

west virginia department of environmental protection

Office of Oil and Gas 601 57th Street, S.E. Charleston, WV 25304 (304) 926-0450 fax: (304) 926-0452

Austin Caperton, Cabinet Secretary www.dep.wv.gov

Thursday, August 2, 2018 WELL WORK PERMIT Horizontal 6A / New Drill

TUG HILL OPERATING, LLC 380 SOUTHPOINTE BOULEVARD, PLAZA II SUITE 200 CANNONSBURG, PA 15317

Re: Permit approval for BLAKE N-8HM 47-051-02054-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0450.

James A. Martin

Chief

Operator's Well Number: BLAKE N-8HM

Farm Name: BLAKE, RUSSELL, ET AL

U.S. WELL NUMBER: 47-051-02054-00-00

Horizontal 6A New Drill Date Issued: 8/2/2018

API Number: 47-05/-02054

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

- 1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
- 2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
- 3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
- 4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
- 5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
- 6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
- 7. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
- 8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
- 9. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
- 10. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

API Number: 47-051-02054

PERMIT CONDITIONS

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, cessation of drilling, sending an email to DEPOOGNotify@wv.gov.

WW-6B (04/15) 4705102054
API NO. 47-051
OPERATOR WELL NO. Blake N-8HM
Well Pad Name: Blake

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS WELL WORK PERMIT APPLICATION

| 1) Well Operator: Tu | ug Hill Operating, LLC | 494510851 | Marshall | Franklin | Glen Easton 7.5' |
|------------------------------|---|--|------------------------------------|----------------------------------|---|
| _ | | Operator ID | County | District | Quadrangle |
| 2) Operator's Well Nu | mber: Blake N-8HM | Well F | ad Name: Blak | ке | |
| 3) Farm Name/Surface | e Owner: Blake, Russe | ell, et al Public R | oad Access: Bu | ırch Ridge Ro | oad - County Route 29 |
| 4) Elevation, current g | ground: 1326' | Elevation, propose | d post-construc | tion: 1326' | 0 |
| 5) Well Type (a) Ga Other | | Un | derground Stor | rage | |
| (b)If (| Gas Shallow x | Deep | | | 4.20 |
| | Horizontal X | | | Ju | 124/18 |
| 6) Existing Pad: Yes o | or No Yes | | _ | 07/ | 1211 |
| | ermation(s), Depth(s), Ast formation at a depth of 64 | | | | of approx. 3800 psi |
| 8) Proposed Total Ver | tical Depth: 6,647' | | | | |
| 9) Formation at Total | | daga | | | |
| 10) Proposed Total Me | easured Depth: 17,50 | 7' | | | |
| 11) Proposed Horizont | tal Leg Length: 10,02 | 7' | | | |
| 12) Approximate Fresh | h Water Strata Depths: | 70', 1042' | | | |
| 13) Method to Determ | ine Fresh Water Depths | . Use shallow offset wells to determine de | repest freshwater. Or determine us | ing prednil tests, testing while | drilling or petrophysical evaluation of resistivity |
| 14) Approximate Saltv | water Depths: 2,167' | | | | |
| 15) Approximate Coal | Seam Depths: Sewick | ly Coal - 951' and l | Pittsburgh Coa | al - 1036' | |
| 16) Approximate Dept | th to Possible Void (coal | l mine, karst, other): | None anticip | ated | |
| | ell location contain coal : djacent to an active min | | N | o X | RECEIVED |
| (a) If Yes, provide M | fine Info: Name: | | | | office of Oil and Gas |
| (, 1. 1.00, provide in | Depth: | | | | JUL 2 6 2018 |
| | Seam: | | | Er | WV Department of ovironmental Protection |
| | Owner: | | | | rotection |

WW-6B (04/15)

| API NO. 47- 051 - | | |
|-------------------|-------|-------------|
| OPERATOR WELL | NO. | Blake N-8HM |
| Well Pad Name: | Blake | |

18)

CASING AND TUBING PROGRAM

| TYPE | Size (in) | New or Used | <u>Grade</u> | Weight per ft. (lb/ft) | FOOTAGE: For Drilling (ft) | INTERVALS: Left in Well (ft) | CEMENT: Fill-up (Cu. Ft.)/CTS |
|--------------|--------------|-------------------|--------------|---------------------------|-------------------------------|------------------------------------|-------------------------------------|
| Conductor | 30" | NEW | BW | BW | 120' | 120' | 259FT^3(CTS) |
| Fresh Water | 13 3/8" | NEW | H40 | 48# | 1,140' | 1,140' | 1142ft^3(CTS) |
| Coal | 13 3/8" | NEW | H40 | 48# | 1,140' | 1,140' | 1142ft^3(CTS) |
| Intermediate | 9 5/8" | NEW | J55 | 36# | 2,600' | 2,600' | 933ft^3(CTS) |
| Production | 5 1/2" | NEW | P110 | 20# | 17,507' | 17,507' | 3950ft^3(CTS) |
| Tubing | 2 3/8" | NEW | N80 | 4.7# | | 7,560' | |
| Liners | | | | | | | |

8 1/24/18

| ТҮРЕ | Size (in) | Wellbore Diameter (in) | Wall Thickness (in) | Burst Pressure (psi) | Anticipated Max. Internal Pressure (psi) | Cement Type | Cement Yield (cu. ft./k) |
|--------------|-----------|---------------------------|---------------------------|-------------------------|--|----------------|--------------------------------|
| Conductor | 30" | 36" | 1.0 | 2,333 | 1,866 | CLASS A | 1.2 |
| Fresh Water | 13 3/8" | 17 1/2" | .33 | 1,730 | 1,384 | SEE #24 | 1.2 |
| Coal | 13 3/8" | 17 1/2" | .33 | 1,730 | 1,384 | SEE#24 | 1.2 |
| Intermediate | 9 5/8" | 12 1/4" | .352 | 3,520 | 2,816 | SEE#24 | 1.19 |
| Production | 5 1/2" | 8 7/8_8 3/4 | .361 | 12,640 | 9,000 | SEE#24 | 1.17/1.19 |
| Tubing | 2 3/8" | | .19 | 11,200 | 8,960 | | |
| Liners | | | | | | | |

PACKERS

| Kind: | N/A | |
|-------------|-----|-----------------------|
| Sizes: | N/A | Office of Oil and Gar |
| Depths Set: | N/A | JUL 26 2018 |

API NO. 47- 051 0 5 1 0 2 0 5 4

OPERATOR WELL NO. Blake N-8HM

Well Pad Name: Blake

Ju 124/18

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill through the Marcellus and TD Pilot Hole 100' into the Onondaga. Log vertical section and run a solid cement plug back to proposed KOP. Drill curve and lateral per proposed well plan, run and cement production casing. Perform CBL from 60 deg to surface, make cleanout run, and stimulate.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Well to be completed with approximately 25,067,500 lb proppant and 387,562 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

- 21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 20.72 acres
- 22) Area to be disturbed for well pad only, less access road (acres): 5.94 acres
- 23) Describe centralizer placement for each casing string:

Will run 3 centralizers on surface casing at equal distance. Intermediate will have 1 centralizer every other joint. Production casing will have one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

24) Describe all cement additives associated with each cement type:

*See Attachment

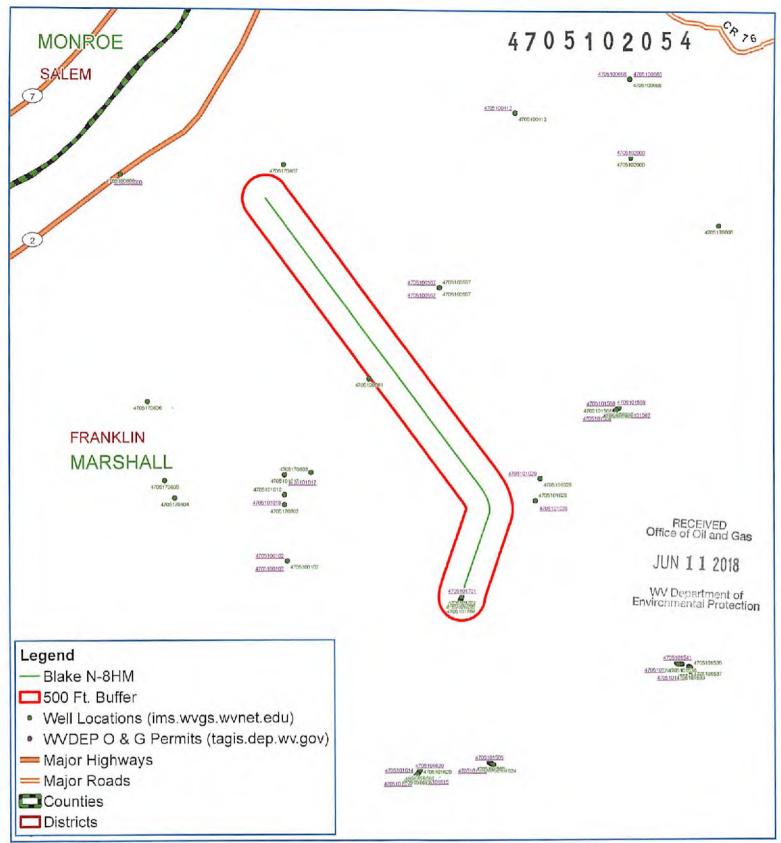
Office of Oil and Gas

25) Proposed borehole conditioning procedures:

JUL 26 2018

Will circulate a minimum of 3 hours at TD, short trip to curve, circulate bottoms up, the charge of POOH

^{*}Note: Attach additional sheets as needed.





Map Created May 4, 2016 Map Current As Of May 4, 2016 Blake N - 8HM Franklin District Marshall County, WV



Notes:
All locations are approximate and are for visualization purposes only.





Operator's Well No. Blake N-8HM

Area of Review

Sources of information to Support 35CSR8 - 5.11: 9.3 et seq.

Description of process to identify potential pathways for well communication during hydraulic fracturing activities.

Data Sources Reviewed:

- 1. IHS Well Data service: Public nationwide data service that pulls directly from State agency Oil and Gas databases
- 2. Farm Maps
- 3. Topo Maps: Recent and older (contact WVGES)
- 4. Check with DPS

Contacted Devin Ducoeur 724-705-0444, <u>dducoeur@dpslandservices.com</u> DPS GIS (05/04/2018) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

- 1. Wellbore with IHS All Wells Layer
- 2. Map with Farm lines overlain and any well spots identified on Farm Maps
- 3. More recent (1970s vintage) topos and older topos

Discussion with Phil Dinterman WVGES GIS Department (7/15/2016)

- WVGES has plotted every well spot they have access to and are aware of with that contains a
 coordinate. 30000, 70000, and 90000 series wells are available via the WVGES online map. Some
 locations aren't great due to vintage and manipulation of maps through time
- 30000 series any well drilled prior to 1929 APIs were not assigned to original wells
- 70000 series Well spots pulled from old Farm line maps that the WVGES has access to
- 90000 series Any sources that the WVGES has access that shows a well spot but has no additional supporting information. DEP does not have 90000 series on their maps.
- There can be duplication between wells in the 3 series
- Phil indicated that other Operators are providing a screenshot of the WVGES map with their planned well and using that for permits

Office of Oil and Gas

Page 1 of 7

JUN 1 1 2018

Permit well - Blake N-8HM

Wells within 500' Buffer

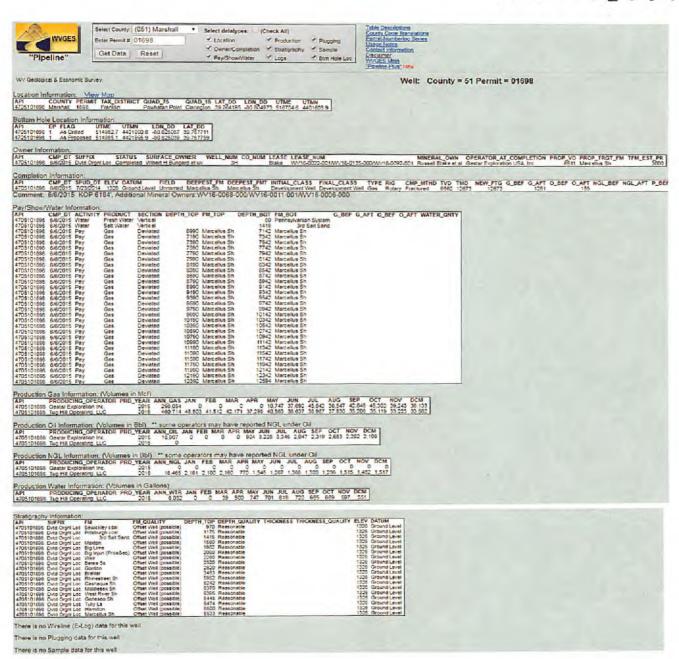
Note: Well spots depicted on Area of Review map (page 3) are derived from State held coordinates. The spots may differ from those depicted on the Well Plat because the Plat locations represent actual field surveyed locations. Please refer to the Plat for surveyed well spots

| API Number | Operator Name | Total Depth | Perforated Fms | Producing zones not perforated | Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation | Comments |
|------------|--------------------|-------------------------|-------------------|--------------------------------|---|--|
| 4705101698 | Tug Hill Operating | 6,562 TVD 12,673' MD | Marcellus | Unknown | Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore | Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown or the well plat. |
| 4705101701 | Tug Hill Operating | 6,572 TVD 13,355' MD | Marcellus | Unknown | Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore | Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown or the well plat. |
| 4705101766 | Tug Hill Operating | 11,066 TVD | Point Pleasar | Unknown | Yes, existing Point Pleasant producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore | Producing Point Pleasant horizonta well. A field survey was conducted to locate this well and it was found producing at the location shown or the well plat. |
| 4705100561 | Mobay Chemical | 2017' TVD | Big Lime | Unknown | No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation. The well is plugged | Well was plugged on 10/12/1987. |

Page 2 of 7

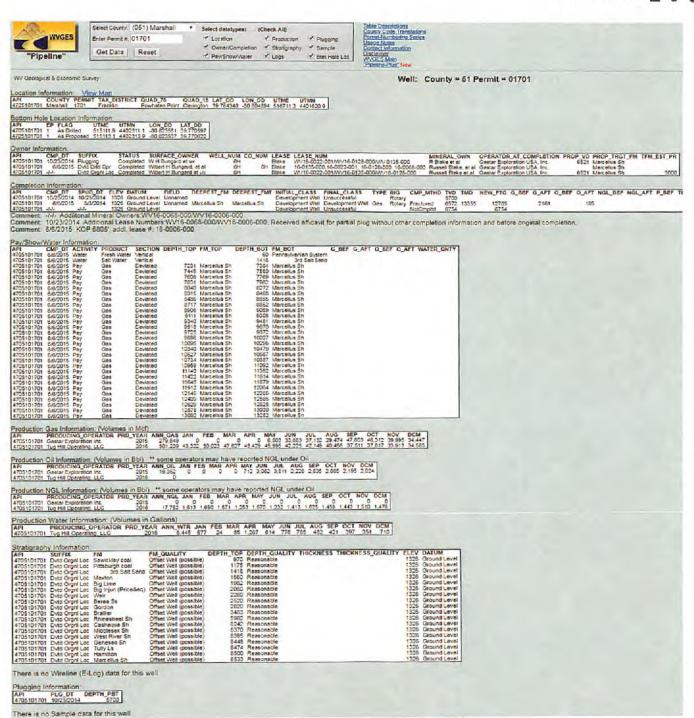
RECEIVED Office of Oil and Gas

JUN 11 2018



RECEIVED Office of Oil and Gas

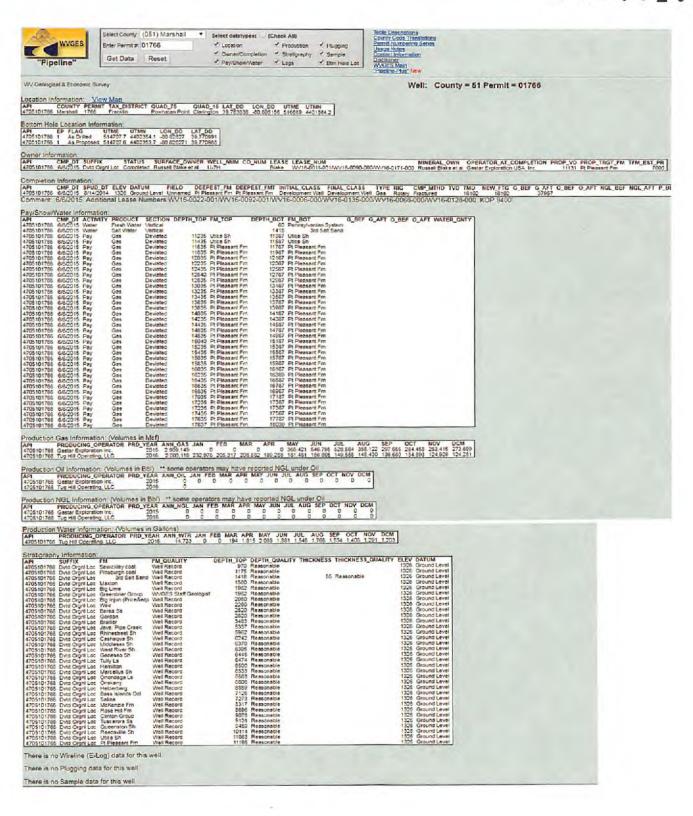
JUN 1 1 2018



RECEIVED Office of Oil and Gas

JUN 1 1 2018

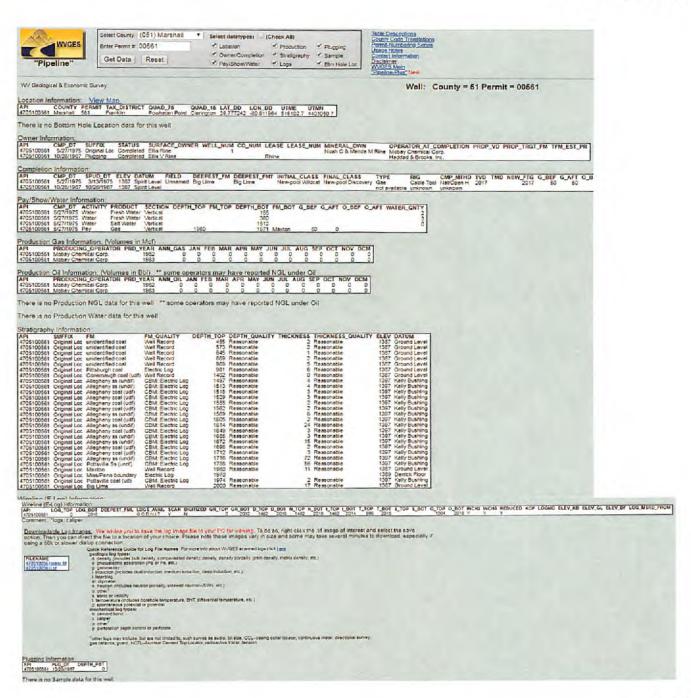
Page 4 of 7



RECEIVED Office of Oil and Gas

JUN 1 1 2018

Page 5 of 7



Page 6 of 7

RECEIVED Office of Oil and Gas

JUN 11 2018



Tug Hill Operating, LLC Casing and Cement Program

Blake N-8HM

Casing

| | String | Grade | Bit Size | Depth (Measured) | Cement Fill Up |
|--------------|---------|---------|---------------|------------------|----------------|
| Conductor | 30" | BW | 36" | 120' | CTS |
| Surface | 13 3/8" | J55 | 17 1/2" | 1,140' | CTS |
| Intermediate | 9 5/8" | J55 | 12 1/4" | 2,600 | CTS |
| Production | 5 1/2" | CYHP110 | 8 7/8 x 8 3/4 | 17,507' | CTS |

Cement

| Conductor: | Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2 |
|----------------|--|
| Surface; | Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2 |
| Intermediate: | Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.19 |
| Kick Off Plug: | Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug |
| Production: | 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L — Production Cement mixed at 15.2ppg, Y = 1.19 |

RECEIVED Office of Oil and Gas

JUL 26 2018

Pilot Hole

PH TD @

6,647' TVD

13 3/8" Csg @ 1,140' MD / 1,140' TVD

9 5/8" Csg @ 2,600' TVD

WELL NAME: Blake N-8HM STATE:

wv

COUNTY: Marshall

Franklin DISTRICT: 1,326 DF Elev:

GL Elev:

1,326

17,507 TD: TH Latitude: 39.76431787 TH Longitude: -80.80490984 BH Latitude: 39.792836 BH Longitude: -80.824757

| FORMATION TOPS | |
|---------------------|----------|
| Formation | Depth TV |
| Deepest Fresh Water | 1042 |
| Sewickley Coal | 951 |
| Pittsburgh Coal | 1036 |
| Big Lime | 2042 |
| Weir | 2430 |
| Berea | 2585 |
| Gordon | 2865 |
| Rhinestreet | 5906 |
| Geneseo/Burkett | 6353 |
| Tully | 6437 |
| Hamilton | 6460 |
| Marcellus | 6495 |
| Landing Depth | 6531 |
| Onondaga | 6547 |
| Pilot Hole Depth | 6647 |

| CASING SUMMARY | | | | | | | | | | |
|----------------|----------------|---------------|------------|-------------|----------------|---------|-------------|--|--|--|
| Туре | Hole Size (in) | Csg Size (in) | Depth (MD) | Depth (TVD) | Weight (lb/ft) | Grade | Top of Ceme | | | |
| Conductor | 36 | 30 | 120' | 120' | BW | BW | Surface | | | |
| Surface | 17.5 | 13 3/8 | 1,140 | 1,140' | 54.5 | 155 | Surface | | | |
| Intermediate 1 | 12 1/4 | 95/8 | 2,600' | 2,600' | 35 | 155 | Surface | | | |
| Production | 87/8×83/4 | 5 1/2 | 17,507' | 6,356' | 20 | CYHP110 | Surface | | | |

| | CEMENT SUMI | MARY | DRILLING DETAILS | | |
|----------------|-------------|-------|------------------|------------|---|
| Sack | | Class | Density | Fluid Type | Centralizer Notes |
| Conductor | 338 | A | 15.6 | Air | None |
| Surface | 1,158 | A | 15.6 | Air | 3 Centralizers at equal distance |
| Intermediate 1 | 842 | Α | 15 | Air | 1 Centralizer every other jt |
| Production | 3,950 | А | 14.5 | Air / SOBM | 1 every other joint in lateral; 1 per joint i curve; 1 every other it to sfc |

KOP @ 6,760' ft MD

Landing Point @,480' MD ,5,531' TVD

Lateral TD @ 17,507' ft MD

2/28/4

6,356 ft TVD

5600

Vertical Section at 333.65" (1400 ft/in)

03

2018

1400

700

2100

2800

3500

6300-

7000 -700

22.05, May 02.2018

West(-)/East(+) (2400 IU/n)

Blake 08 HM PBHL r1

9800

10500

11200

11900

12600

9100

7700

8400



Database: Company: DB_Jul2216dt_v14 Tug Hill Operating LLC

Project: Site:

Marshall County, West Virginia. Blake Pad Blake 08 HM (slot B)

Wellbore: Design:

Well:

Original Hole rev1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference:

Survey Calculation Method:

Well Blake 08 HM (slot B)

GL @ 1326.00ft GL @ 1326.00ft

Grid

Minimum Curvature

Project

Marshall County, West Virginia.

