

State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

API 47 - 009 - 00180 County BROOKE District BUFFALO  
Quad BETHANY Pad Name MARK OWEN BRK PAD Field/Pool Name PANHANDLE  
Farm name OWEN, MARK Well Number MARK OWEN BRK 5H  
Operator (as registered with the OOG) SWN PRODUCTION COMPANY, LLC  
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,452,331.420 Easting 538,685.559  
Landing Point of Curve Northing 4,452,660.879 Easting 538,848.710  
Bottom Hole Northing 4,454,422.879 Easting 538,056.426

Elevation (ft) 1,165.6' GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine  
Mud Type(s) and Additive(s)  
SOBM

Date permit issued 01/03/2017 Date drilling commenced 11/27/2017 Date drilling ceased 01/16/2018  
Date completion activities began 04/22/2018 Date completion activities ceased 05/11/2018  
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

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Freshwater depth(s) ft 300' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 856' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 332' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

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Reviewea

*[Signature]* 8/30/18

Reviewed by:

*[Signature]* 8/30/18

API 47-009 - 00180 Farm name OWEN, MARK Well number MARK OWEN BRK 5H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	24	20	126'	NEW	J-55/94#		Y
Surface	17.5	13.375	406'	NEW	J-55/54.50#		Y, 26 bbls
Coal	SEE SURFACE						
Intermediate 1	12.25	9.625	1,727'	NEW	J-55/36#		Y, 50 bbls
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	12,924'	NEW	HCP-110/20#		Y
Tubing		2.375	6,510	NEW	P-110/4.7#		N
Packer type and depth set							

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	GROUT TO SURFACE	15.60	1.20		SURFACE	24
Surface	CLASS A	442	15.60	1.20	530.40	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	756	15.60	1.19	899.64	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	813/1560	15.60	1.22/1.19	991.86/1856.40	SURFACE	24
Tubing							

Drillers TD (ft) 12,924' Loggers TD (ft) 12,924'  
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5,360'

Check all wireline logs run  caliper  density  deviated/directional  induction  
 neutron  resistivity  gamma ray  temperature  sonic

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_

SURFACE: 7 CENTRALIZERS - EVERY THIRD JOINT OF CASING  
 INTERMEDIATE: 24 CENTRALIZERS - EVERY THIRD JOINT OF CASING  
 PRODUCTION: 181 CENTRALIZERS - EVERY THIRD JOINT FROM SURFACE TO TOP OF CURVE, THEN EVERY JOINT UNTIL TD

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WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_

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**MARK OWEN BRK 5H  
ATTACHMENT 1  
PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	4/1/2018	12,800	12,703	42
2	4/23/2018	12,670	12,563	42
3	4/23/2018	12,530	12,423	42
4	4/23/2018	12,390	12,283	42
5	4/23/2018	12,250	12,143	42
6	4/23/2018	12,110	12,003	42
7	4/24/2018	11,970	11,863	42
8	4/24/2018	11,830	11,723	42
9	4/24/2018	11,690	11,583	42
10	4/24/2018	11,550	11,443	42
11	4/24/2018	11,410	11,303	42
12	4/25/2018	11,270	11,163	42
13	4/25/2018	11,130	11,023	42
14	4/25/2018	10,990	10,883	42
15	4/26/2018	10,850	10,743	42
16	4/26/2018	10,710	10,603	42
17	4/26/2018	10,570	10,463	42
18	4/26/2018	10,430	10,323	42
19	4/26/2018	10,290	10,183	42
20	4/26/2018	10,150	10,043	42
21	4/27/2018	10,010	9,903	42
22	4/27/2018	9,870	9,763	42
23	4/28/2018	9,730	9,623	42
24	4/28/2018	9,590	9,483	42
25	4/29/2018	9,450	9,343	42
26	4/29/2018	9,278	9,203	42
27	4/29/2018	9,170	9,063	42
28	4/29/2018	9,030	8,923	42
29	4/29/2018	8,890	8,783	42
30	4/29/2018	8,750	8,643	42
31	4/30/2018	8,610	8,503	42
32	4/30/2018	8,470	8,363	42
33	4/30/2018	8,330	8,223	32
34	4/30/2018	8,190	8,083	42
35	4/30/2018	8,050	7,943	42
36	4/30/2018	7,910	7,803	42
37	5/1/2018	7,770	7,663	42
38	5/1/2018	7,630	7,523	42
39	5/1/2018	7,490	7,383	42
40	5/1/2018	7,350	7,243	42
41	5/1/2018	7,210	7,103	42
42	5/2/2018	7,070	6,963	42
43	5/2/2018	6,930	6,823	42
44	5/2/2018	6,790	6,683	42
45	5/2/2018	6,650	6,543	42

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ATTACHMENT 2

STIM REPORT

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment	Max Breakdown	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/othe
1	4/22/2018	89.8	7,173	5,198	4,094	280,620	5,019	0
2	4/23/2018	89.1	7,167	6,301	4,246	279,800	4,751	0
3	4/23/2018	89	7,115	6,133	4,391	283,460	4,719	0
4	4/23/2018	87.6	7,021	6,269	4,395	279,940	4,457	0
5	4/23/2018	90.4	7,155	5,809	4,591	281,000	4,556	0
6	4/24/2018	90.4	7,205	5,418	4,429	280,040	3,850	0
7	4/24/2018	90.3	7,141	5,253	4,257	280,700	4,145	0
8	4/24/2018	89.1	7,295	5,453	4,255	280,820	4,381	0
9	4/24/2018	88.5	7,619	5,614	4,700	280,840	4,280	0
10	4/24/2018	89.5	7,163	4,346	4,704	282,390	4,100	0
11	4/25/2018	89.1	7,268	6,163	4,635	281,600	4,183	0
12	4/25/2018	90.3	7,181	6,572	4,612	280,460	4,186	0
13	4/25/2018	88.9	7,025	5,797	4,415	280,160	4,170	0
14	4/25/2018	89	7,264	6,235	4,330	282,820	4,874	0
15	4/26/2018	90.2	7,267	5,875	4,552	283,340	4,130	0
16	4/26/2018	88	6,823	5,921	4,632	280,340	4,204	0
17	4/26/2018	89.7	6,919	6,093	4,637	279,300	4,225	0
18	4/26/2018	89.9	6,624	5,711	4,885	280,820	4,140	0
19	4/26/2018	90.3	6,778	5,552	4,841	281,980	4,190	0
20	4/27/2018	90.1	6,795	5,886	4,811	280,960	4,201	0
21	4/27/2018	89.9	6,819	5,853	4,539	280,650	4,228	0
22	4/27/2018	89.3	6,923	5,831	4,339	280,760	4,144	0
23	4/28/2018	89.1	6,833	6,506	4,400	280,010	4,054	0
24	4/28/2018	89.5	6,700	5,725	4,734	280,060	4,111	0
25	4/29/2018	89.8	6,890	5,741	4,392	280,200	4,095	0
26	4/29/2018	90.4	6,568	4,967	4,440	280,400	4,186	0
27	4/29/2018	90.2	6,593	5,911	4,283	281,250	4,078	0
28	4/29/2018	90.8	6,885	5,702	4,730	281,050	4,593	0
29	4/29/2018	90.3	6,608	5,731	4,748	280,330	3,922	0
30	4/30/2018	89.7	6,638	6,131	4,812	279,620	4,036	0
31	4/30/2018	89.9	6,409	5,918	4,532	280,230	4,075	0
32	4/30/2018	90.4	6,431	6,013	4,802	280,000	4,017	0
33	4/30/2018	90.3	6,296	5,724	4,968	279,850	4,007	0
34	4/30/2018	90.7	6,587	6,129	4,676	280,490	3,935	0
35	4/30/2018	89.4	6,418	5,804	4,712	279,510	3,792	0
36	5/1/2018	89.8	6,992	6,043	4,334	279,880	3,964	0
37	5/1/2018	90.7	6,387	5,751	4,643	280,820	3,969	0
38	5/1/2018	91	6,368	5,427	4,840	280,260	3,977	0
39	5/1/2018	90.6	6,492	5,524	4,977	279,950	3,985	0
40	5/1/2018	90.8	6,378	5,807	4,621	280,600	3,889	0
41	5/1/2018	90.8	6,434	6,017	4,616	280,230	3,887	0
42	5/2/2018	90.1	6,375	6,993	4,837	280,350	3,860	0
43	5/2/2018	90.4	6,377	6,843	5,053	280,530	3,936	0
44	5/2/2018	90.4	6,427	6,004	5,114	279,820	3,913	0
45	5/2/2018	91.6	6,297	6,494	4,571	290,167	4,003	0

