



Company: Noble Energy
Rig: Production/ V.E.S
API # 05-123-15079
Date: 3/27/2013
Surveyor: Jay Hinman
VS: 0.000
Lat : 40.39749
Long: -104.49117

Well: Nakagawa PMB 13-09
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid North is 0.65 Deg
Declination: 8.48
Depth Reference: Ground Level
Elevation: 4567'
Total Depth as Drilled: 6817'

Lat & Long obtained by handheld GPS at wellhead

HA 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
100.000	0.409	84.402	0.035	0.355	99.999	0.409	0.035	0.357
200.000	0.562	54.027	0.358	1.107	199.996	0.294	0.358	1.164
300.000	0.443	65.521	0.806	1.856	299.992	0.156	0.806	2.023
400.000	0.406	79.779	1.029	2.556	399.989	0.111	1.029	2.755
500.000	0.666	99.907	0.992	3.477	499.985	0.317	0.992	3.616
600.000	0.508	85.111	0.930	4.492	599.980	0.218	0.930	4.587
700.000	0.489	90.055	0.967	5.360	699.976	0.047	0.967	5.446
800.000	0.377	98.239	0.919	6.111	799.973	0.128	0.919	6.180
900.000	0.337	94.685	0.848	6.730	899.971	0.045	0.848	6.783
1000.000	0.362	144.948	0.565	7.204	999.969	0.298	0.565	7.226
1100.000	0.242	127.589	0.178	7.553	1099.968	0.150	0.178	7.555
1200.000	0.307	144.489	-0.169	7.876	1199.967	0.104	-0.169	7.878
1300.000	0.266	150.290	-0.589	8.147	1299.966	0.051	-0.589	8.168
1400.000	0.487	158.680	-1.186	8.416	1399.963	0.228	-1.186	8.499
1500.000	0.364	161.148	-1.883	8.673	1499.961	0.124	-1.883	8.876
1600.000	0.275	176.406	-2.423	8.791	1599.959	0.123	-2.423	9.119
1700.000	0.191	223.414	-2.783	8.692	1699.958	0.201	-2.783	9.127
1800.000	0.338	279.461	-2.856	8.287	1799.957	0.280	-2.856	8.765
1900.000	0.297	318.022	-2.615	7.822	1899.956	0.213	-2.615	8.248
2000.000	0.342	344.198	-2.135	7.568	1999.954	0.151	-2.135	7.863
2100.000	0.314	285.925	-1.773	7.223	2099.953	0.320	-1.773	7.438
2200.000	0.378	295.901	-1.554	6.663	2199.951	0.088	-1.554	6.842
2300.000	0.370	290.863	-1.295	6.065	2299.949	0.034	-1.295	6.201
2400.000	0.525	275.319	-1.137	5.307	2399.946	0.195	-1.137	5.428
2500.000	0.477	320.607	-0.773	4.587	2499.943	0.388	-0.773	4.652
2600.000	0.536	320.417	-0.091	4.025	2599.939	0.059	-0.091	4.026
2700.000	0.642	329.561	0.752	3.444	2699.933	0.141	0.752	3.525
2800.000	0.616	336.176	1.727	2.943	2799.927	0.077	1.727	3.412
2900.000	0.551	320.249	2.588	2.418	2899.922	0.174	2.588	3.542
3000.000	0.669	332.564	3.476	1.842	2999.917	0.176	3.476	3.934
3100.000	1.052	301.075	4.468	0.786	3099.906	0.595	4.468	4.537
3200.000	1.613	285.529	5.319	-1.356	3199.879	0.662	5.319	5.489
3300.000	2.421	287.606	6.335	-4.725	3299.816	0.811	6.335	7.903
3400.000	2.673	293.845	7.916	-8.871	3399.717	0.374	7.916	11.890

