



Company: Noble Energy

Rig: Production/Core-Tech

API # 05-123-20038

Date: 4/15/14

Surveyor: Mark Simmons

VS: 0.000

Lat : 40.35816

Long: -104.57059

Well: Perlman 32-13

Location: Weld County, Colorado

North Reference: Grid North

Convergence: GRID North is 0.600 Dc

Declination: 8.38

Depth Reference: RKB = Ground Level

Elevation: 4726

Total Depth as Drilled: 7126

Lat & Long obtained by handheld GPS at wellhead

MS Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100.000	0.342	142.435	-0.237	0.182	99.999	0.342	-0.237	0.299
200.000	0.377	130.088	-0.685	0.616	199.997	0.084	-0.685	0.921
300.000	0.337	134.234	-1.102	1.078	299.996	0.047	-1.102	1.542
400.000	0.681	124.713	-1.646	1.777	399.991	0.353	-1.646	2.422
500.000	1.224	135.803	-2.750	3.010	499.977	0.571	-2.750	4.077
600.000	1.810	142.094	-4.762	4.725	599.942	0.609	-4.762	6.709
700.000	1.759	137.690	-7.143	6.729	699.893	0.146	-7.143	9.814
800.000	1.794	137.885	-9.439	8.812	799.845	0.035	-9.439	12.913
900.000	1.767	139.140	-11.766	10.870	899.797	0.047	-11.766	16.019
1000.000	1.821	138.233	-14.118	12.937	999.748	0.061	-14.118	19.149
1100.000	1.694	136.983	-16.384	15.004	1099.701	0.133	-16.384	22.216
1200.000	1.719	140.396	-18.620	16.969	1199.657	0.105	-18.620	25.192
1300.000	1.565	136.151	-20.760	18.871	1299.616	0.196	-20.760	28.055
1400.000	1.454	132.245	-22.598	20.756	1399.581	0.151	-22.598	30.683
1500.000	1.228	131.446	-24.160	22.498	1499.553	0.227	-24.160	33.013
1600.000	0.966	128.809	-25.398	23.958	1599.535	0.266	-25.398	34.914
1700.000	0.931	126.177	-26.405	25.271	1699.521	0.056	-26.405	36.549
1800.000	0.678	131.226	-27.275	26.372	1799.511	0.262	-27.275	37.940
1900.000	0.678	143.213	-28.139	27.171	1899.504	0.142	-28.139	39.116
2000.000	0.443	113.076	-28.764	27.881	1999.500	0.369	-28.764	40.059
2100.000	0.357	75.945	-28.840	28.539	2099.498	0.268	-28.840	40.574
2200.000	0.323	33.140	-28.528	28.995	2199.496	0.250	-28.528	40.677
2300.000	0.302	34.164	-28.074	29.297	2299.494	0.022	-28.074	40.577
2400.000	0.372	27.039	-27.567	29.593	2399.493	0.081	-27.567	40.443
2500.000	0.744	67.166	-27.025	30.339	2499.488	0.519	-27.025	40.631
2600.000	0.734	65.608	-26.508	31.522	2599.480	0.023	-26.508	41.186
2700.000	0.756	65.316	-25.968	32.704	2699.471	0.022	-25.968	41.761
2800.000	0.699	63.258	-25.419	33.848	2799.463	0.063	-25.419	42.330
2900.000	0.737	62.680	-24.849	34.964	2899.455	0.038	-24.849	42.895
3000.000	0.804	66.539	-24.275	36.179	2999.446	0.085	-24.275	43.568
3100.000	0.701	64.109	-23.728	37.373	3099.438	0.108	-23.728	44.269
3200.000	0.607	80.988	-23.378	38.446	3199.431	0.213	-23.378	44.996
3300.000	0.558	131.291	-23.616	39.335	3299.427	0.497	-23.616	45.880
3400.000	0.810	135.266	-24.439	40.198	3399.420	0.256	-24.439	47.045

