

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

API 47-051-02125 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 205H
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 4,398,202.450 Easting 535,691.230
Landing Point of Curve Northing 4,398,556.770 Easting 535,939.770
Bottom Hole Northing 4,401,265.660 Easting 532,924.780

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 SEP 19 2019

WV Department of
Environmental Protection

Date permit issued 4/1/2019 Date drilling commenced 3/25/2019 Date drilling ceased 4/8/2019
Date completion activities began 5/29/2019 Date completion activities ceased 7/05/2019
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
Opelie Shamba 1/23/2020

Reviewed by:

API 47- 051 - 02125 Farm name JOSEPH LEE AND MICHAEL D. YOCUM Well number YOCUM MSH 205H

| 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, BBLS |
| Coal | SEE INTERMEDIATE | | | | | | |
| Intermediate 1 | 12.25 | 9.625 | 2550 | NEW | J-55/36# | | Y, 45 BBLS |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 8.75/8.50 | 5.5 | 21037 | NEW | P-110/20# | | Y, 48 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 | 479 | 15.60 | 1.19 | 570.01 | 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 | 3,989 | 15.60 | 1.19 | 4746.91 | SURFACE | 24 |
| Tubing | | | | | | | |

Drillers TD (ft) 21,037 Loggers TD (ft) 21,037
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure N/A

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Kick off depth (ft) 6,560'

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

WV Department of Environmental Protection

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 _____

API 47-051 - 02125 Farm name JOSEPH LEE AND MICHAEL D. YOCUM Well number YOCUM MSH 205H

PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|-----------|------------------|------------------------|----------------------|------------------------|--------------|
| | SEE | ATTACHMENT | 1 | | |
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Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

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| 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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Please insert additional pages as applicable.

API 47- 051 - 02125 Farm name JOSEPH LEE AND MICHAEL D. YOCUM Well number YOCUM MSH 205H

| <u>PRODUCING FORMATION(S)</u> | <u>DEPTHS</u> | |
|-------------------------------|---------------|-----------|
| MARCELLUS | 7,103' TVD | 7,585' MD |
| | | |
| | | |
| | | |

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2585 psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas 21,696 mcfpd Oil 19 bpd NGL _____ bpd Water 332 bpd GAS MEASURED BY Estimated Orifice Pilot

| LITHOLOGY/ FORMATION | TOP | BOTTOM | TOP | BOTTOM | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC) |
|-------------------------|-------------------------|--------------------|-------------------|-------------------|--|
| | DEPTH IN FT NAME TVD | DEPTH IN FT TVD | DEPTH IN FT MD | DEPTH IN FT MD | |
| | 0 | | 0 | | |
| | SEE | ATTACHMENT | 3 | | |
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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 ROAD City THE WOODLANDS State TX Zip 77380

Cementing Company BJ SERVICES
Address 11211 FM 2920 City TOMBALL State TX Zip 77377

Stimulating Company HALLIBURTON ENERGY SERVICES INC.
Address 1628 JACKSON MILL RD City JANE LEW State WV Zip 26378

Please insert additional pages as applicable.

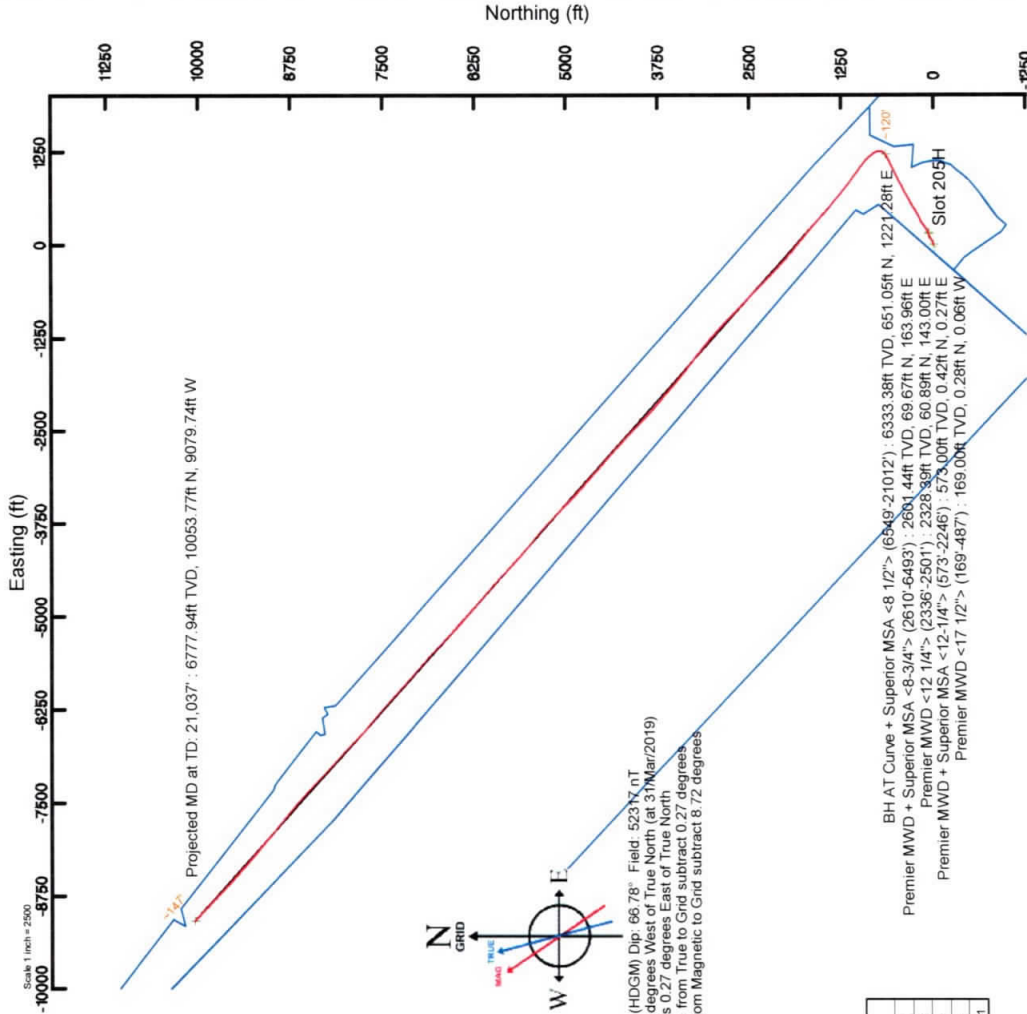
Completed by BOBBY WILLIS Telephone 832-796-2884
Signature  Title SENIOR REGULATORY ANALYST Date 9/18/2019

