

Company: Anadarko Petroleum Corp.

Well/API: FT Lupton Highlands #31-9/05-123-23765

Tool Type: North Seeking Rate Gyro

Rig Name: Production/ V.E.S.

County/State: Weld County / Colorado

Latitude: 40.071, Longitude: -104.780

Directions are relative to True North

VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Elevation = 4999 ft

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ftluptonhighlands#31-9-de_01.ut

Minimum Curvature Method

Report Date/Time: 11/26/2014 / 17:14

Lat/Long Obtained By Handheld GPS At Wellhead

Handheld GPS Reference: NAD83/Device Error: ±9 Feet

VES Survey International - Henderson CO

Jay Hinman

303-853-4976

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	0.905	81.389	99.996	0.118	0.781	0.118	0.790	81.389	0.905
200.000	1.098	66.543	199.981	0.618	2.441	0.618	2.518	75.793	0.322
300.000	0.792	74.180	299.967	1.188	3.985	1.188	4.159	73.402	0.330
400.000	0.739	61.147	399.958	1.688	5.215	1.688	5.481	72.069	0.182
500.000	0.608	48.088	499.951	2.353	6.175	2.353	6.608	69.139	0.201
600.000	0.623	28.325	599.946	3.186	6.827	3.186	7.534	64.985	0.212
700.000	0.700	0.427	699.939	4.275	7.090	4.275	8.279	58.909	0.328
800.000	1.073	5.827	799.927	5.818	7.189	5.818	9.248	51.019	0.381
900.000	1.100	9.302	899.909	7.696	7.439	7.696	10.704	44.028	0.071
1000.000	1.140	2.785	999.890	9.637	7.643	9.637	12.300	38.417	0.134
1100.000	0.916	15.886	1099.874	11.399	7.910	11.399	13.875	34.757	0.324
1200.000	1.238	21.826	1199.856	13.170	8.530	13.170	15.691	32.930	0.341
1300.000	1.007	24.517	1299.837	14.972	9.296	14.972	17.623	31.836	0.237
1400.000	0.615	32.665	1399.827	16.223	9.950	16.223	19.032	31.523	0.407
1500.000	0.862	36.788	1499.818	17.278	10.691	17.278	20.318	31.747	0.253
1600.000	0.649	6.701	1599.810	18.443	11.207	18.443	21.581	31.286	0.443
1700.000	0.853	14.506	1699.801	19.726	11.460	19.726	22.813	30.154	0.227
1800.000	0.949	7.217	1799.789	21.268	11.750	21.268	24.298	28.920	0.150
1900.000	1.112	337.571	1899.774	22.987	11.484	22.987	25.696	26.546	0.551
2000.000	1.225	318.826	1999.753	24.689	10.410	24.689	26.794	22.863	0.396
2100.000	1.409	330.746	2099.727	26.566	9.105	26.566	28.083	18.919	0.329
2200.000	1.475	339.442	2199.695	28.844	8.053	28.844	29.947	15.599	0.228
2300.000	1.517	338.646	2299.661	31.282	7.119	31.282	32.082	12.820	0.047
2400.000	1.206	318.717	2399.633	33.306	5.942	33.306	33.832	10.116	0.562
2500.000	1.176	310.007	2499.612	34.756	4.462	34.756	35.041	7.315	0.183
2600.000	1.585	304.222	2599.583	36.194	2.532	36.194	36.282	4.002	0.431
2700.000	1.953	307.447	2699.535	38.007	0.036	38.007	38.007	0.055	0.381
2800.000	1.907	302.760	2799.478	39.944	-2.716	39.944	40.036	356.110	0.164
2900.000	1.696	308.026	2899.429	41.756	-5.281	41.756	42.088	352.792	0.268
3000.000	2.046	306.180	2999.375	43.721	-7.887	43.721	44.427	349.774	0.355
3100.000	1.765	316.707	3099.320	45.896	-10.384	45.896	47.056	347.251	0.448
3200.000	2.349	318.450	3199.255	48.550	-12.799	48.550	50.209	345.231	0.587
3300.000	2.121	316.640	3299.179	51.429	-15.429	51.429	53.694	343.300	0.238