Map System: Geo Datum: Map Zone:

Universal Transverse Mercator (US Survey Feet)

NAD83 West Virginia - HARN Zone 17N (84 W to 78 W)

System Datum:

Mean Sea Level

Site

Blake Pad

Site Position: From:

Position Uncertainty:

Lat/Long

0.00 ft

0.00 ft

Northing: Easting: Slot Radius: 14,440,917.72 usft

1,695,217.29 usft 13-3/16 " Grid Convergence:

Latitude: Longitude:

39.76416471 -80,80498839

0.12

Well

Blake 08 HM (slot B)

Well Position

+N/-S +E/-W

rev1

0.00 ft 0.00 ft

Northing: Easting:

Wellhead Elevation:

14.440,973.54 usft 1.695,239,24 usft

Latitude: Longitude: Ground Level:

39.76431787 -80.80490984

1.326.00 ft

Wellbore

Position Uncertainty

Original Hole

Magnetics

Model Name Sample Date IGRF2015 4/29/2018

Declination (°) -8,64 Dip Angle (°)

Field Strength (nT)

52,072.72781884

Design

Audit Notes:

Version:

Phase:

PLAN

Tie On Depth:

0.00

66.88

Vertical Section:

Depth From (TVD) (ft) 0.00

+N/-S (ft) 0.00

+E/-W (ft) 0.00

Direction (°) 333.65

Plan Survey Tool Program

Date 5/2/2018

Depth From (ft)

Depth To (ft)

Survey (Wellbore)

Tool Name

Remarks

0.00

15 259.98 rev1 (Original Hole)

MWD MWD - Standard

| Measured Depth (ft) | Inclination (°) | Azimuth | Vertical Depth (ft) | +N/-S (ft) | +E/-W (fi) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Officared Oil and o |
|---------------------|-----------------|---------|---------------------------|---------------|---------------|-----------------------------|----------------------------|---------------------------|------------|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | JUL 26 2018 |
| 2,900.00 | 0.00 | 0.00 | 2,900.00 | 0,00 | 0,00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3,100.00 | 6.00 | 0.00 | 3,099.63 | 10.46 | 0.00 | 3.00 | 3.00 | 0.00 | 0.00 | WV Department on nvironmental Protec |
| 4,086.12 | 35.20 | 18,93 | 4,013.27 | 338.17 | 94.33 | 3.00 | 2.96 | 1.92 | 22.26 | Wironmental Protect |
| 6,760.16 | 35,20 | 18,93 | 5,198.27 | 1,798.30 | 594.47 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,479.93 | 91.00 | 323,10 | 6,531.00 | 2,355.88 | 422.48 | 10.00 | 7.75 | -7.76 | -60.46 B | lake 08 HM LP |
| 15,259.98 | 91.00 | 323.10 | 5,395.00 | 8,576.22 | -4,248.50 | 0.00 | 0.00 | 0.00 | 0.00 E | lake 08 HM PBHL r1 |



Database: Company: DB_Jul2216dt_v14
Tug Hill Operating LLC

Project: Site:

Well:

Marshall County, West Virginia. Blake Pad

Wellbore: Design: Blake 08 HM (slot B) Original Hole

rev1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference:

Survey Calculation Method:

Well Blake 08 HM (slot B)

GL @ 1326.00ft GL @ 1326.00ft

Grid

Minimum Curvature

| Design: | rev1 | | | | | | | | |
|--|-----------------|----------------|---------------------------|----------------|---------------|----------------------------|------------------------------|-------------------------------------|--------------------|
| Planned Survey | | | | | | | | | |
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
| 0,00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14,440,973,54 | 1,595,239,24 | 39,76431787 | -80.8049098 |
| 100,00 | 0.00 | 0,00 | 100.00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239,24 | 39.76431787 | -80.804909 |
| 200,00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 14,440,973,54 | 1,695,239,24 | 39.76431787 | -80.804909 |
| 300,00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239.24 | 39.76431787 | -80.804909 |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 0.00 | 14,440,973.54 | 1,895,239.24 | 39.76431787 | -80.804909 |
| 500,00 | 0,00 | 0.00 | 500,00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239,24 | 39.76431787 | -80,804909 |
| 800.00 | 0.00 | 0.00 | 600.00 | 0.00 | 0.00 | 14,440,973.54 | 1.695.239.24 | 39.76431787 | -80.804909 |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239.24 | 39.76431787 | -80.804909 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239,24 | 39,76431787 | -80.804909 |
| 900.00 | 0,00 | 0.00 | 900,00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239.24 | 39.76431787 | -80.804909 |
| 1,000.00 | 0.00 | 0.00 | 1 000,00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239,24 | 39.76431787 | -80.804909 |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239.24 | 39.76431787 | -60.804909 |
| 1,200.00 | 0.00 | 0,00 | 1,200.00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239.24 | 39.76431787 | -80.804909 |
| 1,300,00 | 0.00 | 0.00 | 1,300,00 | 0.00 | 0.00 | 14,440,973.54 | 1,895,239,24 | 39.76431787 | -80.804909 |
| 1,400.00 | 0.00 | 0.00 | 1,400,00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239,24 | 39.76431787 | -80,804909 |
| 1,500,00 | 0.00 | 0.00 | 1,500.00 | 0.00 | 0.00 | 14,440,973.54 | 1.595.239.24 | 39.76431787 | -80.804909 |
| 1,600.00 | 0,00 | 0.00 | 1 600.00 | 0.00 | 0.00 | 14,440,973.54 | 1,595,239.24 | 39.76431787 | -80,804909 |
| 1,700.00 | 0.00 | 0.00 | 1.700.00 | 0.00 | 0.00 | 14,440,973.54 | 1,595,239.24 | 39,76431787 | -80,804908 |
| 1,300.00 | 0.00 | 0.00 | 1,800,00 | 0,00 | 0.00 | 14,440,973.54 | 1,695,239,24 | 39.76431787 | -80,804909 |
| 1,900.00 | 0.00 | 0.00 | 1 900.00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239,24 | 39,76431787 | -80.804909 |
| 2,000.00 | 0.00 | 0.00 | 2,000.00 | 0.00 | 0.00 | 14,440,973,54 | 1,895,239,24 | 39.76431787 | -80,804909 |
| 2,100.00 | 0.00 | 0.00 | 2,100,00 | 0.00 | 0.00 | 14,440,973.54 | 1,595,239,24 | 39.76431787 | -80.804909 |
| 2,200.00 | 0.00 | 0.00 | 2,200.00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239.24 | 39.76431787 | -60,804909 |
| 2,300.00 | 0.00 | 0.00 | 2,300,00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239.24 | 39.76431787 | -80,804909 |
| 2,400 00 | 0.00 | 0.00 | 2,400,00 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239,24 | 39.76431787 | -8D.804909 |
| 2,500.01 | 0.00 | 0.00 | 2,500.01 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239,24 | 39.76431787 | -80,804909 |
| 2,500.01 | 0.00 | 0.00 | 2,600.01 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239.24 | 39.76431787 | -60.804909 |
| 2,700,01 | 0.00 | 0.00 | 2,700.01 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239.24 | 39.76431787 | -80.804909 |
| 2,800.01 | 0.00 | 0.00 | 2 800.01 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239.24 | 39.76431787 | -80.804909 |
| 2,900.00 | 0.00 | 0.00 | 2,900.00 | 0.00 | 0.00 | 14,440,973.54 | 1 895,239,24 | 39.76431787 | -80.804909 |
| | In 3°/100' bui | | 2,444,74 | | | (4.7.44-7.44) | 4,54,54,54,54,54 | | |
| The state of the s | 0.00 | 0,00 | 2,900.01 | 0.00 | 0.00 | 14,440,973.54 | 1,695,239,24 | 39.76431787 | -80.804909 |
| 2,900,01 3,000,01 | 3 00 | 0.00 | 2,999.96 | 2.62 | 0.00 | 14,440,976.16 | 1.695,239.24 | 39.76432506 | -80.804909 |
| | 5.00 | 0.00 | 3,099.63 | 10.45 | 0.00 | 14,440,984 00 | 1.695,239.24 | 39.7643456C | -80.804909 |
| 3,100,00 | | | 3,030.00 | 10,40 | 0.60 | in _i nnolann na | 1 555,255,27 | 00.70101000 | A. 4.4.4.4.1.1.1.1 |
| | 100' build/tur | | 0.000.04 | 10.10 | 0.00 | ** *** *** | 1 202 202 21 | 39.76434561 | -80.804909 |
| 3,100,01 | 6.00 | 0.00 | 3,099,64 | 10.46 | | 14,440,984.00 | 1 695,239.24 | 39.76438191 | -80.804906 |
| 3 200 01 | 8.85 | 7.41 | 3,198,79 | 23.32 40.96 | 0,99 3,96 | 14,440,996.86 | 1,695,240.23 1,695,243.20 | 39.76443034 | -80.804898 |
| 3,300,01 | 11.77 | 11.19 | 3,297.17 | | | 14,441,014.50 | 1 695,248.15 | 39.76449176 | -80.804877 |
| 3,400,01 | 14.73 | 13.48 | 3,394.50 | 63.34 | 8.91 | 14,441,036.87 | 1 695,255.05 | 39.76456599 | -80.804852 |
| 3,500.01 | 17 70 | 15.02 | 3,490.51 | 90,38 | 15.81 | 14,441,063.92 | | and the first of the control of the | -80.80482 |
| 3,600.01 | 20.68 | 15.12 | 3,584.95 | 122,03 | 24.66 | 14,441,095,57 | 1,695,263,89 | 39,76465285 39,76475209 | -80.804782 |
| 3 700.01 | 23.66 | 15.96 | 3,677.54 | 158,19 | 35,41 | 14,441,131.73 | 1 695,274.65 | 39.76486344 | -80.804737 |
| 3 800.01 | 26,65 | 17,62 | 3,768.05 | 198.76 | 48,05 | 14,441,172.30 | 1,695,287.30 | 39.76498659 | -80.804588 |
| 3,900.01 | 29 63 | 18.16 | 3,856,22 | 243,64 | 62.56 | 14,441,217.17 | 1 695,301.79 | 39.76512120 | -80,804626 |
| 4,000.01 | 32,63 | 18,50 | 3,941,81 | 292.69 | 78,83 | 14,441,266.23 | 1 895,318.10 | 39,76524503 | -80.804571 |
| 4,086,12 | 35 20 | 18.93 | 4,013:27 | 338.17 | 94.33 | 14.441,311.71 | 1 695,333,56 | 39.76524604 | -80.804571 |
| 4,036.12 | 35.20 | 18.93 | 4,013.27 | 338,18 | 94.33 | 14 441,311.72 | 1,695,333.56 | 33.70324004 | -00,00437 |
| | .20° tangent | | | | - | a la la la maniana | 4 805 985 48 | 20 70500004 | on onless |
| 4,100,01 | 35,20 | 18.93 | 4,024.62 | 345.75 | 96.92 | 14,441,319,29 | 1,695,336.16 | 39,76526681 | -80,804562 |
| 4,200.01 | 35.20 | 18:93 | 4,106.33 | 400.28 | 115.63 | 14,441,373,82 | 1,695,354.87 | 39,76541845 | -80,804495 |
| 4,300,01 | 35.20 | 18.93 | 4,188.04 | 454.81 | 134.33 | 14,441,428.34 | 1,695,373.57 | 39.76556609 | -80,804428 |
| 4,400.01 | 35.20 | 18.93 | 4,259.75 | 509,34 | 153,03 | 14,441,482.87 | 1,695,392,27 | 39.76571573 | -80 804361 |
| 4,500,01 | 35 20 | 18 93 | 4,351.46 | 563.86 | 171.74 | 14,441,537.40 | 1,695,410.98 | 39,76586537 | -80.804294 |
| 4,600,01 | 35,20 | 18.93 | 4,433.18 | 618,39 | 190.44 | 14,441,501,93 | Office of Olland | 39.76601501 | -80.804227 |

COMPASS 5000.14 Build 85



Database: Company: Project: DB_Jul/2216dt_v14 Tug Hill Operating LLC Marshall County West Virginia,

Site: Well: Blake Pad Blake 08 HM (slot B)

Wellbore: Design: Original Hole rev1 Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference:

Survey Calculation Method:

Well Blake 08 HM (slot B)

GL @ 1325.00ft GL @ 1325.00ft Grid

Minimum Curvature

Planned Survey

| Measured Depth (ft) | Inclination (°) | Azimuth | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---------------------------|-----------------|----------------|---------------------------|---------------|---------------|---|--------------------------|----------------------------|------------|
| 4,700.01 | 35,20 | 18.93 | 4,514.89 | 672,92 | 209.15 | 14,441,646.46 | 1,695,448.38 | 39.76616465 | -80.804160 |
| 4,800.01 | 35,20 | 18.93 | 4,596,60 | 727.45 | 227.85 | 14,441,700,99 | 1,695,467.09 | 39.76631429 | -80,804093 |
| 4,900,01 | 35.20 | 18,93 | 4,678.31 | 781.98 | 246.55 | 14,441,755.52 | 1,695,485.79 | 39.76646393 | -80,804026 |
| 5,000.01 | 35.20 | 18.93 | 4,780,02 | 836.51 | 265.26 | 14,441,810,05 | 1,695,504,49 | 39.76861357 | -80,803959 |
| 5,100.01 | 35.20 | 18.93 | 4,841.73 | 891.04 | 283.96 | 14,441,864 58 | 1,695,523,20 | 39.76676321 | -80.803892 |
| 5,200,01 | 35.20 | 18.93 | 4,923.45 | 945,57 | 302.67 | 14,441,919,10 | 1,695,541,90 | 39.76691285 | -80,803825 |
| 5,300 01 | 35.20 | 18.95 | 5,005.16 | 1,000.10 | 321.37 | 14,441,973.63 | 1,695,560.61 | 39.76706249 | -80.803758 |
| 5,400.01 | 35.20 | 18.93 | 5.086.87 | 1,054.62 | 340.07 | 14,442,028.16 | 1,695,579.31 | 39.76721213 | -80,803691 |
| 5,500.01 | 35,20 | 18.93 | 5.168.58 | 1,109.15 | 358 78 | 14,442,082.69 | 1,895 598,01 | 39.78736177 | -80.803624 |
| 5,600,01 | 35.20 | 18.93 | 5.250.29 | 1,163,68 | 377.48 | 14,442,137.22 | 1,695,616,72 | 39.76751141 | -80,803557 |
| 5,700.01 | 35.20 | 18.93 | 5.332.00 | 1,218.21 | 395.18 | 14,442,191.75 | 1,695,635.42 | 39.76766105 | -80,803490 |
| 5,800.01 | 35:20 | 18.93 | 5,413,72 | 1,272.74 | 414.89 | 14,442,246.28 | 1,695,654.12 | 39.76781069 | -80,803423 |
| 5,900.01 | 35.20 | 18.93 | 5.495.43 | 1,327.27 | 433,59 | 14,442,300.81 | 1,695,872,83 | 39.76796033 | -80.803356 |
| 6,000.01 | 35,20 | 18.93 | 5,577.14 | 1,381,80 | 452.30 | 14,442,355,34 | 1,695,591,53 | 39.76810996 | -80,803289 |
| 6,100,01 | 35,20 | 18.93 | 5.658.85 | 1,436.33 | 471.00 | 14,442,409,86 | 1,695,710,24 | 39.76825960 | -80,803222 |
| 6,200,01 | 35,20 | 18.93 | 5,740.56 | 1,490.86 | 489.70 | 14,442,464.39 | 1,695,728.94 | 39.75840924 | -80,803155 |
| 6,300,01 | 35,20 | 18.93 | 5.822.27 | 1,545.39 | 508.41 | 14,442,518,92 | 1,695,747,64 | 39,76855888 | -80.803088 |
| 6,400.01 | 35.20 | 18.93 | 5,903.99 | 1,599.91 | 527.11 | 14,442,573.45 | 1,695,766.35 | 39,76870852 | -80,803021 |
| 6,500.01 | 35.20 | 18.93 | 5,985,70 | 1,654.44 | 545.81 | 14,442,627,98 | 1,695,785,05 | 39,78885818 | -80.802954 |
| 6,600.01 | 35,20 | 18,93 | 6.067.41 | 1,708.97 | 564.52 | 14,442,682.51 | 1,695,803.75 | 39,76900780 | -80,802887 |
| 6,700.01 | 35.20 | 18.93 | 5,149.12 | 1,763.50 | 583.22 | 14,442,737.04 | 1,695,822.46 | 39,75915744 | -80,802820 |
| 6,760.16 | 35.20 | 18.93 | 6 198.27 | 1,796.30 | 594,47 | 14,442,769.83 | 1,695,833.71 | 39.76924744 | -80,802780 |
| | 100' build/tu | | 0,100.21 | 1,1,64,04 | Sea to th | 7.6, 7.66,7 604 846 | The stage of | 49-11-68-11-3-1 | 316173101 |
| | 37.31 | 13.21 | 5,230.41 | 1,818.93 | 600.96 | 14,442,792,47 | 1,695,840,20 | 39.76930956 | -80.802757 |
| 6,800,01 | | | 6,306.59 | 1,383.07 | 608.61 | 14,442,856,61 | 1,695,847.85 | 39 /6948565 | -80.862729 |
| 6,900.01 | 43,60 | 1.18 351.81 | 6,374.52 | 1,956.12 | 603.79 | 14,442,929.66 | 1,695,843.02 | 39,76968630 | -80.802745 |
| 7,000.01 | 50.87 | | | | | | | 39,75990540 | -80.802806 |
| 7,100.01 | 58.76 | 344,27 | 6,432,15 | 2,035,86 | 586,63 | 14,443,009.40 | 1,695,825.86 | | -80.802908 |
| 7,200.01 | 67.01 | 337.91 | 6,477.72 | 2 119.88 | 557.65 | 14,443,093,41 | 1,695,796.89 | 39,77013630 | -80.803050 |
| 7,300.01 | 75,49 | 332.31 | 6,509,86 | 2,205.61 | 517.75 | 14,443,179,14 | 1,695,756,98 | 39.77037198 | -80.8C3226 |
| 7,400.01 | 84,09 | 327.12 | 6,527.58 | 2,290 45 | 468.12 | 14,443,263.98 | 1,695,707.36 | 39,77060528 39,77078523 | -80,803388 |
| 7,479.93 | 91.00 | 323.10 | 6,531.00 | 2,355.88 | 422,48 | 14.443,329.41 | 1,695,661.72 | 39.77078323 | -00,000000 |
| | .00° lateral | 323.10 | 11/22/120 | 3 4 5 5 5 5 5 | 122.12 | V 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | | ******** |
| 7,479.93 | 91.00 | 323.10 | 6,531.00 | 2,355.88 | 422.48 | 14,443,329.42 | 1,695,661.72 | 39.77078525 | -80,803388 |
| 7,500,02 | 91.00 | 323.10 | 6,530.65 | 2,371.94 | 410.42 | 14,443,345.47 | 1,695,649.66 | 39.77082942 | -80.803430 |
| 7,600.02 | 91.00 | 323.10 | 6,528.90 | 2,451.89 | 350.38 | 14,443,425.42 | 1,695,589.62 | 39,77104935 | -80.803643 |
| 7,700.02 | 91,00 | 323.10 | 6,527 15 | 2,531.84 | 290,35 | 14,443,505.38 | 1,695,529 58 | 39.77126928 | -80.803856 |
| 7,800.02 | 91.00 | 323.10 | 6,525.40 | 2.611.80 | 230.31 | 14.443,585,33 | 1,695,469.54 | 39.77148922 | -80.804069 |
| 7,900.02 | 91.00 | 323.10 | 6,523.66 | 2,691.75 | 170,27 | 14.443,685.28 | 1,695,409.51 | 39.77170915 | -80.804283 |
| 8,000.02 | 91.00 | 323.10 | 5,521.91 | 2,771.70 | 10.23 | 14,443,745.23 | 1,695,349.47 | 39.77192908 | -80.804496 |
| 8,100.02 | 91.00 | 323.10 | 6,520 16 | 2,851.85 | 50.19 | 14.443,825.19 | 1,695,289.43 | 39.77214901 | -80.804709 |
| 8,200.02 | 91.00 | 323.10 | 6,518.41 | 2,931.61 | -9.84 | 14,443,905.14 | 1,695,229,39 | 39,77236895 | -80.804922 |
| 8,300.02 | 91.00 | 323.10 | 6,516.66 | 3.011.56 | -69.88 | 14 443,985.09 | 1,695,169.36 | 39,77259889 | -80.805135 |
| 8,400.02 | 91.00 | 323,10 | 6,514,92 | 3,091,51 | -129.92 | 14,444,055,04 | 1,695,109.32 | 39,77280881 | -80.805348 |
| 8,500.02 | 91,00 | 323.10 | 6,513.17 | 3,171.46 | -189.96 | 14,444,145,00 | 1,695,049.28 | 39.77302874 | -80.805561 |
| 8,600.02 | 91.00 | 323,10 | 6,511.42 | 3,251.42 | -250.00 | 14.444,224,95 | 1,694,989.24 | 39.77324867 | -80,805774 |
| 8,700.02 | 91.00 | 323.10 | 6,509.67 | 3,331.37 | -310.04 | 14,444,304.90 | 1,694,929.20 | 39.77346860 | -80.805987 |
| 8,800.02 | 91.00 | 323,10 | 6,507.92 | 3.411.32 | -370,07 | 14.444,384.85 | 1,694,869.17 | 39.77368853 | -80,806200 |
| 8,900.02 | 91.00 | 323.10 | 6,506.18 | 3,491.27 | -430.11 | 14.444,464.81 | 1,694,809.13 | 39,77390845 | -80.805413 |
| 9,000.02 | 91.00 | 323.10 | 6,504.43 | 3,571.23 | -490.15 | 14 444,544.76 | 1,694,749.09 | 39.77412838 | -80,806626 |
| 9,100.02 | 91.00 | 323.10 | 6,502,68 | 3,651.18 | -550_19 | 14.444,624.71 | 1,694,689.05 | 39.77434831 | -80.806839 |
| 9,200.02 | 91.00 | 323.10 | 6,500.93 | 3,731.13 | -610.23 | 14,444,704.66 | 1,694,629.01 | 39 77458824 | -80.807052 |
| 9,300.02 | 91.00 | 323.10 | 6,499.18 | 3,611.08 | -670.26 | 14,444,784.62 | 1,694,568.98 | 39.77478817 | -80.807265 |
| 9,400.02 | 91.00 | 323 10 | 8,497 44 | 3,891.04 | -730.30 | 14,444,654.57 | | IVE(39.77500809 | -80.807478 |
| 9,500.02 | 91.00 | 323.10 | 6,495,69 | 3,970.99 | -790,34 | 14,444,944.52 | | il anse 77522802 | -80.807691 |



Database: Company: DB_Jul2216dt_v14
Tug Hill Operating LLC
Marshall County, West Virginia.