3500.000	2.841	293.643	9.853	-13.274	3499.601	0.168	9.853	16.531
3600.000	3.016	293.399	11.891	-17.958	3599.471	0.175	11.891	21.538
3700.000	2.907	289.515	13.783	-22.762	3699.337	0.228	13.783	26.610
3800.000	2.584	304.643	15.911	-27.007	3799.224	0.790	15.911	31.346
3900.000	2.054	307.923	18.294	-30.275	3899.141	0.546	18.294	35.374
4000.000	1.928	320.243	20.689	-32.765	3999.082	0.445	20.689	38.750
4100.000	1.689	320.210	23.115	-34.784	4099.032	0.239	23.115	41.764
4200.000	1.286	314.289	25.030	-36.530	4198.998	0.431	25.030	44.283
4300.000	1.296	319.340	26.672	-38.070	4298.972	0.114	26.672	46.483
4400.000	1.119	279.181	27.685	-39.770	4398.952	0.845	27.685	48.458
4500.000	1.432	272.276	27.890	-41.982	4498.927	0.348	27.890	50.402
4600.000	1.660	258.610	27.654	-44.650	4598.891	0.432	27.654	52.520
4700.000	1.771	256.463	27.006	-47.573	4698.846	0.128	27.006	54.704
4800.000	1.590	255.921	26.307	-50.422	4798.803	0.181	26.307	56.872
4900.000	1.268	250.881	25.607	-52.813	4898.772	0.346	25.607	58.693
5000.000	0.746	276.529	25.319	-54.505	4998.757	0.677	25.319	60.098
5100.000	0.579	287.652	25.546	-55.634	5098.750	0.210	25.546	61.219
5200.000	0.112	84.831	25.708	-56.018	5198.748	0.684	25.708	61.636
5300.000	0.634	80.981	25.804	-55.374	5298.746	0.523	25.804	61.091
5400.000	0.537	124.812	25.623	-54.443	5398.741	0.446	25.623	60.171
5500.000	0.586	118.921	25.108	-53.610	5498.736	0.076	25.108	59.199
5600.000	1.180	106.387	24.570	-52.175	5598.724	0.620	24.570	57.671
5700.000	0.546	86.165	24.312	-50.712	5698.713	0.693	24.312	56.238
5800.000	0.864	109.228	24.095	-49.524	5798.705	0.420	24.095	55.074
5900.000	1.070	112.248	23.494	-47.948	5898.691	0.212	23.494	53.394
6000.000	0.849	96.868	23.052	-46.348	5998.677	0.337	23.052	51.764
6100.000	0.958	111.664	22.654	-44.835	6098.664	0.257	22.654	50.233
6200.000	0.748	110.827	22.113	-43.447	6198.653	0.211	22.113	48.751
6300.000	1.312	98.385	21.714	-41.705	6298.637	0.603	21.714	47.019
6400.000	1.140	109.964	21.208	-39.637	6398.614	0.300	21.208	44.954
6500.000	1.475	115.760	20.308	-37.542	6498.588	0.360	20.308	42.683
6600.000	1.634	104.486	19.392	-35.002	6598.551	0.344	19.392	40.015
6700.000	1.574	113.752	18.482	-32.364	6698.512	0.266	18.482	37.270
6745.000	1.557	117.249	17.953	-31.255	6743.496	0.216	17.953	36.045

0

rees East of True North

Cbrg

0.000
84.402
72.093
66.524
68.073
74.081
78.308
79.774
81.444
82.815
85.512
88.650
91.230
94.133
98.022
102.250
105.411
107.757
109.017
108.483
105.754
103.790
103.125
102.049
102.093
99.563
91.292
77.676
59.593
43.054
27.915
9.980
345.697
323.279
311.744

306.585
303.511
301.195
300.505
301.143
302.270
303.605
304.419
305.015
304.843
303.598
301.772
299.583
297.553
295.867
294.916
294.664
294.652
294.985
295.204
295.096
295.217
295.614
295.945
296.104
296.444
296.807
296.975
297.505
298.149
298.411
298.988
299.729
299.874