

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

API 47-009-00230 County BROOKE District BUFFALO
Quad TILTONSVILLE & BETHANY Pad Name BARRY GREATHOUSE A-BRK-PAD-1 Field/Pool Name PANHANDLE FIELD WET
Farm name BARRY L. GREATHOUSE & PATRICIA a. GREATHOUSE Well Number BARRY GREATHOUSE A BRK 6H
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 4,449,079.29 Easting 531,014.73
Landing Point of Curve Northing 4,448,968.85 Easting 531,003.42
Bottom Hole Northing 4,445,330.68 Easting 532,402.31

Elevation (ft) 1136.2 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

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Date permit issued 04/16/2019 Date drilling commenced 05/11/2019 Date drilling ceased 05/22/2019
Date completion activities began 07/04/2019 Date completion activities ceased 09/07/2019
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 275' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 384' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 292' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

Reviewed

Spoke Shannon for Eric Blend 1/2/2020

API 47-009 - 00230

Farm name BARRY L. GREATHOUSE & PATRICIA a. GREATHOUSE

Well number BARRY GREATHOUSE A BRK 6H

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	384'	NEW	J-55/54.50#	195.9	Y, 21 BBLs
Coal	SEE SURFACE						
Intermediate 1	12.25	9.625	1,632'	NEW	J-55/36#		Y, 38 BBLs
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	18,892'	NEW	HCP-110/20#		Y
Tubing		2.875	6,352'	NEW	P-110/6.50#		N
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	GROUT TO SURFACE				SURFACE	24
Surface	CLASS A	466'	15.60	1.20	559.2	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	656'	15.60	1.20	787.2	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	3,550'	15.60	1.19	4,224.5	SURFACE	24
Tubing							

Drillers TD (ft) 18,892' Loggers TD (ft) 18,892'

Deepest formation penetrated Marcellus Shale Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5,175' MD

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

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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API 47- 009 - 00230 Farm name BARRY L. GREATHOUSE & PATRICIA a. GREATHOUSE Well number BARRY GREATHOUSE A BRK 6H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	SEE	ATTACHMENT	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	2				

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Please insert additional pages as applicable.

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API 47- 009 - 00230

Farm name BARRY L. GREATHOUSE & PATRICIA a. GREATHOUSE

Well number BARRY GREATHOUSE A BRK 6H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>MARCELLUS SHALE</u>	<u>5,785'</u> TVD	<u>5,977'</u> MD
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow

OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 872 psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas 5,310 mcfpd Oil 718 bpd NGL _____ bpd Water 667 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	<u>0</u>		<u>0</u>		
	<u>SEE</u>	<u>ATTACHMENT</u>	<u>3</u>		
					RECEIVED Office of Oil and Gas NOV 22 2019 WV Department of Environmental Protection

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 ROAD City THE WOODLANDS State TX Zip 77380

Cementing Company SCHLUMBER WELL SERVICES
Address 1080 US-33 City WESTON State WV Zip 26452

Stimulating Company HALLIBURTON ENERGY SERVICES
Address 1628 JACKSON MILL ROAD City JANE LEW State WV Zip 26378

Please insert additional pages as applicable.

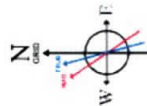
Completed by BOBBY WILLIS Telephone 832-796-2884
Signature  Title SENIOR REGULATORY ANALYST Date 11/21/2019

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

SOUTHWESTERN ENERGY

Location: Brooke County, WV
 Field: Brooke
 Facility: Barry Greathouse A BRK Pad Wellbore: Barry Greathouse A BRK 6H PWB

Slot: Slot #6H
 Well: Barry Greathouse A BRK 6H
 Plot reference wellpath is Barry Greathouse A BRK 6H PWP Rev-C @ Grid System: NAD83 / UTM Zone 17 North, US feet
 True vertical depths are referenced to SDC 40 (RKB)
 Measured depths are referenced to SDC 40 (RKB)
 Scale: True distance
 Depths are in feet
 SDC 40 (RKB) to Mean Sea Level: 1163.3 feet
 Mean Sea Level to Ground level (At Slot: Slot #6H): -1137.3 feet
 Coordinates are in feet referenced to Slot



Magnetic North is 67.46° Field 52486 n.T.
 Grid North is 0.24 degrees East of True North
 To correct azimuth from True to Grid subtract 0.24 degrees
 To correct azimuth from Magnetic to Grid subtract 6.34 degrees

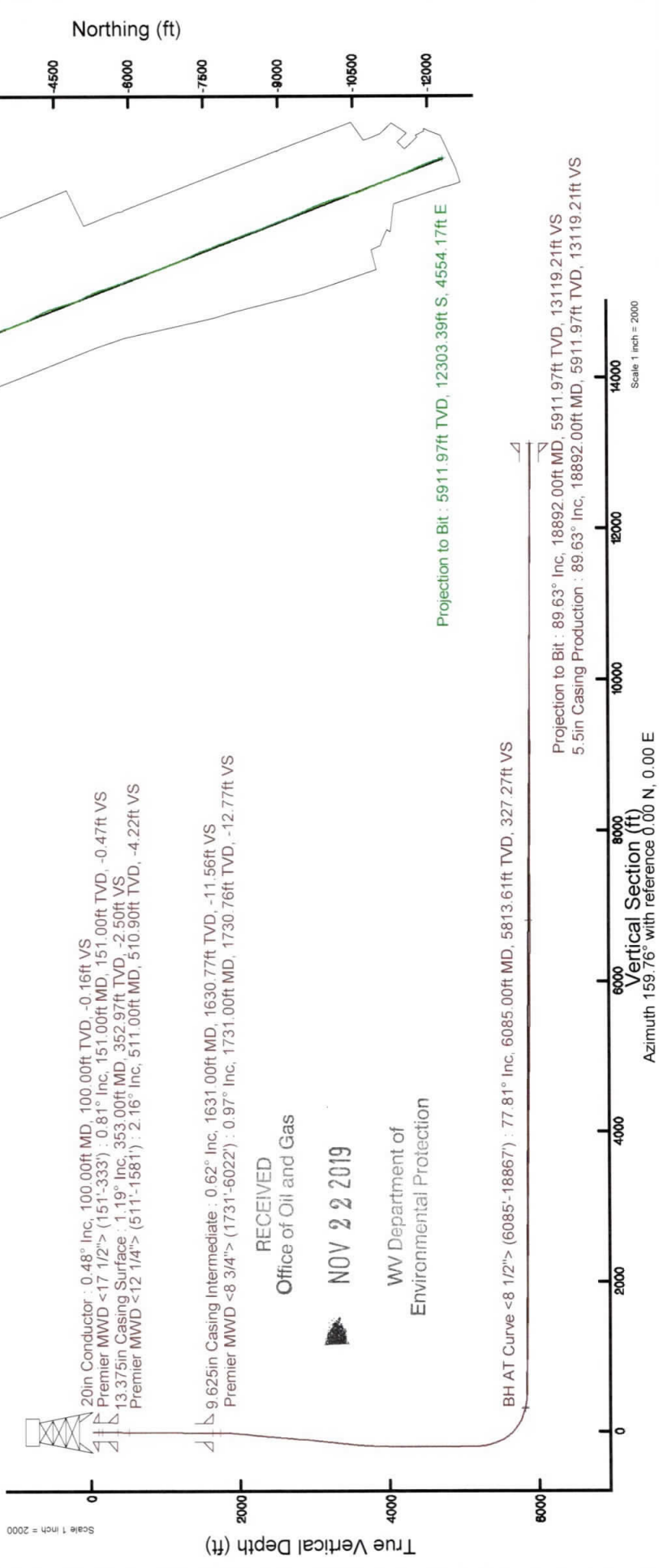
20in Conductor : 0.48° Inc, 100.00ft MD, 100.00ft TVD, -0.16ft VS
 Premier MWD <17 1/2"> : 0.81° Inc, 151.00ft MD, 151.00ft TVD, -0.47ft VS
 13.375in Casing Surface : 1.19° Inc, 353.00ft MD, 352.97ft TVD, -2.50ft VS
 Premier MWD <12 1/4"> : 2.16° Inc, 511.00ft MD, 510.90ft TVD, -4.22ft VS

9.625in Casing Intermediate : 0.62° Inc, 1631.00ft MD, 1630.77ft TVD, -11.56ft VS
 Premier MWD <8 3/4"> : 0.97° Inc, 1731.00ft MD, 1730.76ft TVD, -12.77ft VS

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BH AT Curve <8 1/2"> : 6085°-18867° : 77.81° Inc, 6085.00ft MD, 5813.61ft TVD, 327.27ft VS

Projection to Bit : 89.63° Inc, 18892.00ft MD, 5911.97ft TVD, 13119.21ft VS
 5.5in Casing Production : 89.63° Inc, 18892.00ft MD, 5911.97ft TVD, 13119.21ft VS



Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Barry Greathouse A BRK Pad	1742183.879	14596655.836	40°11'29.197"N 80°38'08.133"W
Slot #6H	Local N (ft)	Grid East (US ft)	Grid North (US ft)
31.83	-13.03	1742170.855	14596687.657
26ft			
1137.3ft			
1163.3ft			
Comments			
API: 47-009-00230-0000			
BH Job #: 109602841			
Rig: SDC 40			
Duration: 05/17/2019 - 05/20/2019			

REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #6H
Area	Brooke County, WV	Well	Barry Greathouse A BRK 6H
Field	Brooke	Wellbore	Barry Greathouse A BRK 6H AWB
Facility	Barry Greathouse A BRK Pad		

REPORT SETUP INFORMATION

Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.1
North Reference	Grid	User	Atenjen
Scale	0.999612	Report Generated	5/30/2019 at 4:30:20 PM
Convergence at slot	0.24° East	Database/Source file	WA_MPL_EASTERNUS_Defn/Barry_Greathouse_A_BRK_6H_AWP_Proj_18892_.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	31.83	-13.03	1742170.86	14596687.66	40°11'29.512"N	80°38'08.299"W
Facility Reference Pt			1742183.88	14596655.84	40°11'29.197"N	80°38'08.133"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

WELLPATH DATUM

Calculation method	Minimum curvature	SDC 40 (RKB) to Facility Vertical Datum	1163.30ft
Horizontal Reference Pt	Slot	SDC 40 (RKB) to Mean Sea Level	1163.30ft
Vertical Reference Pt	SDC 40 (RKB)	SDC 40 (RKB) to Ground Level at Slot (Slot #6H)	26.00ft
MD Reference Pt	SDC 40 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	159.76°

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Actual Wellpath Report

Barry Greathouse A BRK 6H AWP Proj: 18892'

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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #6H
SOUTHWESTERN ENERGY	Well	Barry Greathouse A BRK 6H
Area	Wellbore	Barry Greathouse A BRK 6H AWB
Field		
Facility		

