



Company: Noble Energy

Well: Hoffner 14-35

API: 05-123-22824

Rig Name: Production/Lightning

Location: Weld County, Colorado

Latitude: 40.437, 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: msgyro\_run01-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 12/12/2012 / 16:06

Vaughn Energy Services

Henderson, CO.

Justin Williams

303-853-4976

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	0.247	159.534	100.000	-0.202	0.075	-0.202	0.215	159.534	0.247
200.000	0.414	107.046	199.998	-0.509	0.496	-0.509	0.711	135.779	0.328
300.000	0.420	121.427	299.996	-0.806	1.154	-0.806	1.407	124.952	0.105
400.000	0.404	159.282	399.993	-1.328	1.591	-1.328	2.072	129.839	0.268
500.000	0.419	159.279	499.991	-1.999	1.845	-1.999	2.721	137.295	0.014
600.000	0.446	158.710	599.988	-2.703	2.116	-2.703	3.433	141.952	0.027
700.000	0.634	165.195	699.983	-3.600	2.398	-3.600	4.326	146.332	0.197
800.000	0.469	168.939	799.979	-4.536	2.618	-4.536	5.238	150.010	0.169
900.000	0.601	168.893	899.974	-5.452	2.797	-5.452	6.128	152.838	0.132
1000.000	0.506	167.701	999.970	-6.397	2.992	-6.397	7.063	154.932	0.096
1100.000	0.544	143.906	1099.965	-7.212	3.366	-7.212	7.959	154.980	0.220
1200.000	0.786	147.737	1199.959	-8.176	4.012	-8.176	9.107	153.862	0.246
1300.000	0.762	176.018	1299.950	-9.420	4.425	-9.420	10.407	154.840	0.379
1400.000	0.163	161.994	1399.946	-10.218	4.515	-10.218	11.171	156.163	0.606
1500.000	0.615	204.991	1499.944	-10.839	4.332	-10.839	11.673	158.217	0.508
1600.000	0.474	203.837	1599.939	-11.704	3.938	-11.704	12.349	161.404	0.141
1700.000	0.920	147.637	1699.933	-12.761	4.200	-12.761	13.435	161.781	0.766
1800.000	0.784	113.733	1799.922	-13.715	5.256	-13.715	14.687	159.030	0.514
1900.000	0.713	96.020	1899.914	-14.055	6.501	-14.055	15.486	155.177	0.241
2000.000	0.429	147.397	1999.909	-14.436	7.322	-14.436	16.186	153.106	0.557
2100.000	0.850	54.128	2099.905	-14.316	8.124	-14.316	16.461	150.426	0.973
2200.000	0.815	76.154	2199.894	-13.712	9.416	-13.712	16.633	145.523	0.320
2300.000	0.788	77.679	2299.885	-13.395	10.778	-13.395	17.193	141.178	0.034
2400.000	0.435	76.133	2399.879	-13.157	11.819	-13.157	17.686	138.066	0.353
2500.000	0.414	77.688	2499.876	-12.989	12.541	-12.989	18.055	136.005	0.024
2600.000	0.426	76.863	2599.873	-12.827	13.256	-12.827	18.446	134.059	0.013
2700.000	0.463	71.523	2699.870	-12.615	14.001	-12.615	18.845	132.019	0.056
2800.000	0.469	59.521	2799.867	-12.279	14.737	-12.279	19.182	129.801	0.098
2900.000	0.396	81.173	2899.864	-12.018	15.431	-12.018	19.559	127.914	0.178
3000.000	0.419	113.939	2999.862	-12.114	16.106	-12.114	20.153	126.948	0.231
3100.000	0.246	106.860	3099.860	-12.324	16.645	-12.324	20.711	126.516	0.178
3200.000	0.354	171.336	3199.859	-12.692	16.897	-12.692	21.133	126.912	0.333
3300.000	0.417	153.658	3299.857	-13.324	17.105	-13.324	21.683	127.917	0.134
3400.000	0.770	103.644	3399.852	-13.809	17.920	-13.809	22.623	127.618	0.595

