



Company: Noble Energy
Lease / Well: State Clark / 36-22
API#: 05-123-19009
Rig Name: Production / Lightning Wireline
State / County: Colorado / Weld County
Latitude: 40.361, Longitude: -104.618
GRID North is 0.570 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: 9/1/2011 / 10:31

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	0.193	187.311	100.000	-0.167	-0.021	-0.167	0.168	187.311	0.193
200.000	0.315	202.509	199.999	-0.588	-0.148	-0.588	0.606	194.149	0.139
300.000	0.593	202.688	299.996	-1.319	-0.453	-1.319	1.395	198.954	0.277
400.000	0.746	188.242	399.989	-2.441	-0.746	-2.441	2.552	196.992	0.227
500.000	1.045	177.124	499.977	-3.996	-0.793	-3.996	4.074	191.230	0.344
600.000	0.992	130.692	599.962	-5.471	-0.092	-5.471	5.472	180.959	0.804
700.000	1.259	141.752	699.943	-6.898	1.244	-6.898	7.010	169.774	0.343
800.000	1.368	121.513	799.917	-8.385	2.942	-8.385	8.886	160.663	0.474
900.000	1.456	137.327	899.887	-9.943	4.821	-9.943	11.050	154.131	0.398
1000.000	1.371	148.650	999.857	-11.899	6.305	-11.899	13.466	152.081	0.291
1100.000	1.210	167.009	1099.832	-13.949	7.165	-13.949	15.682	152.813	0.441
1200.000	1.002	137.449	1199.814	-15.622	7.994	-15.622	17.548	152.902	0.599
1300.000	0.633	166.398	1299.804	-16.803	8.715	-16.803	18.929	152.587	0.543
1400.000	0.371	187.124	1399.800	-17.662	8.805	-17.662	19.735	153.503	0.315
1500.000	0.584	312.242	1499.799	-17.640	8.387	-17.640	19.533	154.571	0.853
1600.000	1.360	333.407	1599.784	-16.237	7.479	-16.237	17.876	155.269	0.842
1700.000	1.943	314.740	1699.743	-13.982	5.744	-13.982	15.116	157.669	0.786
1800.000	2.224	295.649	1799.678	-11.949	2.790	-11.949	12.271	166.856	0.744
1900.000	2.441	276.606	1899.596	-10.864	-1.074	-10.864	10.917	185.647	0.801
2000.000	2.351	259.755	1999.510	-10.984	-5.208	-10.984	12.156	205.368	0.708
2100.000	2.261	235.944	2099.431	-12.454	-8.861	-12.454	15.284	215.432	0.955
2200.000	2.257	217.674	2199.355	-15.117	-11.699	-15.117	19.115	217.735	0.717
2300.000	2.109	200.857	2299.283	-18.395	-13.558	-18.395	22.852	216.391	0.655
2400.000	1.664	200.784	2399.229	-21.472	-14.728	-21.472	26.037	214.447	0.445
2500.000	0.913	225.006	2499.203	-23.392	-15.806	-23.392	28.232	214.047	0.912
2600.000	0.847	209.308	2599.192	-24.600	-16.731	-24.600	29.751	214.221	0.249
2700.000	0.684	188.850	2699.183	-25.835	-17.185	-25.835	31.028	213.632	0.316
2800.000	0.821	192.928	2799.174	-27.124	-17.437	-27.124	32.245	212.737	0.147
2900.000	1.045	179.238	2899.161	-28.734	-17.586	-28.734	33.688	211.467	0.314
3000.000	0.677	176.585	2999.150	-30.236	-17.538	-30.236	34.954	210.116	0.370
3100.000	0.709	154.612	3099.143	-31.384	-17.238	-31.384	35.806	208.778	0.266
3200.000	0.899	112.522	3199.134	-32.243	-16.248	-32.243	36.106	206.745	0.604
3300.000	1.296	111.916	3299.115	-32.965	-14.475	-32.965	36.003	203.706	0.397
3400.000	1.602	108.940	3399.083	-33.841	-12.104	-33.841	35.941	199.681	0.315

