

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

API 47 - 009 - 00234 County BROOKE District BUFFALO  
Quad BETHANY Pad Name THOMAS PARKINSON BRK PAD Field/Pool Name PANHANDLE FIELD WET  
Farm name BETHANY COLLEGE Well Number THOMAS PARKINSON 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 4451464.47 Easting 537090.91  
Landing Point of Curve Northing 4451467.69 Easting 536980.08  
Bottom Hole Northing 4453924.04 Easting 536121.52

Elevation (ft) 1,160.4 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 2/2/2018 Date drilling commenced 2/16/2018 Date drilling ceased 3/23/2018  
Date completion activities began 5/12/2018 Date completion activities ceased 7/9/2018  
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft 401 Open mine(s) (Y/N) depths \_\_\_\_\_  
Salt water depth(s) ft 813 Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 347 Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

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Reviewed  
*[Signature]* 1-17-19

Reviewed by:  
931-17-19

API 47- 009 - 00234 Farm name BETHANY COLLEGE Well number THOMAS PARKINSON 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	481	NEW	J-54.50/48#	296.2, 337.5	Y, 10
Coal	SEE SURFACE						
Intermediate 1	12.25	9.625	1737	NEW	J-55/36#		Y, 26
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	14950	NEW	HCP-110/20#		Y
Tubing		2.375	6174	NEW	HCP-110/4.7#		N
Packer type and depth set							

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

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	GROUT TO SURFACE				SURFACE	24
Surface	CLASS A	490	15.60	1.20	588	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	659	15.60	1.18	777.62	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	2,748	15.60	1.90	5221.2	SURFACE	24
Tubing							

Drillers TD (ft) 14,950 Loggers TD (ft) 14,950  
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5,412

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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PRODUCING FORMATION(S)	DEPTHS		
<u>MARCELLUS</u>	<u>5,987</u>	<u>TVD</u>	<u>6,183</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 2418 psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs

OPEN FLOW Gas 4,828 mcfpd Oil 526 bpd NGL \_\_\_\_\_ bpd Water 338 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

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

Please insert additional pages as applicable.

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

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

Cementing Company BJ SERVICES  
Address 2228 PHILIPPI PIKE City CLARKSBURG State WV Zip 26309

Stimulating Company US WELL SERVICES  
Address 770 S. POST OAK LN #405 City HOUSTON State TX Zip 77056

Please insert additional pages as applicable.

Completed by BOBBY WJLIS Telephone 832-796-2884  
Signature [Signature] Title REGULATORY ANALYST Date 10/5/2018

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





# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/12/2018
Job End Date:	6/3/2018
State:	West Virginia
County:	Brooke
API Number:	47-009-00234-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Thomas Parkinson BRK 1H
Latitude:	40.21277402
Longitude:	-80.56411996
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	5,973
Total Base Water Volume (gal):	10,161,104
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	82.31025	
Sand	J.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	16.62566	
HCL Acid (12.6%-17.5%)	J.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.40000	0.78154	
			Hydrogen Chloride	7647-01-0	17.50000	0.18171	
WFRA-2000	J.S. Well Services, LLC	Friction Reducer	Water	7732-18-5	60.00000	0.04187	
			2-Propenoic acid, polymer with 2 propenamides	9003-06-9	30.00000	0.02093	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01717	
BIOC11219A	Nalco Champion	Anti-Bacterial Agent	Methanol	64-17-5	60.00000	0.00886	
			Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00563	
			Glutaraldehyde	111-30-8	10.00000	0.00188	

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SCAL16486A	Nalco Champion	Scale Inhibitor				
			Ethylene Glycol	107-21-1	30.00000	0.00163
			Amine Triphosphate	Proprietary	30.00000	0.00146
AI-303	J.S. Well Services, LLC	Acid Corrosion Inhibitors				
			Ethylene glycol	107-21-1	40.00000	0.00036
			Cinnamaldehyde	104-55-2	20.00000	0.00013
			Formic acid	64-18-6	20.00000	0.00013
			Butyl cellosolve	111-76-2	20.00000	0.00012
			Polyether	60828-78-6	10.00000	0.00006
			Acetophenone, thiourea, formaldehyde polymer	68527-49-1	5.00000	0.00003
LT FLUSH SYSTEM I	J.S. Well Services, LLC	Other				
			Mineral oil, petroleum distillates, hydrotreated light naphthenic	64742-53-6	100.00000	0.00051
AP One	J.S. Well Services, LLC	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00008

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)



