



Company/Rig: Noble Energy/ CoreTech
WELL/API#: Cervi 41-21/05-123-20820
DECLINATION: 8.12 Degrees
TD AS DRILLED: 7586 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.30277, Longitude: -104.43642
Grid North = True North -0.69 degs (NAD 27)
Grid Correction Applied = -0.69 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4790 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 7/19/2016 / 14:37

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Cervi 41-21

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	0.732	289.000	99.997	0.208	-0.604	0.208	0.639	289.000	0.732
200.000	0.516	256.159	199.992	0.308	-1.645	0.308	1.674	280.618	0.409
300.000	0.483	282.585	299.988	0.293	-2.493	0.293	2.510	276.693	0.230
400.000	0.386	216.509	399.986	0.114	-3.105	0.114	3.107	272.095	0.481
500.000	0.723	219.291	499.981	-0.645	-3.705	-0.645	3.761	260.120	0.338
600.000	0.674	224.413	599.973	-1.554	-4.516	-1.554	4.776	251.016	0.079
700.000	0.743	223.096	699.966	-2.447	-5.370	-2.447	5.902	245.503	0.071
800.000	0.753	220.806	799.957	-3.418	-6.243	-3.418	7.117	241.299	0.032
900.000	0.791	220.996	899.948	-4.437	-7.125	-4.437	8.394	238.091	0.038
1000.000	0.810	219.179	999.938	-5.506	-8.025	-5.506	9.732	235.546	0.032
1100.000	0.990	206.167	1099.926	-6.829	-8.853	-6.829	11.181	232.352	0.271
1200.000	0.888	225.930	1199.913	-8.143	-9.790	-8.143	12.734	230.247	0.338
1300.000	1.064	233.727	1299.898	-9.231	-11.095	-9.231	14.433	230.239	0.220
1400.000	1.211	237.716	1399.879	-10.345	-12.737	-10.345	16.409	230.917	0.167
1500.000	1.274	241.863	1499.855	-11.434	-14.611	-11.434	18.553	231.955	0.109
1600.000	1.285	244.242	1599.830	-12.445	-16.601	-12.445	20.747	233.142	0.054
1700.000	1.228	245.985	1699.806	-13.368	-18.589	-13.368	22.897	234.278	0.068
1800.000	1.390	248.033	1799.780	-14.258	-20.693	-14.258	25.130	235.432	0.168

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
1900.000	1.356	257.021	1899.752	-14.978	-22.970	-14.978	27.422	236.894	0.218
2000.000	1.357	268.093	1999.724	-15.283	-25.306	-15.283	29.563	238.872	0.262
2100.000	1.350	267.598	2099.696	-15.371	-27.666	-15.371	31.649	240.943	0.014
2200.000	1.390	263.179	2199.667	-15.565	-30.047	-15.565	33.839	242.615	0.113
2300.000	1.617	232.737	2299.634	-16.563	-32.374	-16.563	36.365	242.905	0.819
2400.000	1.627	216.469	2399.595	-18.559	-34.341	-18.559	39.035	241.612	0.459
2500.000	1.483	216.997	2499.558	-20.734	-35.963	-20.734	41.512	240.035	0.144
2600.000	1.543	236.541	2599.524	-22.510	-37.866	-22.510	44.051	239.269	0.517
2700.000	1.752	222.134	2699.483	-24.387	-40.015	-24.387	46.860	238.640	0.462
2800.000	1.682	223.781	2799.438	-26.580	-42.056	-26.580	49.751	237.707	0.086
2900.000	1.853	218.742	2899.390	-28.901	-44.083	-28.901	52.712	236.751	0.231
3000.000	1.521	194.872	2999.348	-31.444	-45.436	-31.444	55.255	235.314	0.770
3100.000	1.126	183.235	3099.321	-33.708	-45.832	-33.708	56.893	233.666	0.475
3200.000	1.131	136.077	3199.304	-35.400	-45.203	-35.400	57.415	231.934	0.903
3300.000	0.353	148.261	3299.295	-36.373	-44.356	-36.373	57.363	230.648	0.789
3400.000	0.475	281.031	3399.294	-36.555	-44.602	-36.555	57.668	230.662	0.760
3500.000	0.823	268.255	3499.287	-36.498	-45.727	-36.498	58.506	231.404	0.374
3600.000	0.887	254.917	3599.276	-36.721	-47.192	-36.721	59.795	232.113	0.208
3700.000	1.110	299.772	3699.262	-36.441	-48.780	-36.441	60.889	233.238	0.789
3800.000	1.552	296.997	3799.235	-35.346	-50.827	-35.346	61.909	235.185	0.446
3900.000	1.885	288.518	3899.190	-34.209	-53.593	-34.209	63.580	237.450	0.419
4000.000	2.237	300.047	3999.126	-32.709	-56.842	-32.709	65.581	240.082	0.542
4100.000	2.321	311.610	4099.047	-30.387	-60.045	-30.387	67.297	243.157	0.467
4200.000	2.722	318.258	4198.950	-27.271	-63.140	-27.271	68.778	246.640	0.496
4300.000	2.849	315.028	4298.832	-23.741	-66.477	-23.741	70.589	250.346	0.202
4400.000	2.998	315.619	4398.702	-20.115	-70.062	-20.115	72.892	253.981	0.152
4500.000	3.080	319.830	4498.562	-16.193	-73.624	-16.193	75.384	257.596	0.238
4600.000	3.157	316.390	4598.414	-12.146	-77.256	-12.146	78.205	261.065	0.203
4700.000	3.064	331.488	4698.268	-7.804	-80.431	-7.804	80.809	264.458	0.822
4800.000	2.746	328.089	4798.139	-3.423	-82.973	-3.423	83.044	267.638	0.362
4900.000	2.874	326.110	4898.019	0.692	-85.637	0.692	85.640	270.463	0.161
5000.000	2.897	325.843	4997.892	4.864	-88.454	4.864	88.588	273.148	0.027
5100.000	2.399	328.138	5097.785	8.733	-90.978	8.733	91.396	275.483	0.510
5200.000	1.865	344.042	5197.717	12.075	-92.530	12.075	93.315	277.435	0.792
5300.000	1.568	330.966	5297.672	14.835	-93.641	14.835	94.809	279.002	0.490
5400.000	1.375	299.799	5397.641	16.627	-95.346	16.627	96.785	279.892	0.812
5500.000	1.583	335.520	5497.609	18.480	-96.959	18.480	98.704	280.791	0.928
5600.000	1.628	348.352	5597.570	21.128	-97.818	21.128	100.074	282.188	0.362
5700.000	1.528	346.162	5697.533	23.814	-98.424	23.814	101.263	283.601	0.116
5800.000	1.537	355.823	5797.497	26.446	-98.840	26.446	102.317	284.980	0.258

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
5900.000	1.094	350.573	5897.470	28.726	-99.094	28.726	103.174	286.166	0.459
6000.000	0.439	313.134	5997.461	29.930	-99.530	29.930	103.933	286.737	0.792
6100.000	0.210	150.770	6097.461	30.032	-99.720	30.032	104.144	286.760	0.642
6150.000	0.376	171.950	6147.460	29.790	-99.653	29.790	104.010	286.643	0.390