



Company/Rig: NOBLE ENERGY/CORE-TECH  
WELL: WELLS RANCH USX BB 1-6  
DECLINATION: 8.22  
TD AS DRILLED: 7245'  
COUNTY/STATE: WELD/COLORADO  
Latitude: 40.430, Longitude: -104.388  
GRID North is 0.720 Degrees East of True North  
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=SURFACE ELEVATION= 4712'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 10/13/2014 / 15:00

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Nick Kula

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	0.240	4.531	100.000	0.208	0.017	0.208	0.209	4.531	0.240
200.000	0.386	326.135	199.998	0.697	-0.155	0.697	0.714	347.470	0.248
300.000	0.312	306.116	299.996	1.137	-0.563	1.137	1.269	333.676	0.142
400.000	0.273	291.055	399.995	1.383	-1.005	1.383	1.710	324.009	0.086
500.000	0.443	272.066	499.993	1.483	-1.613	1.483	2.191	312.582	0.206
600.000	0.479	312.727	599.990	1.780	-2.307	1.780	2.914	307.655	0.322
700.000	0.460	266.640	699.987	2.040	-3.015	2.040	3.641	304.085	0.368
800.000	0.533	289.728	799.984	2.174	-3.854	2.174	4.425	299.424	0.211
900.000	0.500	285.875	899.980	2.450	-4.711	2.450	5.310	297.476	0.048
1000.000	0.517	256.901	999.976	2.467	-5.570	2.467	6.092	293.890	0.255
1100.000	0.464	240.944	1099.972	2.168	-6.363	2.168	6.722	288.818	0.146
1200.000	0.563	240.518	1199.968	1.730	-7.144	1.730	7.351	283.611	0.099
1300.000	0.345	224.270	1299.965	1.273	-7.782	1.273	7.885	279.288	0.251
1400.000	0.249	218.539	1399.964	0.888	-8.127	0.888	8.176	276.233	0.100
1500.000	0.161	250.403	1499.963	0.671	-8.395	0.671	8.421	274.568	0.141
1600.000	0.059	185.762	1599.963	0.572	-8.532	0.572	8.551	273.837	0.146
1700.000	0.443	73.218	1699.962	0.633	-8.167	0.633	8.191	274.430	0.469
1800.000	0.873	77.820	1799.955	0.905	-7.051	0.905	7.109	277.315	0.433
1900.000	1.327	88.763	1899.936	1.091	-5.148	1.091	5.263	281.965	0.498

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
2000.000	1.557	98.498	1999.905	0.915	-2.647	0.915	2.801	289.075	0.335
2100.000	1.773	96.366	2099.863	0.543	0.234	0.543	0.591	23.294	0.225
2200.000	1.874	101.847	2199.812	0.036	3.371	0.036	3.371	89.390	0.201
2300.000	2.089	98.398	2299.752	-0.566	6.774	-0.566	6.798	94.776	0.246
2400.000	2.200	89.862	2399.682	-0.828	10.496	-0.828	10.529	94.508	0.338
2500.000	1.997	81.140	2499.616	-0.555	14.137	-0.555	14.148	92.246	0.377
2600.000	1.563	73.953	2599.567	0.091	17.170	0.091	17.170	89.697	0.487
2700.000	1.328	59.062	2699.536	1.064	19.474	1.064	19.503	86.874	0.441
2800.000	1.181	37.517	2799.512	2.476	21.095	2.476	21.240	83.305	0.491
2900.000	1.100	31.923	2899.492	4.108	22.231	4.108	22.607	79.529	0.137
3000.000	0.888	21.380	2999.477	5.645	23.021	5.645	23.703	76.221	0.279
3100.000	0.710	18.439	3099.468	6.955	23.500	6.955	24.507	73.513	0.183
3200.000	0.418	32.907	3199.463	7.849	23.894	7.849	25.150	71.814	0.322
3300.000	1.185	194.619	3299.457	7.155	23.831	7.155	24.882	73.289	1.588
3400.000	3.055	185.639	3399.384	3.502	23.308	3.502	23.570	81.455	1.893
3500.000	3.652	179.882	3499.213	-2.334	23.053	-2.334	23.171	95.782	0.685
3600.000	4.337	170.332	3598.971	-9.247	23.694	-9.247	25.435	111.318	0.952
3700.000	5.054	170.723	3698.634	-17.321	25.039	-17.321	30.447	124.674	0.718
3800.000	5.285	169.739	3798.228	-26.200	26.570	-26.200	37.315	134.599	0.247
3900.000	4.593	167.312	3897.856	-34.638	28.270	-34.638	44.710	140.780	0.723
4000.000	3.992	169.886	3997.575	-41.971	29.760	-41.971	51.451	144.660	0.631
4100.000	3.182	166.273	4097.378	-48.094	31.030	-48.094	57.235	147.170	0.840
4200.000	2.312	160.208	4197.263	-52.688	32.372	-52.688	61.838	148.433	0.916
4300.000	1.497	159.348	4297.207	-55.808	33.516	-55.808	65.099	149.013	0.815
4400.000	1.253	157.379	4397.178	-58.040	34.397	-58.040	67.467	149.347	0.249
4500.000	0.943	141.053	4497.159	-59.689	35.335	-59.689	69.364	149.375	0.438
4600.000	1.145	115.380	4597.143	-60.757	36.755	-60.757	71.010	148.828	0.504
4700.000	0.424	149.238	4697.134	-61.504	37.847	-61.504	72.216	148.393	0.827
4800.000	0.065	75.014	4797.133	-61.808	38.091	-61.808	72.603	148.355	0.412
4900.000	0.042	57.298	4897.133	-61.773	38.177	-61.773	72.618	148.283	0.028
5000.000	0.248	49.077	4997.132	-61.612	38.372	-61.612	72.583	148.085	0.207
5100.000	0.447	59.249	5097.130	-61.270	38.870	-61.270	72.560	147.609	0.207
5200.000	0.734	6.722	5197.126	-60.434	39.280	-60.434	72.078	146.977	0.583
5300.000	0.584	79.087	5297.121	-59.702	39.856	-59.702	71.783	146.274	0.788
5400.000	0.961	110.705	5397.112	-59.902	41.140	-59.902	72.668	145.519	0.556
5500.000	1.064	114.440	5497.096	-60.582	42.769	-60.582	74.158	144.779	0.122
5600.000	0.235	82.096	5597.089	-60.938	43.817	-60.938	75.056	144.282	0.875
5700.000	0.482	107.667	5697.087	-61.037	44.420	-61.037	75.490	143.954	0.288
5800.000	0.483	111.060	5797.084	-61.316	45.214	-61.316	76.184	143.595	0.029
5900.000	0.574	95.295	5897.079	-61.514	46.106	-61.514	76.875	143.148	0.171

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6000.000	0.341	70.945	5997.076	-61.463	46.886	-61.463	77.304	142.663	0.298
6100.000	0.013	239.036	6097.076	-61.371	47.158	-61.371	77.397	142.461	0.353
6200.000	0.199	123.695	6197.075	-61.473	47.293	-61.473	77.560	142.428	0.205
6300.000	0.380	169.587	6297.074	-61.896	47.497	-61.896	78.020	142.499	0.281
6400.000	0.176	199.900	6397.073	-62.367	47.505	-62.367	78.399	142.704	0.245
6500.000	0.197	177.565	6497.072	-62.683	47.460	-62.683	78.623	142.869	0.075
6550.000	0.415	108.517	6547.072	-62.826	47.635	-62.826	78.843	142.830	0.782