

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

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Office of Oil and Gas

SEP 19 2019

WV Department of
Environmental Protection

API 47-009-00269 County BROOKE District BUFFALO
Quad TILTONSVILLE Pad Name BARRY GREATHOUSE B BRK PAD Field/Pool Name PANHANDLE FIELD WET
Farm name BARRY L. GREATHOUSE & PATRICIA A. GREATHOUSE Well Number BARRY GREATHOUSE B BRK 1H
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 4,448,652.96 Easting 530,542.25
Landing Point of Curve Northing 4,448,581.98 Easting 530,087.52
Bottom Hole Northing 4,451,439.43 Easting 528,864.87

Elevation (ft) 1,142.8 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 1/30/2019 Date drilling commenced 3/2/2019 Date drilling ceased 3/20/2019
Date completion activities began 6/13/2019 Date completion activities ceased 7/15/2019
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 281' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 405' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 294' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed

Reviewed by:
SB 10-16-19

G. D. O.
10-16-19

API 47-009 - 00269

Farm name BARRY L. GREATHOUSE & PATRICIA A. GREATHOUSE Well number BARRY GREATHOUSE B BRK 1H

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	381	NEW	J-55/54.50#	259.5	Y
Coal	SEE SURFACE						
Intermediate 1	12.25	9.625	1629	NEW	J-55/36#		Y
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	16767	NEW	HCP-110/20#		Y
Tubing		2.875	6540	NEW	P-110/6.5#		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	474	15.60	1.20	568.8	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	660	15.60	1.20	792	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	3,140	15.60	1.19	3,736.6	SURFACE	24
Tubing							

Drillers TD (ft) 16,767 Loggers TD (ft) 16,767

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

Plug back procedure N/A

Kick off depth (ft) 5,172'

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 _____ RECEIVED
Office of Oil and Gas

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 _____ WV Department of Environmental Protection

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

API 47- 009 - 00269

Farm name BARRY L. GREATHOUSE & PATRICIA A. GREATHOUSE

Well number BARRY GREATHOUSE B BRK 1H

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					

Please insert additional pages as applicable.

API 47- 009 - 00269 Farm name BARRY L. GREATHOUSE & PATRICIA A. GREATHOUSE Well number BARRY GREATHOUSE B BRK 1H

PRODUCING FORMATION(S)	DEPTHS	
MARCELLUS	5,773'	TVD 6,380' MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface 925 psi Bottom Hole _____ psi DURATION OF TEST _____ hrs
 OPEN FLOW Gas 6,647 mcfpd Oil 1,248 bpd NGL _____ bpd Water 936 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	
	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 ROAD City THE WOODLANDS State TX Zip 77380
 Cementing Company SCHLUMBERGER 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 9/18/2019

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

Via Federal Express

September 18, 2019

State of West Virginia
Department of Environmental Protection
Office of Oil & Gas
601 57th Street
Charleston, WV 25304

RE: SWN Production Company, LLC
Operator ID: 494512924
Regulatory Filings: WR-34 and WR-35

To Whom It May Concern:

Please find enclosed forms WR-34 Discharge Monitoring Report and WR-35 Well Operator's Report of Well Work along with supporting documentation, for the wells listed below.

API	Well Name
47-051-02133	Yocum MSH 1H
47-051-02024	Yocum MSH 3H
47-051-02124	Yocum MSH 5H
47-051-02125	Yocum MSH 205H
47-009-00269	Barry Greathouse B BRK 1H
47-009-00233	Barry Greathouse B BRK 5H
47-069-00294	Roy Riggle OHI 3H
47-069-00296	Roy Riggle OHI 205H

If you have any questions or require additional information, please contact me via email at bobby_willis@swn.com or telephone at (832) 796-2884.

Sincerely,



Bobby Willis
Senior Regulatory Analyst
SW Appalachia Division

/bw
Encl.