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Well Name: Mark Owen BRK 5H

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ATTACHMENT 3

LITHOLOGY/FORMATION	TOP DEPTH, MD (FT)	TOP DEPTH, TVD (FT)	BOTTOM DEPTH, MD (FT)	BOTTOM DEPTH, TVD (FT)	QUANTITY AND TYPE OF FLUID
Base of Fresh Water	0.00	0.00	300.00	300.00	
Top of Salt Water	856.00	856.00	NA	NA	
Pittsburgh Coal	332.00	332.00	387.00	387.00	
Pottsville (ss)	548.00	548.00	687.00	687.00	
Mauch Chunk (shale)	687.00	687.00	850.00	850.00	
Raven Cliff (ss)	850.00	850.00	1063.00	1063.00	
Maxton (ss)	1205.00	1205.00	1265.00	1265.00	
Greenbriar (ls)	1348.00	1348.00	1502.00	1502.00	
Big Injun (ss)	1502.00	1502.00	1650.00	1650.00	
Berea (siltstone)	2010.00	2010.00	5449.00	5449.00	
Rhinestreet (shale)	5449.00	5449.00	5704.00	5704.00	
Cashaqua (shale)	5704.00	5704.00	5955.00	5761.00	
Middlesex (shale)	5927.00	5771.00	6025.00	5838.00	
Burket (shale)	6025.00	5838.00	6046.00	5852.00	
Tully (ls)	6046.00	5852.00	6135.00	5905.00	
Mahantango (shale)	6135.00	5905.00	6410.00	6029.00	
Marcellus (shale)	6410.00	6029.00	NA	NA	GAS

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**5D Survey Report**

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**SOUTHWESTERN ENERGY**

**Field Name:** *SOUTHWESTERN\_BROOKE CO, WV UTM NAD 83  
(17N)*

**Site Name:** *Mark Owen Pad*

**Well Name:** *Mark Owen BRK 5H*

**Survey:** *Definitive survey*

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14 January 2018

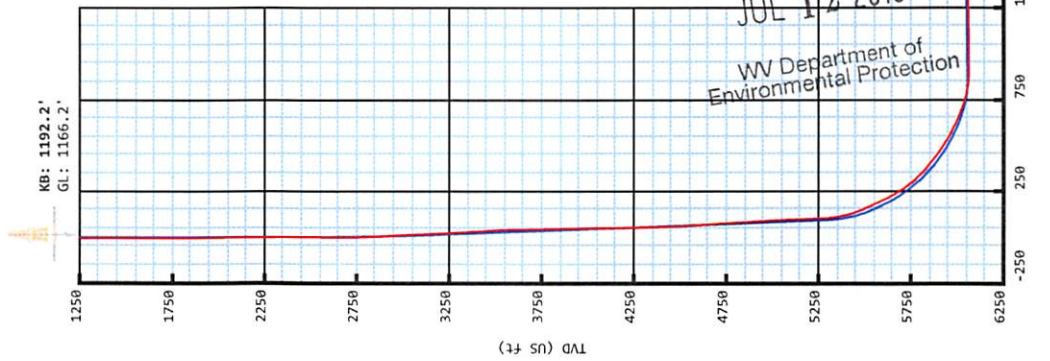
**Weatherford**

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Southwestern Energy  
Mark Owen BRK 5H  
Brooke Co, WV  
SDC 40  
**Plan vs Actual**



**Plan Data for Mark Owen BRK 5H**

DogLeg Severity Unit: °/100.00ft

MD Inc (USft)	Az (°)	TVD (USft)	+N/-S (USft)	+E/-W (USft)	USec (USft)	Position Offsets from Slot centre (DLSU)	DLS Toolface Comments
0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.0
26.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.0 KB Offset
2401.88	0.00	0.00	2401.88	-0.00	0.00	0.00	0.0 Nudge KOP
3201.88	16.00	65.81	3191.52	45.47	101.23	14.33	2.00 65.8 Hold
5375.63	16.00	65.81	5281.07	290.98	647.79	91.70	0.00 0.0 Curve KOP 7° DLS
6363.24	70.00	341.89	6016.05	858.36	624.86	641.56	7.00 270.1 Build/Turn 9° DLS
6601.95	90.64	335.81	6056.00	1076.38	540.10	874.77	9.00 343.2 Landing Point
12948.07	90.64	335.81	5985.00	6864.96	-2060.00	7167.37	0.00 0.0 PBHL M05H

**Target Set Information:**

Name	TVD (USft)	+N/-S (USft)	+E/-W (USft)	Northing (USft)	Easting (USft)	Lat (°)	Long (°)
LP M05H	6056.00	905.06	617.07	14608262.62	1767954.76	40.222989	-80.543101
PBHL M05H	5985.00	6864.96	-2060.00	14614222.52	1765277.69	40.239392	-80.552583

**Plan Data for Mark Owen BRK 5H**

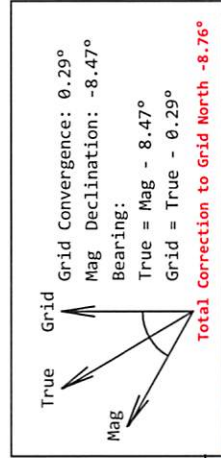
Field: SOUTHWESTERN\_BROOKE CO, WV UTM MAD 83 (17N)  
Map Unit: USFT  
Projected Coordinate System: MAD83 / UTM zone 17N

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 5H  
Position: Offset is from Site centre  
+N/-S: 0.00USft Northing: 14607357.56USft Latitude: 40.220512°  
+E/-W: 0.00USft Easting: 1767337.69USft Longitude: -80.545328°  
Elevation Above VRD: 1166.20USft

