EMPACT ANALYTICAL SYSTEMS INC.
365 S. MAIN ST.
BRIGHTON, CO
80601

303-637-0150

EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

E & P TANK / GLYCALC INFORMATION

PROJECT NO. :	201411042	ANALYSIS NO. :	03
COMPANY NAME :	MULL DRILLING COMPANY	ANALYSIS DATE:	NOVEMBER 10, 2014
ACCOUNT NO. :		SAMPLE DATE :	NOVEMBER 6, 2014
PRODUCER :		CYLINDER NO. :	5053
LEASE NO. :		SAMPLED BY :	JOHN MOSER EMPACT
NAME/DESCRIP :	OIL TREATOR 08:40 MUSF BATTERY 1		
FIELD DATA		SAMPLE TEMP. :	120
SAMPLE PRES. :	36	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; RE-SAMPLE		

COMPONENT	Mole %		Wt %		LV %	
CARBON DIOXIDE	0.0340		0.0137		0.0124	
NITROGEN (AIR)	0.0810		0.0207		0.0189	
METHANE	0.1150		0.0168		0.0415	
ETHANE	0.3510		0.0963		0.2002	
PROPANE	0.9730		0.3916		0.5719	
I-BUTANE	0.2280		0.1209		0.1590	
N-BUTANE	1.0040		0.5325		0.6752	
I-PENTANE	0.5519		0.3633		0.4311	
N-PENTANE	0.9560		0.6294		0.7384	
CYCLOPENTANE (N-C5)	0.8353		0.5346		0.5207	
N-HEXANE	6.5254		5.1316		5.7248	
CYCLOHEXANE (OTHER C6)	4.1277		3.1700		2.9961	
OTHER HEXANES	10.1013		7.8693		8.3768	
OTHER HEPTANES	16.7262		15.1846		15.8123	
METHYLCYCLOHEXANE (OTHER C7)	6.9712		6.2467		5.9716	
2,2,4 TRIMETHYLPENTANE	1.2652		1.1336		1.1141	
BENZENE	0.8198		0.5843		0.4901	
TOLUENE	1.9172		1.6120		1.3653	
ETHYLBENZENE	0.2998		0.2905		0.2460	
XYLENES	1.1302		1.0950		0.9279	
OTHER OCTANES	14.6749		15.3522		15.4487	
OCTANES PLUS	----	47.6762	----	57.4785	----	55.8907
NONANES	11.6246		13.4521		13.2048	
DECANES PLUS	18.6815		26.1551		24.9492	
SUB TOTAL	99.9942		99.9968		99.9970	
ALCOHOLS	0.0058		0.0032		0.0030	
TOTAL	100.0000		100.0000		100.0000	

API Gravity	=	**59.48**	60/60
Vapor Pressure	=	**13.09**	PSIA & 100 F
Average Molecular Weight of Decanes plus	=	**153.43**	
Average Specific Gravity of Decanes plus	=	**0.7780**	

THE DATA PRESENTED HEREIN HAS BEEN ACQUIRED THROUGH JUDICIOUS APPLICATION OF CURRENT STATE-OF-THE ART ANALYTICAL TECHNIQUES. THE APPLICATIONS OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. EMPACT ANALYTICAL SYSTEMS, INC. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE REPORTED INFORMATION NOR ANY CONSEQUENCES OF IT'S APPLICATION.

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EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

BY CARBON NUMBER

PROJECT NO. : 201411042
COMPANY NAME : MULL DRILLING COMPANY
ACCOUNT NO. :
PRODUCER :
LEASE NO. :
NAME/DESCRIP : OIL TREATOR 08:40
MUSF BATTERY 1
FIELD DATA
SAMPLE PRES. : 36
VAPOR PRES. :
COMMENTS : SPOT; NO PROBE; RE-SAMPLE

ANALYSIS NO. : 03
ANALYSIS DATE: NOVEMBER 10, 2014
SAMPLE DATE : NOVEMBER 6, 2014
CYLINDER NO. : 5053
SAMPLED BY : JOHN MOSER
EMPACT

SAMPLE TEMP. : 120
AMBIENT TEMP.:
GRAVITY :

