



Company: Noble Energy
Rig: Production/VES
API # 05-123-29831
Date: 4/27/2013
Surveyor: Justin Williams

Well: Lundvall J17-31D
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid north is -0.44 of True North
Declination: 8.65
Depth Reference: Ground Level
Elevation: 4938
Total Depth as Drilled: 8015

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	0.392	38.360	0.268	0.212	99.999	0.392	0.268	0.342	38.360
200.000	0.240	16.223	0.737	0.483	199.998	0.192	0.737	0.881	33.225
300.000	0.239	118.151	0.840	0.725	299.997	0.372	0.840	1.109	40.803
400.000	0.306	93.537	0.725	1.175	399.996	0.133	0.725	1.381	58.328
500.000	0.311	77.552	0.767	1.707	499.995	0.086	0.767	1.871	65.802
600.000	0.515	126.034	0.561	2.336	599.992	0.387	0.561	2.402	76.495
700.000	1.925	103.118	-0.085	4.335	699.967	1.464	-0.085	4.336	91.121
800.000	3.891	88.134	-0.356	9.363	799.835	2.092	-0.356	9.370	92.175
900.000	5.564	85.103	0.169	17.586	899.491	1.691	0.169	17.587	89.450
1000.000	6.953	76.348	2.011	28.299	998.895	1.681	2.011	28.370	85.934
1100.000	8.766	66.227	6.512	41.155	1097.956	2.275	6.512	41.668	81.008
1200.000	10.435	60.752	14.010	56.032	1196.554	1.901	14.010	57.757	75.962
1300.000	12.578	64.055	23.199	73.727	1294.540	2.240	23.199	77.291	72.533
1400.000	14.376	62.418	33.712	94.522	1391.783	1.838	33.712	100.354	70.371
1500.000	16.328	63.259	45.786	118.081	1488.210	1.966	45.786	126.647	68.806
1600.000	17.360	62.816	58.927	143.906	1583.919	1.039	58.927	155.504	67.732
1700.000	18.739	63.598	72.886	171.566	1678.996	1.401	72.886	186.406	66.983
1800.000	21.876	62.853	88.532	202.539	1772.768	3.148	88.532	221.043	66.389
1900.000	22.661	64.556	105.310	236.513	1865.310	1.017	105.310	258.899	65.999
2000.000	24.444	63.830	122.712	272.481	1956.976	1.806	122.712	298.838	65.755
2100.000	25.853	66.151	140.654	310.994	2047.497	1.720	140.654	341.322	65.664
2200.000	25.454	67.276	157.771	350.756	2137.641	0.630	157.771	384.606	65.782
2300.000	26.572	67.369	174.678	391.222	2227.509	1.119	174.678	428.448	65.940
2400.000	26.676	68.349	191.567	432.730	2316.906	0.451	191.567	473.237	66.121
2500.000	26.360	69.046	207.788	474.326	2406.386	0.444	207.788	517.843	66.343
2600.000	25.650	71.225	222.694	515.552	2496.263	1.190	222.694	561.592	66.638
2700.000	23.767	67.044	237.521	554.605	2587.111	2.568	237.521	603.327	66.816
2800.000	25.382	65.070	254.416	592.599	2678.052	1.812	254.416	644.904	66.765
2900.000	29.823	68.849	272.433	635.250	2766.654	4.772	272.433	691.204	66.787
3000.000	30.915	67.279	291.329	682.139	2852.933	1.350	291.329	741.745	66.874
3100.000	28.460	66.838	310.626	727.747	2939.800	2.465	310.626	791.268	66.886
3200.000	25.193	65.168	328.941	768.982	3029.027	3.352	328.941	836.382	66.841
3300.000	23.753	66.835	345.803	806.816	3120.041	1.597	345.803	877.800	66.800
3400.000	23.532	67.797	361.270	843.815	3211.648	0.445	361.270	917.900	66.822
3500.000	24.501	70.138	375.859	881.801	3302.992	1.359	375.859	958.563	66.914

