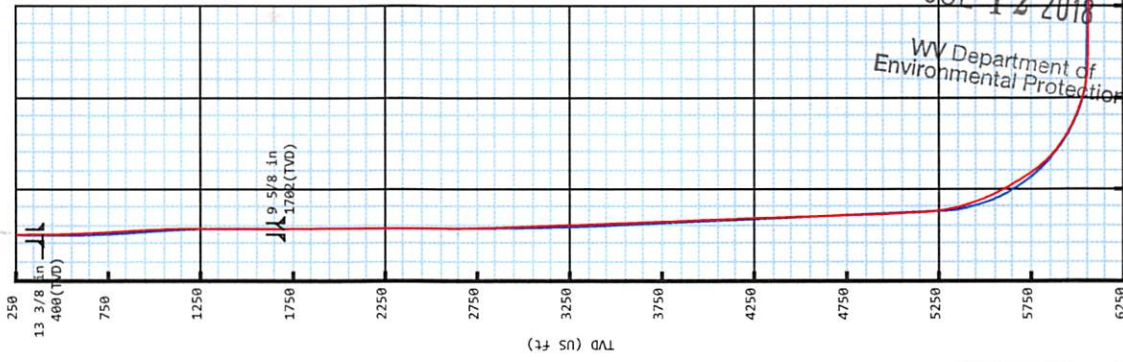




Southwestern Energy®
 Mark Owen BRK 6H
 Brooke Co, WV
 SDC 40
Plan vs Actual

KB: 1192.2'
 GL: 1166.2'



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 WV Department of
 Environmental Protection

Plan Data for Mark Owen BRK 6H

Plan Point Information:

Dogleg Severity Unit: °/100.00ft	MD (USft)	Inc (°)	Az (°)	TVD (USft)	+N/-S (USft)	+E/-W (USft)	Vsec (DLSU)	Position offsets from Slot centre (USft)	DLS Toolface Comments (°)
0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	0.0
26.00	0.00	0.00	26.00	0.00	-0.00	-0.00	0.00	0.00	0.0
500.00	0.00	0.00	500.00	0.00	-0.00	-0.00	0.00	0.00	0.0
950.00	4.50	160.00	949.54	-16.60	-0.00	0.00	0.00	0.00	0.0
1400.00	0.00	0.00	1399.08	-33.19	12.08	35.17	1.00	160.0	Drop
2679.71	0.00	0.00	2678.79	-33.19	12.08	35.17	0.00	180.0	Hold
3529.71	17.00	246.92	3516.37	-82.26	-103.08	53.37	2.00	246.9	Hold
5365.79	17.00	246.92	5272.22	-292.68	-596.94	131.39	7.00	0.0	Curve KOP 7° DLS
6358.39	70.00	161.81	6009.19	-864.48	-583.15	687.93	7.00	268.6	Build/Turn 9° DLS
6579.25	89.15	156.35	6049.00	-1066.24	-505.70	982.75	9.00	343.7	Landing Point
11475.44	89.15	156.35	6122.00	-5550.82	1457.94	5739.10	0.00	0.0	0.0 PBHL M06H

Target Set Information:

Name: Mark Owen BRK 6H

Name	TVD (USft)	+N/-S (USft)	+E/-W (USft)	Northing (USft)	Easting (USft)	Lat (°)	Long (°)
LP M06H	6949.00	-907.04	-575.43	14606431.87	1766748.95	40.217978	-80.547454
PBHL M06H	6122.00	-5550.82	1457.94	14601788.09	17668782.32	40.205198	-80.540256

