EMPACT

EXTENDED NATURAL GAS ANALYSIS (*DHA)

MAIN PAGE

PRIMARY DB KEY:
LEASE #:
FIELD/AREA:

NAME/DESCRIP : **DOLLY VARDEN 41-20 SALES GAS**

PROJECT NO. : **201905053**
COMPANY NAME : **FREMONT PETROLEUM CORP**
OFFICE / BRANCH: FLORENCE, CO
CUSTOMER REF:
PRODUCER :

ANALYSIS NO. : **06**
ANALYSIS DATE: MAY 10, 2019 13:28
SAMPLE DATE : MAY 7, 2019 17:15
TO:
EFFECTIVE DATE:

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

SAMPLE CYCLE:
SAMPLE PRES. : 4 psig
FLOW PRES. : psig
LAB PRES: psig
SAMPLE TEMP. : 59 ºf
AMBIENT TEMP.: ºf
H2O BY STAIN TUBE: - #/mmcf
FIELD COMMENTS:
LAB COMMENTS:

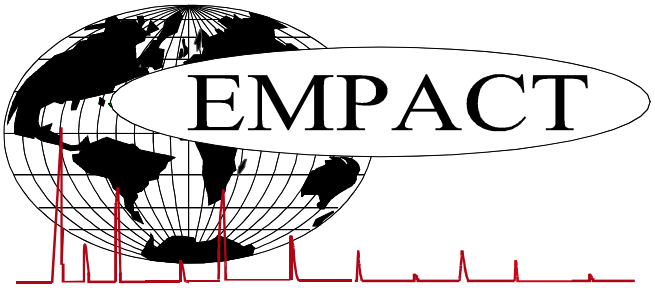
SAMPLE TYPE: SPOT
PROBE : NO
CYLINDER NO. : 0592
SAMPLED BY : GALE MCENDREE
SAMPLING COMPANY: EMPACT
H2S BY STAIN TUBE: **BDL** ppm
CO2 BY STAIN TUBE: - Mol %

COMPONENT	MOLE %	MASS %	GPM @ 14.73	GPM @ 14.65
ALCOHOLS	0.0013	0.0038	0.0000	0.0000
HELIUM	0.06	0.01	---	---
HYDROGEN	0.02	0.00	---	---
OXYGEN/ARGON	0.02	0.03	---	---
NITROGEN	1.31	1.84	---	---
CARBON DIOXIDE	1.32	2.91	---	---
METHANE	86.38210	69.30730	---	---
ETHANE	3.8187	5.7426	1.0243	1.0187
PROPANE	3.6067	7.9540	0.9962	0.9908
I-BUTANE	0.6694	1.9458	0.2191	0.2179
N-BUTANE	1.1774	3.4225	0.3719	0.3699
I-PENTANE	0.4767	1.7164	0.1719	0.1710
N-PENTANE	0.3184	1.1489	0.1156	0.1150
HEXANES PLUS	0.8193	3.9687	0.3442	0.3430
TOTALS	100.00000	100.00000	3.2432	3.2263

BTEX COMPONENTS	MOLE%	WT%
BENZENE	0.0064	0.0250
TOLUENE	0.0009	0.0041
ETHYLBENZENE	0.0008	0.0042
XYLENES	0.0014	0.0073
TOTAL BTEX	0.0095	0.0406

BTU @		14.73	14.65
LOW	NET DRY REAL :	1060.2 /scf	1054.4 /scf
	NET WET REAL :	1041.8 /scf	1036.0 /scf
HIGH	GROSS DRY REAL :	1171.1 /scf	1164.7 /scf
	GROSS WET REAL :	1150.7 /scf	1144.4 /scf
	NET DRY REAL :	20157.1 /lb	20047.7 /lb
	GROSS DRY REAL :	22259.6 /lb	22138.7 /lb
	RELATIVE DENSITY (AIR=1):		0.6895
	DENSITY		0.05269 lb/scf
	COMPRESSIBILITY FACTOR :		0.99712
	REGULAR WOBBE INDEX		1407.1

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

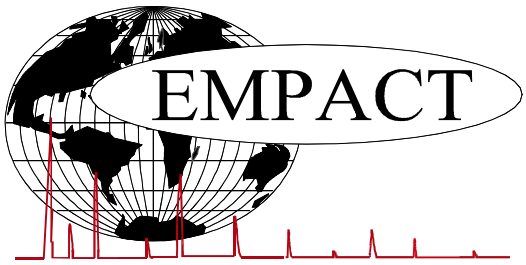


EXTENDED NATURAL GAS ANALYSIS (*DHA)

