



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

Jim Justice , Governor
Austin Caperton , Cabinet Secretary
www.dep.wv.gov

Thursday, August 10, 2017
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
550 BAILEY AVENUE, SUITE 510

FORT WORTH, TX 76107

Re: Permit approval for TEN HIGH 1N-2HM
47-051-01934-00-00

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: TEN HIGH 1N-2HM
Farm Name: LAWRENCE & SHIRLEY CONKLE ESTS
U.S. WELL NUMBER: 47-051-01934-00-00
Horizontal 6A / New Drill
Date Issued: 8/10/2017

Promoting a healthy environment.

08/11/2017

PERMIT CONDITIONS

4705101934

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.

PERMIT CONDITIONS

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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, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov.

WW-6B
(04/15)

4705101934
API NO. 47- 051 -
OPERATOR WELL NO. Ten High 1N-2HM
Well Pad Name: Ten High

4705101934

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

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Meade Glen Easton 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Ten High 1N-2HM Well Pad Name: Ten High

3) Farm Name/Surface Owner: Lawrence & Shirley Conkle, ests Public Road Access: Shepherd Ridge Lane CR 21/9

4) Elevation, current ground: 1323' Elevation, proposed post-construction: 1310'

5) Well Type (a) Gas Oil Underground Storage
Other

(b) If Gas Shallow Deep
Horizontal

jm
4/21/17

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6713' - 6765' thickness of 52' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,865'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 12,689'

11) Proposed Horizontal Leg Length: 5,517'

12) Approximate Fresh Water Strata Depths: 70', 1026'

13) Method to Determine Fresh Water Depths: Offset well reports or noticeable flow at the flowline or when need to start soaping

14) Approximate Saltwater Depths: 2,180'

15) Approximate Coal Seam Depths: Sewickly Coal - 935' and Pittsburgh Coal - 1020'

16) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

(a) If Yes, provide Mine Info: Name: Marshall County Coal Co. / Marshall County Mine
Depth: 1020' TVD and 303' subsea level
Seam: Pittsburgh #8
Owner: Murray Energy / Consolidated Coal Co.

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18) CASING AND TUBING PROGRAM

| TYPE | Size (in) | New or Used | Grade | 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 | 125' | 120' | 259FT^3(CTS) |
| Fresh Water | 13 3/8" | NEW | H40 | 48# | 1,130' | 1,120' | 1128ft^3(CTS) |
| Coal | 13 3/8" | NEW | H40 | 48# | 1,130' | 1,120' | 1128ft^3(CTS) |
| Intermediate | 9 5/8" | NEW | J55 | 36# | 2,990' | 2,980' | 973ft^3(CTS) |
| Production | 5 1/2" | NEW | P110 | 20# | 12,689' | 12,689' | 3244ft^3(CTS) |
| Tubing | 2 3/8" | NEW | N80 | 4.7# | | 6,262' | |
| Liners | | | | | | | |

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4/21/17

| TYPE | 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 | 10,112 | SEE#24 | 1.17/1.19 |
| Tubing | 2 3/8" | | .19 | 11,200 | 8,960 | | |
| Liners | | | | | | | |

PACKERS
4705101936

| | | | | |
|-------------|-----|--|--|--|
| Kind: | N/A | | | |
| Sizes: | N/A | | | |
| Depths Set: | N/A | | | |

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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 13,792,500 lb proppant and 213,242 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.20

22) Area to be disturbed for well pad only, less access road (acres): 5.92

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

4705101038

25) Proposed borehole conditioning procedures:

Will circulate a minimum of 3 hours at TD, short trip to curve, circulate bottoms up, check for flow, POOH

*Note: Attach additional sheets as needed.

WW6B Attachment to #24 – Ten High 1N-2HM

Conductor and Surface Casing Cement:

Premium NE-1 + 2% CaCl

- Premium NE-1 – Class A Portland API Spec
- CaCl – Calcium Chloride

Intermediate Casing:

Premium NE-1 + 2% bwoc CaCl₂ + 46.5% Fresh Water

- Premium NE-1 – Class A Portland API spec
- CaCl₂ – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

Kick Off Plug:

Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L + 38% Fresh Water

- Class H – Increased Compressive Strength Cement
- Sodium Metasilicate – Free Water Control; Early Strength Additive
- R-3 – Cement Retarder
- FP-13L – Anti-Foaming Agent
- CaCl₂ – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

Production Casing Cement:

Lead: 50:50 (Poz:Premium NE-1) + .2% R-3 + .2% MPA-170 + .75 gal/100sk FP-13L

Tail: 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

- Poz – Fly Ash
- Premium NE-1 – Class A Portland API spec
- R-3 – Cement Retarder
- MPA-170 – Gelling Agent
- FP-13L – Anti-Foaming Agent
- ASA-301 – Free Water Control Agent
- BA-10A – Bonding Agent
- ASCA-1 – Solubility Additive

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08/11/2017

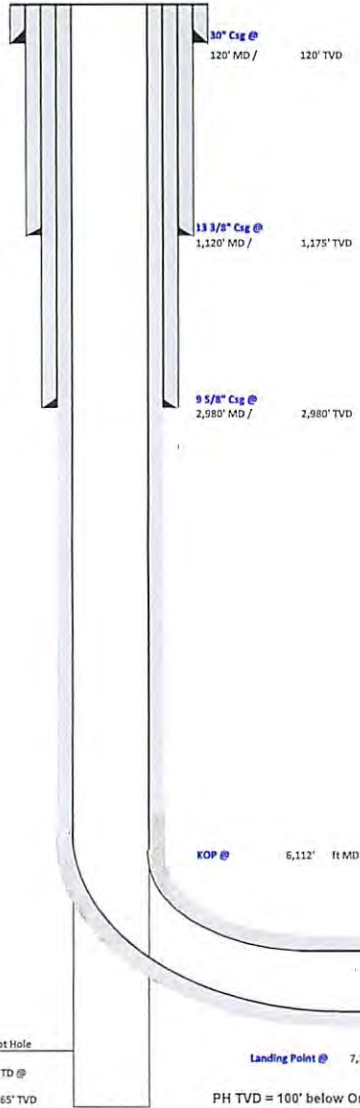


WELL NAME: **Ten High 1N-2HM**
 STATE: **West Virginia** COUNTY: **Marshall**
 DISTRICT: **Meade**
 DF Elev: **1,310'** GL Elev: **1,310'**
 TD: **12,689'**
 TH Latitude: **39.80680885**
 TH Longitude: **-80.68101011**
 BH Latitude: **39.81984407**
 BH Longitude: **-80.69265723**

| FORMATION TOPS | |
|---------------------|-----------|
| Formation | Depth TVD |
| Deepest Fresh Water | 1026 |
| Sewickley Coal | 935 |
| Pittsburgh Coal | 1020 |
| Big Lime | 2049 |
| Weir | 2475 |
| Berea | 2673 |
| Gordon | 2935 |
| Rhinestreet | 6057 |
| Geneseo/Burkett | 6575 |
| Tully | 6606 |
| Hamilton | 6639 |
| Marcellus | 6713 |
| Landing Depth | 6737 |
| Onondaga | 6765 |
| Pilot Hole Depth | 6865 |

| CASING SUMMARY | | | | | | |
|----------------|----------------|---------------|------------|-------------|----------------|---------|
| Type | Hole Size (in) | Csg Size (in) | Depth (MD) | Depth (TVD) | Weight (lb/ft) | Grade |
| Conductor | 36 | 30 | 120' | 120' | 8W | Guide |
| Surface | 17.5 | 13 3/8 | 1,120' | 1,175' | 48 | Surface |
| Intermediate 1 | 12 1/4 | 9 5/8 | 2,980' | 2,980' | 36 | Surface |
| Production | 8 7/8 x 8 3/4 | 5 1/2 | 12,689' | 6,641' | 20 | P110 |

| CEMENT SUMMARY | | | DRILLING DETAILS | | |
|----------------|-------|-------|------------------|-------------|---|
| | Sacks | Class | Density | Fluid Type | Centralizer Notes |
| Conductor | 338 | A | 15.6 | Air | None |
| Surface | 1,142 | A | 15.6 | Air | 3 Centralizers at equal distance |
| Intermediate 1 | 954 | A | 15 | Air | 1 Centralizer every other ft |
| Production | 2,859 | A | 14.5 | Air / SOBMM | 1 every other joint in lateral; 1 per joint in curve; 1 every other ft to sfc |



Handwritten signature and date: 4/21/17

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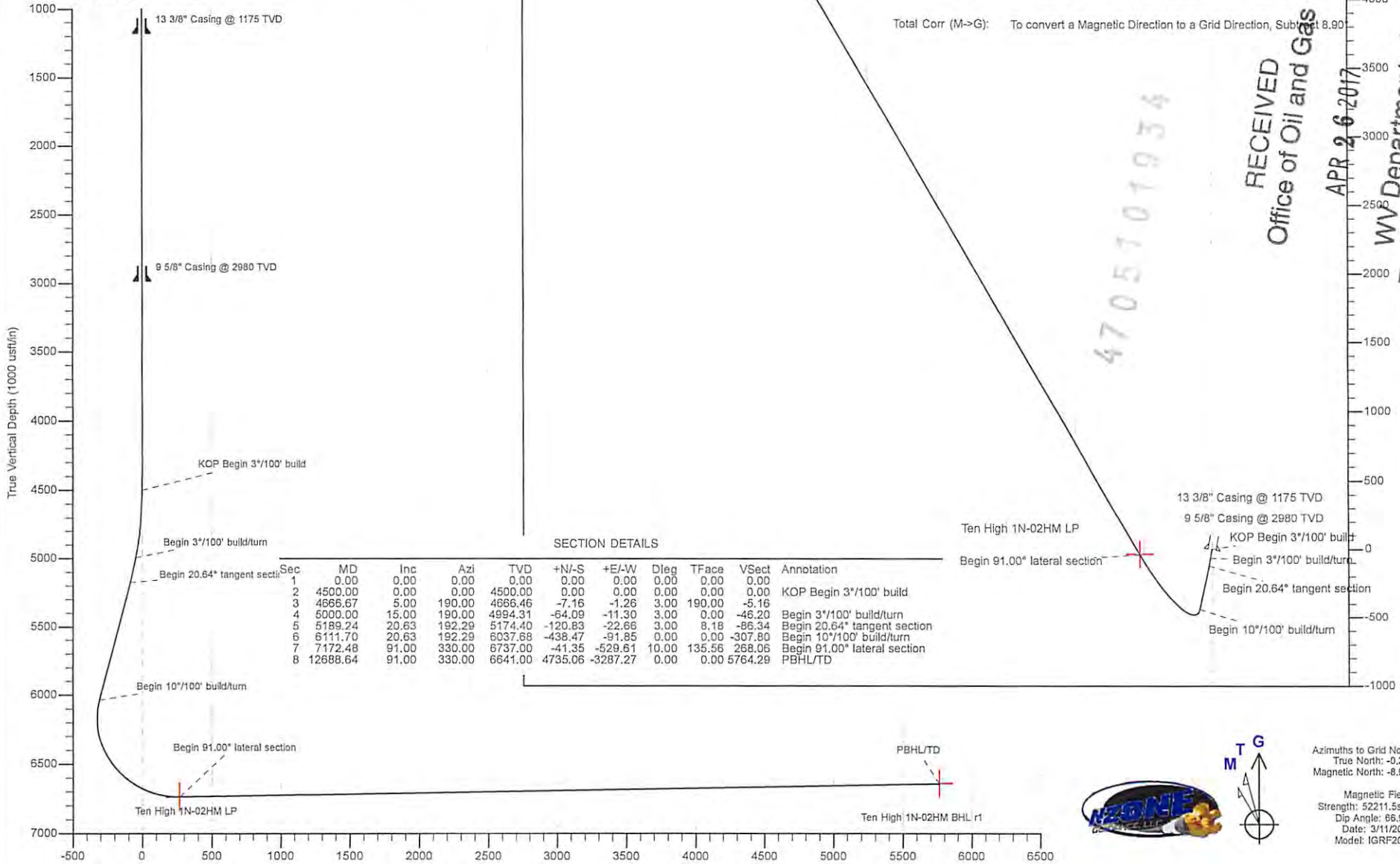
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 Environmental Protection



TUG HILL OPERATING

Well: Ten High 1N-02HM (A)
 Site: Ten High
 Project: Marshall County, West Virginia
 Design: rev1

West(-)/East(+) (1000 usft/m)



Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (84 W to 78 W)
 System Datum: Mean Sea Level
 Depth Reference: GL @ 1310.00usft
 Northing: 14456545.60 Easting: 1730001.42 Latitude: 39.80680885 Longitude: -80.68101011

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.90

SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Annotation |
|-----|----------|-------|--------|---------|---------|----------|-------|--------|---------|------------------------------|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2 | 4500.00 | 0.00 | 0.00 | 4500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | KOP Begin 3*/100' build |
| 3 | 4666.67 | 5.00 | 190.00 | 4666.46 | -7.16 | -1.26 | 3.00 | 190.00 | -5.16 | |
| 4 | 5000.00 | 15.00 | 190.00 | 4984.31 | -64.09 | -11.30 | 3.00 | 0.00 | -46.20 | Begin 3*/100' build/turn |
| 5 | 5189.24 | 20.63 | 192.29 | 5174.40 | -120.83 | -22.66 | 3.00 | 8.18 | -86.34 | Begin 20.64* tangent section |
| 6 | 6111.70 | 20.63 | 192.29 | 6037.68 | -438.47 | -91.85 | 0.00 | 0.00 | -307.80 | Begin 10*/100' build/turn |
| 7 | 7172.48 | 91.00 | 330.00 | 6737.00 | -41.35 | -529.61 | 10.00 | 135.56 | 268.06 | Begin 91.00* lateral section |
| 8 | 12688.64 | 91.00 | 330.00 | 6641.00 | 4735.06 | -3287.27 | 0.00 | 0.00 | 5764.29 | PBHL/TD |

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Azimuths to Grid North
 True North: -0.20°
 Magnetic North: -8.90°
 Magnetic Field Strength: 52211.5nT
 Dip Angle: 66.89°
 Date: 3/11/2017
 Model: IGRF2015



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, dducoeur@dpslandservices.com DPS GIS (12/19/2016) 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

Permit well - Ten High 1N-2HM

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 |
|------------|------------------|-------------|----------------|--------------------------------|---|----------------------------------|
| 4705100838 | Hope Natural Gas | Unknown | Unknown | Unknown | Unknown but unlikely, Appears to be an old shallow producing well that has since been plugged | Old well, records are incomplete |