**THOMAS PARKINSON BRK 1H**  
**ATTACHMENT 1**  
**PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	7/4/2018	14,866	14,769	33
2	5/15/2018	14,734	14,627	42
3	5/16/2018	14,594	14,487	42
4	5/17/2018	14,454	14,347	42
5	5/17/2018	14,314	14,207	42
6	5/17/2018	14,174	14,067	42
7	5/18/2018	14,034	13,927	42
8	5/18/2018	13,894	13,787	42
9	5/18/2018	13,759	13,647	42
10	5/19/2018	13,614	13,510	42
11	5/19/2018	13,474	13,367	42
12	5/19/2018	13,334	13,227	42
13	5/20/2018	13,194	13,087	42
14	5/20/2018	13,054	12,947	42
15	5/20/2018	12,914	12,807	42
16	5/21/2018	12,774	12,667	42
17	5/21/2018	12,634	12,527	42
18	5/22/2018	12,494	12,387	42
19	5/22/2018	12,354	12,247	42
20	5/23/2018	12,214	12,107	42
21	5/23/2018	12,074	11,967	42
22	5/24/2018	11,934	11,827	42
23	5/24/2018	11,794	11,687	42
24	5/24/2018	11,654	11,547	42
25	5/24/2018	11,514	11,407	42
26	5/25/2018	11,374	11,267	42
27	5/25/2018	11,234	11,127	42
28	5/26/2018	11,094	10,987	42
29	5/26/2018	10,954	10,847	42
30	5/26/2018	10,814	10,707	42
31	5/27/2018	10,674	10,567	42
32	5/27/2018	10,534	10,427	42
33	5/27/2018	10,394	10,287	42
34	5/28/2018	10,254	10,147	42
35	5/28/2018	10,114	10,007	42
36	5/28/2018	9,974	9,867	42
37	5/28/2018	9,834	9,727	42
38	5/29/2018	9,694	9,587	42
39	5/29/2018	9,554	9,447	42
40	5/29/2018	9,414	9,307	42
41	5/29/2018	9,274	9,167	42
42	5/30/2018	9,134	9,027	42
43	5/30/2018	8,994	8,887	42

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PERF REPORT

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
44	5/30/2018	8,854	8,747	42
45	5/31/2018	8,714	8,607	42
46	5/31/2018	8,574	8,467	42
47	5/31/2018	8,434	8,323	42
48	5/31/2018	8,294	8,187	42
49	6/1/2018	8,154	8,047	42
50	6/1/2018	8,014	7,907	42
51	6/1/2018	7,874	7,767	42
52	6/1/2018	7,734	7,627	42
53	6/1/2018	7,594	7,487	42
54	6/1/2018	7,454	7,347	42
55	6/1/2018	7,314	7,207	42
56	6/2/2018	7,174	7,067	42
57	6/2/2018	7,034	6,927	42
58	6/2/2018	6,894	6,787	42
59	6/2/2018	6,747	6,647	42
60	6/2/2018	6,614	6,507	42
61	6/2/2018	6,474	6,367	42
62	6/2/2018	6,334	6,227	42

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THOMAS PARKINSON BRK 1H

ATTACHMENT 2

STIM REPORT

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment	Max Breakdown	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/othe
1	5/12/2018	41	8,643	8,414	6,069	13,840	6,023	0
2	5/15/2018	86	7,552	5,449	4,177	281,080	5,960	0
3	5/16/2018	91	7,276	5,865	4,504	281,000	4,670	0
4	5/17/2018	88	6,883	4,993	4,615	278,460	4,974	0
5	5/17/2018	88	7,246	5,889	4,429	279,630	5,349	0
6	5/17/2018	91	7,296	7,625	4,794	279,560	4,332	0
7	5/18/2018	90	7,369	5,996	4,430	280,860	4,728	0
8	5/18/2018	90	7,627	5,396	4,346	280,420	4,401	0
9	5/19/2018	89	7,358	5,398	4,469	281,340	4,267	0
10	5/19/2018	89	7,660	5,530	4,457	281,080	4,680	0
11	5/19/2018	88	7,391	6,066	4,503	280,250	4,703	0
12	5/20/2018	86	7,343	5,301	4,518	282,720	4,133	0
13	5/20/2018	89	7,260	6,207	4,457	280,330	4,545	0
14	5/20/2018	88	7,216	5,968	4,510	280,940	4,605	0
15	5/21/2018	86	7,001	5,834	4,538	279,900	4,746	0
16	5/21/2018	88	7,267	5,931	4,677	280,710	4,960	0
17	5/21/2018	88	7,293	8,354	4,171	280,050	4,632	0
18	5/22/2018	87	7,261	8,243	4,337	280,130	3,954	0
19	5/22/2018	90	7,139	5,981	4,630	280,220	4,158	0
20	5/23/2018	90	6,999	5,856	4,433	279,990	4,503	0
21	5/23/2018	87	7,269	5,913	4,483	280,050	4,018	0
22	5/24/2018	87	7,472	6,130	4,386	279,950	3,912	0
23	5/24/2018	87	6,864	6,342	4,523	280,200	4,176	0
24	5/24/2018	88	7,379	5,207	4,911	279,890	4,002	0
25	5/25/2018	88	6,955	5,566	4,706	280,420	3,870	0
26	5/25/2018	87	6,862	6,040	4,799	279,040	3,847	0
27	5/25/2018	86	7,312	5,709	4,470	280,330	3,881	0
28	5/26/2018	86	7,424	5,901	4,881	280,370	3,767	0
29	5/26/2018	87	6,664	5,529	4,389	280,760	3,767	0
30	5/27/2018	86.5	7,033	5,547	4,872	279,970	3,744	0
31	5/27/2018	85.7	6,778	6,479	4,863	280,090	3,629	0
32	5/27/2018	87	6,954	6,349	4,752	280,540	3,593	0
33	5/27/2018	86.4	6,801	5,418	4,901	280,060	3,654	0
34	5/28/2018	88.2	7,227	5,280	4,625	280,190	3,644	0
35	5/28/2018	86.6	7,092	5,746	4,661	281,080	3,550	0
36	5/28/2018	87.1	6,786	5,598	4,679	279,610	3,577	0
37	5/29/2018	90.2	7,267	5,648	4,457	281,760	3,595	0
38	5/29/2018	88.1	6,493	6,146	4,695	280,450	3,519	0
39	5/29/2018	69.7	6,977	6,019	4,646	280,600	3,499	0
40	5/29/2018	89.3	6,925	6,012	4,778	280,570	3,305	0
41	5/29/2018	87.6	6,774	5,553	4,633	280,840	3,503	0
42	5/30/2018	86.8	6,852	5,698	4,922	281,150	3,574	0
43	5/30/2018	89.1	6,755	6,275	4,841	280,780	3,756	0
44	5/31/2018	89.5	6,928	5,755	4,779	280,600	3,564	0
45	5/31/2018	87.8	7,104	6,359	4,482	280,420	3,554	0
46	5/31/2018	87.3	6,995	6,290	4,950	280,410	3,508	0
47	5/31/2018	89.5	6,385	5,626	4,078	280,170	3,493	0
48	5/31/2018	89.6	6,522	5,670	5,069	281,110	3,478	0
49	6/1/2018	89.8	6,451	5,985	4,750	281,520	3,485	0
50	6/1/2018	90.6	6,565	5,761	4,516	281,030	3,809	0
51	6/1/2018	88	6,907	7,536	4,988	281,030	3,313	0
52	6/1/2018	91.1	6,490	5,715	4,422	280,600	3,292	0
53	6/1/2018	85.8	8,174	5,693	4,599	279,400	3,759	0