GLYCALC INFORMATION

PROJECT NO. :	201905053	ANALYSIS NO. :	06
COMPANY NAME :	FREMONT PETROLEUM CORP	ANALYSIS DATE:	MAY 16, 2019 10:02
ACCOUNT NO. :		SAMPLE DATE :	MAY 7, 2019 17:15
PRODUCER :		CYLINDER NO. :	0592
LEASE NO. :		SAMPLED BY :	GALE MCENDREE
NAME/DESCRIP :	DOLLY VARDEN 41-20 SALES GAS		
FIELD DATA		SAMPLE TEMP. :	59
SAMPLE PRES. :	4	AMBIENT TEMP.:	
COMMENTS :	***SPOT, NO PROBE***		

Componet	Mole %	Wt %
Helium	0.06	0.01
Hydrogen	0.02	0.00
Carbon Dioxide	1.32	2.91
Nitrogen	1.31	1.84
Methane	86.38210	69.30730
Ethane	3.8187	5.7426
Propane	3.6067	7.9540
Isobutane	0.6694	1.9458
n-Butane	1.1774	3.4225
Isopentane	0.4403	1.5887
n-Pentane	0.3184	1.1489
Cyclopentane	0.0364	0.1277
n-Hexane	0.0922	0.3973
Cyclohexane	0.0385	0.1620
Other Hexanes	0.2791	1.1936
Heptanes	0.1821	0.9049
Methylcyclohexane	0.0501	0.2460
2,2,4 Trimethylpentane	0.0007	0.0040
Benzene	0.0064	0.0250
Toluene	0.0009	0.0041
Ethylbenzene	0.0008	0.0042
Xylenes	0.0014	0.0073
C8+ Heavies	0.1671	1.0203
Subtotal	99.97870	99.96620
Oxygen/Argon	0.02	0.03
Alcohols	0.0013	0.0038
Total	100.00000	100.00000



EXTENDED NATURAL GAS ANALYSIS (*DHA)

DHA COMPONENT LIST

PRIMARY DB KEY:
LEASE #:
FIELD/AREA:

NAME/DESCRIP : **DOLLY VARDEN 41-20**
SALES GAS

PROJECT NO. : **201905053**
COMPANY NAME : **FREMONT PETROLEUM CORP**
OFFICE / BRANCH: FLORENCE, CO
CUSTOMER REF:
PRODUCER :

ANALYSIS NO. : **06**
ANALYSIS DATE: MAY 10, 2019 13:28
SAMPLE DATE : MAY 7, 2019 17:15
TO:
EFFECTIVE DATE

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

SAMPLE CYCLE:
SAMPLE PRES. : 4 psig
FLOW PRES. : psig
LAB PRES: psig
SAMPLE TEMP. : 59 ºf
AMBIENT TEMP.: ºf
H2O BY STAIN TUBE: - #/mmcf
FIELD COMMENTS:
LAB COMMENTS:

SAMPLE TYPE: SPOT
PROBE : NO
CYLINDER NO. : 0592
SAMPLED BY : GALE MCENDREE
SAMPLING COMPANY: EMPACT
H2S BY STAIN TUBE: **BDL** ppm
CO2 BY STAIN TUBE: - Mol %

COMPONENT	PIANO #	MOLE %	MASS %	GPM @ **14.73**	GPM @ **14.65**
Helium	---	0.06	0.01	---	---
Hydrogen	---	0.02	0.00	---	---
Oxygen/Argon	---	0.02	0.03	---	---
Nitrogen	---	1.31	1.84	---	---
Carbon Dioxide	---	1.32	2.91	---	---
Methane	P1	86.38210	69.30730	---	---
Ethane	P2	3.8187	5.7426	1.024	1.019
Propane	P3	3.6067	7.9540	0.996	0.991
i-Butane	I4	0.6694	1.9458	0.219	0.218
n-Butane	P4	1.1773	3.4222	0.372	0.370
2,2-Dimethylpropane	I5	0.0011	0.0039	0.000	0.000
i-Pentane	I5	0.4392	1.5848	0.161	0.160
Acetone	X3	0.0013	0.0038	0.000	0.000
UnknownC4s	U4	0.0001	0.0003	0.000	0.000
n-Pentane	P5	0.3181	1.1478	0.116	0.115
2,2-Dimethylbutane	I6	0.0015	0.0064	0.001	0.001
Cyclopentane	N5	0.0364	0.1277	0.011	0.011
2,3-Dimethylbutane	I6	0.0145	0.0625	0.006	0.006
2-Methylpentane	I6	0.1052	0.4534	0.044	0.044
3-Methylpentane	I6	0.0661	0.2849	0.027	0.027
UnknownC5s	U5	0.0003	0.0011	0.000	0.000
n-Hexane	P6	0.0922	0.3973	0.038	0.038
2,2-Dimethylpentane	I7	0.0005	0.0025	0.000	0.000
Methylcyclopentane	N6	0.0917	0.3860	0.032	0.032
2,4-Dimethylpentane	I7	0.0062	0.0311	0.003	0.003
2,2,3-Trimethylbutane	I7	0.0003	0.0015	0.000	0.000

