



Company: Noble Energy
Lease/Well: State A36/15
API: 05-123-14770
Rig Name: Production / V.E.S.
State/County: Colorado/Weld
Latitude: 40.438, Longitude: -104.495
GRID North is 0.650 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: state a36-15_ed.ut
Minimum Curvature Method
Report Date/Time: 2/22/2013 / 23:08

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	0.432	83.974	99.999	0.040	0.375	0.040	0.377	83.974	0.432
200.000	0.434	72.952	199.996	0.190	1.112	0.190	1.128	80.291	0.083
300.000	0.651	90.630	299.992	0.295	2.042	0.295	2.063	81.778	0.271
400.000	0.781	132.104	399.985	-0.168	3.116	-0.168	3.120	93.090	0.521
500.000	0.584	145.565	499.977	-1.046	3.910	-1.046	4.047	104.972	0.253
600.000	0.244	142.431	599.975	-1.634	4.327	-1.634	4.626	110.690	0.341
700.000	0.499	151.288	699.973	-2.184	4.666	-2.184	5.152	115.086	0.260
800.000	0.448	150.375	799.969	-2.906	5.068	-2.906	5.842	119.826	0.051
900.000	0.267	142.641	899.967	-3.431	5.403	-3.431	6.400	122.416	0.186
1000.000	0.507	156.627	999.965	-4.023	5.720	-4.023	6.993	125.117	0.256
1100.000	0.509	143.615	1099.961	-4.787	6.159	-4.787	7.801	127.853	0.115
1200.000	0.374	138.513	1199.958	-5.389	6.639	-5.389	8.551	129.066	0.141
1300.000	0.173	125.369	1299.957	-5.720	6.978	-5.720	9.023	129.344	0.209
1400.000	0.448	99.489	1399.955	-5.872	7.487	-5.872	9.516	128.107	0.302
1500.000	0.689	99.124	1499.950	-6.032	8.467	-6.032	10.396	125.468	0.240
1600.000	0.568	104.996	1599.944	-6.256	9.539	-6.256	11.407	123.257	0.137
1700.000	0.316	118.364	1699.941	-6.515	10.260	-6.515	12.154	122.414	0.271
1800.000	0.481	127.658	1799.939	-6.902	10.835	-6.902	12.847	122.499	0.177
1900.000	0.287	126.557	1899.936	-7.308	11.369	-7.308	13.515	122.734	0.194
2000.000	0.505	136.255	1999.934	-7.776	11.875	-7.776	14.194	123.217	0.227
2100.000	0.665	107.663	2099.929	-8.270	12.733	-8.270	15.183	123.005	0.328
2200.000	0.802	111.252	2199.921	-8.700	13.939	-8.700	16.431	121.972	0.144
2300.000	0.743	88.709	2299.912	-8.940	15.240	-8.940	17.669	120.395	0.308
2400.000	0.683	88.039	2399.904	-8.905	16.485	-8.905	18.736	118.377	0.061
2500.000	0.511	59.351	2499.899	-8.657	17.464	-8.657	19.492	116.368	0.340
2600.000	0.036	68.284	2599.897	-8.418	17.877	-8.418	19.760	115.216	0.475
2700.000	0.384	115.490	2699.897	-8.551	18.209	-8.551	20.117	115.155	0.361
2800.000	0.362	127.703	2799.895	-8.888	18.762	-8.888	20.761	115.349	0.082
2900.000	0.363	136.290	2899.893	-9.311	19.231	-9.311	21.366	115.835	0.054
3000.000	0.469	131.610	2999.890	-9.812	19.756	-9.812	22.059	116.412	0.111
3100.000	0.537	152.045	3099.886	-10.498	20.282	-10.498	22.838	117.365	0.190
3200.000	1.115	144.335	3199.875	-11.702	21.069	-11.702	24.100	119.048	0.588
3300.000	1.748	121.677	3299.844	-13.293	22.934	-13.293	26.508	120.098	0.837
3400.000	1.201	111.984	3399.811	-14.487	25.204	-14.487	29.071	119.889	0.599

