

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

API 47-051-02124 County MARSHALL District LIBERTY
Quad LITTLETON Pad Name YOCUM MSH PAD Field/Pool Name VICTORY FIELD WET
Farm name JOSEPH LEE AND MICHAEL D. YOCUM Well Number YOCUM MSH 3H
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 4,398,198.500 Easting 535,686.600
Landing Point of Curve Northing 4,398,312.840 Easting 535,511.060
Bottom Hole Northing 4,400,568.450 Easting 533,027.560

Elevation (ft) 1079.4' 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

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Date permit issued 12/26/2019 Date drilling commenced 2/19/2019 Date drilling ceased 3/06/2019
Date completion activities began 5/29/2019 Date completion activities ceased 7/13/2019
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 437 Open mine(s) (Y/N) depths N
Salt water depth(s) ft 894 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 878 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed

Jim Nicholson
Spencer Shumate 1/23/2020

Reviewed by: _____

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API 47-051 - 02124

Farm name JOSEPH LEE AND MICHAEL D. YOCUM Well number YOCUM MSH 3H

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	538	NEW	J-55/54.50#		Y, 16 BBLs
Coal	SEE INTERMEDIATE						
Intermediate 1	12.25	9.625	2478	NEW	J-55/36#		Y, 38 BBLs
Intermediate 2							
Intermediate 3							
Production	8.75/8.50	5.5	18470	NEW	HCP-110/20#		Y, 58 BBLs
Tubing				NEW			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	487	15.60	1.20	584.4	SURFACE	8
Coal	SEE INTERMEDIATE						
Intermediate 1	CLASS A	760	15.60	1.19	904.4	SURFACE	8
Intermediate 2							
Intermediate 3							
Production	CLASS A	3,332	15.60	1.19	3,965.08	SURFACE	24
Tubing							

Drillers TD (ft) 18,470 Loggers TD (ft) 18,470
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure N/A

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Kick off depth (ft) 6,304'

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Check all wireline logs run caliper density deviated/directional induction temperature sonic
 neutron resistivity gamma ray

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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 _____

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/7/2019
Job End Date:	6/15/2019
State:	West Virginia
County:	Marshall
API Number:	47-051-02124-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	Yocum MSH 3H
Latitude:	39.73290000
Longitude:	-80.58350000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,087
Total Base Water Volume (gal):	16,482,162
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	85.52362	Density = 8.34
Produced Water	Halliburton	Base Fluid	Water	7732-18-5	100.00000	3.41469	Density = 8.34



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Ingredients	Listed Above	Listed Above						
			Water		7732-18-5		100.00000	
Excelerate LX-1	Halliburton	Friction Reducer			Listed Below			
					Listed Below			
Sand-Premium White-40770	Halliburton	Proppant			Listed Below			
					Listed Below			
HYDROCHLORI C ACID	Halliburton	Solvent			Listed Below			
					Listed Below			
BE-9	Halliburton	Biocide			Listed Below			
					Listed Below			
FSTI-CI-01	FSTI	Acid Corrosion Inhibitor			Listed Below			
					Listed Below			
FSTI-IC-001	FSTI	Iron Control Agent			Listed Below			
					Listed Below			
MC LD-2850	MultChem	Friction Reducer			Listed Below			
					Listed Below			
Sand-Common White-100 Mesh, SSA-2	Halliburton	Proppant			Listed Below			

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			Listed Below					
SCAL16486A	Nalco (Champion)	Scale Inhibitor	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	10.34418			
		Hydrochloric acid	7647-01-0	15.00000	0.09168			
		Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02521			
		Polyacrylate	Proprietary	30.00000	0.01555			
		Ethanolamine, N,N,N-trimethyl-2-[(1-oxo-2-propen-1-yl)oxy]-, chloride (1:1), polymer with 2-propanamide	69418-26-4	30.00000	0.00966			
		Ammonium chloride	12125-02-9	10.00000	0.00581			
		Sodium chloride	7647-14-5	10.00000	0.00581			
		Castor oil, ethoxylated	61791-12-6	10.00000	0.00322			
		Ethoxylated fatty acid	Proprietary	5.00000	0.00259			
		Fatty acid ester	Proprietary	5.00000	0.00259			
		Ethylene glycol	107-21-1	30.00000	0.00189			
		Amine Triphosphate	Proprietary	30.00000	0.00189			
		Acetic acid	64-19-7	60.00000	0.00184			
		Sorbitan monooleate polyoxyethylene derivative	9005-65-6	5.00000	0.00161			
		Alcohols, C12-16, ethoxylated	68551-12-2	5.00000	0.00161			
		9-Octadecenamide, n,n-bis-2(hydroxy-ethyl)-, (Z)	93-83-4	5.00000	0.00161			
		Citric acid	77-92-9	40.00000	0.00123			
		Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00121			
		Methanol	67-56-1	80.00000	0.00071			

