



Gyroscopic Survey Report  
for  
K P Kauffman

Well Location	Weld County, Colorado
Well Name	Alex H Miller No.2
Rig Number	KPK 8
Survey Date	8/14/2014
Latitude	40.0782200°N
Longitude	104.8504300°W
North Reference	True North
Grid Correction	None
Depth Reference	Ground Level (4955.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 280.89Azim (deg)
Definitive Survey	ALEX H MILLER #2
Operator(s)	Jon Valenzuela

**Well Notes**

# Survey Report

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**Survey Date:** 8/14/2014

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
98.73	0.16	347.52	98.73	0.06	0.14	-0.03	0.16	0.14	347.52
112.15	0.15	40.06	112.15	0.05	0.17	-0.02	1.04	0.17	352.39
136.55	0.13	340.01	136.55	0.05	0.22	-0.01	0.58	0.22	357.27
160.57	0.11	59.30	160.57	0.05	0.26	0.00	0.63	0.26	0.04
184.72	0.06	8.20	184.72	0.03	0.28	0.02	0.35	0.28	4.46
210.13	0.05	297.15	210.13	0.04	0.30	0.01	0.26	0.30	2.72
235.43	0.09	228.41	235.43	0.06	0.29	-0.01	0.33	0.29	358.06
260.81	0.13	229.68	260.81	0.09	0.26	-0.05	0.17	0.26	349.85
285.64	0.20	228.99	285.64	0.14	0.21	-0.10	0.26	0.24	334.86
311.01	0.24	244.41	311.01	0.21	0.16	-0.18	0.28	0.24	312.04
336.37	0.24	253.48	336.36	0.30	0.12	-0.28	0.15	0.30	294.15
361.62	0.23	258.13	361.62	0.39	0.10	-0.38	0.09	0.39	284.74
386.98	0.16	279.59	386.97	0.47	0.09	-0.46	0.39	0.47	281.63
411.75	0.20	304.31	411.75	0.54	0.12	-0.53	0.35	0.54	283.24
437.10	0.11	311.24	437.10	0.61	0.17	-0.58	0.34	0.61	285.84
462.52	0.06	301.10	462.52	0.64	0.19	-0.62	0.21	0.64	287.11
487.64	0.08	259.24	487.63	0.67	0.19	-0.64	0.21	0.67	286.70
512.55	0.09	241.51	512.55	0.70	0.18	-0.68	0.11	0.70	284.95
537.65	0.17	202.31	537.65	0.72	0.14	-0.71	0.46	0.72	280.97
559.56	0.20	204.78	559.56	0.74	0.07	-0.74	0.16	0.74	275.61
584.84	0.32	207.85	584.83	0.77	-0.03	-0.79	0.45	0.79	267.83
612.98	0.30	216.36	612.98	0.82	-0.16	-0.87	0.17	0.88	259.71
634.69	0.35	225.53	634.69	0.88	-0.25	-0.95	0.33	0.98	255.27
659.93	0.26	230.79	659.93	0.96	-0.34	-1.05	0.38	1.10	252.07
685.16	0.35	214.58	685.16	1.03	-0.44	-1.13	0.49	1.22	248.90
710.39	0.38	209.64	710.39	1.09	-0.57	-1.22	0.18	1.35	244.80
734.94	0.30	204.10	734.94	1.13	-0.70	-1.29	0.35	1.47	241.31
760.17	0.31	199.08	760.16	1.15	-0.83	-1.34	0.11	1.57	238.18
785.34	0.37	198.63	785.33	1.18	-0.97	-1.38	0.25	1.69	234.97
810.53	0.59	239.38	810.52	1.28	-1.11	-1.52	1.57	1.89	233.81
835.11	0.67	229.85	835.11	1.47	-1.27	-1.74	0.53	2.16	233.88
860.16	0.64	227.18	860.15	1.64	-1.46	-1.96	0.18	2.44	233.25
885.31	0.68	233.89	885.30	1.83	-1.64	-2.18	0.35	2.73	232.98
910.47	0.70	233.02	910.46	2.03	-1.82	-2.42	0.08	3.03	233.02
935.01	0.92	233.72	935.00	2.27	-2.03	-2.70	0.93	3.38	233.07

