

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

RECEIVED  
Office of Oil and Gas  
MAR 23 2018

WV Department of  
Environmental Protection

API 47 - 009 - 00189 County BROOKE District BUFFALO  
Quad BETHANY Pad Name JOHN GOOD JR BRK PAD Field/Pool Name PANHANDLE FIELD WET  
Farm name JOHN P. GOOD JR. IRREVOCABLE Well Number JOHN GOOD JR BRK 10H  
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 4,452,682.814 Easting 535,681.814  
Landing Point of Curve Northing 4,452,731.564 Easting 535,882.698  
Bottom Hole Northing 4,450,939.241 Easting 536,520.700

Elevation (ft) 1152.6 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 3/29/2017 Date drilling commenced 6/23/17 Date drilling ceased 8/30/17  
Date completion activities began 11/14/17 Date completion activities ceased 12/30/17  
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

Freshwater depth(s) ft 326 Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 448 Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 308 Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by:  
\_\_\_\_\_

Reviewed

*C. J. Bl* 5-10-18

API 47-009 - 00189 Farm name JOHN P. GOOD JR. IRREVOCABLE Well number JOHN GOOD JR BRK 10H

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	26	20	126	NEW	J-55/94#		Y
Surface	17.5	13.375	390	NEW	H-40/48#		Y, 14 BBLS
Coal	SEE SURFACE						
Intermediate 1	12.25	9.625	1668	NEW	J-55/36#		Y, 32 BBLS
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	12521	NEW	HCP-110/20#		Y
Tubing		2.375	6159	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				SURFACE	24
Surface	CLASS A	378	15.60	1.20	453.6	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	650	15.60	1.18	767	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	2290	15.60	1.19	2725.1	SURFACE	24
Tubing							

Drillers TD (ft) 12521 Loggers TD (ft) 12521  
 Deepest formation penetrated LOWER MARCELLUS Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5268

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 \_\_\_\_\_  
 WV Department of Environmental Protection

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

API 47- 009 - 00189 Farm name JOHN P. GOOD JR. IRREVOCABLE Well number JOHN GOOD JR BRK 10H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	SEE	ATTACHMENT 1	1		

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
		SEE	ATTACHMENT 1	2				

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Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS	
MARCELLUS	5886.24	TVD 6155.53 MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 1540 psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs

OPEN FLOW Gas 2534 mcfpd Oil 333 bpd NGL \_\_\_\_\_ bpd Water 319 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	0		0		
	SEE	ATTACHMENT	3		

Please insert additional pages as applicable.

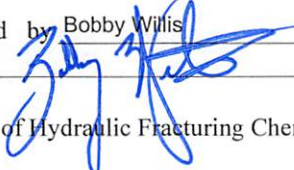
Drilling Contractor SWN DRILLING COMPANY  
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

Logging Company BAKER HUGHES  
Address 9110 GROGANS MILL RD City THE WOODLANDS State TX Zip 77380

Cementing Company SCHLUMBERGER WELL SERVICES  
Address 110 SCHLUMBERGER DRIVE City SUGARLAND State TX Zip 77478

Stimulating Company HALLIBURTON ENERGY SERVICE  
Address 14851 MILNER ROAD, GATE 5A City HOUSTON State TX Zip 77032

Please insert additional pages as applicable.

Completed by Bobby Willis Telephone 832-796-2884  
Signature  Title Regulatory Analyst Date 3-21-18  
Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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JOHN GOOD JR BRK 10H

Perf Summary

Attachment 1

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	10/1/2017	12,192	12,389	42
2	11/14/2017	11,932	12,129	42
3	11/14/2017	11,672	11,869	42
4	11/15/2017	11,412	11,609	42
5	11/16/2017	11,152	11,349	42
6	11/16/2017	10,892	11,089	42
7	11/17/2017	10,632	10,829	42
8	11/17/2017	10,372	10,569	42
9	11/17/2017	10,112	10,309	42
10	11/18/2017	9,852	10,049	42
11	11/18/2017	9,590	9,789	42
12	11/18/2017	9,332	9,529	42
13	11/19/2017	9,072	9,269	42
14	11/19/2017	8,812	9,009	42
15	11/20/2017	8,552	8,749	42
16	11/20/2017	8,292	8,489	42
17	11/21/2017	8,032	8,229	42
18	11/21/2017	7,772	7,969	42
19	11/21/2017	7,512	7,709	42
20	11/22/2017	7,252	7,449	42
21	11/22/2017	6,992	7,189	42
22	11/22/2017	6,732	6,929	42
23	11/23/2017	6,472	6,669	42
24	11/23/2017	6,212	6,409	42

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Frac Summary

Attachment 2

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/other
1	11/14/2017	100	7,404	8,540	3,665	501,080	8,935	
2	11/14/2017	94	7,447	8,580	4,073	506,120	8,159	
3	11/15/2017	96	7,242	7,780	3,973	505,650	7,896	
4	11/16/2017	101	7,502	8,012	3,942	497,990	7,553	
5	11/16/2017	90	7,642	8,984	4,186	501,600	8,264	
6	11/16/2017	96	7,651	8,008	4,361	496,780	7,733	
7	11/17/2017	100	7,917	8,196	3,850	499,080	7,916	
8	11/17/2017	96	7,219	7,524	4,043	509,010	7,931	
9	11/18/2017	98	7,223	8,574	4,086	484,500	7,393	
10	11/18/2017	95	7,459	7,788	4,068	495,930	7,426	
11	11/18/2017	96	7,423	8,104	4,194	507,130	7,319	
12	11/19/2017	100	7,198	8,105	4,044	498,270	7,057	
13	11/19/2017	97	7,319	7,685	4,078	502,530	7,115	
14	11/20/2017	95	7,046	7,733	4,176	497,810	7,817	
15	11/20/2017	100	6,831	7,202	4,831	490,600	7,078	
16	11/20/2017	94	7,114	7,994	4,094	505,870	8,867	
17	11/21/2017	100	6,757	7,243	4,153	500,490	8,035	
18	11/21/2017	96	6,677	8,068	4,145	505,985	7,081	
19	11/22/2017	98	6,748	7,501	3,993	497,805	7,396	
20	11/22/2017	97	6,467	6,669	3,872	497,555	7,886	
21	11/22/2017	100	6,592	7,219	4,188	490,630	7,014	
22	11/23/2017	99	6,323	6,704	4,118	499,960	6,875	
23	11/23/2017	100	6,996	7,178	4,084	502,140	7,275	
24	11/23/2017	100	6,693	6,952	4,409	501,260	7,024	



Well Name: John Good Jr BRK 10H 47009001890000

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	326.00	326.00	
Top of Salt Water	448.00	448.00	NA	NA	
Pittsburgh Coal	308.00	308.00	312.00	312.00	
Pottsville (ss)	440.00	440.00	477.00	477.00	
Mauch Chunk (shale)	639.00	639.00	1302.00	1302.00	
Raven Cliff (ss)	789.00	789.00	946.00	946.00	
Maxton (ss)	1130.00	1130.00	1302.00	1302.00	
Greenbriar (ls)	1302.00	1302.00	1448.00	1446.00	
Big Injun (ss)	1448.00	1446.00	1589.00	1585.00	
Berea (siltstone)	1932.00	1922.00	5666.00	5581.00	
Rhinestreet (shale)	5401.31	5333.19	5661.33	5577.35	
Cashaqua (shale)	5661.33	5577.35	5727.35	5633.47	
Middlesex (shale)	5727.35	5633.47	5803.18	5693.60	
Burket (shale)	5803.18	5693.60	5825.91	5709.57	
Tully (ls)	5825.91	5709.57	5909.45	5766.65	
Mahantango (shale)	5909.45	5766.65	6155.53	5886.24	
Marcellus (shale)	6155.53	5886.24	NA	NA	GAS

# Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	11/14/2017
Job End Date:	11/23/2017
State:	West Virginia
County:	Brooke
API Number:	47-009-00189-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	John Good Jr. BRK 10H
Latitude:	40.22381100
Longitude:	-80.58068110
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	5,956
Total Base Water Volume (gal):	7,632,636
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
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	83.12410	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.98812	



HAI-150E	Halliburton	Corrosion Inhibitor				Listed Below				
HYDROCHLORIC ACID	Halliburton	Solvent				Listed Below				
SAND-COMMON WHITE - 100 MESH, 3307 LB BAG	Halliburton	Proppant				Listed Below				
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant				Listed Below				
3rd Party Biocide	Nalco Champion	Biocide				Listed Below				
3rd Party Scale Inh	Nalco Champion	Scale Inhibitor				Listed Below				
FR-76	Halliburton	Friction Reducer				Listed Below				
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.										
			Crystalline silica, quartz	14808-60-7	100.00000		15.82366			
			Hydrochloric acid	7647-01-0	15.00000		0.13978			
			Inorganic salt	Proprietary	30.00000		0.02812			

				Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02812	
				Acrylamide acrylate copolymer	Proprietary	30.00000	0.02812	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
				Methanol	67-56-1	60.00000	0.01284	
				Bezyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00642	
				Glutaraldehyde	111-30-8	10.00000	0.00214	
				Ethylene Glycol	107-21-1	30.00000	0.00149	
				Amine Triphosphate	Proprietary	30.00000	0.00149	Bryan Hooton, Nalco Champion, 7705 Highway 90-A Sugar Land, Text, 77478, 281 -263-7000
				Non-hazardous food substance	Proprietary	100.00000	0.00028	

\* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

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

\*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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)

# SOUTHWESTERN ENERGY

Location: Brooke County, WV Slot: Slot #10  
 Well: John Good Jr BRK 10H  
 Field: Brooke  
 Facility: John Good Jr BRK Pad Wellbore: John Good Jr BRK 10H.PWB

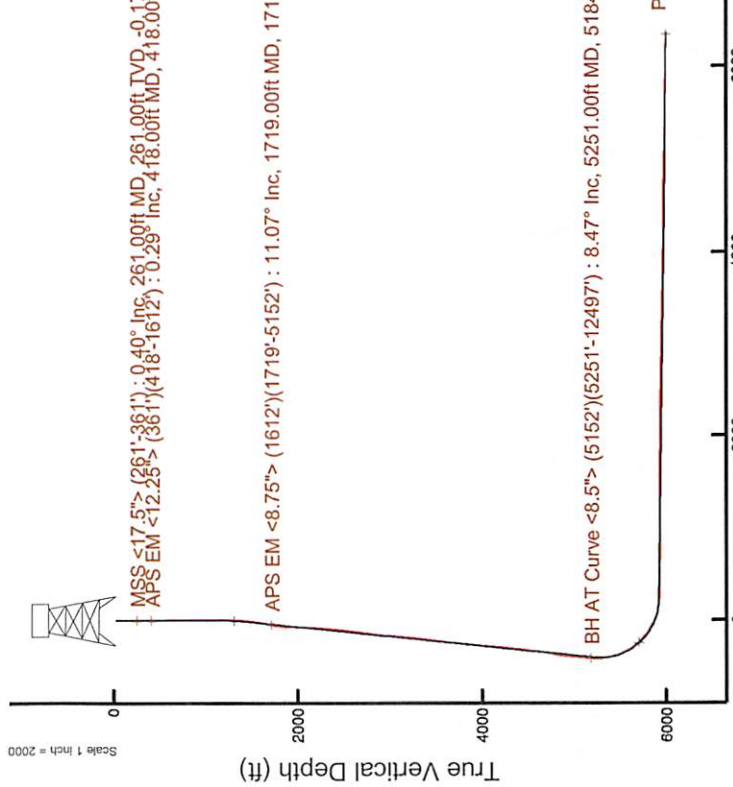
Plot reference wellpath is John Good Jr BRK 10H.PWB Rev-B.0 Grid System: NAD83 / UTM Zone 17 North, US feet  
 True vertical depths are referenced to SDC-46 (KB) North Reference: Grid north  
 Measured depths are referenced to SDC-46 (KB) Scale: True distance  
 SDC-46 (KB) to Mean Sea Level: 1178.6 feet Depths are in feet  
 Mean Sea Level to Ground level (At Slot: Slot #10): -1152.6 feet Created by: amarc on 2017-08-30  
 Coordinates are in feet referenced to Slot Database: WA\_MPL\_EASTERNUS\_Defn

## Location Information

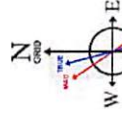
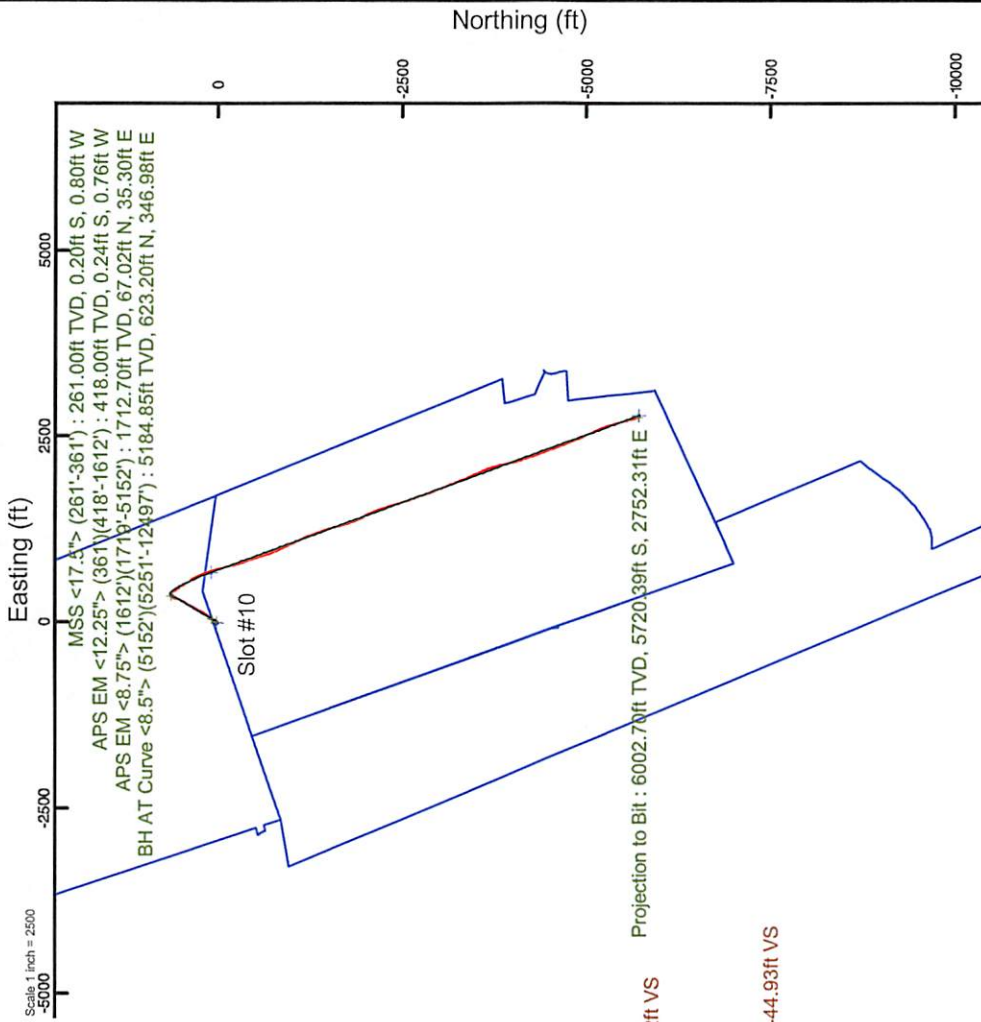
Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
John Good Jr BRK Pad	1757463.232	14608504.851	40°13'25.666"N	80°34'50.452"W
Slot #10	5.35	1757482.750	40°13'25.718"N	80°34'50.200"W
SDC-46 (KB) to Ground level (At Slot: Slot #10)	26ft			
Mean Sea Level to Ground level (At Slot: Slot #10)	-1152.6ft			
SDC-46 (KB) to Mean Sea Level	1178.6ft			

## Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	26.00	0.000	29.936	26.00	0.00	0.00	0.00	0.00
Start Build	1045.02	0.000	29.936	1045.02	0.00	0.00	0.00	0.00
End Build	1570.02	10.500	29.936	1567.09	41.57	23.94	2.00	-26.98
Curve KOP	5279.61	10.500	29.936	5214.56	627.40	361.30	0.00	-407.19
Landing Point	6345.94	89.221	160.040	5919.00	74.84	666.77	9.00	223.26
Total Depth	12521.34	89.221	160.040	6003.00	-5729.05	2774.68	0.00	6365.60



API: 47-009-00189-0000  
 Job#: 8653242  
 Rig: SDC-46  
 Duration: 08/19/17 - 08/27/17



User specified Dip: 67.74° Field: 52706.0T  
 Magnetic North is 8.32 degrees West of True North (at 15/Aug/2017)  
 Grid North is 0.27 degrees East of True North  
 To correct azimuth from True to Grid subtract 0.27 degrees  
 To correct azimuth from Magnetic to Grid subtract 8.59 Degrees

Scale 1 inch = 2000  
 Vertical Section (ft)  
 Azimuth 154.16° with reference 0.00 N, 0.00 E

## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #10
Area	Brooke County, WV	Well	John Good Jr BRK 10H
Field	Brooke	Wellbore	John Good Jr BRK 10H AWB
Facility	John Good Jr BRK Pad		

## REPORT SETUP INFORMATION

Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.1
North Reference	Grid	User	Amarcar
Scale	0.999616	Report Generated	30/Aug/2017 at 09:03
Convergence at slot	0.27° East	Database/Source file	WA_MPL_EASTERNUS_Defm/John_Good_Jr_BRK_10H_AWP_Proj_12521_.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	5.35	19.53	1757482.75	14608510.20	40°13'25.718"N	80°34'50.200"W
Facility Reference Pt			1757463.23	14608504.85	40°13'25.666"N	80°34'50.452"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

## WELLPATH DATUM

Calculation method	Minimum curvature	SDC-46 (KB) to Facility Vertical Datum	26.00ft
Horizontal Reference Pt	Slot	SDC-46 (KB) to Mean Sea Level	1178.60ft
Vertical Reference Pt	SDC-46 (KB)	SDC-46 (KB) to Ground Level at Slot (Slot #10)	26.00ft
MD Reference Pt	SDC-46 (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	154.16°



# Actual Wellpath Report

John Good Jr BRK 10H AWP Proj: 12521'

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## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #10
SOUTHWESTERN ENERGY	Well	John Good Jr BRK 10H
Area	Wellbore	John Good Jr BRK 10H AWB
Field		
Facility		

## WELLPATH DATA (137 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert.Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
0.00†	0.000	256.080	0.00	0.00	0.00	0.00	1757482.75	14608510.20	40°13'25.718"N	80°34'50.200"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	256.080	26.00	0.00	0.00	0.00	1757482.75	14608510.20	40°13'25.718"N	80°34'50.200"W	0.00	0.000	0.00	0.00	0.00
261.00	0.400	256.080	261.00	-0.17	-0.20	-0.80	1757481.95	14608510.00	40°13'25.716"N	80°34'50.210"W	0.82	256.080	0.17	0.17	-44.22
361.00	0.200	64.580	361.00	-0.24	-0.21	-0.98	1757481.77	14608509.99	40°13'25.716"N	80°34'50.213"W	1.00	256.076	0.60	-0.20	168.50
418.00	0.290	121.820	418.00	-0.12	-0.24	-0.76	1757481.99	14608509.96	40°13'25.716"N	80°34'50.210"W	0.80	252.599	0.43	0.16	100.42
510.00	0.620	130.610	509.99	0.54	-0.69	-0.19	1757482.56	14608509.52	40°13'25.711"N	80°34'50.202"W	0.71	195.412	0.37	0.36	9.55
603.00	1.090	145.670	602.98	1.87	-1.74	0.69	1757483.44	14608508.46	40°13'25.701"N	80°34'50.191"W	1.88	188.374	0.56	0.51	16.19
696.00	0.690	128.830	695.97	3.25	-2.83	1.63	1757484.38	14608507.38	40°13'25.690"N	80°34'50.179"W	3.26	150.075	0.51	-0.43	-18.11
788.00	0.560	141.190	787.97	4.19	-3.52	2.34	1757485.09	14608506.68	40°13'25.683"N	80°34'50.170"W	4.23	146.413	0.20	-0.14	13.43
881.00	0.500	143.780	880.96	5.03	-4.21	2.86	1757485.61	14608506.00	40°13'25.676"N	80°34'50.163"W	5.09	145.738	0.07	-0.06	2.78
974.00	0.730	165.470	973.96	6.01	-5.11	3.25	1757486.00	14608505.10	40°13'25.667"N	80°34'50.158"W	6.05	147.500	0.35	0.25	23.32
1067.00	0.650	104.760	1066.95	6.94	-5.81	3.91	1757486.66	14608504.39	40°13'25.660"N	80°34'50.150"W	7.01	146.067	0.75	-0.09	-65.28
1159.00	2.240	48.390	1158.92	6.79	-4.75	5.76	1757488.51	14608505.45	40°13'25.671"N	80°34'50.126"W	7.47	129.524	2.13	1.73	-61.27
1252.00	4.330	35.790	1251.77	4.63	-0.70	9.17	1757491.92	14608509.50	40°13'25.711"N	80°34'50.082"W	9.20	94.349	2.36	2.25	-13.55
1345.00	7.020	30.500	1344.30	-0.19	7.05	14.11	1757496.86	14608517.25	40°13'25.787"N	80°34'50.018"W	15.77	63.460	2.94	2.89	-5.69
1438.00	8.940	25.820	1436.40	-7.83	18.45	20.14	1757502.89	14608528.64	40°13'25.899"N	80°34'49.939"W	27.32	47.512	2.18	2.06	-5.03
1530.00	10.380	21.430	1527.09	-17.88	32.60	26.29	1757509.03	14608542.79	40°13'26.039"N	80°34'49.859"W	41.88	38.879	1.76	1.57	-4.77
1612.00	11.010	15.940	1607.67	-28.74	47.01	31.14	1757513.87	14608557.19	40°13'26.181"N	80°34'49.796"W	56.38	33.519	1.46	0.77	-6.70
1719.00	11.070	7.590	1712.70	-44.93	67.02	35.30	1757518.04	14608577.19	40°13'26.379"N	80°34'49.741"W	75.74	27.777	1.49	0.06	-7.80
1812.00	9.590	17.090	1804.19	-58.06	83.27	38.76	1757521.49	14608593.44	40°13'26.539"N	80°34'49.695"W	91.86	24.957	2.42	-1.59	10.22
1905.00	10.120	41.360	1895.86	-66.90	96.82	46.43	1757529.17	14608606.98	40°13'26.673"N	80°34'49.595"W	107.38	25.623	4.47	0.57	26.10
1997.00	12.660	52.030	1986.05	-72.15	109.09	59.73	1757542.45	14608619.25	40°13'26.793"N	80°34'49.423"W	124.37	28.701	3.58	2.76	11.60
2090.00	11.920	48.930	2076.92	-76.81	121.67	75.00	1757557.72	14608631.82	40°13'26.917"N	80°34'49.226"W	142.93	31.651	1.07	-0.80	-3.33
2182.00	11.360	42.070	2167.03	-82.72	134.64	88.24	1757570.95	14608644.79	40°13'27.044"N	80°34'49.054"W	160.98	33.239	1.62	-0.61	-7.46
2275.00	10.600	36.730	2258.33	-90.10	148.29	99.49	1757582.20	14608658.44	40°13'27.179"N	80°34'48.908"W	178.57	33.857	1.36	-0.82	-5.74
2367.00	10.030	34.860	2348.84	-97.92	161.65	109.13	1757591.84	14608671.79	40°13'27.310"N	80°34'48.783"W	195.04	34.023	0.72	-0.62	-2.03
2460.00	9.380	34.160	2440.51	-105.67	174.57	118.01	1757600.72	14608684.70	40°13'27.437"N	80°34'48.668"W	210.71	34.060	0.71	-0.70	-0.75
2553.00	11.320	27.540	2532.00	-114.91	188.93	126.49	1757609.19	14608699.06	40°13'27.579"N	80°34'48.558"W	227.37	33.802	2.44	2.09	-7.12
2646.00	11.930	24.890	2623.09	-126.44	205.74	134.76	1757617.45	14608715.87	40°13'27.745"N	80°34'48.450"W	245.95	33.224	0.87	0.66	-2.85
2738.00	11.410	23.670	2713.19	-138.37	222.71	142.41	1757625.11	14608732.82	40°13'27.912"N	80°34'48.350"W	264.35	32.597	0.63	-0.57	-1.33



