



Gyroscopic Survey Report
for
KPK

Well Location	WELD, CO
Well Name	MILLARD #2
Rig Number	
Survey Date	10/16/2014
Latitude	40.1072200°N
Longitude	104.8175880°W
North Reference	True North
Grid Correction	None
Depth Reference	GL (4874.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 245.46Azim (deg)
Definitive Survey	MILLARD #2 OUTFUN
Operator(s)	C KIRBY

Well Notes

API-05-123-10548

Survey Report

Well Name: MILLARD #2
Survey: MILLARD #2 OUTFIT
Survey Date: 10/16/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
85.29	0.27	84.03	85.29	-0.19	0.02	0.20	0.32	0.20	84.03
120.84	0.29	63.74	120.84	-0.36	0.07	0.37	0.29	0.37	79.17
147.73	0.33	83.80	147.72	-0.50	0.11	0.51	0.43	0.52	77.84
174.06	0.38	71.26	174.05	-0.66	0.15	0.66	0.35	0.68	77.66
195.88	0.69	78.07	195.88	-0.87	0.20	0.86	1.43	0.88	77.20
222.10	0.90	77.05	222.09	-1.22	0.27	1.22	0.83	1.25	77.28
249.11	0.91	79.96	249.10	-1.64	0.36	1.64	0.17	1.68	77.60
271.68	0.88	76.71	271.67	-1.98	0.43	1.98	0.26	2.03	77.73
297.91	0.86	79.16	297.90	-2.37	0.51	2.37	0.16	2.43	77.76
324.71	0.97	74.88	324.70	-2.79	0.61	2.79	0.47	2.86	77.63
346.48	0.92	79.18	346.46	-3.15	0.69	3.14	0.39	3.22	77.56
373.01	0.89	74.20	372.99	-3.56	0.79	3.55	0.32	3.64	77.46
395.66	0.85	79.77	395.63	-3.89	0.87	3.88	0.41	3.98	77.42
421.91	0.87	79.28	421.88	-4.28	0.94	4.27	0.09	4.37	77.61
448.84	0.80	88.67	448.81	-4.65	0.98	4.66	0.57	4.77	78.11
470.77	0.77	92.86	470.74	-4.92	0.98	4.97	0.30	5.06	78.86
497.82	0.74	89.54	497.78	-5.24	0.97	5.32	0.20	5.41	79.67
524.83	0.77	89.43	524.79	-5.57	0.97	5.68	0.09	5.76	80.27
546.81	0.79	97.22	546.77	-5.83	0.96	5.97	0.49	6.05	80.91
573.78	0.81	94.03	573.73	-6.16	0.92	6.35	0.19	6.42	81.77
596.34	0.81	90.08	596.29	-6.44	0.91	6.67	0.25	6.73	82.25
621.93	0.71	92.51	621.88	-6.75	0.90	7.01	0.39	7.07	82.68
648.82	0.71	97.53	648.77	-7.04	0.87	7.34	0.23	7.39	83.23
670.66	0.74	101.01	670.61	-7.27	0.83	7.61	0.25	7.66	83.80
697.57	0.68	101.80	697.51	-7.54	0.76	7.94	0.22	7.97	84.52
724.39	0.60	107.83	724.33	-7.77	0.69	8.23	0.39	8.26	85.24
746.26	0.62	104.58	746.20	-7.95	0.62	8.45	0.19	8.47	85.80
773.01	0.58	103.75	772.95	-8.16	0.55	8.72	0.18	8.74	86.38
799.73	0.62	119.94	799.67	-8.35	0.45	8.98	0.65	8.99	87.14
821.05	0.53	127.80	820.99	-8.47	0.33	9.15	0.55	9.16	87.93
847.72	0.61	133.26	847.66	-8.58	0.16	9.36	0.38	9.36	89.04
873.28	0.60	140.83	873.21	-8.66	-0.04	9.54	0.32	9.54	90.24
899.70	0.54	148.48	899.63	-8.71	-0.25	9.69	0.37	9.70	91.49
920.48	0.49	141.19	920.41	-8.75	-0.41	9.80	0.39	9.81	92.37
947.19	0.59	149.66	947.12	-8.79	-0.61	9.94	0.48	9.96	93.53

