	0.0008	0.000	0.000
1,1-Methylethylcyclopentane	N8	0.0004	0.0016	0.000	0.000
2,2,4-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0013	0.0053	0.001	0.001
n-Octane	P8	0.0053	0.0218	0.003	0.003
1c,4-Dimethylcyclohexane	N8	0.0007	0.0029	0.000	0.000
i-Propylcyclopentane	I8	0.0001	0.0004	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0001	0.0005	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0003	0.0012	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0015	0.0068	0.001	0.001
2,2,3-Trimethylhexane	I9	0.0006	0.0028	0.000	0.000
2,4-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
Ethylcyclohexane	N8	0.0006	0.0024	0.000	0.000
n-Propylcyclopentane	N8	0.0005	0.0020	0.000	0.000
1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0005	0.000	0.000
3,3-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
2,6-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0001	0.0005	0.000	0.000
Ethylbenzene	I8	0.0010	0.0038	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0020	0.0076	0.001	0.001
1,4-Dimethylbenzene (p-Xylene)	A8	0.0004	0.0015	0.000	0.000
3,4-Dimethylheptane	I9	0.0001	0.0005	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0005	0.000	0.000
4-Methyloctane	I9	0.0002	0.0009	0.000	0.000
2-Methyloctane	I9	0.0003	0.0014	0.000	0.000
3-Ethylheptane	I9	0.0001	0.0005	0.000	0.000
3-Methyloctane	I9	0.0004	0.0018	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0007	0.0027	0.000	0.000
i-Butylcyclopentane	N9	0.0002	0.0009	0.000	0.000

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n-Nonane	P9	0.0014	0.0065	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0002	0.0009	0.000	0.000
i-Propylbenzene	A9	0.0001	0.0004	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0005	0.000	0.000
2,2-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
n-Butylcyclopentane	N9	0.0003	0.0014	0.000	0.000
n-Propylbenzene	A9	0.0002	0.0009	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0005	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0001	0.0005	0.000	0.000
1,3-Methylethylbenzene	A9	0.0002	0.0009	0.000	0.000
1,4-Methylethylbenzene	A9	0.0001	0.0004	0.000	0.000
5-Methylnonane	I10	0.0001	0.0005	0.000	0.000
1,2-Methylethylbenzene	A9	0.0001	0.0004	0.000	0.000
2-Methylnonane	I10	0.0001	0.0005	0.000	0.000
3-Methylnonane	I10	0.0001	0.0005	0.000	0.000
t-Butylbenzene	A10	0.0002	0.0010	0.000	0.000
UnknownC9s	U9	0.0003	0.0014	0.000	0.000
n-Decane	P10	0.0004	0.0021	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0001	0.0004	0.000	0.000
1,3-Methyl-i-propylbenzene	A10	0.0001	0.0005	0.000	0.000
1,3-Methyl-n-propylbenzene	A10	0.0001	0.0005	0.000	0.000
1,4-Diethylbenzene	A10	0.0001	0.0005	0.000	0.000
UnknownC10s	U10	0.0002	0.0010	0.000	0.000
n-Undecane	P11	0.0001	0.0006	0.000	0.000
n-Dodecane	P12	0.0001	0.0006	0.000	0.000
TOTAL		100.00000	100.00000	7.8880	7.8453

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0158	0.0445
TOLUENE	0.0107	0.0355
ETHYLBENZENE	0.0010	0.0038
XYLENES	0.0031	0.0118
TOTAL BTEX	0.0306	0.0956

**(DETAILED HYDROCARBON ANALYSIS/NJ 1993)*
Mod ASTM D6730,GPA 2261 & GPA 2286.
(CALC: GPA 2172, GPA 2145 & TP-17 @14.696 & 60 F)

	BTU @	14.73	14.65
LHV	NET DRY REAL :	972.5 /scf	967.2 /scf
	NET WET REAL :	955.6 /scf	950.3 /scf
HHV	GROSS DRY REAL :	1065.2 /scf	1059.4 /scf
	GROSS WET REAL :	1046.7 /scf	1040.9 /scf
	NET HEATING VALUE (60 °F ideal reaction):		13232.0 Btu/lbm
	GROSS HEATING VALUE (60°F ideal reaction):		14494.4 Btu/lbm
	RELATIVE DENSITY (AIR=1):		0.9577
	DENSITY		0.07315 lb/scf
	COMPRESSIBILITY FACTOR :		0.9966
	REGULAR WOBBE INDEX		1082.2

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

Net Dry Ideal BTU	4577.1 /scf	Relative Density - SG (Air=1)	3.14	*C6+factors*
Gross Dry Ideal BTU	4923.5 /scf	Z Compressiblity Factor	0.99106	0.99026
Net Dry Ideal BTU	19287.8 /lb	Density Factor	239.626 lbm/1000 ft3	
Gross Dry Ideal BTU	20749.3 /lb	Molar Mass or MW	90.932 g/mol	
		Volume Liquid Ideal gas	0.201 scf/gal	24.2

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.