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	1.206	109.634	3499.053	-34.648	-9.790	-34.648	36.005	195.778	0.396
3600.000	1.268	92.009	3599.030	-35.041	-7.694	-35.041	35.876	192.383	0.384
3700.000	1.258	94.070	3699.006	-35.158	-5.493	-35.158	35.584	188.880	0.046
3800.000	1.211	96.929	3798.982	-35.363	-3.349	-35.363	35.521	185.411	0.077
3900.000	1.333	117.963	3898.958	-36.036	-1.273	-36.036	36.058	182.023	0.480
4000.000	1.163	129.273	3998.935	-37.224	0.540	-37.224	37.228	179.168	0.299
4100.000	1.015	131.087	4098.916	-38.448	1.994	-38.448	38.500	177.032	0.152
4200.000	0.865	125.397	4198.903	-39.468	3.276	-39.468	39.603	175.255	0.176
4300.000	0.714	102.476	4298.894	-40.039	4.500	-40.039	40.291	173.588	0.347
4400.000	0.578	100.787	4398.887	-40.268	5.604	-40.268	40.656	172.078	0.137
4500.000	0.543	85.104	4498.883	-40.322	6.571	-40.322	40.854	170.744	0.157
4600.000	1.304	93.767	4598.869	-40.357	8.179	-40.357	41.177	168.544	0.772
4700.000	1.663	106.786	4698.836	-40.850	10.703	-40.850	42.229	165.318	0.490
4800.000	1.587	139.234	4798.797	-42.318	12.997	-42.318	44.269	162.928	0.911
4900.000	1.182	141.344	4898.768	-44.173	14.545	-44.173	46.506	161.774	0.408
5000.000	0.754	115.810	4998.754	-45.265	15.782	-45.265	47.937	160.778	0.598
5100.000	0.748	78.008	5098.746	-45.416	17.013	-45.416	48.498	159.464	0.487
5200.000	0.487	152.048	5198.741	-45.655	17.850	-45.655	49.021	158.646	0.772
5300.000	0.388	178.217	5298.739	-46.369	18.060	-46.369	49.761	158.720	0.220
5400.000	0.609	189.378	5398.735	-47.231	17.983	-47.231	50.539	159.156	0.241
5500.000	0.982	197.845	5498.725	-48.572	17.634	-48.572	51.674	160.047	0.390
5600.000	0.981	157.054	5598.711	-50.176	17.705	-50.176	53.208	160.564	0.684
5700.000	1.104	105.308	5698.697	-51.219	18.968	-51.219	54.618	159.679	0.916
5800.000	1.184	58.261	5798.679	-50.929	20.775	-50.929	55.004	157.808	0.916
5900.000	0.917	4.110	5898.665	-49.588	21.712	-49.588	54.133	156.354	0.985
6000.000	0.368	310.603	5998.659	-48.580	21.525	-48.580	53.135	156.103	0.758
6100.000	0.399	253.739	6098.657	-48.469	20.946	-48.469	52.801	156.628	0.366
6200.000	0.729	216.463	6198.652	-49.078	20.234	-49.078	53.085	157.594	0.477
6300.000	1.519	207.386	6298.632	-50.766	19.246	-50.766	54.292	159.237	0.807
6400.000	1.791	198.132	6398.590	-53.428	18.150	-53.428	56.427	161.236	0.380
6500.000	1.782	209.971	6498.542	-56.259	16.888	-56.259	58.739	163.292	0.368
6600.000	1.770	219.500	6598.494	-58.798	15.129	-58.798	60.713	165.571	0.295
6700.000	1.577	226.352	6698.452	-60.939	13.151	-60.939	62.342	167.822	0.278
6800.000	1.129	205.658	6798.424	-62.777	11.729	-62.777	63.863	169.417	0.656
<div> <div>HORIZONTAL DISPLACEMENT IS</div> <div>63.863 FEET AT 169.417 DEGREES</div> </div>									