

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

API 47-009-00227 County BROOKE District BUFFALO
Quad BETHANY Pad Name WORTHLEY BRK PAD Field/Pool Name PANHANDLE FIELD WET
Farm name KIMBERLY CARMAN WORTHLEY Well Number WORTHLEY BRK 210H
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 4,451,752.65 Easting 537,852.45
Landing Point of Curve Northing 4,451,818.99 Easting 538,330.11
Bottom Hole Northing 4,449,573.50 Easting 539,325.69

Elevation (ft) 1156.51 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 05/15/2018 Date drilling commenced 05/16/2018 Date drilling ceased 07/05/2018
Date completion activities began 09/20/2018 Date completion activities ceased 10/23/2018
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 183 Open mine(s) (Y/N) depths N
Salt water depth(s) ft 800 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 329 Cavern(s) encountered (Y/N) depths _____
Is coal being mined in area (Y/N) N

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Reviewed
1.17.19 C. [Signature]

Reviewed by:
[Signature] 1.17.19

API 47-009 - 00227 Farm name KIMBERLY CARMAN WORTHLEY Well number WORTHLEY BRK 210H

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	36	30	126	NEW	PLS2/234.29#		Y
Surface	26	20	380	NEW	J-55/94#	249.8', 291.8'	Y, 45 BBLs
Coal	SEE SURFACE						
Intermediate 1	17.50	13.375	600	NEW	J-55/54.50#		Y, 25 BBLs
Intermediate 2	12.25	9.625	1740	NEW	J-55/36#		Y, 31 BBLs
Intermediate 3							
Production	8.75/8.50	5.5	14884	NEW	HCP-110/20#		Y, 15 BBLs
Tubing		2.375	6644	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	796	15.60	1.19	947.24	SURFACE	8
Coal	SEE SURFACE						
Intermediate 1	CLASS A	586	15.60	1.20	703.2	SURFACE	8
Intermediate 2	CLASS A	646	15.60	1.19	768.74	SURFACE	8
Intermediate 3							
Production	CLASS A	2,746	15.60	1.19	3267.74	SURFACE	24
Tubing							

Drillers TD (ft) 14,884 Loggers TD (ft) 14,884
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5,410'

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 - 00227

Farm name KIMBERLY CARMAN WORTHLEY

Well number WORTHLEY BRK 210H

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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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>MARCELLUS</u>	<u>6,016'</u> TVD	<u>6,513'</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2425 psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas 1662 mcfpd Oil 168 bpd NGL _____ bpd Water 240 bpd GAS MEASURED BY Estimated Orifice Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>		<u>BOTTOM</u>		<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H₂S, ETC)</u>
	<u>DEPTH IN FT NAME TVD</u>	<u>DEPTH IN FT TVD</u>	<u>DEPTH IN FT MD</u>	<u>DEPTH IN FT MD</u>	
	<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 SCHLUMBERGER WELL SERVICES
Address 110 SCHLUMBERGER DRIVE City SUGAR LAND State TX Zip 77478

Stimulating Company US WELL SERVICES
Address 533 INDUSTRIAL PARK DRIVE City JANE LEW State WV Zip 26378

Please insert additional pages as applicable.

Completed by BOBBY WILLIS Telephone 832-796-2884
Signature [Signature] Title REGULATORY ANALYST Date 1/11/19

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

Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	9/20/2018
Job End Date:	10/9/2018
State:	West Virginia
County:	Brooke
API Number:	47-009-00227-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Worthley BRK 210H
Latitude:	40.21533501
Longitude:	-80.55515498
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,104
Total Base Water Volume (gal):	10,363,506
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	83.08147	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	15.91280	
HCL Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.40000	0.74056	
			Hydrogen Chloride	7647-01-0	17.50000	0.17218	
WFRA-2000	U.S. Well Services, LLC	Friction Reducer	Water	7732-18-5	60.00000	0.03917	
			2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.01959	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01606	
BIOC11139A	Nalco Champion	Anti-Bacterial Agent	Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00711	
			Glutaraldehyde	111-30-8	10.00000	0.00237	
			Ethanol	64-17-5	5.00000	0.00093	

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FSTI-IC-001	FSTI	Iron Control Additive					
			Acetic acid	64-19-7	60.00000	0.00204	
			Citric Acid	77-92-9	40.00000	0.00155	
SCAL16486A	Nalco Champion	Scale Inhibitor					
			Ethylene Glycol	107-21-1	30.00000	0.00168	
			Amine Triphosphate	Proprietary	30.00000	0.00150	
Econo-CI200	Economy Polymers & Chemicals	Acid Corrosion Inhibitors					
			Methanol	67-56-1	80.00000	0.00082	
			Fatty acid	Proprietary	10.00000	0.00013	
LT FLUSH SYSTEM I	J.S. Well Services, LLC	Other					
			Mineral oil, petroleum distillates, hrdotreated light naphthenic	64742-53-6	100.00000	0.00004	

