

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

API 47-069-00239 County OHIO District LIBERTY
Quad VALLEY GROVE Pad Name OCC A OHI PAD Field/Pool Name PANHANDLE
Farm name BOARD OF COMMISSIONERS OF OHIO COUNTY Well Number OCC A OHI 5H
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 4,436,654.44 Easting 534,271.52
Landing Point of Curve Northing 4,437,070.46 Easting 534,339.76
Bottom Hole Northing 4,439,252.05 Easting 533,391.44

Elevation (ft) 1095.8 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 10/24/2017 Date drilling commenced 04/03/2018 Date drilling ceased 05/03/2018
Date completion activities began 09/22/2018 Date completion activities ceased 11/15/2018
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 432' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 586' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 500' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: _____

Reviewed
C. J. Hill 4-3-19

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WR-35
Rev. 8/23/13

API 47-069 - 00239 Farm name BOARD OF COMMISSIONERS OF OHIO COUNTY Well number OCC A OHI 5H

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	540'	NEW	J-55/54.50#		Y, 37 BBLS
Coal	SEE SURFACE						
Intermediate 1	12.25	9.625	1,858'	NEW	J-55/36#		Y, 35 BBLS
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	14,585'	NEW	HCP-110/20#		Y
Tubing		2.375	6,621'	NEW	P-110/4.7#		N
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	GROUT TO SURFACE				SURFACE	24
Surface	CLASS A	482	15.60	1.20	578.4	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	705	15.60	1.19	838.95	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	2,684	15.60	1.19	3,193.96	SURFACE	24
Tubing							

Drillers TD (ft) 14,585' Loggers TD (ft) 14,585'
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5,684'

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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ATTACHMENT 1
PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	9/6/2018	14,495	14,395	36
2	9/24/2018	14,360	14,250	42
3	9/24/2018	14,216	14,106	42
4	9/25/2018	14,072	13,962	42
5	9/26/2018	13,928	13,820	42
6	9/27/2018	13,784	13,674	42
7	9/27/2018	13,640	13,530	42
8	9/28/2018	13,496	13,389	42
9	9/28/2018	13,352	13,242	42
10	9/29/2018	13,208	13,098	42
11	9/30/2018	13,064	12,959	42
12	9/30/2018	12,920	12,810	42
13	10/1/2018	12,776	12,666	42
14	10/2/2018	12,632	12,522	42
15	10/2/2018	12,492	12,378	42
16	10/3/2018	12,344	12,234	42
17	10/4/2018	12,200	12,090	42
18	10/5/2018	12,056	11,946	42
19	10/6/2018	11,912	11,802	42
20	10/7/2018	11,768	11,658	42
21	10/7/2018	11,624	11,514	42
22	10/8/2018	11,480	11,370	42
23	10/8/2018	11,336	11,226	42
24	10/9/2018	11,192	11,082	42
25	10/9/2018	11,048	10,938	42
26	10/10/2018	10,904	10,794	42
27	10/10/2018	10,760	10,650	42
28	10/11/2018	10,616	10,506	42
29	10/12/2018	10,472	10,362	42
30	10/12/2018	10,328	10,218	42
31	10/13/2018	10,184	10,074	42
32	10/13/2018	10,040	9,930	42
33	10/14/2018	9,896	9,786	42
34	10/14/2018	9,752	9,642	42
35	10/15/2018	9,608	9,498	42
36	10/15/2018	9,464	9,354	42
37	10/16/2018	9,320	9,210	42
38	10/17/2018	9,176	9,062	42
39	10/17/2018	9,032	8,922	42
40	10/18/2018	8,888	8,778	42
41	10/18/2018	8,744	8,638	42
42	10/18/2018	8,600	8,490	42

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STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
43	10/19/2018	8,456	8,346	42
44	10/19/2018	8,312	8,205	42
45	10/19/2018	8,168	8,058	42
46	10/21/2018	8,024	7,914	42
47	10/22/2018	7,880	7,770	42
48	10/22/2018	7,736	7,626	42
49	10/23/2018	7,592	7,482	42
50	10/24/2018	7,448	7,339	42
51	10/25/2018	7,304	7,194	42
52	10/26/2018	7,160	7,050	42
53	10/27/2018	7,016	6,906	42
54	10/28/2018	6,872	6,764	42
55	10/28/2018	6,728	6,618	42