WELLPATH DATA (211 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	281.700	0.00	0.00	0.00	0.00	1742170.85	14596687.66	40°11'29.512"N	80°38'08.299"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	281.700	26.00	0.00	0.00	0.00	1742170.85	14596687.66	40°11'29.512"N	80°38'08.299"W	0.00	0.000	0.00	0.00	0.00
151.00	0.810	281.700	151.00	-0.47	0.18	-0.87	1742169.99	14596687.84	40°11'29.514"N	80°38'08.310"W	0.88	281.700	0.65	0.65	-62.64
243.00	0.830	293.230	242.99	-1.27	0.57	-2.11	1742168.74	14596688.23	40°11'29.518"N	80°38'08.326"W	2.19	285.185	0.18	0.02	12.53
303.00	0.860	308.120	302.98	-1.95	1.02	-2.87	1742167.99	14596688.68	40°11'29.522"N	80°38'08.336"W	3.04	289.636	0.37	0.05	24.82
333.00	1.080	282.530	332.98	-2.30	1.22	-3.32	1742167.54	14596688.88	40°11'29.524"N	80°38'08.342"W	3.54	290.225	1.60	0.73	-85.30
511.00	2.160	267.310	510.90	-4.22	1.43	-8.31	1742162.55	14596689.09	40°11'29.527"N	80°38'08.406"W	8.43	279.765	0.65	0.61	-8.55
601.00	1.730	268.640	600.85	-5.17	1.32	-11.36	1742159.50	14596688.97	40°11'29.526"N	80°38'08.446"W	11.44	276.618	0.48	-0.48	1.48
694.00	0.990	288.030	693.82	-6.12	1.53	-13.53	1742157.33	14596689.19	40°11'29.528"N	80°38'08.473"W	13.62	276.467	0.93	-0.80	20.85
787.00	0.900	282.610	786.81	-7.01	1.94	-15.01	1742155.85	14596689.60	40°11'29.532"N	80°38'08.492"W	15.13	277.373	0.14	-0.10	-5.83
880.00	0.800	277.620	879.80	-7.71	2.19	-16.36	1742154.50	14596689.84	40°11'29.534"N	80°38'08.510"W	16.51	277.614	0.13	-0.11	-5.37
973.00	0.900	280.860	972.79	-8.39	2.41	-17.72	1742153.14	14596690.07	40°11'29.537"N	80°38'08.527"W	17.89	277.747	0.12	0.11	3.48
1065.00	0.530	285.210	1064.78	-9.01	2.66	-18.84	1742152.02	14596690.31	40°11'29.539"N	80°38'08.542"W	19.03	278.031	0.41	-0.40	4.73
1158.00	0.680	276.590	1157.78	-9.51	2.83	-19.81	1742151.06	14596690.49	40°11'29.541"N	80°38'08.554"W	20.01	278.145	0.19	0.16	-9.27
1251.00	0.290	330.580	1250.78	-9.99	3.10	-20.47	1742150.39	14596690.76	40°11'29.544"N	80°38'08.563"W	20.70	278.620	0.60	-0.42	58.05
1344.00	0.050	329.070	1343.78	-10.27	3.34	-20.61	1742150.26	14596691.00	40°11'29.546"N	80°38'08.565"W	20.88	279.215	0.26	-0.26	-1.62
1436.00	0.190	359.740	1435.77	-10.45	3.53	-20.63	1742150.23	14596691.19	40°11'29.548"N	80°38'08.565"W	20.93	279.711	0.16	0.15	33.34
1529.00	0.210	336.170	1528.77	-10.76	3.84	-20.70	1742150.17	14596691.50	40°11'29.551"N	80°38'08.566"W	21.05	280.511	0.09	0.02	-25.34
1581.00	0.500	341.550	1580.77	-11.09	4.14	-20.81	1742150.06	14596691.80	40°11'29.554"N	80°38'08.567"W	21.22	281.259	0.56	0.56	10.35
1731.00	0.970	303.820	1730.76	-12.77	5.47	-22.07	1742148.79	14596693.12	40°11'29.567"N	80°38'08.583"W	22.74	283.920	0.43	0.31	-25.15
1821.00	1.080	305.500	1820.75	-14.09	6.39	-23.39	1742147.47	14596694.04	40°11'29.576"N	80°38'08.600"W	24.25	285.270	0.13	0.12	1.87
1912.00	4.050	313.260	1911.65	-17.67	9.09	-26.43	1742144.43	14596696.74	40°11'29.603"N	80°38'08.639"W	27.95	288.973	3.28	3.26	8.53
2005.00	7.350	306.680	2004.17	-25.60	14.89	-33.60	1742137.27	14596702.54	40°11'29.661"N	80°38'08.731"W	36.75	293.907	3.61	3.55	-7.08
2098.00	8.170	303.110	2096.32	-35.88	22.06	-43.90	1742126.97	14596709.70	40°11'29.732"N	80°38'08.864"W	49.13	296.675	1.02	0.88	-3.84
2190.00	8.500	302.350	2187.35	-46.53	29.27	-55.12	1742115.75	14596716.91	40°11'29.804"N	80°38'09.008"W	62.41	297.965	0.38	0.36	-0.83
2283.00	7.330	294.560	2279.47	-56.17	35.41	-66.33	1742104.55	14596723.05	40°11'29.865"N	80°38'09.152"W	75.19	298.097	1.70	-1.26	-8.38
2373.00	7.250	289.940	2368.74	-63.88	39.73	-76.89	1742094.00	14596727.37	40°11'29.908"N	80°38'09.288"W	86.55	297.329	0.66	-0.09	-5.13
2466.00	7.330	286.210	2460.99	-71.19	43.39	-88.10	1742082.79	14596731.03	40°11'29.944"N	80°38'09.432"W	98.21	296.221	0.52	0.09	-4.01
2558.00	7.390	281.810	2552.23	-77.82	46.24	-99.53	1742071.37	14596733.88	40°11'29.973"N	80°38'09.579"W	109.74	294.919	0.62	0.07	-4.78
2652.00	7.380	289.370	2645.45	-84.87	49.48	-111.14	1742059.76	14596737.12	40°11'30.006"N	80°38'09.729"W	121.66	293.999	1.03	-0.01	8.04

Actual Wellpath Report
Barry Greathouse A BRK 6H AWP Proj: 18892
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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #6H
SOUTHWESTERN ENERGY	Well	Barry Greathouse A BRK 6H
Area	Wellbore	Barry Greathouse A BRK 6H AWB
Field		
Facility		

WELLPATH DATA (211 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]
2745.00	7.670	294.770	2737.65	-93.07	54.06	-122.41	1742048.49	14596741.70	40°11'30.051"N	80°38'09.874"W	133.82	293.828	0.82	0.31	5.81
2837.00	7.860	288.420	2828.81	-101.34	58.62	-133.95	1742036.95	14596746.25	40°11'30.097"N	80°38'10.022"W	146.22	293.635	0.95	0.21	-6.90
2930.00	7.590	301.840	2920.97	-110.16	63.87	-145.20	1742025.71	14596751.50	40°11'30.149"N	80°38'10.167"W	158.63	293.743	1.96	-0.29	14.43
3023.00	7.860	301.650	3013.13	-120.02	70.46	-155.85	1742015.07	14596758.09	40°11'30.215"N	80°38'10.304"W	171.04	294.327	0.31	0.31	-0.20
3115.00	8.040	296.230	3104.24	-129.65	76.61	-166.99	1742003.93	14596764.24	40°11'30.276"N	80°38'10.447"W	183.72	294.644	0.83	0.17	-5.89
3208.00	6.630	310.390	3196.49	-139.04	82.96	-176.91	1741994.01	14596770.59	40°11'30.339"N	80°38'10.574"W	195.40	295.124	2.45	-1.52	15.23
3301.00	6.490	312.220	3288.88	-148.38	89.97	-184.90	1741986.03	14596777.60	40°11'30.409"N	80°38'10.677"W	205.62	295.948	0.27	-0.15	1.97
3394.00	6.630	307.140	3381.27	-157.57	96.75	-193.07	1741977.86	14596784.37	40°11'30.476"N	80°38'10.782"W	215.95	296.616	0.64	0.15	-5.46
3486.00	6.090	317.250	3472.71	-166.55	103.54	-200.61	1741970.32	14596791.15	40°11'30.543"N	80°38'10.879"W	225.76	297.298	1.35	-0.59	10.99
3579.00	6.120	318.120	3565.18	-175.71	110.85	-207.27	1741963.66	14596798.46	40°11'30.616"N	80°38'10.964"W	235.05	298.138	0.10	0.03	0.94
3672.00	3.720	318.440	3657.83	-183.13	116.80	-212.58	1741958.35	14596804.41	40°11'30.675"N	80°38'11.032"W	242.56	298.786	2.58	-2.58	0.34
3764.00	3.010	314.120	3749.67	-188.09	120.72	-216.30	1741954.64	14596808.33	40°11'30.714"N	80°38'11.080"W	247.70	299.166	0.82	-0.77	-4.70
3857.00	2.910	317.310	3842.55	-192.47	124.15	-219.65	1741951.29	14596811.76	40°11'30.748"N	80°38'11.123"W	252.31	299.476	0.21	-0.11	3.43
3950.00	1.130	340.390	3935.49	-195.57	126.75	-221.56	1741949.38	14596814.36	40°11'30.774"N	80°38'11.147"W	255.25	299.773	2.07	-1.91	24.82
4043.00	0.890	337.400	4028.47	-197.21	128.28	-222.15	1741948.80	14596815.89	40°11'30.789"N	80°38'11.155"W	256.52	300.005	0.26	-0.26	-3.22
4135.00	0.910	345.280	4120.46	-198.65	129.65	-222.61	1741948.34	14596817.25	40°11'30.802"N	80°38'11.161"W	257.61	300.217	0.14	0.02	8.57
4228.00	0.560	105.210	4213.46	-199.12	130.24	-222.35	1741948.59	14596817.85	40°11'30.808"N	80°38'11.158"W	257.69	300.359	1.38	-0.38	128.96
4321.00	0.850	108.960	4306.45	-198.42	129.90	-221.26	1741949.68	14596817.50	40°11'30.805"N	80°38'11.143"W	256.58	300.416	0.32	0.31	4.03
4410.00	0.660	114.050	4395.44	-197.65	129.47	-220.17	1741950.77	14596817.08	40°11'30.800"N	80°38'11.129"W	255.42	300.458	0.23	-0.21	5.72
4503.00	0.460	78.180	4488.44	-197.22	129.33	-219.32	1741951.62	14596816.94	40°11'30.799"N	80°38'11.118"W	254.61	300.528	0.42	-0.22	-38.57
4596.00	0.460	92.950	4581.43	-197.02	129.39	-218.58	1741952.36	14596817.00	40°11'30.800"N	80°38'11.109"W	254.00	300.624	0.13	0.00	15.88
4688.00	0.440	35.080	4673.43	-197.07	130.23	-218.07	1741952.93	14596817.27	40°11'30.802"N	80°38'11.102"W	253.65	300.742	0.47	-0.02	-62.90
4781.00	0.380	24.830	4766.43	-197.50	130.66	-217.67	1741953.27	14596817.84	40°11'30.808"N	80°38'11.097"W	253.66	300.892	0.10	-0.06	-11.02
4874.00	0.830	122.930	4859.43	-197.17	130.15	-216.98	1741953.96	14596817.75	40°11'30.807"N	80°38'11.088"W	253.02	300.956	1.03	0.48	105.48
4967.00	0.770	117.580	4952.42	-196.17	129.49	-215.86	1741955.08	14596817.10	40°11'30.800"N	80°38'11.074"W	251.72	300.969	0.10	-0.06	-5.75
5059.00	0.650	101.580	5044.41	-195.44	129.10	-214.80	1741956.14	14596816.71	40°11'30.797"N	80°38'11.060"W	250.61	301.007	0.25	-0.13	-17.39
5152.00	0.580	106.570	5137.40	-194.88	128.86	-213.83	1741957.11	14596816.47	40°11'30.794"N	80°38'11.048"W	249.66	301.074	0.09	-0.08	5.37
5243.00	6.530	150.880	5228.19	-189.48	124.20	-210.87	1741960.07	14596811.81	40°11'30.748"N	80°38'11.010"W	244.73	300.498	6.73	6.54	48.69
5336.00	12.660	167.200	5319.86	-174.14	109.63	-206.03	1741964.90	14596797.24	40°11'30.604"N	80°38'10.948"W	233.38	298.017	7.15	6.59	17.55
5429.00	19.320	166.480	5409.22	-148.72	84.71	-200.17	1741970.76	14596772.33	40°11'30.357"N	80°38'10.874"W	217.36	292.936	7.16	7.16	-0.77