COMPONENT / CARBON NUMBER	MOLE%	MASS %	VOLUME %
ALCOHOLS	0.0058	0.0032	0.0030
NITROGEN	0.0810	0.0207	0.0189
CARBON DIOXIDE	0.0340	0.0137	0.0124
C1	0.1150	0.0168	0.0415
C2	0.3510	0.0963	0.2002
C3	0.9730	0.3916	0.5719
C4	1.2320	0.6534	0.8342
C5	2.3432	1.5273	1.6902
C6	21.5742	16.7552	17.5878
C7	25.6146	23.0433	23.1492
C8	17.3701	17.8713	17.7367
C9	11.6246	13.4521	13.2048
C10	8.7380	10.8738	10.4154
C11	4.0411	5.5068	5.1596
C12	2.3683	3.4284	3.2684
C13	1.4029	2.2886	2.1994
C14	0.9902	1.7926	1.7390
C15	0.8910	1.7271	1.6562
C16	0.1433	0.2961	0.2821
C17	0.0577	0.1266	0.1202
C18	0.0384	0.0891	0.0844
C19	0.0106	0.0260	0.0245
C20	0.0000	0.0000	0.0000
C21	0.0000	0.0000	0.0000
C22	0.0000	0.0000	0.0000
C23	0.0000	0.0000	0.0000
C24	0.0000	0.0000	0.0000
C25	0.0000	0.0000	0.0000
C26	0.0000	0.0000	0.0000
C27	0.0000	0.0000	0.0000
C28	0.0000	0.0000	0.0000
C29	0.0000	0.0000	0.0000
C30+	0.0000	0.0000	0.0000
Total	100.0000	100.0000	100.0000

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EXTENDED NATURAL GAS LIQUID ANALYSIS (*DHA)

DHA COMPONENT LIST

PROJECT NO. :	201411042	ANALYSIS NO. :	03
COMPANY NAME :	MULL DRILLING COMPANY	ANALYSIS DATE:	NOVEMBER 10, 2014
ACCOUNT NO. :		SAMPLE DATE :	NOVEMBER 6, 2014
PRODUCER :		CYLINDER NO. :	5053
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	OIL TREATOR 08:40		EMPACT
	MUSF BATTERY 1		
FIELD DATA		SAMPLE TEMP. :	120
SAMPLE PRES. :	36	AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; NO PROBE; RE-SAMPLE		

COMPONENT	PIANO #	MOLE %	MASS %	VOL %
Nitrogen	NHC	0.0810	0.0207	0.0189
Carbon Dioxide	NHC	0.0340	0.0137	0.0124
Methane	P1	0.1150	0.0168	0.0415
Ethane	P2	0.3510	0.0963	0.2002
Propane	P3	0.9730	0.3916	0.5719
i-Butane	I4	0.2280	0.1209	0.1590
n-Butane	P4	1.0040	0.5325	0.6752
2,2-Dimethylpropane	I5	0.0099	0.0065	0.0081
i-Pentane	I5	0.5420	0.3568	0.4230
i-Propanol	X3	0.0058	0.0032	0.0030
n-Pentane	P5	0.9560	0.6294	0.7384
2,2-Dimethylbutane	I6	0.0518	0.0407	0.0461
Cyclopentane	N5	0.8353	0.5346	0.5207
2,3-Dimethylbutane	I6	0.3530	0.2776	0.3082
2-Methylpentane	I6	3.4275	2.6954	3.0344
3-Methylpentane	I6	2.2320	1.7553	1.9431
n-Hexane	P6	6.5254	5.1316	5.7248
2,2-Dimethylpentane	I7	0.0436	0.0399	0.0433
Methylcyclopentane	N6	4.0357	3.0993	3.0439
2,4-Dimethylpentane	I7	0.2324	0.2125	0.2326
2,2,3-Trimethylbutane	I7	0.0371	0.0339	0.0361
Benzene	A6	0.8198	0.5843	0.4901
3,3-Dimethylpentane	I7	0.0245	0.0224	0.0238
Cyclohexane	N6	4.1277	3.1700	2.9961
2-Methylhexane	I7	1.3465	1.2312	1.3361
2,3-Dimethylpentane	I7	0.5228	0.4780	0.5039
1,1-Dimethylcyclopentane	N7	0.7136	0.6394	0.6236
3-Methylhexane	I7	2.0755	1.8977	2.0284
1c,3-Dimethylcyclopentane	N7	1.2990	1.1639	1.1499
1t,3-Dimethylcyclopentane	N7	1.2652	1.1336	1.1141
3-Ethylpentane	I7	0.1838	0.1681	0.1768
1t,2-Dimethylcyclopentane	N7	2.1599	1.9353	1.8953
2,2,4-Trimethylpentane	I8	0.1386	0.1445	0.1530
UnknownC6s	U6	0.0013	0.0010	0.0011
n-Heptane	P7	5.9874	5.4745	5.8902
1c,2-Dimethylcyclopentane	N7	0.1849	0.1657	0.1579
Methylcyclohexane	N7	6.9712	6.2467	5.9716
2,2-Dimethylhexane	I8	1.2664	1.3201	1.3962
Ethylcyclopentane	N7	0.3166	0.2837	0.2724
2,5-Dimethylhexane	I8	0.1175	0.1225	0.1299
2,2,3-Trimethylpentane	I8	0.0480	0.0500	0.0514
2,4-Dimethylhexane	I8	0.2143	0.2234	0.2358