Plan Data for Mark Owen BRK 6H

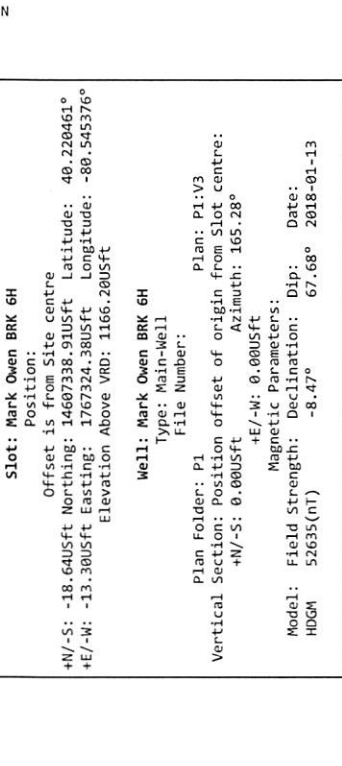
Field: SOUTHWESTERN_BROOKE CO, WV UTM NAD 83 (17N)
 Map Unit: USFT
 Projected Coordinate System: MAD83 / UTM zone 17N

Site: Mark Owen Pad

Unit: USFEET
 Company Name: SOUTHWESTERN ENERGY
 Position: Northing: 14607357.56USft Latitude: 40.220512°
 Easting: 1767337.69USft Longitude: -80.545328°
 North Reference: Grid
 Grid Convergence: 0.29°
 Elevation Above VRD: 1166.20USft

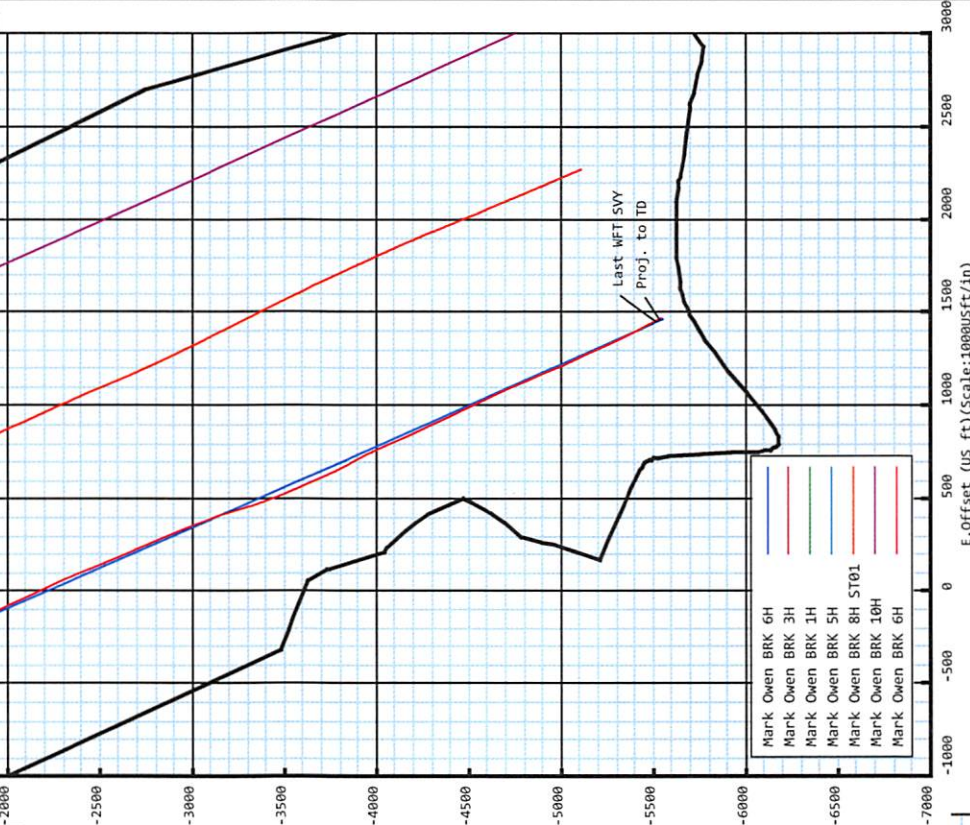
Slot: Mark Owen BRK 6H
 Position: Offset is from Site centre
 +N/-S: -18.64USft Northing: 14607338.91USft Latitude: 40.220461°
 +E/-W: -13.30USft Easting: 1767324.38USft Longitude: -80.545376°
 Elevation Above VRD: 1166.20USft

