

**GyroTracer Directional:**

Date: 1/23/2019  
 Operator : Adrian Bruner  
 API : 05-123-24494  
 Well Name : **Howard USX A 9-13**  
 Field : Noble Energy Inc  
 Tool Number: 1717  
 Bottom Depth : 6900.00  
 Total Well Depth: 7221.00  
 Latitude : 40.49509 N  
 Longitude : 104.56208 W  
 Grid Offset : 0.61  
 Datum: NAD 83

**Starting Point Coordinates (in local grid):**

Northing: 0.00      Easting: 0.00      GLE: 4812.00

**Description:**

*Azimuth measured in degrees and referenced to local grid*

*Inclination measured from Vertical*

*Length measured in US survey feet*

*Lat/Long/Elevation obtained by handheld GPS at wellhead. Device error  $\pm 9$  Feet*

**RKB = Ground Level Elevation**

Start Time: 1/23/2019 14:09

End Time: 1/23/2019 15:18

Depth	Inclination	Azimuth	Closure Direction	True Depth	Coordinates		Dogleg Severity	Closure Distance
					+N/-S	+E/-W		
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100.000	0.030	307.901	291.801	100.000	0.020	-0.050	0.030	0.054
200.000	0.226	308.872	293.847	199.999	0.051	-0.114	0.203	0.125
300.000	0.285	256.541	293.540	299.999	0.184	-0.422	0.235	0.460
400.000	0.393	264.565	289.612	399.997	0.342	-0.959	0.130	1.018
500.000	0.320	274.384	286.320	499.995	0.450	-1.535	0.061	1.600
600.000	0.420	294.524	288.734	599.992	0.747	-2.204	0.192	2.327
700.000	0.458	292.941	290.687	699.988	1.126	-2.982	0.050	3.187
800.000	0.444	302.060	290.693	799.984	1.435	-3.799	0.093	4.062
900.000	0.635	293.834	290.223	899.979	1.717	-4.660	0.182	4.966
1000.000	0.601	290.173	289.515	999.975	1.952	-5.508	0.053	5.843
1100.000	0.641	275.215	288.243	1099.971	2.101	-6.374	0.198	6.711
1200.000	0.329	252.221	286.415	1199.968	2.103	-7.140	0.275	7.444
1300.000	0.315	257.764	284.914	1299.966	2.079	-7.804	0.030	8.076
1400.000	0.315	282.821	283.691	1399.964	2.042	-8.382	0.124	8.627
1500.000	0.385	265.616	282.482	1499.962	1.986	-8.972	0.122	9.190
1600.000	0.398	226.006	281.176	1599.959	1.895	-9.592	0.251	9.777
1700.000	0.455	288.544	280.401	1699.957	1.884	-10.267	0.300	10.438
1800.000	0.611	290.469	280.205	1799.953	1.995	-11.080	0.200	11.258
1900.000	0.628	283.484	280.395	1899.948	2.212	-12.059	0.086	12.261
2000.000	0.540	272.772	280.662	1999.943	2.449	-13.009	0.119	13.238