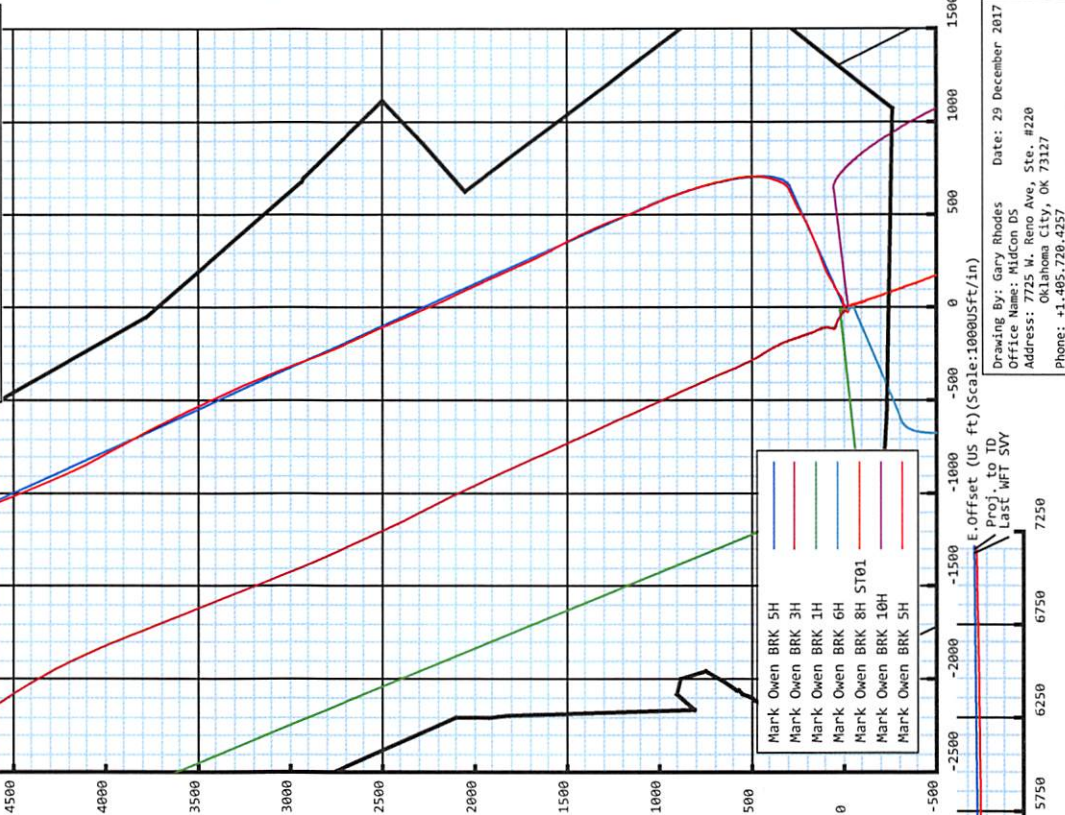
Well: Mark Owen BRK 5H  
Type: Main-Well  
File Number:

Plan Folder: P1  
Vertical Section: Position offset of origin from Slot centre:  
+N/-S: 0.00USft Azimuth: 343.23°  
+E/-W: -0.00USft  
Magnetic Parameters:  
Model: HDGM  
Field Strength: 52639(nT)  
Declination: -8.47°  
Dip: 67.68°  
Date: 2017-12-29



**Plan Point Information:**

Name	TVD (USft)	SS (USft)	MD (USft)
Base of Fresh Water	240.20	952.00	240.20
Pittsburgh Coal	332.20	860.00	332.20
Top of Salt Water	856.20	336.00	856.20
Maxton	1217.20	-25.00	1217.20
Big Lime	1366.20	-174.00	1366.20
Big Injun	1507.20	-315.00	1507.20
Base Big Injun	1657.20	-465.00	1657.20
Berea	2014.20	-822.00	2014.20
Upper Rhinestreet	5454.20	-4262.00	5557.23
Lower Rhinestreet	5569.20	-4377.00	5682.54
Basal Rhinestreet	5635.20	-4443.00	5757.81
Cashaqua	5710.20	-4518.00	5847.88
Middlesex	5766.20	-4574.00	5919.54
Lower Middlesex	5793.20	-4601.00	5955.88
Burket	5828.20	-4636.00	6005.17
Tully	5848.20	-4656.00	6034.66
Mahantango	5902.20	-4710.00	6120.60
Levanna	6010.20	-4818.00	6346.58
Upper Marcellus	6029.20	-4837.00	6405.39



Drawing By: Gary Rhodes  
Office Name: Midcon DS  
Address: 7725 N. Reno Ave, Ste. #228  
Oklahoma City, OK 73127  
Date: 29 December 2017  
Phone: +1.405.726.4257



## Mark Owen BRK 5H

<b>Map Units:</b> US ft	<b>Company Name:</b> SOUTHWESTERN ENERGY		
<b>Field Name:</b>	<b>Vertical Reference Datum (VRD):</b>		
SOUTHWESTER N_BROOKE CO, WV UTM NAD 83 (17N)	<b>Projected Coordinate System:</b> NAD83 / UTM zone 17N		
	<b>Comment:</b>		
<b>Site:</b>  Mark Owen Pad	<b>Units:</b> US ft	<b>North Reference:</b> Grid	<b>Convergence Angle:</b> 0.29
	<b>Position:</b>	<b>Northing:</b> 14607357.56 US ft	<b>Latitude:</b> 40.220512
		<b>Easting:</b> 1767337.69 US ft	<b>Longitude:</b> -80.545328
	<b>Elevation above Field Reference:</b> 1166.20 US ft		
	<b>Comment:</b>		
<b>Slot:</b>  Mark Owen BRK 5H	<b>Position (Relative to Site Centre)</b>		
	<b>+N/-S:</b> 0.00 US ft	<b>Northing:</b> 14607357.56 US ft	<b>Latitude:</b> 40.220512
	<b>+E/-W:</b> 0.00 US ft	<b>Easting:</b> 1767337.69 US ft	<b>Longitude:</b> -80.545328
	<b>Elevation above Field Reference:</b> 1166.20 US ft		
	<b>Comment:</b>		
<b>Well:</b>  Mark Owen BRK 5H	<b>Type:</b> Main well	<b>UWI:</b>	
	<b>File Number:</b>	<b>Comment:</b>	
	<b>Closure Distance:</b> 7165.45 US ft	<b>Closure Azimuth:</b> 343.26°	
	<b>Vertical Section: Position of Origin (Relative to Slot centre)</b>		
	<b>+N/-S:</b> 0.00 US ft	<b>+E/-W:</b> -0.00 US ft	<b>Az:</b> 343.23°

<b>Drill floor: Survey Name: Definitive Survey</b>			
<b>Rig Height (Drill Floor):</b> 26.00 US ft	<b>Elevation above Field Reference:</b> 1192.20 US ft	<b>Inclination:</b> 0.00°	<b>Azimuth:</b> 0.00°

<b>Survey Name: Definitive Survey</b>			
<b>Date:</b> 01/May/2015	<b>Survey Tool:</b> See Survey Tool Ranges below.	<b>Comment:</b>	<b>Company:</b>

<b>Magnetic Model:</b>				
<b>Model Name:</b> HDGM	<b>Date:</b> 29/Dec/2017	<b>Field Strength:</b> 52639.0nT	<b>Declination:</b> -8.47°	<b>Dip:</b> 67.68°

<b>Tie Point:</b>					
<b>MD:</b> 0.00 US ft	<b>Inclination:</b> 0.00°	<b>Azimuth:</b> 0.00°	<b>TVD:</b> -0.00 US ft	<b>North Offset:</b> 0.00 US ft	<b>East Offset:</b> -0.00 US ft

<b>Survey Tool Ranges:</b>			
Name	Start MD(usft)	End MD(usft)	Source Survey
EMS	0.00	392.00	EMS_01
MFAC_US_V2	392.00	474.00	WFT MFAC_01
MWD	474.00	779.00	WFT MWD_01
MFAC_US_V2	779.00	1149.00	WFT MFAC_02
MWD	1149.00	1665.00	WFT MWD_02
MFAC_US_V2	1665.00	1890.00	WFT MFAC_03
MWD	1890.00	5739.00	WFT MWD_03
MWD	5739.00	12924.00	WFT MWD_04

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## 5D Survey Report

Wellpath created using minimum curvature.

