



K.P. KAUFFMAN

SURVEY REPORT

THREE FARMS # 11-23

KPK 2

2/10/2015



The **Ultimate Partner** In Wellbore Placement

CUSTOMER K.P. Kauffman
PROJECT THREE FARMS 11-23
FIELD Spindle

SDI JOB NO. 254821
SDI DISTRICT Casper
SDI KIT/UNIT

SITE INFORMATION

Site Name Weld County, North Dakota
Lat/Long 40.04149° N, 104.86496° W
Northing
Easting

Section NWNW 23
Township 1N
Range 67W 6PM

MAP INFORMATION

North Reference True North
Grid Correction
System
Datum
Map Zone



WELL INFORMATION

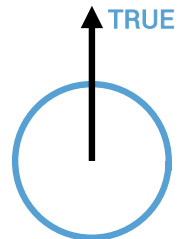
Lat/Long 40.04149° N, 104.86496° W
Northing
Easting
UWI 05-123-15962

DEPTH AND ELEVATION REFERENCE

Ground Level 4961 ft above Mean Sea Level
Reference Datum Ground Level
Reference Height 0 ft above G.L.
Reference Elevation 4961 ft

VERTICAL SECTION REFERENCE

+N/-S 0 ft
+E/-W 0 ft
Proposal Direction
Calculation Method Minimum Curvature



LOCAL GRAVITY REFERENCE INFORMATION

Local Gravity 999.037 mG [computed]

WELL NOTES

Keeper gyro survey run in 4.5" casing from surface to 4825' All depths referenced to ground level

OPERATORS

Jon Valenzuela

SDI Operator Name (Printed)

SIGNATURE

DATE

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DISTANCE	CLOSURE DIRECTION
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
34.69	1.60	22.72	34.69	0.17	0.45	0.19	4.61	0.48	22.72
48.83	1.38	30.76	48.82	0.28	0.77	0.35	2.13	0.85	24.32
73.11	1.29	30.25	73.09	0.41	1.26	0.64	0.36	1.41	26.80
99.54	1.10	33.65	99.52	0.52	1.73	0.93	0.79	1.96	28.21
123.60	0.94	47.29	123.58	0.55	2.06	1.20	1.20	2.38	30.28
148.08	0.77	57.54	148.05	0.49	2.28	1.49	0.92	2.72	33.11
173.07	0.77	60.81	173.04	0.40	2.45	1.78	0.18	3.03	35.91
198.91	0.76	67.51	198.88	0.28	2.60	2.09	0.35	3.34	38.70
223.10	0.81	83.84	223.07	0.11	2.68	2.40	0.94	3.60	41.86
246.87	0.85	87.55	246.84	-0.12	2.71	2.75	0.28	3.86	45.39
273.69	0.80	88.71	273.65	-0.40	2.72	3.13	0.19	4.15	49.00
296.59	0.83	96.15	296.55	-0.64	2.71	3.46	0.48	4.39	51.92
323.55	0.85	105.22	323.51	-0.97	2.63	3.84	0.50	4.66	55.57
346.61	0.83	107.11	346.56	-1.27	2.54	4.17	0.14	4.88	58.64
374.07	0.88	107.59	374.02	-1.64	2.42	4.56	0.15	5.16	62.06
396.33	0.98	116.44	396.27	-1.97	2.28	4.89	0.80	5.40	65.00
423.09	0.84	109.74	423.03	-2.37	2.11	5.28	0.65	5.69	68.20
445.66	0.85	110.91	445.60	-2.68	2.00	5.60	0.08	5.94	70.35
472.67	0.79	109.17	472.61	-3.03	1.87	5.96	0.22	6.24	72.62
499.59	0.74	110.85	499.53	-3.36	1.74	6.29	0.22	6.53	74.52
521.44	0.76	110.45	521.38	-3.63	1.64	6.56	0.13	6.76	75.95
548.48	0.73	112.64	548.41	-3.95	1.51	6.89	0.17	7.05	77.62
571.03	0.71	111.81	570.96	-4.22	1.41	7.15	0.10	7.29	78.88
597.28	0.77	113.66	597.21	-4.53	1.27	7.46	0.23	7.57	80.31
624.13	0.75	107.06	624.05	-4.86	1.15	7.79	0.33	7.88	81.60
645.95	0.76	109.49	645.87	-5.12	1.06	8.07	0.15	8.14	82.50
672.89	0.72	108.89	672.81	-5.43	0.95	8.39	0.14	8.45	83.56
699.69	0.62	104.89	699.61	-5.71	0.86	8.69	0.39	8.73	84.38
721.48	0.69	109.88	721.40	-5.94	0.78	8.93	0.38	8.96	85.00
748.40	0.66	104.29	748.31	-6.22	0.69	9.23	0.26	9.26	85.74
770.17	0.64	111.56	770.08	-6.44	0.61	9.47	0.39	9.49	86.29