# Actual Wellpath Report

John Good Jr BRK 10H AWP Proj: 12521'  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #10
Area	Brooke County, WV	Well	John Good Jr BRK 10H
Field	Brooke	Wellbore	John Good Jr BRK 10H AWB
Facility	John Good Jr BRK Pad		

## WELLPATH DATA (137 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert.Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [r/100ft]	Build Rate [r/100ft]	Turn Rate [r/100ft]
2831.00	10.670	19.480	2804.47	-150.39	239.25	148.98	1757631.67	14608749.36	40°13'28.075"N	80°34'48.265"W	281.84	31.910	1.17	-0.80	-4.51
2924.00	10.520	29.990	2895.89	-161.22	254.72	156.09	1757638.78	14608764.82	40°13'28.228"N	80°34'48.172"W	298.74	31.500	2.08	-0.16	11.30
3016.00	10.750	33.310	2986.31	-170.33	269.16	165.00	1757647.69	14608779.26	40°13'28.370"N	80°34'48.066"W	315.71	31.509	0.71	0.25	3.61
3112.00	9.880	31.980	3080.76	-179.31	283.63	174.28	1757656.96	14608793.72	40°13'28.513"N	80°34'47.936"W	332.90	31.569	0.94	-0.91	-1.39
3205.00	9.330	30.690	3172.45	-187.74	296.92	182.38	1757665.06	14608807.01	40°13'28.644"N	80°34'47.831"W	348.46	31.559	0.58	-0.53	-1.39
3298.00	11.340	32.090	3263.93	-196.79	311.20	191.11	1757673.78	14608821.28	40°13'28.784"N	80°34'47.717"W	365.19	31.554	2.11	2.10	1.49
3390.00	11.740	28.650	3354.07	-207.03	327.07	200.40	1757683.07	14608837.15	40°13'28.941"N	80°34'47.597"W	383.59	31.496	0.86	0.43	-3.73
3483.00	10.940	25.790	3445.25	-218.00	343.32	208.78	1757691.44	14608853.39	40°13'29.101"N	80°34'47.488"W	401.82	31.304	1.05	-0.86	-3.08
3576.00	10.610	22.680	3536.61	-229.15	359.17	215.92	1757698.58	14608869.23	40°13'29.257"N	80°34'47.395"W	419.07	31.012	0.72	-0.35	-3.34
3668.00	9.890	17.640	3627.15	-240.49	374.51	221.58	1757704.24	14608884.57	40°13'29.409"N	80°34'47.321"W	435.15	30.610	1.25	-0.78	-5.48
3761.00	9.310	15.230	3718.84	-251.96	389.38	225.97	1757708.64	14608899.43	40°13'29.555"N	80°34'47.263"W	450.20	30.128	0.76	-0.62	-2.59
3854.00	9.310	26.830	3810.63	-262.19	403.36	231.34	1757714.01	14608913.40	40°13'29.693"N	80°34'47.193"W	464.99	29.836	2.01	0.00	12.47
3946.00	10.940	38.230	3901.20	-270.52	416.86	240.11	1757722.76	14608926.90	40°13'29.826"N	80°34'47.079"W	481.06	29.942	2.80	1.77	12.39
4042.00	10.560	37.380	3995.52	-278.47	431.00	251.08	1757733.74	14608941.04	40°13'29.965"N	80°34'46.937"W	498.81	30.223	0.43	-0.40	-0.89
4135.00	10.330	36.690	4086.97	-286.16	444.46	261.24	1757743.89	14608954.49	40°13'30.098"N	80°34'46.805"W	515.55	30.446	0.28	-0.25	-0.74
4228.00	9.910	31.420	4178.53	-294.33	457.98	270.39	1757753.04	14608968.00	40°13'30.231"N	80°34'46.686"W	531.84	30.558	1.09	-0.45	-5.67
4321.00	9.360	26.660	4270.22	-303.26	471.57	277.96	1757760.60	14608981.58	40°13'30.365"N	80°34'46.588"W	547.39	30.517	1.04	-0.59	-5.12
4413.00	8.440	22.640	4361.11	-312.29	484.48	283.92	1757766.56	14608994.50	40°13'30.492"N	80°34'46.510"W	561.54	30.371	1.21	-1.00	-4.37
4506.00	10.370	25.150	4452.86	-322.09	498.36	290.10	1757772.74	14609008.37	40°13'30.629"N	80°34'46.430"W	576.65	30.204	2.12	2.08	2.70
4599.00	10.800	22.450	4544.27	-333.15	513.99	296.99	1757779.62	14609023.99	40°13'30.783"N	80°34'46.340"W	593.62	30.020	0.71	0.46	-2.90
4691.00	10.440	15.160	4634.70	-345.18	530.00	302.46	1757785.09	14609040.00	40°13'30.941"N	80°34'46.268"W	610.23	29.712	1.51	-0.39	-7.92
4784.00	11.630	20.810	4725.98	-357.98	546.90	307.99	1757790.62	14609056.89	40°13'31.108"N	80°34'46.196"W	627.66	29.386	1.73	1.28	6.08
4877.00	12.140	16.950	4816.99	-371.59	565.02	314.17	1757796.80	14609075.00	40°13'31.287"N	80°34'46.115"W	646.49	29.076	1.02	0.55	-4.15
4973.00	11.050	24.040	4911.04	-384.92	583.07	320.86	1757803.49	14609093.05	40°13'31.465"N	80°34'46.028"W	665.53	28.824	1.87	-1.14	7.39
5065.00	10.110	35.550	5001.48	-394.47	597.70	329.15	1757811.77	14609107.67	40°13'31.609"N	80°34'45.920"W	682.34	28.842	2.51	-1.02	12.51
5152.00	10.030	35.890	5087.14	-401.72	610.05	338.03	1757820.65	14609120.01	40°13'31.731"N	80°34'45.805"W	697.44	28.991	0.11	-0.09	0.39
5251.00	8.470	32.240	5184.85	-409.66	623.20	346.98	1757829.59	14609133.16	40°13'31.860"N	80°34'45.689"W	713.28	29.108	1.68	-1.58	-3.69
5338.00	8.960	65.090	5270.90	-412.94	631.48	356.55	1757839.16	14609141.44	40°13'31.941"N	80°34'45.565"W	725.18	29.450	5.67	0.56	37.76
5430.00	12.300	103.180	5361.41	-406.64	632.26	372.61	1757855.21	14609142.22	40°13'31.948"N	80°34'45.358"W	733.89	30.512	8.25	3.63	41.40
5523.00	17.690	139.390	5451.40	-386.69	619.24	391.50	1757874.10	14609129.20	40°13'31.819"N	80°34'45.115"W	732.62	32.302	11.35	5.80	38.94