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° '' ''')	Longitude (° '' ''')	DLS (%/100US ft)	Comment
0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	40.220512	-80.545328	0.00	
179.00	0.40	334.06	179.00	0.62	0.56	-0.27	40.220514	-80.545329	0.22	
269.00	0.80	322.96	268.99	1.52	1.35	-0.79	40.220516	-80.545331	0.46	
392.00	1.20	292.66	391.98	3.14	2.53	-2.50	40.220519	-80.545337	0.53	
474.00	0.53	285.52	473.97	3.89	2.96	-3.65	40.220520	-80.545341	0.83	
504.00	0.39	313.30	503.96	4.05	3.07	-3.86	40.220520	-80.545342	0.86	
595.00	0.83	148.43	594.96	3.68	2.72	-3.74	40.220520	-80.545341	1.33	
686.00	0.96	129.45	685.95	2.41	1.67	-2.81	40.220517	-80.545338	0.35	
779.00	1.35	125.13	778.93	0.90	0.55	-1.31	40.220514	-80.545333	0.43	
871.00	1.71	123.37	870.90	-1.01	-0.83	0.72	40.220510	-80.545325	0.39	
964.00	1.77	116.96	963.86	-3.06	-2.25	3.16	40.220506	-80.545317	0.22	
1057.00	0.78	109.67	1056.83	-4.43	-3.11	5.04	40.220503	-80.545310	1.08	
1149.00	0.23	349.11	1148.83	-4.62	-3.14	5.59	40.220503	-80.545308	1.00	
1242.00	0.38	343.37	1241.83	-4.13	-2.66	5.47	40.220505	-80.545308	0.16	
1335.00	0.21	3.18	1334.83	-3.66	-2.20	5.39	40.220506	-80.545309	0.21	
1427.00	0.39	343.10	1426.83	-3.19	-1.73	5.31	40.220507	-80.545309	0.22	
1520.00	0.14	72.65	1519.82	-2.87	-1.39	5.33	40.220508	-80.545309	0.44	
1613.00	0.49	76.17	1612.82	-2.89	-1.26	5.82	40.220508	-80.545307	0.38	
1665.00	0.76	100.58	1664.82	-3.06	-1.27	6.37	40.220508	-80.545305	0.72	
1751.00	0.91	69.12	1750.81	-3.27	-1.13	7.57	40.220509	-80.545301	0.55	
1797.00	0.97	57.89	1796.81	-3.14	-0.80	8.24	40.220510	-80.545298	0.42	
1890.00	0.92	64.86	1889.79	-2.82	-0.06	9.59	40.220512	-80.545294	0.13	
1983.00	0.74	48.11	1982.78	-2.46	0.66	10.71	40.220514	-80.545290	0.32	
2076.00	0.69	47.97	2075.78	-1.97	1.43	11.57	40.220516	-80.545287	0.05	
2168.00	0.74	49.44	2167.77	-1.49	2.19	12.44	40.220518	-80.545283	0.06	
2261.00	0.79	42.21	2260.76	-0.92	3.06	13.32	40.220520	-80.545280	0.12	
2354.00	0.80	39.88	2353.75	-0.23	4.03	14.17	40.220523	-80.545277	0.04	
2447.00	1.37	69.25	2446.74	0.20	4.92	15.63	40.220525	-80.545272	0.84	
2540.00	4.42	82.19	2539.61	-0.28	5.80	20.22	40.220528	-80.545255	3.33	
2633.00	7.35	77.64	2632.11	-1.29	7.56	29.58	40.220532	-80.545222	3.19	
2725.00	8.99	66.54	2723.18	-0.91	11.68	41.92	40.220543	-80.545178	2.47	
2818.00	9.67	59.46	2814.95	1.80	18.55	55.32	40.220562	-80.545129	1.43	
2911.00	9.25	56.41	2906.68	5.82	26.65	68.27	40.220584	-80.545083	0.70	
3003.00	9.48	56.54	2997.46	10.13	34.92	80.75	40.220607	-80.545038	0.25	
3096.00	11.40	60.68	3088.91	14.33	43.64	95.16	40.220631	-80.544986	2.22	
3189.00	13.65	62.41	3179.70	18.39	53.23	112.90	40.220657	-80.544923	2.45	
3281.00	14.58	61.62	3268.92	22.76	63.76	132.71	40.220685	-80.544851	1.03	
3374.00	14.41	59.47	3358.96	27.87	75.20	152.97	40.220716	-80.544779	0.61	
3467.00	14.86	59.67	3448.94	33.41	87.10	173.24	40.220749	-80.544706	0.49	
3560.00	16.10	65.56	3538.57	37.93	98.46	195.27	40.220780	-80.544627	2.15	
3652.00	16.31	70.49	3626.92	40.25	108.05	219.06	40.220806	-80.544541	1.51	
3745.00	15.88	69.86	3716.27	41.62	116.80	243.32	40.220829	-80.544454	0.50	
3838.00	15.55	69.27	3805.80	43.23	125.59	266.92	40.220853	-80.544370	0.39	
3931.00	15.13	69.71	3895.48	44.84	134.21	289.96	40.220876	-80.544287	0.47	
4023.00	14.44	69.21	3984.44	46.38	142.45	311.95	40.220899	-80.544208	0.76	
4116.00	14.66	68.28	4074.45	48.21	150.92	333.72	40.220922	-80.544130	0.35	
4209.00	15.59	67.01	4164.23	50.58	160.15	356.16	40.220947	-80.544049	1.06	
4301.00	15.53	67.85	4252.86	53.07	169.62	378.95	40.220972	-80.543967	0.25	
4394.00	15.30	67.41	4342.51	55.48	179.03	401.81	40.220998	-80.543885	0.28	
4487.00	14.94	66.28	4432.30	58.18	188.57	424.11	40.221024	-80.543805	0.50	
4580.00	14.89	63.70	4522.16	61.61	198.68	445.80	40.221051	-80.543727	0.72	
4672.00	15.98	59.72	4610.85	66.52	210.31	467.33	40.221083	-80.543650	1.65	
4765.00	16.57	60.20	4700.12	72.50	223.35	489.90	40.221118	-80.543569	0.65	
4858.00	17.00	60.93	4789.16	78.39	236.55	513.29	40.221154	-80.543485	0.51	
4951.00	16.71	60.66	4878.16	84.20	249.71	536.82	40.221190	-80.543400	0.32	
5043.00	16.34	63.40	4966.36	89.28	261.98	559.93	40.221224	-80.543317	0.94	
5136.00	15.70	64.38	5055.75	93.45	273.28	582.97	40.221254	-80.543235	0.75	