Select County: (051) Marshall

Enter Permit #: 00838

Get Data Reset

Select datatypes: (Check All)

Location Production Plugging

Owner/Completion Stratigraphy Sample

Pay/Show/Water Logs Btm Hole Loc

[Table Descriptions](#)

[County Code Translations](#)

[Permit-Numbering Series](#)

[Usage Notes](#)

[Contact Information](#)

[Disclaimer](#)

[WVGES Main](#)

["Pipeline-Plus" New](#)

WV Geological & Economic Survey: Well: County = 51 Permit = 00838

Well Reassignment Information: Reassigned From

| OLD_COUNTY | OLD_PERMIT | NEW_COUNTY | NEW_PERMIT |
|------------|------------|------------|------------|
| 51 | 70644 | 51 | 838 |

Location Information: [View Map](#)

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|------------|----------|--------|--------------|-------------|---------|-----------|------------|----------|---------|
| 4705100838 | Marshall | 838 | Meade | Glen Easton | Cameron | 39 813527 | -80.686027 | 526873.4 | 4407108 |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPL |
|------------|-----------|--------------|-----------|------------------------|----------|--------|-------|-----------|-------------|-----------------------|
| 4705100838 | 12/4/1998 | Plugging | Completed | Ronald & Theresa Moore | 95-5 | (M-35) | | | | McElroy Coal Company |
| 4705100838 | -/- | Original Loc | Completed | A M Anguish | 517 | | | | | Hope Natural Gas Comp |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTH |
|------------|-----------|------------|------------|--------------|------------|-------------|---------------|--------------|------|---------------|---------|
| 4705100838 | 12/4/1998 | 11/16/1998 | 1178 | Ground Level | | | | | | not available | unknown |
| 4705100838 | -/- | -/- | | | | | unclassified | unclassified | | not available | unknown |

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

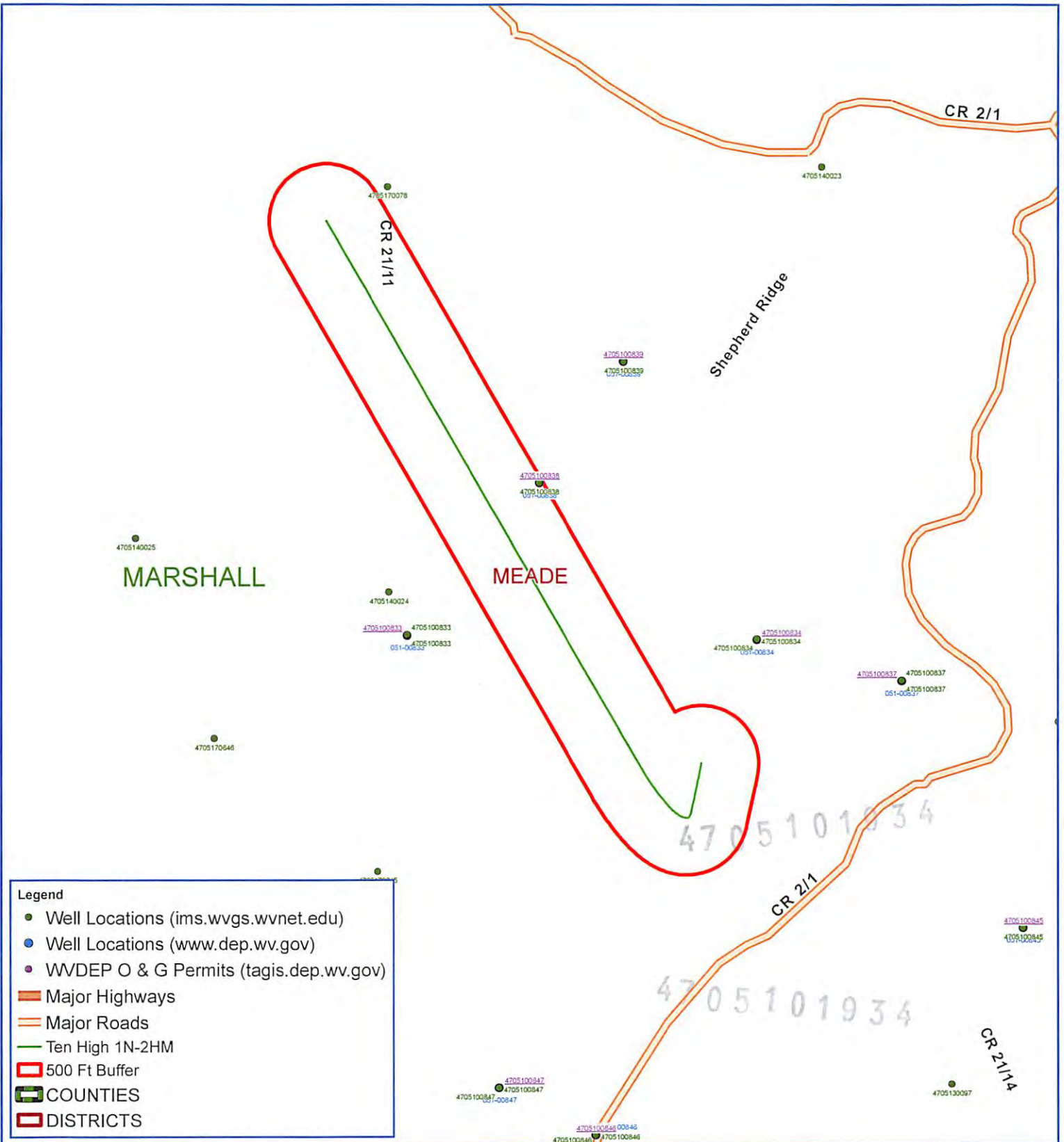
Plugging Information

| API | PLG_DT | DEPTH_PBT |
|------------|-----------|-----------|
| 4705100838 | 12/4/1998 | 7 0 |

There is no Sample data for this well

5.11 Area of Review-- The permittee shall review the area surrounding the proposed well pad so as to identify and evaluate potential conduits for unintended fracture propagation, a report of which the permittee shall provide to the Office with the application for well work. All existing active, plugged, abandoned, and undocumented wells within a five hundred feet (500') radius of the surface location of the well that is the subject of the new application and within a five hundred feet (500') radius of the lateral section of the wellbore shall be considered for the potential of unintended fracture propagation. The report shall detail those wells that are known or reasonably expected to penetrate a depth that could be within the range of the fracture propagation. The detail shall include at a minimum the API number, operator name, total depth, perforated formation(s) and producing zones not perforated.

4705101934



Legend

- Well Locations (ims.wvgs.wvnet.edu)
- Well Locations (www.dep.wv.gov)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Ten High 1N-2HM
- 500 Ft Buffer
- ▭ COUNTIES
- ▭ DISTRICTS



Ten High 1N-2HM Meade District Marshall County, WV



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

Map Created: April 19, 2017
Map Current As Of: April 19, 2017

Map Prepared by:

08/11/2017



Planning Report - Geographic

| | | | |
|------------------|--------------------------------|-------------------------------------|---------------------------|
| Database: | DB Jul2216dt | Local Co-ordinate Reference: | Well Ten High 1N-02HM (A) |
| Company: | Tug Hill Operating LLC | TVD Reference: | GL @ 1310.00usft |
| Project: | Marshall County, West Virginia | MD Reference: | GL @ 1310.00usft |
| Site: | Ten High | North Reference: | Grid |
| Well: | Ten High 1N-02HM (A) | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Original Hole | | |
| Design: | rev1 | | |

| | | | |
|--------------------|--|----------------------|----------------|
| Project | Marshall County, West Virginia | | |
| Map System: | Universal Transverse Mercator (US Survey Feet) | System Datum: | Mean Sea Level |
| Geo Datum: | NAD83 West Virginia - HARN | | |
| Map Zone: | Zone 17N (84 W to 78 W) | | |

| | | | | | |
|------------------------------|-----------|---------------------|--------------------|--------------------------|--------------|
| Site | Ten High | | | | |
| Site Position: | | Northing: | 14,456,545.60 usft | Latitude: | 39.80680885 |
| From: | Lat/Long | Easting: | 1,730,001.41 usft | Longitude: | -80.68101011 |
| Position Uncertainty: | 0.00 usft | Slot Radius: | 13-3/16 " | Grid Convergence: | 0.20 ° |

| | | | | | | |
|-----------------------------|----------------------|-----------|----------------------------|--------------------|----------------------|---------------|
| Well | Ten High 1N-02HM (A) | | | | | |
| Well Position | +N/-S | 0.00 usft | Northing: | 14,456,545.60 usft | Latitude: | 39.80680885 |
| | +E/-W | 0.00 usft | Easting: | 1,730,001.41 usft | Longitude: | -80.68101011 |
| Position Uncertainty | | 0.00 usft | Wellhead Elevation: | 0.00 usft | Ground Level: | 1,310.00 usft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | Original Hole | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2015 | 3/11/2017 | -8.70 | 66.99 | 52,212 |

| | | | | |
|--------------------------|--------------------------------|---------------------|----------------------|----------------------|
| Design | rev1 | | | |
| Audit Notes: | | | | |
| Version: | Phase: | PLAN | Tie On Depth: | 0.00 |
| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
| | 0.00 | 0.00 | 0.00 | 325.23 |

| Plan Sections | | | | | | | | | | |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|---------|---------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4,500.00 | 0.00 | 0.00 | 4,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4,666.67 | 5.00 | 190.00 | 4,666.46 | -7.16 | -1.26 | 3.00 | 3.00 | 0.00 | 190.00 | |
| 5,000.00 | 15.00 | 190.00 | 4,994.31 | -64.09 | -11.30 | 3.00 | 3.00 | 0.00 | 0.00 | |
| 5,189.24 | 20.63 | 192.29 | 5,174.40 | -120.83 | -22.66 | 3.00 | 2.98 | 1.21 | 8.18 | |
| 6,111.70 | 20.63 | 192.29 | 6,037.68 | -438.47 | -91.85 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,172.48 | 91.00 | 330.00 | 6,737.00 | -41.35 | -529.61 | 10.00 | 6.63 | 12.98 | 135.56 | Ten High 1N-02HM LI |
| 12,688.64 | 91.00 | 330.00 | 6,641.00 | 4,735.06 | -3,287.27 | 0.00 | 0.00 | 0.00 | 0.00 | Ten High 1N-02HM BI |

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Planning Report - Geographic

Database: DB Jul2216dt
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Ten High
 Well: Ten High 1N-02HM (A)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Ten High 1N-02HM (A)
 TVD Reference: GL @ 1310.00usft
 MD Reference: GL @ 1310.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|--------------------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|-------------|--------------|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 100.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 500.00 | 0.00 | 0.00 | 500.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 900.00 | 0.00 | 0.00 | 900.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 1,300.00 | 0.00 | 0.00 | 1,300.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 1,400.00 | 0.00 | 0.00 | 1,400.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 1,500.00 | 0.00 | 0.00 | 1,500.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 1,600.00 | 0.00 | 0.00 | 1,600.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 1,700.00 | 0.00 | 0.00 | 1,700.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 1,800.00 | 0.00 | 0.00 | 1,800.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 1,900.00 | 0.00 | 0.00 | 1,900.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 2,000.00 | 0.00 | 0.00 | 2,000.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 2,100.00 | 0.00 | 0.00 | 2,100.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 2,200.00 | 0.00 | 0.00 | 2,200.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 2,300.00 | 0.00 | 0.00 | 2,300.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 2,400.00 | 0.00 | 0.00 | 2,400.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 2,500.00 | 0.00 | 0.00 | 2,500.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 2,600.00 | 0.00 | 0.00 | 2,600.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 2,700.00 | 0.00 | 0.00 | 2,700.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 2,800.00 | 0.00 | 0.00 | 2,800.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 2,900.00 | 0.00 | 0.00 | 2,900.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 3,000.00 | 0.00 | 0.00 | 3,000.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 3,100.00 | 0.00 | 0.00 | 3,100.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 3,200.00 | 0.00 | 0.00 | 3,200.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 3,300.00 | 0.00 | 0.00 | 3,300.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 3,400.00 | 0.00 | 0.00 | 3,400.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 3,500.00 | 0.00 | 0.00 | 3,500.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 3,600.00 | 0.00 | 0.00 | 3,600.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 3,700.00 | 0.00 | 0.00 | 3,700.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 3,800.00 | 0.00 | 0.00 | 3,800.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 3,900.00 | 0.00 | 0.00 | 3,900.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 4,000.00 | 0.00 | 0.00 | 4,000.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 4,100.00 | 0.00 | 0.00 | 4,100.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 4,200.00 | 0.00 | 0.00 | 4,200.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 4,300.00 | 0.00 | 0.00 | 4,300.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 4,400.00 | 0.00 | 0.00 | 4,400.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| 4,500.00 | 0.00 | 0.00 | 4,500.00 | 0.00 | 0.00 | 14,456,545.60 | 1,730,001.41 | 39.80680885 | -80.68101011 |
| KOP Begin 3°/100' build | | | | | | | | | |
| 4,600.00 | 3.00 | 190.00 | 4,599.95 | -2.58 | -0.45 | 14,456,543.02 | 1,730,000.96 | 39.80680178 | -80.68101176 |
| 4,666.67 | 5.00 | 190.00 | 4,666.46 | -7.16 | -1.26 | 14,456,538.44 | 1,730,000.19 | 39.80678921 | -80.68101469 |
| 4,700.00 | 6.00 | 190.00 | 4,699.63 | -10.30 | -1.82 | 14,456,535.30 | 1,729,999.60 | 39.80678057 | -80.68101671 |
| 4,800.00 | 9.00 | 190.00 | 4,798.77 | -23.16 | -4.08 | 14,456,522.45 | 1,729,997.33 | 39.80674530 | -80.68102494 |
| 4,900.00 | 12.00 | 190.00 | 4,897.08 | -41.10 | -7.25 | 14,456,504.50 | 1,729,994.47 | 39.80669605 | -80.68103644 |
| 5,000.00 | 15.00 | 190.00 | 4,994.31 | -64.09 | -11.30 | 14,456,481.51 | 1,729,990.11 | 39.80663296 | -80.68105116 |
| Begin 3°/100' build/tum | | | | | | | | | |