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	1.103	81.250	3499.839	-13.821	19.524	-13.821	23.921	125.295	0.489
3600.000	1.580	70.757	3599.811	-13.221	21.778	-13.221	25.476	121.261	0.534
3700.000	1.453	68.242	3699.776	-12.296	24.256	-12.296	27.195	116.882	0.144
3800.000	1.090	64.019	3799.751	-11.410	26.289	-11.410	28.658	113.462	0.374
3900.000	1.008	58.293	3899.735	-10.531	27.892	-10.531	29.814	110.685	0.133
4000.000	0.244	104.290	3999.728	-10.121	28.846	-10.121	30.570	109.335	0.856
4100.000	0.601	263.865	4099.727	-10.230	28.532	-10.230	30.310	109.725	0.834
4200.000	0.962	263.862	4199.717	-10.376	27.176	-10.376	29.089	110.897	0.361
4300.000	0.992	260.476	4299.703	-10.609	25.488	-10.609	27.608	112.598	0.065
4400.000	0.713	243.479	4399.692	-11.030	24.078	-11.030	26.484	114.612	0.373
4500.000	0.284	204.301	4499.688	-11.533	23.419	-11.533	26.105	116.219	0.525
4600.000	0.741	123.703	4599.685	-12.118	23.855	-12.118	26.757	116.929	0.749
4700.000	0.996	98.330	4699.673	-12.603	25.254	-12.603	28.224	116.521	0.456
4800.000	1.061	93.032	4799.657	-12.778	27.038	-12.778	29.905	115.294	0.115
4900.000	0.819	90.349	4899.644	-12.831	28.678	-12.831	31.417	114.105	0.246
5000.000	0.605	76.745	4999.636	-12.714	29.906	-12.714	32.497	113.032	0.272
5100.000	0.402	355.342	5099.633	-12.244	30.391	-12.244	32.765	111.943	0.674
5200.000	0.424	323.266	5199.631	-11.598	30.142	-11.598	32.296	111.045	0.229
5300.000	0.506	333.918	5299.628	-10.904	29.726	-10.904	31.663	110.144	0.119
5400.000	0.484	327.751	5399.624	-10.150	29.306	-10.150	31.014	109.103	0.058
5500.000	0.416	17.904	5499.621	-9.448	29.193	-9.448	30.683	107.933	0.386
5600.000	0.203	168.601	5599.620	-9.276	29.339	-9.276	30.771	107.546	0.601
5700.000	0.281	227.867	5699.620	-9.615	29.192	-9.615	30.735	108.230	0.249
5800.000	0.296	145.514	5799.619	-9.992	29.157	-9.992	30.821	108.916	0.380
5900.000	0.362	152.523	5899.617	-10.485	29.449	-10.485	31.259	109.598	0.077
6000.000	0.229	115.728	5999.616	-10.852	29.774	-10.852	31.690	110.025	0.225
6100.000	0.273	151.820	6099.615	-11.149	30.067	-11.149	32.068	110.344	0.161
6200.000	0.553	214.656	6199.613	-11.756	29.905	-11.756	32.133	111.460	0.492
6300.000	1.318	199.608	6299.599	-13.236	29.245	-13.236	32.101	114.351	0.797
6400.000	1.810	203.748	6399.561	-15.764	28.223	-15.764	32.328	119.186	0.505
6500.000	1.950	196.104	6499.507	-18.844	27.115	-18.844	33.021	124.798	0.287
6600.000	2.001	204.618	6599.448	-22.066	25.916	-22.066	34.037	130.412	0.298
6700.000	1.989	197.633	6699.388	-25.307	24.664	-25.307	35.337	135.737	0.243
6750.000	1.746	203.840	6749.361	-26.830	24.093	-26.830	36.060	138.077	0.632
HORIZONTAL DISPLACEMENT IS 36.060 FEET AT 138.077 DEGREES									