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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**WORTHLEY BRK 210H
ATTACHMENT 1
PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	8/18/2018	14,777	14,678	36
2	9/21/2018	14,643	14,536	42
3	9/21/2018	14,503	14,396	42
4	9/21/2018	14,363	14,256	42
5	9/21/2018	14,223	14,116	42
6	9/21/2018	14,083	13,976	42
7	9/22/2018	13,943	13,836	42
8	9/22/2018	13,803	13,696	42
9	9/22/2018	13,663	13,556	42
10	9/24/2018	13,523	13,416	42
11	9/25/2018	13,383	13,276	42
12	9/25/2018	13,243	13,136	42
13	9/25/2018	13,103	12,996	42
14	9/25/2018	12,963	12,854	42
15	9/26/2018	12,823	12,716	42
16	9/26/2018	12,683	12,576	42
17	9/26/2018	12,543	12,436	42
18	9/27/2018	12,403	12,296	42
19	9/27/2018	12,263	12,156	42
20	9/27/2018	12,123	12,016	42
21	9/27/2018	11,983	11,876	42
22	9/28/2018	11,843	11,736	42
23	9/28/2018	11,703	11,596	42
24	9/29/2018	11,563	11,456	42
25	9/29/2018	11,423	11,316	42
26	9/29/2018	11,283	11,176	42
27	9/29/2018	11,143	11,036	42
28	9/29/2018	11,003	10,896	42
29	9/30/2018	10,863	10,756	42
30	9/30/2018	10,723	10,616	42
31	9/30/2018	10,583	10,476	42
32	10/1/2018	10,443	10,336	42
33	10/1/2018	10,303	10,196	42
34	10/1/2018	10,166	10,056	42
35	10/2/2018	10,023	9,916	42
36	10/2/2018	9,883	9,776	42
37	10/2/2018	9,743	9,636	42
38	10/3/2018	9,603	9,496	42
39	10/4/2018	9,463	9,356	42
40	10/4/2018	9,323	9,221	42
41	10/4/2018	9,183	9,076	42
42	10/4/2018	9,043	8,936	42
43	10/5/2018	8,903	8,796	42

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WORTHLEY BRK 210H
ATTACHMENT 1
PERF REPORT

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
44	10/5/2018	8,763	8,661	42
45	10/5/2018	8,623	8,516	42
46	10/5/2018	8,480	8,376	42
47	10/6/2018	8,343	8,236	42
48	10/6/2018	8,203	8,096	42
49	10/6/2018	8,063	7,956	42
50	10/7/2018	7,923	7,816	42
51	10/7/2018	7,783	7,676	42
52	10/7/2018	7,643	7,536	42
53	10/8/2018	7,503	7,396	42
54	10/8/2018	7,363	7,256	42
55	10/9/2018	7,223	7,116	42
56	10/9/2018	7,083	6,976	42
57	10/9/2018	6,943	6,836	42
58	10/9/2018	6,803	6,696	42

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Worthley BRK 210H
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	9/20/2018	82	7,854	7,907	4,169	294,420	5,336	0
2	9/21/2018	87	7,814	6,316	4,417	276,740	4,905	0
3	9/21/2018	84	7,932	6,162	4,245	270,720	4,329	0
4	9/21/2018	87	8,302	5,901	4,422	284,340	4,346	0
5	9/21/2018	86	7,815	5,829	4,629	280,890	4,915	0
6	9/22/2018	83	7,871	5,855	4,462	287,300	4,782	0
7	9/22/2018	82	8,394	5,888	4,506	283,460	4,438	0
8	9/22/2018	83	8,092	5,730	4,844	288,680	4,506	0
9	9/24/2018	87	7,900	5,417	4,572	287,340	4,758	0
10	9/25/2018	87	7,891	5,599	4,316	289,320	4,505	0
11	9/25/2018	86	7,516	5,659	4,898	285,160	4,166	0
12	9/25/2018	83	8,037	5,700	4,588	286,240	4,130	0
13	9/25/2018	83	8,132	4,950	4,319	285,340	4,476	0
14	9/26/2018	87	7,933	5,385	4,524	291,380	4,523	0
15	9/26/2018	85	7,966	5,706	4,832	281,560	4,384	0
16	9/26/2018	85	8,056	5,467	4,686	285,560	4,513	0
17	9/26/2018	86	8,189	6,208	4,353	290,120	4,411	0
18	9/27/2018	83	8,048	5,632	4,378	278,040	3,956	0
19	9/27/2018	83	7,514	5,509	4,549	279,700	4,360	0
20	9/27/2018	88	7,355	5,626	4,500	274,360	4,011	0
21	9/28/2018	87	7,469	3,708	4,621	283,840	4,536	0
22	9/28/2018	85	7,645	5,174	4,785	287,440	4,215	0
23	9/28/2018	88	7,296	5,520	4,538	289,680	4,253	0
24	9/29/2018	87	7,426	5,728	4,539	291,780	4,207	0
25	9/29/2018	86	7,437	5,405	4,751	263,100	3,745	0
26	9/29/2018	85	7,557	5,610	4,713	282,480	3,747	0
27	9/29/2018	83	7,160	5,222	4,865	290,000	5,147	0
28	9/30/2018	86	7,752	5,786	4,718	278,800	4,082	0
29	9/30/2018	86	7,323	6,038	4,816	287,800	3,554	0
30	9/30/2018	90	6,994	5,410	4,789	282,560	3,702	0
31	9/30/2018	86	6,975	5,193	5,050	282,040	4,834	0
32	10/1/2018	86	7,265	5,056	4,550	307,960	3,801	0
33	10/1/2018	87	7,511	5,458	4,628	290,040	3,882	0
34	10/1/2018	89	7,079	5,281	4,775	289,140	4,033	0
35	10/2/2018	88	7,308	5,081	4,490	292,980	3,768	0
36	10/2/2018	86	7,204	5,199	4,708	291,200	3,674	0
37	10/3/2018	53	7,616	5,289	4,202	270,840	6,470	0
38	10/4/2018	87	6,984	4,620	4,905	293,280	4,049	0
39	10/4/2018	85	7,144	5,529	4,540	300,460	4,358	0
40	10/4/2018	87	7,131	5,368	4,475	285,020	4,214	0
41	10/4/2018	90	6,706	5,618	4,629	290,340	5,341	0
42	10/5/2018	87	7,040	5,721	4,701	276,940	3,803	0
43	10/5/2018	87	6,999	5,702	4,678	293,240	4,071	0
44	10/5/2018	86	7,017	5,841	4,465	287,340	4,129	0
45	10/5/2018	83	7,516	5,522	4,553	290,220	3,710	0
46	10/5/2018	82	7,645	5,068	4,440	282,220	3,787	0
47	10/6/2018	86	7,465	5,701	4,539	295,520	4,239	0
48	10/6/2018	67	7,839	5,637	4,254	277,750	6,344	0
49	10/7/2018	87	7,205	5,699	4,515	298,740	3,815	0
50	10/7/2018	88	6,791	5,542	4,559	293,740	4,105	0
51	10/7/2018	90	7,011	5,798	4,555	289,640	4,148	0
52	10/8/2018	89	7,254	5,861	4,551	261,620	3,700	0
53	10/8/2018	90	6,917	5,926	4,626	284,380	4,109	0

