



Company: Noble Energy

Rig: Ensign 322

API # 05-123-31051

Date: 4/30/2013

Surveyor: Nick Kula

VS: 0.000

Lat : 40.58238

Long: -104.51

Well: Shable USX AB 11-16P

Location: Weld County, Colorado

North Reference: GRID

Convergence: Grid north is -0.64 of Tr

Declination: 8.49

Depth Reference: Ground Level

Elevation: 4832'

Total Depth as Drilled: 7245'

Lat & Long obtained by handheld GPS at wellhead

HA Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD	Cbrg
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100.000	0.766	348.056	0.654	-0.138	99.997	0.766	0.654	0.668	348.056
200.000	0.731	13.122	1.929	-0.132	199.989	0.327	1.929	1.934	356.093
300.000	0.555	300.215	2.795	-0.406	299.984	0.777	2.795	2.824	351.741
400.000	0.782	22.628	3.668	-0.562	399.979	0.897	3.668	3.711	351.289
500.000	0.436	21.046	4.653	-0.163	499.973	0.346	4.653	4.656	357.995
600.000	0.354	81.291	5.055	0.279	599.971	0.403	5.055	5.063	3.161
700.000	0.591	258.396	4.998	0.079	699.970	0.945	4.998	4.999	0.904
800.000	0.758	242.468	4.588	-1.013	799.963	0.249	4.588	4.699	347.548
900.000	0.666	171.065	3.709	-1.509	899.957	0.834	3.709	4.004	337.854
1000.000	0.965	235.306	2.655	-2.111	999.949	0.903	2.655	3.393	321.510
1100.000	0.103	138.718	2.109	-2.744	1099.944	0.982	2.109	3.461	307.536
1200.000	0.083	214.408	1.981	-2.726	1199.944	0.115	1.981	3.370	306.013
1300.000	0.168	168.795	1.778	-2.738	1299.943	0.125	1.778	3.265	302.999
1400.000	0.161	149.357	1.514	-2.638	1399.943	0.056	1.514	3.042	299.847
1500.000	0.310	298.282	1.522	-2.805	1499.943	0.455	1.522	3.191	298.474
1600.000	0.070	202.803	1.593	-3.067	1599.942	0.324	1.593	3.456	297.448
1700.000	0.062	13.844	1.589	-3.078	1699.942	0.132	1.589	3.464	297.304
1800.000	0.106	64.531	1.681	-2.982	1799.942	0.082	1.681	3.423	299.416
1900.000	0.613	247.296	1.515	-3.392	1899.940	0.719	1.515	3.714	294.063
2000.000	0.602	253.416	1.158	-4.389	1999.935	0.066	1.158	4.539	284.780
2100.000	0.362	16.000	1.311	-4.806	2099.933	0.853	1.311	4.981	285.264
2200.000	0.329	14.328	1.893	-4.647	2199.931	0.034	1.893	5.018	292.166
2300.000	0.753	41.460	2.664	-4.141	2299.927	0.483	2.664	4.924	302.753
2400.000	0.824	29.366	3.783	-3.354	2399.917	0.181	3.783	5.056	318.441
2500.000	1.183	39.375	5.207	-2.347	2499.902	0.398	5.207	5.712	335.742
2600.000	1.971	38.187	7.357	-0.629	2599.863	0.789	7.357	7.384	355.114
2700.000	1.508	41.778	9.690	1.311	2699.817	0.475	9.690	9.778	7.706
2800.000	1.722	33.986	11.917	3.028	2799.777	0.306	11.917	12.296	14.256
2900.000	1.202	13.970	14.180	4.121	2899.745	0.721	14.180	14.767	16.204
3000.000	0.962	337.779	15.975	4.056	2999.728	0.710	15.975	16.482	14.248
3100.000	0.959	325.837	17.444	3.269	3099.714	0.200	17.444	17.748	10.615
3200.000	1.270	5.519	19.239	2.906	3199.696	0.811	19.239	19.458	8.589
3300.000	1.281	337.174	21.373	2.579	3299.673	0.625	21.373	21.528	6.879
3400.000	0.635	296.253	22.649	1.648	3399.659	0.903	22.649	22.708	4.162
3500.000	0.419	160.705	22.549	1.272	3499.657	0.979	22.549	22.584	3.228

3600.000	0.768	73.083	22.399	2.034	3599.653	0.859	22.399	22.491	5.188
3700.000	1.384	67.999	23.046	3.794	3699.635	0.623	23.046	23.356	9.349
3800.000	1.002	83.889	23.592	5.784	3799.614	0.502	23.592	24.290	13.775
3900.000	1.823	105.651	23.256	8.185	3899.583	0.966	23.256	24.654	19.390
4000.000	2.294	96.388	22.604	11.706	3999.518	0.575	22.604	25.455	27.378
4100.000	2.285	89.233	22.408	15.688	4099.439	0.286	22.408	27.354	34.996
4200.000	1.469	100.271	22.206	18.943	4199.385	0.889	22.206	29.188	40.466
4300.000	1.944	89.400	21.995	21.900	4299.340	0.573	21.995	31.039	44.876
4400.000	1.561	90.187	22.008	24.958	4399.293	0.384	22.008	33.276	48.594
4500.000	0.891	97.674	21.900	27.091	4499.270	0.687	21.900	34.836	51.048
4600.000	0.647	88.674	21.809	28.426	4599.261	0.272	21.809	35.829	52.504
4700.000	0.882	83.502	21.910	29.755	4699.252	0.245	21.910	36.951	53.635
4800.000	0.172	66.349	22.057	30.658	4799.247	0.720	22.057	37.768	54.267
4900.000	0.456	259.057	22.041	30.404	4899.246	0.624	22.041	37.553	54.060
5000.000	0.818	255.550	21.788	29.322	4999.240	0.365	21.788	36.531	53.386
5100.000	0.213	155.387	21.441	28.708	5099.236	0.881	21.441	35.831	53.246
5200.000	0.396	317.638	21.527	28.553	5199.236	0.602	21.527	35.759	52.987
5300.000	0.406	296.911	21.942	28.005	5299.233	0.144	21.942	35.577	51.921
5400.000	1.310	291.249	22.516	26.624	5399.221	0.907	22.516	34.869	49.778
5500.000	1.051	281.948	23.120	24.662	5499.200	0.321	23.120	33.805	46.847
5600.000	0.728	289.455	23.522	23.166	5599.188	0.343	23.522	33.014	44.563
5700.000	0.302	288.654	23.818	22.317	5699.184	0.426	23.818	32.640	43.138
5800.000	0.450	321.179	24.208	21.822	5799.181	0.254	24.208	32.591	42.033
5900.000	0.558	259.801	24.427	21.097	5899.178	0.523	24.427	32.276	40.816
6000.000	0.201	274.628	24.355	20.442	5999.176	0.367	24.355	31.797	40.008
6100.000	0.959	239.556	23.945	19.546	6099.170	0.803	23.945	30.909	39.224
6200.000	1.071	274.585	23.596	17.893	6199.155	0.620	23.596	29.613	37.173
6300.000	1.237	250.262	23.306	15.946	6299.136	0.512	23.306	28.239	34.380
6400.000	1.013	243.260	22.544	14.140	6399.116	0.262	22.544	26.611	32.098
6500.000	0.894	279.039	22.268	12.580	6499.103	0.597	22.268	25.576	29.464
6600.000	1.343	248.256	21.957	10.721	6599.085	0.735	21.957	24.434	26.026

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