



Company/Rig: NOBLE ENERGY / PRODUCTION
WELL: ODLE BB 18-13
DECLINATION: 8.27 DEGREES
TD AS DRILLED: 6762 FEET
COUNTY/STATE: WELD / COLORADO
Latitude: 40.394, Longitude: -104.487
GRID North is 0.650 Degrees East of True North
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4561 FEET

DRILLOG GYRO SURVEY CALCULATIONS

Filename: survey.ut
Minimum Curvature Method
Report Date/Time: 10/23/2014 / 10:30

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID
HENDERSON, COLORADO
303-853-4976

Surveyor: NORMAN COWAN

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	0.451	41.298	99.999	0.295	0.260	0.295	0.393	41.298	0.451
200.000	0.513	42.284	199.995	0.922	0.820	0.922	1.234	41.655	0.063
300.000	0.368	48.635	299.992	1.465	1.362	1.465	2.001	42.914	0.152
400.000	0.186	228.979	399.992	1.571	1.481	1.571	2.159	43.309	0.555
500.000	0.185	243.066	499.991	1.391	1.215	1.391	1.847	41.119	0.046
600.000	0.625	244.306	599.989	1.082	0.580	1.082	1.227	28.177	0.440
700.000	0.667	198.587	699.983	0.294	-0.097	0.294	0.309	341.681	0.503
800.000	0.424	209.526	799.978	-0.580	-0.465	-0.580	0.743	218.736	0.264
900.000	0.820	236.848	899.972	-1.293	-1.247	-1.293	1.796	223.955	0.485
1000.000	0.542	208.754	999.966	-2.099	-2.074	-2.099	2.951	224.647	0.427
1100.000	1.168	252.393	1099.955	-2.822	-3.272	-2.822	4.321	229.222	0.861
1200.000	1.079	225.232	1199.936	-3.794	-4.912	-3.794	6.206	232.320	0.534
1300.000	0.964	230.692	1299.920	-4.989	-6.231	-4.989	7.983	231.314	0.151
1400.000	1.384	252.013	1399.900	-5.895	-8.031	-5.895	9.962	233.718	0.599
1500.000	1.359	277.857	1499.872	-6.106	-10.354	-6.106	12.021	239.471	0.614
1600.000	1.187	242.519	1599.849	-6.422	-12.448	-6.422	14.007	242.710	0.790
1700.000	1.453	276.484	1699.824	-6.757	-14.627	-6.757	16.112	245.206	0.812
1800.000	0.619	244.361	1799.807	-6.847	-16.374	-6.847	17.748	247.306	0.986
1900.000	1.425	273.977	1899.791	-6.995	-18.102	-6.995	19.407	248.873	0.938

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	1.671	268.272	1999.754	-6.953	-20.800	-6.953	21.932	251.517	0.290
2100.000	1.640	275.337	2099.713	-6.864	-23.683	-6.864	24.658	253.838	0.206
2200.000	1.773	266.421	2199.669	-6.827	-26.652	-6.827	27.513	255.633	0.296
2300.000	1.529	255.463	2299.627	-7.258	-29.487	-7.258	30.368	256.171	0.398
2400.000	1.454	253.210	2399.593	-7.960	-31.994	-7.960	32.969	256.029	0.095
2500.000	1.798	271.319	2499.554	-8.290	-34.777	-8.290	35.751	256.592	0.614
2600.000	1.463	256.697	2599.513	-8.548	-37.588	-8.548	38.547	257.188	0.532
2700.000	1.801	284.306	2699.474	-8.453	-40.353	-8.453	41.229	258.169	0.845
2800.000	1.185	264.990	2799.440	-8.155	-42.906	-8.155	43.674	259.238	0.788
2900.000	1.496	280.692	2899.413	-8.003	-45.218	-8.003	45.921	259.963	0.479
3000.000	1.068	305.455	2999.389	-7.220	-47.260	-7.220	47.808	261.314	0.690
3100.000	0.717	328.039	3099.377	-6.149	-48.350	-6.149	48.740	262.752	0.491
3200.000	0.508	36.138	3199.372	-5.260	-48.420	-5.260	48.705	263.800	0.707
3300.000	0.591	98.584	3299.368	-4.979	-47.649	-4.979	47.908	264.035	0.574
3400.000	1.318	94.759	3399.354	-5.151	-45.993	-5.151	46.281	263.609	0.730
3500.000	1.327	88.010	3499.327	-5.206	-43.690	-5.206	43.999	263.204	0.156
3600.000	1.519	98.009	3599.296	-5.351	-41.220	-5.351	41.566	262.604	0.313
3700.000	1.461	122.160	3699.264	-6.214	-38.828	-6.214	39.322	260.907	0.626
3800.000	1.780	131.411	3799.224	-7.920	-36.585	-7.920	37.432	257.785	0.411
3900.000	2.567	140.164	3899.151	-10.667	-33.985	-10.667	35.620	252.575	0.853
4000.000	2.571	155.962	3999.052	-14.435	-31.637	-14.435	34.774	245.474	0.706
4100.000	1.656	152.955	4098.983	-17.770	-30.066	-17.770	34.925	239.416	0.921
4200.000	0.792	166.547	4198.959	-19.729	-29.249	-19.729	35.280	235.999	0.906
4300.000	0.173	330.798	4298.957	-20.269	-29.161	-20.269	35.514	235.198	0.959
4400.000	2.083	340.731	4398.933	-18.422	-29.835	-18.422	35.064	238.306	1.913
4500.000	2.574	347.358	4498.850	-14.515	-30.926	-14.515	34.163	244.857	0.559
4600.000	2.440	339.462	4598.755	-10.331	-32.164	-10.331	33.782	252.194	0.370
4700.000	2.634	336.298	4698.657	-6.234	-33.834	-6.234	34.404	259.561	0.239
4800.000	3.350	344.855	4798.520	-1.310	-35.521	-1.310	35.545	267.888	0.842
4900.000	2.652	357.435	4898.383	3.821	-36.388	3.821	36.588	275.995	0.956
5000.000	1.732	353.466	4998.309	7.633	-36.664	7.633	37.450	281.761	0.932
5100.000	0.862	340.280	5098.283	9.843	-37.089	9.843	38.373	284.862	0.914
5200.000	0.409	319.733	5198.277	10.823	-37.574	10.823	39.101	286.069	0.501
5300.000	0.076	273.965	5298.276	11.100	-37.870	11.100	39.463	286.336	0.360
5400.000	0.722	281.875	5398.273	11.234	-38.553	11.234	40.156	286.246	0.647
5500.000	1.299	312.878	5498.257	12.135	-40.000	12.135	41.801	286.876	0.775
5600.000	1.207	317.816	5598.234	13.687	-41.538	13.687	43.735	288.237	0.142
5700.000	0.397	312.089	5698.223	14.699	-42.502	14.699	44.972	289.077	0.813