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Worthley BRK 210H
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	10/8/2018	90	6,555	5,925	4,740	288,300	4,142	0
55	10/9/2018	90	6,372	5,306	4,691	287,420	4,090	0
56	10/9/2018	90	6,689	5,650	4,692	264,340	3,816	0
57	10/9/2018	87	7,540	5,809	4,387	292,400	3,877	0
58	10/9/2018	89	6,653	5,786	4,811	278,940	4,022	0

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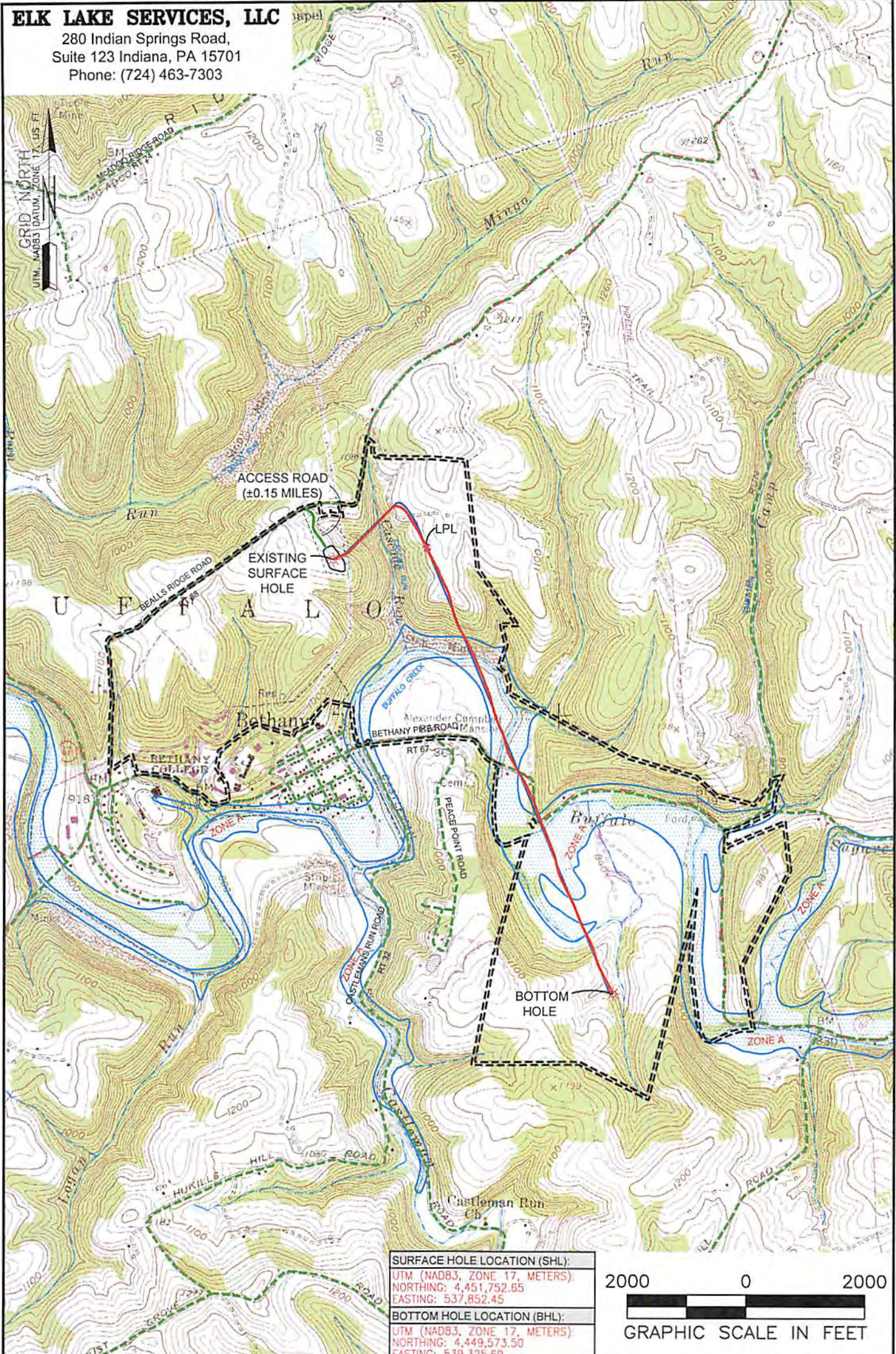
Well Name: Worthley BRK 210H