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Database: DB Jul2216dt
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 Well: Ten High 1N-02HM (A)
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Ten High 1N-02HM (A)
 TVD Reference: GL @ 1310.00usft
 MD Reference: GL @ 1310.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|-------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|---------------------|--------------------|-------------|--------------|
| 5,100.00 | 17.97 | 191.38 | 5,090.19 | -91.97 | -16.59 | 14,456,453.64 | 1,729,984.82 | 39.80655646 | -80.68107036 |
| 5,189.24 | 20.63 | 192.29 | 5,174.40 | -120.83 | -22.66 | 14,456,424.77 | 1,729,978.76 | 39.80647724 | -80.68109233 |
| Begin 20.64° tangent section | | | | | | | | | |
| 5,200.00 | 20.63 | 192.29 | 5,184.47 | -124.54 | -23.47 | 14,456,421.06 | 1,729,977.95 | 39.80646707 | -80.68109525 |
| 5,300.00 | 20.63 | 192.29 | 5,278.06 | -158.97 | -30.97 | 14,456,386.63 | 1,729,970.45 | 39.80637258 | -80.68112239 |
| 5,400.00 | 20.63 | 192.29 | 5,371.64 | -193.41 | -38.47 | 14,456,352.20 | 1,729,962.95 | 39.80627809 | -80.68114953 |
| 5,500.00 | 20.63 | 192.29 | 5,465.22 | -227.84 | -45.97 | 14,456,317.76 | 1,729,955.45 | 39.80618360 | -80.68117668 |
| 5,600.00 | 20.63 | 192.29 | 5,558.81 | -262.27 | -53.47 | 14,456,283.33 | 1,729,947.95 | 39.80608911 | -80.68120382 |
| 5,700.00 | 20.63 | 192.29 | 5,652.39 | -296.71 | -60.97 | 14,456,248.89 | 1,729,940.45 | 39.80599462 | -80.68123096 |
| 5,800.00 | 20.63 | 192.29 | 5,745.98 | -331.14 | -68.47 | 14,456,214.46 | 1,729,932.95 | 39.80590013 | -80.68125811 |
| 5,900.00 | 20.63 | 192.29 | 5,839.56 | -365.58 | -75.97 | 14,456,180.03 | 1,729,925.45 | 39.80580564 | -80.68128525 |
| 6,000.00 | 20.63 | 192.29 | 5,933.15 | -400.01 | -83.47 | 14,456,145.59 | 1,729,917.95 | 39.80571114 | -80.68131239 |
| 6,100.00 | 20.63 | 192.29 | 6,026.73 | -434.44 | -90.97 | 14,456,111.16 | 1,729,910.45 | 39.80561665 | -80.68133953 |
| 6,111.70 | 20.63 | 192.29 | 6,037.68 | -438.47 | -91.85 | 14,456,107.13 | 1,729,909.57 | 39.80560560 | -80.68134271 |
| Begin 10°/100' build/turn | | | | | | | | | |
| 6,200.00 | 15.55 | 215.92 | 6,121.70 | -463.31 | -102.12 | 14,456,082.29 | 1,729,899.29 | 39.80553748 | -80.68137962 |
| 6,300.00 | 14.77 | 254.74 | 6,218.46 | -477.56 | -122.33 | 14,456,068.04 | 1,729,879.08 | 39.80549855 | -80.68145176 |
| 6,400.00 | 19.75 | 284.57 | 6,314.11 | -476.66 | -151.05 | 14,456,068.94 | 1,729,850.36 | 39.80550130 | -80.68155401 |
| 6,500.00 | 27.53 | 300.50 | 6,405.74 | -460.64 | -187.41 | 14,456,084.96 | 1,729,814.01 | 39.80554565 | -80.68168324 |
| 6,600.00 | 36.34 | 309.50 | 6,490.57 | -429.99 | -230.29 | 14,456,115.62 | 1,729,771.12 | 39.80563026 | -80.68183555 |
| 6,700.00 | 45.60 | 315.31 | 6,566.02 | -385.63 | -278.40 | 14,456,159.97 | 1,729,723.01 | 39.80575254 | -80.68200629 |
| 6,800.00 | 55.07 | 319.50 | 6,629.80 | -328.92 | -330.28 | 14,456,216.68 | 1,729,671.14 | 39.80590879 | -80.68219029 |
| 6,900.00 | 64.65 | 322.82 | 6,679.96 | -261.58 | -384.34 | 14,456,284.03 | 1,729,617.07 | 39.80609425 | -80.68238195 |
| 7,000.00 | 74.30 | 325.64 | 6,714.99 | -185.65 | -438.96 | 14,456,359.95 | 1,729,562.46 | 39.80630330 | -80.68257545 |
| 7,100.00 | 83.97 | 328.21 | 6,733.82 | -103.44 | -492.45 | 14,456,442.16 | 1,729,508.96 | 39.80652958 | -80.68276490 |
| 7,172.48 | 91.00 | 330.00 | 6,737.00 | -41.35 | -529.61 | 14,456,504.25 | 1,729,471.81 | 39.80670047 | -80.68289642 |
| Begin 91.00° lateral section | | | | | | | | | |
| 7,200.00 | 91.00 | 330.00 | 6,736.52 | -17.52 | -543.37 | 14,456,528.08 | 1,729,458.05 | 39.80676605 | -80.68294511 |
| 7,300.00 | 91.00 | 330.00 | 6,734.78 | 69.07 | -593.36 | 14,456,614.67 | 1,729,408.05 | 39.80700433 | -80.68312202 |
| 7,400.00 | 91.00 | 330.00 | 6,733.04 | 155.66 | -643.35 | 14,456,701.26 | 1,729,358.06 | 39.80724261 | -80.68329894 |
| 7,500.00 | 91.00 | 330.00 | 6,731.30 | 242.25 | -693.35 | 14,456,787.85 | 1,729,308.07 | 39.80748089 | -80.68347586 |
| 7,600.00 | 91.00 | 330.00 | 6,729.56 | 328.84 | -743.34 | 14,456,874.44 | 1,729,258.08 | 39.80771917 | -80.68365278 |
| 7,700.00 | 91.00 | 330.00 | 6,727.82 | 415.43 | -793.33 | 14,456,961.03 | 1,729,208.09 | 39.80795745 | -80.68382970 |
| 7,800.00 | 91.00 | 330.00 | 6,726.08 | 502.02 | -843.32 | 14,457,047.62 | 1,729,158.09 | 39.80819573 | -80.68400662 |
| 7,900.00 | 91.00 | 330.00 | 6,724.34 | 588.61 | -893.31 | 14,457,134.21 | 1,729,108.10 | 39.80843401 | -80.68418355 |
| 8,000.00 | 91.00 | 330.00 | 6,722.60 | 675.20 | -943.31 | 14,457,220.80 | 1,729,058.11 | 39.80867229 | -80.68436047 |
| 8,100.00 | 91.00 | 330.00 | 6,720.86 | 761.79 | -993.30 | 14,457,307.39 | 1,729,008.12 | 39.80891057 | -80.68453740 |
| 8,200.00 | 91.00 | 330.00 | 6,719.12 | 848.38 | -1,043.29 | 14,457,393.98 | 1,728,958.12 | 39.80914885 | -80.68471433 |
| 8,300.00 | 91.00 | 330.00 | 6,717.38 | 934.97 | -1,093.28 | 14,457,480.57 | 1,728,908.13 | 39.80938713 | -80.68489126 |
| 8,400.00 | 91.00 | 330.00 | 6,715.64 | 1,021.55 | -1,143.28 | 14,457,567.16 | 1,728,858.14 | 39.80962541 | -80.68506819 |
| 8,500.00 | 91.00 | 330.00 | 6,713.90 | 1,108.14 | -1,193.27 | 14,457,653.75 | 1,728,808.15 | 39.80986369 | -80.68524512 |
| 8,600.00 | 91.00 | 330.00 | 6,712.16 | 1,194.73 | -1,243.26 | 14,457,740.34 | 1,728,758.15 | 39.81010197 | -80.68542205 |
| 8,700.00 | 91.00 | 330.00 | 6,710.42 | 1,281.32 | -1,293.25 | 14,457,826.93 | 1,728,708.16 | 39.81034024 | -80.68559899 |
| 8,800.00 | 91.00 | 330.00 | 6,708.68 | 1,367.91 | -1,343.25 | 14,457,913.51 | 1,728,658.17 | 39.81057852 | -80.68577592 |
| 8,900.00 | 91.00 | 330.00 | 6,706.94 | 1,454.50 | -1,393.24 | 14,458,000.10 | 1,728,608.18 | 39.81081680 | -80.68595286 |
| 9,000.00 | 91.00 | 330.00 | 6,705.20 | 1,541.09 | -1,443.23 | 14,458,086.69 | 1,728,558.18 | 39.81105508 | -80.68612979 |
| 9,100.00 | 91.00 | 330.00 | 6,703.45 | 1,627.68 | -1,493.22 | 14,458,173.28 | 1,728,508.19 | 39.81129335 | -80.68630673 |
| 9,200.00 | 91.00 | 330.00 | 6,701.71 | 1,714.27 | -1,543.22 | 14,458,259.87 | 1,728,458.20 | 39.81153162 | -80.68648367 |
| 9,300.00 | 91.00 | 330.00 | 6,699.97 | 1,800.86 | -1,593.21 | 14,458,346.46 | 1,728,408.21 | 39.81176991 | -80.68666061 |
| 9,400.00 | 91.00 | 330.00 | 6,698.23 | 1,887.45 | -1,643.20 | 14,458,433.05 | 1,728,358.22 | 39.81200818 | -80.68683756 |
| 9,500.00 | 91.00 | 330.00 | 6,696.49 | 1,974.04 | -1,693.19 | 14,458,519.64 | 1,728,308.22 | 39.81224646 | -80.68701450 |
| 9,600.00 | 91.00 | 330.00 | 6,694.75 | 2,060.63 | -1,743.19 | 14,458,606.23 | 1,728,258.23 | 39.81248473 | -80.68719144 |
| 9,700.00 | 91.00 | 330.00 | 6,693.01 | 2,147.22 | -1,793.18 | 14,458,692.82 | 1,728,208.24 | 39.81272301 | -80.68736839 |
| 9,800.00 | 91.00 | 330.00 | 6,691.27 | 2,233.81 | -1,843.17 | 14,458,779.41 | 1,728,158.24 | 39.81296129 | -80.68754534 |

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 Design: rev1

Local Co-ordinate Reference: Well Ten High 1N-02HM (A)
 TVD Reference: GL @ 1310.00usft
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 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

| Planned Survey | | | | | | | | | | |
|-----------------------|-----------------|-------------|-----------------------|-------------|-------------|---------------------|--------------------|-------------|--------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N-S (usft) | +E-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude | |
| 9,900.00 | 91.00 | 330.00 | 6,689.53 | 2,320.40 | -1,893.16 | 14,458,866.00 | 1,728,108.25 | 39.81319956 | -80.68772229 | |
| 10,000.00 | 91.00 | 330.00 | 6,687.79 | 2,406.99 | -1,943.16 | 14,458,952.59 | 1,728,058.26 | 39.81343783 | -80.68789924 | |
| 10,100.00 | 91.00 | 330.00 | 6,686.05 | 2,493.58 | -1,993.15 | 14,459,039.18 | 1,728,008.27 | 39.81367611 | -80.68807619 | |
| 10,200.00 | 91.00 | 330.00 | 6,684.31 | 2,580.16 | -2,043.14 | 14,459,125.77 | 1,727,958.27 | 39.81391438 | -80.68825314 | |
| 10,300.00 | 91.00 | 330.00 | 6,682.57 | 2,666.75 | -2,093.13 | 14,459,212.36 | 1,727,908.28 | 39.81415266 | -80.68843009 | |
| 10,400.00 | 91.00 | 330.00 | 6,680.83 | 2,753.34 | -2,143.13 | 14,459,298.95 | 1,727,858.29 | 39.81439093 | -80.68860705 | |
| 10,500.00 | 91.00 | 330.00 | 6,679.09 | 2,839.93 | -2,193.12 | 14,459,385.54 | 1,727,808.30 | 39.81462920 | -80.68878400 | |
| 10,600.00 | 91.00 | 330.00 | 6,677.35 | 2,926.52 | -2,243.11 | 14,459,472.12 | 1,727,758.30 | 39.81486747 | -80.68896096 | |
| 10,700.00 | 91.00 | 330.00 | 6,675.61 | 3,013.11 | -2,293.10 | 14,459,558.71 | 1,727,708.31 | 39.81510575 | -80.68913792 | |
| 10,800.00 | 91.00 | 330.00 | 6,673.87 | 3,099.70 | -2,343.10 | 14,459,645.30 | 1,727,658.32 | 39.81534402 | -80.68931488 | |
| 10,900.00 | 91.00 | 330.00 | 6,672.13 | 3,186.29 | -2,393.09 | 14,459,731.89 | 1,727,608.33 | 39.81558229 | -80.68949184 | |
| 11,000.00 | 91.00 | 330.00 | 6,670.39 | 3,272.88 | -2,443.08 | 14,459,818.48 | 1,727,558.34 | 39.81582056 | -80.68966880 | |
| 11,100.00 | 91.00 | 330.00 | 6,668.65 | 3,359.47 | -2,493.07 | 14,459,905.07 | 1,727,508.34 | 39.81605883 | -80.68984576 | |
| 11,200.00 | 91.00 | 330.00 | 6,666.91 | 3,446.06 | -2,543.06 | 14,459,991.66 | 1,727,458.35 | 39.81629711 | -80.69002273 | |
| 11,300.00 | 91.00 | 330.00 | 6,665.17 | 3,532.65 | -2,593.06 | 14,460,078.25 | 1,727,408.36 | 39.81653538 | -80.69019969 | |
| 11,400.00 | 91.00 | 330.00 | 6,663.43 | 3,619.24 | -2,643.05 | 14,460,164.84 | 1,727,358.37 | 39.81677365 | -80.69037666 | |
| 11,500.00 | 91.00 | 330.00 | 6,661.69 | 3,705.83 | -2,693.04 | 14,460,251.43 | 1,727,308.37 | 39.81701192 | -80.69055363 | |
| 11,600.00 | 91.00 | 330.00 | 6,659.95 | 3,792.42 | -2,743.03 | 14,460,338.02 | 1,727,258.38 | 39.81725019 | -80.69073059 | |
| 11,700.00 | 91.00 | 330.00 | 6,658.21 | 3,879.01 | -2,793.03 | 14,460,424.61 | 1,727,208.39 | 39.81748846 | -80.69090757 | |
| 11,800.00 | 91.00 | 330.00 | 6,656.47 | 3,965.60 | -2,843.02 | 14,460,511.20 | 1,727,158.40 | 39.81772673 | -80.69108454 | |
| 11,900.00 | 91.00 | 330.00 | 6,654.73 | 4,052.18 | -2,893.01 | 14,460,597.79 | 1,727,108.40 | 39.81796500 | -80.69126151 | |
| 12,000.00 | 91.00 | 330.00 | 6,652.98 | 4,138.77 | -2,943.00 | 14,460,684.38 | 1,727,058.41 | 39.81820326 | -80.69143848 | |
| 12,100.00 | 91.00 | 330.00 | 6,651.24 | 4,225.36 | -2,993.00 | 14,460,770.97 | 1,727,008.42 | 39.81844153 | -80.69161546 | |
| 12,200.00 | 91.00 | 330.00 | 6,649.50 | 4,311.95 | -3,042.99 | 14,460,857.56 | 1,726,958.43 | 39.81867980 | -80.69179244 | |
| 12,300.00 | 91.00 | 330.00 | 6,647.76 | 4,398.54 | -3,092.98 | 14,460,944.14 | 1,726,908.43 | 39.81891807 | -80.69196941 | |
| 12,400.00 | 91.00 | 330.00 | 6,646.02 | 4,485.13 | -3,142.97 | 14,461,030.73 | 1,726,858.44 | 39.81915634 | -80.69214639 | |
| 12,500.00 | 91.00 | 330.00 | 6,644.28 | 4,571.72 | -3,192.97 | 14,461,117.32 | 1,726,808.45 | 39.81939460 | -80.69232337 | |
| 12,600.00 | 91.00 | 330.00 | 6,642.54 | 4,658.31 | -3,242.96 | 14,461,203.91 | 1,726,758.46 | 39.81963287 | -80.69250035 | |
| 12,688.63 | 91.00 | 330.00 | 6,641.00 | 4,735.06 | -3,287.27 | 14,461,280.66 | 1,726,714.15 | 39.81984405 | -80.69265721 | |
| PBHL/TD | | | | | | | | | | |
| 12,688.64 | 91.00 | 330.00 | 6,641.00 | 4,735.06 | -3,287.27 | 14,461,280.67 | 1,726,714.14 | 39.81984407 | -80.69265723 | |