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Barry Greathouse A BRK 6H AWP Proj: 18892

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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #6H
Area	Brooke County, WV	Well	Barry Greathouse A BRK 6H
Field	Brooke	Wellbore	Barry Greathouse A BRK 6H AWB
Facility	Barry Greathouse A BRK Pad		

WELLPATH DATA (211 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]
5521.00	27.460	162.000	5493.59	-112.35	49.67	-190.04	1741980.89	14596737.31	40°11'30.011"N	80°38'10.745"W	196.42	284.648	9.05	8.85	-4.87
5614.00	35.660	159.590	5572.77	-63.73	3.79	-173.93	1741996.99	14596691.45	40°11'29.557"N	80°38'10.540"W	173.97	271.249	8.92	8.82	-2.59
5704.00	43.770	160.240	5641.94	-6.27	-50.18	-154.23	1742016.69	14596637.50	40°11'29.022"N	80°38'10.289"W	162.18	251.977	9.02	9.01	0.72
5794.00	54.160	160.150	5700.95	61.52	-113.96	-131.25	1742039.65	14596573.74	40°11'28.391"N	80°38'09.996"W	173.82	229.033	11.54	11.54	-0.10
5886.00	62.010	159.810	5749.55	139.55	-187.28	-104.53	1742066.37	14596500.45	40°11'27.666"N	80°38'09.556"W	214.47	209.168	8.54	8.53	-0.37
5933.00	67.110	159.570	5769.73	181.98	-227.07	-89.80	1742081.09	14596460.68	40°11'27.272"N	80°38'09.468"W	244.18	201.578	10.86	10.85	-0.51
5976.00	71.570	159.220	5784.90	222.20	-264.72	-75.64	1742095.24	14596423.04	40°11'26.899"N	80°38'09.288"W	275.31	195.947	10.40	10.37	-0.81
6022.00	74.270	158.430	5798.41	266.16	-305.71	-59.76	1742111.12	14596382.06	40°11'26.493"N	80°38'09.085"W	311.50	191.060	6.09	5.87	-1.72
6085.00	77.810	158.160	5813.61	327.27	-362.51	-37.15	1742133.72	14596325.29	40°11'25.931"N	80°38'08.797"W	364.41	185.851	5.63	5.62	-0.43
6151.00	80.760	158.450	5825.87	392.09	-422.76	-13.18	1742157.68	14596285.06	40°11'25.335"N	80°38'08.491"W	422.96	181.786	4.49	4.47	0.44
6197.00	84.540	159.840	5831.76	437.70	-465.38	3.05	1742173.91	14596222.45	40°11'24.913"N	80°38'08.284"W	465.39	179.624	8.75	8.22	3.02
6244.00	87.350	159.380	5835.08	484.58	-509.32	19.39	1742190.23	14596178.53	40°11'24.478"N	80°38'08.076"W	509.69	177.820	6.06	5.98	-0.98
6336.00	89.260	157.990	5837.80	576.52	-594.99	52.81	1742223.65	14596092.90	40°11'23.630"N	80°38'07.650"W	597.33	174.928	2.57	2.08	-1.51
6429.00	89.320	155.980	5838.96	669.40	-680.57	89.17	1742259.99	14596007.35	40°11'22.783"N	80°38'07.186"W	686.39	172.536	2.16	0.06	-2.16
6522.00	89.320	155.940	5840.06	762.19	-765.50	127.05	1742297.86	14595922.45	40°11'21.942"N	80°38'06.703"W	775.97	170.576	0.04	0.00	-0.04
6615.00	90.090	159.000	5840.54	855.10	-851.39	162.68	1742333.47	14595836.60	40°11'21.092"N	80°38'06.248"W	866.79	169.183	3.39	0.83	3.29
6707.00	88.770	156.240	5841.45	947.02	-936.45	197.70	1742368.48	14595751.57	40°11'20.250"N	80°38'05.801"W	957.09	168.079	3.33	-1.43	-3.00
6800.00	89.420	157.650	5842.92	1039.89	-1022.01	234.12	1742404.88	14595666.05	40°11'19.403"N	80°38'05.337"W	1048.48	167.097	1.67	0.70	1.52
6893.00	89.780	157.450	5843.57	1132.82	-1107.96	269.63	1742440.38	14595580.13	40°11'18.552"N	80°38'04.884"W	1140.29	166.322	0.44	0.39	-0.22
6986.00	88.520	155.430	5844.95	1225.65	-1193.19	306.80	1742477.53	14595494.93	40°11'17.709"N	80°38'04.409"W	1232.00	165.580	2.56	-1.35	-2.17
7078.00	89.080	158.290	5846.88	1317.50	-1277.76	342.94	1742513.66	14595410.34	40°11'16.871"N	80°38'03.948"W	1322.98	164.976	3.17	0.61	3.11
7171.00	89.350	160.680	5848.15	1410.48	-1364.85	375.53	1742546.23	14595323.40	40°11'16.010"N	80°38'03.533"W	1415.57	164.616	2.59	0.29	2.57
7264.00	89.170	161.720	5849.35	1503.45	-1452.88	405.49	1742576.19	14595235.35	40°11'15.138"N	80°38'03.151"W	1508.40	164.406	1.13	-0.19	1.12
7356.00	89.450	162.390	5850.46	1595.36	-1540.39	433.84	1742604.52	14595147.86	40°11'14.272"N	80°38'02.791"W	1600.32	164.271	0.79	0.30	0.73
7449.00	89.720	163.250	5851.14	1688.23	-1629.24	461.31	1742631.98	14595059.05	40°11'13.393"N	80°38'02.442"W	1693.29	164.191	0.97	0.29	0.92
7542.00	89.880	161.610	5851.46	1781.12	-1717.90	489.38	1742660.04	14594970.43	40°11'12.516"N	80°38'02.085"W	1786.24	164.099	1.77	0.17	-1.76
7635.00	89.780	159.450	5851.74	1874.11	-1805.57	520.37	1742691.03	14594882.79	40°11'11.648"N	80°38'01.690"W	1879.07	163.923	2.33	-0.11	-2.32
7727.00	89.880	157.660	5852.01	1966.08	-1891.20	554.01	1742724.65	14594797.19	40°11'10.801"N	80°38'01.261"W	1970.68	163.673	1.95	0.11	-1.95
7820.00	90.000	157.440	5852.11	2059.02	-1977.15	589.52	1742760.15	14594711.27	40°11'09.950"N	80°38'00.808"W	2063.17	163.397	0.27	0.13	-0.24
7910.00	89.570	157.390	5852.44	2148.94	-2060.25	624.09	1742794.70	14594628.21	40°11'09.127"N	80°38'00.367"W	2152.70	163.147	0.48	-0.48	-0.06

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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #6H
Area	Brooke County, WV	Well	Barry Greathouse A BRK 6H
Field	Brooke	Wellbore	Barry Greathouse A BRK 6H AWB
Facility	Barry Greathouse A BRK Pad		

WELLPATH DATA (211 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]
8002.00	89.630	158.510	5853.09	2240.89	-2145.52	658.63	1742829.22	14594542.98	40°11'08.283"N	80°37'59.927"W	2244.33	162.935	1.22	0.07	1.22
8092.00	88.250	158.450	5854.75	2330.85	-2229.23	691.63	1742862.22	14594459.30	40°11'07.455"N	80°37'59.506"W	2334.06	162.763	1.53	-1.53	-0.07
8185.00	89.050	160.760	5856.94	2423.82	-2316.37	724.03	1742894.60	14594372.19	40°11'06.592"N	80°37'59.093"W	2426.89	162.642	2.63	0.86	2.48
8277.00	90.000	161.030	5857.71	2515.79	-2403.30	754.14	1742924.70	14594285.30	40°11'05.732"N	80°37'58.710"W	2518.84	162.578	1.07	1.03	0.29
8370.00	89.660	159.540	5857.98	2608.79	-2490.84	785.51	1742956.06	14594197.79	40°11'04.866"N	80°37'58.310"W	2611.77	162.497	1.64	-0.37	-1.60
8463.00	89.780	160.040	5858.44	2701.79	-2578.11	817.64	1742988.18	14594110.55	40°11'04.002"N	80°37'57.901"W	2704.66	162.404	0.55	0.13	0.54
8551.00	90.490	159.880	5858.23	2789.78	-2660.79	847.80	1743018.32	14594027.91	40°11'03.184"N	80°37'57.517"W	2792.59	162.327	0.83	0.81	-0.18
8648.00	89.230	157.100	5858.47	2886.75	-2751.02	883.36	1743053.87	14593937.71	40°11'02.291"N	80°37'57.063"W	2889.36	162.198	3.15	-1.30	-2.87
8738.00	89.200	156.380	5859.70	2976.61	-2833.70	918.90	1743089.39	14593855.07	40°11'01.472"N	80°37'56.610"W	2978.96	162.033	0.80	-0.03	-0.80
8831.00	89.200	157.430	5861.00	3069.49	-2919.23	955.37	1743125.85	14593769.56	40°11'00.626"N	80°37'56.144"W	3071.59	161.878	1.13	0.00	1.13
8924.00	89.230	156.900	5862.27	3162.38	-3004.94	991.46	1743161.93	14593683.89	40°10'59.777"N	80°37'55.684"W	3164.27	161.740	0.57	0.03	-0.57
9016.00	89.010	158.380	5863.68	3254.31	-3090.01	1026.45	1743196.91	14593598.86	40°10'58.935"N	80°37'55.238"W	3256.03	161.624	1.63	-0.24	1.61
9109.00	89.230	159.800	5865.11	3347.29	-3176.87	1059.64	1743230.08	14593512.03	40°10'58.075"N	80°37'54.815"W	3348.93	161.554	1.54	0.24	1.53
9202.00	89.080	159.820	5866.48	3440.28	-3264.14	1091.73	1743262.16	14593424.79	40°10'57.212"N	80°37'54.406"W	3441.88	161.507	0.16	-0.16	0.02
9295.00	89.170	160.790	5867.90	3533.26	-3351.69	1123.07	1743293.49	14593337.27	40°10'56.345"N	80°37'54.007"W	3534.85	161.475	1.05	0.10	1.04
9385.00	89.110	161.560	5869.26	3623.22	-3436.87	1152.11	1743322.52	14593252.13	40°10'55.502"N	80°37'53.637"W	3624.83	161.468	0.86	-0.07	0.86
9477.00	89.260	162.060	5870.56	3715.16	-3524.26	1180.83	1743351.22	14593164.77	40°10'54.637"N	80°37'53.272"W	3716.82	161.476	0.57	0.16	0.54
9567.00	89.420	161.540	5871.60	3805.09	-3609.75	1208.93	1743379.32	14593079.31	40°10'53.792"N	80°37'52.914"W	3806.81	161.484	0.60	0.18	-0.58
9660.00	89.450	160.490	5872.52	3898.06	-3697.69	1239.19	1743409.56	14592991.41	40°10'52.921"N	80°37'52.529"W	3899.81	161.473	1.13	0.03	-1.13
9752.00	89.570	158.920	5873.31	3990.06	-3783.97	1271.10	1743441.45	14592905.16	40°10'52.067"N	80°37'52.123"W	3991.76	161.432	1.71	0.13	-1.71
9845.00	89.940	157.040	5873.70	4083.01	-3870.18	1305.96	1743476.31	14592818.98	40°10'51.214"N	80°37'51.678"W	4084.59	161.353	2.06	0.40	-2.02
9938.00	89.690	155.400	5874.00	4175.83	-3955.28	1343.46	1743513.79	14592733.92	40°10'50.371"N	80°37'51.200"W	4177.22	161.239	1.78	-0.27	-1.76
10030.00	89.080	153.580	5874.99	4267.43	-4038.31	1383.08	1743553.39	14592650.93	40°10'49.549"N	80°37'50.694"W	4268.58	161.094	2.09	-0.66	-1.98
10123.00	89.320	151.720	5876.29	4359.70	-4120.90	1425.80	1743596.10	14592568.37	40°10'48.732"N	80°37'50.148"W	4360.58	160.915	2.02	0.26	-2.00
10216.00	89.010	152.580	5877.64	4451.87	-4203.12	1469.24	1743639.52	14592486.18	40°10'47.917"N	80°37'49.593"W	4452.51	160.732	0.98	-0.33	0.92
10308.00	89.200	156.470	5879.08	4543.46	-4286.15	1508.80	1743679.06	14592403.18	40°10'47.095"N	80°37'49.087"W	4543.95	160.607	4.23	0.21	4.23
10401.00	89.320	159.760	5880.28	4636.40	-4372.42	1543.46	1743713.71	14592316.94	40°10'46.241"N	80°37'48.646"W	4636.85	160.557	3.54	0.13	3.54
10494.00	89.600	160.750	5881.16	4729.39	-4459.95	1574.87	1743745.11	14592229.45	40°10'45.375"N	80°37'48.245"W	4729.84	160.551	1.11	0.30	1.06
10587.00	89.170	163.450	5882.16	4822.30	-4548.44	1603.45	1743773.68	14592141.00	40°10'44.499"N	80°37'47.882"W	4822.79	160.581	2.94	-0.46	2.90
10679.00	88.950	164.030	5883.67	4914.06	-4636.74	1629.21	1743799.43	14592052.72	40°10'43.626"N	80°37'47.555"W	4914.64	160.640	0.67	-0.24	0.63