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## 5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (°/100US ft)	Comment
5229.00	15.12	64.63	5145.41	97.20	283.92	605.28	40.221283	-80.543155	0.63	
5322.00	16.36	67.65	5234.92	100.29	294.10	628.35	40.221311	-80.543072	1.60	
5368.00	16.18	61.08	5279.08	102.27	299.66	639.95	40.221326	-80.543030	4.02	
5414.00	17.53	48.85	5323.12	106.48	307.32	650.78	40.221347	-80.542991	8.23	
5461.00	19.22	37.36	5367.73	113.94	318.13	660.81	40.221376	-80.542955	8.49	
5507.00	21.48	29.36	5410.87	124.21	331.49	669.54	40.221413	-80.542923	7.78	
5554.00	24.35	23.83	5454.16	137.54	347.86	677.67	40.221458	-80.542894	7.63	
5600.00	26.38	20.76	5495.73	152.85	366.10	685.13	40.221508	-80.542867	5.26	
5646.00	28.11	17.44	5536.62	169.91	385.99	692.00	40.221562	-80.542842	5.00	
5693.00	29.31	13.75	5577.85	188.98	407.73	698.05	40.221622	-80.542820	4.55	
5739.00	30.33	8.24	5617.76	209.21	430.17	702.40	40.221683	-80.542804	6.35	
5811.00	32.83	0.60	5679.12	244.33	467.70	705.21	40.221786	-80.542793	6.55	
5842.00	35.18	358.88	5704.82	260.96	485.03	705.12	40.221834	-80.542793	8.19	
5885.00	39.31	356.53	5739.04	286.15	511.03	704.05	40.221905	-80.542796	10.16	
5932.00	43.37	353.80	5774.33	316.52	541.95	701.41	40.221990	-80.542805	9.45	
5978.00	46.32	351.47	5806.94	348.52	574.11	697.23	40.222079	-80.542820	7.34	
6024.00	49.72	349.21	5837.71	382.44	607.80	691.48	40.222171	-80.542840	8.24	
6071.00	52.27	347.73	5867.29	418.81	643.58	684.17	40.222270	-80.542865	5.95	
6117.00	53.76	346.73	5894.96	455.46	679.42	676.05	40.222368	-80.542894	3.68	
6163.00	56.20	345.73	5921.36	493.08	716.00	667.08	40.222469	-80.542925	5.60	
6210.00	59.56	344.12	5946.34	532.86	754.43	656.72	40.222574	-80.542962	7.71	
6256.00	62.66	342.60	5968.57	573.13	793.01	645.18	40.222680	-80.543002	7.33	
6303.00	64.98	341.57	5989.30	615.29	833.14	632.20	40.222791	-80.543048	5.31	
6349.00	67.48	340.81	6007.84	657.36	872.98	618.62	40.222900	-80.543096	5.64	
6395.00	69.80	340.32	6024.59	700.15	913.38	604.37	40.223012	-80.543146	5.14	
6442.00	73.37	339.01	6039.44	744.65	955.18	588.87	40.223127	-80.543201	8.04	
6488.00	77.89	337.37	6050.85	789.03	996.54	572.31	40.223240	-80.543259	10.42	
6535.00	82.59	336.29	6058.82	835.04	1039.11	554.09	40.223358	-80.543324	10.25	
6581.00	88.15	335.22	6062.53	880.48	1080.90	535.27	40.223473	-80.543391	12.31	
6674.00	91.05	338.24	6063.18	972.86	1166.31	498.54	40.223708	-80.543521	4.50	
6766.00	89.88	339.77	6062.43	1064.61	1252.20	465.58	40.223944	-80.543637	2.09	
6859.00	90.92	335.57	6061.78	1157.15	1338.20	430.25	40.224181	-80.543762	4.65	
6952.00	90.86	334.30	6060.34	1249.16	1422.43	390.86	40.224412	-80.543902	1.37	
7045.00	90.62	332.58	6059.14	1340.79	1505.60	349.28	40.224641	-80.544049	1.87	
7137.00	91.29	330.64	6057.60	1430.89	1586.52	305.55	40.224864	-80.544204	2.23	
7230.00	91.05	334.97	6055.70	1522.31	1669.21	263.06	40.225092	-80.544355	4.66	
7323.00	90.74	335.34	6054.25	1614.38	1753.59	223.99	40.225324	-80.544493	0.52	
7416.00	90.74	335.42	6053.05	1706.50	1838.13	185.25	40.225557	-80.544631	0.09	
7508.00	90.74	336.14	6051.86	1797.72	1922.02	147.51	40.225788	-80.544764	0.78	
7598.00	90.31	335.53	6051.04	1886.96	2004.13	110.67	40.226014	-80.544895	0.83	
7691.00	90.74	334.54	6050.19	1979.01	2088.44	71.42	40.226246	-80.545034	1.16	
7784.00	90.55	335.57	6049.14	2071.06	2172.75	32.20	40.226478	-80.545173	1.13	
7876.00	90.62	337.31	6048.20	2162.40	2257.08	-4.57	40.226710	-80.545303	1.89	
7969.00	90.31	336.30	6047.44	2254.82	2342.56	-41.19	40.226945	-80.545433	1.14	
8062.00	90.55	337.71	6046.75	2347.26	2428.16	-77.52	40.227181	-80.545561	1.54	
8152.00	90.43	336.92	6045.98	2436.78	2511.20	-112.23	40.227409	-80.545684	0.89	
8241.00	90.43	334.94	6045.31	2525.05	2592.45	-148.53	40.227633	-80.545813	2.22	
8334.00	90.49	335.67	6044.56	2617.16	2676.94	-187.38	40.227866	-80.545950	0.79	
8427.00	90.43	336.82	6043.82	2709.46	2762.06	-224.84	40.228100	-80.546083	1.24	
8519.00	90.25	338.59	6043.27	2801.03	2847.18	-259.74	40.228334	-80.546206	1.93	
8609.00	90.25	339.33	6042.88	2890.78	2931.17	-292.05	40.228565	-80.546321	0.82	
8702.00	90.44	338.90	6042.32	2983.54	3018.06	-325.21	40.228804	-80.546438	0.51	
8795.00	90.25	337.30	6041.76	3076.16	3104.35	-359.89	40.229042	-80.546560	1.73	
8887.00	90.44	338.19	6041.20	3167.74	3189.49	-394.73	40.229276	-80.546684	0.99	
8980.00	90.55	335.93	6040.40	3260.19	3275.13	-430.98	40.229512	-80.546812	2.43	
9073.00	90.31	335.78	6039.70	3352.42	3359.99	-469.02	40.229745	-80.546947	0.30	
9166.00	90.43	336.62	6039.10	3444.71	3445.08	-506.55	40.229979	-80.547080	0.91	
9258.00	90.31	334.49	6038.51	3535.88	3528.82	-544.62	40.230210	-80.547214	2.32	
9351.00	90.25	334.40	6038.05	3627.79	3612.72	-584.73	40.230441	-80.547357	0.12	