Survey Report

Well Name: MILLARD #2
Survey: MILLARD #2 OTRUN
Survey Date: 10/16/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
971.74	0.45	171.63	971.67	-8.77	-0.82	10.02	0.98	10.05	94.67
998.04	0.87	167.69	997.97	-8.70	-1.11	10.08	1.58	10.14	96.31
1023.56	0.74	170.13	1023.48	-8.62	-1.47	10.14	0.50	10.25	98.22
1046.23	0.79	172.68	1046.16	-8.54	-1.77	10.19	0.24	10.34	99.83
1073.15	0.71	173.11	1073.07	-8.43	-2.11	10.23	0.30	10.45	101.67
1099.30	0.85	176.25	1099.22	-8.31	-2.47	10.27	0.59	10.56	103.52
1121.98	0.77	178.38	1121.90	-8.19	-2.79	10.28	0.40	10.65	105.17
1148.89	0.86	178.53	1148.80	-8.04	-3.17	10.29	0.33	10.77	107.12
1170.84	0.86	186.05	1170.75	-7.90	-3.50	10.28	0.51	10.86	108.79
1197.76	0.85	187.59	1197.68	-7.69	-3.90	10.23	0.09	10.95	110.85
1224.01	0.98	191.55	1223.92	-7.45	-4.31	10.16	0.55	11.04	112.99
1246.60	1.11	194.72	1246.50	-7.20	-4.71	10.07	0.61	11.11	115.08
1273.58	1.05	197.55	1273.48	-6.87	-5.20	9.92	0.29	11.20	117.64
1299.90	1.08	196.98	1299.80	-6.54	-5.67	9.78	0.13	11.30	120.09
1322.40	1.05	201.97	1322.29	-6.25	-6.06	9.64	0.43	11.39	122.16
1344.20	1.14	197.82	1344.09	-5.96	-6.45	9.50	0.53	11.48	124.20
1371.18	1.01	201.47	1371.06	-5.61	-6.93	9.33	0.56	11.62	126.60
1398.09	1.20	197.94	1397.96	-5.25	-7.42	9.16	0.76	11.78	129.01
1424.18	0.98	205.66	1424.05	-4.89	-7.88	8.98	1.01	11.94	131.27
1446.76	1.09	203.54	1446.63	-4.59	-8.25	8.81	0.50	12.07	133.12
1473.52	0.98	211.66	1473.39	-4.21	-8.67	8.59	0.68	12.20	135.30
1499.70	1.04	211.66	1499.56	-3.82	-9.07	8.34	0.22	12.32	137.38
1521.87	0.98	216.15	1521.72	-3.49	-9.39	8.13	0.44	12.42	139.12
1548.40	1.00	214.66	1548.25	-3.10	-9.76	7.86	0.13	12.53	141.15
1574.26	1.00	225.24	1574.11	-2.69	-10.11	7.57	0.71	12.63	143.15
1596.41	1.02	229.18	1596.25	-2.32	-10.37	7.29	0.33	12.68	144.90
1622.21	1.04	235.35	1622.05	-1.87	-10.65	6.92	0.44	12.71	146.99
1648.05	1.06	235.40	1647.88	-1.40	-10.92	6.53	0.06	12.73	149.13
1674.32	1.07	237.66	1674.15	-0.92	-11.19	6.12	0.16	12.76	151.31
1696.00	1.08	241.93	1695.83	-0.52	-11.40	5.77	0.37	12.78	153.13
1721.56	1.05	244.56	1721.39	-0.05	-11.61	5.35	0.23	12.78	155.26
1747.37	1.07	246.40	1747.19	0.43	-11.81	4.92	0.16	12.79	157.39
1773.92	1.11	248.71	1773.73	0.93	-12.00	4.45	0.22	12.80	159.64
1795.38	1.14	251.28	1795.19	1.35	-12.14	4.06	0.28	12.80	161.52
1821.95	1.11	248.49	1821.76	1.87	-12.32	3.57	0.24	12.83	163.84
1848.46	1.07	253.40	1848.26	2.37	-12.49	3.09	0.37	12.86	166.08