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
959.99	0.72	234.37	959.98	2.51	-2.24	-2.99	0.81	3.74	233.16
985.05	0.82	226.97	985.03	2.73	-2.46	-3.25	0.57	4.07	232.93
1009.78	0.99	235.07	1009.75	2.98	-2.70	-3.55	0.84	4.46	232.79
1037.07	0.99	245.08	1037.04	3.34	-2.93	-3.96	0.63	4.93	233.49
1059.72	0.87	240.05	1059.69	3.62	-3.10	-4.29	0.65	5.29	234.12
1085.87	0.86	242.08	1085.83	3.93	-3.29	-4.63	0.12	5.68	234.60
1111.80	0.93	243.12	1111.77	4.24	-3.48	-4.99	0.29	6.08	235.13
1137.62	0.92	245.11	1137.58	4.58	-3.66	-5.37	0.13	6.49	235.71
1162.87	0.84	247.73	1162.83	4.90	-3.81	-5.72	0.35	6.88	236.31
1184.96	0.85	244.41	1184.92	5.17	-3.95	-6.02	0.22	7.20	236.75
1210.85	0.72	246.76	1210.80	5.46	-4.09	-6.34	0.51	7.55	237.16
1235.96	0.67	248.15	1235.91	5.71	-4.21	-6.63	0.22	7.85	237.56
1261.71	0.60	252.52	1261.66	5.96	-4.31	-6.89	0.33	8.13	238.00
1287.48	0.65	247.62	1287.42	6.20	-4.41	-7.16	0.30	8.41	238.40
1309.58	0.46	255.85	1309.53	6.38	-4.48	-7.36	0.94	8.62	238.71
1335.31	0.47	261.55	1335.25	6.58	-4.52	-7.57	0.18	8.81	239.17
1360.42	0.51	262.48	1360.36	6.78	-4.55	-7.78	0.15	9.01	239.70
1386.10	0.49	262.35	1386.04	6.99	-4.57	-8.00	0.05	9.22	240.24
1411.78	0.47	258.87	1411.72	7.20	-4.61	-8.21	0.14	9.42	240.70
1437.35	0.59	265.97	1437.29	7.42	-4.64	-8.45	0.53	9.64	241.23
1462.43	0.63	264.63	1462.37	7.68	-4.66	-8.72	0.15	9.88	241.86
1484.45	0.71	266.13	1484.39	7.93	-4.68	-8.97	0.36	10.12	242.44
1510.09	0.65	268.81	1510.03	8.22	-4.70	-9.27	0.24	10.40	243.15
1535.72	0.62	272.41	1535.65	8.50	-4.69	-9.56	0.20	10.65	243.85
1560.72	0.74	265.82	1560.65	8.79	-4.70	-9.85	0.56	10.92	244.50
1586.25	0.63	266.81	1586.18	9.08	-4.72	-10.16	0.40	11.20	245.08
1611.63	0.50	265.73	1611.56	9.33	-4.73	-10.41	0.51	11.44	245.54
1635.77	0.75	270.21	1635.70	9.59	-4.74	-10.67	1.04	11.68	246.04
1661.83	0.77	268.81	1661.76	9.92	-4.75	-11.02	0.11	12.00	246.70
1687.65	0.74	271.02	1687.57	10.26	-4.75	-11.36	0.17	12.31	247.33
1710.19	0.79	272.36	1710.12	10.56	-4.74	-11.66	0.21	12.59	247.89
1735.04	0.77	272.78	1734.96	10.89	-4.72	-12.00	0.07	12.89	248.52
1759.93	0.76	273.07	1759.85	11.22	-4.70	-12.33	0.03	13.20	249.12
1787.98	0.77	273.00	1787.90	11.59	-4.68	-12.71	0.02	13.54	249.76
1810.31	0.77	270.31	1810.22	11.89	-4.68	-13.01	0.16	13.82	250.22
1837.62	1.06	273.91	1837.53	12.32	-4.66	-13.44	1.07	14.22	250.88