**YOCUM MSH 3H
ATTACHMENT 1
PERF REPORT**

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	5/1/2019	18,428	18,330	36
2	5/7/2019	18,296	18,120	24
3	5/8/2019	18,086	17,910	24
4	5/8/2019	17,876	17,700	24
5	5/11/2019	17,666	17,490	24
6	5/11/2019	17,456	17,280	24
7	5/12/2019	17,246	17,070	24
8	5/12/2019	17,036	16,860	19
9	5/12/2019	16,826	16,650	18
10	5/13/2019	16,616	16,440	18
11	5/13/2019	16,406	16,230	18
12	5/13/2019	16,196	16,020	18
13	5/13/2019	15,986	15,810	18
14	5/14/2019	15,776	15,600	18
15	5/14/2019	15,566	15,390	24
16	5/15/2019	15,356	15,180	24
17	5/15/2019	15,146	14,970	24
18	5/15/2019	14,936	14,760	48
19	5/15/2019	14,728	14,550	24
20	5/16/2019	14,516	14,340	24
21	5/16/2019	14,306	14,130	24
22	5/16/2019	14,091	13,920	24
23	5/16/2019	13,882	13,710	24
24	5/17/2019	13,674	13,500	36
25	5/17/2019	13,467	13,290	36
26	5/18/2019	13,256	13,080	36
27	5/18/2019	13,046	12,870	36
28	5/30/2019	12,836	12,660	36
29	5/30/2019	12,626	12,450	36
30	5/31/2019	12,416	12,240	36
31	5/31/2019	12,206	12,030	36
32	5/31/2019	11,996	11,820	36
33	6/1/2019	11,786	11,610	36
34	6/2/2019	11,576	11,400	36
35	6/3/2019	11,366	11,190	36
36	6/3/2019	11,156	10,980	36
37	6/4/2019	10,946	10,770	36
38	6/5/2019	10,736	10,560	24
39	6/5/2019	10,526	10,350	24
40	6/6/2019	10,311	10,140	24
41	6/6/2019	10,106	9,930	18
42	6/7/2019	9,896	9,720	18
43	6/7/2019	9,686	9,510	18
44	6/8/2019	9,476	9,300	18
45	6/9/2019	9,266	9,090	18
46	6/9/2019	9,056	8,880	24
47	6/11/2019	8,847	8,670	18
48	6/11/2019	8,637	8,460	18
49	6/12/2019	8,426	8,250	36
50	6/13/2019	8,216	8,040	36
51	6/13/2019	8,006	7,830	36
52	6/14/2019	7,796	7,624	36
53	6/14/2019	7,586	7,414	36
54	6/15/2019	7,376	7,200	36

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**YOCUM MSH 3H
ATTACHMENT 2
STIM REPORT**