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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #6H
SOUTHWESTERN ENERGY	Well	Barry Greathouse A BRK 6H
Brooke County, WV	Wellbore	Barry Greathouse A BRK 6H AWB
Brooke		
Barry Greathouse A BRK Pad		

WELLPATH DATA (211 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]
10772.00	89.320	164.670	5885.07	5006.75	-4726.29	1654.29	1743824.50	14591963.22	40°10'42.740"N	80°37'47.237"W	5007.44	160.709	0.79	0.40	0.69
10865.00	89.510	164.160	5886.02	5099.44	-4815.86	1679.28	1743849.48	14591873.67	40°10'41.854"N	80°37'46.920"W	5100.24	160.776	0.59	0.20	-0.55
10958.00	89.600	160.600	5886.74	5192.33	-4904.48	1707.42	1743877.61	14591785.09	40°10'40.977"N	80°37'46.562"W	5193.19	160.805	3.83	0.10	-3.83
11051.00	89.570	155.620	5887.42	5285.26	-4990.75	1742.08	1743912.26	14591698.86	40°10'40.123"N	80°37'46.120"W	5286.06	160.758	5.35	-0.03	-5.35
11143.00	89.420	153.270	5888.23	5376.85	-5073.74	1781.77	1743951.93	14591615.90	40°10'39.301"N	80°37'45.613"W	5377.50	160.650	2.56	-0.16	-2.55
11236.00	89.140	153.780	5889.40	5469.29	-5156.98	1823.22	1743993.37	14591532.69	40°10'38.477"N	80°37'45.083"W	5469.79	160.529	0.63	-0.30	0.55
11329.00	89.110	155.730	5890.82	5561.92	-5241.08	1862.88	1744033.01	14591448.62	40°10'37.644"N	80°37'44.577"W	5562.31	160.433	2.10	-0.03	2.10
11421.00	89.880	157.850	5891.63	5653.79	-5325.63	1899.13	1744069.25	14591364.11	40°10'36.807"N	80°37'44.115"W	5654.11	160.374	2.45	0.84	2.30
11511.00	89.720	160.420	5891.94	5743.78	-5409.72	1931.19	1744101.29	14591280.05	40°10'35.975"N	80°37'43.706"W	5744.09	160.354	2.86	-0.18	2.86
11604.00	89.200	162.530	5892.82	5836.73	-5497.89	1960.73	1744130.82	14591191.91	40°10'35.102"N	80°37'43.330"W	5837.06	160.372	2.34	-0.56	2.27
11696.00	89.720	162.800	5893.69	5928.60	-5585.71	1988.14	1744158.22	14591104.13	40°10'34.233"N	80°37'42.982"W	5928.98	160.408	0.64	0.57	0.29
11789.00	89.660	160.950	5894.19	6021.53	-5674.09	2017.07	1744187.14	14591015.78	40°10'33.359"N	80°37'42.614"W	6021.95	160.430	1.99	-0.06	-1.99
11881.00	89.940	160.050	5894.51	6113.52	-5760.81	2047.78	1744217.84	14590929.10	40°10'32.500"N	80°37'42.223"W	6113.94	160.431	1.02	0.30	-0.98
11974.00	89.940	159.210	5894.61	6206.52	-5847.99	2080.15	1744250.20	14590841.95	40°10'31.638"N	80°37'41.811"W	6206.93	160.419	0.90	0.00	-0.90
12064.00	89.880	158.530	5894.75	6296.51	-5931.94	2112.60	1744282.63	14590758.03	40°10'30.807"N	80°37'41.397"W	6296.90	160.397	0.76	-0.07	-0.76
12157.00	89.420	158.830	5895.32	6389.49	-6018.57	2146.41	1744316.43	14590671.43	40°10'29.949"N	80°37'40.966"W	6389.86	160.372	0.59	-0.49	0.32
12247.00	89.880	160.360	5895.87	6479.49	-6102.92	2177.78	1744347.79	14590587.12	40°10'29.114"N	80°37'40.567"W	6479.85	160.361	1.78	0.51	1.70
12340.00	89.850	161.330	5896.09	6572.47	-6190.77	2208.30	1744378.29	14590499.30	40°10'28.245"N	80°37'40.178"W	6572.84	160.368	1.04	-0.03	1.04
12432.00	89.910	161.450	5896.28	6664.43	-6277.96	2237.66	1744407.64	14590412.15	40°10'27.382"N	80°37'39.805"W	6664.83	160.382	0.15	0.07	0.13
12525.00	90.000	161.470	5896.35	6757.39	-6366.13	2267.23	1744437.20	14590324.01	40°10'26.510"N	80°37'39.429"W	6757.81	160.397	0.10	0.10	0.02
12618.00	89.910	160.510	5896.43	6850.37	-6454.06	2297.52	1744467.48	14590236.11	40°10'25.639"N	80°37'39.043"W	6850.80	160.405	1.04	-0.10	-1.03
12711.00	89.750	159.400	5896.70	6943.37	-6541.43	2329.40	1744499.35	14590148.78	40°10'24.775"N	80°37'38.637"W	6943.80	160.399	1.21	-0.17	-1.19
12800.00	89.570	159.040	5897.23	7032.36	-6624.63	2360.97	1744530.91	14590065.61	40°10'23.951"N	80°37'38.235"W	7032.78	160.384	0.45	-0.20	-0.40
12892.00	89.880	160.180	5897.67	7124.36	-6710.87	2393.03	1744562.95	14589979.41	40°10'23.098"N	80°37'37.827"W	7124.77	160.374	1.28	0.34	1.24
12982.00	90.280	160.160	5897.55	7214.36	-6795.53	2423.56	1744593.47	14589894.78	40°10'22.260"N	80°37'37.438"W	7214.77	160.372	0.44	0.44	-0.02
13071.00	90.620	159.660	5898.85	7303.35	-6879.11	2454.13	1744624.02	14589811.23	40°10'21.433"N	80°37'37.049"W	7303.76	160.366	0.68	0.38	-0.56
13160.00	91.320	159.020	5899.34	7392.34	-6962.38	2485.52	1744655.41	14589728.00	40°10'20.608"N	80°37'36.649"W	7392.73	160.354	1.07	0.79	-0.72
13249.00	90.340	156.790	5894.05	7481.27	-7044.82	2518.99	1744688.87	14589645.58	40°10'19.792"N	80°37'36.222"W	7481.64	160.325	2.74	-1.10	-2.51
13338.00	89.820	155.760	5893.93	7570.11	-7126.30	2554.80	1744724.66	14589564.14	40°10'18.986"N	80°37'35.765"W	7570.42	160.277	1.30	-0.58	-1.16
13428.00	89.970	155.350	5894.09	7659.86	-7208.23	2592.05	1744761.89	14589482.24	40°10'18.174"N	80°37'35.290"W	7660.11	160.222	0.49	0.17	-0.46

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Southwestern Energy
Environmental Protection

Actual Wellpath Report

Barry Greathouse A BRK 6H AWP Proj: 18892'
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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #6H
Area	Brooke County, WV	Well	Barry Greathouse A BRK 6H
Field	Brooke	Wellbore	Barry Greathouse A BRK 6H AWB
Facility	Barry Greathouse A BRK Pad		

WELLPATH DATA (211 stations)

