



Company: Noble Energy

Well: Fields X 8-12

API: 05-123-14956

Rig Name: Production/VES

Location: Weld County, Colorado

Latitude: 40.152, Longitude: -104.695

GRID North is 0.520 Degrees East of True North

VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: fields x 8-12-de\_01.ut

Minimum Curvature Method

Report Date/Time: 2/18/2013 / 13:06

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	0.428	238.365	99.999	-0.196	-0.318	-0.196	0.373	238.365	0.428
200.000	0.290	259.494	199.997	-0.438	-0.885	-0.438	0.987	243.667	0.189
300.000	0.315	245.261	299.996	-0.599	-1.383	-0.599	1.507	246.582	0.079
400.000	0.181	262.923	399.995	-0.733	-1.789	-0.733	1.934	247.711	0.152
500.000	0.075	8.493	499.995	-0.688	-1.936	-0.688	2.055	250.439	0.214
600.000	0.236	343.743	599.994	-0.426	-1.984	-0.426	2.029	257.894	0.171
700.000	0.139	90.721	699.994	-0.230	-1.921	-0.230	1.934	263.186	0.306
800.000	0.276	88.307	799.993	-0.224	-1.559	-0.224	1.575	261.825	0.138
900.000	0.246	81.550	899.992	-0.185	-1.106	-0.185	1.121	260.487	0.044
1000.000	0.342	102.132	999.991	-0.217	-0.602	-0.217	0.639	250.200	0.142
1100.000	0.337	152.882	1099.989	-0.541	-0.175	-0.541	0.569	197.947	0.291
1200.000	0.140	57.375	1199.989	-0.738	0.062	-0.738	0.740	175.220	0.377
1300.000	0.321	226.696	1299.988	-0.864	-0.039	-0.864	0.865	182.608	0.459
1400.000	0.358	180.159	1399.987	-1.368	-0.244	-1.368	1.390	190.117	0.270
1500.000	0.094	203.607	1499.986	-1.756	-0.278	-1.756	1.777	188.997	0.274
1600.000	0.109	218.245	1599.986	-1.906	-0.370	-1.906	1.942	190.987	0.030
1700.000	0.493	215.760	1699.984	-2.330	-0.681	-2.330	2.427	196.282	0.384
1800.000	0.470	267.445	1799.981	-2.698	-1.342	-2.698	3.013	206.452	0.420
1900.000	0.741	244.459	1899.976	-2.995	-2.336	-2.995	3.798	217.953	0.359
2000.000	0.902	269.362	1999.966	-3.282	-3.706	-3.282	4.951	228.472	0.387
2100.000	1.057	261.356	2099.951	-3.430	-5.406	-3.430	6.402	237.605	0.207
2200.000	1.536	257.919	2199.925	-3.849	-7.629	-3.849	8.545	243.227	0.485
2300.000	1.753	251.130	2299.884	-4.624	-10.387	-4.624	11.370	246.001	0.291
2400.000	1.895	259.969	2399.833	-5.407	-13.462	-5.407	14.508	248.118	0.315
2500.000	2.284	267.512	2499.767	-5.782	-17.082	-5.782	18.034	251.301	0.476
2600.000	2.609	279.869	2599.676	-5.478	-21.315	-5.478	22.008	255.587	0.617
2700.000	3.149	287.023	2699.550	-4.284	-26.184	-4.284	26.532	260.708	0.648
2800.000	3.269	290.147	2799.393	-2.498	-31.487	-2.498	31.586	265.465	0.212
2900.000	3.670	295.486	2899.210	-0.138	-37.052	-0.138	37.053	269.786	0.515
3000.000	3.762	296.127	2999.000	2.684	-42.887	2.684	42.971	273.580	0.101
3100.000	3.767	301.631	3098.784	5.851	-48.630	5.851	48.981	276.861	0.361
3200.000	4.115	302.458	3198.548	9.500	-54.455	9.500	55.277	279.896	0.353
3300.000	4.259	305.558	3298.281	13.585	-60.504	13.585	62.010	282.655	0.268
3400.000	4.196	308.582	3398.009	18.026	-66.385	18.026	68.789	285.192	0.232

