



Company: Noble Energy
Rig: Production/VES
API # 05-123-31980
Date: 5/17/2013
Surveyor: Nick Kula
VS: 0.000
Lat : 40.31951
Long: -104.798

Well: Five Rivers K17-27
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid north is -0.45 of Tr
Declination: 8.62
Depth Reference: Ground Level
Elevation: 4704'
Total Depth as Drilled: 7423'

Lat & Long obtained by handheld GPS at wellhead

HA Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD	Cbrg
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100.000	0.282	216.353	-0.198	-0.146	100.000	0.282	-0.198	0.246	216.353
200.000	0.167	249.798	-0.447	-0.429	199.999	0.170	-0.447	0.619	223.821
300.000	0.789	122.414	-0.866	0.016	299.996	0.901	-0.866	0.866	178.952
400.000	0.561	130.529	-1.554	0.970	399.989	0.247	-1.554	1.831	148.033
500.000	0.461	139.015	-2.176	1.606	499.985	0.125	-2.176	2.705	143.570
600.000	0.919	197.806	-3.243	1.625	599.979	0.786	-3.243	3.628	153.387
700.000	0.175	106.204	-4.049	1.526	699.974	0.940	-4.049	4.327	159.348
800.000	0.692	194.694	-4.676	1.519	799.971	0.709	-4.676	4.917	162.002
900.000	0.609	266.867	-5.289	0.835	899.967	0.769	-5.289	5.355	171.027
1000.000	0.556	196.121	-5.785	0.170	999.962	0.676	-5.785	5.787	178.320
1100.000	0.786	207.482	-6.859	-0.282	1099.956	0.265	-6.859	6.865	182.351
1200.000	1.109	231.430	-8.072	-1.355	1199.942	0.505	-8.072	8.185	189.530
1300.000	0.869	255.440	-8.866	-2.846	1299.928	0.474	-8.866	9.311	197.797
1400.000	1.052	243.775	-9.462	-4.403	1399.914	0.267	-9.462	10.437	204.956
1500.000	0.448	227.265	-10.133	-5.514	1499.905	0.635	-10.133	11.536	208.554
1600.000	0.712	250.988	-10.601	-6.389	1599.900	0.351	-10.601	12.377	211.075
1700.000	0.473	242.817	-10.992	-7.343	1699.894	0.253	-10.992	13.219	213.744
1800.000	0.448	266.816	-11.202	-8.100	1799.891	0.193	-11.202	13.824	215.871
1900.000	0.718	236.364	-11.571	-9.013	1899.886	0.402	-11.571	14.667	217.915
2000.000	0.580	209.685	-12.358	-9.785	1999.880	0.328	-12.358	15.763	218.373
2100.000	0.606	182.801	-13.325	-10.062	2099.875	0.277	-13.325	16.697	217.056
2200.000	0.860	192.917	-14.585	-10.255	2199.866	0.285	-14.585	17.829	215.113
2300.000	0.971	177.467	-16.163	-10.386	2299.854	0.269	-16.163	19.212	212.723
2400.000	1.172	178.988	-18.031	-10.330	2399.836	0.203	-18.031	20.781	209.808
2500.000	1.506	178.094	-20.367	-10.268	2499.809	0.335	-20.367	22.809	206.756
2600.000	1.913	188.272	-23.332	-10.465	2599.764	0.507	-23.332	25.571	204.157
2700.000	1.004	199.894	-25.808	-11.003	2699.731	0.951	-25.808	28.055	203.091
2800.000	0.758	249.306	-26.865	-11.920	2799.721	0.770	-26.865	29.391	203.926
2900.000	0.938	309.452	-26.579	-13.170	2899.711	0.864	-26.579	29.663	206.360
3000.000	0.395	308.888	-25.842	-14.071	2999.704	0.543	-25.842	29.425	208.567
3100.000	0.889	317.311	-25.056	-14.865	3099.698	0.502	-25.056	29.133	210.680
3200.000	0.916	285.973	-24.265	-16.160	3199.686	0.488	-24.265	29.154	213.662
3300.000	1.028	282.156	-23.856	-17.806	3299.671	0.129	-23.856	29.768	216.737
3400.000	0.734	307.193	-23.280	-19.193	3399.660	0.478	-23.280	30.172	219.504
3500.000	0.642	306.054	-22.563	-20.156	3499.653	0.093	-22.563	30.255	221.776