3600.000	27.079	70.288	390.583	922.738	3393.024	2.579	390.583	1001.998	67.058
3700.000	24.698	68.907	405.781	963.663	3482.982	2.456	405.781	1045.612	67.165
3800.000	23.937	62.355	422.716	1001.134	3574.126	2.802	422.716	1086.719	67.109
3900.000	23.316	64.410	440.677	1036.954	3665.745	1.031	440.677	1126.708	66.976
4000.000	22.309	69.508	455.872	1072.587	3757.931	2.217	455.872	1165.445	66.974
4100.000	25.603	71.987	469.202	1110.926	3849.306	3.444	469.202	1205.946	67.103
4200.000	29.533	70.540	484.100	1154.729	3937.936	3.986	484.100	1252.099	67.255
4300.000	31.300	69.562	501.383	1202.312	4024.170	1.836	501.383	1302.667	67.363
4400.000	32.791	68.886	520.209	1251.917	4108.930	1.533	520.209	1355.697	67.436
4500.000	31.491	69.950	538.919	1301.715	4193.604	1.418	538.919	1408.864	67.510
4600.000	29.529	71.663	555.628	1349.648	4279.755	2.145	555.628	1459.545	67.624
4700.000	28.007	70.330	571.285	1395.153	4367.411	1.652	571.285	1507.587	67.732
4800.000	26.983	68.938	587.342	1438.434	4456.116	1.209	587.342	1553.725	67.789
4900.000	27.230	66.578	604.590	1480.599	4545.134	1.103	604.590	1599.281	67.788
5000.000	25.062	67.191	621.896	1521.120	4634.897	2.185	621.896	1643.338	67.763
5100.000	22.738	66.735	637.742	1558.403	4726.316	2.331	637.742	1683.845	67.744
5200.000	20.726	62.522	653.543	1591.861	4819.210	2.545	653.543	1720.797	67.679
5300.000	20.608	64.355	669.324	1623.425	4912.776	0.658	669.324	1755.991	67.594
5400.000	21.743	67.626	683.992	1656.421	5006.025	1.638	683.992	1792.087	67.563
5500.000	21.698	68.456	697.831	1690.742	5098.926	0.311	697.831	1829.092	67.572
5600.000	17.491	69.864	709.798	1722.060	5193.114	4.233	709.798	1862.606	67.600
5700.000	14.531	69.547	719.357	1747.929	5289.224	2.961	719.357	1890.166	67.630
5800.000	14.203	61.176	729.657	1770.434	5386.107	2.101	729.657	1914.898	67.602
5900.000	14.563	62.138	741.447	1792.297	5482.973	0.432	741.447	1939.606	67.526
6000.000	11.584	66.061	751.400	1812.594	5580.372	3.106	751.400	1962.166	67.484
6100.000	11.292	64.605	759.672	1830.615	5678.386	0.411	759.672	1981.982	67.462
6200.000	10.689	62.876	768.099	1847.713	5776.552	0.687	768.099	2001.005	67.427
6300.000	10.769	59.231	777.107	1863.995	5874.805	0.683	777.107	2019.499	67.369
6400.000	8.263	61.458	785.322	1878.338	5973.421	2.533	785.322	2035.899	67.310
6500.000	5.988	63.524	791.082	1889.321	6072.642	2.289	791.082	2048.254	67.280
6600.000	4.143	61.269	795.144	1897.158	6172.247	1.855	795.144	2057.052	67.260
6700.000	3.186	64.035	798.097	1902.825	6272.042	0.973	798.097	2063.420	67.245
6800.000	2.559	68.385	800.136	1907.399	6371.916	0.664	800.136	2068.427	67.242
6900.000	1.913	65.605	801.648	1910.994	6471.839	0.655	801.648	2072.327	67.242
7000.000	1.339	66.997	802.794	1913.589	6571.798	0.575	802.794	2075.163	67.241
7100.000	0.686	56.377	803.582	1915.163	6671.782	0.677	803.582	2076.919	67.238
7200.000	0.668	71.340	804.100	1916.214	6771.775	0.177	804.100	2078.089	67.236
7300.000	0.476	16.158	804.685	1916.882	6871.771	0.557	804.685	2078.931	67.228
7400.000	0.469	42.031	805.389	1917.272	6971.768	0.212	805.389	2079.563	67.214
7500.000	0.395	319.689	805.955	1917.323	7071.766	0.571	805.955	2079.830	67.200
7600.000	0.820	50.877	806.669	1917.655	7171.762	0.917	806.669	2080.413	67.186
7700.000	0.939	356.931	807.939	1918.167	7271.751	0.805	807.939	2081.377	67.159
7750.000	0.742	351.556	808.669	1918.097	7321.746	0.425	808.669	2081.596	67.140