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

Location: Marshall County, WV
 Field: Marshall
 Facility: Yocum MSH Pad
 Slot: Slot 205H
 Well: Yocum MSH 205H
 Wellbore: Yocum MSH 205H PWB

Plot reference wellbore is Yocum MSH 205H PWB Rev-C 0
 True vertical depths are referenced to SDC 46 (KB)
 Measured depths are referenced to SDC 46 (KB)
 SDC 46 (KB) to Mean Sea Level: 1079.4 feet
 Mean Sea Level to Mud Line (At Slot Slot 205H): -1053.4 feet
 Coordinates are in feet referenced to Slot

| Location Information | | | |
|--|-------------------|--------------------|-----------------|
| Facility Name | Grid East (US ft) | Grid North (US ft) | Longitude |
| Yocum MSH Pad | 1442976.622 | 3094359.530 | 80°35'01.421" W |
| Slot | Local E (ft) | Local N (ft) | Longitude |
| Slot 205H | -16.43 | 66.92 | 80°35'00.568" W |
| SDC 46 (KB) to Mud Line (At Slot Slot 205H) | 1737513.629 | 1442976.622 | 26ft |
| Mean Sea Level to Mud Line (At Slot Slot 205H) | | | -1053.4ft |
| SDC 46 (KB) to Mean Sea Level | | | 1079.4ft |



User specified (HDGM) Dip: 66.78° Field: 523° N NT
 Magnetic North is 8.45 degrees West of True North (at 31Mar2019)
 Grid North is 0.27 degrees East of True North
 To correct azimuth from True to Grid subtract 0.27 degrees
 To correct azimuth from Magnetic to Grid subtract 8.72 degrees

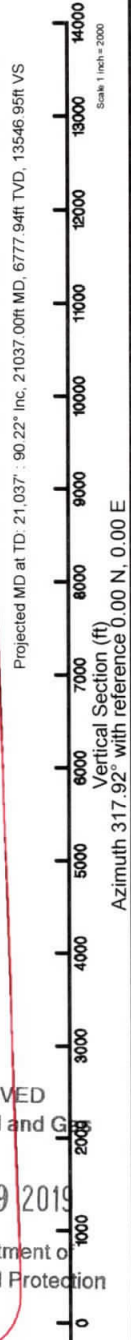
- Premier MWD <17 1/2"> (169-487) : 0.23° Inc, 169.00ft MD, 169.00ft TVD, 0.25ft VS
- Premier MWD + Superior MSA <12-1/4"> (573-2246) : 0.30° Inc, 573.00ft MD, 573.00ft TVD, 0.13ft VS
- Premier MWD <12 1/4"> (2336-2501) : 5.01° Inc, 2336.00ft MD, 2328.39ft TVD, -50.64ft VS
- Premier MWD + Superior MSA <8-3/4"> (2610-6493) : 4.22° Inc, 2610.00ft MD, 2601.44ft TVD, -58.17ft VS

| Well Profile Data | | | | | |
|-------------------|----------|---------|---------|----------|---------|
| Design Comment | MD (ft) | Inc (") | Az (°) | TVD (ft) | VS (ft) |
| Top On | 8035.00 | 91.670 | 310.290 | 7113.37 | 3.26 |
| Proj. Hole Depth | 8063.00 | 91.670 | 310.290 | 7112.49 | 0.00 |
| Adj. Inc/Az | 8179.20 | 91.839 | 312.026 | 7108.94 | 1.50 |
| BHL | 21034.46 | 91.839 | 312.026 | 6696.50 | 0.00 |