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WV Department of
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SOUTHWESTERN ENERGY

Location: Brooke County, WV

Field: Brooke

Facility: Barry Greathouse B BRK Pad Wellbore: Barry Greathouse B BRK 1H PWB

Slot: Slot #1H

Well: Barry Greathouse B BRK 1H

Plot reference wellpath is Barry Greathouse B BRK 1H PWB Rev: B to Grid System: NAD83 / UTM Zone 17 North, US feet

True vertical depths are referenced to SDC 40 (KB)

Measured depths are referenced to SDC 40 (KB)

SDC 40 (KB) to Mean Sea Level: 1169.4 feet

Mean Sea Level to Ground level (At Slot: Slot #1H): -1143.4 feet

Coordinates are in feet referenced to Slot

Scale: True distance

North Reference: Grid north

Created by: atempen on 2019-04-03

Database: WA_MPL_EASTERNUS_Defn



Southwestern Energy

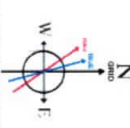


Baker Hughes a GE company

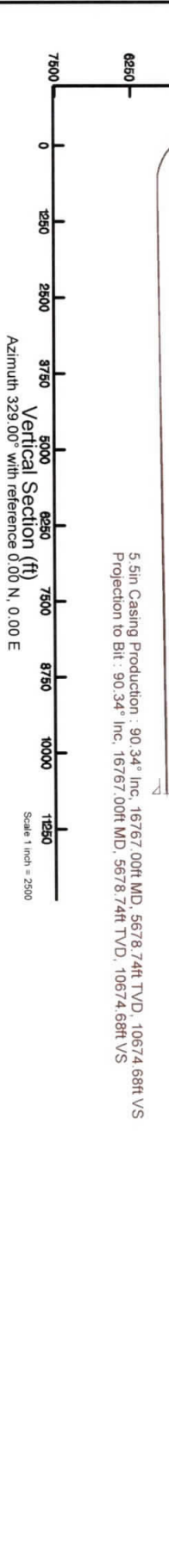
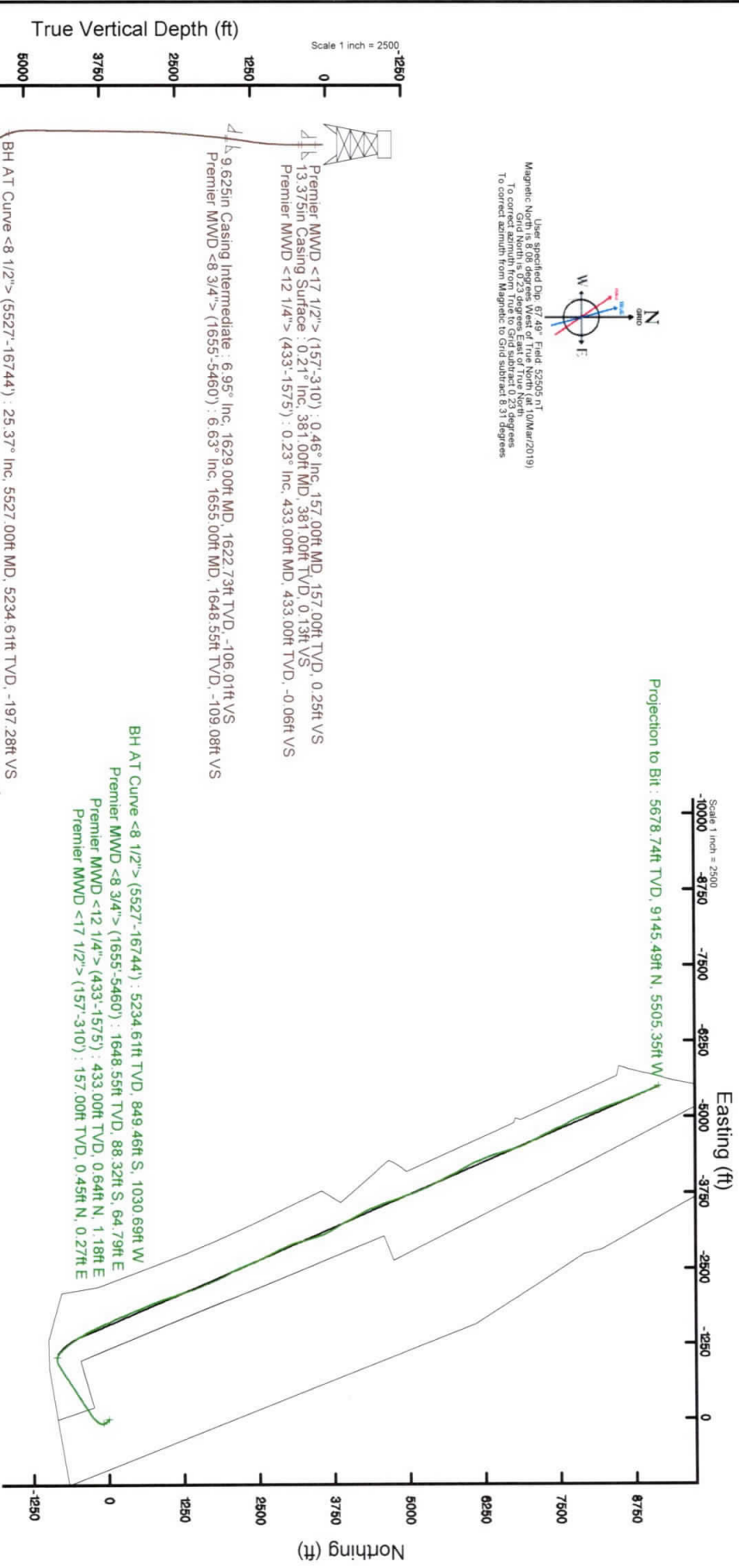
Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude
Barry Greathouse B BRK Pad	1740612.720	14595277.430	40°11'52.34"N
Local N (ft)	Local E (ft)	Grid East (US ft)	Longitude
11.50	7.97	1740620.688	80°38'28.355"W
Slot #1H		Grid North (US ft)	UTM Zone
SDC 40 (KB) to Ground level (At Slot: Slot #1H)		14595288.929	40°11'52.347"N
Mean Sea Level to Ground level (At Slot: Slot #1H)		26ft	80°38'28.355"W
SDC 40 (KB) to Mean Sea Level		-1143.4ft	UTM

