



Company: Noble Energy
Well: Shale USX AB 11-9P
API #: 05-123-31319
Rig Name: Production/Lightning
State/County: Colorado/Weld
Latitude: 40.586, Longitude: -104.509
GRID North is 0.640 Degrees East of True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01_ed.ut

Minimum Curvature Method

Report Date/Time: 11/8/2012 / 20:34

Vaughn Energy Services

Henderson, Colorado

866-835-8333

Randy Holcomb

RKB=Ground Level

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	0.385	262.098	99.999	-0.046	-0.332	-0.046	0.336	262.098	0.385
200.000	0.160	318.364	199.998	0.012	-0.758	0.012	0.758	270.911	0.324
300.000	0.122	311.548	299.998	0.187	-0.930	0.187	0.948	281.358	0.042
400.000	0.174	276.680	399.998	0.275	-1.160	0.275	1.192	283.328	0.102
500.000	0.202	355.272	499.997	0.468	-1.325	0.468	1.405	289.448	0.239
600.000	0.131	40.046	599.997	0.731	-1.266	0.731	1.462	299.991	0.143
700.000	0.984	128.398	699.992	0.285	-0.520	0.285	0.593	298.730	0.988
800.000	0.938	187.135	799.980	-1.060	0.051	-1.060	1.062	177.254	0.943
900.000	1.122	227.110	899.965	-2.539	-0.768	-2.539	2.653	196.830	0.725
1000.000	0.949	229.914	999.949	-3.739	-2.119	-3.739	4.297	209.543	0.180
1100.000	1.133	236.472	1099.932	-4.818	-3.577	-4.818	6.001	216.589	0.219
1200.000	0.680	243.322	1199.919	-5.631	-4.931	-5.631	7.485	221.211	0.465
1300.000	0.724	240.637	1299.912	-6.207	-6.012	-6.207	8.641	224.086	0.055
1400.000	0.793	250.975	1399.903	-6.742	-7.216	-6.742	9.876	226.947	0.153
1500.000	0.373	233.884	1499.898	-7.159	-8.133	-7.159	10.835	228.645	0.450
1600.000	0.530	251.876	1599.895	-7.495	-8.836	-7.495	11.586	229.694	0.210
1700.000	0.536	247.148	1699.890	-7.820	-9.707	-7.820	12.465	231.142	0.044
1800.000	0.490	230.882	1799.886	-8.272	-10.469	-8.272	13.343	231.688	0.152
1900.000	0.586	192.498	1899.882	-9.041	-10.912	-9.041	14.171	230.356	0.365
2000.000	0.835	191.391	1999.875	-10.255	-11.167	-10.255	15.161	227.436	0.249
2100.000	1.077	187.276	2099.861	-11.902	-11.430	-11.902	16.502	223.839	0.252
2200.000	1.266	183.432	2199.840	-13.938	-11.615	-13.938	18.143	219.806	0.204
2300.000	1.135	176.026	2299.818	-16.028	-11.612	-16.028	19.792	215.924	0.203
2400.000	0.387	126.393	2399.809	-17.216	-11.272	-17.216	20.578	213.215	0.932
2500.000	0.576	68.914	2499.806	-17.235	-10.532	-17.235	20.198	211.427	0.492
2600.000	0.836	51.505	2599.798	-16.600	-9.491	-16.600	19.122	209.759	0.335
2700.000	0.955	53.163	2699.786	-15.646	-8.253	-15.646	17.690	207.812	0.121
2800.000	0.640	47.607	2799.776	-14.771	-7.174	-14.771	16.421	205.907	0.324
2900.000	0.616	45.990	2899.770	-14.020	-6.375	-14.020	15.402	204.451	0.029
3000.000	0.560	30.357	2999.765	-13.225	-5.741	-13.225	14.417	203.467	0.169
3100.000	0.265	358.058	3099.763	-12.571	-5.502	-12.571	13.722	203.636	0.365
3200.000	0.090	59.752	3199.762	-12.300	-5.442	-12.300	13.451	203.865	0.236
3300.000	0.249	81.236	3299.762	-12.228	-5.159	-12.228	13.272	202.875	0.169
3400.000	0.381	97.446	3399.760	-12.238	-4.614	-12.238	13.079	200.659	0.158