| Design Targets | | | | | | | | | | |
|---|---------------|--------------|------------|-------------|-------------|-----------------|----------------|-------------|--------------|--|
| Target Name | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N-S (usft) | +E-W (usft) | Northing (usft) | Easting (usft) | Latitude | Longitude | |
| Ten High 1N-02HM BHL - hit/miss target - Shape - Point | 0.00 | 0.00 | 6,641.00 | 4,735.06 | -3,287.27 | 14,461,280.67 | 1,726,714.14 | 39.81984407 | -80.69265723 | |
| Ten High 1N-02HM LP - plan hits target center - Point | 0.00 | 0.00 | 6,737.00 | -41.35 | -529.61 | 14,456,504.26 | 1,729,471.80 | 39.80670047 | -80.68289642 | |

| Casing Points | | | | |
|-----------------------|-----------------------|---------------------------|---------------------|-------------------|
| Measured Depth (usft) | Vertical Depth (usft) | Name | Casing Diameter (") | Hole Diameter (") |
| 1,175.00 | 1,175.00 | 13 3/8" Casing @ 1175 TVD | 13-3/8 | 17-1/2 |
| 2,980.00 | 2,980.00 | 9 5/8" Casing @ 2980 TVD | 9-5/8 | 12-1/4 |

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 APR 26 2017



Planning Report - Geographic

| | | | |
|------------------|--------------------------------|-------------------------------------|---------------------------|
| Database: | DB Jul2216dt | Local Co-ordinate Reference: | Well Ten High 1N-02HM (A) |
| Company: | Tug Hill Operating LLC | TVD Reference: | GL @ 1310.00usft |
| Project: | Marshall County, West Virginia | MD Reference: | GL @ 1310.00usft |
| Site: | Ten High | North Reference: | Grid |
| Well: | Ten High 1N-02HM (A) | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Original Hole | | |
| Design: | rev1 | | |

| Plan Annotations | | | | |
|-----------------------|-----------------------|-------------------|--------------|------------------------------|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment |
| | | +N/-S (usft) | +E/-W (usft) | |
| 4,500.00 | 4,500.00 | 0.00 | 0.00 | KOP Begin 3°/100' build |
| 5,000.00 | 4,994.31 | -64.09 | -11.30 | Begin 3°/100' build/turn |
| 5,189.24 | 5,174.40 | -120.83 | -22.66 | Begin 20.64° tangent section |
| 6,111.70 | 6,037.68 | -438.47 | -91.85 | Begin 10°/100' build/turn |
| 7,172.48 | 6,737.00 | -41.35 | -529.61 | Begin 91.00° lateral section |
| 12,688.63 | 6,641.00 | 4,735.06 | -3,287.27 | PBHL/TD |

470510-221

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APR 26 2017
WV Department of
Environmental Protection

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Ten High 1N-2HM

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 Quadrangle Glen Easton 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 frac and flow back water

Will a synthetic liner be used in the pit? Yes No If so, what ml.? AST Tanks will be used with proper containm

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number UIC 2459, UIC 965, UIC 359, UIC 2D0732540, UIC 2D0732523)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain _____)

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 in 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? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386426)

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature _____

Company Official (Typed Name) Sean Gasser

Company Official Title Engineer

Subscribed and sworn before me this 18 day of April, 2017

My commission expires _____

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Office of Oil and Gas

APR 26 2017

Annette Jenkin
9/24/2019



08/11/2017

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 16.20 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

| Temporary | | Permanent | |
|-----------------|----------|---------------|----------|
| 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 proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions (L x W x D) of the pit, and dimensions (L x W), and area in acreage, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by:

Jan Nielsen

Comments:

4705101934

Title: Oil + Gas Inspector

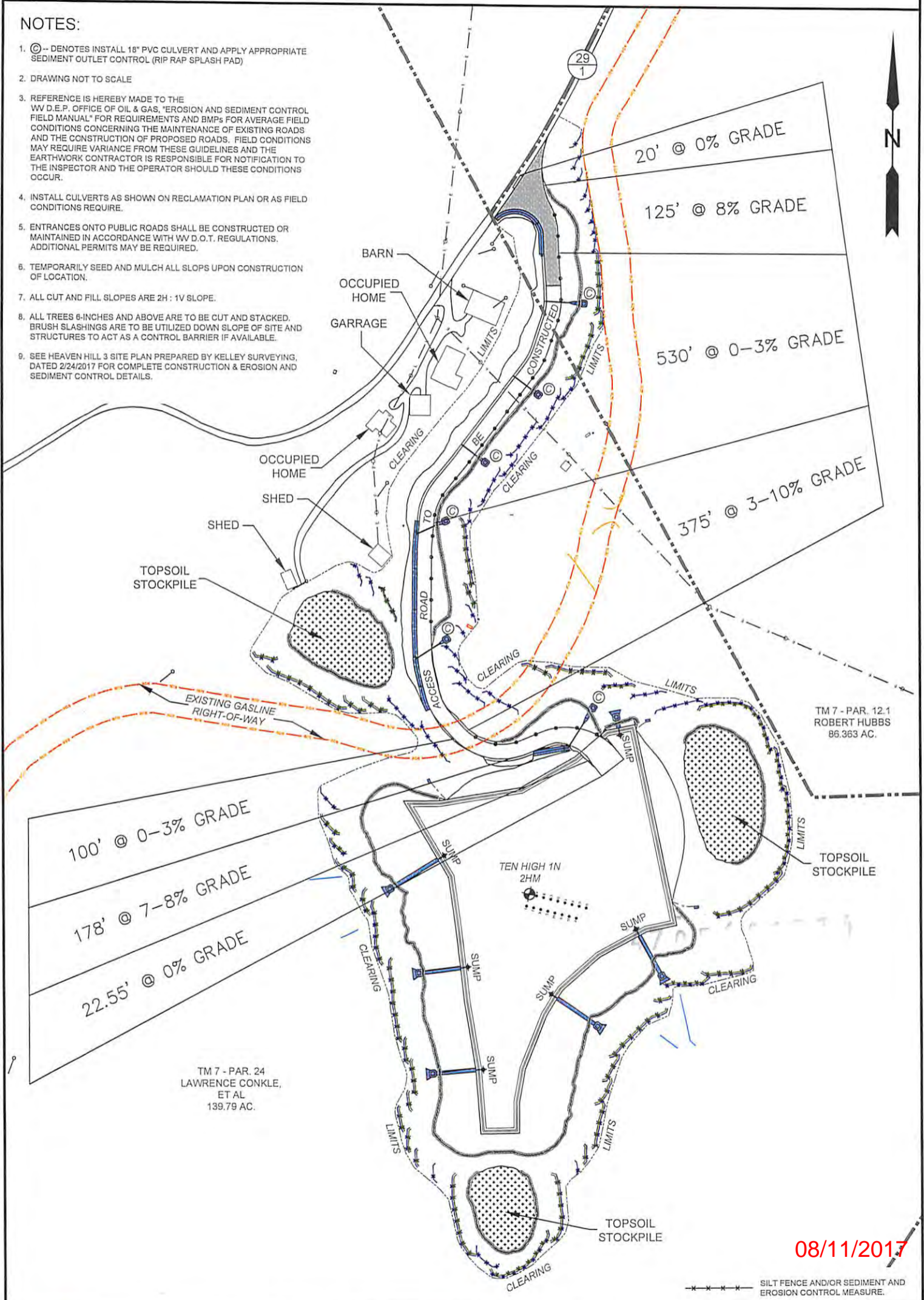
Date: 4/21/17

Field Reviewed? Yes No

PROPOSED TEN HIGH 1N - 2HM

NOTES:

1. (C) - DENOTES INSTALL 18" PVC CULVERT AND APPLY APPROPRIATE SEDIMENT OUTLET CONTROL (RIP RAP SPLASH PAD)
2. DRAWING NOT TO SCALE
3. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
4. INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.
5. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
6. TEMPORARILY SEED AND MULCH ALL SLOPS UPON CONSTRUCTION OF LOCATION.
7. ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.
8. ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO BE UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.
9. SEE HEAVEN HILL 3 SITE PLAN PREPARED BY KELLEY SURVEYING, DATED 2/24/2017 FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.

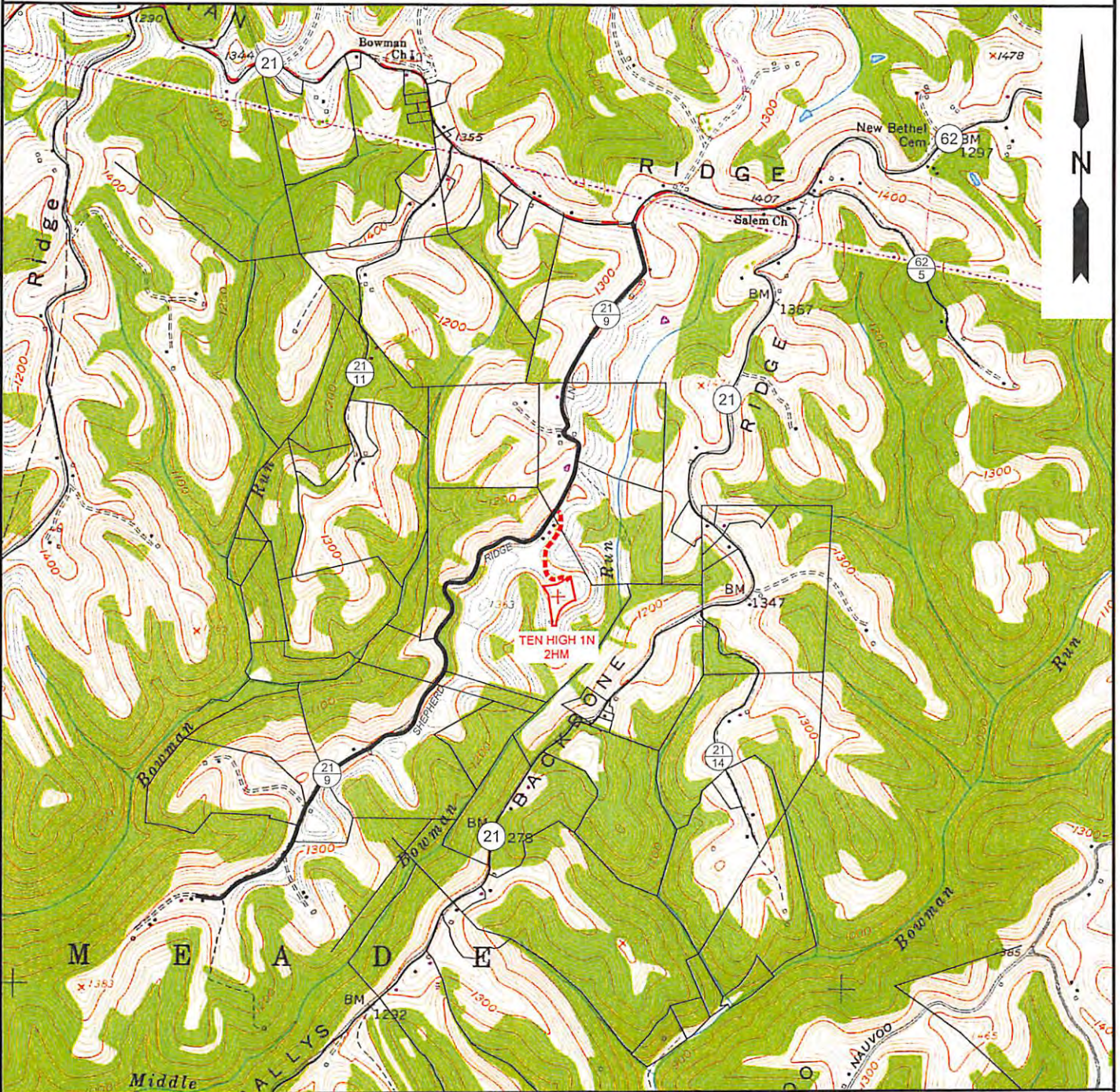


08/11/2017

---x--- SILT FENCE AND/OR SEDIMENT AND EROSION CONTROL MEASURE.

