



Gyroscopic Survey Report
for
K.P. KAUFFMAN
1675 BROADWAY SUITE 2800
DENVER, CO 80202

Well Location	ADAMS COUNTY, CO
Well Name	ALBERT SACK E 1
Rig Number	FMC 134
Survey Date	7/25/2014
Latitude	39.9991100°N
Longitude	104.9247400°W
North Reference	True North
Grid Correction	None
Depth Reference	GROUND LEVEL (5071.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 281.52Azim (deg)
Definitive Survey	ALBERT SACK E 1
Operator(s)	C JAQUES/ C KIRBY

Well Notes

Survey Report

Well Name: ALBERT SACK E 1
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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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
99.31	0.19	130.28	99.31	-0.15	-0.11	0.13	0.19	0.17	130.28
124.14	0.15	143.59	124.14	-0.21	-0.16	0.18	0.24	0.24	132.04
149.81	0.15	133.61	149.81	-0.26	-0.21	0.22	0.10	0.31	133.45
173.22	0.12	110.55	173.22	-0.31	-0.24	0.27	0.26	0.36	131.92
199.17	0.14	110.22	199.17	-0.37	-0.26	0.32	0.09	0.42	128.88
222.47	0.11	322.81	222.46	-0.38	-0.25	0.34	1.06	0.42	126.86
248.59	0.17	334.69	248.59	-0.34	-0.20	0.31	0.25	0.36	122.87
274.60	0.16	326.68	274.60	-0.29	-0.13	0.27	0.10	0.30	116.16
298.46	0.16	8.86	298.46	-0.27	-0.07	0.26	0.48	0.27	105.58
324.45	0.15	353.57	324.45	-0.25	0.00	0.26	0.17	0.26	90.54
347.93	0.14	329.20	347.93	-0.23	0.05	0.24	0.26	0.25	77.87
373.93	0.07	328.82	373.93	-0.19	0.09	0.22	0.26	0.23	66.64
397.51	0.18	347.28	397.51	-0.17	0.14	0.20	0.48	0.24	54.58
423.48	0.09	323.77	423.48	-0.13	0.20	0.18	0.39	0.27	41.93
449.45	0.24	1.55	449.44	-0.11	0.27	0.17	0.69	0.32	31.76
472.89	0.11	345.59	472.88	-0.09	0.34	0.16	0.58	0.38	25.46
498.78	0.22	343.40	498.78	-0.06	0.41	0.14	0.40	0.44	19.02
524.85	0.36	338.81	524.84	0.01	0.54	0.10	0.57	0.55	10.41
548.31	0.33	338.29	548.31	0.09	0.67	0.05	0.12	0.67	3.97
574.18	0.31	341.02	574.17	0.17	0.81	0.00	0.10	0.81	359.69
599.79	0.37	329.01	599.79	0.26	0.94	-0.07	0.35	0.95	355.81
622.78	0.34	336.67	622.78	0.35	1.07	-0.13	0.23	1.08	352.85
648.58	0.37	329.58	648.57	0.45	1.21	-0.21	0.21	1.23	350.30
674.62	0.45	328.71	674.62	0.57	1.37	-0.30	0.28	1.41	347.56
697.71	0.40	331.15	697.70	0.68	1.52	-0.39	0.23	1.57	345.67
723.32	0.42	332.40	723.32	0.80	1.68	-0.47	0.11	1.75	344.24
749.42	0.37	337.12	749.41	0.91	1.84	-0.55	0.22	1.92	343.34
774.95	0.37	331.66	774.95	1.01	1.99	-0.62	0.14	2.09	342.63
797.69	0.47	331.56	797.68	1.12	2.14	-0.70	0.45	2.25	341.82
823.23	0.48	335.36	823.22	1.25	2.33	-0.80	0.13	2.46	341.10
848.74	0.46	333.93	848.74	1.37	2.52	-0.89	0.11	2.67	340.60
874.29	0.47	338.65	874.28	1.49	2.71	-0.97	0.15	2.88	340.29
899.88	0.49	336.21	899.87	1.61	2.90	-1.05	0.11	3.09	340.09
922.78	0.38	335.06	922.77	1.71	3.06	-1.12	0.46	3.26	339.86
948.77	0.47	337.00	948.76	1.82	3.24	-1.20	0.37	3.45	339.65