Well: Mark Owen BRK 6H
 Type: Main-Well
 File Number: Plan: P1:V3
 Plan Folder: P1
 Vertical Section: Position offset of origin from Slot centre:
 +N/-S: 0.00USft Azimuth: 165.28°
 +E/-W: 0.00USft
 Magnetic Parameters:
 Model: Field Strength: Dip: Date:
 HDGM 52635(NI) -8.47° 67.68° 2018-01-13



Formation Point Information:

Name	TVD (USft)	SS (USft)	MD (USft)
Base of Fresh Water	240.00	952.20	240.00
Pittsburgh Coal	332.00	860.20	332.00
Top of Salt Water	856.00	336.20	856.23
Maxton	1217.00	-24.80	1217.89
Big Lime	1366.00	-173.80	1366.92
Big Injun	1507.00	-314.80	1507.92
Base Big Berea	2014.00	-464.80	1657.92
Upper Rhinestreet	5454.00	-821.80	2014.92
Lower Rhinestreet	5569.00	-4261.80	5557.45
Basal Rhinestreet	5635.00	-4376.80	5683.59
Cashaqua	5710.00	-4442.80	5759.44
Middlesex	5766.00	-4517.80	5850.31
Lower Middlesex	5793.00	-4573.80	5922.73
Burket	5827.00	-4600.80	5959.50
Tully	5845.00	-4634.80	6007.98
Mahantango	5899.00	-4652.80	6034.81
Levanna	6007.00	-4706.80	6121.68
Upper Marcellus	6026.00	-4814.80	6352.05
		-4833.80	6414.01



Drawing By: Gary Rhodes Date: 13 January 2018
 Office Name: Midcon DS
 Address: 7725 N. Reno Ave, Ste. #228
 Oklahoma City, OK 73127
 Phone: +1.405.726.4257





Weatherford®

SURVEY REPORT

Report Date: 1/28/2018
 Customer: SWN Production Co., LLC Field: Panhandle
 Job Name: NE-12927107 Rig: SDC 40
 Well Name: Mark Owen BRK 6H Rig Loc: Brooke County, WV

Survey Calculation Method: Minimum Curvature						
Magnetic Reference	Target Direction	Total Magnetic Field	Magnetic Dip Angle	Magnetic Declination	Grid Convergence	Total Correction
Grid North	165.28 deg	52635 nT	67.68 deg	-8.47 deg	0.29 deg	-8.76 deg
Survey Tie-On	Depth	INC	AZ	TVD	NS	EW
	0.00 ft	0.00 deg	0.00 deg	0.00 ft	0.00 ft	0.00 ft