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
1862.10	1.14	278.02	1862.01	12.79	-4.61	-13.91	0.46	14.65	251.66
1889.82	0.85	280.21	1889.72	13.27	-4.53	-14.38	1.04	15.08	252.50
1910.39	0.85	276.89	1910.29	13.57	-4.49	-14.68	0.24	15.35	253.00
1935.59	0.72	277.39	1935.49	13.92	-4.45	-15.03	0.48	15.67	253.52
1960.69	0.79	262.07	1960.59	14.24	-4.45	-15.35	0.84	15.99	253.84
1985.90	0.74	257.18	1985.79	14.55	-4.51	-15.69	0.32	16.32	253.96
2010.50	0.77	259.11	2010.39	14.85	-4.58	-16.00	0.16	16.65	254.04
2035.67	0.91	263.53	2035.56	15.20	-4.63	-16.37	0.60	17.01	254.20
2060.50	0.99	266.74	2060.39	15.60	-4.67	-16.78	0.40	17.42	254.46
2085.15	0.98	272.34	2085.03	16.01	-4.67	-17.20	0.39	17.83	254.82
2112.43	1.04	267.64	2112.31	16.48	-4.67	-17.68	0.38	18.29	255.21
2137.14	1.18	267.54	2137.01	16.95	-4.69	-18.16	0.55	18.76	255.52
2161.93	1.05	279.22	2161.80	17.42	-4.66	-18.64	1.04	19.22	255.95
2186.69	0.74	283.98	2186.56	17.81	-4.59	-19.02	1.30	19.57	256.44
2210.91	0.72	263.04	2210.77	18.11	-4.57	-19.32	1.10	19.85	256.69
2235.67	0.84	278.78	2235.53	18.44	-4.56	-19.65	0.99	20.18	256.94
2260.33	0.85	274.77	2260.18	18.80	-4.52	-20.01	0.24	20.52	257.28
2285.04	0.77	275.88	2284.90	19.15	-4.49	-20.36	0.33	20.85	257.57
2309.75	0.77	283.77	2309.60	19.48	-4.43	-20.69	0.43	21.16	257.91
2337.29	0.79	289.18	2337.14	19.85	-4.32	-21.05	0.27	21.49	258.39
2362.02	0.75	288.95	2361.87	20.18	-4.21	-21.36	0.17	21.77	258.84
2386.72	0.68	294.65	2386.57	20.48	-4.10	-21.64	0.39	22.03	259.27
2411.43	0.81	302.97	2411.27	20.79	-3.94	-21.92	0.69	22.28	259.80
2436.12	0.69	295.58	2435.96	21.09	-3.79	-22.20	0.65	22.53	260.32
2460.10	0.65	281.90	2459.94	21.36	-3.70	-22.47	0.68	22.77	260.66
2484.71	0.55	286.22	2484.55	21.62	-3.63	-22.72	0.46	23.00	260.91
2512.68	0.60	273.18	2512.52	21.90	-3.59	-22.99	0.50	23.27	261.13
2537.22	0.56	264.69	2537.06	22.14	-3.59	-23.24	0.38	23.51	261.21
2561.62	0.78	282.86	2561.45	22.42	-3.57	-23.52	1.24	23.79	261.38
2585.58	0.59	263.81	2585.42	22.70	-3.54	-23.80	1.22	24.06	261.53
2610.28	0.71	272.86	2610.11	22.98	-3.55	-24.08	0.62	24.34	261.61
2636.21	0.80	264.38	2636.04	23.31	-3.56	-24.42	0.57	24.68	261.70
2662.22	0.95	247.34	2662.05	23.66	-3.66	-24.80	1.15	25.07	261.60
2683.88	0.56	253.06	2683.70	23.91	-3.76	-25.07	1.87	25.35	261.47
2710.01	0.51	276.88	2709.83	24.13	-3.78	-25.30	0.86	25.59	261.49
2736.03	0.57	307.72	2735.85	24.37	-3.69	-25.52	1.13	25.79	261.77