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Benzene	A6	0.0064	0.0250	0.002	0.002
3,3-Dimethylpentane	I7	0.0002	0.0010	0.000	0.000
Cyclohexane	N6	0.0385	0.1620	0.013	0.013
2-Methylhexane	I7	0.0204	0.1022	0.009	0.009
2,3-Dimethylpentane	I7	0.0130	0.0652	0.006	0.006
1,1-Dimethylcyclopentane	N7	0.0063	0.0310	0.003	0.003
3-Methylhexane	I7	0.0267	0.1338	0.012	0.012
1c,3-Dimethylcyclopentane	N7	0.0157	0.0771	0.007	0.007
1t,3-Dimethylcyclopentane	N7	0.0181	0.0889	0.008	0.008
3-Ethylpentane	I7	0.0023	0.0115	0.001	0.001
1t,2-Dimethylcyclopentane	N7	0.0291	0.1429	0.013	0.013
2,2,4-Trimethylpentane	I8	0.0007	0.0040	0.000	0.000
UnknownC6s	U6	0.0001	0.0004	0.000	0.000
n-Heptane	P7	0.0357	0.1789	0.016	0.016
1c,2-Dimethylcyclopentane	N7	0.0021	0.0103	0.001	0.001
Methylcyclohexane	N7	0.0501	0.2460	0.020	0.020
2,2-Dimethylhexane	I8	0.0075	0.0429	0.003	0.003
Ethylcyclopentane	N7	0.0055	0.0270	0.002	0.002
2,5-Dimethylhexane	I8	0.0018	0.0103	0.001	0.001
2,2,3-Trimethylpentane	I8	0.0001	0.0005	0.000	0.000
2,4-Dimethylhexane	I8	0.0032	0.0183	0.002	0.002
1c,2t,4-Trimethylcyclopentane	N8	0.0061	0.0342	0.003	0.003
3,3-Dimethylhexane	I8	0.0004	0.0023	0.000	0.000
1t,2c,4-Trimethylcyclopentane	N8	0.0092	0.0516	0.004	0.004
2,3,4-Trimethylpentane	I8	0.0013	0.0074	0.001	0.001
Toluene	A7	0.0009	0.0041	0.000	0.000
2,3-Dimethylhexane	I8	0.0027	0.0154	0.001	0.001
2-Methyl-3-ethylpentane	I8	0.0017	0.0097	0.001	0.001
1,1,2-Trimethylcyclopentane	N8	0.0002	0.0011	0.000	0.000
2-Methylheptane	I8	0.0116	0.0663	0.006	0.006
4-Methylheptane	I8	0.0029	0.0165	0.001	0.001
3-Methyl-3-ethylpentane	I8	0.0003	0.0017	0.000	0.000
3,4-Dimethylhexane	I8	0.0007	0.0040	0.000	0.000
1c,2c,4-Trimethylcyclopentane	N8	0.0003	0.0017	0.000	0.000
1c,3-Dimethylcyclohexane	N8	0.0002	0.0011	0.000	0.000
3-Methylheptane	I8	0.0042	0.0240	0.002	0.002
1c,2t,3-Trimethylcyclopentane	N8	0.0097	0.0544	0.005	0.005
3-Ethylhexane	I8	0.0014	0.0080	0.001	0.001
1t,4-Dimethylcyclohexane	N8	0.0038	0.0213	0.002	0.002
1,1-Dimethylcyclohexane	N8	0.0010	0.0056	0.000	0.000
3t-Ethylmethylcyclopentane	N8	0.0019	0.0106	0.001	0.001
2t-Ethylmethylcyclopentane	N8	0.0014	0.0078	0.001	0.001
1,1-Methylethylcyclopentane	N8	0.0051	0.0286	0.003	0.003
2,2,4-Trimethylhexane	I9	0.0003	0.0019	0.000	0.000
1t,2-Dimethylcyclohexane	N8	0.0053	0.0298	0.003	0.003
1t,3-Dimethylcyclohexane	N8	0.0008	0.0045	0.000	0.000
n-Octane	P8	0.0123	0.0703	0.006	0.006
i-Propylcyclopentane	I8	0.0002	0.0011	0.000	0.000
2,3,5-Trimethylhexane	I9	0.0005	0.0032	0.000	0.000
2,2,3,4-Tetramethylpentane	I9	0.0002	0.0013	0.000	0.000
2,3,4-Trimethylhexane	I9	0.0004	0.0025	0.000	0.000
1c,2-Dimethylcyclohexane	N8	0.0009	0.0050	0.000	0.000
2,2-Dimethylheptane	I9	0.0001	0.0006	0.000	0.000
1,1,4-Trimethylcyclohexane	N9	0.0038	0.0240	0.002	0.002
2,2,3-Trimethylhexane	I9	0.0017	0.0109	0.001	0.001
2,4-Dimethylheptane	I9	0.0004	0.0025	0.000	0.000
4,4-Dimethylheptane	I9	0.0002	0.0013	0.000	0.000
Ethylcyclohexane	N8	0.0027	0.0151	0.001	0.001
n-Propylcyclopentane	N8	0.0011	0.0061	0.000	0.000