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DISTANCE	CLOSURE DIRECTION
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
797.07	0.58	113.18	796.98	-6.71	0.50	9.73	0.21	9.74	87.03
823.85	0.57	110.48	823.76	-6.96	0.40	9.98	0.11	9.99	87.68
845.57	0.58	115.10	845.48	-7.16	0.32	10.18	0.21	10.18	88.20
872.54	0.52	126.60	872.45	-7.41	0.19	10.40	0.46	10.40	88.95
897.91	0.45	120.38	897.82	-7.62	0.07	10.58	0.34	10.58	89.61
924.88	0.54	124.14	924.79	-7.85	-0.05	10.77	0.35	10.77	90.28
947.38	0.53	130.78	947.28	-8.05	-0.18	10.94	0.28	10.94	90.94
973.56	0.48	128.49	973.46	-8.28	-0.33	11.12	0.21	11.12	91.68
996.03	0.32	132.45	995.93	-8.44	-0.43	11.24	0.70	11.24	92.18
1022.79	0.28	138.01	1022.69	-8.58	-0.53	11.34	0.18	11.35	92.67
1048.70	0.29	133.83	1048.60	-8.71	-0.62	11.43	0.08	11.44	93.11
1071.37	0.28	140.19	1071.27	-8.82	-0.70	11.50	0.14	11.53	93.50
1098.10	0.32	139.83	1098.00	-8.96	-0.81	11.59	0.15	11.62	94.01
1124.20	0.32	144.50	1124.11	-9.11	-0.93	11.69	0.10	11.72	94.54
1146.57	0.21	156.46	1146.48	-9.21	-1.02	11.74	0.54	11.78	94.96
1171.93	0.21	147.54	1171.83	-9.30	-1.10	11.78	0.13	11.83	95.34
1199.77	0.32	139.01	1199.68	-9.43	-1.20	11.86	0.40	11.92	95.79
1223.28	0.18	161.71	1223.19	-9.52	-1.29	11.92	0.71	11.98	96.16
1249.23	0.14	157.15	1249.13	-9.59	-1.35	11.94	0.16	12.02	96.47
1274.77	0.42	339.94	1274.67	-9.53	-1.30	11.92	2.19	11.99	96.20
1299.32	0.11	176.75	1299.22	-9.47	-1.24	11.89	2.14	11.95	95.93
1324.40	0.20	171.12	1324.30	-9.52	-1.30	11.90	0.36	11.97	96.25
1346.55	0.21	166.54	1346.45	-9.59	-1.38	11.91	0.08	11.99	96.60
1373.05	0.15	179.32	1372.95	-9.65	-1.46	11.93	0.24	12.01	96.98
1398.71	0.12	192.19	1398.61	-9.69	-1.52	11.92	0.17	12.02	97.27
1420.86	0.14	247.41	1420.76	-9.69	-1.55	11.89	0.55	11.99	97.45
1447.33	0.18	195.69	1447.23	-9.70	-1.61	11.85	0.55	11.96	97.73
1472.98	0.15	221.74	1472.88	-9.72	-1.67	11.82	0.32	11.93	98.06
1499.46	0.18	199.15	1499.36	-9.74	-1.74	11.78	0.28	11.91	98.39
1521.59	0.18	207.80	1521.49	-9.76	-1.80	11.75	0.12	11.89	98.71
1547.34	0.19	198.67	1547.24	-9.79	-1.88	11.72	0.13	11.87	99.10
1573.67	0.24	195.84	1573.57	-9.83	-1.97	11.69	0.20	11.86	99.58