Survey Report

Well Name:		MILLARD #2							
Survey:		MILLARD #2 OTRUN							
Survey Date:		10/16/2014							
MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
1874.19	1.14	252.06	1873.98	2.86	-12.63	2.62	0.28	12.90	168.29
1896.19	1.14	253.67	1895.98	3.30	-12.76	2.20	0.15	12.95	170.21
1922.69	1.14	254.95	1922.48	3.82	-12.91	1.70	0.10	13.02	172.52
1948.56	1.11	258.14	1948.34	4.32	-13.02	1.20	0.26	13.08	174.73
1970.69	1.24	251.66	1970.46	4.76	-13.14	0.76	0.82	13.17	176.67
1996.47	1.15	256.92	1996.24	5.29	-13.29	0.25	0.55	13.29	178.93
2022.95	1.19	259.81	2022.72	5.82	-13.40	-0.28	0.28	13.40	181.21
2049.18	1.45	252.33	2048.94	6.42	-13.55	-0.87	1.17	13.57	183.66
2074.81	1.19	254.50	2074.56	7.00	-13.72	-1.43	1.04	13.79	185.96
2097.02	1.12	260.00	2096.77	7.44	-13.82	-1.87	0.59	13.94	187.69
2123.29	1.11	263.19	2123.03	7.93	-13.89	-2.37	0.24	14.09	189.69
2148.95	1.16	261.69	2148.69	8.41	-13.96	-2.87	0.22	14.25	191.64
2171.09	1.01	262.66	2170.82	8.81	-14.01	-3.29	0.67	14.40	193.21
2197.35	1.11	262.46	2197.07	9.28	-14.08	-3.77	0.37	14.57	195.00
2222.82	0.95	267.98	2222.54	9.71	-14.12	-4.23	0.75	14.74	196.67
2248.79	0.97	272.10	2248.51	10.10	-14.12	-4.66	0.28	14.87	198.27
2274.64	0.93	273.22	2274.36	10.48	-14.10	-5.09	0.17	14.99	199.85
2299.96	0.95	269.95	2299.67	10.86	-14.09	-5.50	0.23	15.12	201.34
2321.62	0.90	272.12	2321.33	11.17	-14.08	-5.85	0.30	15.25	202.58
2347.62	0.94	276.66	2347.33	11.54	-14.05	-6.27	0.31	15.38	204.05
2373.60	0.88	272.67	2373.30	11.90	-14.01	-6.68	0.32	15.52	205.49
2398.78	0.98	271.16	2398.48	12.26	-14.00	-7.09	0.38	15.69	206.86
2424.63	0.99	275.16	2424.32	12.66	-13.98	-7.53	0.27	15.88	208.33
2449.92	0.84	279.46	2449.62	13.00	-13.93	-7.93	0.67	16.03	209.67
2471.45	0.84	281.79	2471.14	13.26	-13.87	-8.24	0.16	16.13	210.73
2496.87	0.96	286.97	2496.56	13.57	-13.77	-8.63	0.58	16.25	212.07
2523.31	0.97	283.26	2523.00	13.91	-13.65	-9.06	0.24	16.38	213.56
2545.01	0.86	287.37	2544.69	14.17	-13.56	-9.39	0.56	16.49	214.70
2572.10	0.83	295.90	2571.77	14.45	-13.41	-9.76	0.48	16.59	216.05
2599.29	0.90	294.06	2598.96	14.72	-13.24	-10.14	0.29	16.67	217.43
2621.38	0.75	288.08	2621.05	14.94	-13.12	-10.43	0.78	16.77	218.48
2648.51	0.73	287.83	2648.18	15.20	-13.02	-10.76	0.10	16.89	219.59
2670.55	0.58	301.10	2670.22	15.36	-12.92	-10.99	0.95	16.96	220.40
2697.55	0.76	307.35	2697.21	15.53	-12.74	-11.25	0.71	17.00	221.45
2724.62	0.98	302.73	2724.28	15.74	-12.50	-11.59	0.88	17.05	222.83
2746.52	1.23	295.26	2746.19	15.99	-12.30	-11.96	1.29	17.16	224.19