MID [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]
13516.00	89.540	154.430	5894.47	7747.54	-7287.91	2629.39	1744799.22	14589402.59	40°10'17.386"N	80°37'34.813"W	7747.73	160.161	1.15	-0.49	-1.05
13606.00	88.890	156.610	5895.70	7837.28	-7369.81	2666.68	1744836.49	14589320.72	40°10'16.575"N	80°37'34.337"W	7837.43	160.108	2.53	-0.72	2.42
13694.00	89.350	159.750	5897.05	7925.23	-7451.49	2699.38	1744869.18	14589239.08	40°10'15.766"N	80°37'33.920"W	7925.36	160.087	3.61	0.52	3.57
13783.00	89.910	160.130	5897.63	8014.23	-7535.09	2729.90	1744899.69	14589155.51	40°10'14.939"N	80°37'33.532"W	8014.35	160.085	0.76	0.63	0.43
13871.00	89.750	158.620	5897.89	8102.22	-7617.44	2760.90	1744930.68	14589073.19	40°10'14.124"N	80°37'33.137"W	8102.35	160.077	1.73	-0.18	-1.72
13961.00	89.690	157.750	5898.33	8192.19	-7701.00	2794.35	1744964.11	14588989.67	40°10'13.297"N	80°37'32.711"W	8192.29	160.056	0.97	-0.07	-0.97
14049.00	89.690	158.730	5898.80	8280.15	-7782.72	2826.97	1744996.72	14588907.97	40°10'12.488"N	80°37'32.295"W	8280.25	160.037	1.11	0.00	1.11
14139.00	89.910	159.820	5899.12	8370.15	-7866.90	2858.82	1745028.56	14588823.83	40°10'11.654"N	80°37'31.889"W	8370.24	160.029	1.24	0.24	1.21
14228.00	90.220	160.380	5899.02	8459.14	-7950.58	2889.11	1745058.84	14588740.18	40°10'10.826"N	80°37'31.503"W	8459.24	160.030	0.72	0.35	0.63
14317.00	89.880	158.270	5898.94	8548.14	-8033.85	2920.53	1745090.25	14588656.95	40°10'10.002"N	80°37'31.103"W	8548.23	160.022	2.40	-0.38	-2.37
14406.00	89.690	158.810	5899.27	8637.12	-8116.67	2953.09	1745122.79	14588574.15	40°10'09.182"N	80°37'30.688"W	8637.20	160.007	0.64	-0.21	0.61
14496.00	89.780	159.530	5899.69	8727.11	-8200.79	2985.09	1745154.79	14588490.07	40°10'08.350"N	80°37'30.281"W	8727.18	159.998	0.81	0.10	0.80
14585.00	89.820	159.730	5900.00	8816.11	-8284.22	3016.07	1745185.75	14588406.66	40°10'07.524"N	80°37'29.886"W	8816.18	159.995	0.23	0.04	0.22
14674.00	90.030	160.640	5900.12	8905.10	-8367.95	3046.24	1745215.91	14588322.97	40°10'06.695"N	80°37'29.502"W	8905.18	159.997	1.05	0.24	1.02
14767.00	88.120	160.150	5901.62	8998.08	-8455.55	3077.44	1745247.10	14588235.41	40°10'05.828"N	80°37'29.105"W	8998.16	160.001	2.12	-2.05	-0.53
14860.00	90.310	159.320	5902.89	9091.07	-8542.78	3109.65	1745279.29	14588148.21	40°10'04.965"N	80°37'28.695"W	9091.15	159.998	2.52	2.35	-0.89
14952.00	90.990	160.260	5901.85	9183.06	-8629.10	3141.43	1745311.06	14588061.92	40°10'04.111"N	80°37'28.290"W	9183.14	159.996	1.26	0.74	1.02
15045.00	91.200	158.610	5900.07	9276.04	-8716.16	3174.09	1745343.71	14587974.90	40°10'03.249"N	80°37'27.874"W	9276.11	159.990	1.79	0.23	-1.77
15138.00	90.310	156.200	5898.85	9368.94	-8802.01	3209.82	1745379.42	14587889.08	40°10'02.399"N	80°37'27.419"W	9369.00	159.965	2.76	-0.96	-2.59
15230.00	90.000	157.890	5898.60	9460.84	-8886.72	3245.69	1745415.28	14587804.41	40°10'01.561"N	80°37'26.961"W	9460.88	159.936	1.87	-0.34	1.84
15323.00	89.720	159.180	5898.82	9553.81	-8973.26	3279.73	1745449.30	14587717.89	40°10'00.704"N	80°37'26.528"W	9553.85	159.923	1.42	-0.30	1.39
15416.00	90.030	160.660	5899.03	9646.81	-9060.61	3311.65	1745481.22	14587630.58	40°09'59.839"N	80°37'26.121"W	9646.85	159.923	1.63	0.33	1.59
15508.00	90.860	160.170	5898.12	9738.80	-9147.28	3342.49	1745512.04	14587543.94	40°09'58.982"N	80°37'25.729"W	9738.84	159.927	1.05	0.90	-0.53
15601.00	89.380	158.300	5898.12	9831.79	-9234.24	3375.46	1745545.00	14587457.02	40°09'58.121"N	80°37'25.309"W	9831.83	159.921	2.56	-1.59	-2.01
15694.00	89.630	157.290	5898.92	9924.73	-9320.33	3410.61	1745580.13	14587370.96	40°09'57.269"N	80°37'24.861"W	9924.76	159.901	1.12	0.27	-1.09
15786.00	89.660	156.810	5899.49	10016.62	-9405.05	3446.48	1745615.99	14587286.28	40°09'56.430"N	80°37'24.403"W	10016.64	159.875	0.52	0.03	-0.52
15879.00	90.120	156.600	5899.67	10109.49	-9490.47	3483.26	1745652.75	14587200.89	40°09'55.584"N	80°37'23.934"W	10109.50	159.846	0.54	0.49	-0.23
15972.00	89.910	155.270	5899.65	10202.28	-9575.38	3521.18	1745690.66	14587116.01	40°09'54.744"N	80°37'23.450"W	10202.29	159.810	1.45	-0.23	-1.43
16065.00	89.290	155.940	5900.29	10295.04	-9660.08	3559.59	1745729.06	14587031.35	40°09'53.905"N	80°37'22.960"W	10295.04	159.772	0.98	-0.67	0.72
16157.00	89.720	158.230	5901.09	10386.93	-9744.81	3595.41	1745764.86	14586946.65	40°09'53.066"N	80°37'22.503"W	10386.93	159.748	2.53	0.47	2.49



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WV Department of Environmental Protection

Office of Oil and Gas

Actual Wellpath Report

Barry Greathouse A BRK 6H AWP Proj: 18892

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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #6H
Area	Brooke County, WV	Well	Barry Greathouse A BRK 6H
Field	Brooke	Wellbore	Barry Greathouse A BRK 6H AWB
Facility	Barry Greathouse A BRK Pad		

WELLPATH DATA (211 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]
16250.00	89.720	158.570	5901.54	10479.90	-9831.28	3629.64	1745799.08	14586860.22	40°09'52.210"N	80°37'22.067"W	10479.90	159.736	0.37	0.00	0.37
16343.00	89.630	159.850	5902.07	10572.89	-9918.22	3662.65	1745832.08	14586773.31	40°09'51.350"N	80°37'21.647"W	10572.89	159.732	1.38	-0.10	1.38
16432.00	89.630	160.950	5902.65	10661.88	-10002.06	3692.50	1745861.92	14586689.50	40°09'50.520"N	80°37'21.267"W	10661.88	159.737	1.24	0.00	1.24
16522.00	89.690	161.970	5903.18	10751.84	-10087.38	3721.12	1745890.52	14586604.21	40°09'49.676"N	80°37'20.903"W	10751.84	159.752	1.14	0.07	1.13
16615.00	89.820	162.540	5903.58	10844.75	-10175.96	3749.46	1745918.86	14586515.67	40°09'48.799"N	80°37'20.543"W	10844.75	159.773	0.63	0.14	0.61
16707.00	89.690	163.110	5903.97	10936.62	-10263.85	3776.63	1745946.01	14586427.81	40°09'47.930"N	80°37'20.198"W	10936.62	159.799	0.64	-0.14	0.62
16800.00	89.720	164.450	5904.45	11029.38	-10353.15	3802.61	1745971.98	14586338.55	40°09'47.046"N	80°37'19.868"W	11029.39	159.832	1.44	0.03	1.44
16893.00	90.000	165.120	5904.68	11122.03	-10442.89	3827.01	1745996.38	14586248.84	40°09'46.158"N	80°37'19.558"W	11122.05	159.874	0.78	0.30	0.72
16989.00	89.940	163.290	5904.73	11217.73	-10535.26	3853.14	1746022.50	14586156.51	40°09'45.244"N	80°37'19.227"W	11217.77	159.911	1.91	-0.06	-1.91
17078.00	90.770	161.380	5904.18	11306.64	-10620.06	3880.15	1746049.49	14586071.74	40°09'44.405"N	80°37'18.884"W	11306.69	159.930	2.34	0.93	-2.15
17171.00	88.920	158.150	5904.43	11399.62	-10707.30	3912.31	1746081.64	14585984.53	40°09'43.542"N	80°37'18.474"W	11399.67	159.928	4.00	-1.99	-3.47
17261.00	90.000	157.030	5905.28	11489.55	-10790.50	3946.62	1746115.93	14585901.37	40°09'42.718"N	80°37'18.037"W	11489.59	159.910	1.73	1.20	-1.24
17354.00	88.920	155.800	5906.15	11582.38	-10875.72	3983.83	1746153.13	14585816.18	40°09'41.874"N	80°37'17.562"W	11582.41	159.882	1.76	-1.16	-1.32
17446.00	89.880	157.880	5907.12	11674.25	-10960.30	4020.00	1746189.29	14585731.63	40°09'41.037"N	80°37'17.101"W	11674.27	159.858	2.49	1.04	2.26
17539.00	89.690	157.440	5907.47	11767.19	-11046.32	4055.35	1746224.63	14585645.65	40°09'40.186"N	80°37'16.651"W	11767.20	159.841	0.52	-0.20	-0.47
17632.00	89.350	158.480	5908.24	11860.14	-11132.52	4090.25	1746259.51	14585559.48	40°09'39.332"N	80°37'16.206"W	11860.15	159.826	1.18	-0.37	1.12
17725.00	89.750	160.350	5908.98	11953.13	-11219.57	4122.95	1746292.19	14585472.46	40°09'38.471"N	80°37'15.789"W	11953.14	159.823	2.06	0.43	2.01
17817.00	89.480	160.050	5909.59	12045.12	-11306.13	4154.11	1746323.34	14585385.94	40°09'37.614"N	80°37'15.393"W	12045.13	159.826	0.44	-0.29	-0.33
17910.00	90.310	158.900	5909.76	12138.12	-11393.22	4186.72	1746355.94	14585298.88	40°09'36.752"N	80°37'14.978"W	12138.13	159.823	1.52	0.89	-1.24
18002.00	90.150	157.680	5909.39	12230.09	-11478.70	4220.75	1746389.95	14585213.44	40°09'35.906"N	80°37'14.544"W	12230.09	159.811	1.34	-0.17	-1.33
18095.00	90.180	156.970	5909.13	12323.00	-11564.51	4256.60	1746425.79	14585127.66	40°09'35.056"N	80°37'14.087"W	12323.01	159.793	0.76	0.03	-0.76
18185.00	89.970	156.370	5909.01	12412.87	-11647.15	4292.24	1746461.42	14585045.05	40°09'34.238"N	80°37'13.633"W	12412.87	159.770	0.71	-0.23	-0.67
18277.00	90.310	155.160	5908.78	12504.65	-11731.04	4330.00	1746499.17	14584961.20	40°09'33.408"N	80°37'13.151"W	12504.65	159.741	1.37	0.37	-1.32
18370.00	89.540	155.890	5908.11	12597.39	-11815.68	4368.53	1746537.68	14584876.59	40°09'32.570"N	80°37'12.659"W	12597.40	159.709	1.14	-0.83	0.78
18463.00	89.660	157.930	5909.56	12690.27	-11901.22	4405.00	1746574.14	14584791.08	40°09'31.723"N	80°37'12.194"W	12690.28	159.689	2.20	0.13	2.19
18552.00	89.630	158.670	5910.11	12779.24	-11983.91	4437.91	1746607.03	14584708.42	40°09'30.904"N	80°37'11.775"W	12779.25	159.679	0.83	-0.03	0.83
18642.00	89.750	159.800	5910.59	12869.23	-12068.07	4469.82	1746638.93	14584624.30	40°09'30.071"N	80°37'11.369"W	12869.24	159.676	1.26	0.13	1.26
18735.00	89.720	159.890	5911.02	12962.23	-12155.37	4501.86	1746670.96	14584537.03	40°09'29.207"N	80°37'10.961"W	12962.24	159.677	0.10	-0.03	0.10
18824.00	89.630	160.640	5911.53	13051.22	-12239.14	4531.91	1746701.00	14584453.29	40°09'28.378"N	80°37'10.578"W	13051.24	159.681	0.85	-0.10	0.84
18867.00	89.630	161.010	5911.81	13094.22	-12279.75	4546.03	1746715.12	14584412.69	40°09'27.976"N	80°37'10.399"W	13094.23	159.685	0.86	0.00	0.86