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## 5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (° ' ")	Longitude (° ' ")	DLS (%/100US ft)	Comment
9444.00	90.49	333.94	6037.45	3719.63	3696.43	-625.25	40.230671	-80.547500	0.56	
9536.00	90.31	331.60	6036.81	3810.09	3778.23	-667.34	40.230896	-80.547650	2.55	
9629.00	90.31	330.93	6036.31	3901.07	3859.77	-712.05	40.231121	-80.547808	0.72	
9722.00	90.25	332.27	6035.85	3992.16	3941.58	-756.29	40.231346	-80.547965	1.44	
9815.00	90.55	331.13	6035.20	4083.28	4023.46	-800.37	40.231572	-80.548122	1.27	
9908.00	90.43	332.44	6034.41	4174.42	4105.40	-844.34	40.231797	-80.548278	1.41	
10001.00	90.49	337.16	6033.66	4266.39	4189.53	-883.92	40.232029	-80.548418	5.08	
10093.00	90.31	336.59	6033.02	4357.82	4274.13	-920.06	40.232262	-80.548546	0.65	
10186.00	90.25	336.63	6032.56	4450.20	4359.49	-956.98	40.232497	-80.548677	0.08	
10279.00	90.55	337.93	6031.91	4542.69	4445.27	-992.89	40.232733	-80.548804	1.43	
10372.00	90.53	338.19	6031.04	4635.31	4531.53	-1027.64	40.232970	-80.548927	0.28	
10465.00	90.62	337.07	6030.10	4727.86	4617.52	-1063.03	40.233207	-80.549052	1.21	
10557.00	91.23	336.72	6028.62	4819.29	4702.13	-1099.13	40.233439	-80.549180	0.76	
10647.00	91.05	337.31	6026.83	4908.74	4784.97	-1134.27	40.233667	-80.549304	0.69	
10737.00	90.79	339.43	6025.38	4998.40	4868.62	-1167.43	40.233898	-80.549421	2.37	
10830.00	90.71	337.67	6024.17	5091.08	4955.17	-1201.44	40.234136	-80.549542	1.89	
10923.00	90.99	334.36	6022.79	5183.32	5040.11	-1239.23	40.234370	-80.549676	3.57	
11012.00	90.99	331.83	6021.25	5270.91	5119.46	-1279.50	40.234588	-80.549818	2.84	
11102.00	89.88	331.77	6020.56	5359.12	5198.78	-1322.03	40.234806	-80.549969	1.24	
11192.00	90.31	333.92	6020.41	5447.64	5278.85	-1363.10	40.235027	-80.550115	2.44	
11282.00	90.44	334.67	6019.83	5536.55	5359.94	-1402.13	40.235250	-80.550253	0.85	
11374.00	90.37	335.13	6019.18	5627.57	5443.25	-1441.16	40.235479	-80.550392	0.51	
11464.00	90.43	335.62	6018.55	5716.73	5525.06	-1478.66	40.235705	-80.550525	0.55	
11554.00	90.55	336.47	6017.78	5806.01	5607.31	-1515.20	40.235931	-80.550654	0.95	
11646.00	90.43	336.41	6016.99	5897.37	5691.64	-1551.97	40.236163	-80.550784	0.15	
11739.00	90.74	338.35	6016.04	5989.87	5777.47	-1587.74	40.236399	-80.550911	2.11	
11829.00	90.80	339.50	6014.83	6079.61	5861.44	-1620.10	40.236630	-80.551025	1.28	
11922.00	90.62	339.24	6013.68	6172.39	5948.47	-1652.86	40.236870	-80.551141	0.34	
12014.00	90.68	337.26	6012.64	6264.03	6033.91	-1686.95	40.237105	-80.551262	2.15	
12107.00	90.79	336.25	6011.44	6356.43	6119.36	-1723.65	40.237340	-80.551392	1.09	
12197.00	90.92	336.40	6010.10	6445.77	6201.77	-1759.78	40.237567	-80.551520	0.22	
12289.00	91.23	336.53	6008.37	6537.11	6286.11	-1796.51	40.237799	-80.551650	0.37	
12382.00	90.92	335.89	6006.63	6629.40	6371.19	-1834.02	40.238033	-80.551783	0.76	
12475.00	90.86	336.02	6005.18	6721.64	6456.11	-1871.91	40.238267	-80.551917	0.15	
12568.00	91.17	336.24	6003.54	6813.91	6541.14	-1909.54	40.238501	-80.552050	0.41	
12657.00	90.99	332.28	6001.86	6901.79	6621.28	-1948.18	40.238721	-80.552187	4.45	
12750.00	90.68	333.89	6000.50	6993.32	6704.19	-1990.27	40.238950	-80.552336	1.76	
12843.00	90.79	335.90	5999.31	7085.33	6788.40	-2029.72	40.239181	-80.552476	2.16	
12901.00	91.17	334.33	5998.32	7142.74	6841.00	-2054.12	40.239326	-80.552563	2.78	Last WFT SVY
12924.00	91.17	334.33	5997.85	7165.45	6861.73	-2064.08	40.239383	-80.552598	0.00	Proj. to TD

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/22/2018
Job End Date:	5/2/2018
State:	West Virginia
County:	Brooke
API Number:	47-009-00180-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Mark Owen BRK 5H
Latitude:	40.22051200
Longitude:	-80.54532800
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,034
Total Base Water Volume (gal):	7,816,761
Total Base Non Water Volume:	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Southwestern Energy	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	83.00284	
Sand	J.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	16.09135	
HCL Acid (12.6%-17.5%)	J.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.40000	0.66754	
			Hydrogen Chloride	7647-01-0	17.50000	0.15520	
WFRA-2000	J.S. Well Services, LLC	Friction Reducer					
			Water	7732-18-5	60.00000	0.03254	
			2-Propanoic acid, polymer with propenamide	29003-06-9	30.00000	0.01627	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01334	
BIOC11219A	Nalco Champion	Anti-Bacterial Agent					
			Methanol	64-17-5	60.00000	0.00904	
			Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00575	
			Glutaraldehyde	111-30-8	10.00000	0.00192	

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SCAL16486A	Nalco Champion	Scale Inhibitor					
			Ethylene Glycol	107-21-1		30.00000	0.00160
			Amine Triphosphate	Proprietary		30.00000	0.00143
AI-303	J.S. Well Services, LLC	Acid Corrosion Inhibitors					
			Ethylene glycol	107-21-1		40.00000	0.00033
			Cinnamaldehyde	104-55-2		20.00000	0.00012
			Formic acid	64-18-6		20.00000	0.00012
			Butyl cellosolve	111-76-2		20.00000	0.00011
			Polyether	30828-78-6		10.00000	0.00006
			Acetophenone, thiourea, formaldehyde polymer	88527-49-1		5.00000	0.00003
LT FLUSH SYSTEM I	J.S. Well Services, LLC	Other					
			Mineral oil, petroleum distillates, hydro treated light naphthenic	64742-53-6		100.00000	0.00042

