



Company: Noble Energy  
Well: Lang 11-35  
API#: 05-123-22337  
Rig Name: Production / Lightning  
Location: Weld County, Colorado  
Latitude: 40.535, Longitude: -104.525  
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: lang11-35\_ed.ut  
Minimum Curvature Method  
Report Date/Time: 2/8/2012 / 14:21

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	0.717	184.007	99.997	-0.624	-0.044	-0.624	0.626	184.007	0.717
200.000	0.346	177.637	199.993	-1.550	-0.075	-1.550	1.551	182.770	0.375
300.000	0.352	174.755	299.991	-2.157	-0.034	-2.157	2.157	180.916	0.019
400.000	0.389	185.186	399.989	-2.801	-0.037	-2.801	2.801	180.759	0.077
500.000	0.425	173.029	499.986	-3.507	-0.023	-3.507	3.507	180.373	0.093
600.000	0.500	169.466	599.983	-4.303	0.102	-4.303	4.305	178.644	0.080
700.000	0.472	162.069	699.980	-5.124	0.308	-5.124	5.133	176.557	0.069
800.000	0.497	149.927	799.976	-5.891	0.652	-5.891	5.927	173.680	0.106
900.000	0.587	145.885	899.972	-6.690	1.157	-6.690	6.789	170.188	0.097
1000.000	0.537	115.097	999.967	-7.313	1.868	-7.313	7.547	165.668	0.302
1100.000	0.485	107.023	1099.963	-7.635	2.697	-7.635	8.097	160.545	0.089
1200.000	0.490	121.815	1199.959	-7.984	3.465	-7.984	8.704	156.542	0.126
1300.000	0.556	128.861	1299.955	-8.514	4.206	-8.514	9.497	153.711	0.092
1400.000	0.514	96.655	1399.951	-8.871	5.030	-8.871	10.198	150.447	0.300
1500.000	0.607	115.789	1499.946	-9.154	5.953	-9.154	10.919	146.964	0.208
1600.000	0.708	102.475	1599.940	-9.518	7.033	-9.518	11.834	143.537	0.182
1700.000	0.439	109.722	1699.935	-9.780	7.997	-9.780	12.634	140.727	0.278
1800.000	0.566	103.941	1799.931	-10.029	8.837	-10.029	13.367	138.613	0.136
1900.000	0.500	122.967	1899.927	-10.385	9.682	-10.385	14.198	137.005	0.188
2000.000	0.683	165.001	1999.922	-11.198	10.202	-11.198	15.149	137.664	0.458
2100.000	0.606	157.440	2099.915	-12.263	10.560	-12.263	16.183	139.267	0.115
2200.000	0.574	181.543	2199.910	-13.252	10.749	-13.252	17.063	140.953	0.248
2300.000	0.723	194.524	2299.904	-14.364	10.577	-14.364	17.838	143.632	0.208
2400.000	0.944	205.875	2399.893	-15.715	10.060	-15.715	18.659	147.375	0.274
2500.000	0.890	238.901	2499.881	-16.857	9.035	-16.857	19.126	151.809	0.524
2600.000	0.834	242.376	2599.870	-17.596	7.725	-17.596	19.217	156.296	0.077
2700.000	0.837	232.720	2699.859	-18.376	6.499	-18.376	19.491	160.522	0.141
2800.000	0.644	240.950	2799.851	-19.091	5.427	-19.091	19.847	164.131	0.220
2900.000	0.447	247.327	2899.846	-19.514	4.576	-19.514	20.043	166.802	0.206
3000.000	0.515	243.985	2999.843	-19.861	3.813	-19.861	20.224	169.133	0.073
3100.000	0.254	271.022	3099.841	-20.055	3.188	-20.055	20.306	170.968	0.311
3200.000	0.373	261.193	3199.839	-20.100	2.644	-20.100	20.274	172.505	0.131
3300.000	1.215	289.410	3299.829	-19.798	1.322	-19.798	19.842	176.179	0.904
3400.000	1.741	276.471	3399.796	-19.274	-1.188	-19.274	19.311	183.526	0.620