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	0.713	110.679	3499.797	-15.099	26.759	-15.099	30.725	119.435	0.489
3600.000	1.305	93.511	3599.781	-15.389	28.477	-15.389	32.369	118.386	0.658
3700.000	1.570	119.949	3699.751	-16.142	30.801	-16.142	34.774	117.658	0.706
3800.000	0.850	118.327	3799.728	-17.178	32.640	-17.178	36.885	117.757	0.720
3900.000	1.518	107.847	3899.706	-17.936	34.554	-17.936	38.932	117.432	0.700
4000.000	1.465	120.711	3999.672	-18.995	36.914	-18.995	41.515	117.229	0.338
4100.000	0.534	139.545	4099.656	-20.002	38.316	-20.002	43.223	117.566	0.974
4200.000	0.111	147.094	4199.654	-20.439	38.671	-20.439	43.740	117.857	0.425
4300.000	0.545	176.833	4299.652	-20.995	38.750	-20.995	44.072	118.448	0.452
4400.000	0.973	188.725	4399.643	-22.309	38.648	-22.309	44.624	119.995	0.454
4500.000	1.445	175.750	4499.621	-24.406	38.612	-24.406	45.679	122.296	0.543
4600.000	1.222	156.012	4599.594	-26.637	39.139	-26.637	47.344	124.238	0.507
4700.000	1.520	145.917	4699.566	-28.710	40.316	-28.710	49.493	125.455	0.383
4800.000	1.103	126.550	4799.540	-30.381	41.832	-30.381	51.700	125.990	0.603
4900.000	1.017	111.691	4899.523	-31.282	43.430	-31.282	53.523	125.765	0.287
5000.000	1.452	110.546	4999.500	-32.055	45.441	-32.055	55.610	125.200	0.435
5100.000	1.098	93.839	5099.475	-32.564	47.583	-32.564	57.659	124.386	0.510
5200.000	0.833	75.593	5199.461	-32.447	49.243	-32.447	58.972	123.382	0.403
5300.000	1.056	46.916	5299.448	-31.637	50.619	-31.637	59.693	122.005	0.515
5400.000	1.005	2.371	5399.433	-30.132	51.328	-30.132	59.519	120.415	0.782
5500.000	0.339	344.381	5499.426	-28.971	51.285	-28.971	58.902	119.462	0.690
5600.000	0.852	336.451	5599.420	-28.005	50.908	-28.005	58.103	118.815	0.519
5700.000	0.997	293.644	5699.408	-26.974	49.814	-26.974	56.648	118.435	0.688
5800.000	0.903	284.552	5799.395	-26.427	48.254	-26.427	55.017	118.708	0.177
5900.000	0.671	299.064	5899.385	-25.945	46.980	-25.945	53.668	118.910	0.304
6000.000	0.559	323.316	5999.380	-25.269	46.177	-25.269	52.639	118.689	0.280
6100.000	0.827	332.818	6099.372	-24.236	45.556	-24.236	51.601	118.013	0.290
6200.000	0.730	355.435	6199.363	-22.959	45.175	-22.959	50.674	116.940	0.320
6300.000	0.684	6.171	6299.356	-21.730	45.189	-21.730	50.142	115.682	0.140
6400.000	0.465	15.077	6399.351	-20.744	45.358	-20.744	49.877	114.576	0.236
6500.000	0.297	85.821	6499.349	-20.333	45.722	-20.333	50.039	113.975	0.462
6600.000	0.245	71.051	6599.348	-20.245	46.182	-20.245	50.425	113.671	0.087
6700.000	0.570	62.721	6699.345	-19.948	46.826	-19.948	50.898	113.074	0.330
6800.000	0.630	70.929	6799.340	-19.540	47.787	-19.540	51.628	112.240	0.105
6820.000	0.621	67.343	6819.338	-19.463	47.991	-19.463	51.787	112.075	0.201

<div> HORIZONTAL DISPLACEMENT IS 51.787 FEET AT 112.075 DEGREES </div>
