



Company: Noble Energy
Lease/Well: Samuel J 7/#10
API: 05-123-22077
Rig Name: Production/VES
State/County: Colorado/Weld
Latitude: 40.412, Longitude: -104.820
GRID North is 0.440 Degrees East of True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : Ground Level

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: samuel j 7-10_ed.ut
Minimum Curvature Method
Report Date/Time: 2/23/2013 / 13:39

Vaughn Energy Services
Fort Worth, Texas
817-741-3610
Robert Hooper

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	0.687	149.468	99.998	-0.516	0.305	-0.516	0.599	149.468	0.687
200.000	0.785	165.258	199.989	-1.695	0.783	-1.695	1.868	155.199	0.225
300.000	0.507	171.276	299.983	-2.796	1.025	-2.796	2.978	159.867	0.286
400.000	0.512	182.377	399.979	-3.680	1.074	-3.680	3.834	163.737	0.099
500.000	0.261	184.296	499.977	-4.355	1.038	-4.355	4.477	166.592	0.252
600.000	0.386	225.867	599.975	-4.817	0.779	-4.817	4.879	170.814	0.258
700.000	0.446	229.791	699.973	-5.303	0.239	-5.303	5.308	177.416	0.066
800.000	0.498	241.680	799.969	-5.761	-0.441	-5.761	5.778	184.376	0.110
900.000	0.550	256.143	899.965	-6.082	-1.289	-6.082	6.217	191.970	0.142
1000.000	0.789	270.672	999.958	-6.189	-2.444	-6.189	6.654	201.549	0.291
1100.000	0.875	278.206	1099.948	-6.072	-3.888	-6.072	7.210	212.637	0.139
1200.000	0.910	280.186	1199.936	-5.822	-5.426	-5.822	7.959	222.983	0.046
1300.000	1.095	288.508	1299.920	-5.378	-7.113	-5.378	8.918	232.907	0.235
1400.000	1.535	281.475	1399.894	-4.809	-9.332	-4.809	10.498	242.737	0.468
1500.000	1.248	287.416	1499.864	-4.217	-11.683	-4.217	12.420	250.155	0.321
1600.000	1.864	294.322	1599.827	-3.221	-14.204	-3.221	14.564	257.223	0.643
1700.000	1.920	290.935	1699.772	-1.952	-17.251	-1.952	17.361	263.543	0.125
1800.000	1.540	312.952	1799.728	-0.438	-19.799	-0.438	19.804	268.733	0.759
1900.000	1.286	313.812	1899.697	1.255	-21.593	1.255	21.629	273.326	0.255
2000.000	1.005	298.671	1999.677	2.452	-23.172	2.452	23.301	276.042	0.411
2100.000	0.640	282.492	2099.667	2.994	-24.486	2.994	24.668	276.971	0.429
2200.000	0.479	278.574	2199.662	3.177	-25.444	3.177	25.642	277.117	0.165
2300.000	0.282	242.182	2299.660	3.124	-26.074	3.124	26.261	276.833	0.302
2400.000	0.954	211.305	2399.654	2.299	-26.724	2.299	26.823	274.916	0.727
2500.000	1.042	204.471	2499.639	0.760	-27.533	0.760	27.544	271.581	0.148
2600.000	1.095	211.023	2599.621	-0.887	-28.403	-0.887	28.417	268.211	0.133
2700.000	1.068	222.625	2699.604	-2.392	-29.526	-2.392	29.623	265.369	0.220
2800.000	1.024	251.625	2799.588	-3.359	-31.005	-3.359	31.187	263.817	0.525
2900.000	1.006	269.046	2899.572	-3.655	-32.731	-3.655	32.934	263.627	0.308
3000.000	1.196	271.625	2999.554	-3.640	-34.651	-3.640	34.842	264.002	0.196
3100.000	1.177	272.268	3099.532	-3.570	-36.720	-3.570	36.893	264.447	0.023
3200.000	1.210	265.115	3199.511	-3.620	-38.799	-3.620	38.967	264.670	0.153
3300.000	1.337	253.947	3299.486	-4.032	-40.972	-4.032	41.170	264.380	0.278
3400.000	1.526	247.530	3399.455	-4.863	-43.323	-4.863	43.595	263.595	0.248