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

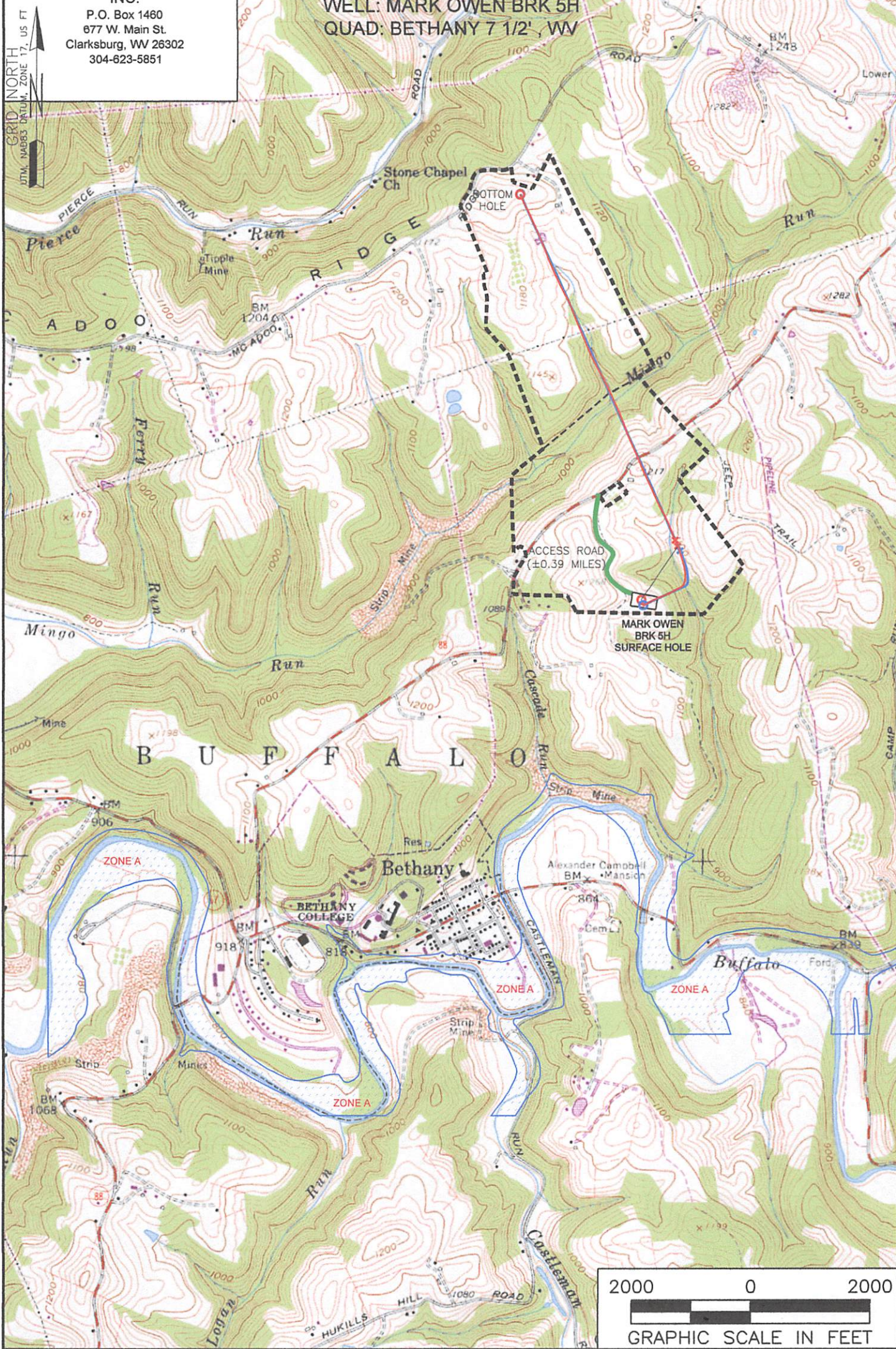
Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided. Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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**JACKSON SURVEYING  
INC.**  
P.O. Box 1460  
677 W. Main St.  
Clarksburg, WV 26302  
304-623-5851

**WELL: MARK OWEN BRK 5H  
QUAD: BETHANY 7 1/2', WV**



NOTE:  
THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF PROPOSED GAS WELLS AND DOES NOT REPRESENT A CLOSED BOUNDARY SURVEY. PROPERTY LINES AND OWNERS WERE OBTAINED FROM VARIOUS FIELD EVIDENCE, TAX RECORDS, AND AERIAL MAPPING.

**LEGEND:**

----- EXTERNAL BOUNDARY

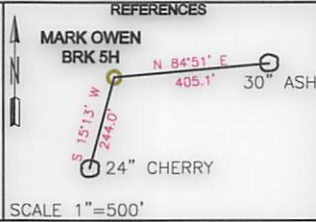
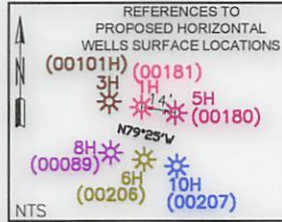
Applicant/Well Operator Name SWN PRODUCTION COMPANY, LLC	Well (Farm) Name MARK OWEN BRK	Well# 5H
Address PO BOX 1300 JANE LEW, WV 26378	County BROOKE	District BUFFALO
Surface Landowner/ Lessor MICHAEL A. DUNN ET UX	USGS 7 1/2 Quadrangle Map Name BETHANY	



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GRID NORTH  
UTM, NAD83 DATUM, ZONE 17, US FT



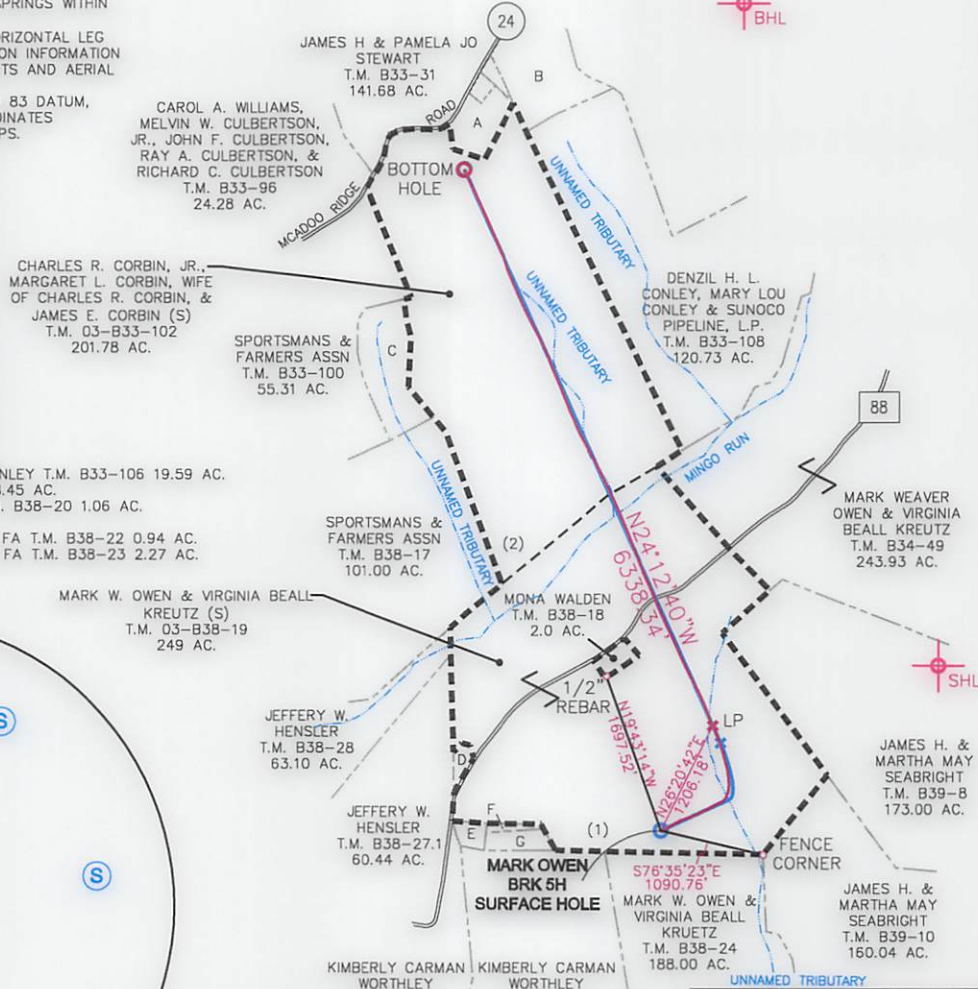
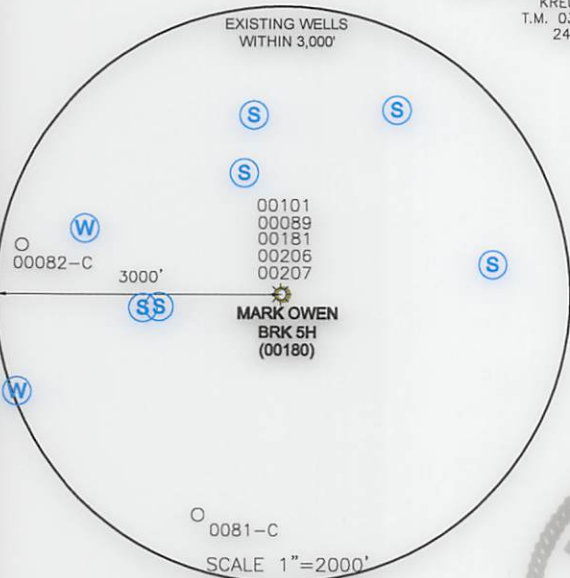
<b>SURFACE HOLE LOCATION (SHL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,331.480 EASTING: 538,685.602
<b>"LANDING POINT" LOCATION (LPL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,607.334 EASTING: 538,873.682
<b>BOTTOM HOLE LOCATION (BHL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,454,423.921 EASTING: 538,057.716