- BH AT Curve + Superior MSA <8 1/2"> (6549-21012) : 6333.38ft TVD, 651.05ft N, 1221.28ft E
- Premier MWD + Superior MSA <8-3/4"> (2610-6493) : 2601.44ft TVD, 69.67ft N, 163.96ft E
- Premier MWD <12 1/4"> (2336-2501) : 2328.39ft TVD, 60.69ft N, 143.00ft E
- Premier MWD + Superior MSA <12-1/4"> (573-2246) : 573.00ft TVD, 0.42ft N, 0.27ft E
- Premier MWD <17 1/2"> (169-487) : 169.00ft TVD, 0.28ft N, 0.06ft W

BH AT Curve + Superior MSA <8 1/2"> (6549-21012) : 23.05° Inc, 6549.00ft MD, 6333.38ft TVD, -335.25ft VS

API: 47-051-02125-0000
 BH Job # 109703985
 Rig: SDC 46
 Duration: 3/30/2019 - 4/04/2019



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Hydraulic Fracturing Fluid Product Component Information Disclosure

| | |
|--------------------------------|---------------------|
| Job Start Date: | 5/9/2019 |
| Job End Date: | 6/16/2019 |
| State: | West Virginia |
| County: | Marshall |
| API Number: | 47-051-02125-00-00 |
| Operator Name: | Southwestern Energy |
| Well Name and Number: | Yocum MSH 205H |
| Latitude: | 39.73290000 |
| Longitude: | -80.58340000 |
| Datum: | NAD83 |
| Federal Well: | NO |
| Indian Well: | NO |
| True Vertical Depth: | 6,917 |
| Total Base Water Volume (gal): | 21,105,075 |
| 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 | 85.26943 | Density = 8.34 |
| Produced Water | Halliburton | Base Fluid | | | | | |
| | | | Water | 7732-18-5 | 100.00000 | 4.13631 | Density = 8.34 |

| Ingredients | Listed Above | Listed Above | Listed Above | | | | | | | |
|-----------------------------------|------------------|--------------|--------------------------|-------|--|--------------|-----------|---------|--|--|
| | | | | Water | | 7732-18-5 | 100.00000 | 0.59147 | | |
| BE-9 | Halliburton | | Biocide | | | | | | | |
| FSTI-IC-001 | FSTI | | Iron Control Agent | | | Listed Below | | | | |
| | | | | | | Listed Below | | | | |
| HYDROCHLORIC ACID | Halliburton | | Solvent | | | | | | | |
| | | | | | | Listed Below | | | | |
| SCAL16486A | Nalco (Champion) | | Scale Inhibitor | | | | | | | |
| | | | | | | Listed Below | | | | |
| MC LD-2850 | MultiChem | | Friction Reducer | | | | | | | |
| | | | | | | Listed Below | | | | |
| Sand-Premium White-40/70 | Halliburton | | Proppant | | | | | | | |
| | | | | | | Listed Below | | | | |
| Sand-Common White-100 Mesh, SSA-2 | Halliburton | | Proppant | | | | | | | |
| | | | | | | Listed Below | | | | |
| FSTI-CI-01 | FSTI | | Acid Corrosion Inhibitor | | | Listed Below | | | | |

| | | | | | | | | | |
|---|-------------|------------------|--|-------------|--------------|-----------|--|---------|--|
| Excellerate LX-1 | Halliburton | Friction Reducer | | | Listed Below | | | | |
| | | | | | 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 | | 9.94501 | |
| | | | Hydrochloric acid | 7647-01-0 | | 15.00000 | | 0.08097 | |
| | | | Hydrotreated light petroleum distillate | 64742-47-8 | | 30.00000 | | 0.02627 | |
| | | | Polyacrylate | Proprietary | | 30.00000 | | 0.01855 | |
| | | | Ethanediamine, N,N,N-trimethyl-2-[(1-oxo-2-propen-1-yl)oxy]-, chloride (1:1), polymer with 2-propenamide | 69418-26-4 | | 30.00000 | | 0.00772 | |
| | | | Ammonium chloride | 12125-02-9 | | 10.00000 | | 0.00566 | |
| | | | Sodium chloride | 7647-14-5 | | 10.00000 | | 0.00566 | |
| | | | Ethoxylated fatty acid | Proprietary | | 5.00000 | | 0.00309 | |
| | | | Fatty acid ester | Proprietary | | 5.00000 | | 0.00309 | |
| | | | Castor oil, ethoxylated | 61791-12-6 | | 10.00000 | | 0.00257 | |
| | | | Ethylene glycol | 107-21-1 | | 30.00000 | | 0.00193 | |
| | | | Amine Triphosphate | Proprietary | | 30.00000 | | 0.00193 | |
| | | | Acetic acid | 64-19-7 | | 60.00000 | | 0.00163 | |
| | | | Alcohols, C12-16, ethoxylated | 68551-12-2 | | 5.00000 | | 0.00129 | |
| | | | 9-Octadecenamide, n,n-bis-(hydroxy-ethyl)-,(Z) | 93-83-4 | | 5.00000 | | 0.00129 | |
| | | | Sorbitan monooleate polyoxyethylene derivative | 9005-65-6 | | 5.00000 | | 0.00129 | |
| | | | Tributyl tetradecyl phosphonium chloride | 81741-28-8 | | 10.00000 | | 0.00120 | |
| | | | Citric acid | 77-92-9 | | 40.00000 | | 0.00109 | |
| | | | Methanol | 67-56-1 | | 80.00000 | | 0.00063 | |

