



Company: NOBLE ENERGY
 Well: HAMILTON 25-16B
 API: 05-123-16493
 Rig Name: PRODUCTION/LIGHTNING
 State/County: COLORADO/WELD
 Latitude: 40.365, Longitude: -104.605
 GRID North is 0.580 Degrees East of True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GROUND LEVEL

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 11/13/2012 / 16:48

VAUGHN ENERGY SERVICES

HENDERSON, COLORADO

866-835-8333

NICK KULA

DEPTH REFERENCE=GROUND LEVEL

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
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.200	71.050	100.000	0.057	0.165	0.057	0.175	71.050	0.200
200.000	0.254	328.508	199.999	0.303	0.215	0.303	0.371	35.372	0.356
300.000	0.102	137.917	299.999	0.426	0.158	0.426	0.454	20.400	0.354
400.000	0.161	41.566	399.999	0.465	0.311	0.465	0.560	33.766	0.200
500.000	0.271	335.305	499.998	0.786	0.306	0.786	0.843	21.249	0.254
600.000	0.174	293.273	599.998	1.061	0.067	1.061	1.063	3.603	0.184
700.000	0.119	199.069	699.997	1.023	-0.107	1.023	1.029	354.029	0.218
800.000	0.257	359.806	799.997	1.149	-0.142	1.149	1.158	352.968	0.372
900.000	0.200	302.104	899.996	1.467	-0.291	1.467	1.495	348.794	0.226
1000.000	0.114	90.424	999.996	1.559	-0.340	1.559	1.595	347.713	0.303
1100.000	0.146	35.171	1099.996	1.662	-0.167	1.662	1.671	354.263	0.124
1200.000	0.150	214.483	1199.996	1.659	-0.167	1.659	1.667	354.235	0.296
1300.000	0.032	210.784	1299.996	1.528	-0.256	1.528	1.549	350.504	0.118
1400.000	0.268	276.196	1399.995	1.529	-0.502	1.529	1.609	341.822	0.256
1500.000	0.242	223.882	1499.995	1.402	-0.881	1.402	1.656	327.862	0.226
1600.000	0.325	310.755	1599.994	1.435	-1.242	1.435	1.898	319.123	0.395
1700.000	0.429	254.760	1699.992	1.522	-1.818	1.522	2.371	309.929	0.366
1800.000	0.625	250.671	1799.988	1.243	-2.695	1.243	2.968	294.761	0.200
1900.000	0.702	244.257	1899.981	0.796	-3.761	0.796	3.845	281.951	0.107
2000.000	0.537	205.165	1999.975	0.106	-4.512	0.106	4.514	271.349	0.443
2100.000	0.658	204.801	2099.970	-0.839	-4.952	-0.839	5.023	260.385	0.122
2200.000	0.862	189.333	2199.961	-2.103	-5.315	-2.103	5.716	248.416	0.288
2300.000	0.896	194.825	2299.949	-3.601	-5.637	-3.601	6.689	237.432	0.091
2400.000	0.388	193.553	2399.943	-4.685	-5.917	-4.685	7.547	231.625	0.508
2500.000	0.613	190.873	2499.939	-5.540	-6.097	-5.540	8.238	227.741	0.226
2600.000	0.416	193.714	2599.935	-6.418	-6.284	-6.418	8.982	224.395	0.198
2700.000	0.705	197.183	2699.930	-7.359	-6.552	-7.359	9.853	221.681	0.290
2800.000	0.466	171.073	2799.925	-8.348	-6.670	-8.348	10.686	218.626	0.352
2900.000	0.380	169.254	2899.922	-9.075	-6.545	-9.075	11.190	215.800	0.088
3000.000	0.881	175.229	2999.916	-10.167	-6.420	-10.167	12.024	212.269	0.505
3100.000	0.728	165.405	3099.906	-11.548	-6.196	-11.548	13.105	208.214	0.206
3200.000	1.653	170.685	3199.883	-13.586	-5.802	-13.586	14.773	203.126	0.931

HORIZONTAL DISPLACEMENT IS 61.808 FEET AT 213.893 DEGREES
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