



Company: Noble Energy
Rig: Production/VES
API # 05-123-15162
Date: 1/12/2014
Surveyor: Randy Holcomb
VS: 0.000
Lat : 40.205
Long: -104.661

Well: Frank H 21-16
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid north is 0.54 East of True North
Declination: 8.45
Depth Reference: Ground Level
Elevation: 4811 Feet
Total Depth as Drilled: 7292 Feet

**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
100.000	0.932	1.364	0.813	0.019	99.996	0.932	0.813	0.813	1.364
200.000	0.737	352.015	2.263	-0.051	199.985	0.238	2.263	2.264	358.719
300.000	0.731	19.815	3.500	0.076	299.977	0.353	3.500	3.501	1.250
400.000	0.521	353.938	4.552	0.245	399.971	0.347	4.552	4.558	3.076
500.000	0.389	22.764	5.316	0.328	499.968	0.260	5.316	5.327	3.529
600.000	0.365	315.990	5.858	0.238	599.966	0.415	5.858	5.863	2.327
700.000	0.480	13.717	6.494	0.116	699.964	0.420	6.494	6.495	1.027
800.000	0.331	215.770	6.668	0.047	799.963	0.797	6.668	6.668	0.405
900.000	0.139	246.546	6.385	-0.233	899.962	0.223	6.385	6.389	357.914
1000.000	0.353	230.783	6.142	-0.582	999.961	0.223	6.142	6.170	354.584
1100.000	0.311	225.395	5.757	-1.014	1099.960	0.052	5.757	5.845	350.007
1200.000	0.191	292.279	5.629	-1.362	1199.959	0.295	5.629	5.792	346.397
1300.000	0.081	188.332	5.623	-1.527	1299.959	0.225	5.623	5.826	344.808
1400.000	0.552	213.465	5.151	-1.803	1399.957	0.480	5.151	5.457	340.709
1500.000	0.163	224.738	4.648	-2.169	1499.955	0.394	4.648	5.129	334.983
1600.000	0.309	225.793	4.358	-2.462	1599.954	0.146	4.358	5.006	330.535
1700.000	0.385	231.447	3.961	-2.918	1699.952	0.083	3.961	4.920	323.621
1800.000	0.459	300.501	3.955	-3.526	1799.950	0.482	3.955	5.299	318.284
1900.000	0.508	298.580	4.371	-4.260	1899.946	0.052	4.371	6.104	315.731
2000.000	0.524	276.913	4.638	-5.104	1999.942	0.195	4.638	6.897	312.259
2100.000	0.410	326.948	4.993	-5.754	2099.939	0.409	4.993	7.618	310.950
2200.000	0.758	343.141	5.926	-6.141	2199.934	0.381	5.926	8.534	313.979
2300.000	0.607	8.501	7.083	-6.255	2299.927	0.334	7.083	9.449	318.553
2400.000	0.905	9.641	8.385	-6.044	2399.918	0.298	8.385	10.336	324.215
2500.000	1.012	354.751	10.042	-5.993	2499.905	0.270	10.042	11.694	329.174
2600.000	0.587	16.787	11.412	-5.925	2599.895	0.517	11.412	12.859	332.560
2700.000	0.354	354.030	12.210	-5.810	2699.892	0.294	12.210	13.521	334.553
2800.000	0.764	336.812	13.130	-6.104	2799.887	0.438	13.130	14.479	335.065
2900.000	0.777	5.228	14.417	-6.305	2899.878	0.378	14.417	15.736	336.379
3000.000	0.807	335.759	15.734	-6.532	2999.869	0.404	15.734	17.036	337.454
3100.000	1.274	326.295	17.301	-7.438	3099.852	0.496	17.301	18.832	336.736
3200.000	1.202	293.119	18.637	-9.020	3199.830	0.710	18.637	20.705	334.175
3300.000	1.339	281.743	19.287	-11.129	3299.806	0.286	19.287	22.267	330.015
3400.000	1.289	306.439	20.193	-13.178	3399.780	0.564	20.193	24.112	326.872
3500.000	1.832	274.822	20.995	-15.675	3499.744	0.998	20.995	26.201	323.256
3600.000	1.681	242.812	20.459	-18.571	3599.700	0.979	20.459	27.631	317.769
3700.000	1.751	216.631	18.563	-20.787	3699.656	0.780	18.563	27.869	311.765

3800.000	1.247	226.582	16.589	-22.490	3799.622	0.565	16.589	27.946	306.413
3900.000	2.032	248.483	15.190	-24.929	3899.581	0.990	15.190	29.193	301.355
4000.000	1.717	249.397	14.013	-27.981	3999.528	0.316	14.013	31.294	296.602
4100.000	1.630	265.358	13.371	-30.801	4099.486	0.473	13.371	33.578	293.465
4200.000	2.043	262.166	13.013	-33.984	4199.434	0.425	13.013	36.390	290.952
4300.000	1.575	253.213	12.373	-37.066	4299.384	0.545	12.373	39.076	288.459
4400.000	1.114	258.017	11.774	-39.333	4399.356	0.474	11.774	41.058	286.664
4500.000	0.738	219.204	11.072	-40.692	4499.344	0.711	11.072	42.171	285.222
4600.000	1.138	253.032	10.283	-42.049	4599.331	0.666	10.283	43.288	283.743
4700.000	0.663	313.468	10.391	-43.418	4699.320	0.995	10.391	44.644	283.460
4800.000	1.047	325.489	11.542	-44.355	4799.309	0.422	11.542	45.832	284.586
4900.000	2.853	0.669	14.784	-44.844	4899.250	2.087	14.784	47.218	288.246
5000.000	2.703	17.916	19.516	-44.090	4999.134	0.846	19.516	48.216	293.876
5100.000	1.947	33.467	23.177	-42.428	5099.052	0.978	23.177	48.345	298.646
5200.000	1.546	47.981	25.496	-40.489	5199.006	0.594	25.496	47.848	302.199
5300.000	1.531	13.229	27.700	-39.181	5298.972	0.919	27.700	47.984	305.259
5400.000	1.518	29.551	30.153	-38.222	5398.937	0.433	30.153	48.684	308.269
5500.000	1.279	7.962	32.411	-37.414	5498.908	0.574	32.411	49.500	310.901
5600.000	1.246	329.206	34.450	-37.816	5598.885	0.838	34.450	51.155	312.333
5700.000	1.318	353.778	36.528	-38.497	5698.861	0.550	36.528	53.069	313.496
5800.000	1.191	308.794	38.322	-39.432	5798.839	0.967	38.322	54.986	314.182
5900.000	1.529	328.965	40.117	-40.930	5898.812	0.581	40.117	57.312	314.425
6000.000	1.481	330.049	42.380	-42.264	5998.777	0.056	42.380	59.852	315.079
6100.000	2.561	321.006	45.237	-44.315	6098.714	1.123	45.237	63.326	315.590
6200.000	2.646	299.491	48.110	-47.730	6198.613	0.975	48.110	67.769	315.227
6300.000	3.791	308.943	51.324	-52.311	6298.454	1.258	51.324	73.284	314.455
6400.000	2.222	348.886	55.305	-55.256	6398.323	2.528	55.305	78.178	315.025
6500.000	2.411	10.150	59.277	-55.259	6498.243	0.874	59.277	81.039	317.009
6600.000	2.588	26.400	63.370	-53.884	6598.150	0.728	63.370	83.182	319.625
6700.000	2.871	23.540	67.688	-51.880	6698.036	0.313	67.688	85.283	322.531