| | | | |
|------------------|----------|---|-------|
| TOPO SECTION: | | OPERATOR: | |
| GLEN EASTON 7.5' | | PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317 | |
| COUNTY | DISTRICT | DATE | SCALE |
| MARSHALL | MEADE | 04/13/2017 | NONE |
| DRAWN BY | JOB NO. | DATE | SCALE |
| K.G.M. | 8655 | 04/13/2017 | NONE |

PROPOSED TEN HIGH 1N - 2HM




NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN PUBLIC SERVICE DISTRICT
PROCTOR, WV

LAT: 39.7137712
LON: -80.8258327
LOCATED: S 51°01'33" W AT 52,972' FROM TEN HIGH 1N - 2HM SURFACE LOCATION



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www.slssurveys.com

| | | | |
|------------------|----------|-------------------------|------------|
| TOPO SECTION: | | OPERATOR: | |
| GLEN EASTON 7.5' | | PREPARED FOR: | |
| COUNTY | DISTRICT | TUG HILL OPERATING, LLC | |
| MARSHALL | MEADE | 380 SOUTHPOINTE BLVD | |
| | | SUITE 200 | |
| | | CANONSBURG, PA 15317 | |
| DRAWN BY | JOB NO. | DATE | SCALE |
| K.G.M. | 8655 | 04/13/2017 | 1" = 2000' |



TUG HILL
OPERATING



Well Site Safety Plan

Tug Hill Operating, LLC

John
4/21/17

Well Name: Ten High 1N-2HM

Pad Location: Ten High

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing-4,406,363.91

Easting -527,305.49

April 2017

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APR 26 2017
WV Department of
Environmental Protection

08/11/2017

**TEN HIGH 1N LEASE
WELL 2HM
TUG HILL OPERATING**

| LINE | BEARING | DISTANCE |
|------|------------|----------|
| L1 | S 12°47' W | 444.01' |

| CURVE | ARC LENGTH | RADIUS | CHORD BEARING | CHORD LENGTH |
|-------|------------|----------|---------------|--------------|
| C1 | 16.79' | 234.83' | S 16°19' W | 16.78' |
| C2 | 39.34' | 45.07' | S 45°56' W | 38.10' |
| C3 | 47.25' | 79.53' | N 80°21' W | 46.56' |
| C4 | 105.43' | 362.11' | N 53°29' W | 105.06' |
| C5 | 461.53' | 1710.83' | N 35°53' W | 460.13' |

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 478,161.7 E. 1,636,721.7
 NAD'83 GEO. LAT-(N) 39.806809 LONG-(W) 80.681010
 NAD'83 UTM (M) N. 4,406,363.91 E. 527,305.49

LANDING POINT
 NAD'83 S.P.C.(FT) N. 478,129.2 E. 1,636,191.2
 NAD'83 GEO. LAT-(N) 39.806700 LONG-(W) 80.682896
 NAD'83 UTM (M) N. 4,406,351.3 E. 527,144.1

BOTTOM HOLE
 NAD'83 S.P.C.(FT) N. 482,952.7 E. 1,633,512.9
 NAD'83 GEO. LAT-(N) 39.819844 LONG-(W) 80.692657
 NAD'83 UTM (M) N. 4,407,807.2 E. 526,303.5

LATITUDE 39°50'00"

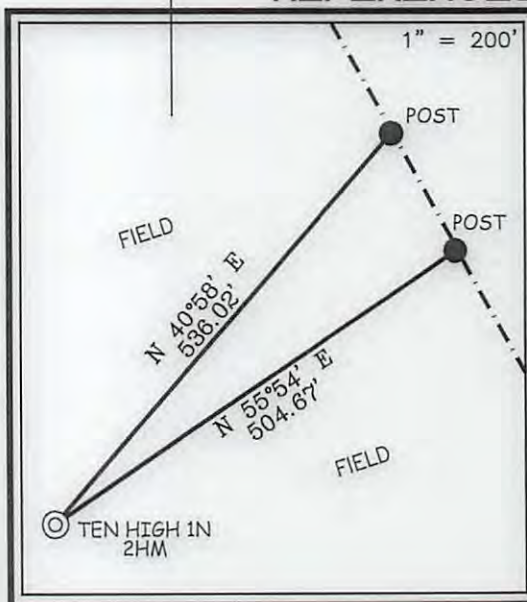
LONGITUDE 80°40'00"
4,914' B.H.
9,662' T.H.

| LEASE NO. | TAG | PARCEL | OIL & GAS ROYALTY OWNER | DEED | BOOK / PG. |
|-----------------|-----|--------|--|------|------------|
| 10*16140 | A | 9-7-24 | ANDY PAUL & JACKIE KUHN | 905 | 526 |
| 10*15558 | A | 9-7-24 | ARNIE GOODNIGHT | 777 | 59 |
| 10*15666 | A | 9-7-24 | BRENDA J. WHETZEL | 863 | 635 |
| 10*16585 | A | 9-7-24 | DALE BRIAN GOODMAN | 909 | 506 |
| 10*47051.295.5 | A | 9-7-24 | DALE R. MOORE | 904 | 506 |
| 10*16049 | A | 9-7-24 | DANNY SHAWN KERNS & MARY LYNN KERNS | 905 | 518 |
| 10*47051.295.10 | A | 9-7-24 | DEENA J. PALOMO | 905 | 470 |
| 10*47051.295.12 | A | 9-7-24 | EARL D. WELLMAN | 905 | 432 |
| 10*47051.295.3 | A | 9-7-24 | HAZEL ARIZONA MOORE REYNOLDS | 904 | 632 |
| 10*16141 | A | 9-7-24 | HOWARD L. KUHN & MARY L. KUHN | 905 | 528 |
| 10*16139 | A | 9-7-24 | HUBERT DEAN KUHN & ANDREA KUHN | 905 | 524 |
| 10*47051.295.9 | A | 9-7-24 | JAMES HIMELRICH JR. & KAREN HIMELRICK | 904 | 465 |
| 10*47051.295.7 | A | 9-7-24 | JEANNE V. MELCHIORI | 904 | 462 |
| 10*15662 | A | 9-7-24 | LARRY LEE CONKLE | 863 | 354 |
| 10*16138 | A | 9-7-24 | LARRY W. KUHN & VICKIE B. KUHN | 905 | 522 |
| 10*47051.295.4 | A | 9-7-24 | LLOYD D. MOORE | 904 | 459 |
| 10*16501 | A | 9-7-24 | LLOYD D. & GWENDOLYN MOORE | 907 | 392 |
| 10*16553 | A | 9-7-24 | MARK EDWARD & KARRIE A. GOODMAN | 909 | 81 |
| 10*47051.295.6 | A | 9-7-24 | MARY I. BURKHART | 904 | 638 |
| 10*47051.295.11 | A | 9-7-24 | REGINA D. FIGUEROA & DAVID | 905 | 435 |
| 10*16820 | A | 9-7-24 | ROBERTA ANN & DAVID S. GIBB | 919 | 237 |
| 10*15663 | A | 9-7-24 | ROY A. CONKLE SR. | 863 | 311 |
| 10*47051.291.13 | A | 9-7-24 | THE DOLLYE F. WOOD REVOCABLE TRUST BY NICHOLAS CHARLES WOOD AS TRUSTEE | 904 | 641 |
| 10*15664 | A | 9-7-24 | THERESA ANN HUGHES | 863 | 343 |
| 10*15501 | B | 9-7-13 | RONALD & EDNA MOORE | 661 | 449 |
| 10*15558 | C | 9-7-14 | ARNIE GOODNIGHT | 777 | 59 |
| 10*15500 | D | 9-7-6 | JERRY FLETCHER & CAROLYN FLETCHER | 661 | 154 |
| 10*15502 | D | 9-7-6 | SHERWOOD YEATER | 748 | 268 |

NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'

REFERENCES



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I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 677 *Gregory A. Smith*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE APRIL 20, 20 17
 REVISED _____, 20 ____
 OPERATORS WELL NO. TEN HIGH 1N-2HM
 API WELL NO. 47 - 051 - 01934 HCA
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8655P2HMR.dwg
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 1000'

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

WELL TYPE: OIL ___ GAS INJECTION ___ WASTE DISPOSAL ___ IF "GAS" PRODUCTION STORAGE ___ DEEP ___ SHALLOW

LOCATION: GROUND = 1,322.70' PROPOSED = 1,310.06' WATERSHED MIDDLE BOWMAN RUN OF FISH CREEK (HUC-10)
 DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER LAWRENCE & SHIRLEY CONKLE ESTS ACREAGE 139.79±
 ROYALTY OWNER ANDY PAUL & JACKIE KUHN, ET AL - SEE TABLE ABOVE ACREAGE 139.79±

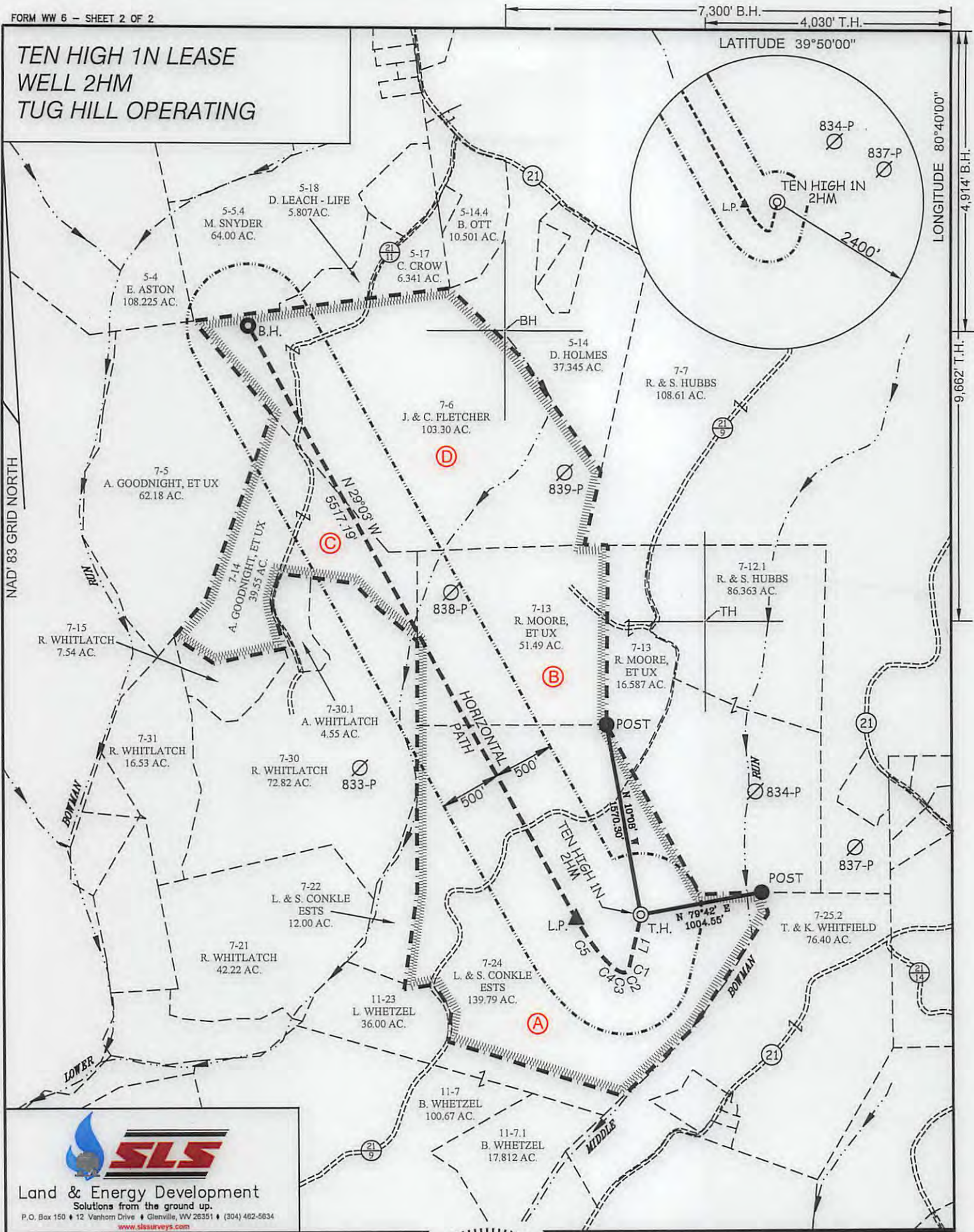
PROPOSED WORK: DRILL CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ PLUG AND ABANDON ___ CLEAN OUT AND REPLUG ___ OTHER ___
 PHYSICAL CHANGE IN WELL (SPECIFY) TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD: 6,865' / TMD: 12,689'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD
 FORT WORTH, TX 76107 CHARLESTON, WV 25313

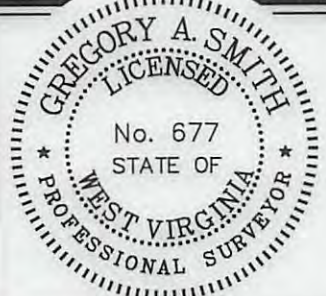
COUNTY NAME PERMIT

08/11/2017

**TEN HIGH 1N LEASE
WELL 2HM
TUG HILL OPERATING**



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(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL
- LEASE # (SEE PG. 1)

SCALE 1" = 1000' FILE NO. 8655P2HMR.dwg
 DATE APRIL 20, 20 17
 REVISED _____, 20 _____
 OPERATORS WELL NO. TEN HIGH 1N-2HM
 API WELL NO. 47 STATE 051 COUNTY 01934 PERMIT 0871172017

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

DIANNA STAMPER
DESIGNATED AGENT CT CORPORATION SYSTEM
ADDRESS 5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

WELL OPERATOR TUG HILL OPERATING, LLC
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500
FORT WORTH, TX 76107

COUNTY NAME
PERMIT

**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 |
|-------------------------|-----------------------|-----------------------|---------|-----------|
|-------------------------|-----------------------|-----------------------|---------|-----------|