Project: Site: Well:

Blake Pad Blake 08 HM (slot B)

Wellbore: Design: Original Hole rev1 Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference:

Survey Calculation Method:

Well Blake 08 HM (slot B)

GL @ 1326.00ft GL @ 1326.00ft

Grid

Minimum Curvature

| anned Survey | | | | | | | | | |
|---------------------------|-----------------|---------|---------------------------|---------------|---------------|---------------------------|--------------------------|--------------------|------------|
| Measured Depth (ft) | Inclination (°) | Azimuth | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
| 9,600.02 | 91,00 | 323_10 | 6.493,94 | 4,050,94 | -850,38 | 14,445,024.47 | 1,694,388.86 | 39,77544794 | -80.807905 |
| 9,700.02 | 91.00 | 323.10 | 6 492.19 | 4,130.89 | -910,42 | 14,445,104.43 | 1,894,328.82 | 39.77566787 | -80.808118 |
| 9,800.02 | 91.00 | 323.10 | 5,490.44 | 4,210.85 | -970,45 | 14,445,184.38 | 1,694,268.79 | 39.77588760 | -00.808331 |
| 9,900.02 | 91.00 | 323.10 | 6,488.70 | 4,290.80 | -1,030.49 | 14,445,264,33 | 1,694,208.75 | 39,77610772 | -80,808544 |
| 10,000.02 | 91.00 | 323,10 | 5,486,95 | 4,370.75 | -1,090,53 | 14,445,344.28 | 1,694,148.71 | 39.77632764 | -80.808757 |
| 10,100.02 | 91.00 | 323,10 | 6,485 20 | 4,450.70 | -1,150.57 | 14,445,424.23 | 1,694,088.67 | 39.77654757 | -80.808970 |
| 10,200.02 | 91.00 | 323.10 | 6,483,45 | 4,530.66 | -1,210.61 | 14,445,504.19 | 1,694,028.63 | 39,77676749 | -80,809183 |
| 10,300.02 | 91,00 | 323.10 | 6,481.70 | 4,610.61 | -1,270.64 | 14,445,584.14 | 1,693,968.60 | 39.77698742 | -80.809396 |
| 10,400.02 | 91,00 | 323,10 | 6,479.96 | 4,690.56 | -1,330.68 | 14,445,664.09 | 1,693,908.56 | 39.77720734 | -80,809609 |
| 10,500.02 | 91,00 | 323.10 | 6,478.21 | 4,770,51 | -1,390.72 | 14,445,744.04 | 1,693,848.52 | 39.77742726 | -80.809821 |
| 10,600.02 | 91.00 | 323.10 | 6,476.46 | 4,850,47 | -1,450.76 | 14 445,824.00 | 1,693,788.48 | 39.77764718 | -80.810035 |
| 10,700.02 | 91.00 | 323.10 | 6,474.71 | 4,930,42 | -1,510.80 | 14.445,903.95 | 1,693,728.44 | 39,77786710 | -80,810248 |
| 10,800.02 | 91,00 | 323.10 | 6,472.96 | 5,010.37 | -1,570.84 | 14,445,983.90 | 1,693,668.41 | 39.77808703 | -80.810462 |
| 10,900,02 | 91.00 | 323,10 | 6,471.21 | 5,090,32 | -1,630.87 | 14,446,053,85 | 1,693,608.37 | 39.77830695 | -80.810673 |
| 11,000.02 | 91.00 | 323.10 | 6,469.47 | 5,170.28 | -1,690,91 | 14 446,143.81 | 1,693,548.33 | 39.77852687 | -30.610888 |
| 11,100.02 | 91.00 | 323.10 | 6,467.72 | 5,250.23 | -1,750.95 | 14,446,223.76 | 1.693,488.29 | 39.77874679 | -80.811101 |
| 11,200,02 | 91.00 | 323.10 | 6,465.97 | 5,330.18 | -1,810.99 | 14 446,303.71 | 1,693,428.25 | 39.77896671 | -80.811314 |
| 11,300.02 | 91.00 | 323.10 | 6,464.22 | 5,410.14 | -1.871.03 | 14,446,383,66 | 1,693,368,22 | 39,77918663 | -80,811527 |
| 11,400,02 | 91.00 | 323.10 | 6,462.47 | 5,490.09 | -1,931.06 | 14,448,463,62 | 1,893,308.18 | 39.77940654 | -80.811740 |
| 11,500.02 | 91.00 | 323,10 | 6,460.73 | 5,570.04 | -1,991,10 | 14,446,543,57 | 1,693,248.14 | 39,77962646 | -80,811953 |
| 11,600.02 | 91.00 | 323.10 | 6,458.98 | 5,649,99 | -2,051.14 | 14,446,623,52 | 1,693,188,10 | 39 77984638 | -80.812166 |
| 11,700,02 | 91.00 | 323.10 | 6,457.23 | 5,729.95 | -2,111.18 | 14,446,703.47 | 1,693,128.56 | 39,78006630 | -80,812379 |
| 11,800.02 | 91.00 | 323.10 | 6,455.48 | 5,809.90 | -2,171,22 | 14,446,783.43 | 1,693,068,03 | 39.78028622 | -80.812592 |
| 11,900,02 | 91.00 | 323.10 | 6,453.73 | 5,889.85 | -2,231.25 | 14,448,863.38 | 1,693,007.99 | 39.78050613 | -30.81289 |
| 12,000,02 | 91.00 | 323.10 | 6,451.99 | 5,959.80 | -2 291,29 | 14,446,943.33 | 1,692,947.95 | 39.78072605 | -80.813019 |
| 12,100,02 | 91.00 | 323.10 | 6,450.24 | 6,049.76 | -2,351.33 | 14,447,023.28 | 1,692,887.91 | 39,78094596 | -80,813232 |
| 12,200.02 | 91.00 | 323,10 | 6,448.49 | 6,129.71 | -2,411.37 | 14,447 103.24 | 1,692,827.87 | 39,78116588 | -80.813445 |
| 12,300,02 | 91.00 | 323 10 | 6,446.74 | 6,209.66 | -2,471.41 | 14,447 183.19 | 1,692,767.84 | 39.78138580 | -80.813658 |
| 12,400.03 | 91.00 | 323.10 | 6,444.99 | 6,289.61 | -2,531.44 | 14,447.263.14 | 1,692,707.80 | 39.78160571 | -80.813871 |
| 12,500.03 | 91.00 | 323 10 | 6,443.25 | 6,389.57 | -2,591.48 | 14,447,343,09 | 1,692,647.76 | 39.76132562 | -00,814084 |
| 12,600.03 | 91.00 | 323,10 | 6,441.50 | 6,449.52 | -2,651,52 | 14,447,423,05 | 1,692,587.72 | 39.78204554 | -80,814297 |
| 12,700,03 | 91.00 | 323.10 | 6,439.75 | 6,529.47 | -2,711.58 | 14,447,503,00 | 1,692,527,68 | 39.78226545 | -80,814510 |
| 12,800.03 | 91.00 | 323,10 | 6,438.00 | 6,609.42 | -2,771.60 | 14,447,582.95 | 1,692,467,65 | 39.78248537 | -80.814724 |
| 12,900,03 | 91.00 | 323.10 | 6,436.25 | 6,689.38 | -2,831.63 | 14,447.862.90 | 1,692,407.61 | 39.78270528 | -80.814937 |
| 13.000.03 | 91.00 | 323,10 | 6,434,51 | 6,759.33 | -2.891.67 | 14,447,742.85 | 1,692,347.57 | 39.78292519 | -80.815150 |
| 13,100,03 | 91.00 | 323.10 | 6,432.76 | 6,849,28 | -2,951.71 | 14,447,822,81 | 1,692,287.53 | 39,78314510 | -80.815363 |
| 13 200.03 | 91.00 | 323,10 | 6,431.01 | 6,929.23 | -3,011.75 | 14,447,902.76 | 1,692,227.50 | 39.78336501 | -80.815576 |
| 13,300,03 | 91.00 | 323.10 | 6,429.26 | 7,009.19 | -3.071.79 | 14,447,982.71 | 1,692,167,46 | 39.78358493 | -80.815789 |
| 13 400 03 | 91.00 | 323.10 | 6,427.51 | 7,089.14 | -3 131.83 | 14,448,062.66 | 1,692,107.42 | 39.78380484 | -80,816002 |
| 13.500,03 | 91.00 | 323.10 | 6,425.77 | 7,159.09 | -3,191.85 | 14,448,142.62 | 1,692,047.38 | 39,78402475 | 80.816215 |
| 13,600.03 | 91.00 | 323,10 | 6,424.02 | 7,249.04 | -3,251.90 | 14,448,222.57 | 1,691,987.34 | 39.78424466 | -80,816429 |
| 13.700.03 | 91.00 | 323.10 | 6,422.27 | 7,329.00 | -3,311.94 | 14,448,302.52 | 1,891,927.31 | 39.78446457 | -80:816642 |
| 13,800.03 | 91.00 | 323,10 | 6,420.52 | 7,408.95 | -3,371.98 | 14,448,382.47 | 1,691,867.27 | 39.78468448 | -80.816855 |
| 13,900.03 | 91.00 | 323.10 | 6,418.77 | 7.488.90 | -3 432.02 | 14,448,462.43 | 1,691,807.23 | 39.78490439 | -80.817068 |
| 14.000.03 | 91.00 | 323,10 | 6,417.02 | 7.568.85 | -3,492,05 | 14,448,542.38 | 1,691,747.19 | 39.78512429 | -80.81728 |
| 14 100.03 | 91.00 | 323.10 | 6,415.28 | 7.648.81 | -3 552 09 | 14,448,622.33 | 1,691,687.15 | 39,78534420 | -80,817494 |
| 14,200,03 | 91.00 | 323,10 | 6,413,53 | 7.728.76 | -3.612.13 | 14,448,702.28 | 1,691,627.12 | 39,78556411 | -80,817707 |
| 14,300,03 | 91,00 | 323,10 | 6,411.78 | 7.808,71 | -3,572.17 | 14,448,782.24 | 1,691,557,08 | 39,78578402 | -80 817920 |
| 14,400.03 | 91.00 | 323,10 | 6,410,03 | 7 838,66 | -3,732.21 | 14,448,862.19 | 1,691,507.04 | 39,78600392 | -80.818134 |
| 14,500.03 | 91.00 | 323.10 | 6,408.28 | / 968.62 | 3,792 24 | 14,448,942.14 | 1,891,447,00 | 39.78622383 | -80.81834 |
| 14,500,03 | 91.00 | 323,10 | 6,406,54 | 8 048,57 | -3,852.28 | 14,449,022.09 | 1.691,386.96 | 39,78644374 | -80.81856 |
| 14,700.03 | 91.00 | 323.10 | 6,404.79 | 8 128.52 | -3,912 32 | 14,449,102.05 | 1.691,326.93 | 39 78666364 | -80 81877 |
| 14,800,03 | 91,00 | 323,10 | 6,403.04 | 8.208,48 | -3,972.36 | 14,449,182,00 | 1.691,266.8BEC | EIVE69,78688355 | -80.818986 |
| 14,900.03 | 91.00 | 323.10 | 6.401.29 | 8.288.43 | -4,032.40 | 14,449,261.95 | 1 891 Offices of (| Oil 0199, 98190345 | -80.819199 |
| 15,000.03 | 91.00 | 323.10 | 6,399.54 | 8,368,38 | -4,092.43 | 14,449,341.90 | 1.691,146.61 | 39.78732336 | -80.819412 |



Database: Company: Project: DB_Jul2216dt_v14 Tug Hill Operating LLC Marshall County, West Virginia.

Site: Well: Wellbore:

Design:

Blake Pad Blake 08 HM (slot B) Original Hole

rev1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference:

Survey Calculation Method:

Well Blake 08 HM (slot B)

GL @ 1326.00ft GL @ 1326.00ft Grid

Minimum Curvature

| Planned Survey | | | | | | | | | |
|---------------------------|-----------------|-------------|---------------------------|---------------|---------------|---------------------------|--------------------------|-------------|--------------|
| Measured Depth (ft) | inclination (°) | Azimuth | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
| 15,100.03 | 91.00 | 323.10 | 6,397.80 | 8,448.33 | -4,152.47 | 14,449,421.86 | 1,691,086.77 | 39.78754326 | -80,81962607 |
| 15,200.03 | 91.00 | 323.10 | 6,396,05 | 8,528.29 | -4,212,51 | 14,449,501.81 | 1,691,026.74 | 39.78776316 | -80.81983921 |
| 15,259,98 | 91,00 | 323.10 | 6,395.00 | 8,576.22 | -4,248,50 | 14,449,549.74 | 1,690,990.74 | 39.78789500 | -80 81996700 |
| PBHL/TD | 15259.98 MD | 6395.00 TVC |) | | | | | | |

| Design Targets | | | | | | | | | |
|--|--------------|----------|-------------|---------------|---------------|--------------------|-------------------|-------------|--------------|
| Target Name - hit/miss target - Shape | Dip Angle | Dip Dir. | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usff) | Easting (usft) | Latitude | Longitude |
| Blake 08 HM PBHL r1 - plan hits target cen - Point | 0.00 iter | 0.00 | 6,395.00 | 8,576.22 | -4,248.50 | 14,449,549,74 | 1,690,990.74 | 39.78789500 | -80.81996700 |
| Blake 08 HM LP - plan hits target cen - Point | 0,00 iter | 0.00 | 6,531.00 | 2,355.88 | 422.48 | 14,443,329.42 | 1,695,661.72 | 39.77078525 | -80,80338803 |

| lan Annota | tions | | | | | |
|------------|-----------|----------|------------|-----------|---------------------------------|--|
| | Measured | Vertical | Local Coor | dinates | | |
| | Depth | Depth | +N/-S | +E/-W | | |
| | (ft) | (ft) | (ft) | (ft) | Comment | |
| | 2,900.00 | 2,900.00 | 0,00 | 0.00 | KOP Begin 3°/100' build | |
| | 3,100.00 | 3,099.63 | 10.46 | 0.00 | Begin 3°/100' build/turn | |
| | 4,086.12 | 4,013.27 | 338.18 | 94.33 | Begin 35,20° tangent | |
| | 6,760.16 | 6,198.27 | 1,796.30 | 594.47 | Begin 10°/100' build/turn | |
| | 7,479.93 | 6,531.00 | 2,355.88 | 422.48 | Begin 91.00° lateral | |
| | 15,259.98 | 6,395.00 | 8,576.22 | -4,248.50 | PBHL/7D 15259.98 MD/6395.00 TVD | |

RECEIVED Gas

JUL 26 2018

WW-9 (4/16) RECEIVED Office of Oil and Gas

JUN 1 1 2018

WV Department of Environmental Protection

API Number 47 - 051

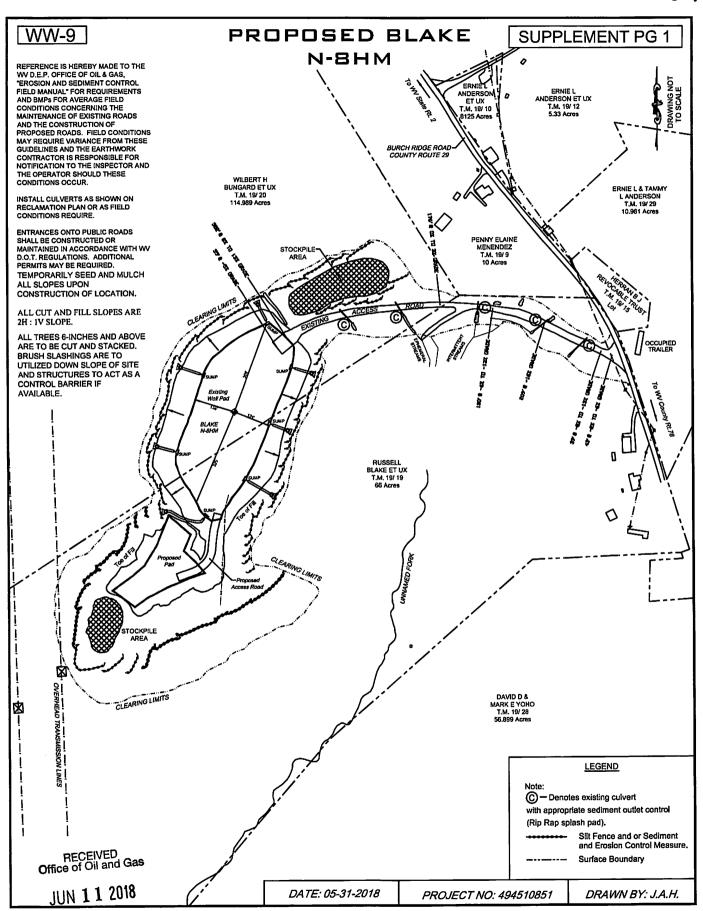
Operator's Well No. Blaken 7HM 0 5 1 0 2 0 5 4

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION OFFICE OF OIL AND GAS

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

| Operator Name Tug Hill Operating, LLC OP Code 494510851 | |
|---|--|
| Watershed (HUC 10) Fish Creek - Ohio River (Undefined) Quadrangle Powhatan Point 7.5' | |
| Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes | No |
| Will a pit be used? Yes No ✓ | |
| If so, please describe anticipated pit waste: AST Tanks with proper containment will be used for staging fresh water for | or frac and flow back water |
| Will a synthetic liner be used in the pit? Yes No V If so, what ml.? ASI TURKS WE BE US | ed with proper contain |
| Proposed Disposal Method For Treated Pit Wastes: | |
| Land Application Underground Injection (UIC Permit Number UIC 2459, UIC 985, UIC 359, UIC 20073 Reuse (at API Number Off Site Disposal (Supply form WW-9 for disposal location) Other (Explain | 32540, UIC 2D0732523) |
| Will closed loop system be used? If so, describe: Yes - For Vertical and Horizontal Drilling | |
| Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air for | vertical / Oil for Horizontal |
| -If oil based, what type? Synthetic, petroleum, etc. Synthetic Oil Base | |
| Additives to be used in drilling medium? Barite for weight | |
| Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. All drill cuttings to be disposed of | n a Landfill |
| -If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A | |
| -Landfill or offsite name/permit number? Wotzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LI | .C (SAN14C5 / PA DEP EC#1388426) |
| Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associate West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permi where it was properly disposed. | d waste rejected at any ttee shall also disclose |
| I certify that I understand and agree to the terms and conditions of the GENERAL WATER POL on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Prote provisions of the permit are enforceable by law. Violations of any term or condition of the general per law or regulation can lead to enforcement action. I certify under penalty of law that I have personally examined and am familiar with the info application form and all attachments thereto and that, based on my inquiry of those individuals in obtaining the information, I believe that the information is true, accurate, and complete. I am aware penalties for submitting false information, including the possibility of fine or imprisonment. Company Official Signature Company Official Title Vice President Geoscience | etion. I understand that the mit and/or other applicable ormation submitted on this namediately responsible for |
| Subscribed and sworn before me this 6 day of JVNE , 20_18_ | COMMONWEALTH OF DENDRY VANIA |
| Subscribed and sworn before me this 6 day of JVNE , 20 18 Maurice A Strad Notary Public My commission expires 1/28/19 | NOTARIAL SEAL NOTARIAL SEAL MAUREEN A STEAD Notary Public CECIL TWP, WASHINGTON COUNTY My Commission Expires Jan 28, 2019 |

| Tug Hill Operating, LL0 | | | |
|--|---|---|--|
| Proposed Revegetation Treatmen | | Prevegetation p | ьн 6.0 |
| Lime 3 | Tons/acre or to correct to pH | 6.5 | |
| Fertilizer type 10-20-2 | 0 | | |
| Fertilizer amount 500 | lbs | /acre | |
| Mulch 2.5 | Tons/ac | ere | |
| | Seed | <u>Mixtures</u> | |
| Tempo | orary | Perm | nanent |
| Seed Type | lbs/acre | Seed Type | lbs/acre |
| Annual Ryegrass | 40 | Orchard Grass | 12 |
| Spring Oats | 96 | Ladino | 3 |
| | | White Clover | 2 |
| Attach: Maps(s) of road, location, pit and provided). If water from the pit watereage, of the land application a | ill be land applied, include din rea. | tion (unless engineered plans incl nensions (L x W x D) of the pit, an | uding this info have been and dimensions (L x W), and |
| Maps(s) of road, location, pit and provided). If water from the pit watereage, of the land application as Photocopied section of involved | vill be land applied, include din rea 7.5' topographic sheet. | tion (unless engineered plans incl | uding this info have been nd dimensions (L x W), and |
| Maps(s) of road, location, pit and provided). If water from the pit watereage, of the land application a Photocopied section of involved Plan Approved by: | ill be land applied, include din rea. | tion (unless engineered plans incl | uding this info have been and dimensions (L x W), and |
| Maps(s) of road, location, pit and provided). If water from the pit watereage, of the land application as Photocopied section of involved | vill be land applied, include din rea 7.5' topographic sheet. | tion (unless engineered plans incl | uding this info have been and dimensions (L x W), and RECEIVED Office of Oil and Gas |
| Maps(s) of road, location, pit and provided). If water from the pit watereage, of the land application a Photocopied section of involved Plan Approved by: | vill be land applied, include din rea 7.5' topographic sheet. | tion (unless engineered plans incl | nd dimensions (L x W), and |
| Maps(s) of road, location, pit and provided). If water from the pit watereage, of the land application a Photocopied section of involved Plan Approved by: | vill be land applied, include din rea 7.5' topographic sheet. | tion (unless engineered plans incl | RECEIVED Office of Oil and Gas |
| Maps(s) of road, location, pit and provided). If water from the pit watereage, of the land application a Photocopied section of involved Plan Approved by: | vill be land applied, include din rea 7.5' topographic sheet. | tion (unless engineered plans incl | RECEIVED Office of Oil and Gas JUN 1 1 2018 WV Department of |





Well Site Safety Plan Tug Hill Operating, LLC

D1/24/8

Well Name: Blake N-8HM

Pad Location: Blake Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17: Northing: 4,401,617.54

Easting: 516,709.95

June 2018

RECEIVED Office of Oil and Gas

JUL 26 2018

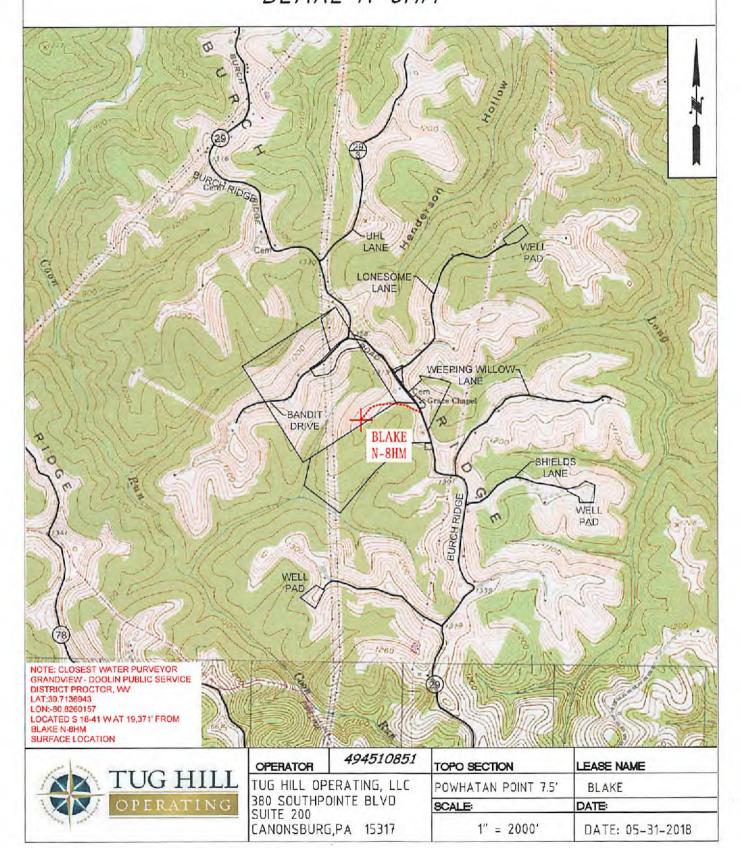
JUN 1 1 2018

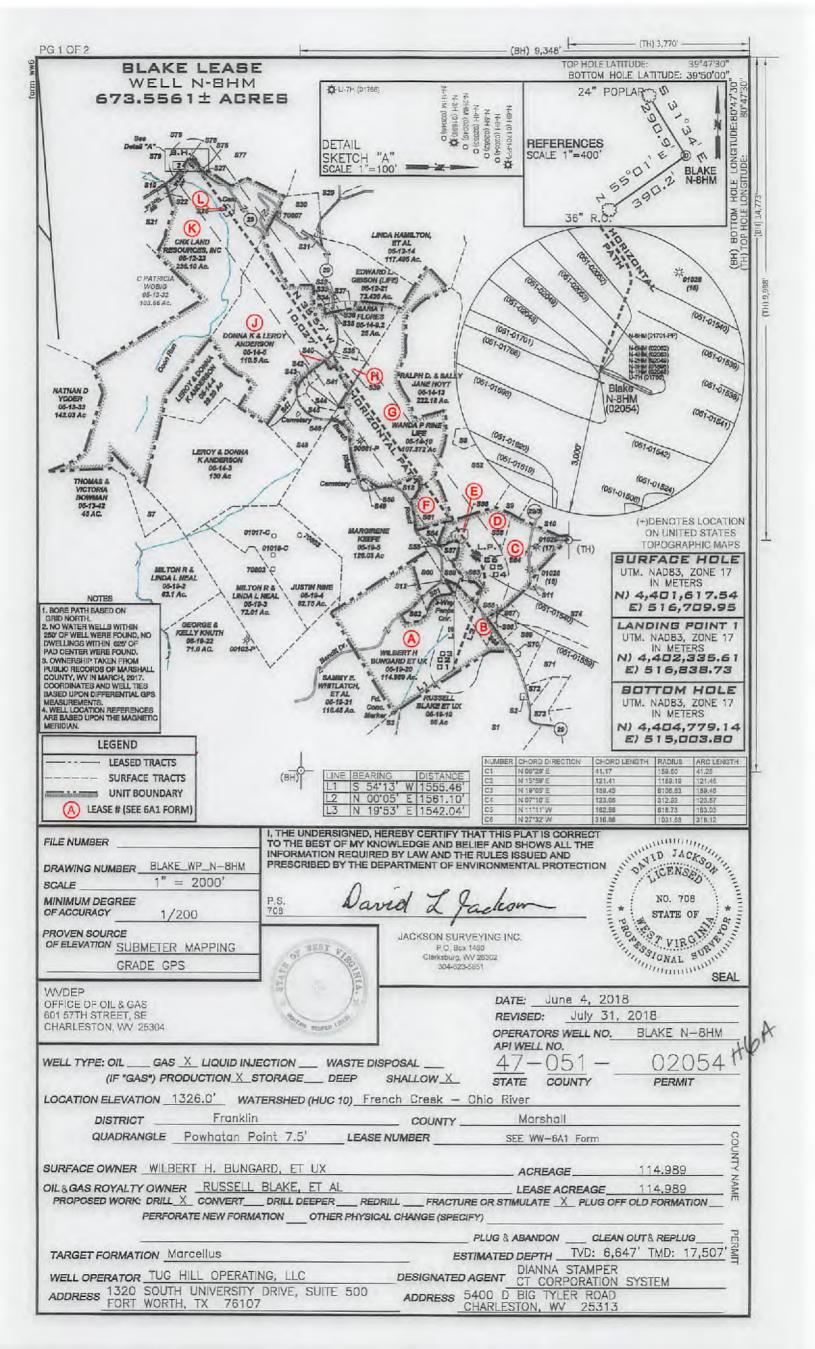
WW-9

WV Department of Environmental Protection PROPOSED

BLAKE N-8HM

SUPPLEMENT PG 2





| | Detail "A" | |
|-----|------------------|-------|
| 879 | 578 B. H. | in in |
| 1 | 05-12-23 | 237 |
| | SCALE 1"=400' | |