1c,2t,4-Trimethylcyclopentane	N8	0.7161	0.7332	0.7069
3,3-Dimethylhexane	I8	0.1272	0.1326	0.1375
2,3,4-Trimethylpentane	I8	0.0460	0.0480	0.0491
2,3,3-Trimethylpentane	I8	0.0012	0.0013	0.0013
Toluene	A7	1.9172	1.6120	1.3653
2,3-Dimethylhexane	I8	0.3880	0.4044	0.4181
2-Methyl-3-ethylpentane	I8	0.0735	0.0766	0.0784
1,1,2-Trimethylcyclopentane	N8	0.0640	0.0655	0.0624
2-Methylheptane	I8	1.6660	1.7366	1.8277
4-Methylheptane	I8	0.4091	0.4264	0.4379
3-Methyl-3-ethylpentane	I8	0.2015	0.2100	0.2126
3,4-Dimethylhexane	I8	0.1301	0.1356	0.1386
1c,2c,4-Trimethylcyclopentane	N8	0.0592	0.0606	0.0578
1c,3-Dimethylcyclohexane	N8	0.0521	0.0533	0.0512
3-Methylheptane	I8	0.7473	0.7790	0.8128
1c,2t,3-Trimethylcyclopentane	N8	1.5594	1.5967	1.5257
3-Ethylhexane	I8	0.3095	0.3226	0.3330
1t,4-Dimethylcyclohexane	N8	0.8700	0.8908	0.8600
1,1-Dimethylcyclohexane	N8	0.2031	0.2080	0.1961
3c-Ethylmethylcyclopentane	N8	0.0132	0.0135	0.0130
3t-Ethylmethylcyclopentane	N8	0.1233	0.1262	0.1212
2t-Ethylmethylcyclopentane	N8	0.0984	0.1008	0.0965
1,1-Methylethylcyclopentane	N8	0.2878	0.2947	0.2779
2,2,4-Trimethylhexane	I9	0.0526	0.0616	0.0634
1t,2-Dimethylcyclohexane	N8	0.8036	0.8228	0.7809
1c,2c,3-Trimethylcyclopentane	N8	0.0067	0.0069	0.0065
1t,3-Dimethylcyclohexane	N8	0.0472	0.0483	0.0453
UnknownC7s	U7	0.3334	0.3048	0.3279
n-Octane	P8	2.9674	3.0931	3.2399
1c,4-Dimethylcyclohexane	N8	1.0847	1.1107	1.0447
i-Propylcyclopentane	I8	0.0827	0.0847	0.0803
2,4,4-Trimethylhexane	I9	0.0411	0.0481	0.0490
2,2,3,4-Tetramethylpentane	I9	0.0210	0.0246	0.0252
2,3,4-Trimethylhexane	I9	0.0345	0.0404	0.0412
1c,2-Dimethylcyclohexane	N8	0.1725	0.1766	0.1633
2,3,5-Trimethylhexane	I9	0.1295	0.1516	0.1546
2,2-Dimethylheptane	I9	0.0304	0.0356	0.0369
1,1,4-Trimethylcyclohexane	N9	0.9649	1.1115	1.0603
2,2,3-Trimethylhexane	I9	0.5588	0.6540	0.6602
2,4-Dimethylheptane	I9	0.0234	0.0274	0.0282
4,4-Dimethylheptane	I9	0.0690	0.0808	0.0831
Ethylcyclohexane	N8	0.5195	0.5319	0.4972
n-Propylcyclopentane	N8	0.2656	0.2720	0.2579
1c,3c,5-Trimethylcyclohexane	N9	0.0488	0.0562	0.0536
2,5-Dimethylheptane	I9	0.0627	0.0734	0.0754
3,3-Dimethylheptane	I9	0.0638	0.0747	0.0767
3,5-Dimethylheptane	I9	0.0478	0.0559	0.0574
2,6-Dimethylheptane	I9	0.0420	0.0492	0.0511
1,1,3-Trimethylcyclohexane	N9	0.0990	0.1140	0.1087
Ethylbenzene	A8	0.2998	0.2905	0.2460
1c,2t,4t-Trimethylcyclohexane	N9	0.3907	0.4501	0.4212
2,3-Dimethylheptane	I9	0.7596	0.8890	0.9016
1,3-Dimethylbenzene (m-Xylene)	A8	0.3121	0.3024	0.2576
1,4-Dimethylbenzene (p-Xylene)	A8	0.4140	0.4011	0.3427
3,4-Dimethylheptane	I9	0.0929	0.1087	0.1094
3,4-Dimethylheptane (2)	I9	0.1833	0.2145	0.2159
4-Ethylheptane	I9	0.0642	0.0751	0.0773
4-Methyloctane	I9	0.2308	0.2701	0.2759
2-Methyloctane	I9	0.3859	0.4517	0.4660
1c,2t,4c-Trimethylcyclohexane	I9	0.1145	0.1340	0.1360
3-Ethylheptane	I9	0.0794	0.0929	0.0941
3-Methyloctane	I9	0.4648	0.5440	0.5557
3,3-Diethylpentane	I9	0.0593	0.0694	0.0677
1c,2t,3-Trimethylcyclohexane	N9	0.0602	0.0694	0.0649
1,1,2-Trimethylcyclohexane	N9	0.0528	0.0608	0.0569
1,2-Dimethylbenzene (o-Xylene)	A8	0.4041	0.3915	0.3276
i-Butylcyclopentane	N9	0.2279	0.2625	0.2475
UnknownC8s	U8	0.0594	0.0619	0.0648
n-Nonane	P9	1.8007	2.1075	2.1620
1,1-Methylethylcyclohexane	N9	0.5363	0.6277	0.6459
i-Propylbenzene	A9	0.3271	0.3587	0.3059
i-Propylcyclohexane	N9	0.1143	0.1317	0.1209
2,2-Dimethyloctane	I10	0.0418	0.0543	0.0541
2,4-Dimethyloctane	I10	0.0589	0.0765	0.0762