*See attached

**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

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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 needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Tug Hill Operating, LLC
 By: Jonathan White
 Its: Regulatory Analyst - Appalachia Region

| Lease Name or No. | Tag | Parcel | Grantor, Lessor, ect. | Grantee, Lessee, ect. | Royalty | Deed Book/Pg | | Assignment | Assignment | Assignment |
|-------------------|-----|--------|---|-----------------------|---------|--------------|-----|-----------------------------|--------------------------|-----------------------------|
| 10*16140 | A | 9-7-24 | ANDY PAUL & JACKIE KUHN | TH EXPLORATION LLC | 1/8+ | 905 | 526 | N/A | N/A | N/A |
| 10*15558 | A | 9-7-24 | ARNIE GOODNIGHT | CHEVRON USA INC | 1/8+ | 777 | 59 | Chevron to Tug Hill: 36/148 | N/A | N/A |
| 10*15666 | A | 9-7-24 | BRENDA J WHETZEL | CHEVRON USA INC | 1/8+ | 863 | 635 | Chevron to Tug Hill: 36/148 | N/A | N/A |
| 10*16585 | A | 9-7-24 | DALE BRIAN GOODMAN | TH EXPLORATION LLC | 1/8+ | 909 | 506 | N/A | N/A | N/A |
| 10*47051.295.5 | A | 9-7-24 | DALE R MOORE | TH EXPLORATION LLC | 1/8+ | 904 | 635 | N/A | N/A | N/A |
| 10*16049 | A | 9-7-24 | DANNY SHAWN KERNS AND AMY LYNN KERNS | TH EXPLORATION LLC | 1/8+ | 905 | 518 | N/A | N/A | N/A |
| 10*47051.295.10 | A | 9-7-24 | DEENA J PALOMO | TH EXPLORATION LLC | 1/8+ | 905 | 470 | N/A | N/A | N/A |
| 10*47051.295.12 | A | 9-7-24 | EARL D WELLMAN | TH EXPLORATION LLC | 1/8+ | 905 | 432 | N/A | N/A | N/A |
| 10*47051.295.3 | A | 9-7-24 | HAZEL ARIZONA MOORE REYNOLDS | TH EXPLORATION LLC | 1/8+ | 904 | 632 | N/A | N/A | N/A |
| 10*16141 | A | 9-7-24 | HOWARD L KUHN AND MARY L KUHN | TH EXPLORATION LLC | 1/8+ | 905 | 528 | N/A | N/A | N/A |
| 10*16139 | A | 9-7-24 | HUBERT DEAN KUHN AND ANDREA KUHN | TH EXPLORATION LLC | 1/8+ | 905 | 524 | N/A | N/A | N/A |
| 10*47051.295.9 | A | 9-7-24 | JAMES E HIMELRICK JR AND KAREN HIMELRICK | TH EXPLORATION LLC | 1/8+ | 904 | 465 | N/A | N/A | N/A |
| 10*47051.295.7 | A | 9-7-24 | JEANNE V MELCHIORI | TH EXPLORATION LLC | 1/8+ | 904 | 462 | N/A | N/A | N/A |
| 10*15662 | A | 9-7-24 | LARRY LEE CONKLE | CHEVRON U.S.A. INC. | 1/8+ | 863 | 354 | N/A | N/A | Chevron to Tug Hill: 36/148 |
| 10*16138 | A | 9-7-24 | LARRY W KUHN AND VICKIE B KUHN, HUSBAND AND WIFE | TH EXPLORATION LLC | 1/8+ | 905 | 522 | N/A | N/A | N/A |
| 10*47051.295.4 | A | 9-7-24 | LLOYD D MOORE | TH EXPLORATION LLC | 1/8+ | 904 | 459 | N/A | N/A | N/A |
| 10*16501 | A | 9-7-24 | LLOYD DOYLE MOORE AND GWENDOLYN K MOORE | TH EXPLORATION LLC | 1/8+ | 907 | 392 | N/A | N/A | N/A |
| 10*16553 | A | 9-7-24 | MARK EDWARD AND KARRIE A GOODMAN | TH EXPLORATION LLC | 1/8+ | 909 | 81 | N/A | N/A | N/A |
| 10*47051.295.6 | A | 9-7-24 | MARY I BURKHART | TH EXPLORATION LLC | 1/8+ | 904 | 638 | N/A | N/A | N/A |
| 10*47051.295.11 | A | 9-7-24 | REGINA D FIGUEROA AND DAVID FIGUEROA | TH EXPLORATION LLC | 1/8+ | 905 | 435 | N/A | N/A | N/A |
| 10*16820 | A | 9-7-24 | ROBERTA ANN AND DAVID S GIBB | TH EXPLORATION LLC | 1/8+ | 919 | 237 | N/A | N/A | N/A |
| 10*15663 | A | 9-7-24 | ROY A CONKLE SR | CHEVRON USA INC | 1/8+ | 863 | 311 | N/A | N/A | Chevron to Tug Hill: 36/148 |
| 10*47051.295.13 | A | 9-7-24 | THE DOLLYE F WOOD REVOCABLE TRUST BY NICHOLAS CHARLES WOOD AS TRUSTEE | TH EXPLORATION LLC | 1/8+ | 904 | 641 | N/A | N/A | N/A |
| 10*15664 | A | 9-7-24 | THERESA ANNE HUGHES | CHEVRON USA INC | 1/8+ | 863 | 343 | N/A | N/A | Chevron to Tug Hill: 36/148 |
| 10*15501 | B | 9-7-13 | RONALD AND EDNA MOORE | TRIENERGY, INC | 1/8+ | 661 | 449 | Tri Energy to NPAR: 25/463 | NPAR to Chevron: 756/332 | Chevron to Tug Hill: 36/148 |
| 10*15558 | C | 9-7-14 | ARNIE GOODNIGHT | CHEVRON USA INC | 1/8+ | 777 | 59 | Chevron to Tug Hill: 36/148 | N/A | N/A |
| 10*15500 | D | 9-7-6 | JERRY FLETCHER AND CAROLYN FLETCHER, HUSBAND AND WIFE | TRIENERGY, INC | 1/8+ | 661 | 154 | Tri Energy to NPAR: 25/463 | NPAR to Chevron: 756/332 | Chevron to Tug Hill: 36/148 |
| 10*15502 | D | 9-7-6 | SHERWOOD YEATER | TRIENERGY, INC | 1/8+ | 748 | 268 | Tri Energy to NPAR: 25/463 | NPAR to Chevron: 756/332 | Chevron to Tug Hill: 36/148 |

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Page 2 of 2
08/11/2017

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STATE OF TEXAS §
 § SS
COUNTY OF TARRANT §

On this 18th day of October, 2016, before me, the undersigned authority, personally appeared David D. Kalish ("Affiant") who being first duly sworn under oath, deposes and saith:

1. TH Exploration, LLC, TH Exploration II, LLC and TH Exploration III, LLC are wholly owned subsidiaries of THQ Appalachia I, LLC.
2. Tug Hill Operating, LLC provides oil and gas operations services to THQ Appalachia I, LLC under an Operating Services Agreement dated July 23, 2014.
3. David D. Kalish, the Affiant, is the Vice President of Tug Hill Operating, LLC, THQ Appalachia I, LLC, TH Exploration, LLC, TH Exploration II, LLC and TH Exploration III, LLC, and;
3. Tug Hill Operating, LLC is authorized to operate and maintain the assets owned by THQ Appalachia I, LLC, including, as referenced above, TH Exploration, LLC, TH Exploration II, LLC, and TH Exploration III, LLC, including oil and gas leases, wells, pipelines, surface facilities, and other all other assets that support the business of THQ Appalachia I, LLC, and;
4. Specifically, Tug Hill Operating, LLC is authorized to submit and obtain well work permits and carry out all activities pursuant to such work permits for assets owned by TH Exploration, LLC, TH Exploration II, LLC, TH Exploration III, LLC.

FURTHER, AFFIANT SAITH NOT.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this 18th day of October, 2016.

David D. Kalish
Affiant: David D. Kalish

JURAT

Jan Pest
MARSHALL County 03:44:28 PM
Instrument No 1416299
Date Recorded 10/19/2016
Document Type MIS
Pages Recorded 1
Book-Page 28-62
Recording Fee \$5.00
Additional \$6.00

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STATE OF TEXAS §
 § SS
COUNTY OF TARRANT §

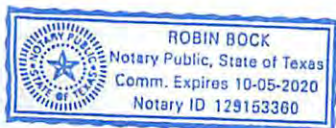
Sworn and subscribed to (or affirmed) before me on this, the 18th day of October, 2016, by David D. Kalish.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission Expires: 10-05-2020

Signature/Notary Public: Robin Bock

Name/Notary Public (Print): Robin Bock



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08/11/2017



April 18, 2017

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

RE: Ten High 1N-2HM

Subject: Marshall County Route 21/9 and 21/11 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 21/9 and 21/11 in the area reflected on the Ten High 1N-2HM well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 304-689-7676, or by email at Jwhite@tug-hilop.com.

Sincerely,

Jonathan White
Regulatory Analyst – Appalachia Region
Cell 304-689-7676
Email: jwhite@tug-hilop.com

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

Date of Notice Certification: 04/21/2017

API No. 47- 051 - _____
Operator's Well No. Ten High 1N-2HM
Well Pad Name: Ten High

Notice has been given:

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

| | |
|---------------------------------------|--|
| State: <u>West Virginia</u> | UTM NAD 83 Easting: <u>527,305.49</u> |
| County: <u>Marshall</u> | Northing: <u>4,406,363.91</u> |
| District: <u>Meade</u> | Public Road Access: <u>Shepherd Ridge Lane (Co. Rt. 21/9)</u> |
| Quadrangle: <u>Glen Easton 7.5'</u> | Generally used farm name: <u>LAWRENCE & SHIRLEY CONKLE, ESTS</u> |
| Watershed: <u>(HUC 10) Fish Creek</u> | |

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

| | |
|---|--|
| Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following: *PLEASE CHECK ALL THAT APPLY | |
| <input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED | <input type="checkbox"/> RECEIVED/ NOT REQUIRED |
| <input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED | <input type="checkbox"/> RECEIVED |
| <input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or <input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH) | <input type="checkbox"/> RECEIVED/ NOT REQUIRED |
| <input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION | <input checked="" type="checkbox"/> RECEIVED |
| <input checked="" type="checkbox"/> 5. PUBLIC NOTICE | <input type="checkbox"/> RECEIVED |
| <input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION | <input type="checkbox"/> RECEIVED |

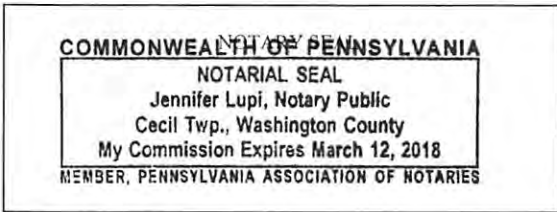
Required Attachments:

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:

THEREFORE, I Jonathan White, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

| | | | |
|----------------|---|------------|--|
| Well Operator: | <u>Tug Hill Operating, LLC</u> | Address: | <u>380 Southpointe Blvd, Southpointe Plaza II, Suite 200</u> |
| By: | <u>Jonathan White</u> <i>Jonathan White</i> | | <u>Canonsburg, PA 15317</u> |
| Its: | <u>Regulatory Analyst - Appalachia</u> | Facsimile: | <u>724-338-2030</u> |
| Telephone: | <u>724-749-8388</u> | Email: | <u>jwhite@tug-hillop.com</u> |



Subscribed and sworn before me this 21st day of April 2017.

Jennifer Lupi Notary Public

My Commission Expires March 12, 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 deprivacyofficer@wv.gov.

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

Notice Time Requirement: notice shall be provided no later than the filing date of permit application.

Date of Notice: 04/21/2017 **Date Permit Application Filed:** 04/24/2017

Notice of:

- PERMIT FOR ANY WELL WORK CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

Delivery method pursuant to West Virginia Code § 22-6A-10(b)

- PERSONAL SERVICE REGISTERED MAIL METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") 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.

Application Notice WSSP Notice E&S Plan Notice Well Plat Notice is hereby provided to:

SURFACE OWNER(s)
Name: Estate of Lawrence & Shirley Mae Conkle c/o Roy Conkle
Address: 75 Arlington Avenue
Moundsville, WV 26041

Name: Roy A. Conkle, Sr., and Lorie A.
Address: 75 Arlington Avenue
Moundsville, WV 26041 *See Attached*

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: Robert G. Hubbs and Scarlett E. Otte
Address: 132 Shepherds Ridge Lane
Glen Easton, WV 26039

Name: None
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)
Name: None
Address: _____

COAL OWNER OR LESSEE
Name: Murray Energy Corporation
Address: 46226 National Road
St. Clairsville, OH 43950

COAL OPERATOR
Name: Same as above coal owner 4705101934
Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: *See supplement page 1A attached
Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: None
Address: _____

*Please attach additional forms if necessary

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WV Department of Environmental Protection

08/11/2017

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

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:

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

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.**

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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.

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WW-6A
(8-13)

API NO. 47- 051 -
OPERATOR WELL NO. Ten High 1N-2HM
Well Pad Name: Ten High

Notice is hereby given by:

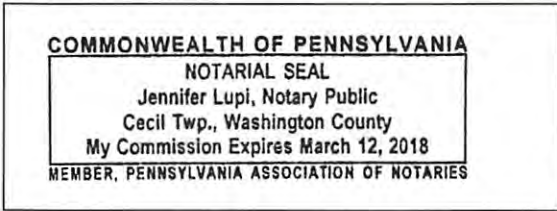
Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-8388
Email: jwhite@tug-hillop.com

Address: 380 Southpointe Blvd, Southpointe Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

Jonathan White

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 deprivacyofficer@wv.gov.