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	0.243	194.217	3499.759	-12.486	-4.337	-12.486	13.218	199.153	0.475
3600.000	0.809	257.360	3599.755	-12.846	-5.078	-12.846	13.813	201.567	0.732
3700.000	1.288	262.702	3699.738	-13.144	-6.882	-13.144	14.836	207.636	0.488
3800.000	1.622	260.444	3799.706	-13.521	-9.392	-13.521	16.463	214.785	0.338
3900.000	1.913	261.046	3899.658	-14.016	-12.436	-14.016	18.738	221.583	0.292
4000.000	1.755	258.871	3999.607	-14.571	-15.588	-14.571	21.338	226.930	0.173
4100.000	1.153	229.983	4099.575	-15.514	-17.861	-15.514	23.658	229.023	0.931
4200.000	0.955	234.830	4199.558	-16.641	-19.313	-16.641	25.493	229.250	0.217
4300.000	0.670	213.699	4299.548	-17.608	-20.319	-17.608	26.886	229.089	0.409
4400.000	0.868	204.343	4399.539	-18.784	-20.955	-18.784	28.142	228.127	0.234
4500.000	1.028	186.618	4499.526	-20.365	-21.371	-20.365	29.520	226.381	0.332
4600.000	0.867	186.429	4599.512	-22.007	-21.559	-22.007	30.808	224.410	0.161
4700.000	0.634	197.651	4699.504	-23.286	-21.811	-23.286	31.906	223.127	0.274
4800.000	0.773	133.540	4799.498	-24.278	-21.490	-24.278	32.423	221.514	0.756
4900.000	0.701	111.145	4899.489	-24.963	-20.431	-24.963	32.258	219.298	0.295
5000.000	0.642	131.206	4999.483	-25.553	-19.438	-25.553	32.107	217.260	0.241
5100.000	0.653	136.636	5099.476	-26.337	-18.625	-26.337	32.258	215.267	0.062
5200.000	0.505	137.104	5199.471	-27.075	-17.933	-27.075	32.476	213.519	0.148
5300.000	0.509	45.469	5299.469	-27.087	-17.317	-27.087	32.149	212.591	0.727
5400.000	1.342	27.488	5399.455	-25.737	-16.460	-25.737	30.550	212.601	0.872
5500.000	1.964	33.224	5499.413	-23.264	-14.980	-23.264	27.670	212.778	0.643
5600.000	1.275	22.847	5599.372	-20.805	-13.609	-20.805	24.861	213.190	0.746
5700.000	0.920	14.252	5699.354	-19.001	-12.980	-19.001	23.011	214.337	0.391
5800.000	0.892	17.055	5799.341	-17.479	-12.554	-17.479	21.520	215.686	0.053
5900.000	0.808	10.282	5899.331	-16.042	-12.200	-16.042	20.153	217.253	0.131
6000.000	0.874	13.895	5999.320	-14.608	-11.891	-14.608	18.836	219.145	0.085
6100.000	1.021	13.663	6099.306	-13.002	-11.497	-13.002	17.356	221.485	0.147
6200.000	1.139	23.234	6199.288	-11.223	-10.894	-11.223	15.641	224.150	0.215
6300.000	1.044	12.583	6299.270	-9.420	-10.304	-9.420	13.961	227.565	0.224
6400.000	1.008	9.373	6399.254	-7.663	-9.962	-7.663	12.569	232.431	0.067
6500.000	0.775	12.160	6499.242	-6.134	-9.676	-6.134	11.457	237.630	0.237
6600.000	0.673	36.969	6599.234	-5.003	-9.181	-5.003	10.456	241.411	0.327
6700.000	0.149	332.200	6699.232	-4.420	-8.888	-4.420	9.927	243.562	0.624
6800.000	0.174	294.007	6799.231	-4.243	-9.088	-4.243	10.029	244.972	0.108
6900.000	0.868	10.004	6899.227	-3.436	-9.095	-3.436	9.722	249.306	0.843
7000.000	1.017	19.513	6999.214	-1.853	-8.667	-1.853	8.863	257.930	0.216
7100.000	0.823	32.633	7099.201	-0.412	-7.983	-0.412	7.994	267.046	0.285
7200.000	0.606	38.549	7199.193	0.606	-7.266	0.606	7.291	274.771	0.229
7300.000	0.256	3.324	7299.190	1.243	-6.924	1.243	7.034	280.179	0.423
7400.000	0.427	119.438	7399.189	1.283	-6.586	1.283	6.710	281.024	0.587
7500.000	0.802	128.107	7499.183	0.668	-5.711	0.668	5.750	276.669	0.386
7600.000	0.976	111.200	7599.171	-0.073	-4.365	-0.073	4.366	269.048	0.313
7700.000	0.806	110.485	7699.159	-0.627	-2.912	-0.627	2.979	257.855	0.171
7800.000	0.997	115.699	7799.147	-1.250	-1.469	-1.250	1.929	229.610	0.208
7900.000	1.109	147.762	7899.131	-2.446	-0.169	-2.446	2.452	183.947	0.592
8000.000	0.937	150.023	7999.115	-3.974	0.756	-3.974	4.045	169.224	0.177
8100.000	0.320	125.497	8099.108	-4.844	1.392	-4.844	5.041	163.966	0.660
8200.000	0.699	83.191	8199.105	-4.934	2.225	-4.934	5.413	155.726	0.510
HORIZONTAL DISPLACEMENT IS 5.413 FEET AT 155.726 DEGREES									