| 51 | 05-19-28 | DAVID D. & MARK E. YOHO | 56.899 |
|-----|------------|--|---------|
| S2 | 05-19-32 | JASPER N. BURCH ET AL - TRUSTEES | 0.397 |
| 53 | 05-22-04 | CNX GAS COMPANY, LLC | 159.05 |
| S7 | 05-14-02 | JOHN B. WILLIAMS, ET AL | 20.17 |
| S8 | 05-14-12.1 | HENRY WILSON PLUNKERT, JR. | 5.0 |
| 59 | 05-14-14 | ROBERT L. SHIELDS ET AL | 29.05 |
| S10 | 05-14-15 | ROBERT L. SHIELDS ET AL | 53.0 |
| S11 | 05-19-13.1 | DONALD SHIELDS | 0.80 |
| S12 | 05-19-20 | WILBERT H. BUNGARD ET UX | 114.989 |
| S13 | 05-14-10.4 | ADAM & JESSE ROBINSON | 3.343 |
| 519 | 05-12-25 | CSX | 12.B |
| S21 | 05-12-24.3 | CNX LAND RESOURCES, INC. | 18.523 |
| 522 | 05-12-24.1 | W.V. DEPT. OF HIGHWAYS | 0.99 |
| 527 | 05-12-23.1 | JAMES N. DAUGHERTY | 0.28 |
| 528 | 05-12-22 | CNX LAND RESOURCES, INC. | 0.944 |
| 529 | 05-12-07 | ROBERT WM. RIGGENBACH, ET UX | 104.23 |
| 530 | 05-12-21.1 | ROBERT W. JR. & | 14.222 |
| 330 | 03-12-21.1 | WENDY L. RIGGENBACH | |
| 531 | 05-12-15 | WOODLAND HILL CHURCH OF GOD, TRS | 0.375 |
| 532 | 05-12-16 | GARY E. GIBSON, ET AL | 0.104 |
| 533 | 05-12-16.1 | GARY E. GIBSON, ET AL | 0.146 |
| 534 | 05-12-20 | JONI LYN LEON | 0.457 |
| S35 | 05-12-19 | JONI LYN LEON | 0.457 |
| 536 | 05-12-18 | HILDA DELORIS BAXTER | 1.018 |
| 537 | 05-12-17 | HILDA DELORIS BAXTER | 0.752 |
| S38 | 05-14-9.1 | MARIA T. FLOREZ | 2.882 |
| S39 | 05-14-9.5 | MARIA T. FLOREZ | 6.024 |
| 540 | 05-14-19 | BRIAN A. & CHARLOTTE MULL | 0.92 |
| S41 | 05-14-09 | WALTER W. STREIGHT JR., ET UX | 9.311 |
| | | JUSTIN & JODY RINE | 1.1044 |
| S42 | 05-14-17 | | 1.6386 |
| S43 | 05-14-16 | GEORGE A. KNUTH | 3.404 |
| 544 | 05-14-9.4 | VERNIE A. RINE, ET UX | 4.118 |
| 545 | 05-14-9.3 | VERNIE A. RINE, ET UX | 2.7.7 |
| S46 | 05-14-10.3 | VERNIE A. & JODY K. RINE | 1.54 |
| 547 | 05-14-07 | DONNA K. & LEROY ANDERSON | 4.60 |
| 548 | 05-14-08 | LAWRENCE EUGENE ANDERSON | 18.29 |
| S49 | 05-14-10.1 | IDA RUTAN (LIFE), RALPH R. HOYT | 0.50 |
| S50 | 05-14-10.2 | IDA RUTAN (LIFE), RALPH R. HOYT | 0.495 |
| S51 | 05-14-11 | DALE R. GALLAHER, ET AL | 12.0 |
| S52 | 05-14-12 | DALE R. GALLAHER, ET AL | 135.10 |
| S54 | 05-19-06 | MARTHA M. RUTAN | 5.1099 |
| S55 | 05-19-7.3 | OLAN V. RUTAN, ET UX | 0.341 |
| S56 | 05-19-7.4 | OLAN V. RUTAN, ET UX | 1.787 |
| 557 | 05-19-7.2 | OLAN RUTAN | 2.783 |
| 558 | 05-19-7 | OLAN V. RUTAN, ET UX | 32,480 |
| S59 | 05-19-7.1 | ROBERT L. SHIELD, ET AL | 3.399 |
| S60 | 05-19-20.2 | CASANDRA L. HARMON | 7.448 |
| S61 | 05-19-20.1 | JOHN J. EBERT, EST. | 3.848 |
| S62 | 05-19-20.3 | SIDNEY HARMON | 3.715 |
| S63 | 05-19-7.5 | ADAM T. & JESSE L. ROBINSON | 2.640 |
| | | CNX GAS COMPANY, LLC | 40.0 |
| S64 | 05-19-8 | ERNIE L. ANDERSON, ET UX | 0.08 |
| S65 | 05-19-11 | | - |
| 566 | 05-19-10 | ERNIE L. ANDERSON, ET UX | 0.812 |
| S67 | 05-19-12 | ERNIE L. ANDERSON, ET UX | 5.33 |
| S68 | 05-19-09 | PENNY ELAINE MENENDEZ | 10.44 |
| S69 | 05-19-29 | ERNIE L. & TAMMY L. ANDERSON | 10.96 |
| S70 | 05-19-15 | B.J. HERRAN REVOCABLE TRUST | 0.177 |
| S71 | 05-19-30 | ERNIE & TAMMY ANDERSON | 19.03 |
| S72 | 05-19-30.1 | ERIC R.W. & ASHLEY A. HUGGINS | 2.911 |
| S73 | 05-19-31 | CHARLES F. & DIANA L. HAYNES | 8.779 |
| S74 | 05-19-13 | RONA LEE RICE & CHARLES FRANKLIN MCCARDLE | 94.92 |
| S75 | 05-12-23.3 | WVDOH | 0.11 |
| S76 | 05-12-6.1 | WVDOH | 0.31 |
| S77 | 05-12-6 | CNX LAND RESOURCES | 70.81 |
| S78 | 05-12-6.2 | CONSOLIDATION COAL CO. & MURRAY ENERGY C/O LAND DEPT. | 25.50 |
| S79 | 05 10 07 0 | CNX LAND RESOURCES | 12.50 |
| 3/8 | 05-12-23.2 | UNA LAND RESOURCES | 12.00 |

SURFACE OWNER

ACRES

Number TAX MAP -PARCEL



David L Jackson



OPERATOR'S

WELL#: Blake N-8HM

DISTRICT: Franklin

COUNTY: Marshall

STATE: WV

WELL PLAT

PAGE 2 OF 2

DATE: 06/04/2018

REVISED:

07/31/2018

WW-6A1 (5/13)

| Operator's Well No. | Blake N-8HM |
|---------------------|-------------|
|---------------------|-------------|

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE Chapter 22, Article 6A, Section 5(a)(5) IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

| Lease Name or Number | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Book/Page |
|-------------------------|-----------------------|-----------------------|---------|-----------|
| Leace Name or | | | | |

*See attached pages

Acknowledgement of Possible Permitting/Approval In Addition to the Office of Oil and Gas

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all neglected of Oil and Gas permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

| Well Operator: | Tug Hill Operating, LLC | JUL 26 2018 |
|----------------|-------------------------|--|
| By: | Amy L. Miller (MU Slud | WV Department of Environmental Protection |
| Its: | Permitting Specialist | |

Operator's Well No. Blake N - 8HM

| | | | | | | | | | | | | MA Description of section | n | |
|----------|--|---------|--|--|-------------------|--|-------------|------------|------------|------------|------------|--|---|--|
| Lease ID | Tag | Parcel | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Deed Bo | ok/Page | Assignment | Assignment | Assignment | Assignment | O Delastantiant Ore | Assignment | Assignment |
| zeuse is | | 4 | | | | | | | | | | Manuelus | Certificate of Merger - Gastar | |
| | | 7 | | | | | | | j | | | #nviror" | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14141 | l a | 5-19-20 | DAVID TAKACH AND WIFE DEBORAH | GASTAR EXPLORATION USA INC | 1/8+ | 720 | 233 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | | | | | | | | |
| | 1 | 0 | | | | | · ' | | | | | | | |
| 1 | | _ | | | ĺ | | i | | | | | | | |
| 10*17492 | l a | 5-19-9 | DIANA L WELLMAN | TH EXPLORATION LLC | 1/8+ | 940 | 434 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 17432 | ٿ | | DENNIS D CALDWELL AND APRIL N | | 1 2/5 | | | | | · | | | | |
| 10*17493 | В | 5-19-9 | CALDWELL | TH EXPLORATION LLC | 1/8+ | 942 | 409 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*17454 | В | 5-19-9 | MARGARET A BONNETT | TH EXPLORATION LLC | 1/8+ | 940 | 431 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | • | | | | | | | | | | | Certificate of Merger - Gastar | |
| | 1 | 100 | COMMERCIAL OPTICAL MANUFACTURING | | 1 | | | | 1 | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14635 | В | 5-19-9 | INC | GASTAR EXPLORATION USA INC | 1/8+ | 775 | 21 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | 0 | | | 1 | | | | | | | 1 | Certificate of Merger - Gastar | |
| | 1 | | | | 1 | | | _ | | | | 1 | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14640 | В | 5-19-9 | SHERRI SNYDER | GASTAR EXPLORATION USA INC | 1/8+ | 799 | 545 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| Į. | | • . | | { | 1 | 1 | | | | l | | | Certificate of Merger - Gastar | Gastas Euniosation Inc. to TU |
| 1 | | 4 | | | .,, | | | N/A | N/A | N/A | N/A | N/A | Exploration USA Inc to Gastar Exploration Inc: 21/41 | Gastar Exploration Inc. to TH Exploration II LLC: 36/9 |
| 10*14649 | В_ | 5-19-9 | DONALD GARY GROVES II | GASTAR EXPLORATION USA INC | 1/8+ | 842 | 382 | N/A | N/A | N/A | N/A | ly/ | Exploration Inc. 21/41 | Gastar Exploration Inc. to TH |
| | | | TIMOTHY DWIGHT GROVES | GASTAR EXPLORATION INC | 1/8+ | 842 | 384 | N/A | N/A | N/A I | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10*14650 | В | 5-19-9 | TIMOTHY DWIGHT GROVES | GASTAR EXPLORATION INC | 1/0+ | 042 | 304 | 11/2 | N/A | | .90 | | 1,7,1 | Gastar Exploration Inc. to TH |
| 10*14651 | l B | 5-19-9 | DAVID V CALDWELL | GASTAR EXPLORATION INC | 1/8+ | 842 | 386 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10 14051 | <u> </u> | 1333 | | | "" | | | | | | | | | Gastar Exploration Inc. to TH |
| 10*14652 | В | 5-19-9 | CANDICE GUTIERREZ | GASTAR EXPLORATION INC | 1/8+ | 842 | 388 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| | | 1 | | | | | | | | | | | Certificate of Merger - Gastar | |
| 1 | | Į. | | | ļ | l | l | 1 | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14641 | В | 5-19-9 | LORA LANGLEY | GASTAR EXPLORATION USA INC | 1/8+ | 800 | 621 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | 1 | l | 1 | | ĺ | | 1 | Certificate of Merger - Gastar | |
| 1 | | 1 | | | 1 | i | 1 | | 1 | | | 1 | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14642 | В | 5-19-9 | MARY B. FERRIS BY REBECCA R. F | GASTAR EXPLORATION USA INC | 1/8+ | 808 | 457 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | 1 | l | l | | | | | | Certificate of Merger - Gastar | Gastas Euplemation Inc. to TU |
| | ١. | l | | CASTAR SVDI ORATION LISA INS | 1 | | 541 | N/A | N/A | N/A | N/A | N/A | Exploration USA Inc to Gastar Exploration Inc: 21/41 | Gastar Exploration Inc. to TH Exploration II LLC: 36/9 |
| 10*14643 | В. | 5-19-9 | MARTHA RENEE ROBINSON | GASTAR EXPLORATION USA INC | 1/8+ | 809 | 341 | N/A | | 11/2 | 147 | | Certificate of Merger - Gastar | Exploration in EEC. 30/3 |
| 1 | I | | ŀ | } | 1 | 1 | l | 1 | | i l | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14644 | В | 5-19-9 | CHERYL HILL | GASTAR EXPLORATION USA INC | 1/8+ | 809 | 517 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10 14044 | | 3-13-3 | CHERTE MEE | | 1 2/0 | 1 | | | | | • | <u> </u> | Certificate of Merger - Gastar | |
| | 1 | | | İ | | l | | | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14645 | В | 5-19-9 | RANDY BERISFORD | GASTAR EXPLORATION USA INC | 1/8+ | 810 | 328 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | | | | | | | | Gastar Exploration Inc. to TH |
| 10*14647 | В | 5-19-9 | JAMES W ROBINSON III | GASTAR EXPLORATION INC | 1/8+ | 836 | 102 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| | | | | | | | l | | | l | | | l | Gastar Exploration Inc. to TH |
| 10*14648 | В | 5-19-9 | LORI ANN ROBINSON | GASTAR EXPLORATION INC | 1/8+ | 836 | 104 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| | | | | | | l | | 1 | | | | | Certificate of Merger - Gastar | Gastas Euplosation Inc. to TU |
| | l . | | | GACTAR SURI ORATION LICA INC | 1 | | | N/A | N/A | N/A | N/A | N/A | Exploration USA Inc to Gastar Exploration Inc: 21/41 | Gastar Exploration Inc. to TH Exploration II LLC: 36/9 |
| 10*14636 | В | 5-19-9 | WANDA RIDING | GASTAR EXPLORATION USA INC | 1/8+ | 794 | 503 | N/A | N/A | N/A | NyA | 14/4 | Certificate of Merger - Gastar | Exploration in EEC. 38/9 |
| | 1 | | 1 | I | 1 | 1 | l | l | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14637 | В | 5-19-9 | KIMBERLY S. DENNY | GASTAR EXPLORATION USA INC | 1/8+ | 794 | 511 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10 1403/ | ├ | 12-13-3 | MINDENET J. DENIET | C. C | 1 -10- | | | | -4 | | | | Certificate of Merger - Gastar | |
| | 1 | ľ | | 1 | | 1 | l | l | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14638 | В | 5-19-9 | нидн үоно | GASTAR EXPLORATION USA INC | 1/8+ | 794 | 478 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | Ť | T | | | T | | | | | | | | Certificate of Merger - Gastar | |
| 1 | 1 | | 1 | 1 | ! | 1 | l | l | | | | 1 | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14639 | В | 5-19-9 | GARY PARSONS | GASTAR EXPLORATION USA INC | 1/8+ | 794 | 521 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | 1 | I | | 1 | l l | | 1 | 1 | Gastar Exploration Inc. to TH |
| 10*14653 | В | 5-19-9 | KRISTIN DOUGLAS | GASTAR EXPLORATION INC | 1/8+ | 842 | 390 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10*19853 | | 5-19-9 | TIMOTHY B AND MICHELE P JENNINGS | TH EXPLORATION LLC | 1/8+ | 946 | 20 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*19854 | В | 5-19-9 | CHRISTOPHER M JENNINGS | TH EXPLORATION LLC | 1/8+ | 946 | 18 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | 1 _ | L | PATRICK W JENNINGS AND SUSAN PACKER- | THE SYNLONATION LLC | 1.0 | | 1 | l 1/2 | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*19851 | I B | 5-19-9 | JENNINGS | TH EXPLORATION LLC TH EXPLORATION LLC | 1/8+ | 946 946 | 24 | N/A N/A | N/A N/A | N/A | N/A | N/A | N/A | N/A N/A |
| 10*19852 | В | 5-19-9 | JEFFREY A AND SHANNON M JENNINGS SARAH K SCHNEIDER AND DANIEL K | IN EAPLORATION LLC | 1/8+ | 340 | | II/A | IVA | 17/2 | 140 | 197 | 19/0 | 146 |
| 10*17635 | В | 5-19-9 | SCHEIDER | TH EXPLORATION LLC | 1/8+ | 942 | 414 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 1/033 | 1 0 | 12-72-2 | Johnson | 1 2 2010111011 222 | -,-,- | | | 1 | 1 | 1 | | | • | *************************************** |

| Lease ID | Teg | Parcal | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Deed Bo | ok/Page | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment |
|----------|-------------|----------|-------------------------------------|-----------------------------|---------|------------------|-------------|------------------------------------|-------------------------------------|-------------------------------------|---|--|---|--|
| Lease ID | 128 | | diantor, Lessor, etc. | Crantacy services | ,, | | | | | | | , and the second | • | Gastar Exploration Inc. to TH |
| 10*14646 | в ! | 5-19-9 | PENNY ELAINE MENENDEZ | GASTAR EXPLORATION INC | 1/8+ | 822 | 266 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| | | | | | | 1 | | | | | | | | Gastar Exploration Inc. to TH |
| 10*14571 | С | کان | MATTHEW S ANDERSON AND BRENDA | GASTAR EXPLORATION INC | 1/8+ | 840 | 165 | N/A | N/A | N/A | N/A | N/A | N/A Certificate of Merger - Gastar | Exploration II LLC: 36/9 |
| 1 | - 1 | 0 | | | | | | | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 1 | _ [. | | | GASTAR EXPLORATION USA INC | 1/8+ | 727 | ١. | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14423 | D ! | 5-19-7 | OLAN V RUTAN AND PATRICIA E | GASTAR EXPLORATION USA INC | 1/8+ | 121 | - | N/A | N/A | N/A | 14/2 | · · · · · · · · · · · · · · · · · · · | Certificate of Merger - Gastar | Exploration (FEEC. 30/3 |
| 1 1 | | | | 1 | l | | | i | | | | Į | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14423 | F . | 5-19-2 | OLAN V RUTAN AND PATRICIA E | GASTAR EXPLORATION USA INC | 1/8+ | 727 | 1 | N/A | N/A | N/A | N/A | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10 11112 | - | | | | | | | | | | | | a-a | |
| 1 1 | - 1 | - | | • | İ | 1 | İ | | | AB Resources to Chief Exploration & | | | | |
| 1 1 | | D. | | | l | 1 | | TriEnergy Inc to AB Resources LLC: | AB Resources to Chief Exploration & | Development LLC & Radler 2000 LP: | Chief Exploration, et al to Chevron | AB Resources LLC to Chevron USA | Chevron USA Inc to Gastar | |
| 10*14928 | _ | | JOSEPH D PARRIOTT AND NELLIE B | TRIENERGY INC | 1/8+ | 660 | 517 | 19/623 | Development LLC: 666/40 | 24/319 | U.S.A Inc: 25/1 | | Exploration Inc: 32/355 | Gastar to TH Exploration II LLC: 36/9 |
| 10 14520 | | 0 | JOSE II O I FINANCI F FINO INCLUE O | | 1 -7, - | | | | | | | | Certificate of Merger - Gastar | |
| l l | | | | 1 | | | | | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14420 | G | 5-14-0 | ELLIS V. RINE AND WANDA P. RIN | GASTAR EXPLORATION USA INC | 1/8+ | 725 | 141 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | | | | | | Chesapeake Appalachia LLC and | | |
| | l | 4 | | | 1 | 1 | | | | | | Statoil USA Onshore Properties Inc to | | L |
| | l | | | | 1 |] | l | | | A) 4- | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14619 | Н | 5-14-9.5 | SHIRLEY R MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 414 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 Chesapeake Appalachia LLC and | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 1 1 | 1 | • | i | | | { | | | 1 | | ł | Statoil USA Onshore Properties Inc to | Contillecto of Morror Garage | |
| 1 1 | Į. | | | 1 | | | | | | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| | I | | ANITA R MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 416 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14620 | н | 5-14-9.5 | ANTIA K MILLER | CHESAPEARE AFFADACHIA ECC | 1/0+ | /13 | 410 | | N/A | | | Chesapeake Appalachia LLC and | Expression me. 227-2 | Exploration in EEC. 30/3 |
| 1 1 | | | | | | | | | | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| 1 1 | - 1 | | | | | | | | | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14621 | н | 5-14-9.5 | WILLIAM DALE AND NOREEN G MILL | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 415 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10 14011 | | 2.7.5.5 | | | 1 | | | | | | | Chesapeake Appalachia LLC and | | |
| 1 1 | - 1 | | | | 1 | | | | | 1 | ł | Statoil USA Onshore Properties Inc to | | l l |
| 1 | 1 | | | | | | | | | | 1 | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14622 | н | 5-14-9.5 | KELLY D MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 713 | 606 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | 1 | | | | 1 | | | | 1 | Chesapeake Appalachia LLC and | | |
| 1 1 | | | | 1 | 1 | | | | | | | Statoil USA Onshore Properties Inc to | | |
| l i | | | | | | l | ١ | | N/A | N/A | 1 | Gastar Exploration USA Inc & Atinum Marcellus I LLC: 27/321 | Exploration USA Inc to Gastar Exploration Inc: 21/41 | Gastar Exploration Inc. to TH Exploration II LLC: 36/9 |
| 10°14623 | н | 5-14-9.5 | DUANE D MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 717 | 149 | N/A | N/A | N/A | N/A | Chesapeake Appalachia LLC and | Exploration Inc. 21/41 | exploration in EEC. 36/9 |
| 1 1 | | | | | | ŀ | | | | | İ | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | Ì |
| 1 1 | - 1 | | | 1 | 1 | 1 | 1 | | | | Chesapeake Appalachia LLC to Statoil | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14624 | | 5-14-9.5 | DOUGLAS E MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 725 | 559 | N/A | N/A | | USA Onshore Properties Inc: 25/582 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10-14624 | n | 3-14-9.3 | DOOGEAS E WILLER | CHESAL PARE ALL AGRETIA CCO | 1,0. | 1.25 | 555 | | | | | Chesapeake Appalachia LLC and | | |
| | | | | | l . | | ĺ | | | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| 1 | | | | | | | | | | | Chesapeake Appalachia LLC to Statoil | Gastar Exploration USA Inc & Atlnum | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14625 | н | 5-14-9.5 | JACQUELYN J JOHNSON | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 616 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | | | | | 1 | Chesapeake Appalachia LLC and | | |
| | | | 1 | | 1 | | | | | | l | Statoil USA Onshore Properties Inc to | | L |
| | | | | | | | . | 1 | ļ "" | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14626 | н | 5-14-9.5 | STEVEN POND | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 622 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | Marcellus I LLC: 27/321 Chesapeake Appalachia LLC and | Exploration Inc: 21/41 | Exploration (I LLC: 36/9 |
| | | | ! | | 1 | | | | 1 | | | Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to | Certificate of Memor - Gartar | |
| | | | 1 | j | l | | [| | ļ | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| | | | BRIAN AND LENA POND | CHESAPEAKE APPALACHIA LLC | 1/8+ | 717 | 51 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14627 | Н | 5-14-9.5 | DUINIA WAD LEAN LOUD | CHESAT EARE AT FALACTIM LLC | 1 2/07 | ''' | | 170 | 1 | .46 | | Chesapeake Appalachia LLC and | | |
| | | | | 1 | 1 | 1 | | | 1 | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | | | | | 1 | 1 | | | | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14628 | н | 5-14-9.5 | TEXYN L AND GEORGIA A MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 514 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | 1 | | | 1 | T | | | · | | | Chesapeake Appalachia LLC and | | |
| | | | 1 | 1 | 1 | 1 | 1 | | 1 | | | Statoil USA Onshore Properties Inc to | | |
| | | | | | 1 | | | | | | | Gastar Exploration USA Inc & Atinum | | Gaster Exploration Inc. to TH |
| 10*14629 | Н | 5-14-9.5 | GERALD R AND LEE A MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 717 | 1 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | 1 | | 1 | | | Chesapeake Appalachia LLC and | | |
| 1 | | 1 | I | i | 1 | 1 | 1 | | i | | 1 | Statoil USA Onshore Properties Inc to | | 1 |
| 1 | | | i | | | i . | 1 | | I | | let | Carrier Frankrick (Co.) C. C. | Produced on the A to the territory | G-4-5-1-4-4 : |
| 10*14630 | | 5-14-9.5 | BARBARA K BURLEY | CHESAPEAKE APPALACHIA LLC | 1/8+ | 716 | 637 | N/A | N/A | N/A | Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 24/204 | Gastar Exploration USA Inc & Atinum | Exploration USA Inc to Gastar Exploration Inc: 21/41 | Gastar Exploration Inc. to TH Exploration II LLC: 36/9 |