| | | | | | | | |
|--|--|--|---|--------------|----------|---------|--|
| | | | Fatty acids | Trade Secret | 10.00000 | 0.00007 | |
| | | | Hydroquinone monomethyl ether | 150-76-5 | 0.10000 | 0.00003 | |
| | | | Diethanolamine | 111-42-2 | 0.10000 | 0.00003 | |
| | | | Nitrotriacetic acid, trisodium salt monohydrate | 5064-31-3 | 0.10000 | 0.00003 | |
| | | | Sodium glycollate | 2836-32-0 | 0.10000 | 0.00003 | |
| | | | Formaldehyde | 50-00-0 | 0.10000 | 0.00003 | |
| | | | Ethylenediaminetetraacetic acid, tetrasodium salt | 64-02-8 | 0.10000 | 0.00003 | |
| | | | 1,4-Dioxane | 123-91-1 | 0.10000 | 0.00003 | |

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

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

*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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)

**YOCUM MSH 205H
ATTACHMENT 1
PERF REPORT**

| STAGE NUM | Perf Date | Perf Top MD | Perf Bottom MD | # SHOTS PER STG |
|-----------|-----------|-------------|----------------|-----------------|
| 1 | 5/1/2019 | 20,994 | 20,895 | |
| 2 | 5/10/2019 | 20,861 | 20,685 | 24 |
| 3 | 5/10/2019 | 20,651 | 20,475 | 24 |
| 4 | 5/10/2019 | 20,441 | 20,265 | 24 |
| 5 | 5/10/2019 | 20,231 | 20,055 | 24 |
| 6 | 5/14/2019 | 20,021 | 19,845 | 24 |
| 7 | 5/18/2019 | 19,811 | 19,635 | 18 |
| 8 | 5/18/2019 | 19,597 | 19,425 | 18 |
| 9 | 5/18/2019 | 19,387 | 19,215 | 18 |
| 10 | 5/19/2019 | 19,181 | 19,005 | 18 |
| 11 | 5/19/2019 | 18,971 | 18,795 | 18 |
| 12 | 5/19/2019 | 18,761 | 18,585 | 18 |
| 13 | 5/19/2019 | 18,547 | 18,375 | 18 |
| 14 | 5/20/2019 | 18,341 | 18,165 | 18 |
| 15 | 5/20/2019 | 18,131 | 17,957 | 18 |
| 16 | 5/21/2019 | 17,921 | 17,745 | 18 |
| 17 | 5/21/2019 | 17,711 | 17,535 | 18 |
| 18 | 5/21/2019 | 17,497 | 17,325 | 18 |
| 19 | 5/22/2019 | 17,291 | 17,115 | 18 |
| 20 | 5/22/2019 | 17,081 | 16,905 | 18 |
| 21 | 5/23/2019 | 16,871 | 16,695 | 18 |
| 22 | 5/23/2019 | 16,661 | 16,345 | 27 |
| 23 | 5/23/2019 | 16,486 | 16,275 | 9 |
| 24 | 5/23/2019 | 16,241 | 16,065 | 18 |
| 25 | 5/24/2019 | 16,031 | 15,855 | 18 |
| 26 | 5/25/2019 | 15,821 | 15,645 | 18 |
| 27 | 5/25/2019 | 15,611 | 15,435 | 18 |
| 28 | 5/26/2019 | 15,401 | 15,225 | 18 |
| 29 | 5/26/2019 | 15,191 | 15,015 | 18 |
| 30 | 5/26/2019 | 14,981 | 14,805 | 18 |
| 31 | 5/27/2019 | 14,771 | 14,595 | 18 |
| 32 | 5/27/2019 | 14,561 | 14,385 | 18 |
| 33 | 5/27/2019 | 14,346 | 14,175 | 18 |
| 34 | 5/28/2019 | 14,141 | 13,965 | 18 |
| 35 | 5/28/2019 | 13,931 | 13,755 | 18 |
| 36 | 5/28/2019 | 13,721 | 13,545 | 18 |
| 37 | 5/29/2019 | 13,511 | 13,335 | 24 |
| 38 | 5/29/2019 | 13,301 | 13,125 | 24 |
| 39 | 5/30/2019 | 13,091 | 12,915 | 24 |
| 40 | 5/30/2019 | 12,881 | 12,708 | 24 |
| 41 | 5/31/2019 | 12,671 | 12,495 | 24 |
| 42 | 5/31/2019 | 12,461 | 12,285 | 24 |
| 43 | 6/1/2019 | 12,251 | 12,072 | 24 |