2,6-Dimethyloctane	I10	0.0129	0.0167	0.0172
2,5-Dimethyloctane	I10	0.0315	0.0409	0.0407
n-Butylcyclopentane	N9	0.1579	0.2021	0.1863
3,3-Dimethyloctane	I10	0.0848	0.1101	0.1097
n-Propylbenzene	A9	0.3803	0.4171	0.3557
3,6-Dimethyloctane	I10	0.1380	0.1792	0.1784
3-Methyl-5-ethylheptane	I10	0.2035	0.2382	0.2417
1,3-Methylethylbenzene	A9	0.2564	0.2812	0.2378
1,4-Methylethylbenzene	A9	0.2137	0.2344	0.1982
1,3,5-Trimethylbenzene	A9	0.1086	0.1191	0.1014
2,3-Dimethyloctane	I10	0.0660	0.0857	0.0853
5-Methylnonane	I10	0.1679	0.2180	0.2191
1,2-Methylethylbenzene	A9	0.2648	0.2904	0.2443
2-Methylnonane	I10	0.0720	0.0935	0.0948
3-Ethyloctane	I10	0.1036	0.1345	0.1339
3-Methylnonane	I10	0.1958	0.2542	0.2552
1,2,4-Trimethylbenzene	A9	0.0340	0.0373	0.0314
t-Butylbenzene	A10	0.5180	0.6344	0.5395
i-Butylcyclohexane	N10	0.1972	0.2524	0.2290
1t-Methyl-2-n-propylcyclohexane	I10	0.0684	0.0801	0.0813
i-Butylbenzene	A10	0.0319	0.0391	0.0338
sec-Butylbenzene	A10	0.0145	0.0178	0.0152
UnknownC9s	U9	1.7350	2.0306	2.0831
n-Decane	P10	1.4025	1.8209	1.8366
1,2,3-Trimethylbenzene	A9	0.2399	0.2631	0.2168
1,3-Methyl-i-propylbenzene	A10	0.0715	0.0784	0.0660
1,4-Methyl-i-propylbenzene	A10	0.0991	0.1087	0.0914
Sec-Butylcyclohexane	N10	0.3304	0.4229	0.3832
1,2-Methyl-i-propylbenzene	A10	0.1816	0.2224	0.1869
3-Ethylnonane	I10	0.0559	0.0726	0.0736
1,3-Diethylbenzene	A10	0.0904	0.1107	0.0944
1,3-Methyl-n-propylbenzene	A10	0.0480	0.0588	0.0503
1,4-Diethylbenzene	A10	0.0542	0.0664	0.0568
1,4-Methyl-n-propylbenzene	A10	0.1623	0.1988	0.1706
n-Butylbenzene	A10	0.0490	0.0600	0.0513
1,3-Dimethyl-5-ethylbenzene	A10	0.0369	0.0452	0.0385
1,2-Diethylbenzene	A10	0.1269	0.1554	0.1302
1,2-Methyl-n-propylbenzene	A10	0.0865	0.1059	0.0893
1,4-Dimethyl-2-ethylbenzene	A10	0.0998	0.1222	0.1026
1,3-Dimethyl-4-ethylbenzene	A10	0.0280	0.0343	0.0288
1,2-Dimethyl-4-ethylbenzene	A10	0.1511	0.1851	0.1560
1,3-Dimethyl-2-ethylbenzene	A10	0.0808	0.0990	0.0819
1t,2c,4-Trimethylcyclopentane	A10	0.8445	0.8647	0.8517
1,2-Dimethyl-3-ethylbenzene	A10	0.0892	0.1092	0.0902
1,2-Ethyl-i-propylbenzene	A10	0.0519	0.0636	0.0535
1,4-Methyl-t-butylbenzene	A11	0.1226	0.1502	0.1262
UnknownC10s	U10	2.3673	3.0735	3.1000
n-Undecane	P11	1.1412	1.6278	1.6191
1,4-Ethyl-i-propylbenzene	A11	0.0569	0.0697	0.0586
1,2,4,5-Tetramethylbenzene	A11	0.0781	0.0957	0.0796
1,2-Methyl-n-butylbenzene	A11	0.0646	0.0791	0.0665
1,2,3,5-Tetramethylbenzene	A11	0.0422	0.0517	0.0428
1,2-Methyl-t-butylbenzene	A11	0.0987	0.1209	0.1016
5-Methylindan	A11	0.0121	0.0188	0.0185
4-Methylindan	A11	0.0091	0.0141	0.0139
1,2-Ethyl-n-propylbenzene	A11	0.1296	0.1587	0.1334
2-Methylindan	A11	0.0416	0.0647	0.0637
1,3-Methyl-n-butylbenzene	A11	0.0537	0.0658	0.0553
1,3-Di-i-propylbenzene	A11	0.0387	0.0474	0.0398
sec-Pentylbenzene	A11	0.1015	0.1243	0.1045
n-Pentylbenzene	A11	0.0383	0.0518	0.0445
1t-M-2-(4MP)cyclopentane	P12	0.0381	0.0592	0.0582
1,2-Di-n-propylbenzene	A11	0.0597	0.0731	0.0614
1,4-Di-i-propylbenzene	A11	0.1545	0.1892	0.1590
Tetrahydronaphthalene	A10	0.0868	0.1063	0.0893
t-Decahydronaphthalene	A10	0.0604	0.0740	0.0622
Naphthalene	A10	0.0763	0.0892	0.0750
1-t-Butyl-3,5-dimethylbenzene	A12	0.0375	0.0459	0.0386
1,4-Ethyl-t-butylbenzene	A11	0.0734	0.0899	0.0756
UnknownC11s	U11	1.3673	1.9503	1.9398
n-Dodecane	P12	0.8297	1.2897	1.2687
1,3-Di-n-propylbenzene	A12	0.0662	0.0811	0.0682
1,3,5-Triethylbenzene	A12	0.0748	0.0820	0.0698
1,2,4-Triethylbenzene	A12	0.3539	0.3881	0.3263