| | | | 10 | Courte Lacres etc | Royalty | Dood Do | ok/Baga | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment |
|----------|--|------------|--|----------------------------|---------|---------|-------------|------------|------------|------------|--------------------------------------|---------------------------------------|---|--|
| Lease ID | Tag | | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Deed Bo | OA/F EBE | Assignment | | - Table | | Chesapeake Appalachia LLC and | | 1 |
| | | 4 | | | | | | | | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | | ٠ | | | | | 1 | | | | Chesapeake Appalachia LLC to Statoil | Gastar Exploration USA Inc & Atinum | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14631 | Ιн | 5-14-9.5 | LISA ANN MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 520 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*18806 | | | E SHIELA PAVLOVICH | TH EXPLORATION LLC | 1/8+ | 929 | 576 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*21223 | Н. | 5-14-9.5 | | TH EXPLORATION LLC | 1/8+ | 961 | 468 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 11115 | '' | 3 1 7 3 13 | EUGENE C GRIEB AND SHIRLEY K GRIEB SEAN M GRENOBLE AND CHERYL A GRENOBLE | | | | | | | | | | | |
| 10*21938 | Ιн | 5-14-9.5 | GRENOBLE | TH EXPLORATION LLC | 1/8+ | 960 | 91 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 11550 | | | JAMES CONTRERAS AND CATHERINE | | | | | | | | | | | 1 |
| 10*17547 | Ιн | 5-14-9.5 | CONTRERAS | TH EXPLORATION LLC | 1/8+ | 942 | 400 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | ~ | RICHARD ARTHUR VAN GROL AND JEANNE | | | | | | | | | | | |
| 10*17548 | н | 5-14-9.5 | MARIE VAN GROL | TH EXPLORATION LLC | 1/8+ | 942 | 389 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | N N | JAMES A GRENOBLE AND MARY JANE | | | | | | | | | | _ | |
| 10*21930 | н | 5-14-9.5 | GRENOBLE | TH EXPLORATION LLC | 1/8+ | 953 | 263 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*21924 | Н | 5-14-9.5 | BEVERLY A MILLER | TH EXPLORATION LLC | 1/8+ | 953 | 533 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | VIOLA JANE BREON AND JAMES RONALD | | | i | | | 1 | | | | | |
| 10*21926 | н_ | 5-14-9.5 | BREON | TH EXPLORATION LLC | 1/8+ | 953 | 360 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18202 | н | 5-14-9.5 | TERRANCE V POWDERLY SR | TH EXPLORATION LLC | 1/8+ | 929 | 85 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 4 | | | | | l | ł | | j | l | l | Certificate of Merger - Gastar | Gardas Europaration Inc. to Til |
| 1 | 1 | | 1 | | | | | | g. 4. | N | l ",, | | Exploration USA Inc to Gastar Exploration Inc: 21/41 | Gastar Exploration Inc. to TH Exploration II LLC: 36/9 |
| 10*14898 | Н | 5-14-9.5 | SHERLEY RAY STOWE | GASTAR EXPLORATION USA INC | 1/8+ | 813 | 444 | N/A | N/A | N/A | N/A | N/A | Certificate of Merger - Gastar | Exploration II LLC: 30/9 |
| | | 1 | | | 1 | | 1 | | | | l | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| | , | | SANDRA J HARMON AND WALTER D | | | | ١ | | | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14899 | H | 5-14-9.5 | HARMON | GASTAR EXPLORATION USA INC | 1/8+ | 813 | 442 | N/A | N/A | N/A | N/A | N/A | Certificate of Merger - Gastar | Exploration in Ecc. 30/3 |
| | | | | | | 1 | | | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 1 | | | 1 | | l | | | | | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14900 | H | 5-14-9.5 | STANLEY EUGENE STOWE | GASTAR EXPLORATION USA INC | 1/8+ | 813 | 440 | N/A | N/A | N/A | N/A | N/A | Certificate of Merger - Gastar | Exploration in Etc. 30/5 |
| | | | | | | | | 1 | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| | | | | | | | | 1 | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14901 | Н | 5-14-9.5 | MARGARET CLICKNER | GASTAR EXPLORATION USA INC | 1/8+ | 815 | 244 | N/A | N/A | 19/4 | 17/0 | 1970 | Exploration Inc. 22/42 | Gastar Exploration Inc. to TH |
| | | 1 | | | ۱ | 836 | 98 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10*14902 | Н | 5-14-9.5 | BENNY MILLER | GASTAR EXPLORATION INC | 1/8+ | 836 | 98 | N/A | 14/4 | 10/2 | 19/2 | 370 | , | Gastar Exploration Inc. to TH |
| | l | l | | GASTAR EXPLORATION INC | 1/8+ | 836 | 100 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10*14903 | Н | 5-14-9.5 | SUE PRUITT | GASTAR EXPLORATION INC | 1/0+ | 630 | 100 | IVA | 170 | | .,,,, | | | Gastar Exploration Inc. to TH |
| l | н | | 45004 144150 | GASTAR EXPLORATION INC | 1/8+ | 846 | 398 | l N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10*14904 | H | 5-14-9.5 | LEROY MILLER | GASTAR EXPLORATION INC | 1/0+ | 840 | 356 | 14/2 | 1,000 | | .,,,,, | 1,47 | | Gastar Exploration Inc. to TH |
| 10114005 | l H | E 14 0 E | JAMES K MILLER | GASTAR EXPLORATION INC | 1/8+ | 854 | 610 | N/A | N/A | N/A | l N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10*14905 | <u> </u> | 5-14-9.5 | JAMES K MILLER | GASTAR EXITEDIATION INC | 1,0. | | 1 020 | | | | | | | Gastar Exploration Inc. to TH |
| | Ι | 5-14-9.5 | MARY LOU MILLER-HORTON | GASTAR EXPLORATION INC | 1/8+ | 862 | 417 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10*14906 | " - | 5-14-9.5 | MAKI LOU WILLEK-HORTON | GASTAR EXPEDITATION INC | 1,0, | 1 002 | 727 | | 1,7,1 | | | | | <u> </u> |
| 10010200 | ۱., | 5-14-9.5 | CORRINE E VERNA & JONATHAN C VERNA | TH EXPLORATION LLC | 1/8+ | 929 | 82 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18209 | " | 3-14-9.3 | DAVID F POWEDERLY JR AND NANCY A | THEM EDITITION EEG | ,- | | | | | | | | | |
| 10*18210 | Н | 5-14-9.5 | POWDERLY | TH EXPLORATION LLC | 1/8+ | 929 | 87 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 10210 | - п | 3-14-3.3 | TOWNER. | | 1 7 | 1 | | | <u> </u> | | i | | | |
| 10*18211 | Н | 5-14-9.5 | REBECCA LYNN KIER AND ERIC JAMES KIER | TH EXPLORATION LLC | 1/8+ | 929 | 90 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 10211 | ''- | 1 | The state of the s | | 1 | | i | | | | | | | |
| 10*18212 | H | 5-14-9.5 | THOMAS C DAVIS AND MARY ELLEN DAVIS | TH EXPLORATION LLC | 1/8+ | 929 | 92 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18212 | H | 5-14-9.5 | THOMAS A POWDERLY | TH EXPLORATION LLC | 1/8+ | 929 | 94 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18214 | | 5-14-9.5 | ANNE M AND JOHN LEACH | TH EXPLORATION LLC | 1/8+ | 929 | 96 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 1 | MARGARET J WHITFORD AND LANCE W | | | 1 | | | | 1 | | | | |
| 10*18215 | н | 5-14-9.5 | WHITFORD | TH EXPLORATION LLC | 1/8+ | 929 | 103 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18218 | | | ERIN E SCHOLL | TH EXPLORATION LLC | 1/8+ | 929 | 106 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | T | 1 | | | I | | | | | | 1 | Chesapeake Appalachia LLC and | | |
| 1 | | | | 1 | | | | 1 | | | 1 | Statoil USA Onshore Properties Inc to | | 1 |
| | | 1 | 1 | 1 | | | | | 1 | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14633 | н | 5-14-9.5 | MARIA T. FLORES | CHESAPEAKE APPALACHIA LLC | 1/8+ | 719 | 318 | N/A | N/A | N/A | USA Onshore Properties Inc: 25/582 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | 1 | | | | | | | 1 | | 1 | Chesapeake Appalachia LLC and | l | |
| 1 | 1 | 1 | | 1 | 1 | 1 | 1 | | 1 | | 1 | Statoil USA Onshore Properties Inc to | | 1 |
| 1 | | 1 | | 1 | | 1 | | | 1 | | [| Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14619 | 1 . | 5-14-19 | SHIRLEY R MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 414 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | 1 | | | | | 1 | | | | 1 | | Chesapeake Appalachia LLC and | | |
| | 1 | | | 1 | | 1 | | | 1 | | | Statoil USA Onshore Properties Inc to | | |
| | 1 | | | | 1 | 1 | 1 | | 1 | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14620 | 1 1 | 5-14-19 | ANITA R MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 416 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | | | | | | | | |

| Lease ID | Tag | Parcel | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Deed 8 | ok/Page | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment |
|----------------------|--|---------|------------------------------------|--|---------|--------|---------|------------|------------|------------|---------------------------------------|---------------------------------------|--------------------------------|-------------------------------|
| | | | | | | | | | | | | Chesapeake Appalachia LLC and | | |
| | 1 | 4 | | | 1 | 1 | | | | | | Statoil USA Onshore Properties Inc to | | |
| | | 7 | | | | l | | | | | | Gastar Exploration USA Inc & Atinum | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| LO*14621 | 1 1 | 5-14-11 | WILLIAM DALE AND NOREEN G MILL | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 415 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | - | | | | | | | | Chesapeake Appalachia LLC and | | |
| | | 0 | i | | | | | | | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | 1 | | | | Į. | | | | i | | | Gastar Exploration USA Inc & Atinum | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14622 | i . | 5-14-19 | KELLY D MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 713 | 606 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10 14022 | ' - | 3-14-7 | RELET O MILEUN | diesa cancari and term and | -/ | 1.20 | | | 17.7 | | | Chesapeake Appalachia LLC and | | |
| | | | | | 1 | ļ | | | | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | | 0 | | | ł | 1 | | | | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| | Ι. | l | DUANE D MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 717 | 149 | N/A | N/A | N/A | N/A | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14623 | | 5-14-19 | DUANE D MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 1/1/ | 143 | N/A | 17/4 | IVA | 14/8 | Chesapeake Appalachia LLC and | Exploration life. 21/41 | Exploration in EEC. 30/3 |
| | 1 | l | | | | | i | | | | | Statoil USA Onshore Properties Inc to | Contilients of Masses Contac | |
| | 1 | S. | ļ | | | | | | | | Character Associately (1 Cas Santai) | | | Cartas Suelannian Ian A. 711 |
| | 1 | | 1 | | | | | | | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 0°14624 | 1 | 5-14-1 | DOUGLAS E MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 725 | 559 | N/A | N/A | N/A | USA Onshore Properties Inc: 25/582 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | | | 1 | | | Chesapeake Appalachia LLC and | | |
| | | | | | 1 | | | | | | Į. | Statoil USA Onshore Properties Inc to | | |
| | 1 | | | | | | | | | | Chesapeake Appalachia LLC to Statoil | Gastar Exploration USA Inc & Atinum | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 0*14625 | 1 . | 5-14-19 | JACQUELYN J JOHNSON | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 616 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 0 14015 | | 1 2 2 2 | | | | | | | | | | Chesapeake Appalachia LLC and | | |
| | I | l | l | | ŀ | 1 | 1 | I | | | 1 | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | 1 |
| | Ī | 1 | | | l | 1 | | I | | | Chesaneake Annalachia II C to Statoil | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| | l . | | | CUESAREAUS AGRALACIUA LLC | 10. | 715 | 622 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14626 | 1 - | 5-14-19 | STEVEN POND | CHESAPEAKE APPALACHIA LLC | 1/8+ | /15 | 622 | N/A | N/A | N/A | USA Onshore Properties Inc. 24/204 | Chesapeake Appalachia LLC and | Exploration Inc. 21/41 | Exploration il CCC: 36/9 |
| | | | | 1 | | | | | | | | | | |
| | 1 | | | | | | | | | i | | Statoil USA Onshore Properties Inc to | | |
| | 1 | 1 | | | 1 | | | | | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14627 | 1 | 5-14-19 | BRIAN AND LENA POND | CHESAPEAKE APPALACHIA LLC | 1/8+ | 717 | 51 | N/A | N/A | N/A | N/A | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | | | | | | Chesapeake Appalachia LLC and | | |
| | | 1 | | | | | | | | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | i |
| | 1 | Į. | | | i | | | | | ł | | Gastar Exploration USA Inc & Atinum | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14628 | 1. | 5-14-19 | TEXYN L AND GEORGIA A MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 514 | l N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10 14028 | +- | 3-14-13 | TEXTIL CALLS GEOMORY WILLEN | | 1 -7- | 1 | | .,,., | | | | Chesapeake Appalachia LLC and | • | |
| | 1 | | | | | Į. | | | | | 1 | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | 1 |
| | i i | 1 | 1 |] | | | 1 | | | | Charanaska Aanalashia II Caa Statail | Gastar Exploration USA Inc & Atinum | | Gastas Evolomation Inc. to TU |
| | | ı | | l | l | l | | l | | | | | | Gastar Exploration Inc. to TH |
| 10*14629 | | 5-14-19 | GERALD R AND LEE A MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 717 | 1 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | 1 | | | 1 | | | | | | | Chesapeake Appalachia LLC and | | |
| | | 1 | | | | | | | | | | Statoil USA Onshore Properties Inc to | | |
| | | 1 | | | | | | | | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14630 | 1 1 | 5-14-19 | BARBARA K BURLEY | CHESAPEAKE APPALACHIA LLC | 1/8+ | 716 | 637 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | † | | | | | | | | | | Chesapeake Appalachia LLC and | | |
| | 1 | 1 | | | | 1 | | 1 | | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | İ | 1 | | 1 | l . | 1 | | | | | Chesapeake Appalachia LLC to Statoil | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14631 | | 5-14-19 | LISA ANN MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 520 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10°14631 10°18806 | | 5-14-19 | E SHIELA PAVLOVICH | TH EXPLORATION LLC | 1/8+ | 929 | 576 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | EUGENE C GRIEB AND SHIRLEY K GRIEB | TH EXPLORATION LLC | 1/8+ | 961 | 468 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*21223 | + + | 5-14-19 | | I THE EAFLURATION LLC | 1/8+ | 301 | 400 | N/A | N/A | 19/8 | 11/4 | 1975 | iya . | N/A |
| | 1 | L | SEAN M GRENOBLE AND CHERYL A | L., .,,, ., ., ., ., ., . | 1 | | ۱ | 1 | 1 ,,,, | N/A | N/A | N/A | N/A | |
| 10*21938 | +- | 5-14-19 | GRENOBLE | TH EXPLORATION LLC | 1/8+ | 960 | 91 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | 1 | 1 | JAMES CONTRERAS AND CATHERINE | | Ι. | 1 | 1 | | 1 . | | | l | | i |
| 10*17547 | 1 | 5-14-19 | CONTRERAS | TH EXPLORATION LLC | 1/8+ | 942 | 400 | N/A | N/A | N/A | N/A | N/A | N/A | N/A_ |
| | | | RICHARD ARTHUR VAN GROL AND JEANNE | 1 | 1 | 1 | 1 | | 1 | | 1 | | | |
| 10*17548 | 1 1 | 5-14-19 | MARIE VAN GROL | TH EXPLORATION LLC | 1/8+ | 942 | 389 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | 1 | | JAMES A GRENOBLE AND MARY JANE | | | 1 | | l | | | | | | |
| 10*21930 | 1 . | 5-14-19 | GRENOBLE | TH EXPLORATION LLC | 1/8+ | 953 | 263 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*21924 | | | BEVERLY A MILLER | TH EXPLORATION LLC | 1/8+ | 953 | 533 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1744 | + | 1 | VIOLA JANE BREON AND JAMES RONALD | | T-7- | T | T | | | | | · · · · · · · · · · · · · · · · · · · | | |
| 10021020 | 1 . | 5-14-19 | BREON | TH EXPLORATION LLC | 1/8+ | 953 | 360 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*21926 | 1 1 | 3-14-19 | PREVIN | THE EAST COMMITTEE COMMITT | +/0₹ | 933 | 300 | 14/0 | - ''' | 170 | - 170 | | Certificate of Merger - Gastar | 170 |
| | 1 | 1 | | 1 | 1 | 1 | I | 1 | | | 1 | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| | | 1 | I | L | 1 | 1 | l | | ļ " | | 1 | | | |
| 10*14898 | | 5-14-19 | SHERLEY RAY STOWE | GASTAR EXPLORATION USA INC | 1/8+ | 813 | 444 | N/A | N/A | N/A | N/A | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | 1 | | 1 | 1 | 1 | 1 | 1 | | | 1 | | Certificate of Merger - Gastar | 1 |
| | | | SANDRA J HARMON AND WALTER D | | 1 | 1 | 1 | 1 | | | 1 | 1 | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14899 | 1 | 5-14-19 | HARMON | GASTAR EXPLORATION USA INC | 1/8+ | 813 | 442 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | T | 1 | | T | T | | | | | | | Certificate of Merger - Gastar | |
| | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | l | | l | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 1 | | 1 | | | | | | | | | | | | |
| 10*14900 | ١. | 5-14-19 | STANLEY EUGENE STOWE | GASTAR EXPLORATION USA INC | 1/8+ | 813 | 440 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |

| Lease ID Ta | ag P | arcal I | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Deed Bo | ok/Page | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment |
|--------------|--|-------------|---------------------------------------|--|--|---------|---------|--|--|------------|--------------------------------------|--|--------------------------------|--|
| Lease ID 18 | ag P | | grantor, tessor, etc. | Grantee, sessee, sta | Hoyalty | - | on, ogs | 7 100 13 11 11 11 11 11 11 11 11 11 11 11 11 | | | | | Certificate of Merger - Gastar | * |
| | | 4 | | | | | | | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14901 | ، اد | -14-19 | MARGARET CLICKNER | GASTAR EXPLORATION USA INC | 1/8+ | 815 | 244 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10 14901 | 1 3 | -14-13[[] | WIANGARET CEICRITER | anomina de la control de la co | -, | | | | | | <u> </u> | | | Gastar Exploration Inc. to TH |
| 10*14902 | . | -14-19 | BENNY MILLER | GASTAR EXPLORATION INC | 1/8+ | 836 | 98 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10*18202 | 1 5 | | | TH EXPLORATION LLC | 1/8+ | 929 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 16202 | ' ' | | TERROREE TTOWNERS ON | | | | | | | | | | | Gastar Exploration Inc. to TH |
| 10*14903 1 | , | -14-19 | SUE PRUITT | GASTAR EXPLORATION INC | 1/8+ | 836 | 100 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10 14303 1 | ' | 0 | SOCTROTT | | | | | | | | | | | Gastar Exploration Inc. to TH |
| 10*14904 | . | 5-14-19 | LEROY MILLER | GASTAR EXPLORATION INC | 1/8+ | 846 | 398 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10 14304 | - | | | | | | | | | | | | | Gastar Exploration Inc. to TH |
| 10*14905 I | 1 5 | | JAMES K MILLER | GASTAR EXPLORATION INC | 1/8+ | 854 | 610 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10 14505 | ` | <u>L</u> | | | | | | | | | | | | Gastar Exploration Inc. to TH |
| 10*14906 I | ı İ5 | | MARY LOU MILLER-HORTON | GASTAR EXPLORATION INC | 1/8+ | 862 | 417 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10 1100 | ` | 0 | | | | | | | | | ł | | | |
| 10*18209 I | ı İs | 5-14-19 | CORRINE E VERNA & JONATHAN C VERNA | TH EXPLORATION LLC | 1/8+ | 929 | 82 | N/A | N/A | N/A_ | N/A | N/A | N/A | N/A |
| | _ | | DAVID F POWEDERLY IR AND NANCY A | | | | | | | | | | | |
| 10*18210 | 1 5 | 5-14-19 | POWDERLY | TH EXPLORATION LLC | 1/8+ | 929 | 87 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | —-t | 4 | | | | | | | 1 | | 1 | | _ | |
| 10*18211 | ı s | 5-14-19 | REBECCA LYNN KIER AND ERIC JAMES KIER | TH EXPLORATION LLC | 1/8+ | 929 | 90 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | | | |
| 10*18212 | 1 5 | 5-14-19 | THOMAS C DAVIS AND MARY ELLEN DAVIS | | 1/8+ | 929 | 92 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10°18213 | 1 5 | 5-14-19 | THOMAS A POWDERLY | TH EXPLORATION LLC | 1/8+ | 929_ | | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18214 | 1 5 | 5-14-19 | | TH EXPLORATION LLC | 1/8+ | 929 | 96 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | MARGARET I WHITFORD AND LANCE W | | 1 | i | l | | | <u>.</u> | 1 | | | |
| 10*18215 I | 1 5 | 5-14-19 | | TH EXPLORATION LLC | 1/8+ | 929 | 103 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18218 | 1 5 | 5-14-19 | | TH EXPLORATION LLC | 1/8+ | 929 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18046 | 1 5 | 5-14-19 | BRIAN A & CHARLOTTIE MULL | TH EXPLORATION LLC | 1/8+ | 927 | 112 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | ł | Chesapeake Appalachia LLC and | | |
| | | | | | | | | | | | 1 | Statoil USA Onshore Properties Inc to | | |
| | | | | | | 1 | | | | | 1 | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14619 J |) 5 | 5-14-5 | SHIRLEY R MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 414 | N/A | N/A | N/A | N/A | Marcellus / LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | 1 | | l | | | | | | Chesapeake Appalachia LLC and | | |
| 1 | | | | | 1 | 1 | | | | | | Statoll USA Onshore Properties Inc to | | |
| | - 1 | | | | l . | | | | | | 1 | Gastar Exploration USA Inc & Atinum | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH Exploration II LLC: 36/9 |
| 10*14621 | J 5 | 5-14-5 | WILLIAM DALE AND NOREEN G MILL | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 415 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration inc: 21/41 | Exploration if LLC: 36/9 |
| | | | | | | | | | | | | Chesapeake Appalachia LLC and Statoil USA Onshore Properties Inc to | Cartificate of Manual Contac | |
| 1 | | | | | | | İ | | | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| | | | | | | | | | | | | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14620 | J 5 | 5-14-5 | ANITA R MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 416 | N/A | N/A | N/A | N/A | Chesapeake Appalachia LLC and | Exploration Inc. 21/41 | Exploration in EEC: 30/9 |
| | - 1 | | ! | | | | ţ | | | | | Statoli USA Onshore Properties Inc to | Cortificate of Marros Castas | |
| 1 | - 1 | | | ļ | i | l | 1 | | | | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| | | : | | | 1 | | | l | N/A | N/A | l N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14622 | 1 5 | 5-14-5 | KELLY D MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 713 | 606 | N/A | N/A | N/A | 1978 | Chesapeake Appalachia LLC and | Exploration inc. 21/41 | Exploration in EEC. 30/3 |
| | - 1 | | | 1 | 1 | l | I | | 1 | | 1 | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | | | | 1 | 1 | I | I | | | | 1 | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| l | . 1. | | L | CHESAPEAKE APPALACHIA LLC | 1/8+ | 717 | 149 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14623 | ا ر | 5-14-5 | DUANE D MILLER | LITEDAPEARE APPALACHIA LLC | 1/8+ | 111 | 149 | N/A | N/A | 1975 | 170 | Chesapeake Appalachia LLC and | | |
| | | | | 1 | 1 | I | I | l | | | 1 | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| 1 1 | | | | 1 | | | | | | | Chesaneake Appalachia LLC to Statoil | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 1 | | | DOUGLAS FAMILES | CHESAPEAKE APPALACHIA LLC | 1/8+ | 725 | 559 | N/A | N/A | N/A | USA Onshore Properties Inc: 25/582 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14624 | 1 1 | 5-14-5 | DOUGLAS E MILLER | CHESAFEARE APPALACHIA LLC | 1/8+ | 1/25 | 229 | N/A | 1 100 | 1970 | | Chesapeake Appalachia LLC and | | |
| 1 1 | | | | | 1 | 1 | 1 | | | | 1 | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| 1 1 | | | | 1 | 1 | Į | 1 | | | | Chesapeake Appalachia LLC to Statoil | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| | , l. | | IACOUELYN I POUNEON | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 616 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14625 | <u>, </u> | 5-14-5 | JACQUELYN I JOHNSON | CHEMPEANE AFFALACHIA LLC | 1/07 | 1 ,13 | 1 010 | 14/2 | | .,,,, | 24/204 | Chesapeake Appalachia LLC and | | |
| 1 | | | | 1 | 1 | 1 | 1 | | | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| \ | - 1 | | | Į. | | 1 | 1 | | | | Chesapeake Appalachia LLC to Statoli | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| | | | STEVEN BOND | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 622 | l N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*14626 | 1 ! | 5-14-5 | STEVEN POND | CHESAFEARE AFFADACHIA LLC | 1/07 | 1 113 | 1 022 | 17/0 | 147 | | | Chesapeake Appalachia LLC and | | |
| 1 1 | - [| | | | 1 | Į. | 1 | 1 | | l | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | | | | | 1 | | ì | ì | | l | | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| | - 1 | | | | | | | | | | | | | |
| 10*14627 | | 5-14-5 | BRIAN AND LENA POND | CHESAPEAKE APPALACHIA LLC | 1/8+ | 717 | 51 | N/A | N/A | N/A | N/A | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |

| Lease (D | Tag P | Parcel | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Deed Bo | ok/Page | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment |
|-----------|-----------------|--------------|---------------------------------------|----------------------------|--|--------------|----------|---------------------------------------|------------|------------|--------------------------------------|---------------------------------------|--------------------------------|--|
| | | 7 | | | | | | | | | | Chesapeake Appalachia LLC and | | |
| | ı | | | | | | | | | 1 | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | | K | | | | | | | | i | | Gastar Exploration USA Inc & Atinum | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14628 | ا ر | 5-14-5 | TEXYN L AND GEORGIA A MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 514 | N/A | N/A | N/A | N/A | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 1 | | - | | | | | | | | | | Chesapeake Appalachia LLC and | | |
| | - 1 | ~ ! | | | | | | | 1 | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | 1 | 2 | | · | | | | | | | Chesapeake Appalachia LLC to Statoil | Gastar Exploration USA Inc & Atinum | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14629 | 1 5 | 5-14-5 | GERALD R AND LEE A MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 717 | 1 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10 14015 | | | | | | | | | | | | Chesapeake Appalachia LLC and | | |
| | | | 1 | | | | 1 | | 1 | | 1 | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | | 4 | | | | | i | | 1 | | Chesapeake Appalachia LLC to Statoil | Gastar Exploration USA Inc & Atinum | | Gastar Exploration Inc. to TH |
| 10*14630 | , | 5-14-60 | BARBARA K BURLEY | CHESAPEAKE APPALACHIA LLC | 1/8+ | 716 | 637 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | Marcellus I LLC: 27/321 | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10 14030 | - | | | | | 1 | | | | | | Chesapeake Appalachia LLC and | | |
| | | _ | | | | | 1 | | 1 | | | Statoil USA Onshore Properties Inc to | Certificate of Merger - Gastar | |
| | 1 | 0 | | | | | i | | † | | Chesapeake Appalachia LLC to Statoil | Gastar Exploration USA Inc & Atinum | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14631 | 1 15 | 5-14- | LISA ANN MILLER | CHESAPEAKE APPALACHIA LLC | 1/8+ | 715 | 520 | N/A | N/A | N/A | USA Onshore Properties Inc: 24/204 | | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| 10*18806 | | 5-14-5 | E SHIELA PAVLOVICH | TH EXPLORATION LLC | 1/8+ | 929 | 576 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*21223 | | | EUGENE C GRIEB AND SHIRLEY K GRIEB | TH EXPLORATION LLC | 1/8+ | 961 | 468 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| -2 57552 | | | SEAN M GRENOBLE AND CHERYL A | | T -7. | T | T | 711 | 1 | 1 | | | 1 | |
| 10*21938 | ، ا | 5-14-5 | GRENOBLE | TH EXPLORATION LLC | 1/8+ | 960 | 91 | N/A | N/A | N/A | N/A | l N/A | N/A | N/A |
| 20 22333 | | | JAMES CONTRERAS AND CATHERINE | | | 1 | <u> </u> | | | | i i | | | |
| 10*17547 | ا را | 5-14-5 | CONTRERAS | TH EXPLORATION LLC | 1/8+ | 942 | 400 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 29 27 347 | - 1 | | RICHARD ARTHUR VAN GROL AND JEANNE | | | T | T | 7 | 1.7.1. | 1 | | | 1 | |
| 10*17548 | , , | 5-14-5 | MARIE VAN GROL | TH EXPLORATION LLC | 1/8+ | 942 | 389 | N/A | N/A | N/A | N/A | l N/A | N/A | N/A |
| | | | JAMES A GRENOBLE AND MARY JANE | | | | | | 1 | | | | | |
| 10*21930 | | 5-14-5 | GRENOBLE | TH EXPLORATION LLC | 1/8+ | 953 | 263 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*21924 | | 5-14-5 | BEVERLY A MILLER | TH EXPLORATION LLC | 1/8+ | 953 | 533 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 22324 | | - | VIOLA JANE BREON AND JAMES RONALD | | | | | · · · · · · · · · · · · · · · · · · · | · | | | | | |
| 10*21926 | , , | 5-14-5 | BREON | TH EXPLORATION LLC | 1/8+ | 953 | 360 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 21510 | | 3 2 7 3 | | | | | | | · · | | | <u> </u> | | |
| 10*18209 | | 5-14-5 | CORRINE E VERNA & JONATHAN C VERNA | TH EXPLORATION LLC | 1/8+ | 929 | 82 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 10105 | | | DAVID F POWEDERLY JR AND NANCY A | | <u> </u> | | | | | 1 | | ĺ | | |
| 10*18210 | ا ر ا | 5-14-5 | POWDERLY | TH EXPLORATION LLC | 1/8+ | 929 | 87 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10 10110 | 1 | | | | | <u> </u> | | · | | | | | | |
| 10*18211 | l , k | 5-14-5 | REBECCA LYNN KIER AND ERIC JAMES KIER | TH EXPLORATION LLC | 1/8+ | 929 | 90 | N/A | N/A | l N/A | N/A | N/A | N/A | N/A |
| 10 10111 | | | | | | | | | | | | | | |
| 10*18212 | وا ر ا | 5-14-5 | THOMAS C DAVIS AND MARY ELLEN DAVIS | TH EXPLORATION LLC | 1/8+ | 929 | 92 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18213 | | 5-14-5 | THOMAS A POWDERLY | TH EXPLORATION LLC | 1/8+ | 929 | 94 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10*18214 | | 5-14-5 | ANNE M AND JOHN LEACH | TH EXPLORATION LLC | 1/8+ | 929 | 96 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | MARGARET J WHITFORD AND LANCE W | <u> </u> | | | | | | | | | | |
| 10*18215 | وايا | 5-14-5 | WHITFORD | TH EXPLORATION LLC | 1/8+ | 929 | 103 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10°18218 | J ! | 5-14-5 | ERIN E SCHOLL | TH EXPLORATION LLC | 1/8+ | 929 | 106 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | | Certificate of Merger - Gastar | |
| | | | | 1 | 1 | | | | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14898 | ; | 5-14-5 | SHERLEY RAY STOWE | GASTAR EXPLORATION USA INC | 1/8+ | 813 | 444 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | 1 | I | | | | | 1 | | Certificate of Merger - Gastar | |
| ! | 1 1 | | SANDRA J HARMON AND WALTER D | 1 | 1 | 1 | 1 | | | 1 | 1 | l | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14899 | ! ر | 5-14-5 | HARMON | GASTAR EXPLORATION USA INC | 1/8+ | 813 | 442 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | | | | | | | Certificate of Merger - Gastar | |
| | | | 1 | 1 | 1 | 1 | | | | 1 | | l | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14900 | ا ر إ | 5-14-5 | STANLEY EUGENE STOWE | GASTAR EXPLORATION USA INC | 1/8+ | 813 | 440 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | | | | | | | Certificate of Merger - Gastar | |
| | 1 | | | 1 | | i | 1 | | | 1 | | [| Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14901 | ایا | 5-14-5 | MARGARET CLICKNER | GASTAR EXPLORATION USA INC | 1/8+ | 815 | 244 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | T | | | | | | 1 | | Gastar Exploration Inc. to TH |
| 10*14902 | ایا | 5-14-5 | BENNY MILLER | GASTAR EXPLORATION INC | 1/8+ | 836 | 98 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10°18202 | | 5-14-5 | TERRANCE V POWDERLY SR | TH EXPLORATION LLC | 1/8+ | 929 | 85 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | · · · · · · · · · · · · · · · · · · · | | Gastar Exploration Inc. to TH |
| 10*14903 | J | 5-14-5 | SUE PRUITT | GASTAR EXPLORATION INC | 1/8+ | 836 | 100 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| | | | | | 1 | | | | | | | | | Gastar Exploration Inc. to TH |
| 10*14904 | 1 | 5-14-5 | LEROY MILLER | GASTAR EXPLORATION INC | 1/8+ | 846 | 398 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| | | | | | | 1 | | | | | | | | Gastar Exploration Inc. to TH |
| | | I | JAMES K MILLER | GASTAR EXPLORATION INC | 1/8+ | 854 | 610 | N/A | N/A | N/A | N/A | N/A | N/A | Exploration II LLC: 36/9 |
| 10*14905 | l | 5-14-5 | JAIVIES K WILLER | GASTAR EXPLORATION INC | 1/0+ | 054 | | | .,,,, | | | | | |
| 10*14905 | ı | 5-14-5 | MARY LOU MILLER-HORTON | GASTAR EXPLORATION INC | 1/8+ | 862 | | N/A | N/A | N/A | N/A | N/A | N/A | Gastar Exploration Inc. to TH Exploration II LLC: 36/9 |

WW-6A1 Supplement
Operator's Well No. Blake N - 8HM

| Lease ID | Tag | Parcel | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Deed Bo | ok/Page | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment | Assignment |
|----------|-----|---------|-------------------------------|----------------------------|---------|---------|---------|------------|------------|------------|------------|------------|--------------------------------|----------------------------------|
| | | | | | | | | | | | | | Certificate of Merger - Gastar | |
| ! ! | | | | | | l | | l i | | | | | Exploration USA Inc to Gastar | Gastar Exploration Inc. to TH |
| 10*14568 | J. | 5-14-5 | LEROY ANDERSON & DONNA K ANDE | GASTAR EXPLORATION USA INC | 1/8+ | 772 | 69 | N/A | N/A | N/A | N/A | N/A | Exploration Inc: 21/41 | Exploration II LLC: 36/9 |
| | | | | | | | | | | | | | | Memorandum of Operating |
| | 1 | | | | l | | | | | | l i | | | Agreement between TH Exploration |
| | | | | Į. | l | l | l | | | | | | | LLC and HG Energy II Appalachia, |
| 041112 | ĸ | 5-12-23 | HG ENERGY II APPALACHIA LLC | TH EXPLORATION LLC | 1/8+ | 988 | 286 | N/A | N/A | N/A | N/A | N/A | N/A | LLC: 988/286 |
| | | | | | | | | | | | | | | Memorandum of Operating |
| | | | | } | l | | 1 | | | | | | | Agreement between TH Exploration |
| 1 | | | | 1 | l | I | l | | | | | | | LLC and HG Energy II Appalachia, |
| 041112 | ĺι | 5-12-22 | HG ENERGY II APPALACHIA LLC | TH EXPLORATION LLC | 1/8+ | 988 | 286 | N/A | N/A | N/A | N/A | N/A | N/A | LLC: 988/286 |

4705102054

MARK 0988 PAGE 0286

MEMORANDUM OF OPERATING AGREEMENT AND FINANCING STATEMENT

This Memorandum of Operating Agreement and Financing Statement (hereinafter referred to as "Memorandum") is executed to be effective concurrently with that certain Operating Agreement (the "Operating Agreement") by and between TH Exploration, LLC, as Operator, and HG Energy II Appalachia, LLC and TH Exploration II, LLC, as Non-Operators, covering, among other things, the development and production of crude oil, natural gas and associated substances from the leases (hereinafter called the "Contract Area") described on Exhibit "A-1" and Exhibit "A-2" attached hereto and owned by Operator and Non-Operator in the respective percentages of shares indicated on Exhibit "A" to the Operating Agreement.

The Operating Agreement contains an Accounting Procedure, along with provisions giving the parties hereto mutual liens and security interests where one or more parties hereto are or may become Debtors to one or more other parties hereto. This Memorandum incorporates by reference all of the terms and conditions of the Operating Agreement, including but not limited to the lien and security interest provisions.

The purpose of this Memorandum is to place third parties on notice of the Operating Agreement, and to secure and perfect the mutual liens and security interests of the parties hereto.

The Operating Agreement specifically provides and the parties do hereby confirm and agree that:

- The Operator shall conduct and direct and have full control of all operations on the Contract Area as permitted and required by, and within the limits of, the Operating Agreement.
- The liability of the parties under the Operating Agreement shall be several, not
 joint or collective. Each party shall be responsible only for its obligations and
 shall be liable only for its proportionate share of costs.
- 3. Each Non-Operator grants to Operator a lien upon its oil and gas rights, oil and gas leases and mineral interests in the Contract Area, and a security interest in its share of oil and/or gas when extracted and its interest in all fixtures, inventory, personal property and equipment located on or used on the Contract Area and in all its contract rights and receivables related thereto and arising therefrom to secure payment of its present and future share of costs and expenses, together with interest thereon at the rate provided in the Accounting Procedure referred to above. To the extent that Operator has a security interest under the Uniform Commercial Code ("Code") of the state or states in which the Contract Area is located, Operator without prejudice and in addition to all other legal, equitable and contractual remedies which are expressly reserved, shall be entitled to exercise the rights and remedies of a secured party under the Code. The bringing of a suit and the obtaining of judgment by Operator for the secured indebtedness shall not be deemed an election of remedies or otherwise affect the rights or security interests for the payment thereof.
- 4. The Operator grants to Non-Operator a lien and security interest equivalent to that granted to Operator as described in Paragraph 3 above, to secure payment by Operator of its own share of costs and expenses when due.

As reflected above, either or both Operator and Non-Operator may become Debtors if they default in their payment obligations under the terms of the Operating Agreement. On default, the non-defaulting party(ies) will be considered secured party(ies).

The Operating Agreement contains other provisions which do not conflict but supplement the above-described provisions, including, but not limited to, non-consent provisions which provide that parties who elect not to participate in certain operations shall be deemed to have relinquished their interest until the consenting parties are able to recover their costs of such operations plus a specified amount. Should any person or firm desire additional information regarding the Operating Agreement or wish to inspect a copy of the Operating Agreement, said person or firm should contact the Operator.

For purposes of protecting said liens and security interest, the undersigned parties agree that this Memorandum covers all right, title and interest of the Debtors in:

Property Subject to Security Interests:

- (A) All personal property located upon or used in connection with the Contract Area.
- (B) All fixtures on the Contract Area.
- (C) All oil, gas and associated substances of value in, on or under the Contract Area, or which may be extracted therefrom.
- (D) All accounts and receivables resulting from the sale of the items described in subparagraph (C) at the wellhead of every well located on the Contract Area or on lands pooled therewith.
- (E) All items used, useful, or purchased for the production, treatment, handling, storage, transportation, processing, manufacture, or sale of the items described in subparagraph (C).
- (F) All accounts, contract rights, rights under any gas balancing agreement, general intangibles, equipment, inventory, farmout rights, option farmout rights, acreage and/or cash contributions, and conversions rights, whether now owned or existing or hereafter acquired or arising, including but not limited to all interest in any enterprise that holds, owns, or controls any interest in the Contract Area or in any property encumbered by this Memorandum.
- (G) All severed and extracted oil, gas and associated substances now or hereafter produced from or attributable to the Contract Area, including without limitation, oil, gas and associated substances in tanks or pipelines or otherwise held by any person or entity for treatment, storage, transportation, manufacture, processing or sale.
- (H) All the proceeds and products of the items described in the foregoing paragraphs now existing or hereafter arising, and all substitutions therefore, improvements and enhancements thereto, replacements thereof, or accessions thereto.
- (I) All personal property and fixtures now and hereafter acquired in furtherance of the purposes of this Operating Agreement. Certain of the above-described items are, or are to become, fixtures on the Contract Area.
- (J) The proceeds and products of collateral are also specifically covered.

Property Subject to Liens:

- (A) All real property, within the Contract Area, including all oil, gas and associated substances of value in, on or under the Contract Area, or which may be extracted therefrom.
- (B) All fixtures within the Contract Area.
- (C) All real property and fixtures now and hereafter acquired in furtherance of the purposes of this Operating Agreement.

The above items will be financed at the wellhead of the well or wells located on the Contract Area, and this Memorandum is to be filed for record in the real estate records of the county and in the Uniform Commercial Code records in which the Contract Area is located.

On default of any covenant or condition of the Operating Agreement, in addition to any other remedy afforded by law, each party to the Operating Agreement and any successor to such party by assignment, operation of law, or otherwise, shall have, and is hereby given and vested with, the power and authority to take possession of and sell any interest which the defaulting party has in property identified above securing the obligations provided in the Operating Agreement and to foreclose this lien and security interest in the manner provided by law.

Upon expiration of the Operating Agreement and the satisfaction of all debts and outstanding interest, the Operator shall file of record a release and termination on behalf of all parties concerned. Upon the filing of such release and termination, all benefits and obligations under this Memorandum shall terminate as to all parties who have executed or ratified this Memorandum. In addition, the Operator shall have the right to file a continuation statement on behalf of all parties who have executed or ratified this Memorandum when Operator.

It is understood and agreed by the parties hereto that if any part, term or provision of this Memorandum is held to be illegal or in conflict with any applicable state or federal law or regulation, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Memorandum did not contain the particular part, term or provision held to be invalid.

This Memorandum shall be binding upon and shall inure to the benefit of the parties hereto and to their respective heirs, devisees, legal representatives, successors and assigns.

A party having an interest in the Contract Area can ratify this Memorandum by execution hereof or a separate counterpart hereof or by execution and delivery of an instrument of ratification, adopting the provisions of this Memorandum or agreeing to be bound by the terms hereof. Any such ratification shall have the same effect as if the ratifying party had executed this Memorandum or a counterpart thereof. By execution or ratification of this Memorandum, such party hereby consents to its ratification and adoption by any party who may have or may acquire any interest in the Contract Area.

The parties hereto agree to execute, acknowledge and deliver or cause to be executed, acknowledged and delivered any instrument, or take any action necessary or appropriate to effectuate the terms of the Operating Agreement or any Exhibit, instrument, certificate or other document pursuant thereto.

This Memorandum may be executed or ratified in one or more counterparts and all of the executed or ratified counterparts shall together constitute one instrument. For purpose of recording, only one copy of this Memorandum with individual signature pages attached thereto needs to be filed of record.

Executed this 1st day of July, 2018.

OPERATOR: TH Exploration, LLC

Name: Sean Willis

Title: Sr. Vice President

NON-OPERATOR: HG Energy II Appalachia, LLC

Ву: ____

Name: Jared Hall Title: President

NON-OPERATOR: TH Exploration II, LLC

Name: David Kalish

Title: Sr. Vice President - Land

| ACKNOWLEDGEMENT |
|---|
| COMMONWEALTH OF PENNSYCUANIA) |
| COUNTY OF Washington |
| On this the 11th day of July 2018, before me, a notary public, the undersigned authority, personally appeared Sean Willis, who acknowledged his self to be the Sr. Vice President of TH Exploration, LLC, a limited liability company, and that he as such Sr. Vice President being authorized to do so, executed the foregoing instrument for the purposed therein contained by signing the name of the limited liability company by his self as Sr. Vice President. |
| IN WITNESS WHEREOF, I hereunto set my hand and official seal. |
| My Commission Expires: 2/16/2020 Signature/Notary Public: |
| Name/Notary Public (print): DANO G. Deltaco COMMONWEALTH OF PENNSYLVANIA NOTARIAL SEAL David Gabriel Detallo, Notary Public Cecil Township, Washington County My Commission Expires February 16, 2020 |
| ACKNOWLEDGEMENT |
| COMMONWEALTH OF YELLIST YANIA) SS: |
| COUNTY OF WASHINGTON) |
| On this the 11th day of July 2018, before me, a notary public, the undersigned authority, personally appeared David D. Kalish, who acknowledged his self to be the Sr. Vice President - Land of TH Exploration II, LLC, a limited liability company, and that he as such Sr. Vice President - Land being authorized to do so, executed the foregoing instrument for the purposed therein contained by signing the name of the limited liability company by his self as Sr. Vice President - Land. |
| IN WITNESS WHEREOF, I hereunto set my hand and official seal. |
| My Commission Expires: 2 1は2020 Signature/Notary Public: |
| Name/Notary Public (print): DAID G. DELACO COMMONWEALTH OF PENNSYLVANIA NOTARIAL SEAL David Gabriel Detailo, Notary Public Cacil Township, Washington County My Commission Expires February 16, 2020 |
| ACKNOWLEDGEMENT |
| STATE OF WEST VIRGINIA) SS: COUNTY OF WOOD) |
| This instrument was acknowledged before me on the day of, 2018 by Jared Hall, as President of HG Energy II Appalachia, LLC, a Delaware limited liability company, on behalf of said company. |
| Given under my hand and seal this the day of, 2018. |

Notary Public, State of _____

Prepared by and please return to: TH Exploration, LLC 380 Southpointe Boulevard, Suite 200 Canonsburg, PA 15317 The parties hereto agree to execute, acknowledge and deliver or cause to be executed, acknowledged and delivered any instrument, or take any action necessary or appropriate to effectuate the terms of the Operating Agreement or any Exhibit, instrument, certificate or other document pursuant thereto.

This Memorandum may be executed or ratified in one or more counterparts and all of the executed or ratified counterparts shall together constitute one instrument. For purpose of recording, only one copy of this Memorandum with individual signature pages attached thereto needs to be filed of record.

Executed this 1st day of July, 2018.

| OPE | RATOR: TH Exploration, LLC |
|-----|--|
| | |
| By: | N |
| | Name: |
| NON | N-OPERATOR: HG Energy II Appalachia, LLC |
| Ву: | Name: Jared Hall Title: President |
| NON | N-OPERATOR: TH Exploration II, LLC |
| | |
| | Name: |
| | Title: |

ACKNOWLEDGEMENT

| STATE OF |) |
|---|--|
| COUNTY OF |) SS: |
| authority, personally appeared Sean Will Exploration, LLC, a limited liability comp | 2018, before me, a notary public, the undersigned lis, who acknowledged his self to be the Sr. Vice President of TH any, and that he as such Sr. Vice President being authorized to at for the purposed therein contained by signing the name of the Vice President. |
| IN WITNESS WHEREOF, I here | unto set my hand and official seal. |
| My Commission Expires: | Signature/Notary Public: |
| Name/Notary Public (print): | |
| | ACKNOWLEDGEMENT |
| STATE OF |) |
| COUNTY OF |) SS:) |
| Land of TH Exploration II, LLC, a limited being authorized to do so, executed to | 2018, before me, a notary public, the undersigned Kalish, who acknowledged his self to be the Sr. Vice President - liability company, and that he as such Sr. Vice President - Land he foregoing instrument for the purposed therein contained by ompany by his self as Sr. Vice President - Land. |
| IN WITNESS WHEREOF, I here | unto set my hand and official seal. |
| My Commission Expires: | Signature/Notary Public: |
| Name/Notary Public (print): | |
| | ACKNOWLEDGEMENT |
| STATE OF <u>WEST VIRGINIA</u> |)) SS:) |
| This instrument was acknowledged before President of HG Energy II Appalachia company. | ore me on the 11 day of Tuly, 2018 by Jared Hall, as LLC, a Delaware limited liability company, on behalf of said |
| Given under my hand and seal this the | 11 day of July , 2018. |
| OFFICIAL SEAL NOTARY PUBLIC STATE OF WEST VIRGINIA JEANINE M. GAUTHIER GENERY, LLC 250 Dupori Road Perkoriburg, West Virginia 28101 My Contribistoria Aug. 30, 20 | Alasan Dublic Otaca at the 1601 11 contact |

Prepared by and please return to: TH Exploration, LLC 380 Southpointe Boulevard, Suite 200 Canonsburg, PA 15317



May 17, 2018

WV Department of Environmental Protection Office of Oil & Gas 601 57th Street, SE Charleston, WV 25304 Attention: Laura Adkins

RE: Blake N-8HM

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Blake N-8HM well plat.

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 304-376-0111, or by email at amiller@tug-hillop.com.