Comments

API: 47-009-00289-0000
 BH Job #: 109709448
 Rig: SDC 40
 Duration: 03/15/2019 - 03/18/2019



Use specified Dip (67.48° Field: S2595 in 10M/2019)
 Magnetic North is 67.48 degrees East of True North
 Grid North is 67.23 degrees East of True North
 To correct Azimuth from True to Grid subtract 0.23 degrees
 To correct Azimuth from Magnetic to Grid subtract 0.23 degrees



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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	6/13/2019
Job End Date:	6/28/2019
State:	West Virginia
County:	Brooke
API Number:	47-009-00269-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Barry Greathouse B BRK 1H
Latitude:	40.18770000
Longitude:	-80.64120000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	5,736
Total Base Water Volume (gal):	18,013,874
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	87.62460	Density = 8.34
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.03182	



FSTI-CI-01	FSTI	Acid Corrosion Inhibitor		Listed Below			
FSTI-IC-001	FSTI	Iron Control Agent		Listed Below			
LEGEND(TM) LD-7750W	Multichem	Scale Control		Listed Below			
MC LD-2850	Multichem	Friction Reducer		Listed Below			
BE-9	Halliburton	Biocide		Listed Below			
Sand-Common White-100 Mesh, SSA-2	Halliburton	Proppant		Listed Below			
FSTI HCl	FSTI	Acid		Listed Below			
FR-A12	Halliburton	Additive		Listed Below			
OptiKleen-WF (TM)	Halliburton	Concentrate		Listed Below			

				Listed Below					
Sand-Premium White-40/70	Halliburton	Proppant		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		11.80132		
			Hydrochloric acid	7647-01-0	15.00000		0.07060		
			Hydrotreated light petroleum distillate	64742-47-8	30.00000		0.02251		
			Ethaniminium, N,N,N-trimethyl-2-[(1-oxo-2-propen-1-yl)oxy]-, chloride (1:1), polymer with 2-propenamide	69418-26-4	30.00000		0.02251		
			Sodium chloride	7647-14-5	10.00000		0.00791		
			Ammonium chloride	12125-02-9	10.00000		0.00750		
			Castor oil, ethoxylated	61791-12-6	10.00000		0.00750		
			Methanol	67-56-1	80.00000		0.00542		
			9-Octadecenamide, n,n-bis-2(hydroxy-ethyl)-(Z)	93-83-4	5.00000		0.00375		
			Alcohols, C12-16, ethoxylated	68551-12-2	5.00000		0.00375		
			Sorbitan monooleate polyoxyethylene derivative	9005-65-6	5.00000		0.00375		
			Sodium perborate tetrahydrate	10486-00-7	100.00000		0.00215		
			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000		0.00162		
			Acetic acid	64-19-7	60.00000		0.00141		
			Citric acid	77-92-9	40.00000		0.00094		
			Phosphoric Acid Salt	Proprietary	5.00000		0.00040		
			Formaldehyde	50-00-0	0.10000		0.00008		
			Sodium glycolate	2836-32-0	0.10000		0.00008		
			1,4-Dioxane	123-91-1	0.10000		0.00008		