# Actual Wellpath Report

John Good Jr BRK 10H AWP Proj: 12521'

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**BAKER HUGHES**  
a GE company

## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #10
Area	Brooke County, WV	Well	John Good Jr BRK 10H
Field	Brooke	Wellbore	John Good Jr BRK 10H AWB
Facility	John Good Jr BRK Pad		

## WELLPATH DATA (137 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
5616.00	25.330	145.520	5537.87	-353.30	592.07	412.00	1757894.59	14609102.04	40°13'31.549"N	80°34'44.852"W	721.31	34.832	8.55	8.22	6.59
5709.00	33.380	146.750	5618.86	-308.19	554.21	437.33	1757919.91	14609064.20	40°13'31.174"N	80°34'44.528"W	705.98	38.277	8.68	8.66	1.32
5801.00	41.070	147.260	5692.07	-253.00	507.56	467.59	1757950.16	14609017.56	40°13'30.712"N	80°34'44.141"W	690.12	42.653	8.37	8.36	0.55
5894.00	49.560	147.830	5757.41	-187.38	451.80	503.02	1757985.58	14608961.83	40°13'30.159"N	80°34'43.687"W	676.14	48.071	9.14	9.13	0.61
5987.00	56.910	148.960	5813.03	-113.31	388.38	542.01	1758024.55	14608898.43	40°13'29.530"N	80°34'43.189"W	666.79	54.376	7.96	7.90	1.22
6080.00	64.300	150.690	5858.65	-32.57	318.36	582.67	1758065.19	14608828.44	40°13'28.837"N	80°34'42.669"W	663.97	61.349	8.11	7.95	1.86
6173.00	72.820	153.800	5892.62	53.86	241.81	622.88	1758105.39	14608751.91	40°13'28.078"N	80°34'42.155"W	668.17	68.783	9.67	9.16	3.34
6265.00	81.290	158.360	5913.22	143.36	159.92	659.13	1758141.63	14608670.06	40°13'27.267"N	80°34'41.693"W	678.25	76.362	10.39	9.21	4.96
6358.00	89.230	163.420	5920.90	235.30	72.44	689.42	1758171.90	14608582.61	40°13'26.401"N	80°34'41.308"W	693.21	84.002	10.11	8.54	5.44
6451.00	88.950	167.790	5922.38	326.41	-17.61	712.63	1758195.00	14608492.60	40°13'25.511"N	80°34'41.015"W	712.75	91.416	4.71	-0.30	4.70
6543.00	88.890	164.540	5924.12	416.37	-106.91	734.52	1758216.99	14608403.33	40°13'24.627"N	80°34'40.737"W	742.26	98.282	3.53	-0.07	-3.53
6636.00	89.800	165.350	5925.62	507.72	-196.71	758.68	1758241.13	14608313.57	40°13'23.739"N	80°34'40.431"W	783.76	104.536	0.96	0.40	0.87
6729.00	89.380	164.370	5926.72	599.09	-286.47	782.96	1758265.41	14608223.84	40°13'22.850"N	80°34'40.124"W	833.73	110.097	1.06	0.13	-1.05
6821.00	89.200	159.850	5927.86	690.18	-374.00	811.22	1758293.65	14608136.35	40°13'21.984"N	80°34'39.765"W	893.28	114.751	4.92	-0.20	-4.91
6914.00	89.320	160.400	5929.06	782.67	-461.45	842.83	1758325.25	14608048.93	40°13'21.119"N	80°34'39.363"W	960.88	118.701	0.61	0.13	0.59
7007.00	89.380	163.710	5930.12	874.77	-549.91	871.48	1758353.89	14607960.51	40°13'20.243"N	80°34'38.999"W	1030.47	122.252	3.56	0.06	3.56
7099.00	89.630	165.350	5930.91	965.26	-638.57	896.02	1758378.42	14607871.88	40°13'19.366"N	80°34'38.688"W	1100.28	125.477	1.80	0.27	1.78
7192.00	89.480	161.390	5931.64	1057.04	-727.66	922.62	1758405.02	14607782.83	40°13'18.484"N	80°34'38.350"W	1175.04	128.262	4.26	-0.16	-4.26
7285.00	89.880	153.920	5932.16	1149.80	-813.61	957.96	1758440.34	14607696.90	40°13'17.633"N	80°34'37.900"W	1256.84	130.342	8.04	0.43	-8.03
7378.00	89.970	155.080	5932.28	1242.79	-897.55	997.99	1758480.36	14607613.00	40°13'16.802"N	80°34'37.389"W	1342.23	131.967	1.25	0.10	1.25
7470.00	90.000	155.280	5932.30	1334.78	-981.05	1036.61	1758518.96	14607529.53	40°13'15.975"N	80°34'36.897"W	1427.24	133.423	0.22	0.03	0.22
7563.00	90.120	154.950	5932.21	1427.77	-1065.42	1075.75	1758558.08	14607445.20	40°13'15.139"N	80°34'36.397"W	1514.05	134.724	0.38	0.13	-0.35
7656.00	89.880	154.740	5932.21	1520.76	-1149.60	1115.28	1758597.60	14607361.05	40°13'14.306"N	80°34'35.893"W	1601.69	135.868	0.34	-0.26	-0.23
7749.00	89.910	158.390	5932.38	1613.66	-1234.91	1152.26	1758634.56	14607275.77	40°13'13.461"N	80°34'35.421"W	1689.00	136.983	3.92	0.03	3.92
7842.00	89.510	159.540	5932.85	1706.33	-1321.71	1185.64	1758667.93	14607189.00	40°13'12.601"N	80°34'34.996"W	1775.57	138.106	1.31	-0.43	1.24
7934.00	89.540	160.550	5933.61	1797.84	-1408.18	1217.03	1758699.31	14607102.56	40°13'11.745"N	80°34'34.597"W	1861.22	139.165	1.10	0.03	1.10
8027.00	89.510	163.320	5934.38	1889.98	-1496.59	1245.87	1758728.14	14607014.19	40°13'10.870"N	80°34'34.231"W	1947.30	140.224	2.98	-0.03	2.98
8120.00	89.570	164.580	5935.13	1981.62	-1585.96	1271.58	1758753.84	14606924.86	40°13'09.986"N	80°34'33.905"W	2032.78	141.278	1.36	0.06	1.35
8213.00	89.690	165.030	5935.73	2073.01	-1675.70	1295.96	1758778.21	14606835.14	40°13'09.098"N	80°34'33.596"W	2118.37	142.282	0.50	0.13	0.48
8306.00	89.510	162.230	5936.38	2164.73	-1764.92	1322.16	1758804.40	14606745.96	40°13'08.215"N	80°34'33.264"W	2205.24	143.162	3.02	-0.19	-3.01



# Actual Wellpath Report

John Good Jr BRK 10H AWP Proj: 12521'  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #10
Area	Brooke County, WV	Well	John Good Jr BRK 10H
Field	Brooke	Wellbore	John Good Jr BRK 10H AWB
Facility	John Good Jr BRK Pad		