**YOCUM MSH 205H
ATTACHMENT 1
PERF REPORT**

| STAGE NUM | Perf Date | Perf Top MD | Perf Bottom MD | # SHOTS PER STG |
|-----------|-----------|-------------|----------------|-----------------|
| 44 | 6/1/2019 | 12,041 | 11,865 | 24 |
| 45 | 6/2/2019 | 11,830 | 11,655 | 24 |
| 46 | 6/3/2019 | 11,621 | 11,445 | 24 |
| 47 | 6/4/2019 | 11,411 | 11,235 | 24 |
| 48 | 6/4/2019 | 11,201 | 11,025 | 24 |
| 49 | 6/5/2019 | 10,991 | 10,812 | 24 |
| 50 | 6/5/2019 | 10,781 | 10,605 | 24 |
| 51 | 6/6/2019 | 10,571 | 10,395 | 24 |
| 52 | 6/6/2019 | 10,361 | 10,185 | 18 |
| 53 | 6/7/2019 | 10,147 | 9,975 | 18 |
| 54 | 6/7/2019 | 9,941 | 9,765 | 43 |
| 55 | 6/9/2019 | 9,731 | 9,555 | 18 |
| 56 | 6/9/2019 | 9,521 | 9,345 | 18 |
| 57 | 6/10/2019 | 9,311 | 9,135 | 18 |
| 58 | 6/11/2019 | 9,101 | 8,925 | 36 |
| 59 | 6/13/2019 | 8,891 | 8,715 | 36 |
| 60 | 6/13/2019 | 8,679 | 8,505 | 36 |
| 61 | 6/14/2019 | 8,467 | 8,295 | 36 |
| 62 | 6/14/2019 | 8,261 | 8,085 | 36 |
| 63 | 6/14/2019 | 8,047 | 7,875 | 36 |
| 64 | 6/16/2019 | 7,837 | 7,665 | 36 |

YOCUM MSH 205H

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 | 5/9/2019 | 75.2 | 8,956 | 8,454 | 3,806 | 280,370 | 7,511 | 0 |
| 2 | 5/10/2019 | 75 | 8,526 | 4,877 | 4,096 | 315,131 | 8,534 | 0 |
| 3 | 5/10/2019 | 71 | 8,449 | 5,698 | 4,353 | 316,163 | 7,997 | 0 |
| 4 | 5/10/2019 | 72.3 | 8,171 | 5,875 | 4,546 | 314,903 | 7,975 | 0 |
| 5 | 5/11/2019 | 83.6 | 8,593 | 4,552 | 4,294 | 314,617 | 8,025 | 0 |
| 6 | 5/14/2019 | 73.4 | 8,476 | 5,258 | 4,457 | 315,462 | 6,511 | 0 |
| 7 | 5/18/2019 | 64.5 | 7,991 | 6,013 | 4,405 | 315,038 | 7,383 | 0 |
| 8 | 5/18/2019 | 65 | 8,162 | 7,759 | 4,759 | 314,568 | 7,427 | 0 |
| 9 | 5/18/2019 | 61.4 | 8,224 | 5,876 | 4,628 | 315,020 | 7,533 | 0 |
| 10 | 5/18/2019 | 61.9 | 8,074 | 5,449 | 4,540 | 315,154 | 7,040 | 0 |
| 11 | 5/19/2019 | 56.8 | 8,178 | 5,510 | 4,124 | 314,100 | 7,636 | 0 |
| 12 | 5/19/2019 | 66.4 | 8,471 | 5,236 | 4,656 | 310,970 | 7,411 | 0 |
| 13 | 5/20/2019 | 62.8 | 8,167 | 5,633 | 4,424 | 314,540 | 7,165 | 0 |
| 14 | 5/20/2019 | 66.8 | 8,461 | 5,846 | 4,654 | 315,788 | 7,391 | 0 |
| 15 | 5/20/2019 | 53 | 8,505 | 5,678 | 4,130 | 315,540 | 7,897 | 0 |
| 16 | 5/21/2019 | 66.8 | 8,337 | 5,504 | 4,469 | 315,666 | 7,089 | 0 |
| 17 | 5/21/2019 | 14.7 | 8,370 | 5,364 | 4,854 | 2,635 | 3,199 | 0 |
| 18 | 5/22/2019 | 67.3 | 8,456 | 5,692 | 4,561 | 315,390 | 8,416 | 0 |
| 19 | 5/22/2019 | 66.9 | 8,520 | 5,667 | 4,430 | 314,900 | 7,675 | 0 |
| 20 | 5/22/2019 | 65.6 | 8,287 | 5,648 | 4,002 | 316,700 | 9,032 | 0 |
| 21 | 5/23/2019 | 60.2 | 8,399 | 6,097 | 4,658 | 315,643 | 10,079 | 0 |
| 22 | 5/23/2019 | 61.9 | 8,428 | 5,575 | 4,410 | 314,340 | 7,223 | 0 |
| 23 | 5/24/2019 | 67.2 | 8,385 | 5,735 | 4,311 | 319,073 | 9,715 | 0 |
| 24 | 5/24/2019 | 57.3 | 8,040 | 5,804 | 4,182 | 316,040 | 8,182 | 0 |
| 25 | 5/25/2019 | 69.6 | 8,039 | 5,305 | 3,968 | 316,200 | 8,605 | 0 |
| 26 | 5/25/2019 | 69.5 | 8,525 | 5,559 | 4,487 | 315,962 | 7,932 | 0 |
| 27 | 5/26/2019 | 57.2 | 8,077 | 6,066 | 4,355 | 314,570 | 7,613 | 0 |
| 28 | 5/26/2019 | 66 | 8,170 | 5,915 | 4,164 | 316,930 | 7,996 | 0 |
| 29 | 5/26/2019 | 73.2 | 8,483 | 5,981 | 4,345 | 316,764 | 7,909 | 0 |
| 30 | 5/27/2019 | 63.1 | 7,981 | 6,037 | 4,456 | 314,960 | 7,416 | 0 |
| 31 | 5/27/2019 | 61.5 | 8,217 | 5,884 | 4,311 | 316,356 | 7,714 | 0 |
| 32 | 5/27/2019 | 74.4 | 8,464 | 4,724 | 4,601 | 321,834 | 7,573 | 0 |
| 33 | 5/27/2019 | 60 | 8,261 | 7,243 | 4,483 | 314,950 | 7,305 | 0 |
| 34 | 5/28/2019 | 47 | 8,665 | 6,085 | 4,336 | 315,153 | 7,799 | 0 |
| 35 | 5/28/2019 | 73.5 | 7,929 | 2,439 | 4,379 | 315,050 | 7,764 | 0 |
| 36 | 5/29/2019 | 74.2 | 8,180 | 5,846 | 4,549 | 314,070 | 10,146 | 0 |
| 37 | 5/29/2019 | 69.2 | 7,961 | 5,967 | 4,629 | 285,527 | 7,908 | 0 |
| 38 | 5/30/2019 | 65.7 | 7,319 | 5,828 | 4,401 | 314,260 | 10,525 | 0 |
| 39 | 5/30/2019 | 79 | 8,156 | 5,874 | 4,486 | 316,260 | 7,912 | 0 |
| 40 | 5/31/2019 | 85.1 | 8,332 | 5,615 | 4,888 | 314,210 | 7,892 | 0 |
| 41 | 5/31/2019 | 79 | 8,017 | 5,722 | 4,304 | 315,588 | 7,979 | 0 |
| 42 | 5/31/2019 | 84 | 8,196 | 5,855 | 5,117 | 504,361 | 7,958 | 0 |
| 43 | 6/1/2019 | 84.5 | 8,206 | 5,681 | 4,822 | 316,359 | 8,023 | 0 |
| 44 | 6/2/2019 | 83.7 | 8,507 | 5,940 | 5,349 | 269,463 | 6,953 | 0 |
| 45 | 6/3/2019 | 93.8 | 8,174 | 5,659 | 4,869 | 318,330 | 7,985 | 0 |
| 46 | 6/3/2019 | 90.6 | 8,338 | 6,060 | 4,989 | 315,438 | 7,860 | 0 |
| 47 | 6/4/2019 | 91.6 | 8,149 | 5,631 | 4,485 | 252,130 | 7,514 | 0 |
| 48 | 6/5/2019 | 85.6 | 8,298 | 6,335 | 5,216 | 243,850 | 6,773 | 0 |
| 49 | 6/5/2019 | 88.2 | 8,213 | 5,992 | 5,326 | 314,670 | 7,934 | 0 |
| 50 | 6/6/2019 | 89.1 | 8,046 | 5,681 | 4,504 | 315,440 | 7,608 | 0 |
| 51 | 6/6/2019 | 85.7 | 8,165 | 5,581 | 4,251 | 314,950 | 8,312 | 0 |
| 52 | 6/7/2019 | 78.9 | 8,140 | 6,010 | 4,407 | 314,340 | 8,193 | 0 |
| 53 | 6/7/2019 | 64.5 | 8,394 | 6,190 | 4,357 | 314,180 | 8,956 | 0 |