1c,3c,5-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
2,5-Dimethylheptane	I9	0.0004	0.0025	0.000	0.000
3,3-Dimethylheptane	I9	0.0004	0.0025	0.000	0.000
3,5-Dimethylheptane	I9	0.0003	0.0019	0.000	0.000
2,6-Dimethylheptane	I9	0.0003	0.0019	0.000	0.000
1,1,3-Trimethylcyclohexane	N9	0.0005	0.0031	0.000	0.000
Ethylbenzene	I8	0.0008	0.0042	0.000	0.000
1c,2t,4t-Trimethylcyclohexane	N9	0.0006	0.0038	0.000	0.000
2,3-Dimethylheptane	I9	0.0007	0.0045	0.000	0.000
1,3-Dimethylbenzene (m-Xylene)	A8	0.0002	0.0010	0.000	0.000
1,4-Dimethylbenzene (p-Xylene)	A8	0.0010	0.0053	0.000	0.000
3,4-Dimethylheptane	I9	0.0003	0.0019	0.000	0.000
3,4-Dimethylheptane (2)	I9	0.0001	0.0006	0.000	0.000
4-Ethylheptane	I9	0.0001	0.0006	0.000	0.000
4-Methyloctane	I9	0.0005	0.0032	0.000	0.000
2-Methyloctane	I9	0.0006	0.0038	0.000	0.000
1c,2t,3-Trimethylcyclohexane	N9	0.0001	0.0006	0.000	0.000
3-Ethylheptane	I9	0.0002	0.0013	0.000	0.000
3-Methyloctane	I9	0.0006	0.0038	0.000	0.000
1c,2t,4c-Trimethylcyclohexane	I9	0.0001	0.0006	0.000	0.000
1,2-Dimethylbenzene (o-Xylene)	A8	0.0002	0.0010	0.000	0.000
i-Butylcyclopentane	N9	0.0004	0.0025	0.000	0.000
n-Nonane	P9	0.0011	0.0070	0.001	0.001
1,1-Methylethylcyclohexane	N9	0.0002	0.0012	0.000	0.000
i-Propylbenzene	A9	0.0003	0.0018	0.000	0.000
i-Propylcyclohexane	N9	0.0001	0.0006	0.000	0.000
2,4-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
n-Butylcyclopentane	N9	0.0002	0.0012	0.000	0.000
n-Propylbenzene	A9	0.0002	0.0012	0.000	0.000
3,6-Dimethyloctane	I10	0.0001	0.0007	0.000	0.000
3-Methyl-5-ethylheptane	I10	0.0002	0.0014	0.000	0.000
1,3,5-Trimethylbenzene	A9	0.0002	0.0012	0.000	0.000
5-Methylnonane	I10	0.0001	0.0007	0.000	0.000
1,2-Methylethylbenzene	A9	0.0002	0.0012	0.000	0.000
t-Butylbenzene	A10	0.0012	0.0080	0.001	0.001
i-Butylcyclohexane	N10	0.0001	0.0007	0.000	0.000
sec-Butylbenzene	A10	0.0001	0.0006	0.000	0.000
UnknownC9s	U9	0.0023	0.0147	0.001	0.001
n-Decane	P10	0.0004	0.0028	0.000	0.000
1,2,3-Trimethylbenzene	A9	0.0028	0.0168	0.002	0.002
1,3-Methyl-i-propylbenzene	A10	0.0001	0.0006	0.000	0.000
1,4-Methyl-i-propylbenzene	A10	0.0003	0.0020	0.000	0.000
Sec-Butylcyclohexane	A10	0.0015	0.0105	0.001	0.001
1,2-Methyl-i-propylbenzene	A10	0.0001	0.0006	0.000	0.000
1,3-Diethylbenzene	A10	0.0002	0.0013	0.000	0.000
1,4-Diethylbenzene	A10	0.0001	0.0006	0.000	0.000
1,4-Methyl-n-propylbenzene	A10	0.0012	0.0080	0.001	0.001
n-Butylbenzene	A10	0.0038	0.0255	0.002	0.002
1,3-Dimethyl-5-ethylbenzene	A10	0.0026	0.0174	0.002	0.002
1,2-Diethylbenzene	A10	0.0013	0.0087	0.001	0.001
1,2-Methyl-n-propylbenzene	A10	0.0029	0.0195	0.002	0.002
1,4-Dimethyl-2-ethylbenzene	A10	0.0018	0.0121	0.001	0.001
1,2-Dimethyl-4-ethylbenzene	A10	0.0029	0.0195	0.001	0.001
1,3-Dimethyl-2-ethylbenzene	A10	0.0001	0.0006	0.000	0.000
1,2-Dimethyl-3-ethylbenzene	A10	0.0001	0.0006	0.000	0.000
1,2-Ethyl-i-propylbenzene	A10	0.0003	0.0022	0.000	0.000
1,4-Methyl-t-butylbenzene	A11	0.0050	0.0371	0.003	0.003
UnknownC10s	U10	0.0007	0.0050	0.000	0.000
n-Undecane	P11	0.0004	0.0031	0.000	0.000

