



Company/Rig: NOBLE ENERGY/VESI
WELL/API#: KARCH BLUE D25-07/05-123-16247
DECLINATION: 8.22 DEGREES
TD AS DRILLED: 7022 FEET
COUNTY/STATE: WELD/COLORADO
Latitude: 40.198, Longitude: -104.497
GRID North is 0.650 Degrees East of True North
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4769 FEET

DRILLOG GYRO SURVEY CALCULATIONS

Filename: strapdown-de_01_mrg.ut

Minimum Curvature Method

Report Date/Time: 2/18/2015 / 14:18

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: KEVIN MCDOWELL

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	0.196	192.715	100.000	-0.167	-0.038	-0.167	0.171	192.715	0.196
200.000	0.119	214.765	199.999	-0.419	-0.134	-0.419	0.440	197.786	0.097
300.000	0.114	285.119	299.999	-0.478	-0.290	-0.478	0.559	211.230	0.134
400.000	0.223	317.466	399.999	-0.308	-0.518	-0.308	0.602	239.238	0.141
500.000	0.240	356.716	499.998	0.044	-0.661	0.044	0.663	273.839	0.156
600.000	0.320	331.150	599.997	0.498	-0.808	0.498	0.949	301.640	0.146
700.000	0.371	311.718	699.995	0.958	-1.184	0.958	1.523	308.964	0.127
800.000	0.313	332.744	799.993	1.416	-1.551	1.416	2.100	312.393	0.137
900.000	0.469	1.874	899.991	2.068	-1.662	2.068	2.653	321.202	0.248
1000.000	0.575	334.178	999.987	2.928	-1.867	2.928	3.473	327.476	0.270
1100.000	0.747	309.138	1099.981	3.792	-2.592	3.792	4.593	325.646	0.332
1200.000	0.611	349.817	1199.974	4.728	-3.192	4.728	5.705	325.979	0.489
1300.000	0.696	318.339	1299.968	5.707	-3.690	5.707	6.796	327.116	0.364
1400.000	0.847	330.151	1399.959	6.802	-4.462	6.802	8.135	326.739	0.219
1500.000	0.687	324.287	1499.950	7.931	-5.180	7.931	9.472	326.850	0.178
1600.000	0.822	322.631	1599.941	8.988	-5.965	8.988	10.787	326.427	0.136
1700.000	0.753	334.058	1699.932	10.149	-6.688	10.149	12.155	326.614	0.171
1800.000	0.895	312.112	1799.922	11.264	-7.555	11.264	13.563	326.148	0.343
1900.000	0.790	277.335	1899.912	11.875	-8.818	11.875	14.791	323.405	0.513