**YOCUM MSH 205H
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 | 6/9/2019 | 79.7 | 8,098 | 5,646 | 4,327 | 313,800 | 9,997 | 0 |
| 55 | 6/9/2019 | 65.1 | 8,318 | 5,795 | 4,113 | 315,040 | 8,059 | 0 |
| 56 | 6/10/2019 | 70.9 | 8,522 | 5,654 | 4,817 | 261,460 | 7,736 | 0 |
| 57 | 6/11/2019 | 72.4 | 8,246 | 6,205 | 4,314 | 315,260 | 7,540 | 0 |
| 58 | 6/13/2019 | 99.1 | 8,036 | 5,946 | 5,092 | 316,383 | 8,805 | 0 |
| 59 | 6/13/2019 | 99.1 | 7,789 | 5,664 | 4,683 | 315,850 | 8,480 | 0 |
| 60 | 6/14/2019 | 98.8 | 7,753 | 5,549 | 4,864 | 315,302 | 7,792 | 0 |
| 61 | 6/14/2019 | 99.1 | 7,868 | 5,712 | 4,343 | 315,370 | 7,804 | 0 |
| 62 | 6/14/2019 | 99.6 | 7,557 | 5,845 | 4,292 | 316,307 | 7,840 | 0 |
| 63 | 6/14/2019 | 99.5 | 7,517 | 5,476 | 4,497 | 315,446 | 7,808 | 0 |
| 64 | 6/16/2019 | 99.9 | 7,408 | 5,646 | 4,551 | 317,070 | 7,662 | 0 |



ATTACHMENT 3
47051021250000

Well Name: Yocum MSH 205H

| 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 | |
| Rhonestreet (shale) | 6618.00 | 6398.00 | 6960.00 | 6721.00 | |
| Cashaqua (shale) | 6960.00 | 6721.00 | 7096.00 | 6843.00 | |
| Middlesex (shale) | 7096.00 | 6843.00 | 7224.00 | 6943.00 | |
| Burket (shale) | 7224.00 | 6943.00 | 7268.00 | 6974.00 | |
| Tully (ls) | 7268.00 | 6974.00 | 7302.00 | 6994.00 | |
| Mahantango (shale) | 7302.00 | 6994.00 | 7585.00 | 7103.00 | |
| Marcellus (shale) | 7585.00 | 7103.00 | NA | NA | GAS |