1,4-Ethyl-i-propylbenzene	A11	0.0020	0.0148	0.001	0.001
1,2,4,5-Tetramethylbenzene	A11	0.0029	0.0195	0.001	0.001
1,2,3,5-Tetramethylbenzene	A11	0.0011	0.0074	0.001	0.001
4-Methylindan	A11	0.0002	0.0013	0.000	0.000
2-Methylindan	A11	0.0011	0.0072	0.001	0.001
1,3-Methyl-n-butylbenzene	A11	0.0001	0.0007	0.000	0.000
1,3-Di-i-propylbenzene	A11	0.0006	0.0048	0.000	0.000
sec-Pentylbenzene	A11	0.0001	0.0007	0.000	0.000
1,4-Di-i-propylbenzene	A11	0.0010	0.0081	0.001	0.001
1,4-Ethyl-t-butylbenzene	A11	0.0001	0.0008	0.000	0.000
UnknownC11s	U11	0.0052	0.0407	0.003	0.003
n-Dodecane	P12	0.0001	0.0008	0.000	0.000
UnknownC12s	U12	0.0013	0.0101	0.001	0.001
UnknownC13s	U13	0.0001	0.0009	0.000	0.000
TOTAL		100.00000	100.00000	3.2432	3.2263

BTEX COMPONENTS	**MOLE%**	**WT%**
BENZENE	0.0064	0.0250
TOLUENE	0.0009	0.0041
ETHYLBENZENE	0.0008	0.0042
XYLENES	0.0014	0.0073
TOTAL BTEX	0.0095	0.0406

**(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**
LOW	NET DRY REAL :	1060.2 **/scf**	1054.4 **/scf**
	NET WET REAL :	1041.8 **/scf**	1036.0 **/scf**
HIGH	GROSS DRY REAL :	1171.1 **/scf**	1164.7 **/scf**
	GROSS WET REAL :	1150.7 **/scf**	1144.4 **/scf**
	NET DRY REAL :	20157.1 **/lb**	20047.7 **/lb**
	GROSS DRY REAL :	22259.6 **/lb**	22138.7 **/lb**
	RELATIVE DENSITY (AIR=1):		0.6895
	DENSITY		0.05269 **lb/scf**
	COMPRESSIBILITY FACTOR :		0.99712
	REGULAR WOBBE INDEX		1407.1

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

Net Dry Ideal BTU	4887.6 **/scf**	Relative Density - SG (Air=1)	3.3465	***C6+factors***
Gross Dry Ideal BTU	5277.8 **/scf**	**Z** Compressiblity Factor	0.99256	0.99158
Net Dry Ideal BTU	19512.8 **/lb**	Density Factor	255.395 **lbm/1000 ft3**	
Gross Dry Ideal BTU	21066.4 **/lb**	Molar Mass or MW	96.914 **g/mol**	
		Volume Liquid Ideal gas	0.343 **scf/gal**	22.6

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.