Well Name: MILLARD #2
Survey: MILLARD #2 OUTFIT
Survey Date: 10/16/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
2773.62	0.71	269.11	2773.27	16.33	-12.18	-12.39	2.47	17.37	225.49
2796.33	0.94	286.41	2795.99	16.60	-12.13	-12.71	1.50	17.57	226.34
2822.58	0.93	290.78	2822.24	16.91	-11.99	-13.12	0.28	17.77	227.56
2849.67	1.09	294.35	2849.31	17.24	-11.81	-13.55	0.65	17.98	228.93
2872.00	0.88	296.83	2871.65	17.48	-11.64	-13.90	0.96	18.13	230.05
2898.55	0.86	292.75	2898.19	17.75	-11.48	-14.27	0.24	18.31	231.19
2920.77	1.00	287.80	2920.41	18.00	-11.35	-14.61	0.72	18.50	232.15
2946.81	0.85	298.03	2946.44	18.29	-11.19	-14.99	0.86	18.71	233.27
2973.48	1.04	290.03	2973.11	18.58	-11.01	-15.40	0.88	18.93	234.42
2995.63	0.81	297.26	2995.25	18.82	-10.87	-15.73	1.16	19.12	235.34
3021.66	0.68	299.72	3021.29	19.03	-10.71	-16.02	0.54	19.28	236.24
3048.18	0.75	280.32	3047.80	19.26	-10.60	-16.33	0.95	19.47	237.01
3074.70	0.81	283.13	3074.32	19.55	-10.53	-16.69	0.26	19.73	237.75
3096.31	0.73	306.04	3095.93	19.74	-10.41	-16.95	1.46	19.89	238.43
3122.84	1.01	291.18	3122.46	19.99	-10.23	-17.30	1.34	20.10	239.41
3148.73	0.67	264.53	3148.34	20.29	-10.16	-17.67	1.97	20.38	240.09
3171.00	0.34	244.15	3170.61	20.48	-10.20	-17.86	1.66	20.57	240.26
3197.59	0.62	281.99	3197.20	20.68	-10.21	-18.07	1.53	20.75	240.54
3223.33	0.76	266.95	3222.94	20.94	-10.19	-18.37	0.88	21.01	240.99
3249.86	0.81	264.78	3249.46	21.28	-10.21	-18.74	0.23	21.34	241.40
3272.01	0.74	281.24	3271.62	21.55	-10.20	-19.03	1.05	21.59	241.81
3297.82	0.67	258.94	3297.42	21.83	-10.20	-19.34	1.08	21.87	242.20
3324.35	0.68	272.15	3323.95	22.12	-10.22	-19.65	0.59	22.15	242.52
3349.28	0.82	263.39	3348.88	22.43	-10.24	-19.98	0.71	22.45	242.87
3371.54	0.79	234.78	3371.14	22.73	-10.34	-20.26	1.79	22.75	242.96
3397.88	0.67	277.09	3397.47	23.04	-10.43	-20.57	2.05	23.06	243.11
3423.53	0.76	255.88	3423.12	23.33	-10.45	-20.88	1.08	23.35	243.41
3449.94	0.70	236.50	3449.53	23.67	-10.58	-21.18	0.95	23.68	243.45
3471.91	0.62	225.50	3471.50	23.91	-10.74	-21.38	0.69	23.93	243.33
3497.96	0.64	253.40	3497.55	24.19	-10.88	-21.62	1.16	24.20	243.29
3524.61	0.56	268.61	3524.20	24.45	-10.93	-21.89	0.67	24.47	243.48
3547.61	0.61	257.07	3547.20	24.67	-10.96	-22.12	0.56	24.69	243.65
3572.25	0.89	214.44	3571.83	24.97	-11.14	-22.36	2.44	24.98	243.51
3597.46	0.75	256.49	3597.04	25.29	-11.34	-22.63	2.38	25.31	243.38
3623.82	0.75	252.15	3623.39	25.63	-11.44	-22.96	0.22	25.65	243.52
3645.90	0.60	251.25	3645.48	25.89	-11.52	-23.21	0.68	25.91	243.61