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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
974.24	0.54	344.80	974.22	1.94	3.45	-1.27	0.37	3.68	339.74
999.26	0.50	344.48	999.25	2.04	3.67	-1.33	0.15	3.90	340.03
1024.88	0.54	346.31	1024.86	2.14	3.90	-1.39	0.19	4.14	340.33
1048.26	0.52	342.50	1048.25	2.24	4.10	-1.45	0.19	4.35	340.54
1074.38	0.53	349.16	1074.36	2.34	4.34	-1.51	0.24	4.59	340.81
1098.14	0.56	349.40	1098.12	2.43	4.56	-1.55	0.14	4.81	341.21
1124.42	0.70	21.22	1124.40	2.45	4.83	-1.52	1.41	5.07	342.59
1148.15	0.61	328.28	1148.13	2.51	5.08	-1.53	2.48	5.30	343.23
1174.41	0.64	342.24	1174.38	2.68	5.33	-1.65	0.59	5.58	342.84
1197.97	0.66	342.71	1197.95	2.81	5.59	-1.73	0.12	5.85	342.82
1223.88	0.62	342.38	1223.85	2.95	5.87	-1.81	0.16	6.14	342.81
1249.81	0.67	340.86	1249.78	3.10	6.14	-1.91	0.18	6.43	342.76
1273.16	0.64	342.48	1273.13	3.23	6.40	-1.99	0.14	6.70	342.71
1299.08	0.66	346.50	1299.04	3.36	6.68	-2.07	0.20	6.99	342.79
1322.82	0.65	338.88	1322.78	3.49	6.94	-2.15	0.37	7.27	342.79
1348.70	0.67	346.42	1348.67	3.64	7.22	-2.24	0.34	7.56	342.78
1373.77	0.65	337.97	1373.74	3.78	7.50	-2.33	0.39	7.85	342.76
1397.55	0.61	334.39	1397.51	3.93	7.74	-2.43	0.22	8.11	342.55
1423.36	0.65	333.64	1423.32	4.10	7.99	-2.56	0.12	8.39	342.27
1449.28	0.68	329.77	1449.24	4.29	8.26	-2.70	0.23	8.69	341.90
1472.54	0.60	328.53	1472.50	4.47	8.48	-2.83	0.34	8.94	341.53
1498.43	0.57	325.56	1498.38	4.66	8.70	-2.98	0.18	9.20	341.12
1524.36	0.59	321.87	1524.31	4.85	8.92	-3.13	0.17	9.45	340.64
1547.66	0.56	325.08	1547.61	5.02	9.10	-3.27	0.19	9.67	340.23
1573.48	0.54	322.29	1573.43	5.21	9.30	-3.42	0.13	9.91	339.83
1599.33	0.56	318.75	1599.28	5.40	9.49	-3.58	0.15	10.14	339.36
1622.56	0.53	315.13	1622.51	5.58	9.65	-3.73	0.19	10.35	338.90
1648.50	0.54	312.75	1648.45	5.78	9.82	-3.90	0.10	10.57	338.34
1674.38	0.52	318.13	1674.33	5.98	9.99	-4.07	0.22	10.79	337.85
1697.60	0.53	318.12	1697.55	6.15	10.15	-4.21	0.05	10.99	337.48
1723.88	0.52	322.59	1723.83	6.34	10.33	-4.36	0.16	11.22	337.12
1749.54	0.51	319.90	1749.49	6.52	10.51	-4.51	0.10	11.44	336.80
1772.98	0.53	323.02	1772.92	6.68	10.68	-4.64	0.14	11.64	336.52
1798.77	0.55	319.05	1798.71	6.87	10.87	-4.79	0.17	11.88	336.21
1824.42	0.53	322.72	1824.37	7.05	11.06	-4.95	0.16	12.11	335.91
1849.47	0.51	320.47	1849.41	7.23	11.24	-5.09	0.13	12.33	335.64