**THOMAS PARKINSON BRK 1H  
ATTACHMENT 2  
STIM REPORT**

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment	Max Breakdown	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/othe
54	6/1/2018	88.9	6,276	5,990	5,091	279,200	3,408	0
55	6/2/2018	88.9	6,602	6,004	4,935	280,060	3,403	0
56	6/2/2018	88.1	6,424	6,190	4,925	280,210	3,330	0
57	6/2/2018	91.2	6,088	4,711	4,663	281,160	3,235	0
58	6/2/2018	93.5	6,323	6,007	4,450	281,800	3,154	0
59	6/2/2018	89.4	6,235	5,465	4,459	281,420	3,122	0
60	6/2/2018	89	6,224	6,137	5,020	281,150	3,355	0
61	6/2/2018	90.7	6,198	5,801	4,128	281,190	3,300	0
62	6/3/2018	87.9	6,281	5,857	4,700	272,550	3,299	0

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Well Name:

Thomas Parkinson BRK 1H

47009002340000

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	401.00	401.00	
Top of Salt Water	813.00	813.00	NA	NA	
Pittsburgh Coal	339.00	339.00	347.00	347.00	
Maxton (ss)	1170.00	1170.00	1536.00	1536.00	
Big Injun (ss)	1536.00	1536.00	2009.00	2009.00	
Berea (siltstone)	2009.00	2009.00	5563.00	5530.00	
Rhinestreet (shale)	5563.00	5530.00	5718.00	5677.00	
Cashaqua (shale)	5718.00	5677.00	5779.00	5734.00	
Middlesex (shale)	5779.00	5734.00	5856.00	5799.00	
Burket (shale)	5856.00	5799.00	5872.00	5813.00	
Tully (ls)	5872.00	5813.00	5942.00	5865.00	
Mahantango (shale)	5942.00	5865.00	6183.00	5987.00	
Marcellus (shale)	6183.00	5987.00	NA	NA	GAS