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head			Dogleg (deg/100ft)
				NS (ft)	EW (ft)	Vsect (ft)	
50.00	0.89	113.77	50.00	-0.16	0.36	0.24	1.78
100.00	0.96	112.50	99.99	-0.47	1.10	0.74	0.15
150.00	0.83	100.63	149.99	-0.70	1.84	1.15	0.45
200.00	1.13	116.65	199.98	-0.99	2.64	1.63	0.81
250.00	1.03	109.20	249.97	-1.36	3.50	2.20	0.34
263.00	0.54	122.64	262.97	-1.43	3.66	2.31	4.00
357.00	0.55	143.23	356.96	-2.03	4.31	3.06	0.21
473.00	1.05	164.09	472.95	-3.50	4.93	4.64	0.49
503.00	1.31	168.92	502.95	-4.10	5.07	5.25	0.93
593.00	2.43	162.18	592.90	-6.92	5.85	8.18	1.27
685.00	2.75	161.32	684.80	-10.87	7.16	12.33	0.35
777.00	3.52	158.97	776.66	-15.60	8.88	17.34	0.85
870.00	3.57	157.86	869.49	-20.95	10.99	23.05	0.09
963.00	2.96	165.33	962.34	-25.95	12.69	28.32	0.80
1055.00	2.44	187.43	1054.24	-30.19	13.04	32.51	1.25
1148.00	0.75	221.22	1147.20	-32.61	12.39	34.69	2.00
1241.00	0.48	302.39	1240.19	-32.86	11.66	34.74	0.89
1334.00	0.37	321.78	1333.19	-32.42	11.14	34.18	0.19
1426.00	0.53	271.80	1425.19	-32.17	10.53	33.79	0.44
1519.00	0.30	332.75	1518.19	-31.94	9.99	33.43	0.50
1612.00	0.10	92.76	1611.19	-31.73	9.96	33.22	0.39
1657.00	0.36	186.11	1656.19	-31.87	9.98	33.36	0.84
1797.00	0.37	171.15	1796.18	-32.75	10.01	34.22	0.07
1886.00	0.38	200.69	1885.18	-33.31	9.95	34.75	0.22
1982.00	0.30	234.31	1981.18	-33.76	9.63	35.10	0.22
2075.00	0.32	238.16	2074.18	-34.04	9.21	35.26	0.03
2168.00	0.37	255.49	2167.18	-34.25	8.70	35.34	0.12
2261.00	0.53	255.72	2260.17	-34.43	7.99	35.33	0.17
2353.00	0.25	288.71	2352.17	-34.47	7.39	35.22	0.38
2446.00	0.49	295.51	2445.17	-34.23	6.84	34.85	0.26
2539.00	0.51	298.78	2538.17	-33.86	6.12	34.31	0.04
2631.00	0.91	255.03	2630.16	-33.86	5.05	34.03	0.70
2725.00	2.21	227.47	2724.12	-35.27	3.00	34.88	1.81
2817.00	3.86	229.68	2815.99	-38.48	-0.67	37.04	1.80
2910.00	5.46	236.39	2908.68	-42.95	-6.74	39.83	1.81

