

Company: ANADARKO PETROLEUM

Well: BIRKLE #24-15L

API: 05-123-17840

Rig Name: PRODUCTION/CANARY

State/County: COLORADO / WELD

Latitude: 40.206, Longitude: -104.837

Directions are relative to True North

VS-Azi: 0.000 Degrees

**FIELD COPY ONLY (NOT DEFINITIVE)**

Depth Reference : RKB = GROUND LEVEL

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/15/2013 / 19:48

VAUGHN ENERGY SERVICES

HENDERSON, COLORADO

303-853-4976

NICK KULA

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	0.827	120.656	99.997	-0.368	0.620	-0.368	0.721	120.656	0.827
200.000	0.638	75.511	199.989	-0.596	1.780	-0.596	1.877	108.524	0.588
300.000	0.126	211.317	299.987	-0.551	2.261	-0.551	2.327	103.692	0.733
400.000	0.580	151.197	399.985	-1.088	2.448	-1.088	2.679	113.971	0.529
500.000	0.659	141.900	499.979	-1.985	3.047	-1.985	3.636	123.078	0.127
600.000	0.805	115.239	599.972	-2.736	4.037	-2.736	4.877	124.131	0.366
700.000	0.539	104.354	699.965	-3.153	5.128	-3.153	6.020	121.582	0.294
800.000	0.315	99.944	799.962	-3.317	5.854	-3.317	6.729	119.533	0.226
900.000	0.061	181.555	899.961	-3.417	6.123	-3.417	7.012	119.161	0.312
1000.000	0.409	246.047	999.960	-3.615	5.796	-3.615	6.831	121.949	0.387
1100.000	0.648	253.457	1099.956	-3.920	4.928	-3.920	6.297	128.502	0.248
1200.000	0.959	198.429	1199.947	-4.875	4.122	-4.875	6.384	139.785	0.792
1300.000	0.998	204.535	1299.933	-6.461	3.496	-6.461	7.346	151.582	0.111
1400.000	1.028	208.791	1399.917	-8.038	2.703	-8.038	8.481	161.417	0.081
1500.000	0.990	218.438	1499.902	-9.501	1.734	-9.501	9.658	169.659	0.174
1600.000	1.147	220.781	1599.884	-10.935	0.543	-10.935	10.949	177.157	0.163
1700.000	1.127	225.302	1699.865	-12.385	-0.810	-12.385	12.411	183.741	0.092
1800.000	0.955	244.135	1799.849	-13.440	-2.259	-13.440	13.629	189.540	0.381
1900.000	1.140	264.368	1899.832	-13.901	-3.998	-13.901	14.465	196.046	0.411
2000.000	1.053	281.589	1999.814	-13.814	-5.888	-13.814	15.017	203.086	0.339
2100.000	1.224	294.846	2099.794	-13.181	-7.758	-13.181	15.294	210.480	0.313
2200.000	1.642	326.768	2199.764	-11.533	-9.513	-11.533	14.950	219.517	0.885
2300.000	1.899	351.068	2299.718	-8.698	-10.555	-8.698	13.677	230.512	0.786
2400.000	1.931	4.769	2399.663	-5.382	-10.673	-5.382	11.953	243.241	0.458
2500.000	1.716	12.911	2499.612	-2.243	-10.198	-2.243	10.442	257.595	0.336
2600.000	1.719	13.857	2599.567	0.673	-9.504	0.673	9.528	274.047	0.029
2700.000	1.597	15.377	2699.525	3.472	-8.776	3.472	9.437	291.585	0.130
2800.000	1.450	5.739	2799.490	6.074	-8.280	6.074	10.269	306.265	0.295
2900.000	1.219	354.132	2899.463	8.391	-8.262	8.391	11.776	315.445	0.355

Measured	Incl	Drift	TVD	+N/-S	+E/-W	Vertical	Closure	Closure	Dogleg
Depth	Angle	Direction				Section	Distance	Direction	Severity
FT	Deg	Deg	FT	FT	FT	FT	FT	Deg	Deg/100

HORIZONTAL DISPLACEMENT IS
65.090 FEET AT 260.842 DEGREES