

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

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JUN 9 2017

WV Department of
Environmental Protection

API 47 - 009 - 00168 County BROOKE District BUFFALO
Quad STEBENVILLE EAST & BETHANY Pad Name BROOKE COUNTY PARKS-BRK-1H Field/Pool Name PANHANDLE FIELD
Farm name BROOKE CO. PARK COMMISSION Well Number BROOKE COUNTY PARKS BRK 10H
Operator (as registered with the OOG) SWN PRODUCTION COMPANY, LLC
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,456,758.133 Easting 538,454.654
Landing Point of Curve Northing 4,456,656.503 Easting 538,723.912
Bottom Hole Northing 4,454,485.470 Easting 539,464.501

Elevation (ft) 1206' 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 12/10/2015 Date drilling commenced 11/6/2016 Date drilling ceased 11/17/2016
Date completion activities began 03/04/2017 Date completion activities ceased 04/03/2017
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 250' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1126' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 316' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

APPROVED

NAME: Eric Beard
DATE: 11-8-17

Reviewed by: _____
01/05/2018

API 47-009 - 00168 Farm name BROOKE CO. PARK COMMISSION Well number BROOKE COUNTY PARKS BRK 10H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/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	369	NEW	H-40/48#		Y; 22 BBLs RETURNED
Coal	SURFACE						
Intermediate 1	12.25	9.625	1682	NEW	J-55/36#		Y; 23 BBLs RETURNED
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	14040	NEW	HCP-110/20#		Y
Tubing		2.375	6261	NEW	L-80/4.7#		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	150	17.0		150	SURFACE	24
Surface	CLASS A	380	15.60	1.20	456	SURFACE	8
Coal	SURFACE						
Intermediate 1	CLASS A	650	15.60	1.20	780	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	856/1686	15.60	1.23/1.19	1052.88/2006.34	SURFACE	24
Tubing							

Drillers TD (ft) 14,040' Loggers TD (ft) 14,040'
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure _____

Kick off depth (ft) 5,371'

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 _____
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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____
 WV Department of Environmental Protection

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

Well Name:

BROOKE COUNTY PARKS BRK 10H

47009001680000

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	N/A	N/A	250.00	250.00	
Top of Salt Water	1126.00	1126.00	N/A	N/A	
Pittsburgh Coal	316.00	316.00	321.00	321.00	
Big Injun (ss)	1425.00	1424.95	1632.00	1631.93	
Berea (siltstone)	1976.00	1975.89	5446.81	5373.35	
Rhinestreet (shale)	5446.81	5373.35	5711.67	5616.77	
Cashaqua (shale)	5711.67	5616.77	5782.18	5675.09	
Middlesex (shale)	5782.18	5675.09	5855.56	5731.00	
Burket (shale)	5855.56	5731.00	5881.25	5748.70	
Tully (ls)	5881.25	5748.70	5968.60	5804.97	
Mahantango (shale)	5968.60	5804.97	6305.30	5937.58	
Marcellus (shale)	6305.30	5937.58	N/A	N/A	GAS

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BROOKE COUNTY PARKS BRK 10H
PERF SUMMARY

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	3/4/2017	13,737	13,931	42
2	3/4/2017	13,481	13,675	42
3	3/4/2017	13,225	13,419	42
4	3/5/2017	12,969	13,163	42
5	3/5/2017	12,713	12,907	42
6	3/5/2017	12,457	12,651	42
7	3/5/2017	12,201	12,395	42
8	3/5/2017	11,945	12,139	43
9	3/7/2017	11,689	11,883	42
10	3/7/2017	11,433	11,627	42
11	3/8/2017	11,177	11,371	42
12	3/8/2017	10,921	11,115	42
13	3/8/2017	10,665	10,859	42
14	3/9/2017	10,409	10,603	42
15	3/9/2017	10,153	10,347	42
16	3/9/2017	9,897	10,091	42
17	3/9/2017	9,641	9,835	42
18	3/10/2017	9,385	9,579	31
19	3/10/2017	9,129	9,323	42
20	3/17/2017	8,873	9,067	42
21	3/17/2017	8,617	8,811	42
22	3/17/2017	8,361	8,555	42
23	3/17/2017	8,105	8,299	42
24	3/17/2017	7,849	8,043	42
25	3/17/2017	7,593	7,787	42
26	3/18/2017	7,337	7,531	42
27	3/18/2017	7,081	7,275	42
28	3/18/2017	6,825	7,019	42
29	3/18/2017	6,569	6,763	42
30	3/18/2017	6,313	6,507	42