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment	Max Breakdown	ISIP (PSI)	Amount of Proppant	Amount of water bbls	Amount of nitrogen/other
1	5/7/2019	77.8	8,442	8,144	4,396	280,097	7,946	0
2	5/7/2019	75.1	8,955	8,172	4,467	314,790	7,786	0
3	5/8/2019	68.7	8,423	5,321	4,662	316,063	7,317	0
4	5/8/2019	15.5	8,431	5,760	8,140	13,231	5,580	0
5	5/11/2019	74	8,643	6,060	4,324	314,611	7,722	0
6	5/12/2019	75.5	8,595	6,546	4,472	318,073	5,950	0
7	5/12/2019	64	8,438	5,976	4,646	321,444	6,904	0
8	5/12/2019	71.2	8,383	5,511	4,438	318,157	6,259	0
9	5/12/2019	62.9	8,293	5,661	4,590	316,997	5,955	0
10	5/13/2019	67.3	8,425	6,469	4,547	315,672	6,192	0
11	5/13/2019	64.1	8,443	5,601	4,258	315,682	6,074	0
12	5/13/2019	68.8	8,440	6,458	4,384	316,616	6,841	0
13	5/13/2019	67.2	8,225	5,919	4,302	315,604	5,880	0
14	5/14/2019	65	8,426	5,695	4,663	315,657	5,883	0
15	5/14/2019	68.1	8,142	5,886	4,819	315,675	5,841	0
16	5/15/2019	68.5	8,375	6,276	4,674	315,368	5,860	0
17	5/15/2019	59.7	7,963	6,170	7,806	205,611	6,170	0
18	5/15/2019	56	8,033	6,202	4,104	314,634	7,809	0
19	5/16/2019	73.5	8,246	5,354	4,447	315,687	7,823	0
20	5/16/2019	67.7	8,231	6,584	4,530	315,001	6,485	0
21	5/16/2019	69.2	8,166	6,130	4,386	315,371	6,588	0
22	5/16/2019	66.8	8,187	6,451	4,576	315,582	7,329	0
23	5/16/2019	66.2	7,754	6,212	4,205	315,299	7,888	0
24	5/17/2019	88.9	8,113	6,210	4,766	318,279	7,375	0
25	5/17/2019	85.6	8,085	6,242	4,613	316,700	6,570	0
26	5/18/2019	63.1	7,759	6,266	4,656	315,291	6,098	0
27	5/29/2019	55.9	7,329	6,411	4,419	315,190	7,512	0
28	5/30/2019	69.9	8,193	6,397	4,564	316,100	7,857	0
29	5/30/2019	73.2	8,407	5,914	4,564	314,000	8,674	0
30	5/31/2019	70.8	8,249	6,280	4,996	216,307	6,400	0
31	5/31/2019	67.5	8,069	6,161	4,643	251,525	7,436	0
32	6/1/2019	80	8,305	5,985	4,750	316,690	7,653	0
33	6/1/2019	74.5	8,217	5,719	4,727	316,335	7,834	0
34	6/2/2019	77.6	8,328	5,486	4,816	316,640	8,741	0
35	6/3/2019	77.8	8,529	3,841	4,590	316,197	7,876	0
36	6/4/2019	91	8,671	6,310	4,954	316,230	7,908	0
37	6/4/2019	73.4	8,260	5,989	4,950	314,606	9,694	0
38	6/5/2019	73.4	8,313	5,722	5,016	244,580	6,818	0
39	6/5/2019	92.3	8,248	5,588	4,791	315,490	7,420	0
40	6/6/2019	87.5	8,426	5,655	4,683	282,460	7,357	0
41	6/6/2019	80.7	8,210	6,149	4,869	313,280	8,708	0
42	6/7/2019	77.8	8,156	5,681	5,647	314,160	8,758	0
43	6/8/2019	63.6	8,177	5,691	5,314	313,709	9,205	0
44	6/9/2019	71.8	8,170	6,467	4,733	314,510	8,515	0
45	6/9/2019	79.4	8,180	6,435	5,279	314,960	8,506	0
46	6/10/2019	41	8,482	6,016	4,876	27,857	5,501	0
47	6/11/2019	93.2	7,850	5,160	5,092	253,720	6,799	0
48	6/12/2019	68.7	7,923	6,187	4,130	317,638	8,812	0
49	6/13/2019	91.7	7,782	6,691	4,562	314,780	7,951	0
50	6/13/2019	98	7,793	6,697	4,529	315,490	7,996	0
51	6/14/2019	97.8	7,505	6,238	4,897	316,802	7,713	0
52	6/14/2019	94.1	7,709	6,003	4,517	316,040	7,840	0
53	6/14/2019	99.5	7,253	6,255	4,517	315,047	7,717	0
54	6/15/2019	99.3	7,115	6,152	4,332	316,220	7,839	0

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ATTACHMENT 3

47051021240000

Well Name: Yocum MSH 3H

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	437.00	437.00	
Top of Salt Water	894.00	894.00	NA	NA	
Pittsburgh Coal	878.00	878.00	NA	NA	
Pottsville (ss)	980.00	980.00	1019.00	1019.00	
Raven Cliff (ss)	1508.00	1508.00	1605.00	1605.00	
Maxton (ss)	1864.00	1864.00	2063.00	2063.00	
Big Injun (ss)	2071.00	2063.00	2353.00	2344.00	
Berea (siltstone)	2686.00	2676.00	3628.00	3600.00	
Rhinestreet (shale)	6389.00	6388.00	6711.00	6694.00	
Cashaqua (shale)	6729.00	6710.00	6880.00	6833.00	
Middlesex (shale)	6880.00	6833.00	7022.00	6929.00	
Burket (shale)	7022.00	6929.00	7075.00	6959.00	
Tully (ls)	7075.00	6959.00	7118.00	6980.00	
Mahantango (shale)	7118.00	6980.00	7440.00	7083.00	
Marcellus (shale)	7440.00	7083.00	NA	NA	GAS