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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
1872.74	0.56	327.23	1872.68	7.39	11.41	-5.21	0.34	12.55	335.45
1898.23	0.58	320.75	1898.16	7.57	11.61	-5.36	0.26	12.79	335.22
1923.59	0.61	310.20	1923.52	7.79	11.80	-5.55	0.46	13.04	334.83
1949.08	0.59	321.78	1949.01	8.01	11.99	-5.73	0.49	13.29	334.46
1974.48	0.59	323.41	1974.42	8.21	12.20	-5.89	0.07	13.55	334.23
1997.40	0.64	323.36	1997.33	8.39	12.40	-6.04	0.21	13.79	334.04
2022.86	0.63	319.33	2022.79	8.61	12.62	-6.21	0.18	14.06	333.78
2048.50	0.67	313.57	2048.43	8.85	12.83	-6.41	0.29	14.34	333.43
2073.99	0.67	321.78	2073.92	9.09	13.05	-6.62	0.38	14.63	333.12
2099.31	0.70	318.72	2099.23	9.32	13.28	-6.81	0.20	14.92	332.86
2124.68	0.65	317.41	2124.60	9.56	13.50	-7.01	0.23	15.21	332.57
2149.96	0.59	309.66	2149.88	9.79	13.69	-7.20	0.40	15.47	332.25
2172.75	0.68	312.77	2172.68	10.01	13.86	-7.39	0.44	15.71	331.92
2198.23	0.63	314.80	2198.15	10.26	14.06	-7.60	0.24	15.98	331.59
2224.24	0.63	312.88	2224.15	10.50	14.26	-7.81	0.09	16.26	331.28
2247.68	0.59	310.00	2247.59	10.72	14.42	-8.00	0.22	16.49	330.99
2273.63	0.55	310.16	2273.54	10.95	14.59	-8.20	0.16	16.74	330.67
2298.89	0.69	301.07	2298.81	11.20	14.75	-8.42	0.67	16.98	330.27
2323.14	0.46	312.18	2323.05	11.42	14.89	-8.62	1.06	17.20	329.93
2348.79	0.42	305.51	2348.70	11.59	15.01	-8.77	0.24	17.39	329.70
2376.83	0.45	340.87	2376.74	11.75	15.18	-8.89	0.95	17.59	329.63
2397.75	0.28	305.20	2397.66	11.83	15.28	-8.96	1.33	17.72	329.62
2423.68	0.37	307.54	2423.59	11.97	15.37	-9.08	0.37	17.85	329.43
2449.36	0.32	304.99	2449.27	12.11	15.46	-9.20	0.19	17.99	329.24
2475.00	0.32	294.86	2474.91	12.24	15.53	-9.33	0.22	18.12	329.02
2497.98	0.31	334.19	2497.89	12.34	15.62	-9.41	0.92	18.23	328.93
2523.77	0.29	309.51	2523.68	12.44	15.72	-9.49	0.51	18.37	328.88
2549.41	0.27	301.73	2549.32	12.56	15.80	-9.59	0.17	18.48	328.73
2574.85	0.29	301.20	2574.76	12.67	15.86	-9.70	0.07	18.59	328.55
2598.03	0.30	309.34	2597.94	12.78	15.93	-9.80	0.19	18.70	328.41
2623.73	0.38	308.78	2623.64	12.92	16.03	-9.92	0.30	18.85	328.25
2649.28	0.28	317.70	2649.19	13.04	16.13	-10.02	0.44	18.99	328.13
2671.99	0.29	340.81	2671.90	13.12	16.22	-10.08	0.50	19.10	328.14
2697.94	0.24	312.26	2697.84	13.20	16.32	-10.14	0.53	19.22	328.14
2723.94	0.31	321.56	2723.85	13.30	16.41	-10.23	0.31	19.34	328.07
2749.45	0.31	294.32	2749.35	13.42	16.50	-10.33	0.58	19.47	327.93