BARRY GREATHOUSE B BRK 1H**ATTACHMENT 1****PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom M	# SHOTS PER S
1	6/3/2019	16,678	16,583	36
2	6/13/2019	16,548	16,441	42
3	6/14/2019	16,408	16,301	42
4	6/15/2019	16,268	16,161	42
5	6/15/2019	16,128	16,021	42
6	6/15/2019	15,988	15,881	42
7	6/15/2019	15,848	15,741	42
8	6/16/2019	15,708	15,601	42
9	6/16/2019	15,568	15,461	42
10	6/16/2019	15,428	15,321	42
11	6/16/2019	15,288	15,181	42
12	6/17/2019	15,148	15,041	42
13	6/17/2019	15,008	14,901	42
14	6/17/2019	14,868	14,761	42
15	6/17/2019	14,728	14,621	42
16	6/17/2019	14,588	14,481	42
17	6/18/2019	14,448	14,341	42
18	6/18/2019	14,308	14,201	42
19	6/3/2019	14,168	14,061	42
20	6/18/2019	14,028	13,921	42
21	6/19/2019	13,888	13,781	42
22	6/19/2019	13,748	13,641	42
23	6/19/2019	13,608	13,501	42
24	6/19/2019	13,468	13,361	42
25	6/20/2019	13,328	13,221	42
26	6/20/2019	13,188	13,081	42
27	6/20/2019	13,048	12,941	42
28	6/21/2019	12,908	12,801	42
29	6/21/2019	12,768	12,661	42
30	6/21/2019	12,628	12,521	42
31	6/21/2019	12,488	12,381	42
32	6/21/2019	12,348	12,241	42
33	6/22/2019	12,208	12,101	42
34	6/22/2019	12,068	11,961	42
35	6/22/2019	11,928	11,821	42
36	6/22/2019	11,788	11,681	42
37	6/22/2019	11,648	11,541	42
38	6/22/2019	11,508	11,401	42
39	6/23/2019	11,368	11,261	42
40	6/23/2019	11,228	11,121	42
41	6/23/2019	11,088	10,981	42
42	6/23/2019	10,948	10,841	42
43	6/23/2019	10,808	10,701	42

44	6/23/2019	10,668	10,561	42
45	6/24/2019	10,528	10,421	42
46	6/24/2019	10,388	10,281	42
47	6/24/2019	10,248	10,141	42
48	6/24/2019	10,108	10,001	42
49	6/24/2019	9,968	9,861	42
50	6/24/2019	9,828	9,721	42
51	6/25/2019	9,688	9,581	42
52	6/25/2019	9,548	9,441	42
53	6/25/2019	9,408	9,301	42
54	6/25/2019	9,268	9,161	42
55	6/25/2019	9,128	9,021	42
56	6/26/2019	8,988	8,881	42
57	6/26/2019	8,848	8,741	42
58	6/26/2019	8,708	8,601	42
59	6/26/2019	8,568	8,461	42
60	6/26/2019	8,428	8,321	42
61	6/26/2019	8,286	8,181	42
62	6/26/2019	8,148	8,041	42
63	6/27/2019	8,008	7,901	42
64	6/27/2019	7,868	7,761	42
65	6/27/2019	7,728	7,621	42
66	6/27/2019	7,588	7,485	42
67	6/28/2019	7,448	7,341	42
68	6/28/2019	7,308	7,201	42
69	6/28/2019	7,168	7,061	42
70	6/28/2019	7,028	6,921	42
71	6/28/2019	6,888	6,781	42
72	6/28/2019	6,748	6,641	42