## WELLPATH DATA (137 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
8398.00	89.420	158.600	5937.24	2256.17	-1851.58	1353.00	1758835.22	14606659.33	40°13'07.357"N	80°34'32.872"W	2293.24	143.843	3.95	-0.10	-3.95
8491.00	89.320	153.820	5938.26	2349.08	-1936.65	1390.50	1758872.71	14606574.30	40°13'06.515"N	80°34'32.394"W	2384.13	144.322	5.14	-0.11	-5.14
8583.00	88.950	152.720	5939.65	2441.05	-2018.81	1431.87	1758914.07	14606492.17	40°13'05.877"N	80°34'31.865"W	2475.04	144.653	1.26	-0.40	-1.20
8676.00	88.890	154.320	5941.40	2534.03	-2102.03	1473.33	1758955.51	14606408.98	40°13'04.701"N	80°34'31.336"W	2566.95	144.973	1.72	-0.06	-1.72
8769.00	88.860	161.200	5943.23	2626.77	-2188.05	1508.50	1758990.67	14606323.00	40°13'04.025"N	80°34'30.888"W	2657.65	145.417	7.40	-0.03	7.40
8862.00	88.980	163.530	5944.98	2718.80	-2276.65	1536.67	1759018.83	14606234.43	40°13'03.148"N	80°34'30.530"W	2746.73	145.982	2.51	0.13	2.51
8955.00	88.890	162.050	5946.71	2810.72	-2365.47	1564.18	1759046.33	14606145.64	40°13'02.269"N	80°34'30.181"W	2835.86	146.525	1.59	-0.10	-1.59
9047.00	88.980	163.380	5948.42	2901.68	-2453.30	1591.51	1759073.65	14606057.85	40°13'01.400"N	80°34'29.834"W	2924.31	147.028	1.45	0.10	1.45
9140.00	89.050	164.160	5950.02	2993.36	-2542.58	1617.50	1759099.63	14605968.60	40°13'00.517"N	80°34'29.505"W	3013.47	147.537	0.84	0.08	0.84
9229.00	89.140	160.690	5951.43	3081.41	-2627.40	1644.37	1759126.48	14605883.81	40°12'59.677"N	80°34'29.164"W	3099.55	147.960	3.90	0.10	-3.90
9322.00	89.080	158.200	5952.87	3174.00	-2714.46	1677.01	1759159.11	14605796.79	40°12'58.815"N	80°34'28.748"W	3190.72	148.292	2.68	-0.06	-2.68
9415.00	88.890	161.930	5954.52	3266.48	-2801.86	1708.71	1759190.80	14605709.42	40°12'57.950"N	80°34'28.345"W	3281.79	148.623	4.02	-0.20	4.01
9507.00	88.800	161.540	5956.37	3357.65	-2889.21	1737.54	1759219.62	14605622.11	40°12'57.086"N	80°34'27.979"W	3371.44	148.978	0.43	-0.10	-0.42
9600.00	88.860	155.730	5958.27	3450.31	-2975.76	1771.40	1759253.46	14605535.59	40°12'56.229"N	80°34'27.548"W	3463.09	149.236	6.25	0.06	-6.25
9693.00	88.920	158.420	5960.08	3543.17	-3061.39	1807.61	1759289.67	14605449.99	40°12'55.381"N	80°34'27.086"W	3555.22	149.440	2.89	0.06	2.89
9785.00	89.020	158.510	5961.73	3634.89	-3146.96	1841.38	1759323.42	14605364.46	40°12'54.534"N	80°34'26.656"W	3646.10	149.667	0.15	0.11	0.10
9878.00	89.140	158.300	5963.22	3727.62	-3233.42	1875.60	1759357.63	14605278.03	40°12'53.678"N	80°34'26.220"W	3738.03	149.883	0.26	0.13	-0.23
9971.00	89.230	158.730	5964.55	3820.35	-3319.95	1909.66	1759391.67	14605191.54	40°12'52.821"N	80°34'25.787"W	3829.99	150.092	0.47	0.10	0.46
10063.00	89.320	155.500	5965.71	3912.20	-3404.69	1945.43	1759427.43	14605106.83	40°12'51.982"N	80°34'25.331"W	3921.30	150.256	3.51	0.10	-3.51
10156.00	89.080	154.330	5967.01	4005.19	-3488.91	1984.85	1759466.84	14605022.64	40°12'51.148"N	80°34'24.928"W	4013.99	150.364	1.28	-0.26	-1.26
10249.00	89.230	157.390	5968.38	4098.12	-3573.75	2022.88	1759504.85	14604937.83	40°12'50.307"N	80°34'24.543"W	4106.55	150.489	3.29	0.16	3.29
10342.00	89.290	158.980	5969.58	4190.88	-3660.08	2057.44	1759539.39	14604851.53	40°12'49.453"N	80°34'23.903"W	4198.72	150.658	1.71	0.06	1.71
10434.00	89.570	165.650	5970.50	4281.90	-3747.68	2085.37	1759567.31	14604763.97	40°12'48.586"N	80°34'23.548"W	4288.81	150.907	7.26	0.30	7.25
10527.00	89.380	167.380	5971.35	4372.74	-3838.11	2107.05	1759588.99	14604673.57	40°12'47.691"N	80°34'23.275"W	4378.44	151.234	1.87	-0.20	1.86
10620.00	89.820	168.630	5972.00	4463.03	-3929.08	2126.38	1759608.31	14604582.64	40°12'46.791"N	80°34'23.031"W	4467.56	151.578	1.42	0.47	1.34
10713.00	90.060	165.840	5972.10	4553.61	-4019.77	2146.92	1759628.85	14604491.98	40°12'45.894"N	80°34'22.772"W	4557.17	151.894	3.01	0.26	-3.00
10805.00	90.150	163.070	5971.93	4644.12	-4108.40	2171.58	1759653.49	14604403.39	40°12'45.017"N	80°34'22.460"W	4647.01	152.140	3.01	0.10	-3.01
10898.00	88.550	161.820	5972.98	4736.14	-4197.05	2199.63	1759681.53	14604314.77	40°12'44.140"N	80°34'22.104"W	4738.52	152.342	2.18	-1.72	-1.34
10991.00	89.050	161.270	5974.93	4828.35	-4285.25	2229.06	1759710.95	14604226.61	40°12'43.267"N	80°34'21.730"W	4830.33	152.518	0.80	0.54	-0.56
11084.00	88.520	160.150	5976.90	4920.72	-4373.01	2259.77	1759741.65	14604138.88	40°12'42.398"N	80°34'21.339"W	4922.38	152.672	1.33	-0.57	-1.20





# Actual Wellpath Report

John Good Jr BRK 10H AWP Proj: 12521'

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**BAKER HUGHES**  
a GE company

## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #10
SOUTHWESTERN ENERGY	Well	John Good Jr BRK 10H
Area	Wellbore	John Good Jr BRK 10H AWB
Field		
Facility		