1,4-Methyl-n-pentylbenzene	A12	0.0561	0.0687	0.0577
n-Hexylbenzene	A12	0.0525	0.0777	0.0667
1,2,3,4,5-Pentamethylbenzene	A13	0.1564	0.1916	0.1610
2-Methylnaphthalene	A11	0.1362	0.1767	0.1485
1-Methylnaphthalene	A11	0.2211	0.2869	0.2073
UnknownC12s	U12	0.8595	1.3360	1.3142
n-Tridecane	P13	0.3809	0.6408	0.6229
UnknownC13s	U13	0.8656	1.4562	1.4155
n-Tetradecane	P14	0.2415	0.4372	0.4241
UnknownC14s	U14	0.7487	1.3554	1.3149
n-Pentadecane	P15	0.1684	0.3264	0.3130
UnknownC15s	U15	0.7226	1.4007	1.3432
n-Hexadecane	P16	0.0239	0.0494	0.0471
UnknownC16s	U16	0.1194	0.2467	0.2350
n-Heptadecane	P17	0.0414	0.0908	0.0862
UnknownC17s	U17	0.0163	0.0358	0.0340
n-Octadecane	P18	0.0063	0.0146	0.0138
UnknownC18s	U18	0.0321	0.0745	0.0706
UnknownC19s	U19	0.0106	0.0260	0.0245
TOTAL		100.0000	100.0000	100.0000