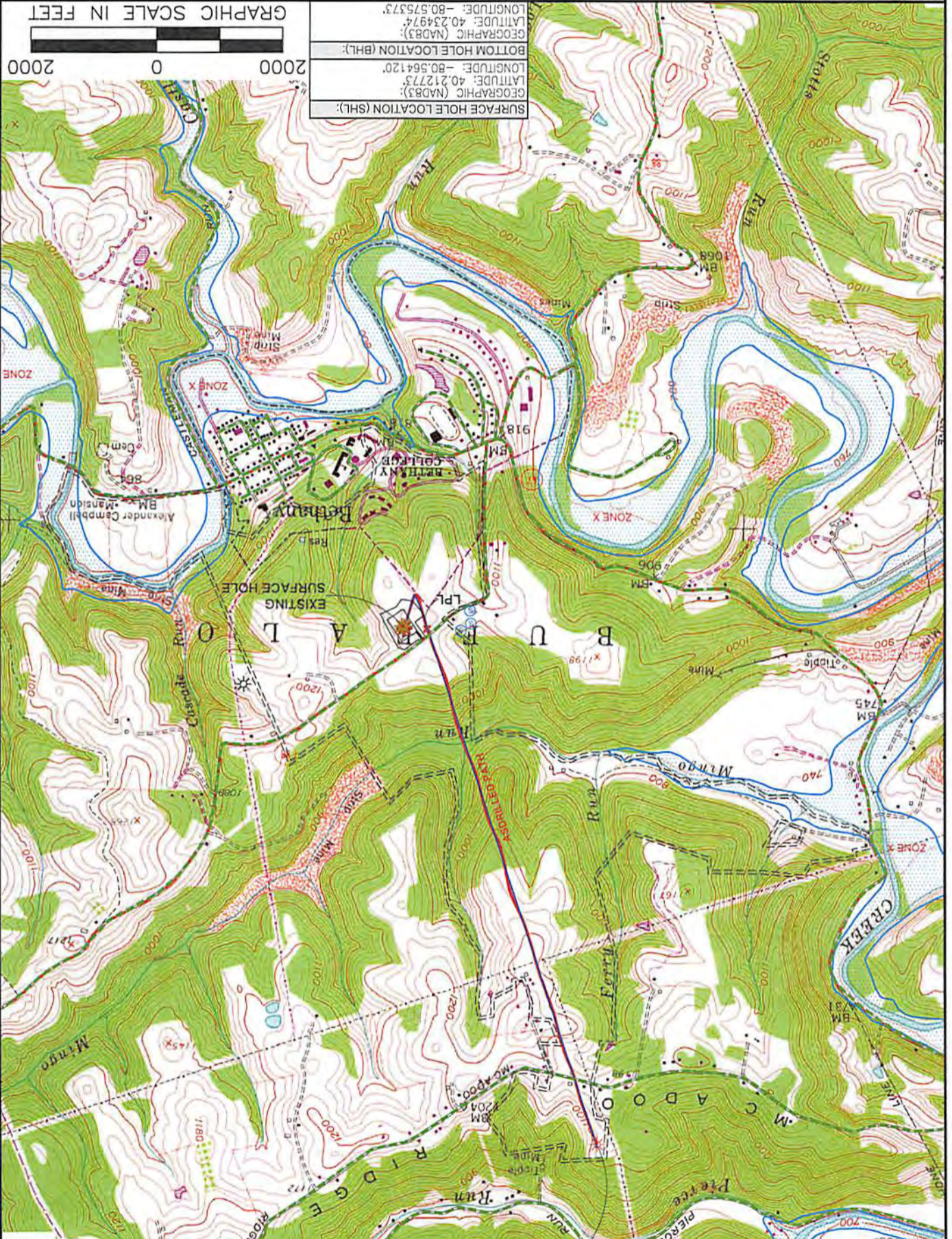
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GRID NORTH  
UTM, NAD83 DATUM, ZONE 17, US FT



**SURFACE HOLE LOCATION (SHL):**  
 GEOGRAPHIC (NAD83):  
 LATITUDE: 40.212773  
 LONGITUDE: -80.564120

**BOTTOM HOLE LOCATION (BHL):**  
 GEOGRAPHIC (NAD83):  
 LATITUDE: 40.234974  
 LONGITUDE: -80.575373

- LEGEND:**
- NATURAL WATERWAY
  - ACCESS ROAD
  - PUBLIC ROAD
  - PROPOSED SURFACE HOLE / BOTTOM HOLE
  - EXISTING / PRODUCING WELLHEAD
  - LANDING POINT LOCATION
  - FLOOD PLAN
  - ASDRILLED PATH
  - PROPOSED PATH
  - ASRILLED PATH

- NOTES ON SURVEY:**
1. 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.
  2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
  3. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

<b>WELL OPERATOR:</b> SWN PRODUCTION COMPANY, LLC		<b>WELL (FARM) NAME:</b> THOMAS PARKINSON BRK		<b>WELL #</b>	<b>SERIAL #</b>
<b>ADDRESS:</b> P.O. BOX 1300 JANE LEW, WV 26378		<b>COUNTY:</b> BROOKE	<b>CODE:</b> 009	<b>DISTRICT:</b> BUFFALO	<b>USGS 7 1/2 QUADRANGLE MAP NAME:</b> BETHANY, WV
<b>SURFACE OWNER:</b> BETHANY COLLEGE		<b>COMPLETION ID 2501165582</b> PAD ID 3001165582			

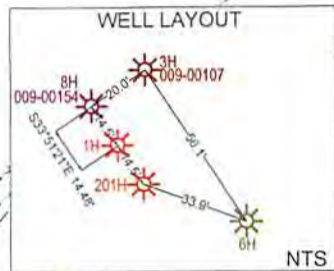
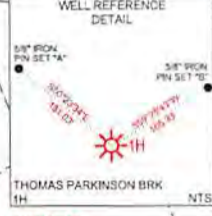
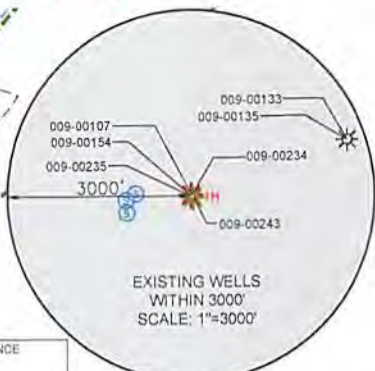
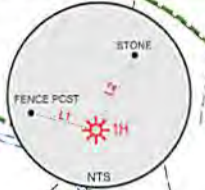


LATITUDE: 40°15'00" SURFACE HOLE ← 6273'

LATITUDE: 40°15'00" BOTTOM HOLE ← 9412'

**JHA** SURVEYORS  
ENGINEERS  
ENVIRONMENTAL  
GIS MAPPING  
www.jhacompanies.com  
68011 Vineyard Road  
St. Clairsville, Ohio 43950  
740-695-6100

LINE	BEARING	DISTANCE
L1	S75°53'30"E	945.14'
L2	S29°07'23"W	1811.59'



**SURFACE HOLE LOCATION (SHL):**  
UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4451492.32  
EASTING: 537084.44

**LANDING POINT LOCATION (LPL):**  
UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4451473.20  
EASTING: 536976.13