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	0.815	292.578	3499.770	-18.830	-3.354	-18.830	19.126	190.100	0.985
3600.000	0.114	66.672	3599.767	-18.518	-3.920	-18.518	18.928	191.953	0.898
3700.000	1.006	78.606	3699.761	-18.305	-2.968	-18.305	18.544	189.211	0.895
3800.000	1.942	77.879	3799.727	-17.776	-0.451	-17.776	17.781	181.454	0.936
3900.000	2.441	88.130	3899.654	-17.350	3.334	-17.350	17.668	169.123	0.632
4000.000	2.415	91.116	3999.564	-17.322	7.568	-17.322	18.903	156.399	0.129
4100.000	2.152	86.183	4099.485	-17.238	11.548	-17.238	20.748	146.182	0.328
4200.000	2.261	100.941	4199.411	-17.487	15.358	-17.487	23.274	138.710	0.577
4300.000	1.806	98.617	4299.348	-18.098	18.852	-18.098	26.133	133.831	0.462
4400.000	1.449	119.336	4399.308	-18.953	21.512	-18.953	28.671	131.382	0.682
4500.000	1.412	126.318	4499.277	-20.302	23.607	-20.302	31.136	130.696	0.178
4600.000	1.468	141.507	4599.246	-22.034	25.397	-22.034	33.623	130.945	0.385
4700.000	1.592	140.890	4699.210	-24.115	27.070	-24.115	36.254	131.695	0.125
4800.000	1.345	172.313	4799.179	-26.357	28.104	-26.357	38.529	133.162	0.830
4900.000	1.115	206.062	4899.157	-28.394	27.833	-28.394	39.761	135.572	0.747
5000.000	0.767	262.347	4999.146	-29.358	26.742	-29.358	39.712	137.670	0.939
5100.000	1.207	316.082	5099.132	-28.688	25.348	-28.688	38.282	138.537	0.975
5200.000	1.592	353.026	5199.104	-26.551	24.449	-26.551	36.093	137.360	0.959
5300.000	1.463	335.421	5299.069	-24.011	23.749	-24.011	33.772	135.315	0.484
5400.000	0.636	333.334	5399.052	-22.354	22.969	-22.354	32.051	134.223	0.828
5500.000	0.304	301.042	5499.048	-21.722	22.492	-21.722	31.269	134.001	0.412
5600.000	0.571	317.696	5599.045	-21.216	21.929	-21.216	30.512	134.053	0.293
5700.000	0.924	323.691	5699.037	-20.197	21.116	-20.197	29.220	133.726	0.360
5800.000	1.014	325.199	5799.022	-18.821	20.134	-18.821	27.561	133.070	0.094
5900.000	0.791	286.317	5899.011	-17.900	18.967	-17.900	26.080	133.344	0.637
6000.000	0.228	281.129	5999.006	-17.668	18.109	-17.668	25.301	134.294	0.564
6100.000	0.191	229.919	6099.006	-17.737	17.787	-17.737	25.119	134.920	0.184
6200.000	0.198	311.100	6199.005	-17.731	17.529	-17.731	24.933	135.327	0.253
6300.000	0.176	251.422	6299.005	-17.666	17.253	-17.666	24.693	135.678	0.187
6400.000	0.090	8.681	6399.005	-17.637	17.119	-17.637	24.579	135.855	0.232
6500.000	0.167	353.733	6499.005	-17.415	17.115	-17.415	24.417	135.498	0.083
6600.000	0.096	93.388	6599.004	-17.275	17.182	-17.275	24.365	135.154	0.206
6700.000	0.243	115.225	6699.004	-17.370	17.458	-17.370	24.627	134.856	0.157
6800.000	0.445	76.492	6799.002	-17.370	18.026	-17.370	25.033	133.937	0.297
HORIZONTAL DISPLACEMENT IS 25.033 FEET AT 133.937 DEGREES									