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	183.00	183.00	
Top of Salt Water	800.00	800.00	NA	NA	
Pittsburgh Coal	329.00	329.00	482.00	482.00	
Pottsville (ss)	482.00	482.00	784.00	784.00	
Raven Cliff (ss)	784.00	784.00	1182.00	1182.00	
Maxton (ss)	1182.00	1182.00	1510.00	1510.00	
Big Injun (ss)	1510.00	1510.00	5431.00	5430.00	
Rhinestreet (shale)	5431.00	5430.00	5698.00	5682.00	
Cashaqua (shale)	5698.00	5682.00	5762.00	5737.00	
Middlesex (shale)	5762.00	5737.00	6111.00	5819.00	
Burket (shale)	6111.00	5819.00	6131.00	5833.00	
Tully (ls)	6131.00	5833.00	6219.00	5887.00	
Mahantango (shale)	6219.00	5887.00	6513.00	6016.00	
Marcellus (shale)	6513.00	6016.00	NA	NA	Gas

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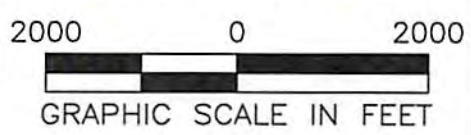
ELK LAKE SERVICES, LLC

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



SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,451,752.65
EASTING: 537,852.45

BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,449,573.50
EASTING: 539,325.69



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.

LEGEND:	PROPOSED SURFACE HOLE / BOTTOM HOLE	ACCESS ROAD
EXISTING / PRODUCING WELLHEAD	PUBLIC ROAD	ACCESS ROAD TO PREV. SITE
LPL* LANDING POINT LOCATION	LEASE BOUNDARY	EXISTING PATH
FLOOD PLAN	PROPOSED PATH	

WELL OPERATOR:
SWN PRODUCTION COMPANY, LLC

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

SURFACE OWNER:
KIMBERLY CARMAN WORTHLEY

WELL (FARM) NAME: WORTHLEY BRK	WELL # 210H	SERIAL # XXXX
COUNTY BROOKE COUNTY - 9	DISTRICT: BUFFALO	
USGS 7 1/2 QUADRANGLE MAP NAME BETHANY, WV		

Latitude: 40°15'00" SURFACE HOLE 3767'

BOTTOM HOLE 10608'

Latitude: 40°12'30"

BOTTOM HOLE 4626'

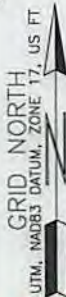
Longitude: 80°30'00"

Longitude: 80°32'30"