THRASHER

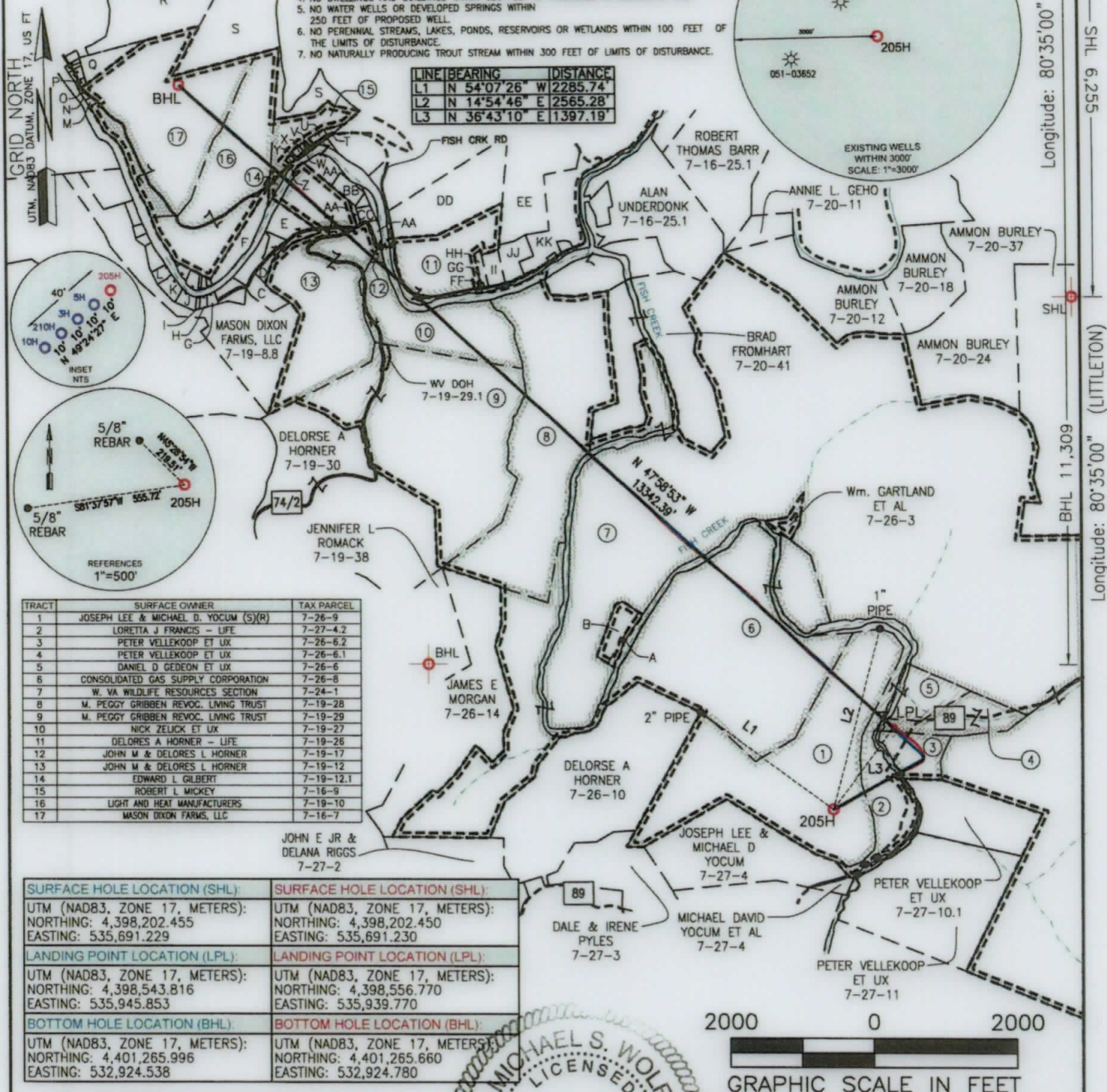
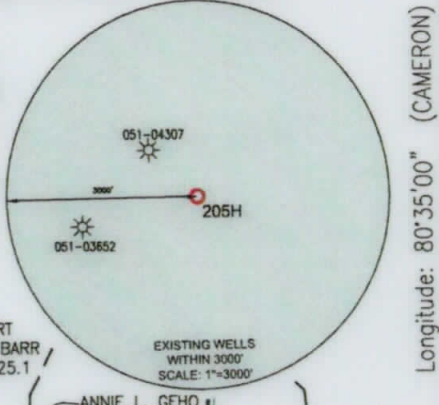
THE THRASHER GROUP, INC.
600 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE 304-624-4108

