

Rig Name: Production/Lightning Wireline

State/County: Colorado/Weld

VS-Azi: 0.000 Degrees

Latitude: 40.00307, Longitude: -104.87142

All Azimuths referenced to True North

No Grid Correction Applied



Depth Reference : RKB=Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 5/11/2018 / 08:02

Vaughn Energy Services

Henderson, CO

303-853-4976

Surveyor: Levi Sheldon

Seltzer E 1 / API 05-123-10490

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	0.604	305.033	99.998	0.302	-0.431	0.302	0.527	305.033	0.604
200.000	0.660	279.580	199.992	0.701	-1.431	0.701	1.593	296.095	0.284
300.000	0.778	284.670	299.984	0.968	-2.655	0.968	2.826	290.040	0.134
400.000	0.579	291.528	399.977	1.326	-3.782	1.326	4.007	289.320	0.214
500.000	0.756	293.135	499.971	1.771	-4.859	1.771	5.171	290.022	0.178
600.000	0.792	279.280	599.961	2.141	-6.147	2.141	6.510	289.204	0.190
700.000	0.972	262.394	699.950	2.140	-7.670	2.140	7.963	285.592	0.314
800.000	0.841	261.748	799.937	1.923	-9.238	1.923	9.436	281.758	0.131
900.000	0.834	245.343	899.927	1.514	-10.626	1.514	10.733	278.107	0.239
1000.000	0.728	255.542	999.917	1.051	-11.903	1.051	11.949	275.048	0.175
1100.000	0.747	249.012	1099.909	0.659	-13.126	0.659	13.142	272.876	0.086
1200.000	0.617	270.711	1199.902	0.433	-14.273	0.433	14.279	271.737	0.286
1300.000	0.337	250.268	1299.899	0.340	-15.087	0.340	15.091	271.292	0.324
1400.000	0.362	235.903	1399.897	0.064	-15.625	0.064	15.626	270.235	0.091
1500.000	0.320	260.948	1499.895	-0.157	-16.162	-0.157	16.163	269.444	0.153
1600.000	0.569	239.919	1599.892	-0.449	-16.867	-0.449	16.873	268.474	0.294
1700.000	0.401	277.367	1699.889	-0.653	-17.644	-0.653	17.656	267.879	0.349
1800.000	0.550	282.424	1799.885	-0.505	-18.460	-0.505	18.467	268.433	0.155

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	0.560	285.651	1899.881	-0.270	-19.400	-0.270	19.402	269.203	0.033
2000.000	0.849	285.718	1999.873	0.063	-20.584	0.063	20.584	270.174	0.289
2100.000	0.768	294.002	2099.863	0.536	-21.909	0.536	21.916	271.401	0.142
2200.000	0.758	295.041	2199.854	1.089	-23.121	1.089	23.146	272.696	0.017
2300.000	0.691	289.948	2299.846	1.574	-24.287	1.574	24.338	273.709	0.093
2400.000	0.549	304.992	2399.840	2.055	-25.247	2.055	25.330	274.653	0.215
2500.000	0.563	302.433	2499.836	2.593	-26.054	2.593	26.182	275.684	0.028
2600.000	0.723	280.447	2599.829	2.971	-27.089	2.971	27.251	276.258	0.291
2700.000	0.600	284.091	2699.823	3.213	-28.217	3.213	28.399	276.495	0.130
2800.000	0.475	311.387	2799.818	3.614	-29.036	3.614	29.260	277.096	0.281
2900.000	0.466	266.817	2899.815	3.866	-29.754	3.866	30.004	277.403	0.357
3000.000	0.297	246.276	2999.813	3.739	-30.398	3.739	30.627	277.013	0.215
3100.000	0.152	200.930	3099.813	3.511	-30.682	3.511	30.883	276.527	0.219
3200.000	0.140	201.993	3199.812	3.273	-30.776	3.273	30.949	276.071	0.012
3300.000	0.363	101.907	3299.811	3.094	-30.512	3.094	30.668	275.791	0.411
3400.000	0.355	140.385	3399.810	2.791	-30.004	2.791	30.134	275.313	0.237
3500.000	0.567	106.311	3499.807	2.413	-29.332	2.413	29.431	274.703	0.338
3600.000	0.569	115.866	3599.802	2.058	-28.411	2.058	28.485	274.142	0.095
3700.000	0.468	83.993	3699.798	1.884	-27.558	1.884	27.622	273.911	0.301
3800.000	0.500	107.685	3799.794	1.794	-26.735	1.794	26.795	273.839	0.201
3900.000	0.260	161.197	3899.792	1.446	-26.247	1.446	26.286	273.154	0.404
4000.000	0.349	176.135	3999.791	0.928	-26.153	0.928	26.169	272.032	0.118
4100.000	0.457	202.690	4099.788	0.257	-26.286	0.257	26.287	270.559	0.213
4200.000	0.593	209.966	4199.784	-0.559	-26.698	-0.559	26.704	268.801	0.151
4300.000	0.636	216.416	4299.778	-1.454	-27.286	-1.454	27.325	266.950	0.082
4400.000	0.801	205.568	4399.771	-2.531	-27.917	-2.531	28.032	264.820	0.213
4500.000	0.732	240.183	4499.762	-3.479	-28.773	-3.479	28.982	263.106	0.461
4600.000	0.816	262.009	4599.753	-3.895	-30.031	-3.895	30.283	262.610	0.304
4700.000	0.878	261.153	4699.742	-4.112	-31.493	-4.112	31.761	262.561	0.064
4800.000	0.874	258.992	4799.731	-4.376	-33.000	-4.376	33.288	262.447	0.033
4900.000	0.881	262.862	4899.719	-4.617	-34.511	-4.617	34.818	262.380	0.060
5000.000	0.996	266.467	4999.706	-4.766	-36.141	-4.766	36.454	262.488	0.129
5100.000	0.982	241.608	5099.691	-5.227	-37.762	-5.227	38.122	262.119	0.426
5200.000	1.061	228.642	5199.675	-6.247	-39.211	-6.247	39.706	260.948	0.244
5300.000	0.983	201.508	5299.660	-7.657	-40.221	-7.657	40.944	259.221	0.486
5400.000	1.200	208.854	5399.642	-9.372	-41.041	-9.372	42.098	257.136	0.257
5500.000	1.232	186.289	5499.620	-11.358	-41.664	-11.358	43.184	254.751	0.477
5600.000	1.274	180.660	5599.596	-13.538	-41.795	-13.538	43.933	252.052	0.130
5700.000	1.125	193.164	5699.574	-15.605	-42.031	-15.605	44.834	249.631	0.300
5800.000	0.957	191.070	5799.558	-17.381	-42.415	-17.381	45.838	247.717	0.171