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
2762.03	0.42	305.29	2761.85	24.57	-3.56	-25.70	0.57	25.95	262.12
2787.43	0.40	277.60	2787.25	24.74	-3.49	-25.87	0.78	26.10	262.31
2809.74	0.30	249.57	2809.56	24.87	-3.50	-26.00	0.87	26.23	262.33
2835.71	0.03	214.40	2835.53	24.93	-3.53	-26.06	1.04	26.30	262.29
2861.59	0.28	14.21	2861.41	24.93	-3.48	-26.05	1.20	26.28	262.40
2887.55	0.21	242.23	2887.37	24.96	-3.44	-26.08	1.73	26.31	262.49
2912.93	0.44	297.68	2912.75	25.09	-3.41	-26.21	1.45	26.43	262.58
2935.21	0.28	26.72	2935.03	25.16	-3.32	-26.26	2.35	26.47	262.79
2961.14	0.36	128.50	2960.95	25.07	-3.32	-26.17	1.94	26.38	262.77
2986.17	0.23	104.12	2985.99	24.95	-3.38	-26.06	0.72	26.28	262.61
3011.73	0.23	63.73	3011.55	24.86	-3.37	-25.96	0.63	26.18	262.61
3037.20	0.27	22.10	3037.02	24.80	-3.29	-25.89	0.71	26.10	262.76
3062.64	0.39	114.49	3062.45	24.71	-3.27	-25.79	1.90	26.00	262.77
3084.77	0.17	121.71	3084.59	24.60	-3.32	-25.69	1.03	25.91	262.64
3109.60	0.08	125.14	3109.42	24.56	-3.35	-25.65	0.37	25.87	262.56
3134.91	0.55	115.97	3134.72	24.42	-3.41	-25.53	1.86	25.75	262.39
3160.59	0.15	23.72	3160.41	24.30	-3.43	-25.40	2.23	25.64	262.30
3186.06	0.06	336.07	3185.87	24.30	-3.39	-25.40	0.47	25.62	262.39
3210.93	0.12	144.79	3210.75	24.29	-3.40	-25.39	0.70	25.61	262.37
3236.39	0.29	246.05	3236.20	24.32	-3.45	-25.43	1.32	25.66	262.28
3261.74	0.17	257.42	3261.56	24.41	-3.48	-25.53	0.52	25.76	262.23
3287.18	0.10	254.89	3286.99	24.46	-3.50	-25.58	0.27	25.82	262.22
3312.03	0.10	344.64	3311.85	24.49	-3.48	-25.61	0.57	25.84	262.26
3337.45	0.19	219.65	3337.26	24.52	-3.49	-25.64	1.05	25.88	262.25
3362.87	0.27	258.34	3362.68	24.60	-3.53	-25.73	0.66	25.97	262.18
3384.69	0.11	284.85	3384.51	24.67	-3.54	-25.80	0.80	26.04	262.19
3410.10	0.17	326.93	3409.91	24.72	-3.50	-25.84	0.45	26.08	262.28
3434.93	0.23	244.37	3434.75	24.78	-3.49	-25.91	1.08	26.14	262.32
3460.25	0.35	251.31	3460.06	24.89	-3.54	-26.03	0.48	26.27	262.26
3485.55	0.24	260.72	3485.36	25.01	-3.57	-26.15	0.45	26.40	262.22
3511.05	0.29	287.42	3510.86	25.12	-3.56	-26.27	0.52	26.51	262.28
3535.73	0.36	289.88	3535.54	25.26	-3.52	-26.40	0.27	26.64	262.41
3561.08	0.38	294.57	3560.89	25.42	-3.46	-26.55	0.14	26.78	262.59
3586.43	0.44	282.71	3586.24	25.60	-3.40	-26.72	0.43	26.94	262.75
3611.53	0.49	278.17	3611.34	25.80	-3.36	-26.92	0.24	27.13	262.88
3636.44	0.66	277.67	3636.25	26.06	-3.33	-27.17	0.70	27.38	263.02