**NOTES ON SURVEY**

1. NO DWELLINGS OR AGRICULTURAL BUILDINGS GREATER THAN 2,500 SQUARE FEET WITHIN 625 FEET OF PROPOSED CENTER OF PAD.
2. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
3. ALL WELLS WITHIN 500' OF THE HORIZONTAL LEG ARE SHOWN ON THIS PLAT BASED UPON INFORMATION TAKEN FROM DEP MAPPING, WELL PLATS AND AERIAL PHOTOS.
4. COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.

LEGEND	
WATERWELL	(W)
SPRING	(S)
STREAM	(ST)
SURFACE OWNER	(S)
DIVISION LINES BEHIND LEASE TRACTS	
ADJOINERS LINES	

- A CHARLES R. CORBIN, JR. T.M. B33-103 8.85 AC.
- B HENRY E DONLEY IV & YVONNE CAWTHORNE DONLEY T.M. B33-106 19.59 AC.
- C SPORTSMANS & FARMERS ASSN T.M. B33-101 18.45 AC.
- D KEVIN SCOTT STEWART & LISA KAY STEWART T.M. B38-20 1.06 AC.
- E LANCE M ELSON T.M. B38-21 1.62 AC.
- F NOLTE & GLADYS VANCAMP TRUST OF VANCAMP FA T.M. B38-22 0.94 AC.
- G NOLTE & GLADYS VANCAMP TRUST OF VANCAMP FA T.M. B38-23 2.27 AC.



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 708

*David L. Jackson*

<b>SURFACE HOLE LOCATION (SHL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,331.420 EASTING: 538,685.559
<b>LANDING POINT (LPL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,660.879 EASTING: 538,848.710
<b>BOTTOM HOLE LOCATION (BHL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,454,422.879 EASTING: 538,056.426

PLAT SCALE 1"=2000'

COMPANY: **SWN** Production Company, LLC

<p>(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS</p> <p>WVDEP OFFICE OF OIL &amp; GAS 601 57TH STREET CHARLESTON, WV 25034</p>	MINIMUM DEGREE OF ACCURACY: 1/200 PROVEN SOURCE OF ELEVATION: SURVEY GRADE GPS (NAVD 88, US FT)	COMPANY: <b>SWN</b> Production Company, LLC OPERATOR'S WELL #: <b>5H</b> API WELL #: <b>47 009 00180</b> STATE COUNTY PERMIT
---	--	---

WELL TYPE: OIL  WASTE DISPOSAL  PRODUCTION  DEEP  GAS  LIQUID INJECTION  STORAGE  SHALLOW

WATERSHED: BUFFALO CREEK ELEVATION: 1,165.6'

DISTRICT: BUFFALO COUNTY: BROOKE QUADRANGLE: BETHANY 7 1/2'

SURFACE OWNER: MARK W. OWEN & VIRGINIA BEALL KREUTZ ACREAGE: 249.00

OIL & GAS ROYALTY OWNER: MARK W. OWEN, VIRGINIA BEALL KREUTZ, VIRGINIA W. RUSSELL, & JOHN LATROBE ACREAGE: 249.00

DRILL  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION

CONVERT  PLUG & ABANDON  CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY) ASDRILLED

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,063' TVD 12,924' TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC ADDRESS: P.O. BOX 1300 CITY: JANE LEW STATE: WV ZIP CODE: 26378	DESIGNATED AGENT: DEE SOUTHALL ADDRESS: P.O. BOX 1300 CITY: JANE LEW STATE: WV ZIP CODE: 26378
--	--

LEGEND: (O) PROPOSED SURFACE HOLE / BOTTOM HOLE (S) EXISTING / PRODUCING WELLHEAD (LPL) LANDING POINT LOCATION (W) EXISTING WATER WELL (S) EXISTING SPRING	SURVEYED BOUNDARY DRILLING UNIT LEASE BOUNDARY ASDRILLED PATH PROPOSED PATH	REVISIONS: DATE: 06-04-2018 DRAWN BY: N. MANO SCALE: 1" = 2000' DRAWING NO: WELL LOCATION PLAT
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**ADJOINING OWNERS**

TRACT	ADJOINING SURFACE OWNER (S)	TAX PARCEL	ACRES
A	TAMMY M. WITHERS (S)	07-B34-04	13.00
B	TAMMY M. WITHERS (S)	07-B39-06	11.08
C	TAMMY M. WITHERS (S)	07-B39-05	1.94
D	PHILLIP M. GREATHOUSE & MARY GREATHOUSE (S)	07-B39-07	13.01
E	RAYMOND W. KIRKBRIDE JR. & JENNIFER VAIL-KIRKBRIDE (S)	07-B34-51	3.42
F	MICHAEL M. HENSLER (S)	07-B34-57.4	18.27
G	KEVIN L. MINOR & RULETTA K. MINOR (S)	07-B34-52	2.61
H	MARK T. KYANKO & MARI J. KYANKO (S)	07-B34-53	2.40
I	MICHAEL M. HENSLER (S)	07-B34-57.1	0.55
J	MICHAEL M. HENSLER (S)	07-B34-54	1.22
K	LOUIS W. HENSLER JR. & MARGARET HENSLER (S)	07-B34-55	1.22
L	WILLIAM W. ROADMAN & PAULA L. ROADMAN (S)	07-B34-56	1.13
M	LEE R. MENEELY & CLEA C. MENEELY (S)	07-B34-41	0.28
N	ROBERT E. ANDREWS & JACQUILINE ANDREWS (S)	07-B34-40	0.58
O	WILLIAM MATTHEW GADD & BARBARA ESTELLE GADD (S)	07-B34-39	0.67
P	DEUTSCHE BANK NATIONAL TRUST COMPANY (S)	07-B34-38	0.70
Q	DAVID LAZZAROTTI & LAURA LAZZAROTTI (S)	07-B34-37	0.58
R	DAVID LAZZAROTTI & LAURA LAZZAROTTI (S)	07-B34-36	0.86
S	WILLIAM J. WALES & MARSHA E. WALES (S)	07-B34-59	1.05
T	JEFFERY A. SHAFFER & MARTHA L SHAFFER (S)	07-B34-34	0.57
U	BRIAN KEITH WHITE (S)	07-B34-33	0.58
V	HELEN ANN VANCAMP (S)	07-B34-31	0.58
W	TERRY L. ROWLAND & CATHY ROWLAND (S)	07-B34-60	1.27

REVISIONS:	COMPANY:	 	
	OPERATOR'S	MARK OWEN BRK	
	WELL #:	5H	
	LOCATION:	BUFFALO DISTRICT, BROOKE COUNTY, WEST VIRGINIA	
		DATE:	06-04-2018
		DRAWN BY: N. MANO	
		SCALE: N/A	
		DRAWING NO:	
		ADJOINING OWNERS	