**BARRY GREATHOUSE B BRK 1H
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	6/13/2019	89.6	8,136	8,806	3,268	278,650	8,153	0
2	6/13/2019	99.7	8,002	4,638	3,889	282,090	8,771	0
3	6/14/2019	100.5	8,140	5,061	3,890	279,470	8,542	0
4	6/14/2019	100.9	8,027	5,512	4,186	280,430	8,328	0
5	6/15/2019	100.3	7,826	5,137	4,085	279,800	8,552	0
6	6/15/2019	101.1	7,974	4,750	3,990	279,740	8,355	0
7	6/16/2019	98.2	7,861	4,741	3,961	281,050	8,245	0
8	6/16/2019	99.1	8,107	5,399	4,050	278,410	8,340	0
9	6/16/2019	99.2	7,898	5,067	4,234	279,670	9,453	0
10	6/16/2019	99.3	7,872	5,067	4,243	281,310	8,191	0
11	6/16/2019	99.3	7,724	5,032	4,173	281,750	7,453	0
12	6/17/2019	96.6	7,471	5,119	4,182	280,020	6,413	0
13	6/17/2019	98.7	7,297	4,963	4,257	279,950	6,196	0
14	6/17/2019	99.8	7,206	4,890	4,280	280,430	6,377	0
15	6/17/2019	99	7,561	5,144	4,189	306,130	6,057	0
16	6/18/2019	97.1	7,799	4,996	4,170	281,330	6,156	0
17	6/18/2019	98.2	7,690	5,248	4,121	280,445	6,022	0
18	6/18/2019	98	7,224	5,131	4,191	280,980	6,220	0
19	6/18/2019	102.4	7,687	5,250	4,300	281,560	6,260	0
20	6/19/2019	100.7	7,277	4,930	4,347	281,680	6,123	0
21	6/19/2019	97.8	7,115	5,068	4,031	279,802	6,162	0
22	6/19/2019	96.2	7,060	4,911	4,155	282,166	6,222	0
23	6/19/2019	98.4	7,134	4,792	4,257	281,730	6,085	0
24	6/20/2019	99.1	7,255	4,962	4,270	280,840	7,356	0
25	6/20/2019	99.4	7,037	4,760	4,157	279,760	6,052	0
26	6/20/2019	96.7	6,884	4,950	4,584	279,940	5,994	0
27	6/21/2019	99.5	7,013	4,878	4,216	280,910	6,162	0
28	6/21/2019	99.4	6,982	5,106	4,300	279,741	6,153	0
29	6/21/2019	99.2	7,012	5,064	6,147	279,632	6,147	0
30	6/21/2019	100.1	7,082	4,894	4,160	281,563	5,879	0
31	6/21/2019	99.3	7,011	5,127	3,947	281,754	5,958	0
32	6/21/2019	99.7	7,276	5,242	4,186	281,230	6,155	0
33	6/22/2019	99.8	7,324	4,967	4,227	284,140	6,177	0
34	6/22/2019	96.3	6,883	5,252	4,293	282,361	5,954	0
35	6/22/2019	98.7	6,847	4,794	4,299	281,156	6,012	0
36	6/22/2019	99.1	6,931	5,152	4,115	280,425	5,808	0
37	6/22/2019	97.7	7,075	5,167	4,308	280,930	6,182	0
38	6/22/2019	99.8	7,104	4,836	4,217	279,940	6,155	0
39	6/23/2019	99.6	7,014	5,086	4,154	279,450	6,044	0
40	6/23/2019	99.9	6,642	5,169	4,353	285,984	6,236	0
41	6/23/2019	98.6	6,694	5,243	4,297	280,884	5,842	0
42	6/23/2019	98.7	6,699	5,012	4,343	283,237	5,785	0
43	6/23/2019	94.6	6,595	5,250	4,214	282,750	5,821	0
44	6/23/2019	100	7,052	5,138	4,165	279,870	5,823	0
45	6/24/2019	99.9	6,945	4,996	4,210	279,280	5,883	0
46	6/24/2019	99.5	6,537	5,159	4,188	280,870	5,866	0
47	6/24/2019	99.9	6,584	5,081	4,302	281,260	5,808	0
48	6/24/2019	98.4	6,437	5,052	4,299	280,870	5,820	0
49	6/24/2019	100.1	6,689	5,061	4,168	270,650	5,205	0
50	6/25/2019	100.7	6,822	5,264	4,139	280,460	5,319	0
51	6/25/2019	99.6	6,792	5,191	4,135	281,370	5,412	0
52	6/25/2019	96.2	6,650	5,236	4,514	281,150	4,775	0
53	6/25/2019	98.5	6,288	5,156	4,531	280,700	4,647	0
54	6/25/2019	98.7	6,502	5,320	4,488	280,130	4,635	0
55	6/25/2019	96.4	6,434	5,221	4,370	280,320	4,625	0

