



Company: EXXON MOBIL  
 Lease/Well: FREEDOM UNIT/33-B5  
 API #: 05-103-1142500  
 Rig Name: PRODUCTION  
 State/County: COLORADO/RIO BLANCO  
 Latitude: 39.92  
 GRID North is 1.80 Degrees West of True North  
 VS-Azi: 0.00 Degrees



DEPTH REFERENCE : KB = 0' (30.1' AGL)

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: fru197-33b5raw.ut

Minimum Curvature Method

Report Date/Time: 12/1/2010 / 14:08

Vaughn Energy Services

Rifle, Colorado - 970 456 2071

Surveyor: S. Anderson

North Seeking Rate Gyro

Freedom Unit 197-33-B5 - API #05-103-1142500

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
200.00	0.24	166.19	200.00	-0.41	0.10	-0.41	0.42	166.19	0.12
400.00	2.82	165.95	399.91	-5.59	1.39	-5.59	5.76	165.99	1.29
600.00	8.79	160.67	598.80	-24.80	7.65	-24.80	25.95	162.85	2.99
800.00	12.68	157.09	795.26	-59.44	21.26	-59.44	63.13	160.32	1.97
1000.00	16.01	153.65	989.00	-104.39	42.05	-104.39	112.54	158.06	1.72
1200.00	18.59	153.50	1179.94	-157.64	68.52	-157.64	171.88	156.51	1.29
1400.00	19.01	153.82	1369.27	-215.40	97.11	-215.40	236.27	155.73	0.22
1600.00	19.34	151.53	1558.18	-273.75	127.27	-273.75	301.88	155.07	0.41
1800.00	19.47	150.36	1746.82	-331.83	159.53	-331.83	368.18	154.32	0.20
2000.00	19.57	152.22	1935.33	-390.43	191.63	-390.43	434.92	153.86	0.31
2200.00	19.16	150.35	2124.01	-448.59	223.48	-448.59	501.18	153.52	0.37
2400.00	18.16	153.21	2313.50	-504.93	253.76	-504.93	565.11	153.32	0.68
2600.00	18.86	152.50	2503.16	-561.43	282.73	-561.43	628.60	153.27	0.37
2800.00	19.72	151.50	2691.92	-619.77	313.76	-619.77	694.66	153.15	0.46
3000.00	20.19	151.68	2879.91	-679.81	346.24	-679.81	762.90	153.01	0.24
3200.00	19.31	151.77	3068.14	-739.33	378.25	-739.33	830.47	152.91	0.44
3400.00	16.13	151.66	3258.63	-792.94	407.10	-792.94	891.34	152.82	1.59
3600.00	13.36	152.09	3452.02	-837.82	431.11	-837.82	942.23	152.77	1.39
3800.00	10.75	152.27	3647.59	-874.76	450.60	-874.76	984.00	152.75	1.31
4000.00	7.69	150.02	3844.99	-902.87	465.97	-902.87	1016.02	152.70	1.54