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DISTANCE	CLOSURE DIRECTION
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
1595.06	0.21	208.01	1594.96	-9.87	-2.05	11.66	0.26	11.84	99.98
1621.52	0.20	205.67	1621.42	-9.89	-2.14	11.62	0.06	11.81	100.42
1647.84	0.23	229.10	1647.74	-9.90	-2.21	11.56	0.35	11.77	100.84
1673.58	0.29	220.55	1673.48	-9.90	-2.30	11.47	0.28	11.70	101.32
1699.92	0.32	227.62	1699.82	-9.90	-2.40	11.38	0.19	11.63	101.90
1722.00	0.34	229.77	1721.90	-9.89	-2.48	11.28	0.10	11.55	102.41
1747.74	0.31	236.87	1747.63	-9.86	-2.57	11.16	0.20	11.46	102.96
1773.55	0.35	246.60	1773.45	-9.82	-2.64	11.03	0.27	11.34	103.45
1799.06	0.29	254.96	1798.96	-9.75	-2.69	10.90	0.29	11.23	103.84
1823.97	0.40	226.37	1823.87	-9.71	-2.76	10.78	0.81	11.12	104.38
1846.14	0.37	234.55	1846.03	-9.70	-2.86	10.66	0.29	11.04	105.00
1872.78	0.37	231.18	1872.68	-9.67	-2.96	10.53	0.08	10.93	105.71
1895.75	0.35	238.05	1895.64	-9.64	-3.05	10.41	0.21	10.84	106.31
1923.22	0.37	223.58	1923.12	-9.62	-3.15	10.27	0.33	10.75	107.06
1949.73	0.36	226.48	1949.63	-9.62	-3.27	10.15	0.07	10.67	107.87
1972.91	0.38	253.43	1972.81	-9.57	-3.35	10.03	0.75	10.57	108.45
1995.81	0.45	236.11	1995.70	-9.52	-3.42	9.88	0.63	10.46	109.08
2022.25	0.45	252.67	2022.14	-9.44	-3.51	9.70	0.49	10.31	109.88
2049.06	0.51	242.95	2048.95	-9.35	-3.59	9.49	0.39	10.15	110.74
2070.88	0.51	244.13	2070.77	-9.29	-3.68	9.31	0.05	10.01	111.56
2097.84	0.52	246.76	2097.73	-9.20	-3.78	9.09	0.09	9.85	112.57
2124.67	0.57	244.72	2124.56	-9.10	-3.88	8.86	0.20	9.67	113.67
2145.75	0.52	244.46	2145.63	-9.03	-3.97	8.68	0.25	9.55	114.58
2172.68	0.53	233.65	2172.57	-8.96	-4.10	8.47	0.37	9.41	115.81
2198.77	0.49	242.03	2198.65	-8.91	-4.22	8.27	0.34	9.29	117.03
2221.25	0.51	245.18	2221.13	-8.84	-4.31	8.10	0.16	9.17	118.00
2248.17	0.56	245.67	2248.05	-8.75	-4.41	7.87	0.19	9.02	119.27
2274.22	0.55	249.27	2274.10	-8.64	-4.51	7.64	0.14	8.87	120.55
2296.82	0.59	251.03	2296.70	-8.54	-4.58	7.43	0.18	8.73	121.68
2322.77	0.75	250.69	2322.65	-8.40	-4.68	7.14	0.65	8.54	123.25
2349.58	0.70	264.19	2349.45	-8.22	-4.76	6.81	0.67	8.31	124.92
2372.28	0.74	262.90	2372.15	-8.03	-4.79	6.53	0.22	8.10	126.26