Sincerely,

Amy L. Miller

Permitting Specialist - Appalachia Region

Office of Oil and Gas
JUN 1 1 2018

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS **NOTICE CERTIFICATION**

| Date of Notice | e Certification: 06/07/2018 | API No. 47 | | |
|--|--|--|--|--|
| | | Operator's | Well No. Blake | N-8HM |
| | | Well Pad N | ame: Blake | |
| Notice has b | oeen given: | | | |
| | | § 22-6A, the Operator has provided the req | uired parties w | ith the Notice Forms listed |
| | tract of land as follows: | Post on | 540 700 05 | |
| State: | West Virginia | UTM NAD 83 Easting: | 516,709.95 | |
| County: | Marshall | Northing: | 4,401,617.54 | d - County Route 29 |
| District: | Franklin | Public Road Access: Generally used farm name: | Wibert H. Bungare | |
| Quadrangle: | Powhatan Point 7.5' | Generally used farm name: | Wibert H. Burigan | u, et ux |
| Watershed: | French Creek - Ohio River (HUC 10) | | | |
| it has provide information re of giving the requirements Virginia Code | ed the owners of the surface descri- equired by subsections (b) and (c), so surface owner notice of entry to so of subsection (b), section sixteen of | shall contain the following information: (14 bed in subdivisions (1), (2) and (4), subsection sixteen of this article; (ii) that the recurvey pursuant to subsection (a), section to f this article were waived in writing by the tender proof of and certify to the secretary int. | ection (b), sec quirement was en of this artic the surface ow | ction ten of this article, the deemed satisfied as a result cle six-a; or (iii) the notice yner; and Pursuant to West |
| that the Ope. *PLEASE CHE 1. NOT 2. NOT | rator has properly served the require ECK ALL THAT APPLY FICE OF SEISMIC ACTIVITY or | Decrator has attached proof to this Notice Control of Parties with the following: NOTICE NOT REQUIRED BECAUTED OF LAT SURVEY WAS CONDUCTED OF ENTRY FOR PLAT SURVEY WAS CONDUCTED OF LAT SURVEY WAS C | JSE NO IED ONDUCTED JSE VEY | OOG OFFICE USE ONLY RECEIVED/ NOT REQUIRED RECEIVED/ NOT REQUIRED |
| ■ 5. PUE | TICE OF PLANNED OPERATION BLIC NOTICE TICE OF APPLICATION | RECEIVED Office of Oil and JUN 1120 WV Departmen Environmental Pro | 18 | □ RECEIVED □ RECEIVED □ RECEIVED |

Required Attachments:

The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

Certification of Notice is hereby given:

| ave personally examined and am familiar with the information submitted based on my inquiry of those individuals immediately responsible for |
|--|
| registered mail or by any method of delivery that requires a receipt or lave personally examined and am familiar with the information submitted based on my inquiry of those individuals immediately responsible for ue, accurate and complete. I am aware that there are significant penalties in and imprisonment. Address: 380 Southpointe Boulevard, Plaza II, Suite 200 Canonsburg, PA 15317 Facsimile: 724-338-2030 |
| have personally examined and am familiar with the information submitted based on my inquiry of those individuals immediately responsible for ue, accurate and complete. I am aware that there are significant penalties in and imprisonment. Address: 380 Southpointe Boulevard, Plaza II, Suite 200 Canonsburg, PA 15317 Facsimile: 724-338-2030 |
| based on my inquiry of those individuals immediately responsible for ue, accurate and complete. I am aware that there are significant penalties in and imprisonment. Address: 380 Southpointe Boulevard, Plaza II, Suite 200 Canonsburg, PA 15317 Facsimile: 724-338-2030 |
| Address: 380 Southpointe Boulevard, Plaza II, Suite 200 Canonsburg, PA 15317 Facsimile: 724-338-2030 |
| Address: 380 Southpointe Boulevard, Plaza II, Suite 200 Canonsburg, PA 15317 Facsimile: 724-338-2030 |
| Address: 380 Southpointe Boulevard, Plaza II, Suite 200 Canonsburg, PA 15317 724-338-2030 |
| Canonsburg, PA 15317 Facsimile: 724-338-2030 |
| Canonsburg, PA 15317 Facsimile: 724-338-2030 |
| |
| Email: amiller@tug-hillop.com |
| |
| |
| without and many before me this 7 day of JUNE 2018 |
| day of Orlow Auto. |
| large of the bank |
| WHI WOULD I STORAL |
| Notary Public |
| Notary Public No |
| scribed and sworn before me this 7 day of JUNE 2018 |

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

Office of Oil and Gas

JUN 1 1 2018

API NO. 47- 051 OPERATOR WELL NO. Blake N-8HM
Well Pad Name: Blake

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF 4.7 AND GASO 2 0 5 4 NOTICE OF APPLICATION

| Notice Time Requirement: notice shall be provided no later than | the filing date of permit application. |
|---|--|
| Date of Notice: 6/7/2018 Date Permit Application Filed: 6/8/20 Notice of: | 18 |
| PERMIT FOR ANY WELL WORK CONSTRUCTION OF A | ROVAL FOR THE N IMPOUNDMENT OR PIT |
| Delivery method pursuant to West Virginia Code § 22-6A-10(| b) |
| | DD OF DELIVERY THAT REQUIRES A PT OR SIGNATURE CONFIRMATION |
| the surface of the tract on which the well is or is proposed to be located oil and gas leasehold being developed by the proposed well work, if the described in the erosion and sediment control plan submitted pursuant operator or lessee, in the event the tract of land on which the well promore coal seams; (4) The owners of record of the surface tract or trace well work, if the surface tract is to be used for the placement, construing the land of this article; (5) And have a water well, spring or water supply source located within one the provide water for consumption by humans or domestic animals; and (proposed well work activity is to take place. (c)(1) If more than three subsection (b) of this section hold interests in the lands, the applicant records of the sheriff required to be maintained pursuant to section eight provision of this article to the contrary, notice to a lien holder is not not a section of the sheriff required to the contrary, notice to a lien holder is not not a section of the sheriff required to be maintained pursuant to section eight and the section of this article to the contrary, notice to a lien holder is not not a section of the sheriff required to be maintained pursuant to section eight and the section of this article to the contrary, notice to a lien holder is not not a section of the section | e signature confirmation, copies of the application, the erosion and e well plat to each of the following persons: (1) The owners of record of ed; (2) The owners of record of the surface tract or tracts overlying the the surface tract is to be used for roads or other land disturbance as at to subsection (c), section seven of this article; (3) The coal owner, sposed to be drilled is located [sic] is known to be underlain by one or ats overlying the oil and gas leasehold being developed by the proposed ction, enlargement, alteration, repair, removal or abandonment of any my surface owner or water purveyor who is known to the applicant to mousand five hundred feet of the center of the well pad which is used to (6) The operator of any natural gas storage field within which the tenants in common or other co-owners of interests described in may serve the documents required upon the person described in the ght, article one, chapter eleven-a of this code. (2) Notwithstanding any notice to a landowner, unless the lien holder is the landowner. W. Va. ovide the Well Site Safety Plan ("WSSP") to the surface owner and any |
| ☐ Application Notice ☐ WSSP Notice ☐ E&S Plan Notice | ☐ Well Plat Notice is hereby provided to: |
| Z SURFACE OWNER(s) | ☑ COAL OWNER OR LESSEE |
| Name: Wilbert H. and Pamela June Bungard (access road and well pad) | Name: CNX Land Resources, Attn: Casey Saunders |
| Address: 243 Bandit Drive | Address: 1000 Consol Energy Drive |
| Proctor, WV 26055 | Canonsburg, PA 15318 |
| | □ COAL OPERATOR |
| Address: 3343 Burch Ridge Road | Name: |
| Proctor, WV 26055 | Address: |
| SURFACE OWNER(s) (Road and/or Other Disturbance) | |
| | □ SURFACE OWNER OF WATER WELL |
| | AND/OR WATER PURVEYOR(s) |
| | Name: Wilbert H. Bungard and Pamela June Bungard (*See attached list) |
| | Address: 243 Bandit Drive |
| Address: | Proctor, WV 26055 |
| | □ OPERATOR OF ANY NATURAL GAS STORAGE FIELD |
| SURFACE OWNER(s) (Impoundments or Pits) | Name: |
| Name: | Address: |
| Address: | |
| RECEIVED Office of Oil and Gas | *Please attach additional forms if necessary |

JUN 1 1 2018

WW-6A (8-13) RECEIVED Office of Oil and Gas

JUN 1 1 2018

API NO. 47 07 0-5 1 0 2 0 5 4
OPERATOR WELL NO. Blake North 5 4
Well Pad Name: Blake

WV Department of Environmental Protection

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

This Notice Shall Include:

Pursuant to W. Va, Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Location Restrictions

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items WW-6A (8-13) API NO. 474057 0-5102054
OPERATOR WELL NO. Blake N-8HM

Well Pad Name: Blake

examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

Water Well Testing:

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

Water Testing Laboratories:

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

Written Comment:

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

RECEIVED
Office of Oil and Gas**

Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0450

JUN 1 1 2018

WV Department of Environmental Protection

Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.

WW-6A (8-13)

API NO. 47-47-05-10-20-5-4
OPERATOR WELL NO. Blake N-BHA 0-5-4
Well Pad Name: Blake

Time Limits and Methods for Filing Comments.

The law requires these materials to be served on or before the date the operator files its Application. You have THIRTY (30) DAYS after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

Comment Requirements

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

Permit Denial or Condition

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective:
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

RECEIVED Office of Oil and Gas

JUN 1 1 2018

WW-6A (8-13)

Well Pad Name: Blake

Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC

Telephone: 724-749-8388

Email: amiller@tug-hillop.com

Address: 380 Southpointe Boulevard, Plaza II, Suite 200

Canonsburg, PA 15317

Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

COMMONWEALTH OF PENNSYLVANIA

NOTARIAL SEAL MAUREEN A STEAD Notary Public CECIL TWP, WASHINGTON COUNTY My Commission Expires Jan 28, 2019 Subscribed and sworn before me this 7 day of JVNE 2018

Notary Public

My Commission Expires

RECEIVED Office of Oil and Gas

JUN 1 1 2018

WW-6A

Supplement Pg. 1A

Tug Hill Operating, LLC 380 Southpointe BLVD, Suite 200 Canonsburg, PA 15317

WATER WELL REPORT

RECEIVED Office of Oil and Gas

JUN 1 1 2018

WV Department of Environmental Protection

BLAKE N -8HM

District: Franklin County: Marshall State: WV

Well:

There appears to be Sixteen (16) possible water sources within 2,000 feet of the above referenced well location.

| Topo Spot # 1 | Topo Spot #2 | Topo Spot # 3 |
|------------------------------|---------------------------|------------------------|
| (House) | (Abandoned House) | (House) |
| TM 19 Par. 20 | TM 19 Par. 20 | TM 19 Par. 20.2 |
| Wilbert H. Bungard, et ux | Wilbert H. Bungard, et ux | Casandra L. Harmon |
| 304-476-6494 | 304-476-6494 | 304-639-9837 |
| 243 Bandit Drive | 243 Bandit Drive | 37 Bandit Drive |
| Proctor, WV 26055 | Proctor, WV 26055 | Proctor, WV 26055 |
| Topo Spot # 4 | Topo Spot # 5 | Topo Spot # 6 |
| (House) | (House) | (House) |
| TM 19 Par. 20.1 | TM 19 Par. 7.1 | TM 19 Par. 7.5 |
| John J. Ebert (Life) | Robert L. Shields, et ux | Adam & Jesse Robinson |
| 304-455-3967 | 304-455-5387 | 304-280-9745 |
| 26 Bandit Drive | 2756 Burch Ridge Rd. | 2932 Burch Ridge Rd. |
| Proctor, WV 26055 | Proctor, WV 26055 | Proctor, WV 26055 |
| Topo Spot # 7 | Topo Spot # 8 | Topo Spot # 9 |
| (House-New) | (House) | (House) |
| TM 19 Par. 10 | TM 19 Par. 10 | TM 19 Par. 9 |
| Ernie L. Anderson, et ux | Ernie L. Anderson, et ux | Penny E. Menendez |
| 304-455-3818 | 304-455-3818 | 304-455-5338 |
| 3156 Burch Ridge Rd. | 3156 Burch Ridge Rd. | 3171 Burch Ridge Rd. |
| Proctor, WV 26055 | Proctor, WV 26055 | Proctor, WV 26055 |
| Topo Spot # 10 | Topo Spot # 11 | Topo Spot # 12 |
| (Trailer) | (House) | (Trailer) |
| TM 19 Par. 29 | TM 19 Par. 19 | TM 19 Par. 19 |
| Ernie L. & Tammy L. Anderson | Russell Blake, et al | Russell Blake, et al |
| 304-455-3818 | 304-455-1158 | 304-455-1158 |
| 3156 Burch Ridge Rd. | 3343 Burch Ridge Rd. | 3343 Burch Ridge Rd. |
| (3298 Burch Ridge Rd.) | Proctor, WV 26055 | (3435 Burch Ridge Rd.) |
| Proctor, WV 26055 | | Proctor, WV 26055 |

| Topo Spot # 13 | Topo Spot # 14 | Topo Spot # 15 |
|------------------------------|------------------------------|------------------------------|
| (House) | (House) | (House) |
| TM 19 Par. 30 | TM 19 Par. 31 | TM 19 Par. 28 |
| Ernie & Tammy Anderson | Charles F. & Diana L. Haynes | David D. Yoho & Mark E. Yoho |
| 304-455-3818 | 304-312-5210 | 304-455-3176 |
| 3156 Burch Ridge Rd. | 3508 Burch Ridge Rd. | 3555 Burch Ridge Rd. |
| (3486 Burch Ridge Rd.) | Proctor, WV 26055 | Proctor, WV 26055 |
| Proctor, WV 26055 | | |
| Topo Spot # 16 | | |
| (House) | | |
| TM 19 Par. 28 | | |
| David D. Yoho & Mark E. Yoho | | |
| 304-455-3176 | | |
| 3555 Burch Ridge Rd. | | |
| Proctor, WV 26055 | | |

RECEIVED Office of Oil and Gas

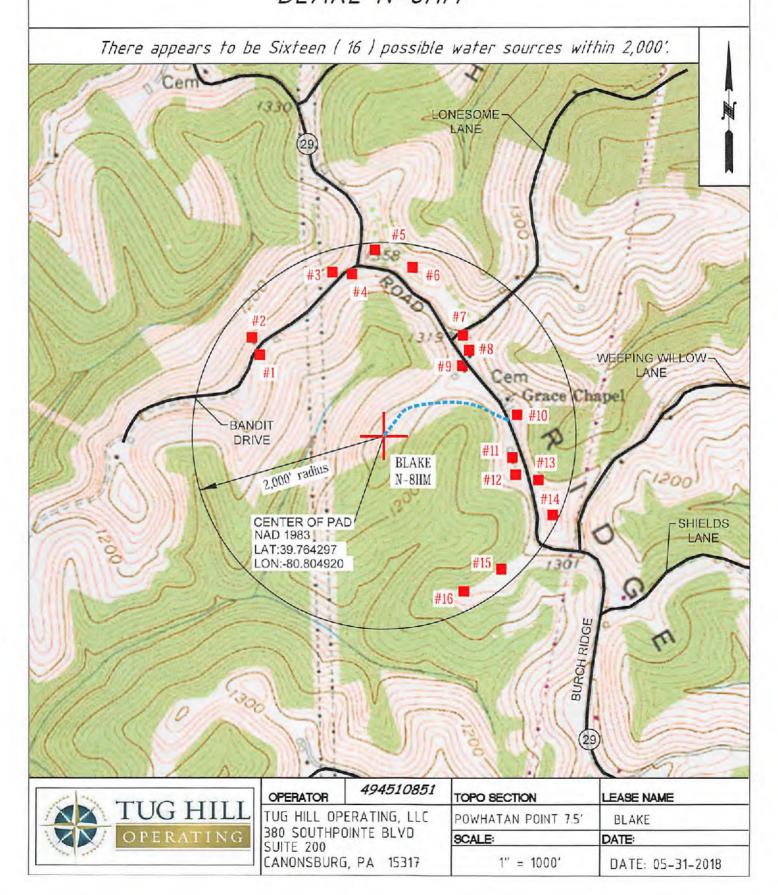
JUN 1 1 2018

4705102054

WW-6A

JUN 11 2018

PROPOSED WV Department of Environmental Protection BLAKE N-8HM SUPPLEMENT PG 1



WW-6A3 (1/12)

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS NOTICE OF ENTRY FOR PLAT SURVEY

| August 1 | equirement: Not | ice snan be prov | ided at leas | t SEVEN (7) day | ys but no more than | I FORTY-FIVE | (45) days prior to |
|--|--|--|--|---|--|---|--|
| entry Date of Notice: | 4/19/2018 | Date of Plan | ned Entry | : 4/26/2018 | | | |
| Delivery metho | od pursuant to V | Vest Virginia Co | de § 22-6 | A-10a | | | |
| ☐ PERSONA | AL DRE | GISTERED | ■ ME | THOD OF DEL | IVERY THAT RE | OUIRES A | |
| SERVICE | | AIL | | | ATURE CONFIR | | |
| on to the surface but no more that beneath such tra owner of minera and Sediment C Secretary, which | e tract to conduct in forty-five days act that has filed a als underlying suc control Manual an | any plat surveys prior to such ent declaration purs the tract in the could the statutes and include contact i | required p ry to: (1) T suant to sec unty tax red d rules rela nformation | ursuant to this ar he surface owner tion thirty-six, a cords. The notice ted to oil and gas i, including the a | ticle. Such notice s of such tract; (2) tricle six, chapter to | thall be provided to any owner or low wenty-two of this attement that copies roduction may be | essee of coal seams code; and (3) any es of the state Erosion obtained from the ary's web site, to |
| Notice is hereb | y provided to: | | | | | | Office of Oil and Gas |
| ■ SURFACE | OWNER(s) | | | ■ COA | L OWNER OR LE | SSEE | JUN 1 1 2018 |
| | nd Pamela June Bungard (a | access road and well pad) | | Name: CN. | K Land Resources | | JUN 1 1 2010 |
| Address: 243 Ban | | | | Address: | 1000 Consol Energy Drive | | WV Department of |
| 1 10 00 00 | WV 26055 | 2 1 2 1 1 1 1 | | Canonsburg, I | PA 15318 | E | nvironmental Protection |
| | i Mary Blake (access roa | ad and well pad) | | | | | |
| Address: 3343 Bu | | | 4 | | ERAL OWNER(s) | | |
| E. P. CO. C. C. | WV 25055 | | ÷ | | id A. and Deborah Takach | (*See Attached List) | |
| | | | | | 14 Zitko Terrace | | |
| Name: | | | *please attach additional forms if necessary | | | | |
| Address: | | | 7 | *nleace attac | h additional forme if ne | naggary. | |
| Address: | | | - | *please attac | h additional forms if neo | cessary | |
| Notice is here Pursuant to Wes a plat survey on State: V County: | by given: | | otice is her | eby given that th Approx. Latit Public Road A | e undersigned well ude & Longitude: | operator is plant 39.76422598; - 80.80 Burch Ridge Road - C | CR 29 |
| Notice is here Pursuant to Wes a plat survey on State: County: District: F | eby given: st Virginia Code the tract of land West Virginia Marshall | | otice is her | eby given that th Approx, Latit Public Road A Watershed: | e undersigned well ude & Longitude: Access: | operator is plant 39.76422598; - 80.80 Burch Ridge Road - C hus-10: FRENCH CRE | 495697 |
| Notice is here Pursuant to Wes a plat survey on State: County: District: F | eby given: st Virginia Code the tract of land West Virginia Marshall | | otice is her | eby given that th Approx. Latit Public Road A | e undersigned well ude & Longitude: Access: | operator is plant 39.76422598; - 80.80 Burch Ridge Road - C | 495697 RR 29 |
| Notice is here Pursuant to Wes a plat survey on State: County: District: Quadrangle: Copies of the stamay be obtained Charleston, WV obtained from th | by given: st Virginia Code of the tract of land West Virginia Marshall Franklin Downhatan Point 7.5' ate Erosion and St d from the Secretary 25304 (304-926) the Secretary by viety given by: | sediment Control ary, at the WV D 5-0450). Copies isiting www.dep | Manual an | Approx. Latit Public Road A Watershed: Generally use ad the statutes an of Environmenta cuments or addit l-and-gas/pages/o | e undersigned well ude & Longitude: Access: d farm name: d rules related to oi d Protection headquional information re default.aspx. | 39.78422598; - 80.80 Burch Ridge Road - C huc-10: FRENCH CREI Blake, Russell Et Al il and gas explora uarters, located at elated to horizon | 495697 ER 29 EK-OHIO RIVER (UNDEFINDED) ation and production t 601 57 th Street, SE, |
| Notice is here Pursuant to Wes a plat survey on State: County: District: Quadrangle: Copies of the stamay be obtained Charleston, WV obtained from th Notice is here Well Operator: | by given: st Virginia Code of the tract of land Nest Virginia Marshall Franklin Powhatan Point 7.5' atte Erosion and Std from the Secretary 25304 (304-926) the Secretary by very given by: Tug Hill Operating, LL | sediment Control ary, at the WV D 5-0450). Copies isiting www.dep | Manual an | Approx. Latit Public Road A Watershed: Generally use ad the statutes an of Environmenta | e undersigned well ude & Longitude: Access: d farm name: d rules related to oid Protection headquional information relefault.aspx. | 39.76422598, - 80.80 Burch Ridge Road - C huc-10: FRENCH CREI Blake, Russell Et Al il and gas explora parters, located at clated to horizon | 495697 ER 29 EK-OHIO RIVER (UNDEFINDED) ation and production t 601 57 th Street, SE, |
| Notice is here Pursuant to Wes a plat survey on State: County: District: Quadrangle: Copies of the stamay be obtained Charleston, WV obtained from th | by given: st Virginia Code of the tract of land West Virginia Marshall Franklin Downhatan Point 7.5' ate Erosion and St d from the Secretary 25304 (304-926) the Secretary by viety given by: | sediment Control ary, at the WV D 6-0450). Copies isiting www.dep | Manual an | Approx. Latit Public Road A Watershed: Generally use ad the statutes an of Environmenta cuments or addit l-and-gas/pages/o | e undersigned well ude & Longitude: Access: d farm name: d rules related to oi d Protection headquional information re default.aspx. | 39.76422598, - 80.80 Burch Ridge Road - C huc-10: FRENCH CREI Blake, Russell Et Al il and gas explora parters, located at clated to horizon | 495697 ER 29 EK-OHIO RIVER (UNDEFINDED) ation and production t 601 57 th Street, SE, |

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

WW-6A3 Notice Attachment Blake N-8HM

Mineral Owners

Russell and Mary Blake 3343 Burch Ridge Road Proctor, WV 26055

Gary L. and Pamela S. Witschey 2645 Paden Fork Road New Martinsville, WV 26155

Gordon L. Witschey 160 E. Thistle Drive New Martinsville, WV 26155

Carl Coffield 970 Allendale Avenue Akron, OH 44306

> RECEIVED Office of Oil and Gas

JUN 11 2018

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE 407 OI 5 AND 0 280 5 4 NOTICE OF PLANNED OPERATION

