



Company: Noble Energy

Lease / Well: FHA / 2-1

API#: 05-123-12827

Rig Name: Production / Lightning Wireline

State / County: Colorado / Weld County

Latitude: 40.343, Longitude: -104.520

GRID North is 0.630 Degrees East of True North

VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: inrun\_ed.ut

Minimum Curvature Method

Report Date/Time: 8/25/2011 / 07:45

Vaughn Energy Services

Henderson, CO

303-853-4976

Robert Davis

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	0.236	247.245	100.000	-0.080	-0.190	-0.080	0.206	247.245	0.236
200.000	0.481	248.380	199.998	-0.314	-0.770	-0.314	0.831	247.819	0.245
300.000	0.272	269.598	299.996	-0.470	-1.397	-0.470	1.474	251.402	0.248
400.000	0.125	244.762	399.995	-0.518	-1.733	-0.518	1.809	253.347	0.167
500.000	0.184	179.737	499.995	-0.726	-1.831	-0.726	1.970	248.389	0.173
600.000	0.374	179.433	599.993	-1.212	-1.827	-1.212	2.193	236.436	0.190
700.000	0.131	192.133	699.992	-1.651	-1.848	-1.651	2.478	228.230	0.248
800.000	0.257	191.265	799.992	-1.983	-1.916	-1.983	2.757	224.022	0.126
900.000	0.418	199.353	899.990	-2.547	-2.081	-2.547	3.289	219.248	0.167
1000.000	0.315	172.000	999.988	-3.163	-2.164	-3.163	3.833	214.369	0.200
1100.000	0.320	176.327	1099.986	-3.715	-2.107	-3.715	4.271	209.567	0.025
1200.000	0.539	192.314	1199.984	-4.454	-2.190	-4.454	4.963	206.184	0.248
1300.000	0.584	206.561	1299.979	-5.369	-2.518	-5.369	5.930	205.126	0.146
1400.000	0.692	215.277	1399.973	-6.318	-3.095	-6.318	7.035	206.097	0.145
1500.000	0.714	224.065	1499.965	-7.259	-3.877	-7.259	8.230	208.107	0.110
1600.000	0.768	228.386	1599.957	-8.152	-4.812	-8.152	9.466	210.550	0.077
1700.000	0.525	235.329	1699.950	-8.857	-5.689	-8.857	10.527	212.712	0.255
1800.000	0.403	232.064	1799.947	-9.334	-6.343	-9.334	11.285	214.198	0.124
1900.000	0.332	236.002	1899.945	-9.713	-6.861	-9.713	11.891	215.237	0.075
2000.000	0.367	244.061	1999.943	-10.015	-7.389	-10.015	12.446	216.421	0.060
2100.000	0.358	244.434	2099.941	-10.290	-7.959	-10.290	13.008	217.721	0.010
2200.000	0.132	294.324	2199.940	-10.377	-8.346	-10.377	13.316	218.808	0.291
2300.000	0.123	281.705	2299.940	-10.307	-8.556	-10.307	13.396	219.695	0.029
2400.000	0.107	304.350	2399.940	-10.233	-8.738	-10.233	13.456	220.495	0.048
2500.000	0.272	312.095	2499.939	-10.021	-8.992	-10.021	13.464	221.901	0.167
2600.000	0.105	290.479	2599.939	-9.830	-9.254	-9.830	13.500	223.271	0.179
2700.000	0.096	296.629	2699.939	-9.760	-9.414	-9.760	13.560	223.966	0.014
2800.000	0.109	275.860	2799.938	-9.713	-9.584	-9.713	13.645	224.616	0.039
2900.000	0.161	307.187	2899.938	-9.618	-9.790	-9.618	13.724	225.508	0.089
3000.000	0.167	321.164	2999.938	-9.419	-9.994	-9.419	13.733	226.694	0.040
3100.000	0.145	258.537	3099.937	-9.331	-10.209	-9.331	13.831	227.573	0.163
3200.000	0.325	265.304	3199.937	-9.379	-10.615	-9.379	14.165	228.537	0.182
3300.000	0.203	260.312	3299.935	-9.432	-11.072	-9.432	14.545	229.573	0.124
3400.000	0.286	257.808	3399.935	-9.515	-11.491	-9.515	14.919	230.374	0.084