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	CLOSURE DISTANCE ft	CLOSURE DIRECTION deg
2398.32	0.81	268.37	2398.19	-7.80	-4.82	6.18	0.38	7.84	127.93
2420.88	0.81	273.07	2420.75	-7.57	-4.81	5.86	0.29	7.59	129.38
2447.48	0.90	277.67	2447.35	-7.25	-4.77	5.47	0.45	7.26	131.12
2474.81	0.89	273.17	2474.68	-6.92	-4.73	5.04	0.26	6.92	133.19
2496.55	0.96	278.35	2496.41	-6.64	-4.70	4.69	0.50	6.64	135.03
2523.28	1.00	284.17	2523.13	-6.25	-4.61	4.25	0.40	6.27	137.34
2549.42	1.06	291.64	2549.27	-5.83	-4.46	3.80	0.57	5.86	139.59
2571.86	1.18	291.43	2571.71	-5.42	-4.30	3.39	0.52	5.48	141.74
2598.85	1.26	296.89	2598.69	-4.88	-4.07	2.87	0.52	4.98	144.79
2621.41	1.22	295.75	2621.25	-4.42	-3.85	2.43	0.19	4.56	147.72
2649.21	1.30	295.25	2649.04	-3.84	-3.59	1.88	0.27	4.05	152.32
2671.77	1.36	298.25	2671.59	-3.34	-3.35	1.42	0.42	3.64	157.11
2699.66	1.46	302.99	2699.48	-2.67	-3.00	0.83	0.56	3.11	164.63
2722.98	1.43	301.16	2722.79	-2.09	-2.69	0.33	0.24	2.71	173.08
2746.28	1.55	301.77	2746.09	-1.50	-2.37	-0.19	0.50	2.38	184.57
2773.43	1.57	302.71	2773.23	-0.77	-1.98	-0.81	0.12	2.14	202.33
2795.75	1.67	305.36	2795.53	-0.15	-1.63	-1.34	0.58	2.10	219.37
2823.00	1.61	303.41	2822.77	0.62	-1.19	-1.98	0.29	2.31	239.08
2845.98	1.74	302.96	2845.74	1.28	-0.82	-2.54	0.54	2.67	252.15
2872.41	1.84	303.47	2872.16	2.09	-0.37	-3.23	0.40	3.25	263.53
2899.70	1.83	308.43	2899.43	2.96	0.15	-3.94	0.58	3.94	272.14
2921.84	1.91	307.77	2921.57	3.68	0.59	-4.51	0.35	4.55	277.49
2949.32	2.01	307.27	2949.03	4.61	1.16	-5.25	0.36	5.38	282.50
2972.29	2.06	308.84	2971.98	5.42	1.67	-5.90	0.35	6.13	285.79
2998.78	2.09	308.60	2998.45	6.38	2.27	-6.64	0.11	7.02	288.84
3021.61	2.07	310.16	3021.27	7.21	2.79	-7.28	0.26	7.80	290.98
3048.89	2.15	308.87	3048.53	8.21	3.43	-8.06	0.34	8.76	293.07
3070.97	2.24	308.74	3070.59	9.05	3.96	-8.72	0.39	9.58	294.44
3098.12	2.24	310.05	3097.73	10.11	4.64	-9.54	0.19	10.61	295.92
3120.27	2.26	308.42	3119.86	10.98	5.19	-10.21	0.31	11.46	296.92
3147.36	2.03	306.56	3146.93	11.99	5.80	-11.02	0.92	12.45	297.78
3171.98	2.24	309.14	3171.54	12.90	6.37	-11.74	0.97	13.36	298.48