Subscribed and sworn before me this 21st day of April, 2017.
Jennifer Lupi Notary Public
My Commission Expires March 12, 2018

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Environmental Protection
WV Department of
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08/11/2017

WW-6A Notice of Application Attachment 1 of 1

Surface Owner(s):

Name: Teresa Anne Hughes and Michael J. /
Address: 252 Conkle Drive
Glen Easton, WV 26039

Brenda Joyce Whetzel /
1863 Shepherds Ridge Lane
Glen Easton, WV 26039

Larry Lee Conkle and Donna D. /
154 Conkle Drive
Glen Easton, WV 26039

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Exhibit WW-6A

Supplement Pg. 1A

Tug Hill Operating, LLC
380 Southpointe Blvd, Suite 200
Cannonsburg, PA 15137

Residences within Two-Thousand Feet (2,000')

Well: Ten High 1N – 2HM
District: Meade (House #'s 1-3)
State: WV

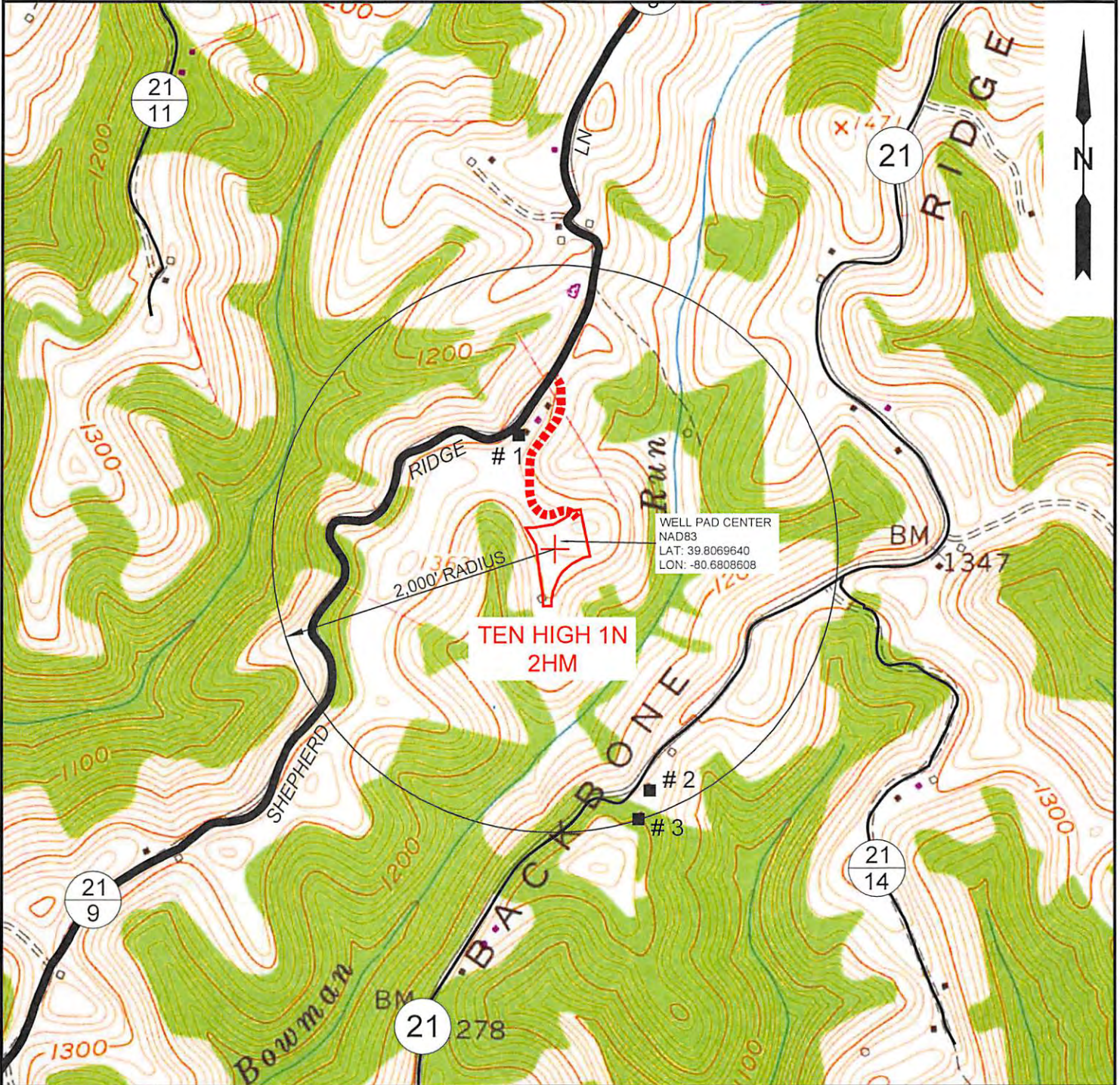
4705101934

There are three (3) residences, no businesses, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

| | | |
|---|--|--|
| <p>House 1 TM 7 Pcl. 24 Lawrence & Shirley Conkle Ests Phone: 304-845-1808; 304-848-1808 Physical Address: 77B Shepards Lane 932 Shepherd Ridge Ln. Glen Easton, WV 26039 Tax Address: 75 Arlington Ave. Moundsville, WV 26041</p> | <p>House 2 TM 7 Pcl. 25 Thomas R. & Kimberly Whitfield Phone: 304-843-1753 Physical Address: 53 Sallys Backbone Rd. 1834 Sally's Backbone Rd. Glen Easton, WV 26039 Tax Address: 1838 Sallys Backbone Rd. Glen Easton, WV 26039</p> | <p>House 3 TM 7 Pcl. 25 Thomas R. & Kimberly Whitfield Phone: 304-843-1753 Physical Address: 53 Sallys Backbone Rd. 1838 Sally's Backbone Rd. Glen Easton, WV 26039 Tax Address: Same</p> |
|---|--|--|

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PROPOSED TEN HIGH 1N - 2HM



NOTE: THERE APPEARS TO BE THREE (3) POSSIBLE WATER SOURCES WITHIN 2,000'.

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SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 462-5634
www.slsurveys.com

| | | | |
|------------------|----------|-------------------------|------------|
| TOPO SECTION: | | OPERATOR: | |
| GLEN EASTON 7.5' | | PREPARED FOR: | |
| COUNTY | DISTRICT | TUG HILL OPERATING, LLC | |
| MARSHALL | MEADE | 380 SOUTHPOINTE BLVD | |
| | | SUITE 200 | |
| | | CANONSBURG, PA 15317 | |
| DRAWN BY | JOB NO. | DATE | SCALE |
| K.G.M. | 8655 | 04/13/2017 | 1" = 1000' |

APR 26 2017
TUG HILL
OPERATING
Department of Environmental Protection
08/11/2017

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

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

Date of Notice: February 9, 2017 **Date of Planned Entry:** February 17, 2017

Delivery method pursuant to West Virginia Code § 22-6A-10a

- PERSONAL SERVICE
 REGISTERED MAIL
 METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

SURFACE OWNER(s)

Name: Estate of Lawrence & Shirley Mae Conkle c/o Roy Conkle ✓
Address: 75 Arlington Avenue
Moundsville, WV 26041

Name: Roy A. Conkle, Sr., and Lorie A. ✓
Address: 75 Arlington Avenue
Moundsville, WV 26041

Name: Larry Lee Conkle and Donna D. ✓
Address: 154 Conkle Drive
Glen Eason, WV 26039 *See Attached

47051010

COAL OWNER OR LESSEE

Name: Murray Energy Corporation ✓
Address: 46226 National Road
St. Clairsville, OH 43950 *See Attached

MINERAL OWNER(s)

Name: Estate of Lawrence & Shirley Mae Conkle c/o Roy Conkle ✓
Address: 75 Arlington Avenue
Glen Easton, WV 26039 *See Attached

*please attach additional forms if necessary

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

| | |
|-------------------------------------|--|
| State: <u>WEST VIRGINIA</u> | Approx. Latitude & Longitude: <u>LAT 39.8067775 LONG -80.6809192</u> |
| County: <u>MARSHALL</u> | Public Road Access: <u>SHEPHERD RIDGE LANE (Co. RT. 21/9)</u> |
| District: <u>MEADE</u> | Watershed: <u>HUC-10 FISH CREEK</u> |
| Quadrangle: <u>GLEN EASTON 7.5'</u> | Generally used farm name: <u>LAWRENCE CONKLE, SR.</u> |

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production 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). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: TUG HILL OPERATING, LLC
Telephone: 724-749-8388
Email: JWHITE@TUG-HILLOP.COM

Address: 380 SOUTHPOINTE BLVD, SOUTHPOINTE PLAZA II, SUITE 200
CANONSBURG, PA 15317
Facsimile: 724-338-2030

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Office of Oil and Gas

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.

APR 2 9 2017
WV Department of
Environmental Protection

08/11/2017

WW-6A3 Notice of Entry for Plat Survey Attachment 1 of 1

Surface Owner(s):

Name: Teresa Anne Hughes and Michael J. /
Address: 252 Conkle Drive
Glen Easton, WV 26039

Brenda Joyce Whetzel /
1863 Shepherds Ridge Lane
Glen Easton, WV 26039

Robert G. Hubbs and Scarlett E. Otte /
132 Shepherds Ridge Lane
Glen Easton, WV 26039

Mineral Owner(s):

Name: Roy A. Conkle, Sr. and Lorie A. /
75 Arlington Avenue
Moundsville, WV 26041

Larry Lee Conkle and Donna D. /
154 Conkle Drive
Glen Easton, WV 26039

Teresa Anne Hughes and Michael J. /
252 Conkle Drive
Glen Easton, WV 26039

Brenda Joyce Whetzel /
1863 Shepherds Ridge Lane
Glen Easton, WV 26039

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STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF PLANNED OPERATION

Notice Time Requirement: notice shall be provided no later than the **filing date of permit application.**

Date of Notice: 04/21/2017 **Date Permit Application Filed:** 04/24/2017

Delivery method pursuant to West Virginia Code § 22-6A-16(c)

CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

Notice is hereby provided to the SURFACE OWNER(s)
(at the address listed in the records of the sheriff at the time of notice):

Name: Estate of Lawrence & Shirley Mae Conkle c/o Roy Conkle
Address: 75 Arlington Avenue
Moundsville, WV 26041

Name: Roy A. Conkle, Sr., and Lorie A.
Address: 75 Arlington Avenue
Moundsville, WV 26041 ****See Attached****

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

| | | | | |
|-------------|----------------------------|---------------------------|--|---------------------|
| State: | <u>West Virginia</u> | UTM NAD 83 | Easting: | <u>527,305.49</u> |
| County: | <u>Marshall</u> | | Northing: | <u>4,406,363.91</u> |
| District: | <u>Meade</u> | Public Road Access: | <u>Shepherd Ridge Lane (Co. Rt. 21/9)</u> | |
| Quadrangle: | <u>Glen Easton 7.5'</u> | Generally used farm name: | <u>LAWRENCE & SHIRLEY CONKLE, ESTS</u> | |
| Watershed: | <u>(HUC 10) Fish Creek</u> | | | |

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. 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 Operator: Tug Hill Operating, LLC
Telephone: 724-749-8388
Email: jwhite@tug-hilltop.com

Address: 380 Southpointe Blvd, Southpointe 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.

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Environmental **08/14/2017**

WW-6A5 Notice of Planned Operation..... Attachment 1 of 1

Surface Owner(s):

Name: Teresa Anne Hughes and Michael J.
Address: 252 Conkle Drive
Glen Easton, WV 26039

Brenda Joyce Whetzel
1863 Shepherds Ridge Lane
Glen Easton, WV 26039

Larry Lee Conkle and Donna D.
154 Conkle Drive
Glen Easton, WV 26039

Robert G. Hubbs and Scarlett E. Otte
132 Shepherds Ridge Lane
Glen Easton, WV 26039



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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Jim Justice
Governor

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

March 13, 2017

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

Subject: DOH Permit for the Ten High 1N Pad, Marshall County
Ten High 1N Unit-2HM Well site

47-051-01934

Dear Mr. Martin,

This well site will be accessed from a DOH permits #06-2017-0127 which have been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off of Marshall County Route 21/9 SLS.

The operator has signed a STATEWIDE 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, LLC
CH, OM, D-6
File

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WV Department of
Environmental Protection

08/11/2017



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Ten High 1N-2HM

| PRODUCT NAME: | CHEMICAL DESCRIPTION: | PRODUCT USE: | HAZARDOUS COMPONENT: |
|---------------|----------------------------------|------------------|--|
| GBW-20C | Hemicellulase Breaker | Breaker - Water | None |
| ALPHA 1427 | | Biocide | Glutaraldehyde – CAS#000111-30-8 Quaternary 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 sizes) | Proppant | Crystalline silica (quartz) CAS# 14808-60-7 |
| S-8C, Sand | Silica Sand (100 mesh) | Sand | Silica – CAS# 14808-60-7 |
| GW-3LDF | | Gellant - Water | Petroleum Distillate Blend – Proprietary, (Not Associated with Diesel Fuel) Guar gum – CAS# 009000-30-0 |
| FRW-18 | | Friction Reducer | Hydrotreated light distillate CAS# 064742-47-8 |
| Scaletrol | | Scale Inhibitor | Ethylene glycol – CAS# 000107-21-1 Diethylene glycol – CAS# 000111-46-6 |

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WEST VIRGINIA COUNTY MAP



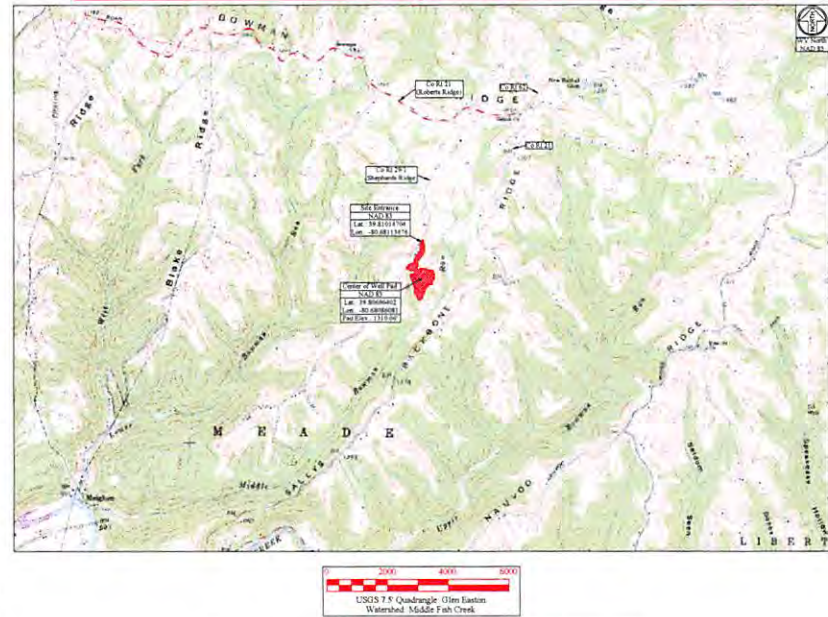
APPROVED WVDEP OOG
5/18/2017

Ten High Well Site
Site Design, Construction Plan, &
Erosion and Sediment Control Plans
Tug Hill Operating
Marshall County
Meade District
Latitude 39.80696402°
Longitude -80.68086081°
Middle Fish Creek Watershed

Pertinent Site Information
Ten High Well Site
Emergency Number: 304-845-1920
Meade District, Marshall County, WV
Watershed: Middle Fish Creek Watershed
Tug Hill Contact Number: 1-817-632-3400

Exhibit A: Final Design: Issue for Permitting

Grid of well locations with coordinates (NAD 27 and NAD 83) for various well identifiers like WVN, WVNAD, WVM, WVMAD, WVT, and WVTAD.