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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #6H
SOUTHWESTERN ENERGY	Well	Barry Greathouse A BRK 6H
Area	Wellbore	Barry Greathouse A BRK 6H AWP
Field		
Facility		

WELLPATH DATA (211 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]
18892.00	89.630	161.010	5911.97	13119.21	-12303.39	4554.17	1746723.25	14584389.06	40°09'27.742"N	80°37'10.295"W	13119.22	159.688	0.00	0.00	0.00

HOLE & CASING SECTIONS - Ref Wellbore: Barry Greathouse A BRK 6H AWP Proj: 18892'

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	End N/S [ft]	Start E/W [ft]	End E/W [ft]	End E/W [ft]
20in Conductor	26.00	100.00	74.00	26.00	100.00	0.00	0.00	0.00	0.00	-0.30
17.5in Open Hole	100.00	353.00	253.00	100.00	352.97	0.06	0.06	-0.30	1.30	-3.71
13.375in Casing Surface	26.00	353.00	327.00	26.00	352.97	0.00	0.00	0.00	1.30	-3.71
12.25in Open Hole	353.00	1631.00	1278.00	352.97	1630.77	1.30	1.30	-3.71	4.57	-21.04
9.625in Casing Intermediate	26.00	1631.00	1605.00	26.00	1630.77	0.00	0.00	0.00	4.57	-21.04
8.75in Open Hole	1632.00	6109.00	4477.00	1631.77	5818.45	4.57	4.57	-21.05	-384.34	-28.43
8.5in Open Hole	6109.00	18892.00	12783.00	5818.45	5911.97	-384.34	-12303.39	-28.43	-12303.39	4554.17
5.5in Casing Production	26.00	18892.00	18866.00	26.00	5911.97	0.00	-12303.39	0.00	-12303.39	4554.17

TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Barry Greathouse A BRK 6H LP Rev-6	5833.04	-425.04	-8.43	1742162.43	14596262.78	40°11'25.312"N	80°38'08.430"W	point
Barry Greathouse A BRK 6H BHL Rev-5	5919.90	-12308.78	4541.52	1746710.60	14584383.68	40°09'27.689"N	80°37'10.458"W	point

REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY		Slot	Slot #6H
Area	Brooke County, WV		Well	Barry Greathouse A BRK 6H
Field	Brooke		Wellbore	Barry Greathouse A BRK 6H AWB
Facility	Barry Greathouse A BRK Pad			

WELLPATH COMPOSITION - Ref Wellbore: Barry Greathouse A BRK 6H AWB Ref Wellpath: Barry Greathouse A BRK 6H AWP Proj: 18892'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	333.00	OWSG MWD rev2 + HRGM	01_Premier MWD <17 1/2"> (151'-333')	Barry Greathouse A BRK 6H AWB
333.00	1581.00	OWSG MWD rev2 + HRGM	02_Premier MWD <12 1/4"> (511'-1581')	Barry Greathouse A BRK 6H AWB
1581.00	6022.00	OWSG MWD rev2 + HRGM	03_Premier MWD <8 3/4"> (1731'-6022')	Barry Greathouse A BRK 6H AWB
6022.00	18867.00	BHI AutoTrak Curve (Short)	04_BH AT Curve <8 1/2"> (6085'-18867')	Barry Greathouse A BRK 6H AWB
18867.00	18892.00	Blind Drilling (std)	Projection to bit	Barry Greathouse A BRK 6H AWB

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REFERENCE WELLPATH IDENTIFICATION

Operator	Area	Field	Facility	Slot	Well	Wellbore	Slot #6H
SOUTHWESTERN ENERGY	Brooke County, WV	Brooke	Barry Greathouse A BRK Pad	Well	Barry Greathouse A BRK 6H		
				Wellbore	Barry Greathouse A BRK 6H AWB		

COMMENTS

Wellpath general comments
API: 47-009-00230-0000
BH Job #: 109802841
Rig: SDC 40
Duration: 05/17/2019 - 05/20/2019

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Hydraulic Fracturing Fluid Product Component Information Disclosure

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Frac Focus
Chemical Disclosure Registry



Job Start Date:	7/5/2019
Job End Date:	8/3/2019
State:	West Virginia
County:	Brooke
API Number:	47-009-00230-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Barry Greathouse A BRK 6H
Latitude:	40.19150000
Longitude:	-80.63560000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	5,886
Total Base Water Volume (gal):	19,081,032
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	Halliburton	Base Fluid					
			Water	7732-18-5	100.00000	66.53012	Density = 8.34
Produced Water	Halliburton	Base Fluid					
			Water	7732-18-5	100.00000	20.29024	Density = 8.34

Ingredients	Listed Above	Listed Above							
			Water	7732-18-5	100.00000	0.03603			
BE-9	Halliburton	Biocide	RECEIVED Office of Oil and Gas	Listed Below					
MC LD-2850	MultiChem	Friction Reducer	NOV 2 2 2019						
			WV Department of Environmental Protection	Listed Below					
FSTI HCl	FSTI	Acid							
				Listed Below					
FSTI-Cl-01	FSTI	Acid Corrosion Inhibitor							
				Listed Below					
FSTI-IC-001	FSTI	Iron Control Agent							
				Listed Below					
Sand-Common White-100 Mesh, SSA-2	Halliburton	Proppant							
				Listed Below					
Sand-Premium White-40/70	Halliburton	Proppant							
				Listed Below					
LEGEND(TM) LD-7750	MultiChem	Scale Inhibitor							

LEGEND(TM) LD-7750W	MultiChem	Scale Control			Listed Below				
					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	11.96009		
				Hydrochloric acid	7647-01-0	7.50000	0.08422		
				Ethanaminium, N,N,N-trimethyl-2-[(1-oxo-2-propen-1-yl)oxy]-, chloride (1:1), polymer with 2-propenamide	69418-26-4	30.00000	0.01943		
				Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01943		
				Sodium chloride	7647-14-5	10.00000	0.00692		
				Castor oil, ethoxylated	61791-12-6	10.00000	0.00648		
				Ammonium chloride	12125-02-9	10.00000	0.00648		
				Alcohols, C12-16, ethoxylated	68551-12-2	5.00000	0.00324		
				Sorbitan monooleate polyoxyethylene derivative	9005-65-6	5.00000	0.00324		
				9-Octadecenamide, n,n-bis-2(hydroxy-ethyl)-(Z)	93-83-4	5.00000	0.00324		
				Methanol	67-56-1	80.00000	0.00254		
				Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00207		
				Acetic acid	64-19-7	60.00000	0.00167		
				Citric acid	77-92-9	40.00000	0.00111		
				Phosphoric Acid Salt	Proprietary	5.00000	0.00044		
				Fatty acids	Trade Secret	10.00000	0.00008		
				Formaldehyde	50-00-0	0.10000	0.00007		
				Ethylenediaminetetraacetic acid, tetrasodium salt	64-02-8	0.10000	0.00006		
				Sodium glycolate	2836-32-0	0.10000	0.00006		

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				150-76-5	0.10000	0.00006	
			Hydroquinone monomethyl ether				
			1,4-Dioxane	123-91-1	0.10000	0.00006	
			Diethanolamine	111-42-2	0.10000	0.00006	
			Nitrotriacetic acid, trisodium salt monohydrate	5064-31-3	0.10000	0.00006	

* 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)

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**BARRY GREATHOUSE A BRK 6H
ATTACHMENT 1
PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	6/26/2019	18,806	18,708	36
2	7/5/2019	18,673	18,566	42
3	7/6/2019	18,533	18,426	42
4	7/6/2019	18,393	18,286	42
5	7/7/2019	18,253	18,146	42
6	7/7/2019	18,113	18,006	42
7	7/7/2019	17,973	17,866	42
8	7/8/2019	17,833	17,726	42
9	7/8/2019	17,693	17,586	42
10	7/8/2019	17,553	17,446	42
11	7/9/2019	17,413	17,306	42
12	7/9/2019	17,273	17,166	42
13	7/9/2019	17,133	17,026	42
14	7/10/2019	16,993	16,886	42
15	7/10/2019	16,853	16,746	42
16	7/10/2019	16,713	16,606	42
17	7/11/2019	16,573	16,466	42
18	7/11/2019	16,444	16,326	42
19	7/12/2019	16,293	16,191	42
20	7/12/2019	16,153	16,046	42
21	7/12/2019	16,013	15,906	42
22	7/13/2019	15,873	15,766	42
23	7/13/2019	15,733	15,626	42
24	7/13/2019	15,593	15,484	42
25	7/13/2019	15,453	15,346	42
26	7/14/2019	15,313	15,206	42
27	7/14/2019	15,173	15,066	42
28	7/14/2019	15,033	14,926	42
29	7/14/2019	14,893	14,786	42
30	7/15/2019	14,753	14,646	42
31	7/15/2019	14,613	14,506	42
32	7/15/2019	14,473	14,366	42
33	7/15/2019	14,333	14,230	42
34	7/16/2019	14,193	14,086	42
35	7/16/2019	14,053	13,946	42
36	7/16/2019	13,913	13,806	42
37	7/17/2019	13,773	13,666	84
38	7/18/2019	13,633	13,526	42
39	7/20/2019	13,493	13,386	42
40	7/20/2019	13,353	13,246	42
41	7/20/2019	13,213	13,106	42
42	7/20/2019	13,073	12,966	42
43	7/20/2019	11,933	11,826	42
44	7/24/2019	12,919	11,966	60
45	7/25/2019	11,813	11,706	42

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46	7/25/2019	11,673	11,566	42
47	7/25/2019	11,533	11,426	42
48	7/26/2019	11,393	11,286	42
49	7/26/2019	11,253	11,146	42
50	7/28/2019	11,113	11,006	42
51	7/27/2019	10,973	10,866	42
52	7/28/2019	10,833	10,726	42
53	7/28/2019	10,693	10,586	42
54	7/28/2019	10,553	10,446	42
55	7/29/2019	10,413	10,306	42
56	7/29/2019	10,273	10,166	42
57	7/29/2019	10,133	10,026	42
58	7/29/2019	9,993	9,886	42
59	7/29/2019	9,853	9,746	42
60	7/29/2019	9,713	9,603	42
61	7/30/2019	9,573	9,466	42
62	7/30/2019	9,433	9,326	42
63	7/30/2019	9,293	9,186	42
64	7/30/2019	9,153	9,046	42
65	7/31/2019	9,017	8,906	42
66	7/31/2019	8,873	8,766	42
67	7/31/2019	8,733	8,626	42
68	7/31/2019	8,593	8,486	42
69	7/31/2019	8,453	8,346	42
70	7/31/2019	8,313	8,206	42
71	8/1/2019	8,173	8,066	42
72	8/1/2019	8,033	7,926	42
73	8/1/2019	7,893	7,786	42
74	8/1/2019	7,753	7,646	42
75	8/1/2019	7,613	7,506	42
76	8/1/2019	7,473	7,366	42
77	8/2/2019	7,333	7,226	42
78	8/2/2019	7,193	7,086	42
79	8/2/2019	7,053	6,946	42
80	8/3/2019	6,913	6,806	42
81	8/3/2019	6,773	6,666	42
82	8/3/2019	6,633	6,526	42
83	8/3/2019	6,493	6,386	42
84	8/3/2019	6,353	6,246	42