56	6/26/2019	98.9	6,814	5,362	4,540	280,060	4,730	0
57	6/26/2019	95.5	6,266	5,292	4,255	280,560	4,940	0
58	6/26/2019	98	6,220	5,477	4,238	281,620	4,665	0
59	6/26/2019	99.4	6,160	5,411	4,180	281,893	5,449	0
60	6/26/2019	99.2	6,197	5,256	4,448	279,860	4,636	0
61	6/27/2019	99.9	6,231	4,995	4,215	280,910	4,662	0
62	6/27/2019	99.3	6,126	5,406	4,170	280,520	4,530	0
63	6/27/2019	99.4	6,011	5,431	4,356	280,980	4,493	0
64	6/27/2019	97.1	6,306	5,450	4,118	281,410	4,540	0
65	6/27/2019	97.3	7,305	5,384	4,331	280,350	4,759	0
66	6/27/2019	99.9	6,133	5,653	4,398	279,830	4,603	0
67	6/28/2019	97.3	6,006	5,485	4,344	279,860	4,431	0
68	6/28/2019	94.9	5,925	5,298	4,215	281,360	4,662	0
69	6/28/2019	94.3	6,155	5,477	4,464	280,040	4,463	0
70	6/28/2019	99.4	6,056	5,253	4,250	281,140	4,484	0
71	6/28/2019	98.2	6,203	5,307	4,215	280,140	4,451	0
72	6/28/2019	96.7	5,926	5,483	4,119	280,160	4,454	0



Well Name:

Barry Greathouse B BRK 1H

ATTACHMENT 3

47009002690000

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			281.00	281.00	
Top of Salt Water	405.00	405.00	NA	NA	
Pittsburgh Coal	294.00	294.00	NA	NA	
Pottsville (ss)	406.00	406.00	787.00	787.00	
Raven Cliff (ss)	787.00	787.00	1156.00	1156.00	
Maxton (ss)	1156.00	1156.00	1407.00	1407.00	
Big Injun (ss)	1407.00	1407.00	1886.00	1886.00	
Berea (siltstone)	1886.00	1886.00	5573.00	5276.00	
Rhinestreet (shale)	5573.00	5276.00	5849.00	5504.00	
Cashagua (shale)	5849.00	5504.00	5918.00	5552.00	
Middlesex (shale)	5918.00	5552.00	6017.00	5616.00	
Burket (shale)	6017.00	5616.00	6041.00	5631.00	
Tully (ls)	6041.00	5631.00	6139.00	5684.00	
Mahantango (shale)	6139.00	5684.00	6380.00	5773.00	
Marcellus (shale)	6380.00	5773.00	NA	NA	GAS

LATITUDE: 40°15'00" BOTTOM HOLE

10023'

LATITUDE: 40°12'30" SURFACE HOLE

4545'

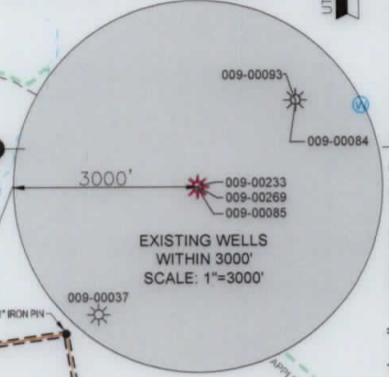
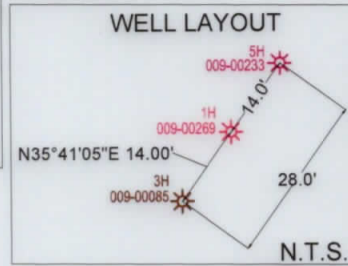
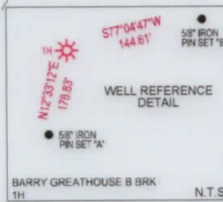


www.jhacompanies.com
68011 Vineyard Road
St. Clairsville, Ohio 43950
740-695-6100

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.