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BROOKE COUNTY PARKS BRK 10H
FRAC STAGE SUMMARY

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	3/4/2017	100	7,591	7,974	3,933	499,120	8,316	
2	3/4/2017	98	7,555	8,215	4,279	500,020	8,088	
3	3/4/2017	98	8,114	8,373	4,412	500,040	7,295	
4	3/5/2017	98	7,499	7,849	4,307	500,000	7,333	
5	3/5/2017	98	7,878	8,902	4,034	500,220	7,324	
6	3/5/2017	98	8,110	8,525	4,524	500,240	7,303	
7	3/5/2017	98	7,655	7,962	4,372	500,220	7,249	
8	3/5/2017	100	7,701	8,107	4,116	470,920	7,005	
9	3/7/2017	98	7,306	8,700	4,247	492,200	7,154	
10	3/7/2017	96	7,428	7,999	4,513	499,820	7,147	
11	3/8/2017	99	7,520	7,889	4,227	500,400	7,330	
12	3/8/2017	98	7,191	8,007	4,431	500,020	7,123	
13	3/8/2017	99	7,151	7,447	4,208	499,860	7,064	
14	3/9/2017	98	6,941	7,513	4,520	500,400	6,930	
15	3/9/2017	95	7,132	7,631	4,628	495,600	6,991	
16	3/9/2017	96	7,056	8,307	4,610	500,400	6,930	
17	3/9/2017	93	6,517	7,374	4,098	331,900	7,318	
18	3/10/2017	95	6,955	7,206	4,346	501,100	6,901	
19	3/10/2017	96	6,696	7,110	4,517	501,780	6,915	
20	3/17/2017	95	7,173	8,558	4,352	494,300	6,901	
21	3/17/2017	100	7,149	7,771	4,306	510,340	6,776	
22	3/17/2017	99	7,099	8,100	4,524	502,060	6,773	
23	3/17/2017	96	6,779	7,385	4,510	499,840	6,791	
24	3/17/2017	95	6,673	6,981	4,510	504,930	6,811	
25	3/17/2017	94	6,970	7,585	4,270	501,680	6,693	
26	3/18/2017	99	6,995	7,446	4,177	500,480	6,716	
27	3/18/2017	100	6,951	7,775	4,313	498,900	6,702	
28	3/18/2017	96	7,040	8,175	4,102	510,440	6,671	
29	3/18/2017	100	6,788	8,880	4,238	503,760	6,606	
30	3/18/2017	99	6,499	7,238	4,116	498,560	6,648	

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Hydraulic Fracturing Fluid Product Component Information Disclosure

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Job Start Date:	3/4/2017
Job End Date:	3/18/2017
State:	West Virginia
County:	Brooke
API Number:	47-009-00168-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	BROOKE COUNTY PARKS BRK 10H
Latitude:	40.26040300
Longitude:	-80.54777700
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,069
Total Base Water Volume (gal):	8,818,884
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Southwestern Energy	Carrier/Base Fluid	Water	7732-18-5	100.00000	82.14497	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	16.55146	
HCL Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.40000	1.00034	
			Hydrogen Chloride	7647-01-0	17.50000	0.23258	
WFRA-2000	U.S. Well Services, LLC	Friction Reducer	Water	7732-18-5	60.00000	0.03659	
			2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.01829	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01500	
AI-303	U.S. Well Services, LLC	Acid Corrosion Inhibitors	Ethylene glycol	107-21-1	40.00000	0.00033	
			Cinnamaldehyde	104-55-2	20.00000	0.00012	
			Formic acid	64-18-6	20.00000	0.00012	

			Butyl cellosolve	111-76-2	20.00000	0.00010
			Polyether	60828-78-6	10.00000	0.00006
			Acetophenone, thiourea, formaldehyde polymer	68527-49-1	5.00000	0.00003
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.						