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Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
3003.00	7.48	238.01	3001.08	-48.61	-15.56	43.06	2.18
3096.00	8.88	240.11	3093.14	-55.39	-26.92	46.73	1.54
3188.00	9.81	244.56	3183.91	-62.30	-40.16	50.05	1.28
3281.00	10.79	247.79	3275.42	-68.99	-55.37	52.66	1.22
3374.00	12.50	244.74	3366.50	-76.58	-72.53	55.63	1.95
3466.00	14.27	244.18	3456.00	-85.77	-91.75	59.64	1.93
3559.00	15.68	247.05	3545.84	-95.66	-113.64	63.64	1.71
3652.00	15.57	249.67	3635.40	-104.90	-136.91	66.66	0.77
3744.00	14.70	247.85	3724.21	-113.59	-159.30	69.38	1.08
3837.00	16.88	248.70	3813.70	-122.94	-182.82	72.45	2.36
3930.00	17.46	247.30	3902.55	-133.23	-208.27	75.94	0.77
4023.00	15.20	245.44	3991.79	-143.68	-232.23	79.96	2.49
4115.00	14.31	243.46	4080.76	-153.78	-253.37	84.35	1.11
4208.00	15.63	245.12	4170.60	-164.18	-275.02	88.91	1.49
4301.00	16.64	249.84	4259.94	-174.04	-298.89	92.39	1.78
4393.00	16.75	251.10	4348.06	-182.88	-323.80	94.60	0.41
4486.00	17.11	250.27	4437.03	-191.84	-349.35	96.77	0.47
4579.00	18.06	247.80	4525.69	-201.90	-375.58	99.84	1.30
4672.00	17.75	247.94	4614.18	-212.67	-402.06	103.53	0.34
4764.00	17.45	249.54	4701.88	-222.76	-427.98	106.70	0.62
4857.00	18.02	250.39	4790.46	-232.47	-454.60	109.32	0.67
4950.00	17.97	250.27	4878.91	-242.14	-481.65	111.80	0.07
5043.00	18.08	247.53	4967.34	-252.50	-508.49	115.00	0.92
5135.00	17.47	245.70	5054.95	-263.63	-534.27	119.23	0.90
5228.00	16.87	243.28	5143.81	-275.45	-559.05	124.35	1.00
5321.00	18.50	240.50	5232.41	-288.78	-583.95	130.92	1.97
5367.00	18.42	230.53	5276.06	-297.00	-595.91	135.83	6.86
5414.00	19.22	221.15	5320.55	-307.54	-606.74	143.28	6.65
5461.00	20.34	211.33	5364.79	-320.35	-616.08	153.29	7.45
5506.00	22.15	204.16	5406.74	-334.78	-623.62	165.33	7.03
5553.00	24.34	198.94	5449.93	-352.02	-630.39	180.29	6.39
5599.00	25.90	194.97	5491.58	-370.70	-636.06	196.91	4.99
5646.00	27.39	190.54	5533.59	-391.25	-640.69	215.61	5.28
5692.00	28.79	186.47	5574.17	-412.66	-643.88	235.51	5.16
5738.00	29.75	182.23	5614.30	-435.07	-645.57	256.76	4.97
5778.00	31.01	179.87	5648.81	-455.29	-645.93	276.22	4.34
5847.00	33.59	176.90	5707.13	-492.14	-644.86	312.13	4.39
5890.00	35.17	175.12	5742.62	-516.35	-643.16	335.98	4.35
5936.00	38.42	173.43	5779.45	-543.76	-640.40	363.19	7.40
5983.00	42.34	172.08	5815.25	-573.96	-636.55	393.38	8.55
6029.00	45.74	170.18	5848.32	-605.54	-631.60	425.18	7.93
6075.00	50.58	168.69	5878.99	-639.22	-625.30	459.35	10.79
6122.00	54.91	167.55	5907.44	-675.81	-617.59	496.71	9.41
6168.00	58.44	166.42	5932.71	-713.25	-608.93	535.12	7.94
6215.00	61.53	166.14	5956.21	-752.79	-599.28	575.80	6.59
6261.00	65.79	166.14	5976.62	-792.80	-589.40	617.01	9.26
6307.00	68.67	166.21	5994.42	-833.98	-579.27	659.42	6.26
6354.00	71.46	164.70	6010.44	-876.74	-568.17	703.60	6.66
6400.00	73.35	162.72	6024.35	-918.82	-555.87	747.42	6.91
6446.00	76.14	160.91	6036.45	-960.98	-542.02	791.72	7.15