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	0.603	192.467	5899.548	-18.714	-42.689	-18.714	46.611	246.328	0.355
6000.000	0.247	190.998	5999.545	-19.440	-42.844	-19.440	47.048	245.594	0.356
6100.000	0.461	228.511	6099.544	-19.918	-43.186	-19.918	47.558	245.240	0.305
6200.000	0.554	309.146	6199.541	-19.880	-43.863	-19.880	48.158	245.618	0.661
6300.000	0.762	322.122	6299.534	-19.050	-44.646	-19.050	48.540	246.893	0.255
6400.000	0.673	320.377	6399.526	-18.072	-45.429	-18.072	48.892	248.306	0.092
6500.000	1.095	323.075	6499.514	-16.857	-46.377	-16.857	49.346	250.026	0.423
6600.000	1.298	348.017	6599.493	-14.985	-47.186	-14.985	49.509	252.381	0.553
6700.000	1.489	6.621	6699.464	-12.588	-47.271	-12.588	48.919	255.089	0.488
6800.000	1.839	11.280	6799.422	-9.724	-46.808	-9.724	47.807	258.265	0.375
6900.000	2.253	22.530	6899.358	-6.334	-45.741	-6.334	46.177	262.116	0.575
7000.000	2.641	40.063	6999.268	-2.755	-43.505	-2.755	43.592	266.376	0.838
7100.000	2.925	44.263	7099.150	0.835	-40.241	0.835	40.249	271.189	0.349
7200.000	2.957	56.265	7199.019	4.095	-36.315	4.095	36.545	276.434	0.616
7300.000	3.212	64.046	7298.875	6.754	-31.650	6.754	32.363	282.046	0.490
7400.000	2.756	66.812	7398.739	8.927	-26.921	8.927	28.362	288.346	0.478
7500.000	2.656	74.773	7498.628	10.482	-22.476	10.482	24.800	295.004	0.389
7600.000	2.122	75.747	7598.541	11.547	-18.446	11.547	21.762	302.045	0.535
7700.000	1.944	75.500	7698.478	12.427	-15.009	12.427	19.486	309.624	0.179
7800.000	1.698	81.802	7798.427	13.063	-11.900	13.063	17.671	317.667	0.316
7900.000	1.432	85.842	7898.390	13.365	-9.187	13.365	16.218	325.496	0.288
8000.000	1.095	96.234	7998.365	13.352	-6.990	13.352	15.071	332.366	0.406
8100.000	0.918	97.636	8098.350	13.142	-5.246	13.142	14.150	338.237	0.179
8180.000	1.132	93.306	8178.337	13.011	-3.822	13.011	13.561	343.628	0.285