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BARRY GREATHOUSE A BRK 6H

ATTACHMENT 2

STIM REPORT

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	7/5/2019	94.4	8,302	8,119	4,182	245,330	6,394	0
2	7/5/2019	90.9	8,248	6,002	4,546	245,000	8,928	0
3	7/6/2019	99.6	8,028	5,537	4,399	244,610	6,866	0
4	7/6/2019	93.1	8,288	5,747	4,701	244,530	7,056	0
5	7/7/2019	100.2	8,044	5,366	4,502	244,440	6,641	0
6	7/7/2019	100.1	7,896	5,038	4,637	244,900	6,720	0
7	7/7/2019	99.7	7,968	5,047	4,481	245,130	6,522	0
8	7/8/2019	98.8	7,841	5,380	4,433	244,680	6,396	0
9	7/8/2019	99.2	7,851	5,634	4,594	245,290	6,346	0
10	7/8/2019	99.1	8,074	5,782	4,593	245,690	5,600	0
11	7/9/2019	98.7	8,054	5,903	4,681	245,380	5,730	0
12	7/9/2019	99.4	7,950	6,206	4,561	245,740	5,725	0
13	7/9/2019	99.4	8,116	5,775	4,622	245,440	5,476	0
14	7/10/2019	99.3	8,021	4,042	4,557	245,280	5,715	0
15	7/10/2019	100.1	7,595	5,731	4,716	246,620	5,739	0
16	7/10/2019	99.8	7,851	5,538	4,606	244,950	5,649	0
17	7/11/2019	99.8	7,881	5,746	4,505	245,130	5,588	0
18	7/11/2019	99.7	7,817	5,679	4,582	244,790	5,690	0
19	7/12/2019	84	8,387	5,388	4,322	245,380	5,812	0
20	7/12/2019	99.6	7,593	5,262	4,427	247,760	5,668	0
21	7/12/2019	100.4	7,846	5,691	4,578	249,230	5,630	0
22	7/13/2019	99.1	7,873	5,642	4,500	244,800	5,511	0
23	7/13/2019	98.3	7,752	5,539	4,560	245,840	5,541	0
24	7/13/2019	94.7	7,922	5,702	4,438	245,160	5,687	0
25	7/13/2019	100.1	7,830	5,250	4,611	245,180	5,645	0
26	7/14/2019	100	7,572	5,484	4,479	244,570	5,476	0
27	7/14/2019	100.5	7,866	5,146	4,412	245,610	5,462	0
28	7/14/2019	100.5	7,908	5,654	4,394	246,080	5,674	0
29	7/15/2019	100.3	7,883	5,385	4,420	246,770	5,681	0
30	7/15/2019	99.6	7,938	5,400	4,214	244,860	5,601	0
31	7/15/2019	100.2	7,814	5,258	4,306	248,110	5,701	0
32	7/15/2019	99.1	7,939	5,206	4,362	282,420	5,616	0
33	7/16/2019	99.9	7,723	5,033	4,187	246,050	5,454	0
34	7/16/2019	96.6	7,768	5,203	4,374	244,720	5,607	0
35	7/16/2019	45.9	7,870	5,194	7,843	43,010	4,716	0
36	7/17/2019	100.1	7,528	4,897	4,111	244,270	5,670	0
37	7/18/2019	95.9	7,857	5,204	4,252	245,580	8,353	0
38	7/18/2019	95.5	7,884	5,037	9,429	239,175	5,006	0
39	7/20/2019	99.6	7,224	5,305	4,319	245,320	8,324	0
40	7/20/2019	99.7	7,529	5,393	4,393	247,620	5,153	0
41	7/20/2019	100.4	7,026	4,954	4,389	245,340	5,066	0
42	7/20/2019	100.4	7,051	5,503	4,306	244,773	5,063	0
43	7/20/2019	100.3	6,989	5,526	3,890	244,554	4,928	0
44	7/24/2019	84.3	6,923	4,225	3,331	1,748,405	36,944	0
45	7/25/2019	99.8	7,503	5,257	4,473	238,430	4,798	0
46	7/25/2019	100.2	7,396	5,016	4,551	244,040	5,243	0
47	7/26/2019	100.2	7,393	5,360	4,463	244,660	5,193	0
48	7/26/2019	99.8	7,297	5,394	4,379	245,520	4,800	0
49	7/26/2019	99.5	6,857	5,342	4,265	244,420	4,909	0
50	7/27/2019	100.2	7,169	5,131	4,364	245,310	4,185	0
51	7/28/2019	100.1	7,527	5,327	4,260	245,030	4,052	0
52	7/28/2019	100	7,262	5,593	4,458	244,080	4,072	0
53	7/28/2019	99.7	6,979	5,972	4,266	244,670	4,059	0
54	7/28/2019	100.2	7,167	5,450	4,351	245,650	4,090	0
55	7/29/2019	100.2	7,330	5,345	4,383	244,960	4,032	0
56	7/29/2019	100.3	7,076	5,579	4,105	244,680	4,071	0
57	7/29/2019	99.4	7,248	5,371	4,220	245,560	4,089	0

58	7/29/2019	100.2	7,060	5,005	4,227	244,180	4,003	0
59	7/29/2019	91.1	7,252	5,102	4,140	250,720	5,368	0
60	7/29/2019	100.2	6,847	5,449	4,092	245,286	4,096	0
61	7/30/2019	82.9	7,030	4,947	4,145	251,940	4,443	0
62	7/30/2019	99.1	6,916	5,037	4,290	249,340	4,090	0
63	7/30/2019	101	6,846	5,183	3,873	248,464	4,333	0
64	7/31/2019	99.9	6,791	5,403	4,215	245,830	4,015	0
65	7/31/2019	100.4	6,803	5,122	4,324	245,340	4,010	0
66	7/31/2019	100	6,868	5,236	4,516	245,960	4,023	0
67	7/31/2019	100.2	6,991	5,180	4,407	246,940	4,032	0
68	7/31/2019	100.2	6,858	7,429	4,390	247,040	4,040	0
69	7/31/2019	100.2	6,942	7,248	4,597	247,017	4,054	0
70	8/1/2019	100.6	6,721	5,239	4,196	245,200	4,219	0
71	8/1/2019	99.9	6,668	5,701	4,169	245,060	3,985	0
72	8/1/2019	99.1	6,909	6,084	4,268	245,740	4,010	0
73	8/1/2019	100	6,789	5,406	4,306	246,001	3,983	0
74	8/1/2019	100	6,973	7,436	4,433	205,475	3,567	0
75	8/1/2019	100.4	6,575	5,741	4,331	246,601	4,093	0
76	8/1/2019	99.3	6,383	5,257	4,168	245,440	4,087	0
77	8/2/2019	99.1	6,398	5,226	4,273	245,110	3,963	0
78	8/2/2019	100.4	6,548	5,121	4,247	245,470	3,886	0
79	8/3/2019	99.5	6,550	5,427	4,100	244,840	4,015	0
80	8/3/2019	99.9	6,473	5,498	4,277	245,990	3,951	0
81	8/3/2019	95.1	6,745	5,321	4,210	246,850	4,030	0
82	8/3/2019	100.4	6,554	6,458	4,250	246,380	3,896	0
83	8/3/2019	100.3	6,283	5,681	4,197	245,786	4,222	0
84	8/3/2019	100.1	6,161	5,258	4,147	243,559	3,953	0

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ATTACHMENT 3

Well Name: Barry Greathouse A BRK 6H **47009002300000**

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	275.00	275.00	
Top of Salt Water	384.00	384.00	NA	NA	
Pittsburgh Coal	292.00	292.00	NA	NA	
Pottsville (ss)	398.00	398.00	796.00	796.00	
Raven Cliff (ss)	796.00	796.00	1047.00	1047.00	
Maxton (ss)	1047.00	1047.00	1349.00	1349.00	
Big Injun (ss)	1349.00	1349.00	1872.00	1868.00	
Berea (siltstone)	1867.00	1867.00	5299.00	5283.00	
Rhinestreet (shale)	5299.00	5283.00	5544.00	5513.00	
Cashaqua (shale)	5544.00	5513.00	5604.00	5564.00	
Middlesex (shale)	5604.00	5564.00	5795.00	5701.00	
Mahantango (shale)	5795.00	5701.00	5977.00	5785.00	
Marcellus (shale)	5977.00	5785.00	NA	NA	GAS

RECEIVED
Office of Oil and Gas

NOV 22 2019

WV Department of
Environmental Protection

(2000' SCALE) SURFACE HOLE LATITUDE 40°12'30" 2972'

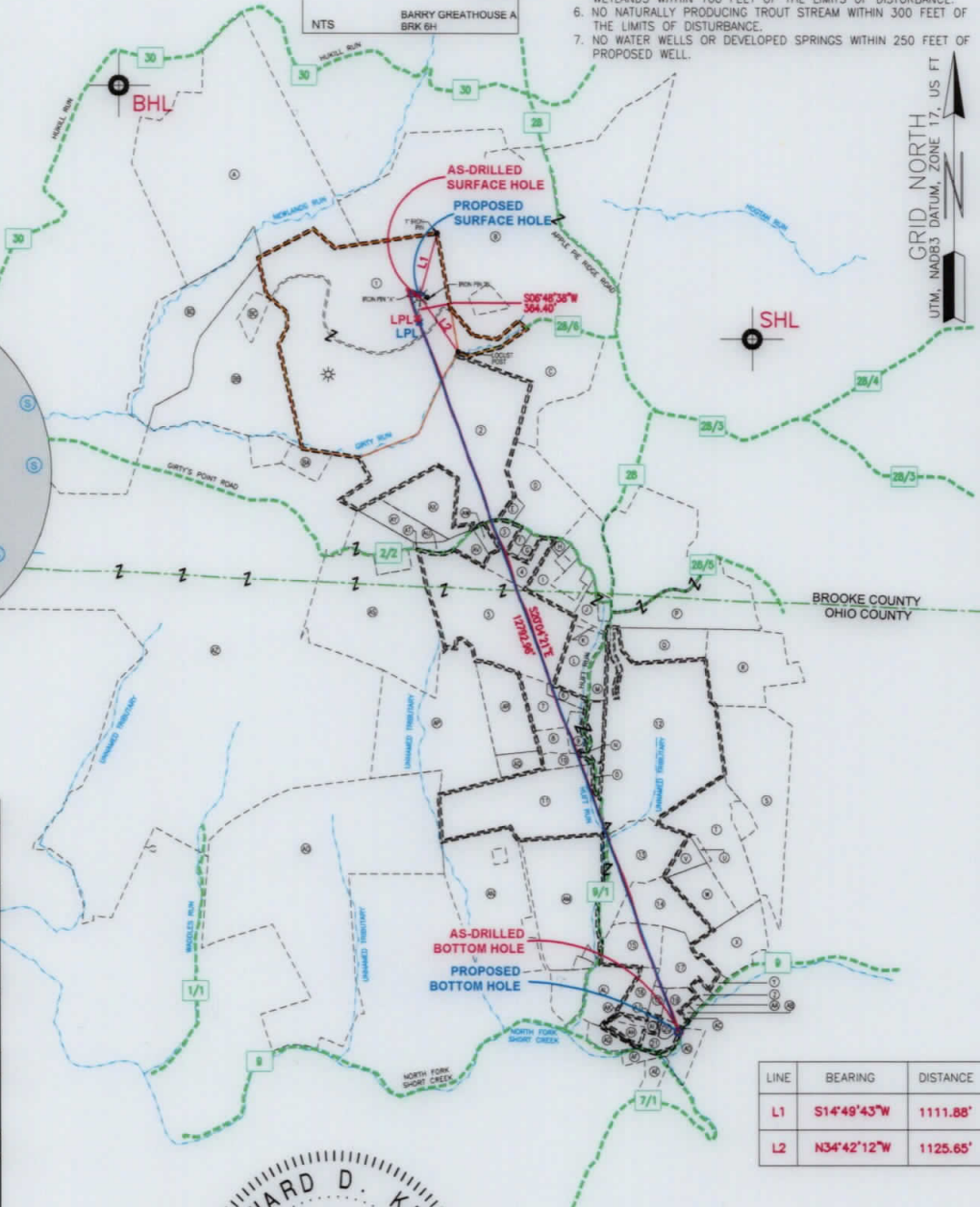
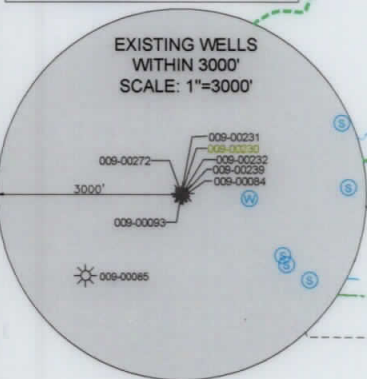
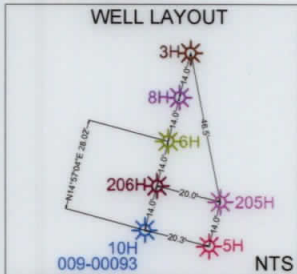
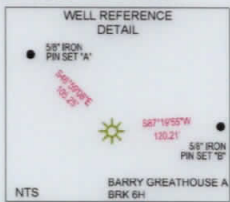
(2000' SCALE) BOTTOM HOLE LATITUDE 40°10'00" 10117'