3500.000	0.799	134.088	-25.427	41.197	3499.410	0.019	-25.427	48.412
3600.000	0.926	146.955	-26.589	42.138	3599.398	0.231	-26.589	49.826
3700.000	0.906	151.930	-27.964	42.951	3699.386	0.082	-27.964	51.252
3800.000	0.995	142.251	-29.348	43.854	3799.372	0.183	-29.348	52.768
3900.000	1.027	146.099	-30.778	44.886	3899.356	0.075	-30.778	54.424
4000.000	0.970	151.037	-32.263	45.795	3999.341	0.103	-32.263	56.019
4100.000	0.837	143.598	-33.592	46.639	4099.329	0.177	-33.592	57.477
4200.000	0.358	171.343	-34.488	47.119	4199.323	0.547	-34.488	58.392
4300.000	0.167	158.998	-34.933	47.219	4299.322	0.197	-34.933	58.736
4400.000	0.195	309.872	-34.960	47.140	4399.322	0.351	-34.960	58.689
4500.000	0.169	286.500	-34.809	46.869	4499.322	0.078	-34.809	58.381
4600.000	0.187	9.038	-34.606	46.754	4599.321	0.235	-34.606	58.168
4700.000	0.219	344.767	-34.261	46.729	4699.321	0.091	-34.261	57.943
4800.000	0.262	305.353	-33.944	46.492	4799.320	0.167	-33.944	57.565
4900.000	0.172	50.695	-33.717	46.422	4899.319	0.350	-33.717	57.374
5000.000	0.164	45.690	-33.521	46.641	4999.319	0.017	-33.521	57.437
5100.000	0.201	55.992	-33.323	46.889	5099.318	0.049	-33.323	57.524
5200.000	0.213	56.547	-33.123	47.189	5199.318	0.013	-33.123	57.653
5300.000	0.440	33.865	-32.701	47.558	5299.316	0.257	-32.701	57.716
5400.000	0.782	27.479	-31.776	48.087	5399.310	0.348	-31.776	57.638
5500.000	1.033	27.692	-30.373	48.821	5499.298	0.250	-30.373	57.498
5600.000	1.277	17.920	-28.515	49.583	5599.277	0.313	-28.515	57.197
5700.000	0.999	353.402	-26.589	49.825	5699.258	0.554	-26.589	56.476
5800.000	0.964	323.110	-25.051	49.220	5799.244	0.514	-25.051	55.228
5900.000	0.099	292.140	-24.345	48.635	5899.239	0.880	-24.345	54.388
6000.000	0.866	158.553	-25.016	48.831	5999.235	0.937	-25.016	54.866
6100.000	1.709	157.525	-27.097	49.677	6099.209	0.844	-27.097	56.587
6200.000	1.919	154.362	-29.985	50.972	6199.159	0.233	-29.985	59.138
6300.000	1.737	140.551	-32.666	52.660	6299.109	0.475	-32.666	61.969
6400.000	1.721	118.400	-34.551	54.944	6399.064	0.664	-34.551	64.905
6500.000	1.782	92.092	-35.322	57.819	6499.019	0.799	-35.322	67.755
6600.000	1.799	85.083	-35.244	60.937	6598.970	0.219	-35.244	70.395
6700.000	1.941	105.940	-35.574	64.129	6698.918	0.691	-35.574	73.335
6800.000	1.906	119.565	-36.860	67.204	6798.862	0.458	-36.860	76.649
6850.000	1.961	123.157	-37.738	68.643	6848.834	0.266	-37.738	78.333

0

egrees East of True North

Cbrg

0.000

142.435

138.060

135.636

132.801

132.412

135.221

136.711

136.970

137.268

137.499

137.517

137.657

137.730

137.433

137.040

136.671

136.258

135.965

136.003

135.893

135.301

134.535

133.778

132.969

131.693

130.062

128.451

126.905

125.402

123.860

122.412

121.303

120.980

121.298

121.683
122.252
123.067
123.791
124.439
125.165
125.763
126.202
126.495
126.561
126.601
126.508
126.248
126.133
125.991
125.705
125.401
125.066
124.513
123.457
121.887
119.903
118.086
116.974
116.591
117.126
118.611
120.467
121.812
122.163
121.421
120.044
119.018
118.744
118.801