



K.P. KAUFFMAN

SURVEY REPORT

GRAHAM #1

1/31/2018



The **Ultimate Partner** In Wellbore Placement

CUSTOMER
PROJECT
FIELD

K.P. Kauffman
Graham #1
Spindle

SDI JOB NO.
SDI DISTRICT
SDI KIT/UNIT

OP.007735
Casper

SITE INFORMATION

Site Name **Graham #1**
Lat/Long **40.067915° N, 104.949582° W**
Northing
Easting

Section **12**
Township **1**
Range **68W**

MAP INFORMATION

North Reference **True North**
Grid Correction
System **US State Plane 1983**
Datum **North American Datum 1983 (GRS 1980)**
Map Zone **Colorado North: 0501**



WELL INFORMATION

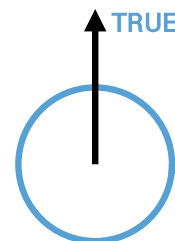
Lat/Long **40.067915° N, 104.949582° W**
Northing
Easting
UWI **05-123-08133 UWBI 05-123-08133**

DEPTH AND ELEVATION REFERENCE

Ground Level **5075 ft above Mean Sea Level**
Reference Datum **GL**
Reference Height **0 ft above G.L.**
Reference Elevation **5075 ft**

VERTICAL SECTION REFERENCE

+N/-S **0 ft**
+E/-W **0 ft**
Proposal Direction **346.19°**
Calculation Method **Minimum Curvature**



LOCAL GRAVITY REFERENCE INFORMATION

Local Gravity **999.028 mG [computed]**

WELL NOTES

Keeper gyro wireline survey in casing. All depths reference ground level

OPERATORS

P. Holbrook

SDI Operator Name (Printed)

SIGNATURE

DATE

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
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
97.36	1.13	127.77	97.35	-0.75	-0.59	0.76	1.16	0.96	127.77
100.00	1.12	128.30	99.99	-0.79	-0.62	0.80	0.41	1.01	127.78
125.00	1.09	130.87	124.99	-1.18	-0.92	1.17	0.24	1.49	128.36
150.00	1.03	124.33	149.98	-1.54	-1.21	1.53	0.54	1.95	128.20
175.00	1.06	118.93	174.98	-1.86	-1.44	1.92	0.41	2.40	126.95
200.00	1.08	123.24	199.98	-2.19	-1.69	2.32	0.33	2.87	126.00
225.00	0.99	126.79	224.97	-2.53	-1.94	2.69	0.45	3.32	125.86
250.00	0.89	120.01	249.97	-2.83	-2.17	3.03	0.58	3.73	125.60
275.00	0.88	107.56	274.97	-3.06	-2.32	3.38	0.77	4.10	124.51
300.00	0.76	97.66	299.96	-3.22	-2.40	3.73	0.74	4.43	122.83
325.00	0.60	97.46	324.96	-3.33	-2.44	4.02	0.64	4.70	121.30
350.00	0.53	84.02	349.96	-3.39	-2.45	4.26	0.59	4.91	119.87
375.00	0.64	59.16	374.96	-3.37	-2.36	4.50	1.10	5.08	117.73
400.00	0.68	69.82	399.96	-3.31	-2.24	4.76	0.51	5.26	115.24
425.00	0.55	74.10	424.96	-3.29	-2.16	5.01	0.54	5.45	113.31
450.00	0.42	46.45	449.95	-3.24	-2.06	5.19	1.05	5.59	111.66
475.00	0.60	22.29	474.95	-3.09	-1.88	5.31	1.10	5.63	109.49
500.00	0.64	30.39	499.95	-2.88	-1.64	5.43	0.39	5.67	106.78
525.00	0.57	28.13	524.95	-2.69	-1.41	5.56	0.31	5.73	104.20
550.00	0.49	21.60	549.95	-2.51	-1.20	5.65	0.41	5.78	101.96
575.00	0.37	16.39	574.95	-2.36	-1.02	5.72	0.51	5.81	100.14
600.00	0.26	50.25	599.95	-2.26	-0.91	5.78	0.83	5.85	98.94
625.00	0.32	64.27	624.95	-2.22	-0.84	5.89	0.38	5.95	98.14
650.00	0.20	72.24	649.95	-2.21	-0.80	5.99	0.52	6.05	97.58
675.00	0.18	14.45	674.95	-2.17	-0.75	6.05	0.74	6.09	97.04
700.00	0.27	12.88	699.95	-2.08	-0.65	6.07	0.37	6.10	96.11
725.00	0.26	49.92	724.95	-2.00	-0.56	6.13	0.68	6.15	95.18
750.00	0.20	41.03	749.95	-1.95	-0.49	6.20	0.27	6.22	94.48
775.00	0.12	10.68	774.95	-1.90	-0.43	6.23	0.45	6.25	93.90
800.00	0.34	358.18	799.95	-1.80	-0.32	6.23	0.87	6.24	92.98
825.00	0.25	44.08	824.95	-1.70	-0.21	6.27	0.97	6.27	91.94