3600.000	1.254	273.136	-22.173	-21.702	3599.639	0.796	-22.173	31.026	224.384
3700.000	0.743	257.285	-22.256	-23.427	3699.624	0.576	-22.256	32.313	226.468
3800.000	0.814	325.410	-21.814	-24.462	3799.617	0.874	-21.814	32.776	228.275
3900.000	0.761	288.301	-21.021	-25.497	3899.608	0.504	-21.021	33.045	230.496
4000.000	1.397	291.624	-20.363	-27.261	3999.589	0.638	-20.363	34.026	233.241
4100.000	1.764	301.090	-19.119	-29.712	4099.551	0.449	-19.119	35.332	237.240
4200.000	1.136	287.039	-18.034	-31.978	4199.519	0.718	-18.034	36.712	240.580
4300.000	0.842	325.012	-17.141	-33.347	4299.505	0.701	-17.141	37.494	242.796
4400.000	0.775	318.587	-16.031	-34.216	4399.495	0.113	-16.031	37.785	244.895
4500.000	0.464	255.904	-15.623	-35.056	4499.490	0.697	-15.623	38.380	245.980
4600.000	0.163	70.964	-15.675	-35.315	4599.489	0.627	-15.675	38.637	246.065
4700.000	0.559	265.334	-15.668	-35.666	4699.488	0.718	-15.668	38.956	246.284
4800.000	0.252	280.550	-15.668	-36.369	4799.486	0.323	-15.668	39.600	246.694
4900.000	0.669	276.873	-15.557	-37.164	4899.482	0.419	-15.557	40.289	247.285
5000.000	0.766	283.804	-15.328	-38.394	4999.474	0.130	-15.328	41.340	248.236
5100.000	0.653	279.260	-15.077	-39.605	5099.467	0.126	-15.077	42.378	249.159
5200.000	0.688	320.272	-14.523	-40.552	5199.460	0.471	-14.523	43.074	250.295
5300.000	0.422	259.590	-14.128	-41.297	5299.456	0.606	-14.128	43.647	251.114
5400.000	0.648	310.999	-13.823	-42.086	5399.452	0.507	-13.823	44.298	251.817
5500.000	0.414	33.371	-13.151	-42.314	5499.449	0.721	-13.151	44.311	252.735
5600.000	0.705	358.302	-12.234	-42.134	5599.445	0.437	-12.234	43.874	253.809
5700.000	0.807	0.790	-10.915	-42.142	5699.436	0.107	-10.915	43.533	255.480
5800.000	0.933	23.413	-9.463	-41.809	5799.425	0.363	-9.463	42.866	257.247
5900.000	1.400	349.086	-7.516	-41.717	5899.405	0.820	-7.516	42.388	259.787
6000.000	1.252	336.738	-5.313	-42.379	5999.378	0.321	-5.313	42.711	262.855
6100.000	0.940	330.505	-3.595	-43.215	6099.360	0.334	-3.595	43.364	265.245
6200.000	1.099	345.315	-1.953	-43.862	6199.344	0.307	-1.953	43.905	267.450
6300.000	1.473	312.291	-0.160	-45.056	6299.320	0.814	-0.160	45.056	269.796
6400.000	1.163	328.175	1.567	-46.542	6399.294	0.476	1.567	46.568	271.928
6500.000	1.658	307.479	3.310	-48.225	6499.264	0.702	3.310	48.338	273.926
6600.000	1.715	308.331	5.118	-50.546	6599.221	0.062	5.118	50.804	275.781
6700.000	0.806	315.559	6.547	-52.212	6699.195	0.921	6.547	52.621	277.148
6800.000	1.216	321.963	7.885	-53.358	6799.180	0.425	7.885	53.938	278.406
6900.000	0.981	314.682	9.323	-54.621	6899.161	0.274	9.323	55.411	279.686
7000.000	1.526	316.124	10.885	-56.152	6999.137	0.546	10.885	57.197	280.970
7100.000	1.050	356.293	12.759	-57.134	7099.113	0.991	12.759	58.541	282.588
7200.000	1.144	307.319	14.278	-57.987	7199.097	0.913	14.278	59.719	283.833

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