**BOTTOM HOLE LOCATION (BHL):**  
UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4453940.26  
EASTING: 536122.10

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

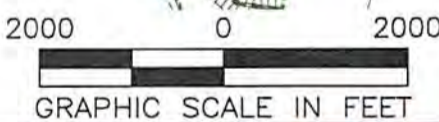
**SURFACE HOLE LOCATION (SHL):**  
UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4451464.47  
EASTING: 537090.91

**LANDING POINT LOCATION (LPL):**  
UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4451467.69  
EASTING: 536980.08

**BOTTOM HOLE LOCATION (BHL):**  
UTM (NAD83, ZONE 17, METERS):  
NORTHING: 4453924.04  
EASTING: 536121.52

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 *[Signature]* 9/28/18



COMPANY: **SWN** Production Company, LLC

(+) 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 SURVEY SOURCE OF GRADE GPS ELEVATION: (NAVD 88, US FT)

THOMAS PARKINSON BRK  
OPERATOR'S WELL #: 1H

API WELL #: 47 009 00234  
STATE COUNTY PERMIT

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

WATERSHED: UPPER OHIO SOUTH ELEVATION: 1,160.4'

DISTRICT: BUFFALO COUNTY: BROOKE QUADRANGLE: BETHANY, WV

SURFACE OWNER: BETHANY COLLEGE ACREAGE: ±822.26

OIL & GAS ROYALTY OWNER: BETHANY COLLEGE, A CORPORATION, F/A THE TRUSTEES OF BETHANY COLLEGE, F/A THE TRUSTEES OF BETHANY COLLEGE, A CORPORATION ACREAGE: ±822.26

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: 6,010' TVD 14,950.0' TMD

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

ADDRESS: P.O. BOX 1300 ADDRESS: P.O. BOX 1300

CITY: JANE LEW STATE: WV ZIP CODE: 26378 CITY: JANE LEW STATE: WV ZIP CODE: 26378

- LEGEND:**
- PROPOSED SURFACE HOLE / BOTTOM HOLE
  - ⊙ EXISTING / PRODUCING WELLHEAD
  - LPL\* LANDING POINT LOCATION
  - ⊙ EXISTING WATER WELL
  - ⊙ EXISTING SPRING
  - PUBLIC ROAD
  - NATURAL WATERWAY
  - SURVEYED BOUNDARY
  - LEASE BOUNDARY
  - AS-DRILLED PATH
  - PROPOSED PATH

**REVISIONS:**

NO.	DATE	DESCRIPTION
	09-28-2018	

DATE: 09-28-2018

DRAWN BY: D. REED

SCALE: 1" = 2000'

DRAWING NO: 2018-675

WELL LOCATION PLAT

RECEIVED  
Office of Oil and Gas  
OCT - 9 2018  
WV Department of Environmental Protection

LONGITUDE: 80°32'30" SURFACE HOLE ← 13567'

LONGITUDE: 80°32'30" BOTTOM HOLE ← 5478'







LATITUDE: 40°15'00" SURFACE HOLE ← 6273'

LATITUDE: 40°15'00" BOTTOM HOLE ← 9412'



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

LINE	BEARING	DISTANCE
L1	S75°33'30"E	945.14'
L2	S29°07'23"W	1811.38'



<b>SURFACE HOLE LOCATION (SHL):</b>
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4451492.32
EASTING: 537084.44
<b>LANDING POINT LOCATION (LPL):</b>
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4451473.20
EASTING: 536976.13
<b>BOTTOM HOLE LOCATION (BHL):</b>
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4453940.26
EASTING: 536122.10

- 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.
  8. THIS AS-DRILLED PLAT IS PREPARED FROM THE FINAL WELL PLAT PREPARED BY ANOTHER CONSULTANT AND THE DRILLING INFORMATION IS PROVIDED TO JHA.

<b>SURFACE HOLE LOCATION (SHL):</b>
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4451464.47
EASTING: 537090.91
<b>LANDING POINT LOCATION (LPL):</b>
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4451467.69
EASTING: 536980.08
<b>BOTTOM HOLE LOCATION (BHL):</b>
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4453924.04
EASTING: 536121.52

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 SURVEY SOURCE OF GRADE GPS ELEVATION: (NAVD 88, US FT)

COMPANY: **SWN** Production Company, LLC

THOMAS PARKINSON BRK  
OPERATOR'S WELL #: 1H  
API WELL #: 47 009 00234  
STATE COUNTY PERMIT

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

WATERSHED: UPPER OHIO SOUTH  
DISTRICT: BUFFALO COUNTY: BROOKE  
SURFACE OWNER: BETHANY COLLEGE  
OIL & GAS ROYALTY OWNER: BETHANY COLLEGE, A CORPORATION, F/A THE TRUSTEES OF BETHANY COLLEGE, F/A THE TRUSTEES OF BETHANY COLLEGE, A CORPORATION

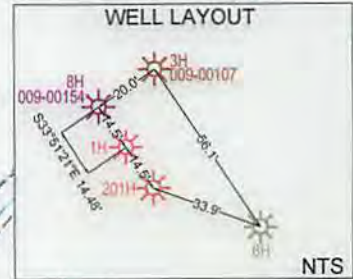
DRILL  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION

CONVERT  PLUG & ABANDON  CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY) AS-DRILLED  
TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 5,910' TVD 14,950.0' TMD