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	%/100ft	ft	deg
850.00	0.23	49.34	849.95	-1.65	-0.14	6.35	0.11	6.35	91.27
875.00	0.18	9.42	874.95	-1.59	-0.07	6.39	0.59	6.39	90.61
900.00	0.23	349.91	899.95	-1.51	0.02	6.39	0.34	6.39	89.81
925.00	0.33	7.73	924.95	-1.39	0.14	6.39	0.53	6.39	88.72
950.00	0.33	31.41	949.95	-1.27	0.28	6.44	0.54	6.44	87.54
975.00	0.22	39.93	974.95	-1.19	0.37	6.50	0.49	6.52	86.71
1000.00	0.14	5.16	999.95	-1.13	0.44	6.54	0.52	6.55	86.15
1025.00	0.29	352.47	1024.95	-1.04	0.53	6.53	0.64	6.55	85.33
1050.00	0.33	17.03	1049.94	-0.92	0.67	6.54	0.54	6.58	84.19
1075.00	0.24	42.21	1074.94	-0.83	0.77	6.60	0.60	6.65	83.33
1100.00	0.15	17.30	1099.94	-0.77	0.84	6.65	0.48	6.70	82.78
1125.00	0.25	344.10	1124.94	-0.69	0.93	6.64	0.60	6.70	82.05
1150.00	0.43	349.96	1149.94	-0.54	1.07	6.61	0.72	6.69	80.78
1175.00	0.40	5.83	1174.94	-0.36	1.25	6.60	0.47	6.72	79.26
1200.00	0.22	15.68	1199.94	-0.24	1.39	6.62	0.74	6.77	78.18
1225.00	0.07	334.87	1224.94	-0.18	1.45	6.63	0.70	6.79	77.69
1250.00	0.36	339.32	1249.94	-0.08	1.53	6.59	1.16	6.77	76.90
1275.00	0.45	353.42	1274.94	0.09	1.71	6.56	0.54	6.77	75.41
1300.00	0.25	28.73	1299.94	0.23	1.85	6.57	1.16	6.83	74.26
1325.00	0.18	16.32	1324.94	0.30	1.94	6.61	0.31	6.89	73.66
1350.00	0.29	338.23	1349.94	0.40	2.03	6.59	0.74	6.90	72.87
1375.00	0.62	340.99	1374.94	0.60	2.22	6.53	1.34	6.89	71.21
1400.00	0.50	355.44	1399.94	0.84	2.46	6.47	0.75	6.92	69.22
1425.00	0.23	27.28	1424.94	0.99	2.61	6.49	1.29	6.99	68.09
1450.00	0.15	9.82	1449.94	1.05	2.69	6.52	0.40	7.05	67.58
1475.00	0.29	337.05	1474.94	1.15	2.78	6.50	0.74	7.07	66.84
1500.00	0.32	343.59	1499.94	1.28	2.91	6.45	0.18	7.08	65.76
1525.00	0.29	356.83	1524.94	1.41	3.04	6.43	0.31	7.11	64.72
1550.00	0.23	351.47	1549.94	1.52	3.15	6.42	0.26	7.15	63.87
1575.00	0.21	308.54	1574.94	1.61	3.23	6.38	0.65	7.15	63.16
1600.00	0.33	308.13	1599.94	1.70	3.30	6.28	0.49	7.10	62.29
1625.00	0.47	331.11	1624.94	1.86	3.43	6.18	0.83	7.07	60.93