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DISTANCE	CLOSURE DIRECTION
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
3198.46	2.26	306.12	3197.99	13.93	7.00	-12.57	0.45	14.39	299.13
3221.26	2.45	307.76	3220.77	14.86	7.57	-13.31	0.85	15.31	299.61
3248.54	2.38	307.09	3248.03	16.01	8.27	-14.23	0.25	16.45	300.16
3274.99	2.43	308.32	3274.45	17.11	8.95	-15.11	0.27	17.56	300.63
3297.77	2.47	306.59	3297.22	18.08	9.54	-15.88	0.36	18.52	300.99
3324.31	2.53	303.85	3323.73	19.23	10.21	-16.83	0.50	19.68	301.24
3347.08	2.51	303.20	3346.48	20.21	10.76	-17.66	0.16	20.68	301.35
3374.24	2.56	302.11	3373.60	21.39	11.41	-18.67	0.26	21.88	301.42
3396.29	2.49	301.25	3395.63	22.34	11.92	-19.50	0.36	22.85	301.43
3423.42	2.67	299.13	3422.74	23.53	12.53	-20.55	0.75	24.07	301.37
3446.44	2.73	300.29	3445.73	24.58	13.07	-21.50	0.35	25.16	301.30
3472.62	2.75	298.78	3471.89	25.80	13.68	-22.59	0.29	26.41	301.21
3495.67	2.83	298.56	3494.90	26.88	14.22	-23.57	0.31	27.53	301.11
3522.16	2.83	298.42	3521.37	28.14	14.85	-24.72	0.03	28.83	300.99
3549.12	2.93	299.20	3548.29	29.45	15.50	-25.90	0.42	30.19	300.89
3571.43	3.02	299.98	3570.57	30.58	16.07	-26.91	0.42	31.34	300.84
3597.47	2.98	297.47	3596.58	31.89	16.72	-28.10	0.53	32.70	300.76
3624.21	3.02	296.82	3623.28	33.24	17.36	-29.35	0.21	34.10	300.61
3645.83	3.06	300.16	3644.87	34.35	17.91	-30.36	0.84	35.25	300.54
3672.43	2.93	298.79	3671.43	35.69	18.60	-31.57	0.55	36.64	300.50
3699.12	2.81	302.01	3698.09	37.00	19.27	-32.72	0.76	37.98	300.49
3724.97	2.58	303.04	3723.91	38.19	19.92	-33.75	0.89	39.19	300.56
3747.28	2.63	306.18	3746.20	39.19	20.50	-34.58	0.67	40.20	300.66
3773.96	2.54	307.99	3772.85	40.39	21.23	-35.54	0.47	41.40	300.85
3799.67	2.51	310.16	3798.54	41.52	21.94	-36.42	0.38	42.52	301.06
3822.21	2.39	313.74	3821.05	42.48	22.58	-37.14	0.88	43.47	301.30
3848.74	2.39	317.71	3847.56	43.58	23.37	-37.91	0.62	44.54	301.66
3874.67	2.52	317.05	3873.47	44.69	24.19	-38.66	0.53	45.61	302.03
3896.91	2.31	319.32	3895.69	45.62	24.89	-39.29	1.04	46.51	302.35
3923.43	2.38	320.17	3922.18	46.70	25.72	-39.99	0.31	47.54	302.75
3949.33	2.40	322.25	3948.07	47.78	26.56	-40.67	0.34	48.57	303.15
3971.57	2.44	322.17	3970.28	48.70	27.30	-41.24	0.16	49.46	303.50