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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/other
1	9/22/2018	76	7,650	6,854	4,535	282,572	6,378	0
2	9/24/2018	92	7,650	4,852	4,643	278,790	4,932	0
3	9/25/2018	91	8,350	7,214	4,862	278,856	5,624	0
4	9/25/2018	93	8,103	6,199	4,700	290,380	4,531	0
5	9/24/2018	95	8,150	8,645	4,570	282,150	4,738	0
6	9/27/2018	91	8,050	8,875	4,860	282,065	4,795	0
7	9/28/2018	91	8,481	6,450	4,793	275,880	4,007	0
8	9/28/2018	94	8,101	5,742	4,707	284,350	3,869	0
9	9/29/2018	95	8,230	5,224	4,042	279,710	3,770	0
10	9/29/2018	97	8,045	5,793	4,821	288,020	3,641	0
11	10/1/2018	96	8,250	5,345	4,707	289,080	3,655	0
12	10/1/2018	100	8,332	3,552	4,701	287,140	3,674	0
13	10/2/2018	98	9,327	4,758	4,214	279,407	3,601	0
14	10/2/2018	98	7,995	5,782	4,475	282,240	3,185	0
15	10/3/2018	90	7,767	5,762	4,103	273,670	4,795	0
16	10/4/2018	90	7,532	5,475	4,141	281,800	3,914	0
17	10/5/2018	92	7,524	5,682	4,877	278,700	4,251	0
18	10/6/2018	97	7,321	6,142	4,562	282,680	4,932	0
19	10/6/2018	94	7,231	5,974	4,469	271,460	8,179	0
20	10/7/2018	98	7,645	5,824	4,681	270,240	4,004	0
21	10/8/2018	100	7,645	5,722	5,120	270,400	3,568	0
22	10/8/2018	99	7,245	5,920	4,782	281,780	4,306	0
23	10/9/2018	96	7,345	5,346	4,521	281,140	4,317	0
24	10/9/2018	98	7,422	6,240	4,936	281,600	4,606	0
25	10/10/2018	93	7,711	6,123	4,572	282,480	3,738	0
26	10/10/2018	97	7,772	5,665	4,856	279,720	3,994	0
27	10/11/2018	72	7,989	5,893	5,037	284,380	4,643	0
28	10/11/2018	98	7,493	5,587	4,512	280,100	5,129	0
29	10/12/2018	100	7,512	5,402	5,204	287,720	4,112	0
30	10/13/2018	93	7,744	4,952	4,767	276,580	3,664	0
31	10/13/2018	95	7,356	4,841	4,852	280,860	3,140	0
32	10/14/2018	100	7,703	6,005	5,152	300,860	3,156	0
33	10/14/2018	99	7,561	5,227	4,421	279,580	2,951	0
34	10/15/2018	98	7,828	4,305	4,889	290,900	3,197	0
35	10/15/2018	99	7,593	5,289	4,712	280,340	3,225	0
36	10/16/2018	97	7,581	5,468	4,410	283,380	3,120	0
37	10/17/2018	98	7,688	4,528	4,915	290,160	3,678	0
38	10/17/2018	96	7,432	5,625	4,734	282,980	3,215	0
39	10/18/2018	99	8,672	4,125	4,847	284,820	3,382	0
40	10/18/2018	99	8,672	5,450	5,392	276,160	3,603	0
41	10/18/2018	98	7,985	5,625	5,188	273,380	3,677	0
42	10/18/2018	98	7,650	5,830	5,460	269,130	3,151	0
43	10/19/2018	96	7,650	5,361	5,114	274,290	3,174	0
44	10/19/2018	99	7,350	4,782	5,066	266,250	3,086	0
45	10/19/2018	98	7,175	5,657	4,686	286,380	3,145	0
46	10/21/2018	99	7,389	5,879	4,317	269,470	3,346	0
47	10/22/2018	99	7,432	5,037	4,935	24,163	3,257	0
48	10/23/2018	98	7,432	5,007	4,610	279,920	3,424	0
49	10/24/2018	98	7,275	4,879	4,733	285,420	3,488	0
50	10/25/2018	90	7,600	4,707	4,736	273,790	3,399	0
51	10/26/2018	98	7,350	5,705	4,970	282,700	3,208	0
52	10/26/2018	99	7,050	6,324	4,879	281,630	2,798	0
53	10/28/2018	97	7,250	6,408	4,803	283,140	2,935	0