EMPACT

CRUDE OIL ASSAY

PROJECT NO. :	201411042	ANALYSIS NO. :	04
COMPANY NAME :	MULL DRILLING COMPANY	ANALYSIS DATE:	NOVEMBER 13, 2014
ACCOUNT NO. :		SAMPLE DATE :	NOVEMBER 6, 2014
PRODUCER :		CYLINDER NO. :	1L GLASS JAR
LEASE NO. :		SAMPLED BY :	JOHN MOSER
NAME/DESCRIP :	PRODUCTION TANK 08:50 MUSF BATTERY 1		EMPACT
FIELD DATA		SAMPLE TEMP. :	66
SAMPLE PRES. :		AMBIENT TEMP.:	
VAPOR PRES. :		GRAVITY :	
COMMENTS :	SPOT; RE-SAMPLE		

SPECIFICATION		TEST METHOD	UNITS	RESULTS
API GRAVITY			API 60/60	39.5
RVP @100 DEG F		D323	PSIG	9.2
TOTAL SULFUR		D2622	WT %	N/A
TOTAL CHLORIDE		D4929	ug/g	N/A
ORGANIC CHLORIDE		D4929	ug/g	N/A
FLASH POINT		D93	° F	N/A
HEATING VALUE		D4809	BTU/ LB	N/A
VISUAL APPEARANCE				BLACK
BS&W		D96		
Crude Oil			VOL %	N/A
Water			VOL %	N/A
Emulsion			VOL %	N/A
Sediment			VOL %	N/A
DISTILLATION:		D86		
INITIAL POINT			DEG F	N/A
50%			DEG F	N/A
90%			DEG F	N/A
END POINT			DEG F	N/A
DISTILLATION:	@TEMP	D445		
Average Centipoise	20°C			N/A
Average Centipoise	30°C			N/A
Average Centipoise	80°C			N/A
Kinetic Viscosity	20°C		cSt (mm2/s)	N/A
Kinetic Viscosity	30°C		cSt (mm2/s)	N/A
Kinetic Viscosity	80°C		cSt (mm2/s)	N/A

ND: NOT DETECTED
N/A: NO TEST PREFORMED FOR THIS PARAMETER

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NATURAL GAS ANALYSIS

PROJECT NO. :	**201406040**	ANALYSIS NO. :	**02**
COMPANY NAME :	**MULL DRILLING**	ANALYSIS DATE:	JUNE 6, 2014
ACCOUNT NO. :		SAMPLE DATE :	MAY 23, 2014
PRODUCER :	MUSF NITROGEN	TO:	
LEASE NO. :		CYLINDER NO. :	0681
NAME/DESCRIP :	MUSF 8		
	CSG GAS-CK NITROGEN		
FIELD DATA			
SAMPLED BY :	BILL	SAMPLE TEMP. :	50
SAMPLE PRES. :	4	AMBIENT TEMP.:	
COMMENTS :	SPOT; NO PROBE		