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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
2772.57	0.28	264.57	2772.48	13.54	16.52	-10.45	0.67	19.54	327.68
2798.67	0.29	292.04	2798.57	13.66	16.53	-10.57	0.52	19.63	327.40
2824.65	0.27	286.44	2824.55	13.79	16.58	-10.69	0.14	19.73	327.18
2848.14	0.30	275.72	2848.04	13.90	16.60	-10.81	0.26	19.81	326.93
2874.21	0.32	288.08	2874.12	14.04	16.63	-10.94	0.27	19.91	326.65
2898.09	0.29	283.80	2897.99	14.17	16.66	-11.07	0.17	20.00	326.41
2923.72	0.33	291.26	2923.63	14.31	16.70	-11.20	0.21	20.11	326.17
2949.74	0.37	296.86	2949.64	14.46	16.77	-11.34	0.20	20.24	325.93
2973.18	0.44	265.99	2973.09	14.62	16.80	-11.50	0.95	20.35	325.61
2999.28	0.53	259.39	2999.18	14.83	16.77	-11.71	0.41	20.45	325.07
3022.72	0.62	254.20	3022.63	15.04	16.71	-11.94	0.48	20.54	324.45
3049.02	0.57	252.39	3048.92	15.28	16.64	-12.20	0.23	20.63	323.74
3074.69	0.74	251.77	3074.59	15.54	16.54	-12.48	0.66	20.73	322.97
3097.89	0.75	247.79	3097.78	15.79	16.44	-12.76	0.23	20.81	322.18
3123.47	0.82	249.06	3123.36	16.08	16.31	-13.09	0.26	20.91	321.26
3149.05	0.90	247.14	3148.94	16.40	16.17	-13.44	0.34	21.03	320.26
3174.78	0.87	249.78	3174.67	16.74	16.02	-13.81	0.19	21.16	319.23
3197.74	0.92	244.78	3197.62	17.03	15.88	-14.14	0.40	21.27	318.32
3223.55	0.98	247.30	3223.43	17.38	15.71	-14.54	0.30	21.40	317.22
3249.19	0.94	245.34	3249.06	17.73	15.54	-14.93	0.21	21.55	316.14
3274.81	1.08	245.09	3274.68	18.10	15.35	-15.34	0.53	21.70	315.01
3297.88	0.95	245.64	3297.75	18.43	15.18	-15.71	0.56	21.85	314.01
3323.05	1.06	245.88	3322.91	18.78	15.00	-16.11	0.45	22.01	312.94
3349.17	1.08	244.60	3349.03	19.18	14.79	-16.56	0.11	22.20	311.78
3372.66	1.14	244.19	3372.51	19.54	14.60	-16.97	0.25	22.38	310.71
3398.13	1.13	246.27	3397.99	19.95	14.39	-17.42	0.17	22.59	309.55
3422.97	1.09	247.67	3422.82	20.34	14.20	-17.87	0.17	22.82	308.47
3449.01	1.15	249.24	3448.85	20.77	14.01	-18.34	0.25	23.08	307.38
3474.65	1.20	250.91	3474.48	21.22	13.83	-18.83	0.24	23.37	306.29
3497.77	1.10	253.20	3497.60	21.62	13.69	-19.28	0.47	23.64	305.38
3523.33	1.19	256.40	3523.16	22.08	13.55	-19.77	0.43	23.97	304.43
3548.79	1.28	255.94	3548.61	22.58	13.42	-20.30	0.32	24.34	303.47
3574.43	1.29	259.47	3574.25	23.10	13.30	-20.86	0.31	24.74	302.52
3599.60	1.28	262.86	3599.41	23.63	13.21	-21.42	0.31	25.17	301.67
3622.53	1.28	261.85	3622.33	24.11	13.15	-21.93	0.10	25.57	300.94
3647.93	1.22	264.42	3647.73	24.64	13.08	-22.48	0.34	26.01	300.19