LINE	BEARING	DISTANCE
L1	S37°12'23"W	3073.52'
L2	S76°34'22"W	2259.62'



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

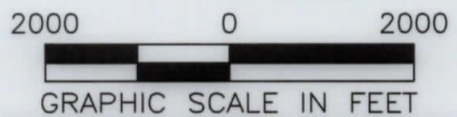
LONGITUDE: -80°37'30" SURFACE HOLE

LONGITUDE: -80°37'30" BOTTOM HOLE

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4448652.96 EASTING: 530542.25
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4448581.98 EASTING: 530087.52
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4451439.43 EASTING: 528864.87
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4448652.96 EASTING: 530542.25
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4448531.314 EASTING: 530119.220
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4451440.91 EASTING: 528867.32

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 B BRK

OPERATOR'S WELL #: 1H

API WELL #: 47 009 00269
STATE COUNTY PERMIT

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

WATERSHED: UPPER OHIO SOUTH ELEVATION: 1,142.8'

DISTRICT: BUFFALO COUNTY: BROOKE QUADRANGLE: TILTONSVILLE, OH-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: 5,798' TVD 16,767' TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC DESIGNATED AGENT: BRITTANY WOODY

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:	— SURVEYED BOUNDARY	REVISIONS:	DATE: 09-09-2019
⊙ EXISTING BOTTOM HOLE	===== LEASE BOUNDARY		API NO: 47-009-00269
⊙ EXISTING / PRODUCING WELLHEAD	— AS DRILLED PATH		DRAWN BY: D. REED
LPL ⊙ EXISTING LANDING POINT LOCATION	— PROPOSED PATH		SCALE: 1" = 2000'
⊙ PROPOSED SURFACE HOLE / BOTTOM HOLE	⊙ EXISTING WATER WELL		DRAWING NO: 2017-547
LPL ⊙ PROPOSED LANDING POINT LOCATION	⊙ EXISTING SPRING		WELL LOCATION PLAT

WELL BORE TABLE FOR SURFACE / ROYALTY OWNERS		
TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL
1	BARRY L. GREATHOUSE & PATRICIA A. GREATHOUSE (S) RAYLE COAL COMPANY (R)	03-B41-0082.0000
TRACT	SURFACE OWNER	TAX PARCEL
2	BARRY L. GREATHOUSE & PATRICIA ANN GREATHOUSE, JTWROS	03-B41-0083.0000
3	BARRY L. GREATHOUSE & PATRICIA ANN GREATHOUSE, JTWROS	03-B41-0032.0000
4	ROBERT J. MILLER, JR. & LINDA MILLER	03-B41-0047.0000
5	ROSEMARY KINDER MOORE	03-B41-0035.0000
6	DONNA MARIE PEREZ	03-B41-0037.0000
7	CNX LAND, LLC	03-B41-0005.0000
8	WINDSOR COAL COMPANY	03-B41-0007.0000
9	WEST PENN POWER COMPANY	01-BB41-0006.0000
10	WEST PENN POWER COMPANY	01-BB36-0028.0000
11	WEST PENN POWER COMPANY	01-BB36-0027.0000
12	WINDSOR COAL COMPANY	01-BB36-0026.0000
13	WINDSOR COAL COMPANY	01-BB36-0025.0000
14	ALLEGHENY ENERGY SUPPLY COMAPANY, LLC	01-BB36-0030.0000
15	BUSINESS DEVELOPMENT CORP OF THE NORTHERN PANHANDLE	01-BB36-0001.0000
16	BUSINESS DEVELOPMENT CORP OF THE NORTHERN PANHANDLE	01-BB36-0024.0000
17	BUSINESS DEVELOPMENT CORP OF THE NORTHERN PANHANDLE	01-BB36-0023.0000