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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	10/28/2018	98	7,005	5,752	4,856	265,260	2,696	0
55	10/29/2018	99	6,900	6,145	5,045	284,720	2,395	0

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Attachment 3

47069002390000

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Well Name:

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	432.00	432.00	
Top of Salt Water	586.00	586.00	NA	NA	
Pittsburgh Coal	500.00	500.00	608.00	608.00	
Pottsville (ss)	608.00	608.00	928.00	928.00	
Raven Cliff (ss)	928.00	928.00	1342.00	1342.00	
Maxton (ss)	1342.00	1342.00	1649.00	1644.00	
Big Injun (ss)	1649.00	1644.00	2167.00	2161.00	
Berea (siltstone)	2167.00	2161.00	5730.00	5619.00	
Rhinstreet (shale)	5730.00	5619.00	6028.00	5885.00	
Cashaqua (shale)	6028.00	5885.00	6104.00	5950.00	
Middlesex (shale)	6104.00	5950.00	6194.00	6025.00	
Burket (shale)	6194.00	6025.00	6216.00	6043.00	
Tully (ls)	6216.00	6043.00	6268.00	6081.00	
Mahantango (shale)	6268.00	6081.00	6515.00	6204.00	
Marcellus (shale)	6515.00	6204.00	NA	NA	GAS

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/22/2018
Job End Date:	10/29/2018
State:	West Virginia
County:	Ohio
API Number:	47-069-00239-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	OCC A OHI 5
Latitude:	40.07946400
Longitude:	-80.59803878
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,179
Total Base Water Volume (gal):	8,761,116
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