## WELLPATH DATA (137 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS ["/100ft]	Build Rate ["/100ft]	Turn Rate ["/100ft]
11176.00	88.830	159.410	5979.03	5012.25	-4459.31	2291.56	1759773.43	14604052.61	40°12'41.544"N	80°34'20.935"W	5013.66	152.802	0.87	0.34	-0.80
11269.00	88.060	159.950	5981.55	5104.78	-4546.49	2323.85	1759805.70	14603965.46	40°12'40.681"N	80°34'20.524"W	5105.96	152.927	1.01	-0.83	0.58
11362.00	88.650	158.280	5984.22	5197.39	-4633.34	2356.98	1759838.82	14603878.65	40°12'39.821"N	80°34'20.102"W	5198.39	153.038	1.90	0.63	-1.80
11455.00	88.520	158.310	5986.52	5290.12	-4719.72	2391.37	1759873.19	14603792.30	40°12'38.966"W	80°34'19.665"W	5290.98	153.130	0.14	-0.14	0.03
11548.00	88.310	158.020	5989.09	5382.86	-4806.02	2425.94	1759907.76	14603706.04	40°12'38.111"N	80°34'19.224"W	5383.59	153.217	0.38	-0.23	-0.31
11640.00	89.450	156.410	5990.89	5474.71	-4890.82	2461.57	1759943.36	14603621.27	40°12'37.272"N	80°34'18.770"W	5475.35	153.284	2.14	1.24	-1.75
11733.00	89.510	154.900	5991.74	5567.67	-4975.54	2499.90	1759981.68	14603536.58	40°12'36.432"N	80°34'18.282"W	5568.26	153.323	1.62	0.06	-1.62
11826.00	89.630	155.610	5992.43	5660.65	-5060.00	2538.83	1760020.60	14603452.15	40°12'35.596"N	80°34'17.785"W	5661.21	153.355	0.77	0.13	0.76
11919.00	89.540	158.430	5993.11	5753.52	-5145.61	2575.13	1760056.89	14603366.58	40°12'34.748"N	80°34'17.323"W	5754.01	153.414	3.03	-0.10	3.03
12012.00	89.450	160.380	5993.93	5846.12	-5232.66	2607.84	1760089.58	14603279.56	40°12'33.887"N	80°34'16.906"W	5846.50	153.509	2.10	-0.10	2.10
12104.00	89.080	161.350	5995.11	5937.48	-5319.57	2638.00	1760119.73	14603192.69	40°12'33.026"N	80°34'16.523"W	5937.75	153.623	1.13	-0.40	1.05
12197.00	89.010	163.300	5996.66	6029.52	-5408.16	2666.23	1760147.95	14603104.13	40°12'32.149"N	80°34'16.165"W	6029.67	153.757	2.10	-0.08	2.10
12290.00	88.920	165.760	5998.34	6120.98	-5497.77	2691.03	1760172.74	14603014.55	40°12'31.263"N	80°34'15.851"W	6121.04	153.919	2.65	-0.10	2.65
12383.00	88.830	165.840	6000.16	6212.05	-5587.91	2713.84	1760195.54	14602924.45	40°12'30.371"N	80°34'15.562"W	6212.06	154.096	0.13	-0.10	0.09
12476.00	88.980	162.970	6001.94	6303.54	-5677.46	2738.83	1760220.52	14602834.93	40°12'29.485"N	80°34'15.246"W	6303.55	154.247	3.09	0.16	-3.09
12497.00	89.050	162.450	6002.30	6324.31	-5697.51	2745.07	1760226.76	14602814.89	40°12'29.286"N	80°34'15.167"W	6324.32	154.275	2.50	0.33	-2.48
12521.00	89.050	162.450	6002.70	6348.05	-5720.39	2752.31	1760233.99	14602792.02	40°12'29.060"N	80°34'15.075"W	6348.07	154.306	0.00	0.00	0.00

## HOLE & CASING SECTIONS - Ref Wellbore: John Good Jr BRK 10H AWB Ref Wellpath: John Good Jr BRK 10H AWP Proj: 12521'

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
17.5in Open Hole	26.00	400.00	374.00	26.00	400.00	0.00	0.00	-0.20	-0.84
13.375in Casing Surface	26.00	380.00	354.00	26.00	380.00	0.00	0.00	-0.19	-0.91
12.25in Open Hole	400.00	1688.00	1288.00	400.00	1682.27	-0.20	-0.84	61.15	34.39
9.625in Casing Intermediate	26.00	1685.00	1659.00	26.00	1679.33	0.00	0.00	60.58	34.29
8.75in Open Hole	1688.00	5226.00	3538.00	1682.27	5160.14	61.15	34.39	620.03	344.94
8.5in Open Hole	5226.00	12621.00	7295.00	5160.14	6002.70	620.03	344.94	-5720.39	2752.31



# Actual Wellpath Report

John Good Jr BRK 10H AWP Proj: 12521'  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #10
SOUTHWESTERN ENERGY	Well	John Good Jr BRK 10H
Area	Wellbore	John Good Jr BRK 10H AWB
Field		
Facility		

## TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
John Good Jr N LL	5897.00	-5.39	-19.50	1757463.26	14608504.81	40°13'25.666"N	80°34'50.452"W	polygon
John Good Jr S LL	5897.00	-5.39	-19.50	1757463.26	14608504.81	40°13'25.666"N	80°34'50.452"W	polygon
John Good Jr SW LL	5897.00	-5.39	-19.50	1757463.26	14608504.81	40°13'25.666"N	80°34'50.452"W	polygon
John Good Jr BRK 10H LP Rev-2	5919.00	74.84	666.77	1758149.27	14608585.01	40°13'26.426"N	80°34'41.600"W	point
John Good Jr BRK 10H BHL Rev-1	6003.00	-5729.05	2774.68	1760256.36	14602783.36	40°12'28.973"N	80°34'14.787"W	point

## WELLPATH COMPOSITION - Ref Wellbore: John Good Jr BRK 10H AWB Ref Wellpath: John Good Jr BRK 10H AWP Proj: 12521'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment
26.00	361.00	OWSG EMS rev2 - Standard	01_MSS <17.5'> (261'-361')
361.00	1612.00	BHI NaviTrak (Axial)	02_APS EM <12.25'> (361')(418'-1612')
1612.00	5152.00	BHI NaviTrak (Axial)	03_APS EM <8.75'> (1612')(1719'-5152')
5152.00	12497.00	BHI AutoTrak Curve (Long spacing)	04_BH AT Curve <8.5'> (5152')(5251'-12497')
12497.00	12521.00	Blind Drilling (std)	Projection to bit

### REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY		Slot	Slot #10
Area	Brooke County, WV		Well	John Good Jr BRK 10H
Field	Brooke		Wellbore	John Good Jr BRK 10H AWB
Facility	John Good Jr BRK Pad			

### WELLPATH COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
261.00	0.400	256.080	261.00	MSS <17.5"> (261'-361')
418.00	0.290	121.820	418.00	APS EM <12.25"> (361')(418'-1612')
1719.00	11.070	7.590	1712.70	APS EM <8.75"> (1612')(1719'-5152')
5251.00	8.470	32.240	5184.85	BH AT Curve <8.5"> (5152')(5251'-12497')
12521.00	89.050	162.450	6002.70	Projection to Bit

### COMMENTS

Wellpath general comments  
 API: 47-009-00189-0000  
 Job#: 8653242  
 Rig: SDC-46  
 Duration: 08/21/17 - 08/28/17

Top Hole Latitude: 40°15'00"

10,934'

Bottom Hole Latitude: 40°15'00"

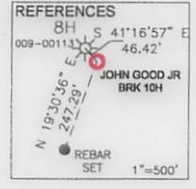
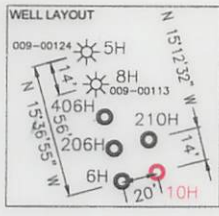
8,209'