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

DESIGNATED AGENT: BRITTANY WOODY  
ADDRESS: P.O. BOX 1300  
CITY: JANE LEW STATE: WV ZIP CODE: 26378

<b>LEGEND:</b>	<ul style="list-style-type: none"> <li>○ PROPOSED SURFACE HOLE / BOTTOM HOLE</li> <li>⊛ EXISTING / PRODUCING WELLHEAD</li> <li>LPL ⊛ LANDING POINT LOCATION</li> <li>⊙ EXISTING WATER WELL</li> <li>⊕ EXISTING SPRING</li> <li>— PUBLIC ROAD</li> <li>— NATURAL WATERWAY</li> <li>— SURVEYED BOUNDARY</li> <li>== LEASE BOUNDARY</li> <li>— AS-DRILLED PATH</li> <li>— PROPOSED PATH</li> </ul>	<b>REVISIONS:</b> DATE: 09-28-2018 DRAWN BY: D. REED SCALE: 1" = 2000' DRAWING NO: 2018-675 WELL LOCATION PLAT
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EXISTING SURFACE HOLE

EXISTING BOTTOM HOLE



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

LONGITUDE: 80°32'30" BOTTOM HOLE

LONGITUDE: 80°32'30" SURFACE HOLE

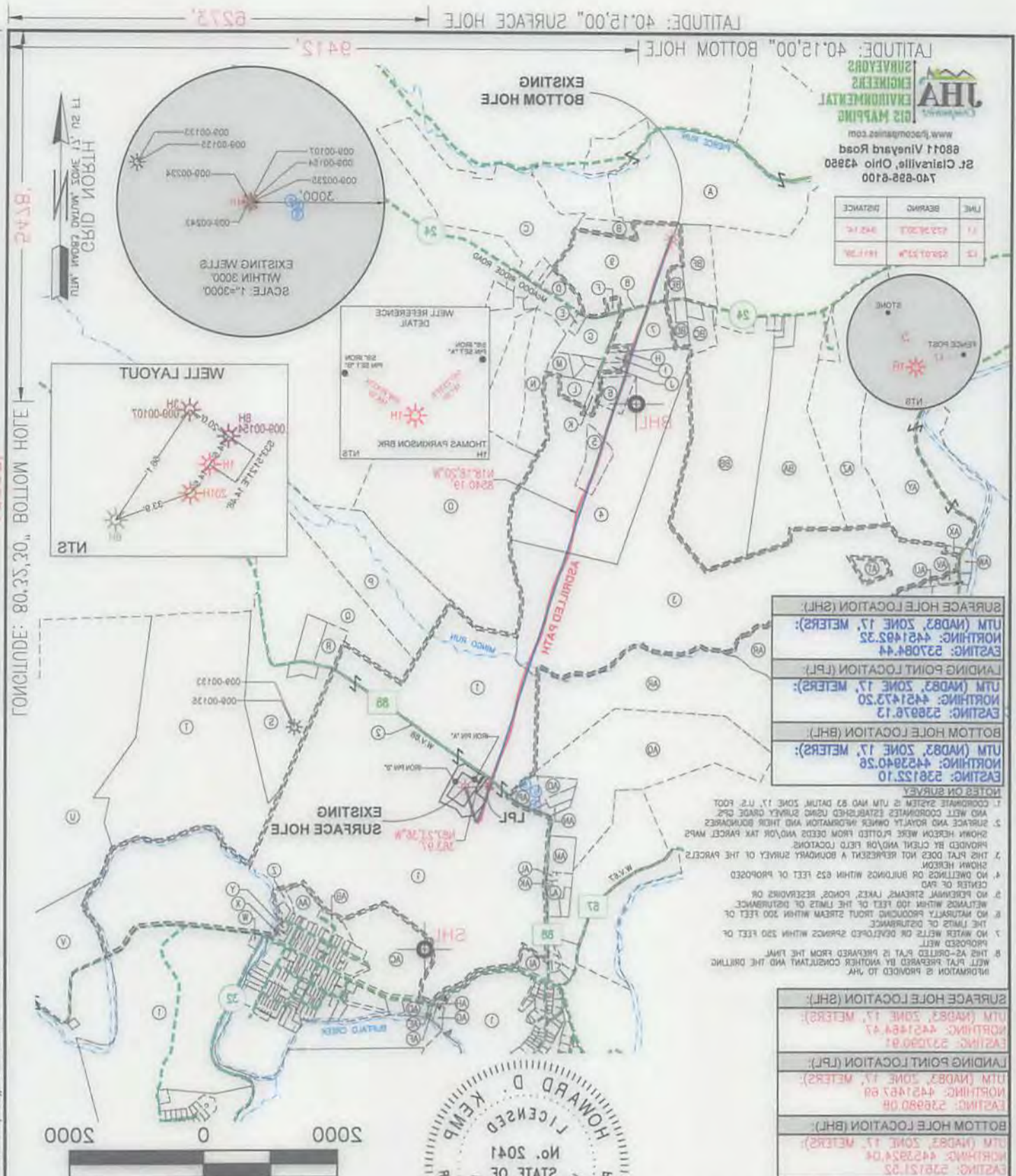
5478'

13567'