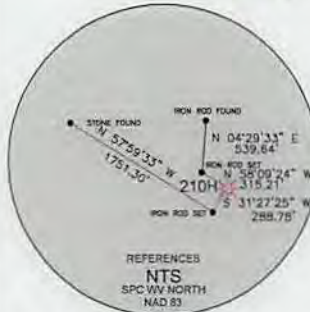
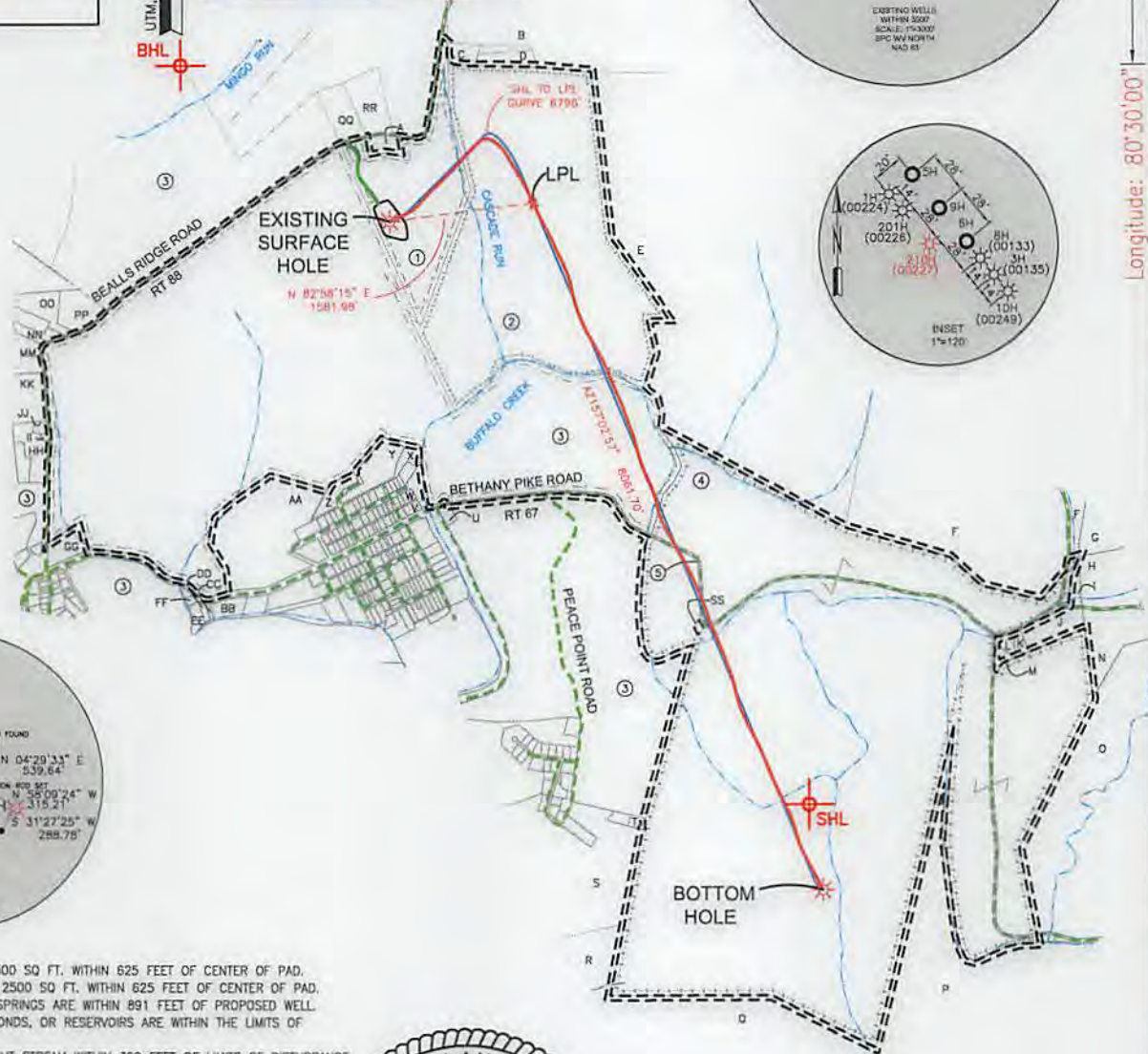
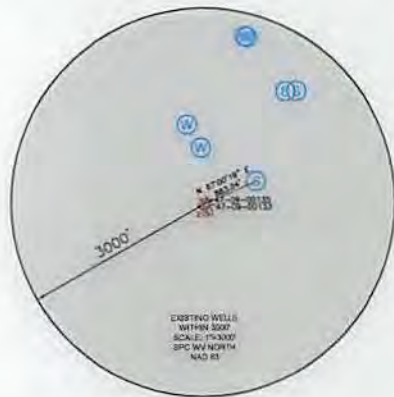
ELK LAKE SERVICES, LLC

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

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,451,752.65 EASTING: 537,852.45
LANDING POINT (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,451,818.99 EASTING: 538,330.11
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,449,573.50 EASTING: 539,325.69



SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,451,752.62 EASTING: 537,852.36
LANDING POINT (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,451,909.95 EASTING: 538,290.54
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,449,564.78 EASTING: 539,314.46



WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 891 FEET OF PROPOSED WELL.
4. PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS ARE WITHIN THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

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 PLAN DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
 3. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.
 4. WELLBORE PARCELS ARE DESIGNATED WITH UNIQUE LINE TYPES.
- I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN 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. 2164



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

WORTHLEY BRK
OPERATOR'S WELL #: 210H
API WELL #: 47 STATE 009 COUNTY 00227 PERMIT

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

WATERSHED: UPPER OHIO SOUTH ELEVATION: 1156.51'

DISTRICT: BUFFALO COUNTY: BROOKE COUNTY QUADRANGLE: BETHANY

SURFACE OWNER: KIMBERLY CARMAN WORTHLEY ACREAGE: ±40.00

OIL & GAS ROYALTY OWNER: COLONIAL CORP, A NEVADA CORP, & KIMBERLY J. CARMAN AKA KIMBERLY J. WORTHLEY, A MARRIED WOMAN DEALING IN HER SASP ACREAGE: ±40.00