ADJOINING OWNERS TABLE		
TRACT	SURFACE OWNER	TAX PARCEL
A	JAY GLEN COLLINS	03-B41-0080.0000
B	DALE T. WOOD & MARY R. WOOD	03-B41-0084.0000
C	DANNY GENE BRITT & VIRGINIA MARGARET BRITT	03-B46-0027.0000
D	BOARD OF COMM. OHIO COUNTY, WHG OHIO COUNTY AIRPORT AUTHORITY	04-R05-0010.0000
E	STACY ANN GREATHOUSE & PATRICIA ANN GREATHOUSE, JTWROS	03-B46-0041.0000
F	BARRY L. GREATHOUSE & PATRICIA A. GREATHOUSE	03-B46-0019.0000
G	BARRY L. GREATHOUSE & PATRICIA A. GREATHOUSE	03-B46-0018.0000
H	CHARLES BELL ESTATE	03-B41-0031.0000
I	ROSEMARY KINDER MOORE	03-B41-0030.0000
J	LAWRENCE MOORE & ROSEMARY MOORE	03-B41-0034.0000
K	LAWRENCE MOORE & ROSEMARY MOORE	03-B41-0033.0000
L	WINDSOR COAL COMPANY	03-B41-0021.0000
M	LAWRENCE MOORE & ROSEMARY MOORE	03-B41-0021.0001
N	WINDSOR COAL COMPANY	01-BB41-0005.0000
O	WINDSOR COAL COMPANY	01-BB41-0003.0000
P	WEST PENN POWER COMPANY	01-BB41-0017.0000
Q	WEST PENN POWER COMPANY	01-BB41-0016.0000
R	WEST PENN POWER COMPANY	01-BB41-0007.0000
S	WEST PENN POWER COMPANY	01-BB41-0014.0000
T	WEST PENN POWER COMPANY	01-BB41-0010.0000
U	OHIO POWER COMPANY GENERAL OFFICE ACCT DEPT	01-BB41-0001.0000
V	BUSINESS DEVELOPMENT CORP OF THE NORTHERN PANHANDLE	01-BB36-0002.0000
W	OHIO RIVER (STATE OF WEST VIRGINIA)	OHIO RIVER
X	BUSINESS DEVELOPMENT CORP OF THE NORTHERN PANHANDLE	01-B36K-0013.0000
Y	STATE ROUTE #2	RIGHT OF WAY
Z	RALPH PLANTS	01-BB36-0003.0000
AA	MARY LOUISE MCALLISTER	01-BB36-0021.0000
AB	BUSINESS DEVELOPMENT CORP OF THE NORTHERN PANHANDLE	03-BB36-0023.0001
AC	WINDSOR COAL COMPANY	03-BB36-0022.0000
AD	WINDSOR COAL COMPANY	01-B36-0091.0000
AE	WINDSOR COAL COMPANY	03-B41-0039.0000
AF	SYLVESTER KELLER & MARY KELLER	03-B41-0038.0000
AG	RAY PAUL NICOLAN	03-B41-0042.0000
AH	JOY ANN SCHUETZ & EBBIE J. SCHUETZ	03-B41-0046.0000
AI	FRED W. YOUNG JR.	03-B41-0054.0001
AJ	DOROTHY S. MOORE	03-B41-0054.0000
AK	KARL DOUGLAS STEPHENS	03-B41-0054.0002
AL	WILLIAM MILLER & DAWNA MILLER	03-B41-0061.0000
AM	FREDERICK C. HAYMAN JR. & STACY A. HAYMAN	03-B41-0083.0001
AN	MICHAEL A. WOLEN & LINDA S. WOLEN	03-B41-0036.0000
AO	WEST PENN POWER COMPANY	01-BB41-0009.0000

REVISIONS:

COMPANY:

SWN
Production Company, LLC

SWN 
Production Company™

OPERATOR'S BARRY GREATHOUSE B BRK
WELL #: 1H

DATE: 09-09-2019
API NO: 47-009-00269
DRAWN BY: D. REED
SCALE: N/A
DRAWING NO: 2017-547
WELL LOCATION PLAT

DISTRICT: BUFFALO COUNTY: BROOKE STATE: WV

PROPERTY NUMBER 2501166099
PAD ID 3001156743