COMPONENTS	NORM. MOLE%	GPM @ **14.65**	GPM @ **14.73**
HELIUM	0.07	-	-
HYDROGEN	0.03	-	-
OXYGEN/ARGON	0.02	-	-
NITROGEN	1.41	-	-
CO2	1.66	-	-
METHANE	5.47	-	-
ETHANE	13.76	3.659	3.679
PROPANE	34.94	9.571	9.623
ISOBUTANE	5.52	1.796	1.806
N-BUTANE	18.10	5.674	5.705
ISOPENTANE	3.91	1.422	1.430
N-PENTANE	5.16	1.860	1.870
HEXANES+	9.95	4.293	4.317
TOTAL	100.00	28.275	28.430

BTU @ 60 DEG F	**14.65**	**14.73**
GROSS DRY REAL =	2885.2	2901.0
GROSS SATURATED REAL =	2834.7	2850.6

RELATIVE DENSITY (AIR=1 @14.696 PSIA 60F) : 1.8091

COMPRESSIBILITY FACTOR : 0.97489

NOTE: REFERENCE GPA 2261(ASTM D1945 & ASME-PTC), 2145, & 2172 CURRENT PUBLICATIONS

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

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NATURAL GAS ANALYSIS

PRIMARY DB KEY:		NAME/DESCRIP :	MUSF 6
LEASE #:			CASING GAS
FIELD/ AREA:	MUSF		
PROJECT NO. :	201903031	ANALYSIS NO. :	05
COMPANY NAME :	MULL DRILLING COMPANY INC	ANALYSIS DATE:	MARCH 06, 2019 15:31
OFFICE / BRANCH:	CHEYENNE WELLS, CO	SAMPLE DATE :	FEBRUARY 26, 2019
CUSTOMER REF:		TO:	
PRODUCER :		EFFECTIVE DATE:	
FIELD DATA			
SAMPLE CYCLE:		SAMPLE TYPE:	SPOT
SAMPLE PRES. :	17 psig	PROBE :	NO
FLOW PRES. :	psig	CYLINDER NO. :	1867
LAB PRES:	psig	SAMPLED BY :	BILL STUTZ
SAMPLE TEMP. :	50 °f	SAMPLING COMPANY:	MULL
AMBIENT TEMP.:	°f	H2S BY STAIN TUBE:	- ppm
H2O BY STAIN TUBE:	- #/mmcf	CO2 BY STAIN TUBE:	- Mol %
FIELD COMMENTS:			
LAB COMMENTS:			

COMPONENTS	NORM. MOLE%	GPM @ 14.65	GPM @ 14.73
HELIUM	0.02	-	-
HYDROGEN	0.01	-	-
OXYGEN/ARGON	0.50	-	-
NITROGEN	65.27	-	-
CO2	1.17	-	-
METHANE	1.22	-	-
ETHANE	2.88	0.7686	0.7728
PROPANE	9.69	2.6650	2.6796
ISOBUTANE	2.12	0.6925	0.6963
N-BUTANE	8.11	2.5519	2.5659
ISOPENTANE	2.20	0.8036	0.8080
N-PENTANE	2.92	1.0568	1.0626
HEXANES+	3.89	1.6853	1.6945
TOTAL	100.00	10.2237	10.2797

BTU @ 60 DEG F	14.65	14.73
GROSS DRY REAL =	1046.0 /scf	1051.7 /scf
GROSS SATURATED REAL =	1027.7 /scf	1033.4 /scf

RELATIVE DENSITY (AIR=1 @14.696 PSIA 60F)	1.2968
GRAVITY (LB/SCF)	0.09898
COMPRESSIBILITY FACTOR :	0.99612

NOTE: REFERENCE GPA 2261(ASTM D1945 & ASME-PTC), 2145, & 2172 CURRENT PUBLICATIONS

Reference: Per GPA 2172-14 sec 9

The C6+ is derived from the following ratios of C6, C7 & C8+ respectively: **60% 30% 10%**