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
3400.000	2.651	312.177	3399.092	54.327	-18.414	54.327	57.363	341.277	0.562
3500.000	2.500	309.260	3498.991	57.261	-21.816	57.261	61.276	339.143	0.200
3600.000	2.419	314.058	3598.899	60.108	-25.022	60.108	65.108	337.399	0.221
3700.000	1.941	311.259	3698.827	62.692	-27.811	62.692	68.584	336.077	0.490
3800.000	2.162	304.592	3798.763	64.880	-30.637	64.880	71.750	334.723	0.325
3900.000	2.048	309.663	3898.695	67.091	-33.565	67.091	75.019	333.422	0.219
4000.000	2.391	303.922	3998.620	69.396	-36.671	69.396	78.489	332.146	0.409
4100.000	2.334	311.184	4098.535	71.901	-39.935	71.901	82.247	330.951	0.305
4200.000	2.526	311.742	4198.445	74.709	-43.112	74.709	86.256	330.012	0.194
4300.000	2.623	307.321	4298.345	77.564	-46.577	77.564	90.474	329.015	0.221
4400.000	1.875	319.303	4398.267	80.192	-49.463	80.192	94.220	328.333	0.880
4500.000	1.695	318.114	4498.219	82.533	-51.518	82.533	97.293	328.027	0.184
4600.000	1.615	323.590	4598.177	84.769	-53.342	84.769	100.155	327.819	0.177
4700.000	2.081	326.275	4698.125	87.413	-55.186	87.413	103.375	327.735	0.474
4800.000	1.859	313.274	4798.066	90.035	-57.375	90.035	106.762	327.492	0.497
4900.000	1.998	312.307	4898.010	92.320	-59.846	92.320	110.020	327.047	0.143
5000.000	1.846	322.563	4997.954	94.772	-62.114	94.772	113.313	326.759	0.375
5100.000	1.830	322.036	5097.902	97.310	-64.075	97.310	116.512	326.636	0.023
5200.000	1.428	309.043	5197.862	99.354	-66.026	99.354	119.292	326.394	0.544
5300.000	1.677	293.015	5297.826	100.711	-68.340	100.711	121.709	325.840	0.498
5400.000	1.740	326.273	5397.783	102.546	-70.530	102.546	124.459	325.480	0.979
5500.000	1.663	336.018	5497.740	105.134	-71.962	105.134	127.404	325.609	0.299
5600.000	1.899	317.293	5597.692	107.677	-73.676	107.677	130.470	325.619	0.625
5700.000	1.797	328.887	5697.640	110.238	-75.610	110.238	133.676	325.554	0.387
5800.000	2.007	324.262	5797.585	113.002	-77.443	113.002	136.992	325.576	0.260
5900.000	2.186	320.224	5897.518	115.889	-79.686	115.889	140.642	325.487	0.232
6000.000	2.735	318.195	5997.426	119.133	-82.497	119.133	144.908	325.298	0.556
6100.000	1.975	325.273	6097.341	122.327	-85.068	122.327	148.998	325.185	0.812
6200.000	1.785	352.319	6197.289	125.287	-86.258	125.287	152.110	325.453	0.898
6300.000	1.253	87.230	6297.266	126.884	-85.374	126.884	152.932	326.065	2.267
6400.000	1.416	106.335	6397.239	126.589	-83.097	126.589	151.426	326.718	0.471
6500.000	1.182	125.484	6497.214	125.643	-81.071	125.643	149.528	327.168	0.490
6600.000	1.194	133.755	6597.192	124.323	-79.478	124.323	147.557	327.410	0.172
6700.000	0.814	108.620	6697.177	123.376	-78.052	123.376	145.992	327.681	0.573
6800.000	0.604	152.213	6797.170	122.682	-77.133	122.682	144.916	327.841	0.561
6900.000	0.745	154.114	6897.163	121.630	-76.603	121.630	143.743	327.797	0.143
7000.000	0.460	145.551	6997.158	120.714	-76.092	120.714	142.695	327.775	0.298
7100.000	0.590	153.756	7097.153	119.921	-75.637	119.921	141.782	327.759	0.150
7200.000	0.584	211.099	7197.149	119.023	-75.673	119.023	141.042	327.552	0.563
7300.000	0.474	233.942	7297.145	118.343	-76.270	118.343	140.791	327.199	0.236
7375.000	0.122	106.153	7372.144	118.138	-76.444	118.138	140.714	327.094	0.742

<div> HORIZONTAL DISPLACEMENT IS 140.714 FEET AT 327.094 DEGREES </div>
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