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	4.216	312.801	3497.740	22.806	-71.942	22.806	75.470	287.589	0.310
3600.000	4.241	320.595	3597.468	28.161	-76.987	28.161	81.975	290.092	0.575
3700.000	3.933	330.994	3697.215	34.017	-80.997	34.017	87.850	292.781	0.801
3800.000	3.566	343.448	3797.003	39.997	-83.546	39.997	92.626	295.583	0.891
3900.000	3.369	357.991	3896.822	45.915	-84.535	45.915	96.199	298.508	0.899
4000.000	3.719	353.815	3996.630	52.075	-84.987	52.075	99.672	301.498	0.435
4100.000	3.932	352.823	4096.408	58.701	-85.765	58.701	103.930	304.389	0.223
4200.000	3.642	351.847	4196.189	65.247	-86.644	65.247	108.463	306.982	0.297
4300.000	3.348	359.590	4296.004	71.311	-87.115	71.311	112.580	309.303	0.556
4400.000	3.655	1.551	4395.817	77.417	-87.050	77.417	116.495	311.648	0.329
4500.000	3.574	354.370	4495.618	83.705	-87.269	83.705	120.923	313.806	0.459
4600.000	3.028	352.857	4595.452	89.428	-87.903	89.428	125.397	315.492	0.552
4700.000	2.599	343.898	4695.332	94.227	-88.861	94.227	129.518	316.679	0.614
4800.000	2.300	356.355	4795.241	98.408	-89.617	98.408	133.099	317.677	0.609
4900.000	2.908	341.689	4895.138	102.819	-90.541	102.819	137.002	318.633	0.897
5000.000	3.352	348.651	4994.989	108.093	-91.914	108.093	141.888	319.625	0.584
5100.000	3.375	353.273	5094.817	113.884	-92.834	113.884	146.927	320.814	0.272
5200.000	3.157	5.438	5194.656	119.549	-92.918	119.549	151.412	322.144	0.725
5300.000	2.690	12.624	5294.526	124.579	-92.144	124.579	154.953	323.512	0.593
5400.000	2.080	28.835	5394.440	128.459	-90.756	128.459	157.284	324.759	0.903
5500.000	1.833	38.707	5494.382	131.297	-88.880	131.297	158.552	325.904	0.417
5600.000	0.893	49.934	5594.353	133.046	-87.284	133.046	159.122	326.733	0.973
5700.000	1.404	67.513	5694.332	134.016	-85.556	134.016	158.998	327.446	0.615
5800.000	1.340	86.308	5794.304	134.560	-83.258	134.560	158.235	328.253	0.452
5900.000	1.721	98.458	5894.269	134.414	-80.605	134.414	156.730	329.050	0.499
6000.000	2.095	107.278	5994.213	133.651	-77.374	133.651	154.432	329.932	0.474
6100.000	1.278	98.414	6094.169	132.944	-74.525	132.944	152.408	330.726	0.855
6200.000	1.593	88.966	6194.138	132.806	-72.032	132.806	151.083	331.525	0.393
6300.000	0.952	120.638	6294.114	132.408	-69.927	132.408	149.739	332.161	0.929
6400.000	1.097	122.554	6394.098	131.470	-68.406	131.470	148.201	332.511	0.149
6500.000	0.717	132.773	6494.085	130.530	-67.140	130.530	146.785	332.780	0.412
6600.000	0.944	123.986	6594.075	129.644	-65.997	129.644	145.476	333.021	0.260
6700.000	0.772	120.109	6694.063	128.846	-64.731	128.846	144.192	333.325	0.181
6800.000	0.651	161.008	6794.056	127.971	-63.963	127.971	143.066	333.443	0.510
6900.000	0.387	108.932	6894.053	127.324	-63.459	127.324	142.262	333.508	0.514
7000.000	0.421	165.982	6994.051	126.858	-63.051	126.858	141.663	333.572	0.387
7100.000	0.117	19.802	7094.050	126.599	-62.927	126.599	141.375	333.570	0.522
7107.000	0.296	17.273	7101.050	126.623	-62.919	126.623	141.393	333.577	2.561

HORIZONTAL DISPLACEMENT IS  
141.393 FEET AT 333.577 DEGREES