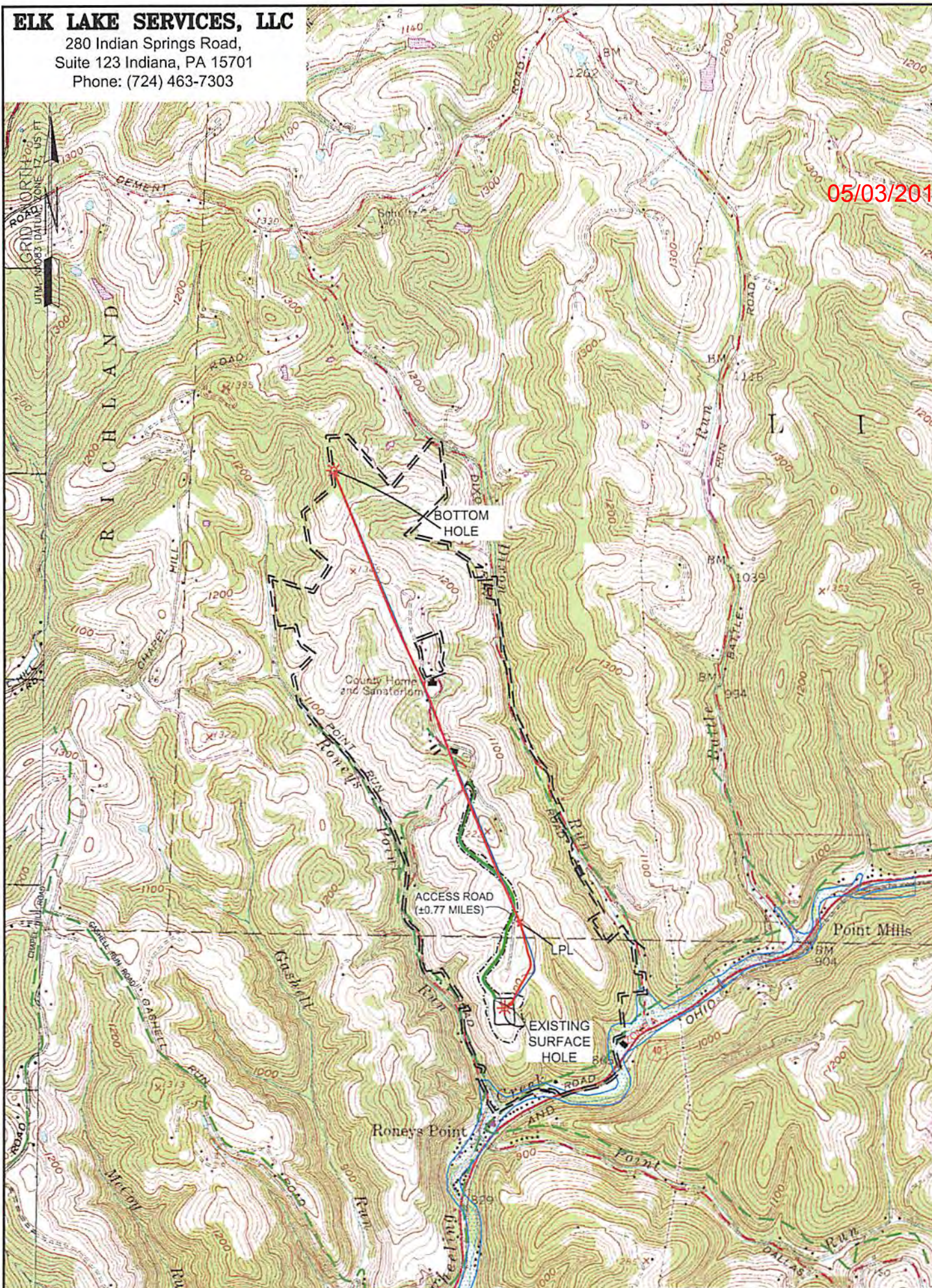
Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
SCAL16486A	Nalco	Scale Inhibitor					
				Listed Below			
	SWN Well Services	Friction Reducer					
				Listed Below			

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ELK LAKE SERVICES, LLC

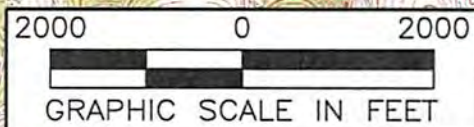
280 Indian Springs Road,
Suite 123 Indiana, PA 15701
Phone: (724) 463-7303

05/03/2019



SURFACE HOLE LOCATION (SHL):
GEOGRAPHIC (NAD83):
LATITUDE: 40.079464287
LONGITUDE: -80.598038918

BOTTOM HOLE LOCATION (BHL):
GEOGRAPHIC (NAD83):
LATITUDE: 40.102902679
LONGITUDE: -80.608226739



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.

API WELL #: **47 069 00239**
STATE COUNTY PERMIT

LEGEND:

- Red star: PROPOSED SURFACE HOLE / BOTTOM HOLE
- Red star with X: EXISTING / PRODUCING WELLHEAD
- LPL X: LANDING POINT LOCATION
- Blue outline: FLOOD PLAIN
- Green dashed line: ACCESS ROAD
- Black dashed line: PUBLIC ROAD
- Black solid line: ACCESS ROAD TO PREV. SITE
- Double line: LEASE BOUNDARY
- Red solid line: EXISTING PATH
- Blue solid line: PROPOSED PATH

WELL OPERATOR:
SWN PRODUCTION COMPANY, LLC

ADDRESS:
1300 FORT PIERPONT DR STE 201, MORGANTOWN, WV 26508

SURFACE OWNER:
BOARD OF COMMISSIONERS OF OHIO COUNTY

WELL (FARM) NAME: OCC A OHI

WELL # 5H **SERIAL #** XXXX

COUNTY OHIO COUNTY - 69 **DISTRICT:** LIBERTY

USGS 7 1/2 QUADRANGLE MAP NAME VALLEY GROVE, WV