| Delivery met | hod pursuant to West Virginia Code | § 22-6A-16(c) | | |
|---|---|---|--|--|
| | | | | |
| | FIED MAIL L | HAND | | |
| RETUR | N RECEIPT REQUESTED | DELIVERY | | |
| return receipt the planned of required to be drilling of a l damages to th (d) The notice of notice. Notice is here | requested or hand delivery, give the sur- operation. The notice required by this provided by subsection (b), section ten- norizontal well; and (3) A proposed su- e surface affected by oil and gas operate as required by this section shall be given by provided to the SURFACE OWN is listed in the records of the sheriff at the | rface owner whose land subsection shall includ of this article to a surfarface use and compensations to the extent the data to the surface owner at ER(s) e time of notice): | will be used for e: (1) A copy ce owner whose ation agreement mages are comp to the address list | cation, an operator shall, by certified mail or the drilling of a horizontal well notice of of this code section; (2) The information e land will be used in conjunction with the t containing an offer of compensation for pensable under article six-b of this chapter, sted in the records of the sheriff at the time |
| Name: Wibert F Address: 243 E Proctor, WV 2808 Notice is her Pursuant to W | 55 | Address Proctor, W e is hereby given that th | e undersigned well on the tra | well operator has developed a planned ct of land as follows: |
| Name: Wilbert F Address: 243 E Prootor, WV 2608 Notice is her Pursuant to W operation on State: | eby given: Vest Virginia Code § 22-6A-16(e), notic | Address Proctor, W e is hereby given that the of drilling a horizontal | : 3343 Burch Ridge V 26055 e undersigned v well on the tra Easting: | well operator has developed a planned ct of land as follows: 516,709,95 |
| Name: Wilbert F Address: 243 E Proctor, WV 2608 Notice is her Pursuant to W operation on State: County: | eby given: Vest Virginia Code § 22-6A-16(c), notice the surface owner's land for the purpose West Virginia Marshall | Address Proctor, W e is hereby given that the of drilling a horizontal UTM NAD 83 | : 3343 Burch Ridge V 26055 e undersigned v well on the tra Easting: Northing: | well operator has developed a planned ct of land as follows: 516,709,95 4,401,617,54 |
| Name: Wibert F Address: 243 E Proctor, WV 2808 Notice is here Pursuant to W operation on State: County: District: | eby given: /est Virginia Code § 22-6A-16(c), notic the surface owner's land for the purpose West Virginia Marshall Franklin | Address Proctor, W e is hereby given that the of drilling a horizontal UTM NAD 83 | e undersigned veell on the tra Easting: Northing: | well operator has developed a planned ct of land as follows: 516,709.95 4,401,617.54 Burch Ridge Road - County Route 29 |
| Name: Wibert F Address: 243 E Proctor, WV 2608 Notice is here Pursuant to W operation on State: County: | eby given: Vest Virginia Code § 22-6A-16(c), notice the surface owner's land for the purpose West Virginia Marshall | Address Proctor, W e is hereby given that the of drilling a horizontal UTM NAD 83 | e undersigned veell on the tra Easting: Northing: | well operator has developed a planned ct of land as follows: 516,709,95 4,401,617,54 |
| Name: Wilbert F Address: 243 E Proctor, WV 2608 Notice is her Pursuant to W operation on State: County: District: Quadrangle: Watershed: This Notice S Pursuant to W to be provide horizontal we surface affect information r headquarters, | eby given: Vest Virginia Code § 22-6A-16(c), notice the surface owner's land for the purpose West Virginia Marshall Franklin Powhatan Point 7.5' French Creek - Onio River Shall Include: Vest Virginia Code § 22-6A-16(c), this ed by W. Va. Code § 22-6A-10(b) to a cell; and (3) A proposed surface use and red by oil and gas operations to the extellated to horizontal drilling may be oblocated at 601 57th Street, SE, Characteristics | Address Proctor, we see is hereby given that the of drilling a horizontal UTM NAD 83 Public Road A Generally use notice shall include: (1) a surface owner whose compensation agreement the damages are contained from the Secreta | e undersigned veell on the tra Easting: Northing: Access: d farm name: A copy of this land will be undersigning armpensable undersigned veel. | well operator has developed a planned ct of land as follows: 516.709.95 4.401,617.54 Burch Ridge Road - County Route 29 Blake, Russell, et al code section; (2) The information required used in conjunction with the drilling of an offer of compensation for damages to the ler article six-b of this chapter. Additional Department of Environmental Protection |
| Name: Wibert F Address: 243 E Proctor, WV 2608 Notice is here Pursuant to W operation on State: County: District: Quadrangle: Watershed: This Notice S Pursuant to W to be provide horizontal we surface affect information r | eby given: Vest Virginia Code § 22-6A-16(c), notice the surface owner's land for the purpose West Virginia Marshall Franklin Powhatan Point 7.5' French Creek - Onio River Shall Include: Vest Virginia Code § 22-6A-16(c), this ed by W. Va. Code § 22-6A-10(b) to a cell; and (3) A proposed surface use and red by oil and gas operations to the extellated to horizontal drilling may be oblocated at 601 57th Street, SE, Characteristics | Address Proctor, we see is hereby given that the of drilling a horizontal UTM NAD 83 Public Road A Generally use notice shall include: (1) a surface owner whose compensation agreement the damages are contained from the Secreta | e undersigned veell on the tra Easting: Northing: Access: d farm name: A copy of this land will be undersigning armpensable undersigned veel. | well operator has developed a planned ct of land as follows: 516.709.95 4.401,617.54 Burch Ridge Road - County Route 29 Blake, Russell, et al code section; (2) The information required used in conjunction with the drilling of an offer of compensation for damages to the ler article six-b of this chapter. Additional Department of Environmental Protection |
| Name: Wilbert F Address: 243 E Proctor, WV 2608 Notice is her Pursuant to W operation on State: County: District: Quadrangle: Watershed: This Notice S Pursuant to W to be provide horizontal we surface affect information r headquarters, | eby given: Vest Virginia Code § 22-6A-16(c), notice the surface owner's land for the purpose West Virginia Marshall Franklin Powhatan Point 7.5' French Creek - Onio River Shall Include: Vest Virginia Code § 22-6A-16(c), this ed by W. Va. Code § 22-6A-10(b) to edl; and (3) A proposed surface use and red by oil and gas operations to the extellated to horizontal drilling may be oblocated at 601 57th Street, SE, Characteristics | Address Proctor, we see is hereby given that the of drilling a horizontal UTM NAD 83 Public Road A Generally use notice shall include: (1) a surface owner whose compensation agreement the damages are contained from the Secreta | e undersigned veell on the tra Easting: Northing: Access: d farm name: A copy of this land will be undersigned will be undersigned will be undersigned will be understand ary, at the WV (304-926-0450) | well operator has developed a planned ct of land as follows: 516.709.95 4.401,617.54 Burch Ridge Road - County Route 29 Blake, Russell, et al code section; (2) The information required used in conjunction with the drilling of an offer of compensation for damages to the ler article six-b of this chapter. Additional Department of Environmental Protection |
| Name: Wibert F Address: 243 E Proctor, WV 2608 Notice is here Pursuant to W operation on State: County: District: Quadrangle: Watershed: This Notice S Pursuant to V to be provide horizontal we surface affect information r headquarters, gas/pages/def | eby given: Vest Virginia Code § 22-6A-16(c), notice the surface owner's land for the purpose West Virginia Marshall Franklin Powhatan Point 7.5' French Creek - Onio River Shall Include: Vest Virginia Code § 22-6A-16(c), this ed by W. Va. Code § 22-6A-10(b) to edl; and (3) A proposed surface use and red by oil and gas operations to the extellated to horizontal drilling may be oblocated at 601 57th Street, SE, Characteristics | Address Proctor, we e is hereby given that the e of drilling a horizontal UTM NAD 83 Public Road A Generally use notice shall include: (1) a surface owner whose compensation agreement the damages are contained from the Secretarleston, WV 25304 (1) | e undersigned veell on the tra Easting: Northing: Access: d farm name: A copy of this land will be undersigned will be undersigned will be undersigned will be understand ary, at the WV (304-926-0450) | well operator has developed a planned ct of land as follows: 516.709.95 4.401,617.54 Burch Ridge Road - County Route 29 Blake, Russell, et al code section; (2) The information required used in conjunction with the drilling of a noffer of compensation for damages to the ler article six-b of this chapter. Additional Department of Environmental Protection or by visiting www.dep.wv.gov/oil-and-ulevard, Plaza II, Suite 200 |

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

RECEIVED Office of Oil and Gas

JUN 1 1 2018



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110 Charleston, West Virginia 25305-0430 • (304) 558-3505

May 3, 2018

Thomas J. Smith, P. E. Secretary of Transportation/ Commissioner of Highways

Jill M. Newman Deputy Commissioner

James A. Martin, Chief Office of Oil and Gas Department of Environmental Protection 601 57th Street, SE Charleston, WV 25304

Subject: DOH Permits for the Blake Well Pad, Marshall County

Blake N-8HM

Dear Mr. Martin,

This well site will be accessed from Permit #06-2013-0426 transferred to Tug Hill Operating for access to the State Road for a well site located off of Marshall County Route 29 SLS.

The operator has signed a DISTRICT WIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

Gary K. Clayton, P.E.

Regional Maintenance Engineer Central Office O&G Coordinator

Cc:

Jonathan White Tug Hill Operating

CH, OM, D-6

File

RECEIVED Office of Oil and Gas

JUN 11 2018



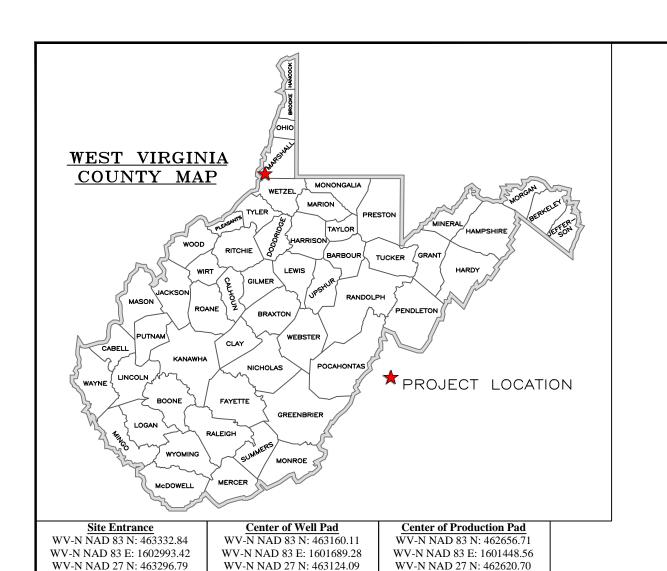
PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

| Well | No. | Blake | N-8HM |
|------|-----|-------|-------|
|------|-----|-------|-------|

CHEMICAL DESCRIPTION: PRODUCT USE: HAZARDOUS COMPONENT: PRODUCT NAME: GBW-20C Hemicellulase Breaker Breaker - Water None **ALPHA 1427** Biocide Glutaraldehyde – CAS#000111-30-8 Quaterary ammonium chloride CAS# 007173-51-5 Alky dimethyl benzyl ammonium Chloride (C12-16) - CAS#068424-85-1 Ethanol - CAS# 000064-17-5 Water - CAS# 007732-18-5 FRAC SAND Silica Sand (various Mesh Proppant Crystalline silica (quartz) sizes) CAS# 14808-60-7 Silica Sand (100 mesh) Sand Silica - CAS# 14808-60-7 S-8C, Sand Gellant - Water Petroleum Distillate Blend - Proprietary, **GW-3LDF** (Not Associated with Diesel Fuel) Guar gum - CAS# 009000-30-0 Friction Reducer FRW-18 Hydrotreated light distillate CAS# 064742-47-8 Scale Inhibitor Scaletrol Ethylene glycol – CAS# 000107-21-1 Diethylene glycol - CAS# 000111-46-6

> RECEIVED Office of Oil and Gas

JUN 1 1 2018



WV-N NAD 27 E: 1633126.99

Lat. NAD 83: 39.76429745

Lat. NAD 27: 39.76422083

Lon. NAD 83: -80.80492031

Lon. NAD 27: -80.80510638

UTM 17 NAD 83 N: 4401615.27

UTM 17 NAD 83 E: 516709.06

Pad Elev .: 1326.20'

WV-N NAD 83 N: 463167.50

WV-N NAD 83 E: 1601692.33

WV-N NAD 27 N: 463131.48

Lat. NAD 83: 39.76431788

Lon. NAD 83: -80.80490984

Lat. NAD 27: 39.76424124

Lon. NAD 27: -80.80509590

Blake 3H WV-N NAD 83 N: 463122.32

WV-N NAD 83 E: 1601674.01

WV-N NAD 27 N: 463086.30

WV-N NAD 27 E: 1633111.73

Lat. NAD 83: 39.76419311

Lon. NAD 83: -80.80497264

Lat. NAD 27: 39.76411648

Lon. NAD 27: -80.80515870

WV-N NAD 27 E: 1632886.29

Lat. NAD 83: 39.76290599

Lon. NAD 83: -80.80575050

Lat. NAD 27: 39.76282935

Lon. NAD 27: -80.80593650

UTM 17 NAD 83 N: 4401460.68

UTM 17 NAD 83 E: 516638.29

Pad Elev .: 1292.02'

WV-N NAD 83 N: 463156.41

WV-N NAD 83 E: 1601687.75 WV-N NAD 27 N: 463120.39

Lat. NAD 83: 39.76428724

Lon. NAD 83: -80.80492555

Lat. NAD 27: 39.76421061

Lon. NAD 27: -80.80511161

Blake N-1HM WV-N NAD 83 N: 463112.04

WV-N NAD 83 E: 1601669.44

WV-N NAD 27 N: 463076.02

WV-N NAD 27 E: 1633107.15

Lat. NAD 83: 39.76416471

Lon. NAD 83: -80.80498839

Lat. NAD 27: 39.76408808

Lon. NAD 27: -80.80517445

/TM 17 NAD 83 (m) N: 4401620.90 UTM 17 NAD 83 (m) N: 4401617.54 UTM 17 NAD 83 (m) N: 4401614.14 UTM 17 NAD 83 (m) N: 4401610.73 UTM 17 NAD 83 (m) E: 516711.32 UTM 17 NAD 83 (m) E: 516709.95 UTM 17 NAD 83 (m) E: 516708.62 UTM 17 NAD 83 (m) E: 516707.28

JTM 17 NAD 83 (m) N: 4401607.33 UTM 17 NAD 83 (m) N: 4401603.68 UTM 17 NAD 83 (m) N: 4401600.52 UTM 17 NAD 83 (m) N: 4401564.63 UTM 17 NAD 83 (m) E: 516705.94 UTM 17 NAD 83 (m) E: 516704.60 UTM 17 NAD 83 (m) E: 516703.26 UTM 17 NAD 83 (m) E: 516688.73

Survey and Engineer

Kenneth Kelly 304-338-6985 Off.

John P. See

304-442-0220 Off.

304-338-6987 Off.

304-340-4277 Off.

Zackary Summerfield

Geotechnical Engineer

American Geotech, Inc.

WV-N NAD 27 E: 1634431.10

Lat. NAD 83: 39.76482352

Lon. NAD 83: -80.80029039

Lat. NAD 27: 39.76474683

Lon. NAD 27: -80.80047668

UTM 17 NAD 83 N: 4401674.53

UTM 17 NAD 83 E: 517105.50

Existing Well Proposed Well

WV-N NAD 83 N: 463178.46

WV-N NAD 83 E: 1601697.00

WV-N NAD 27 N: 463142.44

Lat. NAD 83: 39.76434815

Lon. NAD 83: -80.80489377

Lat. NAD 27: 39.76427153

Lon. NAD 27: -80.80507984

Blake N-2HM WV-N NAD 83 N: 463134.22

WV-N NAD 83 E: 1601678.59

WV-N NAD 27 N: 463098.21

WV-N NAD 27 E: 1633116.31

Lat. NAD 83: 39.76422598

Lon. NAD 83: -80.80495697

Lat. NAD 27: 39.76414935

Lon. NAD 27: -80.80514303

Project Contacts

Jonathan White - Regulatory Analyst

Geoff Radler - V.P. Production

Tug Hill Operating, LLC 380 Southpointe Blvd

Canonsburg, PA 15317

Environmental:

Southpointe Plaza II, Suite 200

dated March 30, 2018

Topographic Information:

Wetland Delineations as provided by Allstar Ecology

The topographic information shown herein is based on

MISS UTILITY OF

WEST VIRGINIA

1-800-245-4848

West Virginia State Law

that you call two business days

IT'S THE LAW

Section XIV: Chapter 24-C requires

aerial photography by Blue Mountain Aerial Mapping, Burton, WV

724-485-2000 Off. 304-689-7676 Cell

Tug Hill Operating

817-632-5200 Off.

WVDEP OOG ACCEPTED AS-BUILT 6 / 14 / 2018

Blake Well Site

Site Design, Construction Plan, & **Erosion and Sediment Control Plans** Tug Hill Operating Marshall County Franklin District Latitude 39.76429745° Longitude -80.80492031°

Pertinent Site Information Blake Well Site

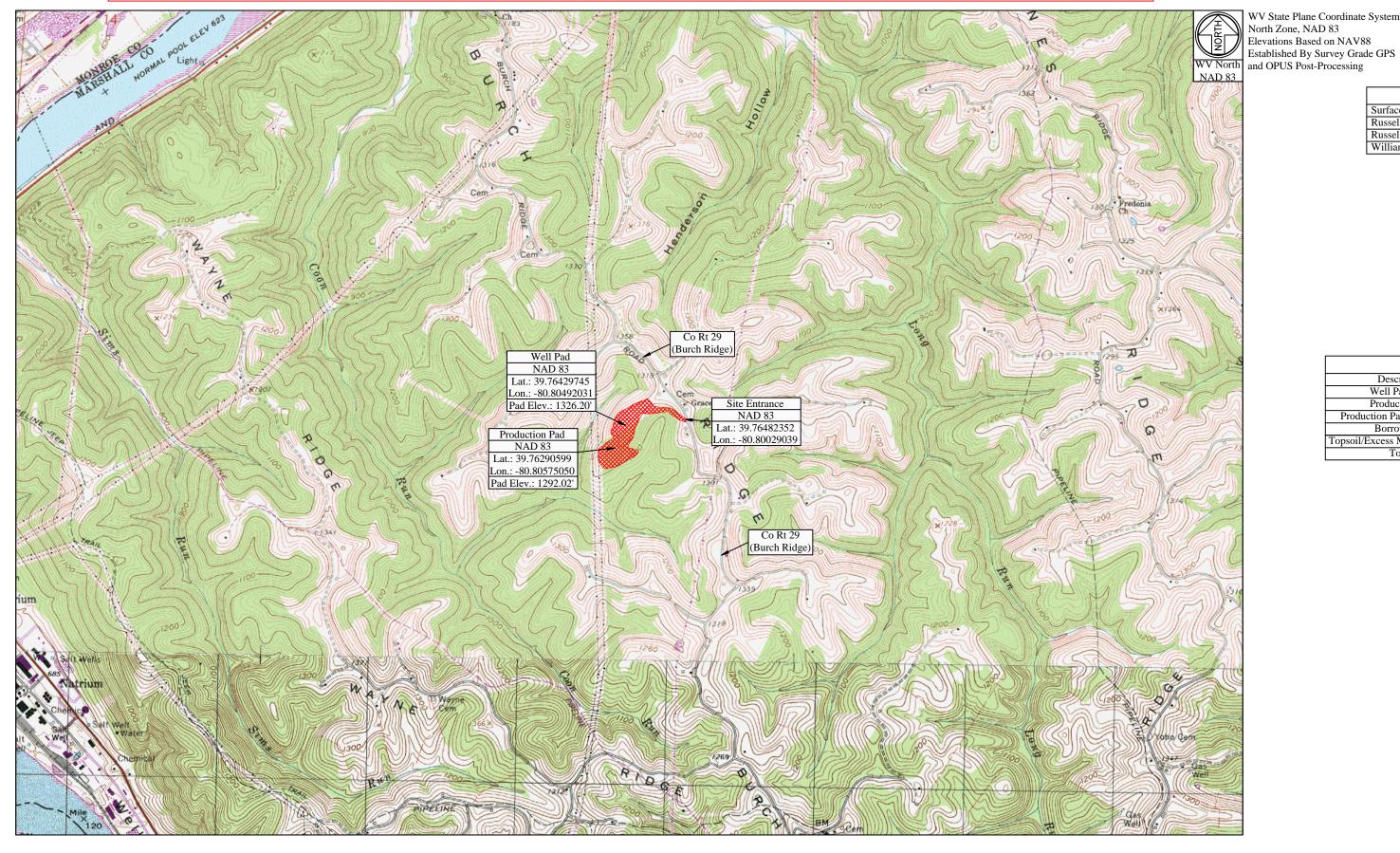
Emergency Number: 304-845-1920 Franklin District, Marshall County, WV Watershed: Stillhouse Run - Ohio River Watershed Site 911 Address:

Tug Hill Contact Number: 1-817-632-3400

TM - Parcel | Well Pad | Prod. Pad | Access Road | Topsoil/Excess | Add. Clearing | Total Disturb Site Totals (Ac) 5.94 1.40 2.21 1.18 9.99 20.72

Exhibit A: Final Design: Issue for Permitting

Stillhouse Run - Ohio River Watershed



Access Road Surface Owner Russell Blake et ux Russell Blake et ux
William Bungard et ux

| Disturbed Area | | | | |
|----------------------------------|---------|--|--|--|
| Well Pad Construction | 5.94 A | | | |
| Production Pad Construction | 1.40 A | | | |
| Access Road Construction | 2.21 A | | | |
| Topsoil / Excess Material | 1.18 A | | | |
| Additional Clearing | 9.99 A | | | |
| Total Disturbed Area | 20.72 A | | | |
| Additional Information | | | | |
| Total Wooded Acres Disturbed | 3.38 A | | | |
| Total Linear Feet of Access Road | 1,474.5 | | | |

| | Blak | ke Well Sit | e Quantiti | es | | |
|-----------------------------------|---------------|-------------|------------|-------------|---------------|-----------------|
| Description | Cut (CY) | Fill (CY) | Spoil (CY) | Borrow (CY) | Max. Slope | Length of Slope |
| Well Pad Berm | 0.00 | 250.00 | 0.00 | 250.00 | N/A | N/A |
| Production Pad | 4,518.56 | 2,526.89 | 1,991.67 | | N/A | N/A |
| Production Pad Access Road | 0.00 | 1,351.30 | | 1,351.30 | 18.00% | 190.15' |
| Borrow Area | 5,000.00 | 0.00 | 5,000.00 | | N/A | N/A |
| Topsoil/Excess Material Stockpile | 0.00 | 3,002.83 | | 3,002.83 | N/A | N/A |
| Totals | 9,518.56 | 7,131.02 | 6,991.67 | 4,604.13 | | |
| | Tatal Casil (| 717) | 2 207 54 | (E | aa Damaara Ma | 4 a mi a 1 \ |

Description

Schedule of Quantities

Pre-Construction Site Conditions

Cover Sheet

Site Soil Map

Clearing Exhibit

E&S Plan View Toe Key Exhibit

Plan View

Overall Plan View

Geotechnical Exhibit

Access Road Details

Site Reclamation

M1-M3 Production Exhibit

Pad Details

D1-D2

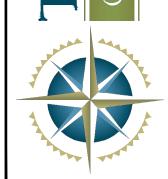
Cross Sections - Well Pad Cross Sections - Production Pad

Cross Sections - Access Road

Landowner Disturbed Area Exhibit

Erosion and Sediment Control Details

Site Notes



PREPARED FOR TUG HILL **OPERATING**



Well

Blake

Date: 05/11/2018 Scale: As Shown Designed By: ZS File No. Sheet 1 of 13

USGS 7.5' Quadrangle: Powhatan Point Watershed: Stillhouse Run - Ohio River

| Site Locations (NAD 27) | | |
|--------------------------|---------------|----------------|
| | | |
| Structure | Latitude (DD) | Longitude (DD) |
| Site Entrance | 39.76474683 | -80.80047668 |
| Center of Well Pad | 39.76422083 | -80.80510638 |
| Center of Production Pad | 39.76282935 | -80.80593650 |

| Site Locations (NAD 83) | | |
|--------------------------|---------------|----------------|
| Structure | Latitude (DD) | Longitude (DD) |
| Site Entrance | 39.76482352 | -80.80029039 |
| Center of Well Pad | 39.76429745 | -80.80492031 |
| Center of Production Pad | 39.76290599 | -80.80575050 |

Approach Routes:

From the intersection of WV Rt 2 and OH Rt 7 near New Martinsville, WV. Travel North on WV Rt 2 for 6.1 mi. Turn Right onto Co Rt 2/2 (Wells Hill Rd). Follow Co Rt 2/2 for 2.4 mi. Turn Right onto Co Rt 78 (Waynes Ridge). Follow Co Rt 78 for 0.8 mi. Turn Left onto Co Rt 29 (Burch Ridge Rd). Follow Co Rt 29 for 1.65 mi. The site entrance will be on the Left (West) side of the road.

| Tug Hill Operating will obtain an Encroachment Permit (Form MM-109) from the WV Department of Transportation, Division of Highways, prior to the commencement of any construction activities |
|--|

<u>Blake N-4HM</u> WV-N NAD 83 N: 463145.32

WV-N NAD 83 E: 1601683.17

WV-N NAD 27 N: 463109.30

Lat. NAD 83: 39.76425661

Lon. NAD 83: -80.80494126

Lat. NAD 27: 39.76417998

Lon. NAD 27: -80.80512732

Blake U-7H WV-N NAD 83 N: 462995.05

WV-N NAD 83 E: 1601619.80

WV-N NAD 27 N: 462959.03

WV-N NAD 27 E: 1633057.51

Lat. NAD 83: 39.76384158

Lon. NAD 83: -80.80515892

Lat. NAD 27: 39.76376495

Lon. NAD 27: -80.80534496

| Floodplain Conditions | | |
|--|-----------------------|-------|
| Do site construction activities take p | lace in a floodplain: | NO |
| Permit needed from county floodpla | in coordinator: | NO |
| Flood Hazard Zone | | X |
| HEC-RAS Study completed: | | N/A |
| Floodplain shown on drawings: | | N/A |
| FIRM Map Number(s) for site: | 54051C | 0145E |
| | | |

| RINGTON Region To the state of the state o |
|--|
| Scale: 1" = 1 Mile |

| | *625' from an occupied dwelling or ba measured from the center of the pad. | rn greater than 2,500 SF used for poultry or dairy | Sheet |
|-----|---|--|------------------|
| | *100' from the edge of disturbance to v pond or reservoir. | wetlands, perennial streams, natural or artificial lake, | V1 N1-N |
| 7 | *300' from the edge of disturbance to a | naturally reproducing trout stream. | 2 3 |
| | *1,000' of a surface or ground water in | take to a public water supply. | 4 5 |
| | (Well Location Restrictions of WV Co | de 22-6A-12) | 6-7 |
| ~ | C. SUMMAN | Design Certification The drawings, construction notes and reference diagrams attached hereto have been prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection, Office of | 9-10 11 |
| | 22214 T | Oil and Gas 35CSR08 All Plans, Sheets, and/or Reference Diagrams included in this design constitutes a complete set of plans. | 12 13 G1-G |
| A P | | A complete set of plans is necessary to construct the site in accordance with the design. | T 1 |

| LA REGISTERE PARTIE | The drawings, construction notes and reference diagrams attached hereto have been prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection, Offi Oil and Gas 35CSR08 |
|--|---|
| 22214 | All Plans, Sheets, and/or Reference Diagrams included in this design constitutes a complete set of p A complete set of plans is necessary to construct the site in accordance with the design. |
| STATE OF WIRGHT STATE OF WIRGH | Zackary C. Summerfield RPE 22214: Kelly Surveying PLLC COA: C04232-00 Date: 06-13-2018 |

All Pad construction complies with the following restrictions.

*250' from an existing well or developed spring used for human or domestic animals.

| WV M | ines Website was consulted. Previous (Cur |
|------|---|
| | activities are not within the AOI. |
| | WVDEP Website files show that there are |
| act | ive and/or abandoned gas wells within the |

ou dig in the state of West Virginia. Know what's below. Call before you dig.