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Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
6493.00	79.71	159.85	6046.28	-1004.26	-526.58	837.50	7.91
6539.00	84.20	159.35	6052.72	-1046.94	-510.71	882.81	9.82
6586.00	88.71	159.09	6055.63	-1090.79	-494.07	929.45	9.61
6678.00	89.32	158.59	6057.21	-1176.57	-460.87	1020.85	0.86
6771.00	89.44	155.76	6058.21	-1262.28	-424.80	1112.91	3.05
6864.00	88.77	154.52	6059.67	-1346.65	-385.71	1204.44	1.52
6957.00	89.02	155.48	6061.46	-1430.92	-346.41	1295.93	1.07
7049.00	89.57	154.91	6062.59	-1514.42	-307.82	1386.50	0.86
7142.00	89.63	155.72	6063.24	-1598.92	-268.98	1478.10	0.87
7235.00	88.95	155.64	6064.39	-1683.66	-230.68	1569.79	0.74
7328.00	89.01	156.80	6066.05	-1768.75	-193.19	1661.61	1.25
7420.00	89.01	154.21	6067.64	-1852.45	-155.05	1752.25	2.81
7513.00	89.38	153.65	6068.95	-1935.98	-114.18	1843.42	0.72
7603.00	89.44	155.43	6069.87	-2017.23	-75.50	1931.84	1.98
7696.00	89.14	155.10	6071.03	-2101.69	-36.59	2023.42	0.48
7788.00	89.38	153.67	6072.21	-2184.64	3.18	2113.75	1.58
7881.00	89.57	155.28	6073.07	-2268.56	43.25	2205.09	1.74
7974.00	89.57	158.65	6073.76	-2354.13	79.64	2297.10	3.62
8067.00	89.14	157.73	6074.81	-2440.46	114.18	2389.38	1.09
8156.00	89.51	156.76	6075.86	-2522.53	148.61	2477.50	1.17
8246.00	89.38	156.16	6076.73	-2605.04	184.55	2566.43	0.68
8339.00	89.26	157.27	6077.83	-2690.45	221.31	2658.38	1.20
8431.00	89.51	156.09	6078.82	-2774.93	257.73	2749.34	1.31
8524.00	89.20	157.81	6079.87	-2860.50	294.14	2841.35	1.88
8614.00	89.01	157.08	6081.28	-2943.60	328.65	2930.50	0.84
8707.00	89.32	159.22	6082.63	-3029.91	363.26	3022.77	2.32
8799.00	89.51	160.10	6083.57	-3116.17	395.24	3114.32	0.98
8892.00	88.89	163.15	6084.87	-3204.41	424.55	3207.11	3.35
8985.00	88.83	163.88	6086.72	-3293.56	450.93	3300.05	0.79
9078.00	89.32	160.46	6088.22	-3382.07	479.40	3392.88	3.71
9170.00	89.07	158.96	6089.51	-3468.35	511.30	3484.44	1.65
9263.00	88.77	155.88	6091.27	-3554.20	547.00	3576.54	3.33
9356.00	88.89	155.82	6093.17	-3639.04	585.04	3668.26	0.14
9448.00	89.01	156.10	6094.85	-3723.05	622.51	3759.03	0.33
9541.00	88.52	152.81	6096.86	-3806.92	662.60	3850.34	3.58
9634.00	90.00	151.48	6098.06	-3889.14	706.05	3940.90	2.14
9727.00	89.32	155.53	6098.61	-3972.35	747.52	4031.92	4.42
9820.00	88.65	156.56	6100.26	-4057.33	785.28	4123.70	1.32
9912.00	88.83	155.92	6102.28	-4141.51	822.34	4214.53	0.72
10005.00	88.89	155.20	6104.13	-4226.16	860.81	4306.18	0.78
10098.00	88.64	155.14	6106.13	-4310.54	899.85	4397.71	0.28
10191.00	88.77	155.31	6108.24	-4394.96	938.81	4489.26	0.23
10284.00	88.58	154.54	6110.39	-4479.17	978.22	4580.72	0.85
10376.00	88.65	155.52	6112.61	-4562.55	1017.04	4671.22	1.07
10469.00	89.26	154.73	6114.31	-4646.90	1056.15	4762.75	1.07
10562.00	89.45	156.61	6115.35	-4731.63	1094.46	4854.44	2.03
10652.00	88.64	156.93	6116.85	-4814.32	1129.96	4943.43	0.97
10742.00	89.14	157.49	6118.60	-4897.28	1164.81	5032.52	0.83
10835.00	89.14	157.54	6119.99	-4983.20	1200.38	5124.66	0.55
10927.00	89.08	154.18	6121.42	-5067.14	1237.99	5215.40	0.55

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Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
11017.00	88.89	155.22	6123.02	-5148.49	1276.45	5303.85	1.17
11107.00	89.32	156.74	6124.42	-5230.68	1313.08	5392.65	1.75
11196.00	88.95	154.51	6125.77	-5311.73	1349.80	5480.38	2.54
11286.00	88.83	153.75	6127.51	-5392.70	1389.06	5568.66	0.85
11379.00	89.08	151.75	6129.21	-5475.36	1431.63	5659.43	2.17
11429.00	89.14	153.99	6129.98	-5519.85	1454.43	5708.25	4.48
Projected to Total Depth:							
11452.00	89.14	153.99	6130.33	-5540.52	1464.52	5730.80	0.00

* MS Gyro surveys from 50.00 ft MD to 357.00 ft MD *
 * Weatherford surveys from 473.00 ft MD to 11429.00 ft MD *
 * TD at 11452 ft MD *
 * The total correction is -8.76 deg relative to Grid North *

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