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
4200.00	3.29	145.04	4044.02	-919.16	475.95	-919.16	1035.08	152.62	2.21
4400.00	0.92	132.71	4243.87	-924.95	480.42	-924.95	1042.28	152.55	1.20
4600.00	1.00	131.28	4443.85	-927.20	482.92	-927.20	1045.43	152.49	0.04
4800.00	1.21	129.70	4643.81	-929.71	485.86	-929.71	1049.01	152.41	0.10
5000.00	1.48	129.76	4843.75	-932.71	489.48	-932.71	1053.35	152.31	0.14
5200.00	1.83	128.36	5043.67	-936.35	493.97	-936.35	1058.66	152.19	0.18
5400.00	2.13	118.77	5243.55	-940.13	499.74	-940.13	1064.70	152.01	0.22
5600.00	2.07	119.69	5443.42	-943.71	506.14	-943.71	1070.87	151.79	0.04
5800.00	2.09	126.50	5643.28	-947.67	512.21	-947.67	1077.23	151.61	0.12
6000.00	1.87	128.06	5843.16	-951.85	517.72	-951.85	1083.54	151.46	0.11
6200.00	2.35	129.25	6043.03	-956.46	523.46	-956.46	1090.33	151.31	0.24
6400.00	2.38	131.12	6242.86	-961.78	529.76	-961.78	1098.03	151.15	0.04
6600.00	2.06	127.22	6442.71	-966.69	535.76	-966.69	1105.22	151.00	0.17
6800.00	2.10	131.04	6642.57	-971.28	541.39	-971.28	1111.97	150.86	0.07
7000.00	2.16	139.39	6842.44	-976.55	546.62	-976.55	1119.12	150.76	0.16
7200.00	2.43	138.53	7042.28	-982.60	551.88	-982.60	1126.97	150.68	0.14
7400.00	2.28	133.41	7242.11	-988.51	557.58	-988.51	1134.92	150.57	0.13
7600.00	2.33	130.07	7441.95	-993.86	563.58	-993.86	1142.53	150.44	0.07
7800.00	2.24	137.47	7641.79	-999.36	569.34	-999.36	1150.16	150.33	0.15
8000.00	1.71	139.99	7841.67	-1004.54	573.91	-1004.54	1156.92	150.26	0.27
8200.00	1.88	162.72	8041.57	-1009.95	576.81	-1009.95	1163.06	150.27	0.36
8400.00	2.04	167.75	8241.45	-1016.56	578.54	-1016.56	1169.66	150.36	0.12
8600.00	1.76	167.63	8441.34	-1023.05	579.95	-1023.05	1176.00	150.45	0.14
8800.00	2.05	169.24	8641.23	-1029.57	581.28	-1029.57	1182.32	150.55	0.15
9000.00	1.74	158.17	8841.12	-1035.91	583.08	-1035.91	1188.73	150.63	0.24
9200.00	1.43	154.00	9041.05	-1040.97	585.30	-1040.97	1194.24	150.65	0.17
9400.00	1.70	151.88	9240.97	-1045.83	587.79	-1045.83	1199.69	150.66	0.14
9600.00	1.26	152.76	9440.91	-1050.39	590.19	-1050.39	1204.84	150.67	0.22
9800.00	1.27	155.15	9640.86	-1054.36	592.13	-1054.36	1209.25	150.68	0.03
10000.00	1.28	155.97	9840.81	-1058.41	593.97	-1058.41	1213.68	150.70	0.01
10200.00	1.13	160.33	10040.76	-1062.30	595.54	-1062.30	1217.85	150.72	0.09
10400.00	1.47	200.02	10240.71	-1066.57	595.32	-1066.57	1221.47	150.83	0.47
10600.00	1.28	217.18	10440.66	-1070.76	593.10	-1070.76	1224.05	151.02	0.23
10800.00	1.21	216.38	10640.61	-1074.23	590.50	-1074.23	1225.83	151.20	0.04
11000.00	1.68	230.27	10840.55	-1077.80	587.00	-1077.80	1227.28	151.43	0.29
11200.00	1.29	229.74	11040.48	-1081.14	583.02	-1081.14	1228.32	151.66	0.20
11400.00	0.70	220.47	11240.45	-1083.52	580.51	-1083.52	1229.23	151.82	0.31
11600.00	0.66	196.87	11440.44	-1085.55	579.39	-1085.55	1230.49	151.91	0.14
11800.00	0.75	141.95	11640.42	-1087.68	579.86	-1087.68	1232.59	151.94	0.33
12000.00	1.63	116.25	11840.38	-1089.97	583.22	-1089.97	1236.20	151.85	0.50
12200.00	1.86	107.62	12040.29	-1092.21	588.87	-1092.21	1240.84	151.67	0.17
12318.00	2.52	101.72	12158.20	-1093.32	593.23	-1093.32	1243.89	151.52	0.59