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3673.09	1.30	261.86	3672.88	25.16	13.01	-23.03	0.39	26.45	299.47
3698.10	1.29	264.64	3697.88	25.70	12.95	-23.59	0.25	26.91	298.76
3723.34	1.40	267.66	3723.12	26.27	12.91	-24.18	0.52	27.41	298.09
3748.92	1.39	271.41	3748.69	26.88	12.90	-24.80	0.36	27.96	297.48
3774.02	1.41	271.15	3773.78	27.49	12.92	-25.42	0.07	28.51	296.94
3799.25	1.28	273.15	3799.01	28.07	12.94	-26.01	0.55	29.05	296.45
3824.31	1.30	272.66	3824.06	28.63	12.97	-26.57	0.09	29.57	296.01
3849.42	1.21	273.90	3849.16	29.17	13.00	-27.12	0.35	30.07	295.61
3874.46	1.26	272.68	3874.19	29.71	13.03	-27.66	0.21	30.58	295.22
3899.12	1.22	271.42	3898.85	30.23	13.05	-28.19	0.20	31.07	294.83
3924.87	1.12	271.21	3924.60	30.75	13.06	-28.72	0.39	31.55	294.45
3948.18	1.02	274.23	3947.90	31.18	13.08	-29.15	0.48	31.95	294.16
3974.01	0.99	273.39	3973.72	31.63	13.11	-29.61	0.13	32.38	293.88
3999.88	0.83	271.13	3999.60	32.03	13.13	-30.02	0.64	32.76	293.62
4023.46	0.61	271.68	4023.18	32.32	13.13	-30.31	0.93	33.03	293.43
4049.49	0.55	269.86	4049.20	32.58	13.14	-30.57	0.25	33.28	293.25
4072.87	0.54	277.38	4072.58	32.80	13.15	-30.79	0.31	33.48	293.13
4098.68	0.55	266.95	4098.39	33.04	13.16	-31.04	0.39	33.71	292.98
4124.50	0.57	252.81	4124.21	33.27	13.12	-31.29	0.54	33.92	292.74
4147.67	0.57	253.51	4147.38	33.48	13.05	-31.51	0.03	34.10	292.50
4173.59	0.56	255.28	4173.29	33.70	12.98	-31.75	0.08	34.30	292.23
4199.57	0.63	248.96	4199.28	33.94	12.90	-32.01	0.37	34.51	291.95
4222.88	0.71	249.60	4222.58	34.17	12.80	-32.26	0.34	34.71	291.64
4248.51	0.69	246.69	4248.21	34.43	12.68	-32.55	0.16	34.94	291.29
4273.99	0.82	249.26	4273.68	34.71	12.56	-32.87	0.55	35.18	290.91
4299.50	0.97	256.25	4299.19	35.06	12.44	-33.25	0.72	35.50	290.52
4322.62	0.87	240.04	4322.32	35.37	12.31	-33.59	1.21	35.77	290.12
4348.54	0.88	230.16	4348.23	35.64	12.08	-33.91	0.58	36.00	289.61
4374.08	0.90	235.56	4373.76	35.90	11.84	-34.23	0.34	36.22	289.09
4399.59	0.89	230.99	4399.28	36.17	11.60	-34.55	0.28	36.44	288.57
4422.53	0.82	228.08	4422.21	36.38	11.38	-34.81	0.36	36.62	288.11
4448.04	1.06	225.75	4447.72	36.62	11.09	-35.12	0.96	36.83	287.53
4473.53	0.99	224.84	4473.20	36.88	10.77	-35.44	0.31	37.04	286.91
4498.96	0.87	216.14	4498.63	37.08	10.46	-35.71	0.73	37.21	286.33
4524.42	0.97	223.80	4524.09	37.27	10.15	-35.97	0.64	37.38	285.76
4549.77	0.98	221.57	4549.43	37.50	9.83	-36.26	0.16	37.57	285.17

Well Name: ALBERT SACK E 1
Survey: ALBERT SACK E 1
Survey Date: 7/25/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
4572.78	0.94	218.49	4572.44	37.68	9.54	-36.51	0.30	37.74	284.64
4598.13	0.99	214.38	4597.79	37.86	9.19	-36.77	0.35	37.90	284.04
4623.94	0.91	220.25	4623.59	38.05	8.85	-37.02	0.49	38.07	283.45
4649.27	0.77	217.68	4648.92	38.22	8.56	-37.26	0.60	38.23	282.95
4674.61	0.50	193.81	4674.26	38.30	8.32	-37.39	1.46	38.30	282.55
4699.92	0.28	222.10	4699.57	38.33	8.17	-37.46	1.14	38.34	282.30
4722.71	0.20	208.41	4722.35	38.37	8.09	-37.51	0.40	38.38	282.18
4747.99	0.43	147.91	4747.63	38.32	7.97	-37.48	1.49	38.32	282.01
4773.19	0.51	126.06	4772.84	38.15	7.83	-37.34	0.77	38.15	281.84
4798.43	0.45	141.63	4798.08	37.98	7.68	-37.19	0.56	37.98	281.67
4822.83	0.43	134.81	4822.48	37.83	7.54	-37.07	0.23	37.83	281.50
4849.15	0.49	92.60	4848.80	37.63	7.47	-36.88	1.28	37.63	281.45
4871.20	0.37	71.55	4870.84	37.48	7.49	-36.72	0.89	37.48	281.52