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS %/100ft	CLOSURE DIST ft	CLOSURE DIR deg
1650.00	0.43	337.84	1649.94	2.05	3.61	6.09	0.26	7.08	59.35
1675.00	0.44	326.98	1674.93	2.23	3.78	6.01	0.33	7.09	57.84
1700.00	0.53	318.18	1699.93	2.43	3.94	5.88	0.49	7.08	56.13
1725.00	0.58	322.53	1724.93	2.65	4.13	5.72	0.25	7.06	54.17
1750.00	0.52	334.73	1749.93	2.87	4.33	5.60	0.52	7.08	52.23
1775.00	0.55	337.01	1774.93	3.10	4.55	5.50	0.13	7.14	50.41
1800.00	0.49	321.90	1799.93	3.32	4.74	5.39	0.59	7.18	48.63
1825.00	0.60	318.50	1824.93	3.54	4.93	5.23	0.46	7.19	46.72
1850.00	0.69	329.82	1849.93	3.80	5.16	5.07	0.61	7.23	44.51
1875.00	0.68	334.77	1874.92	4.09	5.42	4.93	0.24	7.33	42.29
1900.00	0.63	326.72	1899.92	4.36	5.67	4.79	0.41	7.42	40.21
1925.00	0.77	324.55	1924.92	4.65	5.92	4.62	0.58	7.51	37.95
1950.00	0.86	337.06	1949.92	4.99	6.23	4.45	0.79	7.66	35.51
1975.00	0.74	352.24	1974.92	5.34	6.57	4.35	0.96	7.88	33.54
2000.00	0.67	350.11	1999.91	5.64	6.87	4.31	0.29	8.11	32.07
2025.00	0.62	336.41	2024.91	5.92	7.14	4.23	0.66	8.30	30.62
2050.00	0.76	345.30	2049.91	6.22	7.42	4.13	0.72	8.49	29.09
2075.00	0.79	2.42	2074.91	6.55	7.76	4.09	0.93	8.77	27.83
2100.00	0.78	13.10	2099.91	6.87	8.09	4.14	0.58	9.09	27.10
2125.00	0.71	18.92	2124.90	7.15	8.41	4.23	0.41	9.41	26.71
2150.00	0.78	11.57	2149.90	7.44	8.72	4.31	0.47	9.73	26.33
2175.00	0.84	22.43	2174.90	7.74	9.05	4.42	0.65	10.07	26.01
2200.00	0.83	32.30	2199.90	8.01	9.38	4.58	0.57	10.44	26.06
2225.00	0.74	32.63	2224.89	8.25	9.67	4.77	0.35	10.78	26.26
2250.00	0.69	29.24	2249.89	8.47	9.93	4.93	0.28	11.09	26.39
2275.00	0.79	34.57	2274.89	8.69	10.21	5.10	0.50	11.41	26.55
2300.00	0.82	38.64	2299.89	8.92	10.49	5.31	0.26	11.76	26.85
2325.00	0.74	35.21	2324.89	9.13	10.76	5.52	0.39	12.09	27.14
2350.00	0.75	29.82	2349.88	9.36	11.03	5.69	0.29	12.41	27.28
2375.00	0.88	31.08	2374.88	9.61	11.34	5.87	0.51	12.77	27.37
2400.00	0.83	42.43	2399.88	9.85	11.64	6.09	0.70	13.14	27.63
2425.00	0.73	44.12	2424.88	10.03	11.89	6.32	0.42	13.46	28.02

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS %/100ft	CLOSURE DIST ft	CLOSURE DIR deg
2450.00	0.74	43.04	2449.87	10.21	12.12	6.55	0.09	13.77	28.37
2475.00	0.86	46.59	2474.87	10.39	12.37	6.79	0.51	14.11	28.78
2500.00	0.85	51.91	2499.87	10.56	12.61	7.08	0.32	14.46	29.30
2525.00	0.74	50.86	2524.87	10.70	12.83	7.35	0.43	14.78	29.80
2550.00	0.79	45.85	2549.86	10.86	13.05	7.60	0.34	15.10	30.20
2575.00	0.83	50.72	2574.86	11.02	13.28	7.86	0.32	15.44	30.61
2600.00	0.87	53.81	2599.86	11.17	13.51	8.15	0.24	15.78	31.11
2625.00	0.74	53.00	2624.86	11.31	13.72	8.44	0.55	16.11	31.59
2650.00	0.77	43.38	2649.85	11.46	13.94	8.68	0.52	16.42	31.91
2675.00	0.85	44.74	2674.85	11.65	14.19	8.93	0.33	16.77	32.17
2700.00	0.74	60.14	2699.85	11.79	14.41	9.20	0.96	17.09	32.55
2725.00	0.59	63.93	2724.85	11.87	14.54	9.45	0.63	17.34	33.02
2750.00	0.57	46.74	2749.85	11.95	14.68	9.66	0.70	17.58	33.33
2775.00	0.68	46.97	2774.84	12.09	14.87	9.86	0.46	17.84	33.54
2800.00	0.68	54.95	2799.84	12.21	15.06	10.09	0.38	18.12	33.82
2825.00	0.57	52.67	2824.84	12.32	15.22	10.31	0.45	18.38	34.11
2850.00	0.49	43.45	2849.84	12.42	15.37	10.48	0.46	18.60	34.29
2875.00	0.67	42.30	2874.84	12.56	15.56	10.65	0.72	18.85	34.40
2900.00	0.65	56.02	2899.84	12.69	15.75	10.87	0.64	19.13	34.62
2925.00	0.43	83.63	2924.84	12.73	15.84	11.08	1.35	19.33	34.98
2950.00	0.25	70.15	2949.84	12.73	15.86	11.23	0.80	19.43	35.28
2975.00	0.45	38.90	2974.84	12.79	15.96	11.34	1.08	19.58	35.39
3000.00	0.48	57.75	2999.83	12.88	16.09	11.49	0.62	19.77	35.53
3025.00	0.27	87.31	3024.83	12.90	16.15	11.64	1.11	19.90	35.77
3050.00	0.18	46.69	3049.83	12.91	16.18	11.72	0.70	19.98	35.92
3075.00	0.43	28.31	3074.83	13.00	16.29	11.80	1.06	20.11	35.91
3100.00	0.52	37.31	3099.83	13.14	16.46	11.91	0.46	20.32	35.88
3125.00	0.25	19.60	3124.83	13.26	16.61	12.00	1.17	20.49	35.85
3150.00	0.24	55.94	3149.83	13.33	16.69	12.06	0.62	20.59	35.86
3175.00	0.62	58.12	3174.83	13.39	16.79	12.22	1.50	20.76	36.05
3200.00	0.81	51.37	3199.83	13.50	16.97	12.47	0.83	21.06	36.31
3225.00	0.63	34.70	3224.83	13.67	17.19	12.69	1.09	21.37	36.43