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: 6,164' TVD 14,884' TMD

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

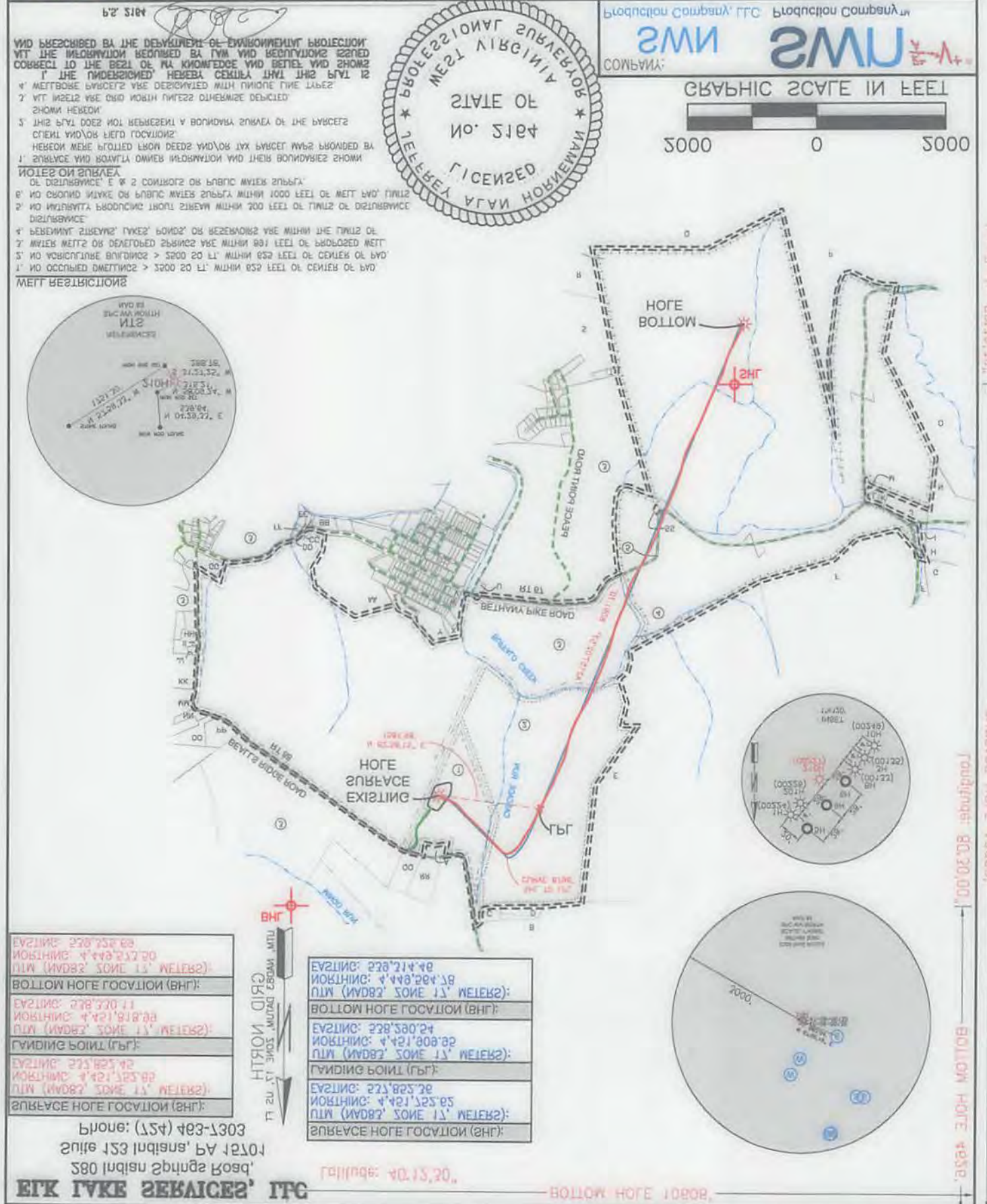
LEGEND:	— SURVEYED BOUNDARY	REVISIONS:	DATE: 01-09-2019
○ PROPOSED SURFACE HOLE / BOTTOM HOLE	— DRILLING UNIT		FILE NO: 17-02
⊙ EXISTING / PRODUCING WELLHEAD	===== LEASE BOUNDARY		DRAWN BY: JMB
LPL* LANDING POINT LOCATION	— EXISTING PATH		SCALE: 1" = 2000'
⊙ EXISTING WATER WELL	— PROPOSED PATH		DRAWING NO: 1
⊙ EXISTING SPRING			WELL LOCATION PLAT 1

<ul style="list-style-type: none"> EXISTING SURFACE EXISTING MINER WELLS GUIDING POINT LOCATION EXISTING \ PROPOSED METHEO PROPOSED SURFACE HOGE \ BOTTOM HOGE 	<ul style="list-style-type: none"> PROPOSED BATH EXISTING BATH GEUGE BOUNDARY DWITTING POINT SHARPEAD BOUNDARY 	METEOROLOGICAL STATION NO: 1 SCALE: 1" = 3000' DRAWN BY: JWB FILE NO: 13-05 DATE: 01-08-2018
CITY: МОРИНГЕЙ STATE: MA ZIP CODE: 02008 ADDRESS: 1300 FORD BIKER ROAD 21E 501 METEOROLOGICAL STATION: 2MI PRODUCTION COMPANY, LLC	CITY: МОРИНГЕЙ STATE: MA ZIP CODE: 02008 ADDRESS: 1300 FORD BIKER ROAD 21E 501 DESIGNATED AGENCY: WETLANDS	ESTIMATED DEPTH: 8'18", LAD 14'88", LMD