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
3500.000	1.646	244.412	3499.417	-5.992	-45.848	-5.992	46.238	262.554	0.148
3600.000	1.540	256.658	3599.378	-6.923	-48.450	-6.923	48.942	261.869	0.356
3700.000	1.620	254.897	3699.340	-7.601	-51.123	-7.601	51.685	261.543	0.094
3800.000	1.882	257.519	3799.294	-8.324	-54.091	-8.324	54.728	261.251	0.274
3900.000	2.005	260.025	3899.236	-8.982	-57.418	-8.982	58.116	261.109	0.150
4000.000	2.061	263.418	3999.173	-9.492	-60.928	-9.492	61.663	261.145	0.133
4100.000	2.198	267.472	4099.104	-9.782	-64.630	-9.782	65.366	261.393	0.203
4200.000	2.355	265.769	4199.025	-10.018	-68.594	-10.018	69.322	261.691	0.171
4300.000	2.671	267.895	4298.929	-10.256	-72.971	-10.256	73.688	262.000	0.329
4400.000	2.692	272.263	4398.820	-10.248	-77.646	-10.248	78.319	262.481	0.205
4500.000	2.887	263.632	4498.701	-10.435	-82.495	-10.435	83.152	262.791	0.463
4600.000	2.709	266.249	4598.582	-10.869	-87.355	-10.869	88.029	262.908	0.219
4700.000	2.658	254.471	4698.473	-11.644	-91.947	-11.644	92.681	262.783	0.553
4800.000	2.038	243.052	4798.390	-13.071	-95.766	-13.071	96.653	262.228	0.774
4900.000	1.610	250.839	4898.339	-14.338	-98.678	-14.338	99.714	261.733	0.493
5000.000	1.342	251.445	4998.305	-15.171	-101.115	-15.171	102.247	261.467	0.269
5100.000	0.890	257.822	5098.286	-15.708	-102.985	-15.708	104.176	261.328	0.467
5200.000	0.331	327.622	5198.281	-15.628	-103.899	-15.628	105.067	261.446	0.836
5300.000	0.347	345.064	5298.279	-15.091	-104.131	-15.091	105.219	261.754	0.104
5400.000	0.388	353.340	5398.277	-14.462	-104.249	-14.462	105.247	262.102	0.067
5500.000	0.273	24.691	5498.276	-13.910	-104.189	-13.910	105.113	262.396	0.210
5600.000	0.564	50.033	5598.273	-13.377	-103.712	-13.377	104.571	262.650	0.339
5700.000	0.950	79.286	5698.265	-12.906	-102.519	-12.906	103.329	262.825	0.535
5800.000	0.589	68.758	5798.255	-12.566	-101.226	-12.566	102.003	262.924	0.387
5900.000	0.420	67.794	5898.251	-12.241	-100.407	-12.241	101.151	263.049	0.169
6000.000	0.137	34.811	5998.250	-12.005	-100.000	-12.005	100.717	263.155	0.314
6100.000	0.129	36.503	6098.250	-11.816	-99.864	-11.816	100.561	263.252	0.009
6200.000	0.117	34.554	6198.250	-11.642	-99.740	-11.642	100.417	263.342	0.012
6300.000	0.389	358.074	6298.249	-11.219	-99.693	-11.219	100.322	263.579	0.303
6400.000	0.391	330.798	6398.247	-10.581	-99.871	-10.581	100.430	263.952	0.184
6500.000	0.398	328.318	6498.244	-9.988	-100.220	-9.988	100.717	264.309	0.018
6600.000	0.533	278.535	6598.241	-9.624	-100.862	-9.624	101.321	264.550	0.411
6700.000	0.575	277.253	6698.237	-9.491	-101.820	-9.491	102.262	264.674	0.043
6800.000	0.267	272.548	6798.234	-9.418	-102.551	-9.418	102.982	264.753	0.309
6900.000	0.450	283.269	6898.232	-9.317	-103.166	-9.317	103.586	264.839	0.194
7000.000	0.187	201.965	6998.230	-9.379	-103.609	-9.379	104.032	264.828	0.460
7100.000	0.450	125.680	7098.229	-9.759	-103.351	-9.759	103.811	264.606	0.444
7200.000	0.563	152.564	7198.225	-10.424	-102.806	-10.424	103.333	264.210	0.260
7300.000	0.152	119.065	7298.223	-10.924	-102.463	-10.924	103.044	263.914	0.444
HORIZONTAL DISPLACEMENT IS 103.044 FEET AT 263.914 DEGREES									