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	0.390	262.618	3499.933	-9.611	-12.073	-9.611	15.431	231.476	0.108
3600.000	0.561	268.273	3599.929	-9.670	-12.900	-9.670	16.122	233.144	0.177
3700.000	0.418	275.917	3699.926	-9.647	-13.751	-9.647	16.798	234.950	0.157
3800.000	0.482	260.732	3799.923	-9.677	-14.529	-9.677	17.457	236.334	0.135
3900.000	0.556	257.061	3899.918	-9.854	-15.417	-9.854	18.297	237.416	0.082
4000.000	0.488	279.352	3999.914	-9.893	-16.311	-9.893	19.076	238.762	0.213
4100.000	0.570	256.212	4099.910	-9.942	-17.214	-9.942	19.879	239.991	0.227
4200.000	0.652	283.148	4199.905	-9.932	-18.252	-9.932	20.779	241.447	0.295
4300.000	0.479	272.210	4299.900	-9.786	-19.223	-9.786	21.571	243.020	0.203
4400.000	0.307	291.139	4399.898	-9.673	-19.890	-9.673	22.118	244.064	0.213
4500.000	0.531	291.737	4499.895	-9.405	-20.571	-9.405	22.619	245.430	0.224
4600.000	0.711	287.395	4599.889	-9.048	-21.594	-9.048	23.413	247.266	0.185
4700.000	0.776	301.432	4699.881	-8.509	-22.763	-8.509	24.302	249.504	0.193
4800.000	0.744	321.469	4799.872	-7.648	-23.746	-7.648	24.947	252.146	0.266
4900.000	0.620	324.687	4899.865	-6.699	-24.463	-6.699	25.363	254.685	0.129
5000.000	1.011	319.965	4999.855	-5.582	-25.343	-5.582	25.951	257.578	0.396
5100.000	0.874	331.744	5099.841	-4.235	-26.272	-4.235	26.611	260.844	0.237
5200.000	0.874	315.355	5199.830	-3.020	-27.169	-3.020	27.336	263.657	0.249
5300.000	1.092	336.603	5299.815	-1.603	-28.083	-1.603	28.129	266.733	0.421
5400.000	1.084	325.669	5399.797	0.052	-28.995	0.052	28.995	270.103	0.207
5500.000	1.244	337.145	5499.777	1.833	-29.949	1.833	30.005	273.502	0.282
5600.000	1.362	348.287	5599.751	3.996	-30.612	3.996	30.872	277.438	0.279
5700.000	0.958	18.825	5699.731	5.951	-30.584	5.951	31.157	281.011	0.724
5800.000	0.719	38.840	5799.721	7.231	-29.920	7.231	30.782	283.586	0.374
5900.000	0.505	25.883	5899.715	8.116	-29.334	8.116	30.436	285.466	0.254
6000.000	0.554	27.908	5999.711	8.941	-28.915	8.941	30.266	287.181	0.053
6100.000	0.526	22.827	6099.706	9.791	-28.511	9.791	30.145	288.953	0.056
6200.000	0.616	33.529	6199.701	10.662	-28.036	10.662	29.995	290.821	0.139
6300.000	0.357	7.875	6299.698	11.418	-27.696	11.418	29.958	292.405	0.333
6400.000	0.797	345.694	6399.692	12.400	-27.826	12.400	30.464	294.020	0.486
6500.000	0.562	341.867	6499.685	13.540	-28.150	13.540	31.237	295.688	0.240
6600.000	0.872	7.163	6599.678	14.761	-28.208	14.761	31.836	297.623	0.436
6700.000	0.885	2.729	6699.666	16.288	-28.076	16.288	32.458	300.119	0.069
HORIZONTAL DISPLACEMENT IS 32.458 FEET AT 300.119 DEGREES									