TYPE OF FORMATION: МАРИНГЕЙ
 CORNER: BATH & WINDING STEEP SLOPE & BATH OTHER CHANGE (SPECIFY) V2-DWITTED
 DRIFT: DRIFT DEEPER BEDROCK FRACTURE OR SHIMMAGE BATH OFF OLD FORMATION BEFORE NEW FORMATION

OIG & CAS BOARD MEMBER: COOPERING COM' & HENRY COM' & KIMBERLY T. SWANN YUK KIMBERLY T. MOONHEA, Y. PAVANEE MOONHEA DEPTO IN NEW ENGL
 SURFACE MEMBER: КИМБЕРЛИ СУВАН МОРИНГЕЙ
 DISTRICT: ВЪЛГАТО СОЦИАЛ: БРООКЕ СОЦИАЛ
 MATERIALS: ПЪРВ ОНЮ СОНН
 METEOROLOGICAL: ОИГ WATER DISCHARGE PRODUCTION DEEP CAS FLUID INJECTION STORAGE SHALLOW

CHARGESTON, MA 02034 801 21TH STREET OFFICE OF OIG & CAS MADEP UNITED STATES GEOGRAPHIC MAPS (+) DENOTES LOCATION OF WELL ON	ELEVATION: (INVD 88' 02' FT) SOURCE OF SURFACE PROVEN ASSURANCE: 1/300 DEGREE OF MINIMUM	STATE: MA COUNTY: 000 PERMIT: 00557 WELL NO: 74 OPERATOR, WELL NO: 310H MORNINGEY BRK
	PRODUCTION COMPANY, LLC PRODUCTION COMPANY, LLC COMPANY:	GRAPHIC SCALE IN FEET 5000 0 5000



ELEVATION: 238'23" 88 NORTHING: 4448'21" 70 PLAN (NAD83) SOME 13' METERS)	BOTTOM HOGE LOCATION (BHG):
ELEVATION: 238'22" 11 NORTHING: 4421'81" 88 PLAN (NAD83) SOME 13' METERS)	GUIDING POINT (GP):
ELEVATION: 238'22" 82 NORTHING: 4421'32" 88 PLAN (NAD83) SOME 13' METERS)	SURFACE HOGE LOCATION (SHG):
PHONE: (514) 483-1303 SUITE 123 INDUSTRIAL ROAD, 280 INDUSTRIAL PARK ROAD, EPR TAKE SERVICES, LLC	

ELEVATION: 238'21" 48 NORTHING: 4448'22" 78 PLAN (NAD83) SOME 13' METERS)	BOTTOM HOGE LOCATION (BHG):
ELEVATION: 238'20" 24 NORTHING: 4421'80" 88 PLAN (NAD83) SOME 13' METERS)	GUIDING POINT (GP):
ELEVATION: 238'20" 28 NORTHING: 4421'32" 85 PLAN (NAD83) SOME 13' METERS)	SURFACE HOGE LOCATION (SHG):



FOUNDING: 80,33,30, ENLARGE HOGE 15858, FOUNDING: 80,30,00, BOTTOM HOGE 4858, SURFACE HOGE 2385,

ELK LAKE SERVICES, LLC

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

WELL BORE TABLE FOR SURFACE / ROYALTY OWNERS		
TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL
1	KIMBERLY CARMAN WORTHLEY (S) COLONIAL CORP, A NEVADA CORP, & KIMBERLY J. CARMAN AKA KIMBERLY J. WORTHLEY, A MARRIED WOMAN DEALING IN HER SASP (R)	3-B38-27
TRACT	SURFACE OWNER	TAX PARCEL
2	KIMBERLY CARMEN WORTHLEY	3-B38-25
3	BETHANY COLLEGE	3-B38-31
4	TRUST OF GENE CHARLES VALENTINE	3-B43-28
5	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS	BETHANY PIKE