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	0.809	263.698	1999.902	11.886	-10.202	11.886	15.664	319.358	0.191
2100.000	0.943	329.371	2099.892	12.516	-11.323	12.516	16.878	317.865	0.957
2200.000	0.576	294.018	2199.884	13.429	-12.202	13.429	18.145	317.742	0.579
2300.000	0.330	300.189	2299.881	13.779	-12.910	13.779	18.882	316.864	0.251
2400.000	0.307	349.282	2399.879	14.187	-13.209	14.187	19.384	317.044	0.265
2500.000	0.104	313.199	2499.879	14.512	-13.325	14.512	19.701	317.442	0.231
2600.000	0.061	124.133	2599.879	14.544	-13.346	14.544	19.739	317.459	0.165
2700.000	0.103	143.018	2699.879	14.442	-13.248	14.442	19.598	317.469	0.050
2800.000	0.348	124.227	2799.878	14.199	-12.942	14.199	19.212	317.651	0.252
2900.000	0.267	105.338	2899.876	13.967	-12.467	13.967	18.721	318.248	0.128
3000.000	0.506	127.590	2999.874	13.636	-11.892	13.636	18.093	318.907	0.277
3100.000	0.532	75.862	3099.871	13.480	-11.093	13.480	17.457	320.549	0.453
3200.000	0.506	143.170	3199.867	13.240	-10.378	13.240	16.822	321.909	0.576
3300.000	0.669	104.111	3299.862	12.744	-9.547	12.744	15.923	323.162	0.422
3400.000	0.533	100.194	3399.857	12.519	-8.523	12.519	15.145	325.754	0.142
3500.000	0.476	104.098	3499.853	12.336	-7.662	12.336	14.521	328.156	0.066
3600.000	0.038	292.663	3599.852	12.247	-7.289	12.247	14.252	329.241	0.514
3700.000	0.549	37.934	3699.850	12.638	-7.024	12.638	14.459	330.933	0.560
3800.000	0.786	324.275	3799.845	13.572	-7.130	13.572	15.331	332.284	0.822
3900.000	0.798	307.040	3899.836	14.549	-8.087	14.549	16.645	330.933	0.238
4000.000	0.949	256.519	3999.825	14.775	-9.449	14.775	17.538	327.402	0.758
4100.000	1.068	276.588	4099.810	14.689	-11.180	14.689	18.460	322.725	0.371
4200.000	1.073	283.099	4199.793	15.008	-13.018	15.008	19.868	319.061	0.122
4300.000	0.892	281.076	4299.778	15.370	-14.695	15.370	21.265	316.287	0.185
4400.000	0.938	260.409	4399.766	15.383	-16.266	15.383	22.388	313.403	0.331
4500.000	1.059	290.790	4499.751	15.575	-17.937	15.575	23.756	310.968	0.536
4600.000	1.230	243.205	4599.733	15.419	-19.760	15.419	25.064	307.966	0.937
4700.000	1.336	270.731	4699.709	14.950	-21.884	14.950	26.503	304.340	0.619
4800.000	1.443	281.156	4799.680	15.209	-24.285	15.209	28.654	302.057	0.274
4900.000	1.203	295.964	4899.653	15.912	-26.464	15.912	30.879	301.017	0.416
5000.000	1.171	249.078	4999.634	16.006	-28.361	16.006	32.566	299.439	0.945
5100.000	1.204	244.167	5099.613	15.184	-30.261	15.184	33.857	296.646	0.107
5200.000	1.365	240.475	5199.588	14.139	-32.243	14.139	35.207	293.679	0.182
5300.000	0.942	250.822	5299.567	13.282	-34.056	13.282	36.554	291.306	0.470
5400.000	0.941	284.573	5399.554	13.219	-35.628	13.219	38.001	290.356	0.547
5500.000	0.985	274.320	5499.540	13.490	-37.280	13.490	39.646	289.893	0.178
5600.000	1.341	254.072	5599.520	13.234	-39.262	13.234	41.433	288.627	0.538
5700.000	0.854	257.597	5699.501	12.753	-41.115	12.753	43.047	287.233	0.491
5800.000	0.552	262.460	5799.494	12.530	-42.320	12.530	44.136	286.492	0.307
5900.000	1.078	273.702	5899.483	12.527	-43.736	12.527	45.494	285.983	0.547

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
6000.000	1.674	282.103	5999.454	12.894	-46.102	12.894	47.871	285.625	0.627
6100.000	1.780	262.874	6099.410	13.008	-49.071	13.008	50.765	284.846	0.586
6200.000	1.926	246.385	6199.358	12.142	-52.151	12.142	53.546	283.106	0.551
6300.000	1.431	247.832	6299.315	10.997	-54.847	10.997	55.939	281.338	0.496
6400.000	0.722	235.379	6399.297	10.168	-56.522	10.168	57.430	280.198	0.743
6500.000	0.296	163.865	6499.293	9.563	-56.969	9.563	57.766	279.529	0.688
6600.000	0.856	167.745	6599.288	8.585	-56.739	8.585	57.384	278.604	0.562
6700.000	0.083	198.830	6699.284	7.786	-56.604	7.786	57.136	277.832	0.786