2100.000	0.694	211.306	279.349	2099.939	2.272	-13.801	0.659	13.986
2200.000	0.799	186.428	274.124	2199.929	1.035	-14.349	0.322	14.386
2300.000	0.851	177.094	268.370	2299.918	-0.410	-14.412	0.150	14.418
2400.000	1.112	160.310	261.545	2399.903	-2.073	-13.948	0.391	14.102
2500.000	0.926	81.758	253.897	2499.884	-3.746	-12.975	1.352	13.504
2600.000	1.191	127.012	244.929	2599.856	-5.265	-11.255	0.268	12.426
2700.000	1.439	135.621	233.933	2699.826	-6.847	-9.402	0.235	11.631
2800.000	1.523	127.219	221.401	2799.794	-8.527	-7.518	0.179	11.368
2900.000	1.312	125.823	209.148	2899.764	-9.896	-5.519	0.178	11.330
3000.000	1.299	122.936	198.001	2999.738	-11.042	-3.588	0.155	11.610
3100.000	1.002	108.458	190.026	3099.723	-11.975	-2.117	0.518	12.161
3200.000	0.994	116.945	183.559	3199.708	-13.036	-0.811	0.188	13.061
3300.000	1.559	87.599	174.972	3299.686	-13.497	1.187	0.856	13.549
3400.000	1.286	66.962	164.300	3399.654	-13.000	3.654	0.515	13.504
3500.000	1.089	93.504	155.893	3499.631	-12.783	5.720	0.584	14.005
3600.000	1.249	89.083	149.737	3599.614	-12.905	7.530	0.182	14.941
3700.000	1.152	87.674	144.366	3699.598	-12.981	9.305	0.058	15.971
3800.000	1.096	100.894	139.440	3799.580	-13.089	11.203	0.198	17.228
3900.000	1.103	88.810	135.195	3899.558	-13.324	13.234	0.265	18.780
4000.000	1.249	95.804	131.410	3999.537	-13.498	15.305	0.199	20.407
4100.000	0.963	87.477	127.944	4099.516	-13.486	17.297	0.375	21.933
4200.000	1.212	86.732	125.330	4199.500	-13.508	19.057	0.219	23.359
4300.000	1.043	101.691	122.906	4299.484	-13.453	20.791	0.277	24.763
4400.000	0.900	82.671	120.422	4399.471	-13.113	22.332	0.313	25.897
4500.000	1.105	75.322	117.820	4499.457	-12.641	23.957	0.168	27.087
4600.000	1.146	80.269	114.929	4599.436	-12.031	25.886	0.077	28.545
4700.000	1.460	81.489	112.149	4699.406	-11.492	28.233	0.052	30.482
4800.000	1.644	89.938	109.547	4799.365	-11.012	31.016	0.290	32.913
4900.000	1.737	96.765	107.744	4899.313	-10.946	34.209	0.265	35.917
5000.000	1.944	116.523	106.859	4999.253	-11.399	37.614	0.690	39.304
5100.000	2.109	100.069	106.136	5099.188	-11.917	41.188	0.621	42.877
5200.000	1.696	101.326	105.554	5199.133	-12.371	44.446	0.428	46.135
5300.000	1.464	102.958	104.935	5299.100	-12.526	46.960	0.513	48.601
5400.000	1.085	88.687	104.480	5399.081	-12.631	48.911	0.418	50.516
5500.000	0.844	93.284	104.205	5499.067	-12.788	50.518	0.276	52.111
5600.000	0.177	90.837	104.063	5599.062	-12.906	51.524	0.788	53.116
5700.000	0.388	249.149	104.450	5699.059	-13.216	51.287	0.600	52.962
5800.000	1.090	255.207	105.227	5799.051	-13.647	50.134	0.778	51.959
5900.000	1.117	252.921	106.305	5899.032	-14.122	48.276	0.065	50.300
6000.000	1.568	266.688	107.530	5999.002	-14.504	45.916	0.468	48.152
6100.000	1.324	270.512	108.364	6098.972	-14.437	43.491	0.284	45.824
6200.000	0.797	253.357	108.815	6198.959	-14.284	41.923	0.366	44.290
6300.000	0.387	179.826	109.402	6298.956	-14.526	41.244	0.632	43.727
6400.000	0.432	162.938	109.966	6398.954	-15.038	41.391	0.241	44.038
6500.000	0.571	150.849	110.558	6498.950	-15.711	41.894	0.110	44.743
6600.000	0.690	155.170	111.253	6598.943	-16.599	42.677	0.094	45.791
6700.000	0.945	147.008	112.105	6698.929	-17.777	43.770	0.222	47.243
6800.000	1.104	134.019	112.901	6798.913	-19.031	45.050	0.190	48.905
6900.000	0.880	127.450	113.594	6898.900	-20.161	46.162	0.252	50.372