MD	INC	AZIM	TVD	VS	+N/-S	+E/-W	DLS	CLOSURE DIST	CLOSURE DIR
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft	deg
3250.00	0.40	16.74	3249.83	13.83	17.39	12.79	1.11	21.59	36.34
3275.00	0.41	32.34	3274.83	13.97	17.55	12.87	0.44	21.76	36.24
3300.00	0.47	49.05	3299.83	14.08	17.69	12.99	0.58	21.95	36.29
3325.00	0.40	36.52	3324.82	14.18	17.83	13.12	0.48	22.14	36.35
3350.00	0.38	15.80	3349.82	14.31	17.98	13.20	0.57	22.31	36.27
3375.00	0.56	27.59	3374.82	14.48	18.17	13.28	0.81	22.50	36.15
3400.00	0.63	41.28	3399.82	14.65	18.38	13.42	0.64	22.76	36.14
3425.00	0.27	52.36	3424.82	14.75	18.52	13.56	1.48	22.96	36.21
3450.00	0.34	354.44	3449.82	14.85	18.63	13.60	1.20	23.07	36.13
3475.00	0.48	10.17	3474.82	15.01	18.81	13.61	0.74	23.22	35.89
3500.00	0.33	5.40	3499.82	15.18	18.99	13.64	0.61	23.38	35.69
3525.00	0.34	359.63	3524.82	15.32	19.13	13.64	0.14	23.50	35.49
3550.00	0.38	11.71	3549.82	15.47	19.29	13.66	0.34	23.64	35.31
3575.00	0.06	10.08	3574.82	15.56	19.38	13.68	1.29	23.72	35.21
3600.00	0.06	144.47	3599.82	15.56	19.38	13.69	0.45	23.73	35.23
3625.00	0.17	46.96	3624.82	15.56	19.40	13.73	0.75	23.76	35.28
3650.00	0.46	306.19	3649.82	15.65	19.48	13.67	2.08	23.80	35.06
3675.00	0.48	303.00	3674.82	15.81	19.60	13.50	0.14	23.80	34.56
3700.00	0.29	271.34	3699.82	15.90	19.66	13.35	1.12	23.76	34.18
3725.00	0.26	315.79	3724.82	15.97	19.70	13.24	0.85	23.74	33.91
3750.00	0.35	342.75	3749.82	16.09	19.81	13.18	0.66	23.80	33.63
3775.00	0.58	298.89	3774.81	16.25	19.95	13.05	1.62	23.84	33.19
3800.00	0.39	338.14	3799.81	16.43	20.09	12.91	1.47	23.88	32.72
3825.00	0.59	311.09	3824.81	16.61	20.25	12.78	1.18	23.95	32.25
3850.00	0.88	323.31	3849.81	16.90	20.49	12.57	1.33	24.04	31.52
3875.00	0.67	336.02	3874.81	17.22	20.78	12.39	1.08	24.19	30.82
3900.00	0.63	322.32	3899.81	17.49	21.02	12.25	0.64	24.33	30.23
3925.00	0.58	298.00	3924.81	17.70	21.19	12.05	1.04	24.38	29.63
3950.00	0.52	314.51	3949.80	17.88	21.33	11.86	0.68	24.40	29.08
3975.00	0.79	322.67	3974.80	18.13	21.55	11.67	1.15	24.50	28.45
4000.00	1.07	300.35	3999.80	18.46	21.80	11.37	1.82	24.59	27.54
4025.00	0.70	297.96	4024.80	18.72	21.99	11.03	1.49	24.60	26.64