Latitude: 39°45'00" (LITTLETON) SHL 111'
BHL 9,141'
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 PLAN DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED OF 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 54°07'26" W | 2285.74' |
| L2 | N 14°54'46" E | 2565.28' |
| L3 | N 36°43'10" E | 1397.19' |



| TRACT | SURFACE OWNER | TAX PARCEL |
|-------|--------------------------------------|------------|
| 1 | JOSEPH LEE & MICHAEL D. YOCUM (S/R) | 7-26-9 |
| 2 | LORETTA J FRANCIS - LIFE | 7-27-4.2 |
| 3 | PETER VELLEKOOP ET UX | 7-26-6.2 |
| 4 | PETER VELLEKOOP ET UX | 7-26-6.1 |
| 5 | DANIEL D GEDEON ET UX | 7-26-6 |
| 6 | CONSOLIDATED GAS SUPPLY CORPORATION | 7-26-8 |
| 7 | W. VA WILDLIFE RESOURCES SECTION | 7-24-1 |
| 8 | M. PEGGY GRIBBEN REVOC. LIVING TRUST | 7-19-28 |
| 9 | M. PEGGY GRIBBEN REVOC. LIVING TRUST | 7-19-29 |
| 10 | NICK ZELUCK ET UX | 7-19-27 |
| 11 | DELRORSE A HORNER - LIFE | 7-19-26 |
| 12 | JOHN W & DELORES L HORNER | 7-19-17 |
| 13 | JOHN W & DELORES L HORNER | 7-19-12 |
| 14 | EDWARD L GILBERT | 7-19-12.1 |
| 15 | ROBERT L MICKY | 7-16-9 |
| 16 | LIGHT AND HEAT MANUFACTURERS | 7-19-10 |
| 17 | MASON DIXON FARMS, LLC | 7-16-7 |

| SURFACE HOLE LOCATION (SHL): | SURFACE HOLE LOCATION (SHL): |
|--|--|
| UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,202.455 EASTING: 535,691.229 | UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,202.450 EASTING: 535,691.230 |
| LANDING POINT LOCATION (LPL): | LANDING POINT LOCATION (LPL): |
| UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,543.816 EASTING: 535,945.853 | UTM (NAD83, ZONE 17, METERS): NORTHING: 4,398,556.770 EASTING: 535,939.770 |
| BOTTOM HOLE LOCATION (BHL): | BOTTOM HOLE LOCATION (BHL): |
| UTM (NAD83, ZONE 17, METERS): NORTHING: 4,401,265.996 EASTING: 532,924.538 | UTM (NAD83, ZONE 17, METERS): NORTHING: 4,401,265.660 EASTING: 532,924.780 |

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



COMPANY: **SWN** Production Company, LLC
Production Company, LLC Production Company™

| | | |
|---|--|---|
| <p>(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS</p> <p>WVDEP OFFICE OF OIL & GAS 601 57TH STREET CHARLESTON, WV 25034</p> | <p>MINIMUM DEGREE OF ACCURACY: 1/200</p> <p>PROVEN SURVEY SOURCE OF GRADE GPS ELEVATION: (NAVD 88, US FT)</p> | <p>OPERATOR'S WELL #: YOCUM MSH 205H</p> <p>API WELL #: 47 051 02125 STATE COUNTY PERMIT</p> |
| | <p>WELL TYPE: OIL <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/> PRODUCTION <input 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"/></p> <p>WATERSHED: FISH CREEK ELEVATION: 1079.4'</p> <p>DISTRICT: LIBERTY COUNTY: MARSHALL QUADRANGLE: LITTLETON, WV</p> <p>SURFACE OWNER: JOSEPH LEE AND MICHAEL D. YOCUM ACREAGE: ± 97.07</p> <p>OIL & GAS ROYALTY OWNER: JOSEPH LEE AND MICHAEL D. YOCUM ACREAGE: ± 97.07</p> <p>DRILL <input type="checkbox"/> DRILL DEEPER <input type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input type="checkbox"/> PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input type="checkbox"/></p> <p>CONVERT <input type="checkbox"/> PLUG & ABANDON <input type="checkbox"/> CLEAN OUT & REPLUG <input type="checkbox"/> OTHER CHANGE <input type="checkbox"/> (SPECIFY) AS-DRILLED</p> <p>TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,777.94 TVD 21,037 MD</p> | <p>WELL OPERATOR: SWN PRODUCTION COMPANY, LLC ADDRESS: 1300 FORT PIERPONT DRIVE SUITE 201 CITY: MORGANTOWN STATE: WV ZIP CODE: 26508</p> <p>DESIGNATED AGENT: BRITTANY WOODY ADDRESS: 1300 FORT PIERPONT DRIVE SUITE 201 CITY: MORGANTOWN STATE: WV ZIP CODE: 26508</p> |
| <p>LEGEND:</p> <ul style="list-style-type: none"> ○ PROPOSED SURFACE HOLE / BOTTOM HOLE ☀ EXISTING / PRODUCING WELLHEAD LPL ✕ LANDING POINT LOCATION ⊙ EXISTING WATER WELL ⊙ EXISTING SPRING — SURVEYED BOUNDARY — DRILLING UNIT ===== LEASE BOUNDARY — PROPOSED PATH — AS-DRILLED PATH | <p>REVISIONS:</p> <p>DATE: 8-16-2019</p> <p>DRAWN BY: K. POTH SCALE: 1" = 2000' DRAWING NO: 030-3170 WELL LOCATION PLAN</p> | |