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3661.54	0.72	279.04	3661.35	26.36	-3.28	-27.47	0.22	27.67	263.18
3686.91	0.90	277.91	3686.71	26.72	-3.23	-27.83	0.74	28.01	263.38
3712.17	0.90	284.18	3711.97	27.11	-3.16	-28.22	0.39	28.39	263.62
3737.41	1.03	281.13	3737.21	27.54	-3.06	-28.63	0.55	28.79	263.89
3762.06	1.20	288.48	3761.86	28.01	-2.94	-29.09	0.92	29.24	264.23
3787.23	1.25	287.65	3787.01	28.55	-2.77	-29.60	0.20	29.73	264.65
3809.59	1.34	290.38	3809.37	29.05	-2.61	-30.08	0.51	30.20	265.05
3835.65	1.23	296.26	3835.42	29.62	-2.38	-30.62	0.68	30.71	265.56
3860.95	1.33	296.80	3860.72	30.16	-2.12	-31.13	0.39	31.20	266.10
3886.91	1.26	302.90	3886.68	30.72	-1.83	-31.63	0.60	31.69	266.68
3912.52	1.08	307.84	3912.28	31.19	-1.53	-32.06	0.81	32.09	267.26
3934.52	1.02	304.71	3934.28	31.55	-1.30	-32.38	0.37	32.41	267.71
3959.55	0.93	315.14	3959.30	31.93	-1.02	-32.71	0.78	32.72	268.21
3985.20	0.84	321.40	3984.95	32.24	-0.73	-32.97	0.54	32.98	268.73
4010.80	0.81	325.25	4010.55	32.51	-0.43	-33.19	0.23	33.20	269.25
4035.71	0.89	324.91	4035.45	32.78	-0.13	-33.41	0.32	33.41	269.78
4061.27	1.02	309.06	4061.01	33.12	0.18	-33.70	1.13	33.70	270.30
4086.21	0.96	303.28	4085.94	33.51	0.43	-34.04	0.46	34.04	270.72
4111.71	0.97	315.38	4111.44	33.89	0.70	-34.37	0.80	34.38	271.17
4137.11	1.01	309.43	4136.84	34.26	1.00	-34.70	0.44	34.71	271.64
4162.04	1.02	305.27	4161.76	34.66	1.26	-35.05	0.30	35.07	272.06
4187.52	0.93	306.08	4187.24	35.05	1.52	-35.40	0.33	35.43	272.45
4209.30	0.89	305.78	4209.01	35.36	1.72	-35.68	0.22	35.72	272.76
4234.89	0.92	304.59	4234.60	35.73	1.95	-36.01	0.16	36.06	273.10
4259.68	0.94	302.57	4259.39	36.10	2.17	-36.34	0.14	36.41	273.42
4285.22	0.73	312.87	4284.93	36.43	2.40	-36.64	1.01	36.72	273.74
4310.64	0.82	310.36	4310.35	36.73	2.62	-36.90	0.41	36.99	274.07
4335.99	0.77	312.44	4335.69	37.03	2.86	-37.16	0.24	37.27	274.40
4361.43	0.64	327.95	4361.13	37.27	3.09	-37.36	0.91	37.49	274.73
4386.08	0.70	332.51	4385.78	37.46	3.34	-37.50	0.35	37.65	275.09
4411.69	0.66	331.98	4411.39	37.65	3.61	-37.65	0.17	37.82	275.48
4437.03	0.73	335.25	4436.73	37.84	3.89	-37.78	0.30	37.98	275.88
4462.26	0.80	330.17	4461.96	38.05	4.19	-37.94	0.39	38.17	276.30
4486.98	0.89	323.26	4486.68	38.30	4.49	-38.14	0.56	38.40	276.72
4512.15	0.82	334.71	4511.84	38.55	4.81	-38.33	0.74	38.63	277.15
4537.29	0.84	335.01	4536.97	38.76	5.14	-38.49	0.09	38.83	277.60

**Well Name:** Alex H Miller No.2  
**Survey:** ALEX H MILLER #2  
**Survey Date:** 8/14/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
4562.19	0.78	333.47	4561.87	38.97	5.46	-38.64	0.25	39.02	278.04
4585.31	0.78	334.12	4585.00	39.16	5.74	-38.78	0.04	39.20	278.42
4611.71	0.72	335.54	4611.39	39.37	6.05	-38.93	0.23	39.39	278.84
4636.74	1.05	323.09	4636.41	39.63	6.38	-39.13	1.51	39.65	279.26
4661.38	0.96	324.39	4661.05	39.95	6.73	-39.39	0.38	39.96	279.69
4688.00	0.96	329.57	4687.67	40.26	7.10	-39.63	0.33	40.26	280.16
4712.03	1.16	314.29	4711.69	40.59	7.45	-39.91	1.44	40.59	280.57
4736.74	0.89	307.87	4736.40	40.97	7.74	-40.24	1.20	40.97	280.89