# THRASHER

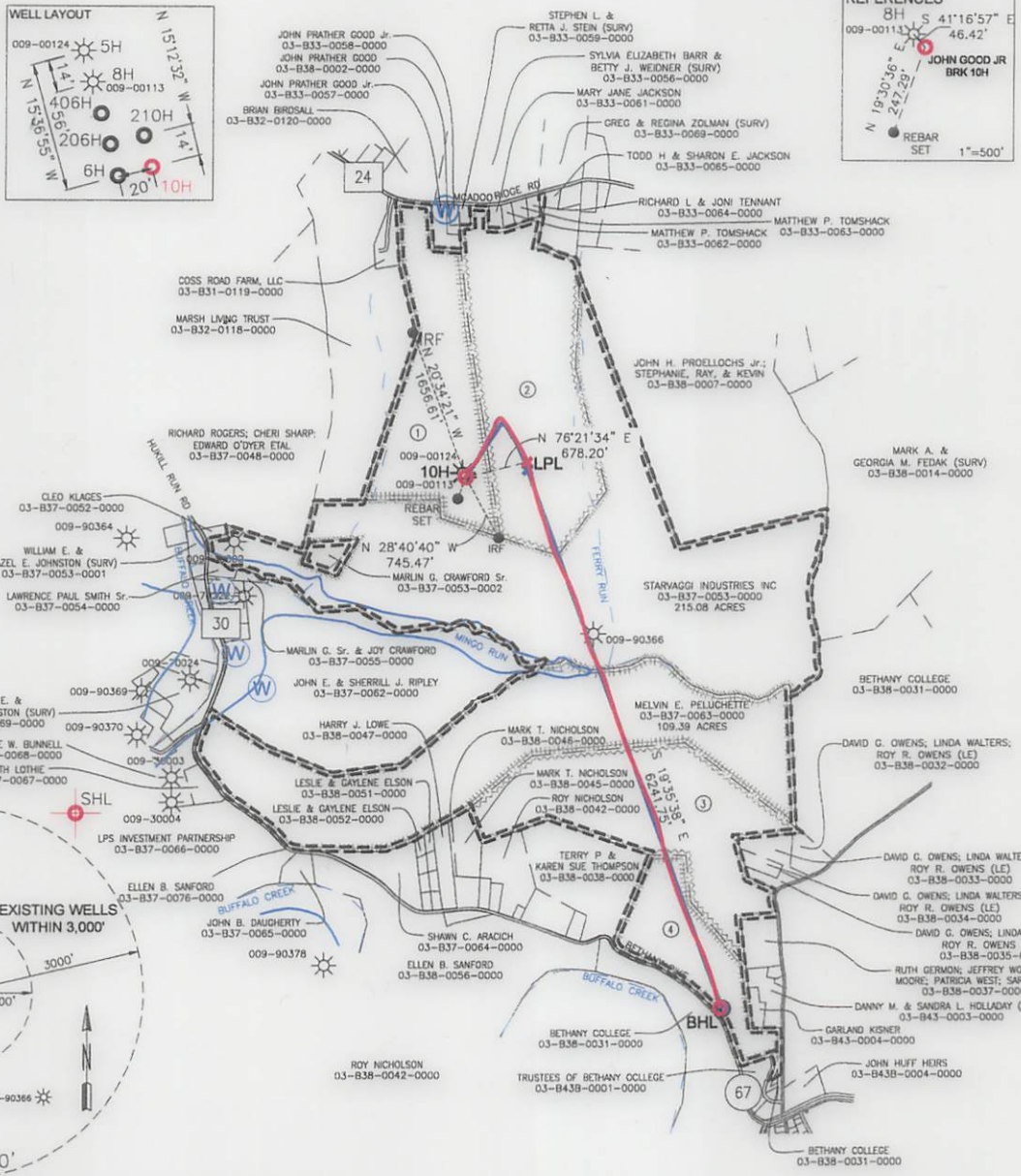
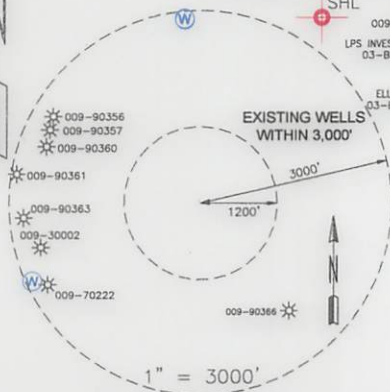
THE THRASHER GROUP, INC.  
600 WHITE OAKS BLVD.  
BRIDGEPORT, WV 26330  
PHONE 304-624-4108

### NOTES ON SURVEY

- COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17. U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED OF CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.



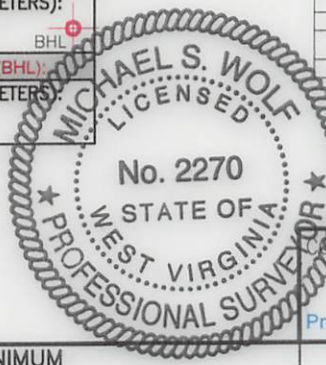
GRID NORTH  
UTM, NAD83 DATUM, ZONE 17, US FT



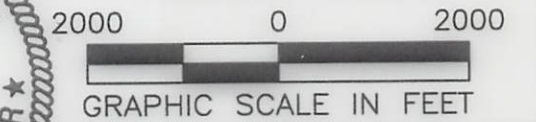
Bottom Hole Longitude: 80°32'30"  
Top Hole Longitude: 80°32'30"

<b>SURFACE HOLE LOCATION (SHL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,682.814 EASTING: 535,681.814	<b>SURFACE HOLE LOCATION (SHL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,682.814 EASTING: 535,681.814
<b>LANDING POINT LOCATION (LPL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,705.616 EASTING: 535,884.969	<b>LANDING POINT LOCATION (LPL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,731.564 EASTING: 535,882.698
<b>BOTTOM HOLE LOCATION (BHL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,450,937.270 EASTING: 536,527.212	<b>BOTTOM HOLE LOCATION (BHL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,450,939.241 EASTING: 536,520.700

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.



TRACT	SURFACE OWNER	TAX PARCEL	ACRES
1	JOHN PRATHER GOOD JR, TRUSTEE OF THE JOHN P. GOOD JR. IRREVOCABLE TRUST	03-B38-0001-0000	66.57
2	MARY JANE JACKSON	03-B33-0060-0000	89.784
3	ALLEN SCOTT JOHNSON, WARREN RAY JOHNSON, DEBORAH SUE CRAIG, VICTORIA LYNN OWENS, CHARLES LAWRENCE JOHNSON	03-B38-0036-0000	84.00
4	BETHANY COLLEGE	03-B38-0031-0000	29.77



P.S. 2270

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP OFFICE OF OIL & GAS 601 57TH STREET CHARLESTON, WV 25034	MINIMUM DEGREE OF ACCURACY: 1/200 PROVEN SOURCE OF ELEVATION: SURVEY GRADE GPS (NAVD 88, US FT)	OPERATOR'S WELL #: JOHN GOOD JR BRK 10H API WELL #: 47 009 00189 STATE COUNTY PERMIT
	WELL TYPE: OIL <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/> PRODUCTION <input checked="" type="checkbox"/> DEEP <input type="checkbox"/> GAS <input checked="" type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/>	

WATERSHED: BUFFALO CREEK	ELEVATION: 1152.6'
DISTRICT: BUFFALO	COUNTY: BROOKE
SURFACE OWNER: JOHN P. GOOD III, TRUSTEE OF THE JOHN P GOOD JR IRREVOCABLE TRUST	QUADRANGLE: BETHANY
OIL & GAS ROYALTY OWNER: JOHN P GOOD JR	ACREAGE: 66.57
DRILL <input type="checkbox"/> DRILL DEEPER <input type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input type="checkbox"/> PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input type="checkbox"/>	ACREAGE: 66.57
CONVERT <input type="checkbox"/> PLUG & ABANDON <input type="checkbox"/> CLEAN OUT & REPLUG <input type="checkbox"/> OTHER CHANGE <input checked="" type="checkbox"/> (SPECIFY) AS-DRILLED	ESTIMATED DEPTH: 6,003 TVD 12,521 TMD
TARGET FORMATION: MARCELLUS	

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

<b>LEGEND:</b> PROPOSED SURFACE HOLE / BOTTOM HOLE EXISTING / PRODUCING WELLHEAD LPL LANDING POINT LOCATION EXISTING WATER WELL EXISTING SPRING SURVEYED BOUNDARY DRILLING UNIT LEASE BOUNDARY PROPOSED PATH AS-DRILLED PATH	<b>REVISIONS:</b> DATE: 01-08-2018 DRAWN BY: R. DOERR SCALE: 1" = 2000' DRAWING NO: 050-5700 WELL LOCATION PLAT
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