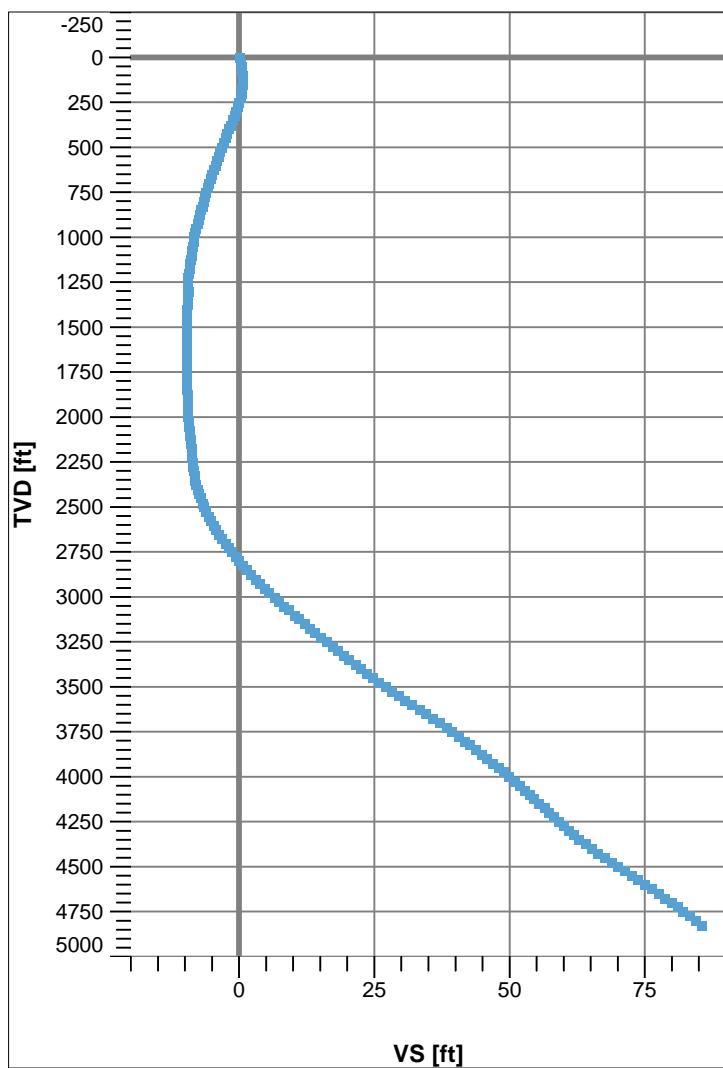
MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DISTANCE	CLOSURE DIRECTION
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
3997.47	2.31	324.19	3996.16	49.76	28.16	-41.88	0.58	50.47	303.91
4024.65	2.25	322.29	4023.32	50.82	29.02	-42.53	0.36	51.49	304.31
4046.16	2.35	322.39	4044.81	51.68	29.71	-43.06	0.47	52.31	304.60
4072.02	2.18	322.88	4070.65	52.68	30.52	-43.68	0.66	53.28	304.94
4098.46	2.15	328.73	4097.07	53.66	31.34	-44.24	0.84	54.22	305.32
4120.06	2.00	329.73	4118.66	54.41	32.02	-44.64	0.72	54.93	305.65
4146.46	2.13	326.47	4145.04	55.33	32.82	-45.14	0.67	55.81	306.02
4172.98	2.01	327.58	4171.55	56.26	33.63	-45.66	0.50	56.71	306.37
4198.43	2.11	333.12	4196.97	57.14	34.42	-46.11	0.89	57.54	306.74
4220.80	2.22	330.79	4219.33	57.94	35.17	-46.51	0.64	58.31	307.09
4247.32	2.17	330.60	4245.83	58.91	36.05	-47.01	0.21	59.24	307.49
4272.97	2.25	333.24	4271.47	59.85	36.93	-47.47	0.51	60.14	307.88
4299.22	2.38	331.32	4297.69	60.86	37.87	-47.97	0.58	61.11	308.29
4320.94	2.36	330.01	4319.39	61.71	38.65	-48.41	0.28	61.94	308.60
4346.27	2.45	328.91	4344.70	62.74	39.56	-48.95	0.43	62.94	308.95
4372.16	2.83	327.71	4370.56	63.89	40.58	-49.58	1.46	64.07	309.30
4398.15	2.64	328.98	4396.52	65.09	41.63	-50.23	0.74	65.24	309.66
4423.29	2.70	327.99	4421.64	66.22	42.63	-50.84	0.28	66.35	309.98
4449.91	2.82	328.79	4448.22	67.46	43.73	-51.51	0.49	67.57	310.33
4474.89	3.09	328.14	4473.17	68.71	44.82	-52.19	1.08	68.79	310.66
4495.87	2.99	325.24	4494.12	69.79	45.75	-52.80	0.89	69.86	310.91
4521.68	2.97	323.60	4519.90	71.11	46.84	-53.58	0.34	71.17	311.16
4547.80	2.80	328.40	4545.99	72.39	47.93	-54.31	1.14	72.44	311.43
4572.05	3.05	329.05	4570.21	73.59	48.99	-54.96	1.04	73.62	311.72
4597.91	2.84	326.96	4596.02	74.87	50.12	-55.66	0.91	74.90	312.00
4623.63	2.84	323.60	4621.71	76.12	51.17	-56.39	0.65	76.14	312.22
4648.70	2.76	324.39	4646.75	77.33	52.16	-57.11	0.35	77.34	312.41
4674.19	2.87	324.90	4672.21	78.55	53.18	-57.83	0.43	78.56	312.60
4699.56	2.75	325.76	4697.55	79.77	54.20	-58.54	0.50	79.78	312.80
4723.23	2.70	321.22	4721.20	80.88	55.10	-59.20	0.94	80.88	312.95
4746.53	2.69	328.11	4744.48	81.95	56.00	-59.84	1.39	81.95	313.10
4772.23	2.70	324.07	4770.14	83.13	57.00	-60.51	0.74	83.13	313.29

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DISTANCE	CLOSURE DIRECTION
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
4798.12	2.35	322.50	4796.01	84.25	57.91	-61.19	1.36	84.25	313.42
4825.10	2.64	320.92	4822.96	85.41	58.83	-61.92	1.09	85.41	313.54



Name : Keeper Gyro Wireline Survey: Outrun
Generated : 2/19/2015 10:17:57 Mountain Standard Time

VS View



Plan View