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THRASHER

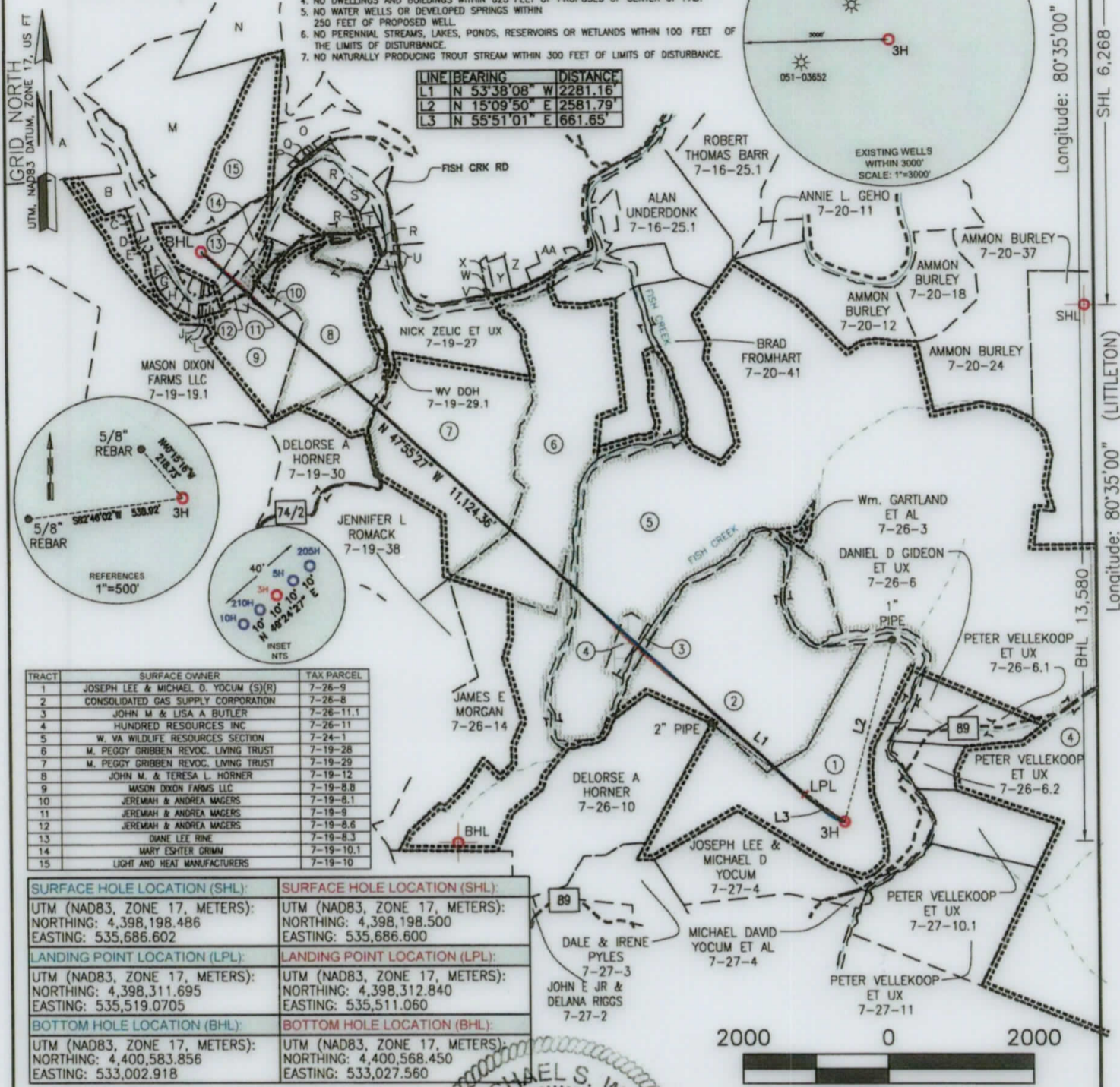
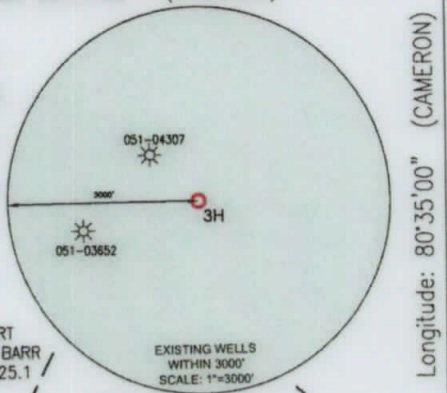
THE THRASHER GROUP, INC.
600 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE 304-624-4108