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	CLOSURE DIST ft	CLOSURE DIR deg
4050.00	0.78	312.71	4049.79	18.97	22.18	10.77	0.81	24.65	25.90
4075.00	0.79	307.18	4074.79	19.24	22.40	10.51	0.30	24.74	25.14
4100.00	0.88	302.74	4099.79	19.51	22.60	10.21	0.44	24.80	24.31
4125.00	0.89	298.15	4124.79	19.78	22.80	9.88	0.29	24.85	23.43
4150.00	0.89	297.45	4149.78	20.04	22.98	9.54	0.05	24.88	22.54
4175.00	0.87	290.24	4174.78	20.27	23.13	9.19	0.45	24.89	21.66
4200.00	0.89	291.88	4199.78	20.49	23.27	8.83	0.14	24.89	20.77
4225.00	0.83	286.58	4224.78	20.70	23.40	8.47	0.40	24.88	19.91
4250.00	0.96	285.25	4249.77	20.89	23.50	8.10	0.51	24.86	19.01
4275.00	0.91	289.13	4274.77	21.10	23.62	7.71	0.32	24.85	18.08
4300.00	0.85	282.40	4299.77	21.29	23.73	7.34	0.47	24.84	17.19
4325.00	0.98	277.87	4324.76	21.45	23.80	6.95	0.57	24.79	16.28
4350.00	1.03	283.97	4349.76	21.63	23.88	6.52	0.47	24.75	15.27
4375.00	0.93	283.74	4374.76	21.83	23.98	6.11	0.37	24.75	14.28
4400.00	0.84	285.42	4399.75	22.02	24.08	5.73	0.37	24.75	13.38
4425.00	0.74	284.44	4424.75	22.18	24.17	5.40	0.42	24.76	12.58
4450.00	0.86	286.45	4449.75	22.35	24.26	5.06	0.51	24.78	11.78
4475.00	1.02	290.17	4474.74	22.57	24.39	4.67	0.65	24.84	10.84
4500.00	1.11	290.49	4499.74	22.83	24.55	4.23	0.36	24.92	9.79
4525.00	1.21	292.19	4524.73	23.12	24.74	3.76	0.42	25.02	8.65
4550.00	1.31	293.89	4549.73	23.45	24.95	3.26	0.43	25.16	7.44
4575.00	1.39	293.20	4574.72	23.81	25.19	2.72	0.34	25.33	6.16
4600.00	1.45	292.03	4599.71	24.18	25.43	2.15	0.26	25.52	4.83
4625.00	1.53	293.20	4624.71	24.56	25.68	1.55	0.33	25.72	3.45
4650.00	1.57	291.44	4649.70	24.96	25.93	0.92	0.25	25.95	2.04
4675.00	1.58	290.57	4674.69	25.35	26.18	0.28	0.12	26.18	0.62
4700.00	1.56	290.16	4699.68	25.74	26.42	-0.36	0.12	26.42	359.22
4725.00	1.55	289.19	4724.67	26.11	26.64	-1.00	0.11	26.66	357.86
4750.00	1.36	287.84	4749.66	26.45	26.85	-1.60	0.77	26.89	356.59
4775.00	1.24	290.66	4774.65	26.76	27.03	-2.13	0.54	27.12	355.49
4800.00	1.50	290.30	4799.65	27.10	27.24	-2.69	1.02	27.37	354.35
4825.00	1.67	288.51	4824.64	27.47	27.47	-3.34	0.72	27.67	353.06

MD ft	INC deg	AZIM deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	CLOSURE DIST ft	CLOSURE DIR deg
4850.00	1.76	287.00	4849.63	27.87	27.70	-4.06	0.39	27.99	351.67
4875.00	1.72	290.43	4874.61	28.27	27.94	-4.77	0.44	28.35	350.31
4900.00	1.66	293.82	4899.60	28.70	28.22	-5.46	0.47	28.74	349.06
4925.00	1.82	296.37	4924.59	29.18	28.54	-6.14	0.72	29.20	347.85
4950.00	2.02	299.35	4949.58	29.74	28.93	-6.88	0.88	29.74	346.62
4959.05	1.89	300.44	4958.62	29.95	29.09	-7.15	1.46	29.95	346.19