Survey Report

Well Name: MILLARD #2
Survey: MILLARD #2 OUTFIT
Survey Date: 10/16/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
3672.98	0.46	248.54	3672.56	26.14	-11.60	-23.44	0.55	26.16	243.67
3695.63	0.57	251.64	3695.21	26.34	-11.67	-23.63	0.53	26.36	243.72
3722.00	0.72	239.41	3721.57	26.64	-11.80	-23.90	0.76	26.65	243.73
3748.92	0.58	248.69	3748.49	26.94	-11.93	-24.17	0.65	26.95	243.73
3771.37	0.43	267.90	3770.94	27.13	-11.98	-24.36	0.99	27.15	243.82
3797.78	0.39	252.98	3797.36	27.32	-12.01	-24.55	0.43	27.33	243.94
3824.84	0.54	266.00	3824.40	27.53	-12.04	-24.76	0.65	27.53	244.07
3847.36	0.47	251.30	3846.93	27.72	-12.08	-24.95	0.65	27.72	244.17
3873.63	0.39	276.14	3873.20	27.90	-12.10	-25.14	0.76	27.90	244.30
3896.26	0.44	255.17	3895.83	28.05	-12.12	-25.30	0.70	28.05	244.41
3922.41	0.40	286.43	3921.97	28.22	-12.12	-25.49	0.87	28.22	244.57
3949.34	0.33	270.28	3948.90	28.36	-12.09	-25.66	0.47	28.36	244.77
3971.86	0.35	246.53	3971.42	28.49	-12.12	-25.78	0.63	28.49	244.83
3998.08	0.33	264.90	3997.64	28.64	-12.16	-25.93	0.43	28.64	244.89
4024.97	0.26	270.03	4024.54	28.77	-12.16	-26.07	0.27	28.77	244.99
4046.70	0.26	277.18	4046.26	28.86	-12.16	-26.17	0.15	28.86	245.09
4073.61	0.30	242.37	4073.18	28.98	-12.18	-26.29	0.63	28.98	245.14
4096.05	0.18	257.56	4095.62	29.07	-12.21	-26.38	0.60	29.07	245.15
4122.21	0.27	228.84	4121.78	29.17	-12.26	-26.46	0.54	29.17	245.14
4148.93	0.26	227.13	4148.49	29.28	-12.35	-26.56	0.03	29.29	245.07
4171.43	0.39	223.79	4170.99	29.40	-12.44	-26.65	0.56	29.41	244.98
4197.17	0.34	228.34	4196.73	29.56	-12.55	-26.76	0.23	29.56	244.88
4223.95	0.20	286.12	4223.51	29.67	-12.59	-26.87	1.07	29.67	244.89
4246.61	0.19	259.32	4246.17	29.74	-12.59	-26.94	0.40	29.74	244.96
4272.32	0.25	247.84	4271.88	29.83	-12.61	-27.04	0.27	29.83	244.99
4298.62	0.27	241.80	4298.18	29.95	-12.66	-27.14	0.14	29.95	244.99
4324.97	0.30	202.15	4324.53	30.06	-12.76	-27.22	0.73	30.06	244.89
4346.25	0.17	201.74	4345.81	30.12	-12.84	-27.25	0.59	30.13	244.78
4372.50	0.29	192.99	4372.06	30.19	-12.94	-27.28	0.46	30.20	244.63
4398.03	0.13	242.88	4397.59	30.26	-13.01	-27.32	0.88	30.26	244.53
4423.36	0.22	305.09	4422.92	30.31	-13.00	-27.39	0.77	30.32	244.61
4449.54	0.20	237.70	4449.10	30.38	-12.99	-27.47	0.88	30.39	244.68
4470.68	0.16	253.17	4470.24	30.45	-13.02	-27.53	0.28	30.45	244.68
4496.80	0.16	253.90	4496.36	30.52	-13.04	-27.60	0.01	30.52	244.70
4522.01	0.04	220.09	4521.57	30.57	-13.06	-27.64	0.51	30.57	244.71
4547.50	0.27	28.60	4547.06	30.53	-13.02	-27.62	1.22	30.53	244.76



Well Name: MILLARD #2
Survey: MILLARD #2 OUTFUN
Survey Date: 10/16/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
4573.31	0.16	317.47	4572.87	30.49	-12.94	-27.61	1.02	30.49	244.90
4597.94	0.29	321.11	4597.50	30.52	-12.86	-27.67	0.51	30.52	245.07
4624.79	0.52	311.06	4624.35	30.58	-12.73	-27.81	0.91	30.58	245.40
4647.26	0.60	219.40	4646.82	30.73	-12.76	-27.96	3.58	30.73	245.48
4670.03	0.46	267.98	4669.59	30.92	-12.85	-28.13	2.00	30.92	245.45
4671.77	0.48	284.92	4671.33	30.94	-12.85	-28.14	8.07	30.94	245.46