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

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

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

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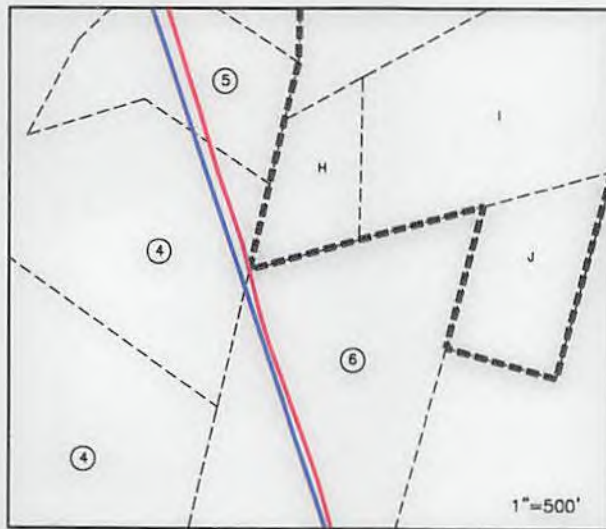
JUN 9 2017

WV Department of
Environmental Protection

THRASHER

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

TRACT	ADJOINER	PARCEL
A	COUNTY COURT OF BROOKE COUNTY	05-03-B34-0049-0000
B	JOHN PAUL POTTER, PENNY POTTER SUAVE, JAY M POTTER II	05-03-B33-0108-0000
C	JOHN G. RADVANSKY & BARBARA J RADVANSKY	05-03-B33-0109-0000
D	GEORGE GIPALO & RHONDA GIPALO	05-03-B33-0110-0000
E	GEORGE GIPALO & RHONDA GIPALO	05-03-B33-0114-0001
F	COUNTY COURT OF BROOKE COUNTY	05-03-B33-0113-0000
G	KEITH SMITH & KATHY SMITH	05-03-B33-0026-0000
H	KEITH SMITH & KATHY SMITH	05-03-B33-0025-0000
I	KEITH SMITH & KATHY SMITH	05-03-B28-0045-0000
J	KEITH R SMITH & KATHY J SMITH	05-03-B28-0063-0000
K	DAVID L. RAGAN	05-03-B28-0062-0000
L	DAVID L. RAGAN	05-03-B28-0059-0000
M	WILLOW SPRINGS INC	05-03-B28-0058-0000
N	WILLIAM CURTIS HUNT & SUSAN L HUNT	05-03-B28-0057-0001
O	DELORES JEANNE BUYAN, SARAH LYNN LYCANS STENGER, JUDITH LEE BRINKLEY	05-03-B28-0066-0000
P	NANCY J AMBROSE	05-03-B29E-0001-0000
Q	NANCY J AMBROSE	05-03-B29J-0007-0000
R	DAVID RAGAN	05-03-B29J-0024-0000
S	CARMAN FANASE	05-03-B29J-0025-0000
T	JAMES L & LAURA INMAN	05-03-B29-0014-0000
U	BRIAN E & JENNIFER B PLANTS	05-03-B34-0001-0000
V	MARK OWEN WEAVER & VIRGINIA BEALL KREUTZ	05-03-B34-0016-0001
W	DENZIL & MARY LOU CONLEY	05-03-B34-0016-0002
X	MARLENE K. HUKILL	05-03-B34-0016-0005
Y	JOHN C WALES & BARBARA A WALES	05-03-B34-0001-0001
Z	BRIAN SMITH	05-03-B34-0016-0004
AA	PHOENIX-GREENLAWN PARTNERS	05-03-B34-0010-0002
BB	STARVAGGI INDUSTRIES INC.	05-03-B34-0007-0000
CC	STARVAGGI INDUSTRIES INC.	05-03-B34-0010-0000
DD	RUSSELL D HERVEY	05-03-B34-0011-0000
EE	STARVAGGI INDUSTRIES INC.	05-03-B34-0014-0000
FF	STARVAGGI INDUSTRIES INC.	05-03-B34-0015-0000
GG	BERNARD J KNORR III & NICOLE C KNORR	05-03-B34-0018-0000
HH	RUBY FAYE KNORR & BERNARD JOHN KNORR JR	05-03-B34-0019-0000
II	BERNARD J KNORR JR & RUBY F KNORR	05-03-B34-0048-0000



01/05/2018

COMPANY:
SWN **SWN** ^{RE-V+}
Production Company, LLC Production Company™

REVISIONS:	DATE:
	05-11-2017
	SHEET 2 OF 3
	DRAWN BY: K. POTH
	SCALE: 1" = 2000'
	DRAWING NO: 050-5525
	WELL LOCATION PLAT