Latitude: 39°45'00" (LITTLETON) SHL 126'
BHL 8,895'
Latitude: 39°47'30" (CAMERON)

NOTES ON SURVEY

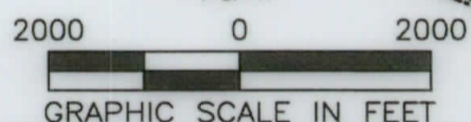
- COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- 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 LIMITS OF DISTURBANCE.

LINE	BEARING	DISTANCE
L1	N 53°38'08" W	2281.16
L2	N 15°09'50" E	2581.79
L3	N 55°51'01" E	661.65



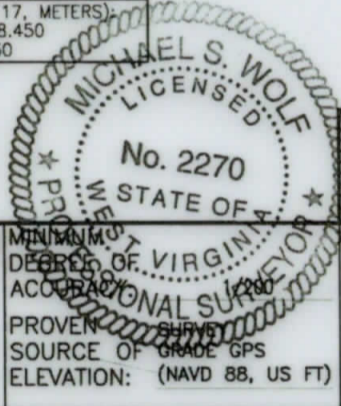
TRACT	SURFACE OWNER	TAX PARCEL
1	JOSEPH LEE & MICHAEL D. YOCUM (S)(R)	7-26-9
2	CONSOLIDATED GAS SUPPLY CORPORATION	7-26-8
3	JOHN M & LISA A BUTLER	7-26-11.1
4	HUNDRED RESOURCES INC	7-26-11
5	W. VA WILDLIFE RESOURCES SECTION	7-24-1
6	M. PEGGY GRIBBEN REVOC. LIVING TRUST	7-19-28
7	M. PEGGY GRIBBEN REVOC. LIVING TRUST	7-19-29
8	JOHN M. & TERESA L. HORNER	7-19-12
9	MASON DIXON FARMS LLC	7-19-B.8
10	JEREMIAH & ANDREA MAGERS	7-19-B.1
11	JEREMIAH & ANDREA MAGERS	7-19-9
12	JEREMIAH & ANDREA MAGERS	7-19-B.6
13	DANE LEE RINE	7-19-B.3
14	MARY ESHTER GRIMM	7-19-10.1
15	LIGHT AND HEAT MANUFACTURERS	7-19-10

SURFACE HOLE LOCATION (SHL):	SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,198.486 EASTING: 535,686.602	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,198.500 EASTING: 535,686.600
LANDING POINT LOCATION (LPL):	LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,311.695 EASTING: 535,519.0705	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,312.840 EASTING: 535,511.060
BOTTOM HOLE LOCATION (BHL):	BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,400,583.856 EASTING: 533,002.918	UTM (NAD83, ZONE 17, METERS): NORTHING: 4,400,568.450 EASTING: 533,027.560



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. 2270 *[Signature]* 8/16/19



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 VIRGINIA ACCURACY PROVEN SOURCE OF GRADE GPS ELEVATION: (NAVD 88, US FT)

OPERATOR'S WELL #: YOCUM MSH 3H
API WELL #: 47 051 02124
STATE COUNTY PERMIT

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

WATERSHED: FISH CREEK ELEVATION: 1079.4'

DISTRICT: LIBERTY COUNTY: MARSHALL QUADRANGLE: LITTLETON, WV

SURFACE OWNER: JOSEPH LEE AND MICHAEL D. YOCUM ACREAGE: ± 97.07

OIL & GAS ROYALTY OWNER: JOSEPH LEE AND MICHAEL D. YOCUM ACREAGE: ± 97.07

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: 6,809.03 TVD 18,470 MD

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:
○ PROPOSED SURFACE HOLE / BOTTOM HOLE	— SURVEYED BOUNDARY		08-16-2019
⊙ EXISTING / PRODUCING WELLHEAD	— DRILLING UNIT		
LPL ⊙ LANDING POINT LOCATION	----- LEASE BOUNDARY		
⊙ EXISTING WATER WELL	— PROPOSED PATH		
⊙ EXISTING SPRING	— AS-DRILLED PATH		