**JHA**  
SURVEYORS  
ENGINEERS  
ENVIRONMENTAL  
GIS MAPPING  
www.jhacommunity.com  
8801 Vineyard Road  
St. Clairsville, Ohio 43980  
740-888-6100

LINE	BEARING	DISTANCE
11	S72°30'07"	342.14'
12	S25°07'27"W	181.17W



**NOTES ON SURVEY:**

1. COORDINATE SYSTEM IS UTM AND 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS AND WELL LOCATION INFORMATION AND THEIR BOUNDARIES.
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 652 FEET OF PROPOSED CENTERS OF P.W.S.
5. NO PERMANENT STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LINES OF DISTURBANCE.
6. NO NATURALLY OCCURRING TROUT STREAM WITHIN 200 FEET OF THE LINES OF DISTURBANCE.
7. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 200 FEET OF PROPOSED WELL.
8. THIS AS-DRIILLED PLAT IS PREPARED FROM THE FINAL WELL PLAT PREPARED BY ANOTHER CONSULTANT AND THE DRILLING INFORMATION IS PROVIDED TO HIM.

Well Location	UTM (NAD83, Zone 17, Meters)	NORTHING	EASTING
BOTTOM HOLE LOCATION (BHL)	UTM (NAD83, Zone 17, Meters):	NORTHING: 4423840.28	EASTING: 528122.10
LANDING POINT LOCATION (LPL)	UTM (NAD83, Zone 17, Meters):	NORTHING: 4421473.20	EASTING: 528278.17
SURFACE HOLE LOCATION (SHL)	UTM (NAD83, Zone 17, Meters):	NORTHING: 4421482.32	EASTING: 527084.44



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.2. 2041

**SWN**  
Production Company, LLC  
Production Company

<b>WELL OPERATOR:</b> SWN PRODUCTION COMPANY, LLC <b>ADDRESS:</b> P.O. BOX 1300 <b>CITY:</b> JANE LEW STATE: WV ZIP CODE: 26378	<b>DESIGNATED AGENT:</b> BRITTANY WOODY <b>ADDRESS:</b> P.O. BOX 1300 <b>CITY:</b> JANE LEW STATE: WV ZIP CODE: 26378
<b>WELL TYPE:</b> OIL <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/> PRODUCTION <input checked="" type="checkbox"/> DEEP <input type="checkbox"/> GAS <input checked="" type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/>	<b>WATERSHED:</b> UPPER OHIO SOUTH <b>DISTRICT:</b> BUFFALO <b>SURFACE OWNER:</b> BETHANY COLLEGE <b>COUNTY:</b> BROOKE
<b>CONVERT</b> <input type="checkbox"/> <b>PLUG &amp; ABANDON</b> <input type="checkbox"/> <b>CLEAN OUT &amp; REPLUG</b> <input type="checkbox"/> <b>OTHER CHANGE</b> <input checked="" type="checkbox"/> (SPECIFY) <b>AS-DRIILLED</b> <b>ESTIMATED DEPTH:</b> 6010' TVD TO 9250' TMD	<b>DRILL</b> <input type="checkbox"/> <b>DRILL DEEPER</b> <input type="checkbox"/> <b>REDRILL</b> <input type="checkbox"/> <b>FRACURE OR STIMULATE</b> <input type="checkbox"/> <b>PLUG OFF OLD FORMATION</b> <input type="checkbox"/> <b>PERFORATE NEW FORMATION</b> <input checked="" type="checkbox"/>
<b>API WELL #:</b> 47 <b>STATE:</b> COUNTY PERMIT <b>OPERATOR'S WELL #:</b> 1H <b>THOMAS PARKINSON BRK</b>	<b>UNITED STATES TOPOGRAPHIC MAPS</b> <b>ACCURACY:</b> 1/300 <b>PROVEN SURVEY</b> <b>SOURCE OF GRADE GPS</b> <b>ELEVATION:</b> (NAD 88, US FT)
<b>LEGEND:</b> ○ EXISTING SPRING ● EXISTING WATER WELL * L.P.L. LANDING POINT LOCATION * EXISTING \ PRODUCING WELLS ○ PROPOSED SURFACE HOLE \ BOTTOM HOLE --- NATURAL WATERWAY --- PUBLIC ROAD	<b>REVISIONS:</b> DRAWN BY: D. REED SCALE: 1" = 2000' DRAWING NO: 2018-625 WELLS LOCATION PLAT







WELL LOCATION PLAT  
DRAWING NO: 2018-028  
SCALE: N/A  
DRAWN BY: D. REED  
DATE: 09-28-2018

WELL #: THOMAS PARKINSON BRK 1H  
DISTRICT: BUFFALO COUNTY: BROOKE STATE: WY  
OPERATOR'S: COMPANY: SWN Production Company, LLC  
DATE: 09-28-2018

REVISIONS:


TRACT	SURFACE OWNER	TAX PARCEL
BF	GREG & REGINA SOLMAN	03-833-0088.0000
BE	LAWRENCE PAUL SMITH, SR. & PATRICIA SHERON	03-833-0070.0000
BD	TYLER N. BROWN	03-833-0067.0000
BC	TODD H. & SHARON E. JACKSON	03-833-0065.0000
BB	MARY JANE JACKSON	03-833-0060.0000
BA	JOHN PRATHER GOOD, JR. IRREVOCABLE TRUST	03-838-0001.0000
AZ	MARSH LIVING TRUST	03-832-0118.0000
AY	RICHARD ROGERS, CHERI SHARR, EDWARD O'BYER & ET AL	03-837-0048.0000
AX	CLEO KLAGES	03-837-0025.0000
AW	WILLIAM E. & HAZEL E. JOHNSTON	03-837-0023.0001
AV	LAWRENCE PAUL SMITH, SR.	03-837-0024.0000
AU	MARLIN G., SR. & JOY H. CRAWFORD	03-837-0025.0000
AT	MARLIN G., SR. & JOY H. CRAWFORD	03-837-0023.0002
AS	JOHN E. & SHERILL J. RIPLEY	03-837-0082.0000
AR	MELVIN E. PELUCHETTE	03-837-0087.0000
AQ	ALLEN JOHNSON & CHARLES WARREN, ET AL	03-838-0026.0000
AP	DAVID G. OWENS & LINDA WALTERS	03-838-0025.0000
AO	DAVID G. OWENS & LINDA WALTERS	03-838-0023.0000
AN	DAVID G. OWENS & LINDA WALTERS	03-838-0022.0000
AM	RUTH GERMON, JEFFREY WOY, SUE MOORE, PATRICIA WEST & SARA WOY	03-838-0027.0000
AL	DENNIS & DERRYLLE RUSCHELL	03-843-0001.0000
AK	DENNIS & DERRYLLE RUSCHELL	03-843-0002.0000
AJ	DANNY M. & SANDRA J. HOLLADAY	03-843-0003.0000
AI	JOHN HUFF HEIRS	03-8438-0004.0000
AH	MITCHELL DONALD STEVEN	03-8437-0083.0000
AG	WILLIAM MITCHELL HEIRS	03-8438-0025.0000
AF	GEORGE SONNEWALD, JR.	03-8437-0081.0000
AE	GEORGE SONNEWALD, JR.	03-8437-0082.0000
AD	TRAVIS C. & GREGORY B. STRAUB	03-8437-0084.0000
AC	BETHANY COLLEGE	01-8438-0028.0000
AB	BETHANY COLLEGE	02-8430-0001.0000
AA	BETHANY COLLEGE	02-8430-0002.0000
AZ	BETHANY COLLEGE	02-8430-0003.0000
Y	BARBARA J. CHAMBERS	02-8430-0026.0000
X	JAMES & KATHLEEN KEGGAN	02-8430-0027.0000
W	RICHARD FRANCIS CORBY	03-843-0027.0000
V	GENE CHARLES VALENTINE TRUST	03-843-0028.0000
U	MARK W. OWEN & VIRGINIA BEALL KRUTZ	03-838-0024.0000
T	KIMBERLY CARMAN WORTHLEY	03-838-0025.0000
S	KIMBERLY CARMAN WORTHLEY	03-838-0027.0000
R	CHARLES F. & DONNA BROWN	03-838-0020.0000
Q	JEFFREY W. HENSLEER	03-838-0027.0001
P	JEFFREY W. HENSLEER	03-838-0028.0000
O	MARK A. & GEORGIA M. FEDAK	03-838-0014.0000
N	JOHN H., JR. & STEPHANIE PROELLOCHS; KEVIN & JODY RAY	03-838-0015.0000
M	ALAN J. & BETH B. KLEIN	03-838-0008.0001
L	ALAN J. & BETH B. KLEIN	03-838-0008.0000
K	JOHN H., SR. & MARGY J. PROELLOCHS	03-838-0007.0002
J	NORMAN K. BOWMAN	03-838-0004.0000
I	SCOTT A., III & LINDSEY LAW	03-838-0003.0000
H	SCOTT A., III & LINDSEY LAW	03-838-0028.0000
G	KEVIN & JODY RAY	03-833-0023.0000
F	ALBERT ROBERT STRICKLER	03-833-0023.0000
E	BRIAN P. & PATRICIA A. SANDRIDGE	03-833-0024.0000
D	KEVIN P. & GERRI L. KOPKO	03-833-0042.0001
C	MICHAEL JAMES & JENNIFER LYNN YANO	03-833-0043.0000
B	MELVIN E. PELUCHETTE	03-833-0023.0000
A	STARVAGGI INDUSTRIES, INC.	03-833-0024.0000

TRACT	SURFACE OWNER	TAX PARCEL
9	DEBRA KAY PELAEZ	03-833-0021.0000
8	WY DOT, DIVISION OF HIGHWAYS	MCADDO RIDGE RD
7	RICARDO PACHECO, A SINGLE MAN	03-833-0088.0001
6	KEVIN & JODIE RAY	03-838-0008.0000
5	JOHN H. PROELLOCHS, JR.	03-838-0007.0001
4	JOHN H., JR. & STEPHANIE PROELLOCHS; KEVIN & JODIE RAY	03-838-0007.0000
3	STARVAGGI INDUSTRIES, INC	03-837-0023.0000
2	WY DOT, DIVISION OF HIGHWAYS	BEALL'S RIDGE RD
1	BETHANY COLLEGE (S) \ BETHANY COLLEGE, A CORPORATION, FKA THE TRUSTEES OF BETHANY COLLEGE, FKA THE TRUSTEES OF BETHANY COLLEGE, A CORPORATION (R)	03-838-0021.0000

ADJOINING OWNERS TABLE

WELL BORE TABLE FOR SURFACE \ ROYALTY OWNERS