ADJOINING OWNERS TABLE		
TRACT	SURFACE OWNER	TAX PARCEL
A	CARRINGTON MORTGAGE SERVICES,LLC	3-B38-26
B	MARK WEAVER OWEN & VIRGINIA BEALL KREUTZ	3-B38-19
C	LANCE M. ELSON	3-B38-21
D	NOLTE & GLADYS VANCAMP	3-B38-23
E	MARK W OWEN & VIRGINIA BEALL KRUETZ	3-B38-24
F	RAYMOND L & LINDSEY G TREDWAY	3-B39-11
G	VICKI G & SHAWN P HAMILTON	3-B44-1
H	JAMES R & LINDA R GREATHOUSE	3-B39-12
I	DONNA M WEEKLEY	3-B44-2
J	CURTIS LEE & LOUANN L NEEL	3-B44-7
K	JANICE F JACKSON	3-B44-8
L	JANICE F JACKSON	3-B44-9
M	JANICE F JACKSON	3-B44-10
N	MILDRED MAIN	3-B44-06
O	FORNEY & SONS HOLDING CO LLC	3-B44-05
P	ST OF WV DEPT OF COMM DIV	3-B44-14
Q	ST OF WV DEPT OF COMM DIV	3-B43-62
R	SAMUEL & MELANIE DONINI	3-B43-57
S	TRUST OF GENE CHARLES VALENTINE	3-B43-49.3
T	MARY E COLLINS	3-B43-49
U	RICHARD FRANCIS GORBY	3-B43-27
V	JAMES & KATHLEEN KEEGAN	2-B43C-37
W	BARBARA L CHAMBERS	2-B43C-36
X	BETHANY COLLEGE	2-B43C-3
Y	BETHANY COLLEGE	2-B43C-2
Z	BETHANY COLLEGE	2-B43C-1
AA	BETHANY COLLEGE	1-B43B-26
BB	TRAVIS G & GREGORY B STRAUB	2-B43F-84
CC	GEORGE JR SONNEWALD	2-B43F-82
DD	GEORGE JR SONNEWALD	2-B43F-81
EE	WILLIAM MITCHELL HEIRS	2-B43B-22
FF	MITCHELL DONALD STEVEN	2-B43F-83
GG	JOHN HUFF HEIRS	2-B43B-4
HH	DANNY M & SANDRA L HOLLADAY	3-B43-3
II	DENNIS & DERRELLE RUSCHELL	3-B43-2
JJ	DENNIS & DERRELLE RUSCHELL	3-B43-1
KK	RUTH GERMON & JEFFREY WOY & SUE MOORE & PATRICIA WEST & SARA WOY	3-B38-37
MM	ALLEN JOHNSON & CHARLES WARREN ETAL	3-B38-36
NN	DAVID G OWENS & LINDA WALTERS	3-B38-35
OO	DAVID G OWENS & LINDA WALTERS	3-B38-33
PP	DAVID G OWENS & LINDA WALTERS	3-B38-32
QQ	CHARLES F & DONNA BROWN	3-B38-30
RR	JEFFREY WILLIAM HENSLER	3-B38-29
SS	CLYDE B ROBERTS	3-B43-29

REVISIONS:	COMPANY:		 	
	OPERATOR'S		WORTHLEY BRK	
	WELL #:		210H	
	DISTRICT:	COUNTY:	STATE:	DATE: 01-09-2019
	BUFFALO	BROOKE COUNTY	WV	FILE NO: 17-02
				DRAWN BY: JMB
				SCALE: N/A
				DRAWING NO: 1
				WELL LOCATION PLAT 1

ELK LAKE SERVICES, LLC


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

TRACT	SURFACE OWNER	TAX PARCEL
1	KIMBERLY CARMAN WORTHLEY (2) COLONIAL CORP, A NEVADA CORP, & KIMBERLY J. CARMAN AKA KIMBERLY J. WORTHLEY, A MARRIED WOMAN DEALING IN HER 2AS2 (R)	3-B38-27
2	KIMBERLY CARMEN WORTHLEY	3-B38-25
3	BETHANY COLLEGE	3-B38-31
4	TRUST OF GENE CHARLES VALENTINE	3-B43-28
5	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS	BETHANY PIKE

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H	JAMES R & LINDA R GREATHOUSE	3-B39-12
I	DONNA M WEEKLEY	3-B44-2
J	CURTIS LEE & LOUANN L NEEL	3-B44-7
K	JANICE F JACKSON	3-B44-8
L	JANICE F JACKSON	3-B44-9
M	JANICE F JACKSON	3-B44-10
N	MILDRED MAIN	3-B44-08
O	FORNEY & SONS HOLDING CO LLC	3-B44-02
P	ST OF WV DEPT OF COMM DIV	3-B44-14
Q	ST OF WV DEPT OF COMM DIV	3-B43-82
R	SAMUEL & MELANIE DONINI	3-B43-27
S	TRUST OF GENE CHARLES VALENTINE	3-B43-49
T	MARY E COLLINS	3-B43-49
U	RICHARD FRANCIS GORBY	3-B43-27
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KK	RUTH GERMON & JEFFREY WOY & SUE MOORE & PATRICIA WEST & SARA WOY	3-B38-37
MM	ALLEN JOHNSON & CHARLES WARREN ETAL	3-B38-36
NN	DAVID G OWENS & LINDA WALTERS	3-B38-32
OO	DAVID G OWENS & LINDA WALTERS	3-B38-33
PP	DAVID G OWENS & LINDA WALTERS	3-B38-32
QQ	CHARLES F & DONNA BROWN	3-B38-30
RR	JEFFREY WILLIAM HENSLER	3-B38-29
SS	CLYDE B ROBERTS	3-B43-29

ADJOINING OWNERS TABLE

TRACT	SURFACE OWNER	TAX PARCEL
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		COMPANY:	REVISIONS:
OPERATOR'S: WORTHLEY BRK WELL #: 210H		DISTRICT:	
DATE: 01-09-2019	FILE NO: 17-02	COUNTY:	
DRAWN BY: JMB	SCALE: N/A	BROOKE COUNTY	
DRAWING NO: 1	WELL LOCATION PLT 1	STATE:	
PROPERTY NUMBER 250115493	PVD ID 200115493	WV	