www.jhacompanies.com
68011 Vineyard Road
St. Clairsville, Ohio 43950
740-695-6100

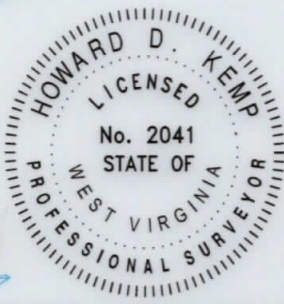
NOTES ON SURVEY

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



SURFACE HOLE LOCATION (SHL): UTM (NAD83, ZONE 17, METERS): NORTHING: 4449079.29 EASTING: 531014.73
LANDING POINT LOCATION (LPL): UTM (NAD83, ZONE 17, METERS): NORTHING: 4448968.85 EASTING: 531003.42
BOTTOM HOLE LOCATION (BHL): UTM (NAD83, ZONE 17, METERS): NORTHING: 4445330.68 EASTING: 532402.31
SURFACE HOLE LOCATION (SHL): UTM (NAD83, ZONE 17, METERS): NORTHING: 4449079.29 EASTING: 531014.73
LANDING POINT LOCATION (LPL): UTM (NAD83, ZONE 17, METERS): NORTHING: 4448949.85 EASTING: 531012.26
BOTTOM HOLE LOCATION (BHL): UTM (NAD83, ZONE 17, METERS): NORTHING: 4445329.04 EASTING: 532398.46

LINE	BEARING	DISTANCE
L1	S14°49'43"W	1111.88'
L2	N34°42'12"W	1125.65'



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. 2041



(+) 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)	BARRY GREATHOUSE A BRK OPERATOR'S WELL #: 6H API WELL #: 47 009 230 STATE COUNTY PERMIT
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WELL TYPE: OIL WASTE DISPOSAL PRODUCTION DEEP GAS LIQUID INJECTION STORAGE SHALLOW

WATERSHED: UPPER OHIO SOUTH ELEVATION: 1136.2'

DISTRICT: BUFFALO COUNTY: BROOKE QUADRANGLE: TILTONVILLE, OH & BETHANY, WV

SURFACE OWNER: BARRY L. GREATHOUSE & PATRICIA A. GREATHOUSE ACREAGE: ±229.00

OIL & GAS ROYALTY OWNER: RAYLE COAL COMPANY ACREAGE: ±229.00

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

CONVERT PLUG & ABANDON CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY) AS-DRILLED

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 5,912 TVD 18,892' TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC ADDRESS: 1300 FORT PIERPONT DRIVE, SUITE 201 CITY: MORGANTOWN STATE: WV ZIP CODE: 26508	DESIGNATED AGENT: BRITTANY WOODY ADDRESS: 1300 FORT PIERPONT DRIVE, SUITE 201 CITY: MORGANTOWN STATE: WV ZIP CODE: 26508
--	--

LEGEND: ○ EXISTING BOTTOM HOLE * EXISTING / PRODUCING WELLHEAD LPL * EXISTING LANDING POINT LOCATION ○ PROPOSED SURFACE HOLE / BOTTOM HOLE LPL * PROPOSED LANDING POINT LOCATION — ACCESS ROAD - - - PUBLIC ROAD FLOOD PLAIN — LEASE BOUNDARY — AS-DRILLED PATH — PROPOSED PATH	REVISIONS: DATE: 11-18-2019 API NO: 47-009-0230 DRAWN BY: R.GRIMES SCALE: 1" = 3000' DRAWING NO: 2017-422 WELL LOCATION PLAT
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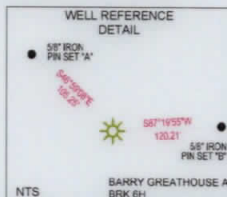
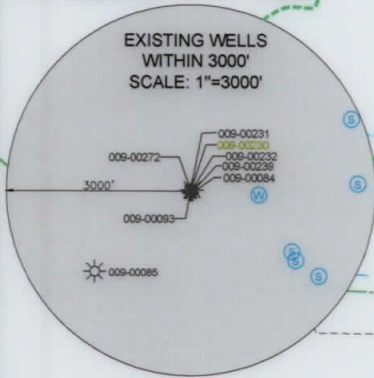
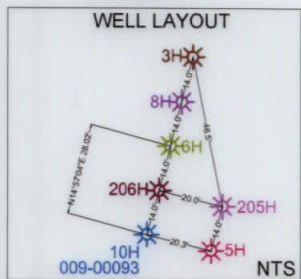
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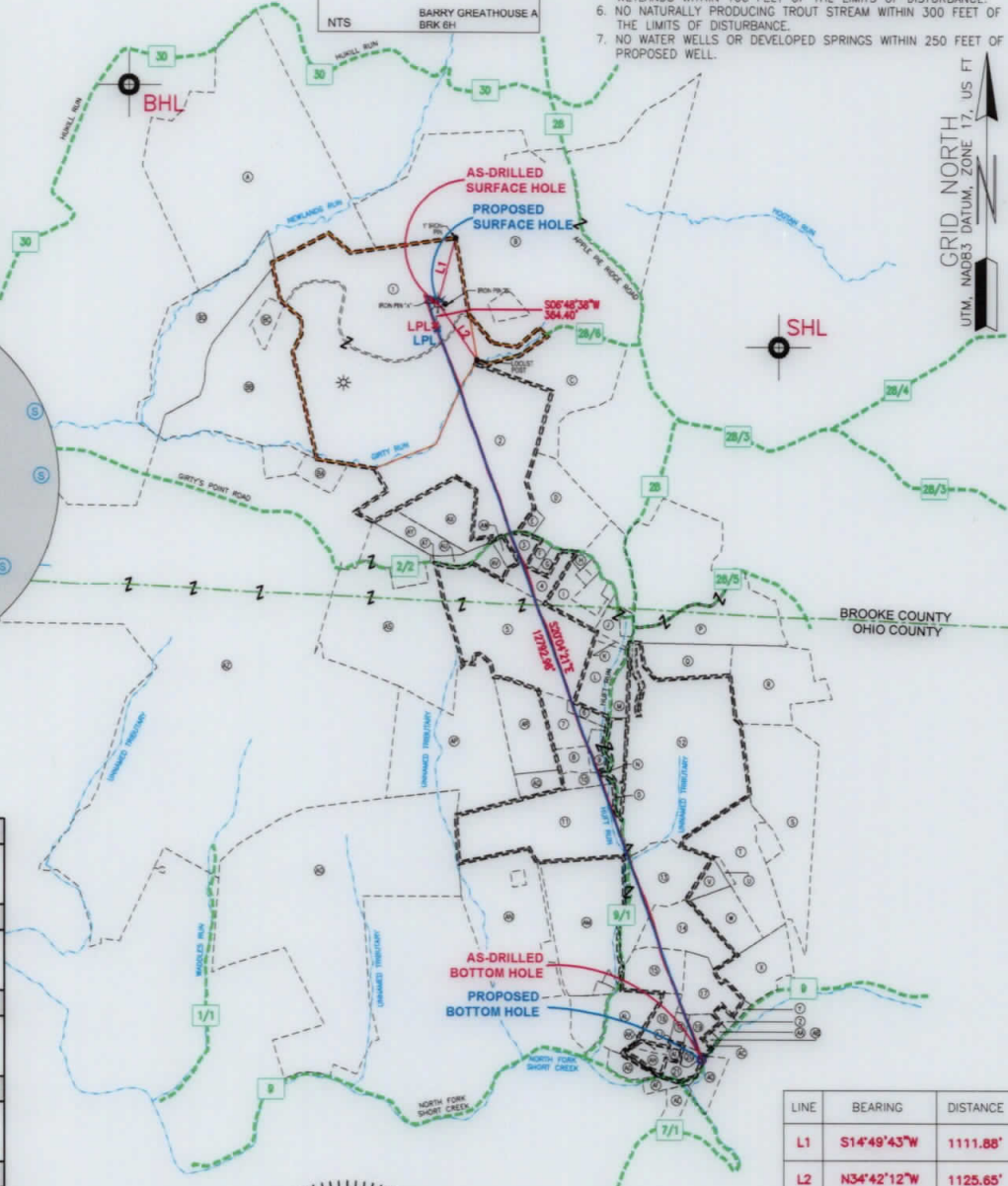
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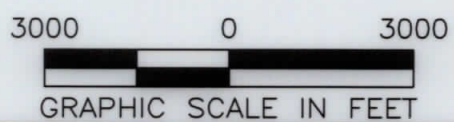
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P.S. 2041

SWN Production Company, LLC **SWN** Production Company™

(+) 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)

BARRY GREATHOUSE A BRK		
OPERATOR'S WELL #:	6H	
API WELL #:	47	009 230
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ADDRESS: 1300 FORT PIERPONT DRIVE, SUITE 201	ADDRESS: 1300 FORT PIERPONT DRIVE, SUITE 201
CITY: MORGANTOWN STATE: WV ZIP CODE: 26508	CITY: MORGANTOWN STATE: WV ZIP CODE: 26508

LEGEND:

EXISTING BOTTOM HOLE	ACCESS ROAD
EXISTING / PRODUCING WELLHEAD	PUBLIC ROAD
EXISTING LANDING POINT LOCATION	FLOOD PLAIN
PROPOSED SURFACE HOLE / BOTTOM HOLE	LEASE BOUNDARY
PROPOSED LANDING POINT LOCATION	AS-DRILLED PATH
	PROPOSED PATH

REVISIONS:	DATE: 11-18-2019
	API NO: 47-009-0230
	DRAWN BY: R.GRIMES
	SCALE: 1" = 3000'
	DRAWING NO: 2017-422
	WELL LOCATION PLAT