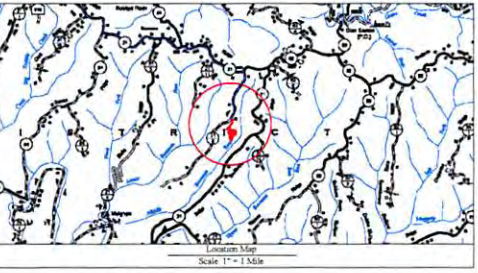


Property Owner Information - Ten High Well Site
Access Road
Disturbed Area
Ten High Well Site Quantities

Project Contacts
Tug Hill Operating
Sweeten Wilson, Regulatory Analyst
724-432-2000 ext. 304-845-1920 (Cell)
Geoff Radler - V.P. Production
817-632-8300 ext.

Approach Routes
From the intersection of WV Rt 2 and OH Rt 7 near New Martinsville, WV...
The WV Mines Website was consulted. Previous (Current) mining activities are within the ACEI.
WVDEP Website files show that there are no active and/or abandoned gas wells within the ACEI.

Site Locations (NAD 27) and Site Locations (NAD 83) tables with columns for Structure, Elevation (FT), Longitude (DD), and UTM coordinates.



Well Location Restrictions
All Pit construction complies with the following restrictions:
*250 feet from an existing well or developed spring used for human or domestic animals
*25 feet from an occupied dwelling or barn greater than 2,500 sq. feet for poultry or dairy measured from the center of the pad.
*100 feet from the edge of disturbance to wetland, perennial stream, natural or artificial lake, pond or reservoir.
*500 feet from the edge of disturbance to a naturally reproducing tree or shrub.
*1,000 feet of a surface or ground water related to a public water supply.
(All Well Location Restrictions of WV Code 22-6-1.2)

Table with 2 columns: Sheet and Description. Lists sheets 1 through 11 including Cover Sheet, Schedule of Quantities, Site Notes, Pre-Construction Site Conditions, etc.

Vertical sidebar containing logos for TUG HILL OPERATING, K&S, and Ten High Well Site Meade District Marshall County, WV. Includes a north arrow and document preparation information.

Ten High Well Site
Tug Hill Operating

Exhibit A: Final Design: Issue for Permitting

APPROVED
WVDEP OOG
7/20 5/18/2017

Center of Well Pad
NAD 83
Lat.: 39.80696402
Lon.: -80.68086081
Pad Elev.: 1310.06'

- Ten High 15-20424
- Ten High 14-20324
- Ten High 14-11202
- Ten High 15-20324
- Ten High 15-1402
- Ten High 15-20324
- Ten High 15-20324
- Ten High 15-20324

NOTE:
All surface boundary lines shown herein are based on boundary evidence collected with mapping grade GPS receivers

| Disturbed Area | Well Pad Construction | Access Road Construction | Access Road Construction | Access Road Construction |
|----------------|-----------------------|--------------------------|--------------------------|--------------------------|
| 1,927 AC | 1,927 AC | 1,927 AC | 1,927 AC | 1,927 AC |
| 1,927 AC | 1,927 AC | 1,927 AC | 1,927 AC | 1,927 AC |
| 1,927 AC | 1,927 AC | 1,927 AC | 1,927 AC | 1,927 AC |
| 1,927 AC | 1,927 AC | 1,927 AC | 1,927 AC | 1,927 AC |

| Access Road | TM | Permit | Road Length | Type |
|-------------------------|------|--------|-------------|------------------------------|
| Robert Hadden, et al | 2011 | 10072 | 1,927 AC | New Access Road Construction |
| Lawrence Cwickle, et al | 2011 | 10072 | 1,927 AC | New Access Road Construction |

Additional Information
Total Area of Well Pad Construction: 1,927 AC
Total Area of Access Road Construction: 1,927 AC

Legend

- Original Contour 2' Contour
- Original Contour 10' Contour
- Pad Change 10' Contour
- Pad Change 15' Contour
- Access Road Design 2' Contour
- Access Road Design 10' Contour
- Center of Structure
- Existing Fence
- 12" Wells
- 24" Compacted Filter Back
- Super 50# Filter
- Line of Obstruction
- Area of Interest
- Existing One Line
- Existing Utility Pole Line
- Rock Land Ditch
- Excavated Control Blanket Land Ditch
- Diversion Ditch
- P2M Wetland
- P2M Wetland
- P2M Wetland
- Perennial Stream
- Intermittent Stream
- Stream Bank
- Stream Control Blanket Slope Area
- Stream Check Dam
- Spring

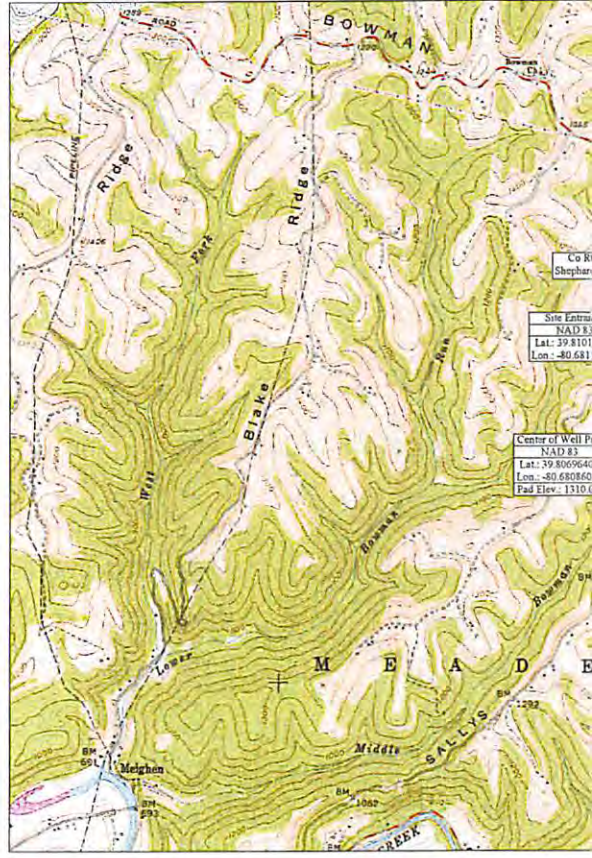
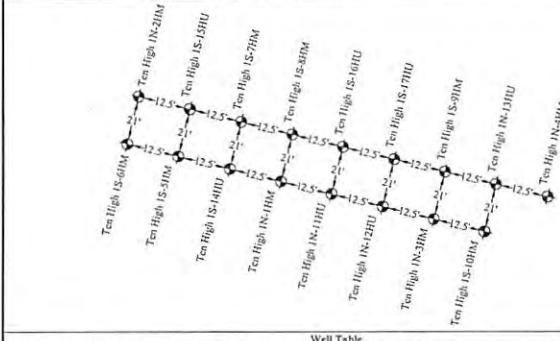
Date: 05/17/2017
 Design: WVDEP Commission
 TUG HILL OPERATING
 THIS DOCUMENT PREPARED FOR TUG HILL OPERATING
 K+S
 Ten High Well Site
 Meade District
 Marshall County, WV
 Date: 05/17/2017
 Scale: As Shown
 Designed by: ZS
 File No:
 Sheet 10 of 13

**WEST VIRGINIA
 COUNTY MAP**



Exhibit A: Final De

| | |
|---|---|
| Site Entrance WV-NAD 83 N: 479378.04 WV-NAD 83 E: 1636702.63 WV-NAD 27 N: 469341.22 WV-NAD 27 E: 1668139.28 Lat. NAD 83: 39.81014704 Lon. NAD 83: -80.68113476 Lat. NAD 27: 39.81009921 Lon. NAD 27: -80.68128666 UTM 17 NAD 83 N: 4406734.37 UTM 17 NAD 83 E: 527293.50 | Center of Well Pad WV-NAD 83 N: 478217.70 WV-NAD 83 E: 1636764.34 WV-NAD 27 N: 478180.87 WV-NAD 27 E: 1668201.01 Lat. NAD 83: 39.80969402 Lon. NAD 83: -80.68086081 Lat. NAD 27: 39.80688611 Lon. NAD 27: -80.68105404 UTM 17 NAD 83 N: 4406381.18 UTM 17 NAD 83 E: 527318.20 Pad Elev.: 1310.06' |
|---|---|



| Ten High 1N-21HM | Ten High 1S-15HM | Ten High 1S-17HM | Ten High 1S-18HM | Ten High 1S-16HM |
|---|---|---|---|---|
| WV-NAD 83 N: 478161.74 WV-NAD 83 E: 1636721.66 WV-NAD 27 N: 478124.91 WV-NAD 27 E: 1668158.33 Lat. NAD 83: 39.80680836 Lon. NAD 83: -80.68101101 Lat. NAD 27: 39.80673095 Lon. NAD 27: -80.68120332 UTM 17 NAD 83 (m) N: 4406358.91 UTM 17 NAD 83 (m) E: 527305.49 | WV-NAD 83 N: 478158.76 WV-NAD 83 E: 1636733.80 WV-NAD 27 N: 478121.94 WV-NAD 27 E: 1668170.47 Lat. NAD 83: 39.80690117 Lon. NAD 83: -80.68096676 Lon. NAD 27: 39.80672322 Lon. NAD 27: -80.68115998 UTM 17 NAD 83 (m) N: 4406363.07 UTM 17 NAD 83 (m) E: 527309.20 | WV-NAD 83 N: 478155.78 WV-NAD 83 E: 1636745.94 WV-NAD 27 N: 478118.96 WV-NAD 27 E: 1668182.61 Lat. NAD 83: 39.80693395 Lon. NAD 83: -80.68092341 Lat. NAD 27: 39.80671548 Lon. NAD 27: -80.68111663 UTM 17 NAD 83 (m) N: 4406362.22 UTM 17 NAD 83 (m) E: 527312.91 | WV-NAD 83 N: 478152.81 WV-NAD 83 E: 1636758.08 WV-NAD 27 N: 478115.98 WV-NAD 27 E: 1668194.75 Lat. NAD 83: 39.80678566 Lon. NAD 83: -80.68088006 Lon. NAD 27: 39.80670775 Lon. NAD 27: -80.68107328 UTM 17 NAD 83 (m) N: 4406361.38 UTM 17 NAD 83 (m) E: 527316.63 | WV-NAD 83 N: 478149.83 WV-NAD 83 E: 1636702.22 WV-NAD 27 N: 478113.00 WV-NAD 27 E: 1668206.89 Lat. NAD 83: 39.80677792 Lon. NAD 83: -80.68083671 Lon. NAD 27: 39.80670001 Lon. NAD 27: -80.68102993 UTM 17 NAD 83 (m) N: 4406360.53 UTM 17 NAD 83 (m) E: 527310.34 |

| Ten High 1S-17HM | Ten High 1S-19HM | Ten High 1N-13HM | Ten High 1N-11HM | Ten High 1S-16HM |
|---|---|---|---|---|
| WV-NAD 83 N: 478146.85 WV-NAD 83 E: 1636752.36 WV-NAD 27 N: 478110.03 WV-NAD 27 E: 1668219.03 Lat. NAD 83: 39.80677019 Lon. NAD 83: -80.68079336 Lat. NAD 27: 39.80669228 Lon. NAD 27: -80.68098559 UTM 17 NAD 83 (m) N: 4406358.69 UTM 17 NAD 83 (m) E: 527334.06 | WV-NAD 83 N: 478143.88 WV-NAD 83 E: 1636794.50 WV-NAD 27 N: 478107.05 WV-NAD 27 E: 1668231.17 Lat. NAD 83: 39.80676246 Lon. NAD 83: -80.68075001 Lat. NAD 27: 39.80668414 Lon. NAD 27: -80.68094324 UTM 17 NAD 83 (m) N: 4406358.84 UTM 17 NAD 83 (m) E: 527327.77 | WV-NAD 83 N: 478140.90 WV-NAD 83 E: 1636806.64 WV-NAD 27 N: 478104.07 WV-NAD 27 E: 1668243.31 Lat. NAD 83: 39.80675472 Lon. NAD 83: -80.68076666 Lat. NAD 27: 39.80667681 Lon. NAD 27: -80.68098989 UTM 17 NAD 83 (m) N: 4406358.00 UTM 17 NAD 83 (m) E: 527331.48 | WV-NAD 83 N: 478137.92 WV-NAD 83 E: 1636818.78 WV-NAD 27 N: 478101.10 WV-NAD 27 E: 1668255.45 Lat. NAD 83: 39.80674699 Lon. NAD 83: -80.68066631 Lat. NAD 27: 39.80666097 Lon. NAD 27: -80.68085654 UTM 17 NAD 83 (m) N: 4406357.15 UTM 17 NAD 83 (m) E: 527335.20 | WV-NAD 83 N: 478134.34 WV-NAD 83 E: 1636716.66 WV-NAD 27 N: 478104.52 WV-NAD 27 E: 1668153.33 Lat. NAD 83: 39.80675259 Lon. NAD 83: -80.68102695 Lat. NAD 27: 39.80669478 Lon. NAD 27: -80.68120117 UTM 17 NAD 83 (m) N: 4406357.67 UTM 17 NAD 83 (m) E: 527304.07 |

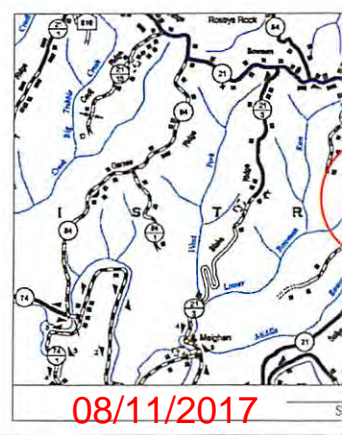
| Ten High 1S-15HM | Ten High 1S-11HM | Ten High 1N-11HM | Ten High 1N-13HM | Ten High 1S-10HM |
|---|---|---|---|---|
| WV-NAD 83 N: 478131.37 WV-NAD 83 E: 1636786.50 WV-NAD 27 N: 478101.54 WV-NAD 27 E: 1668165.47 Lat. NAD 83: 39.80674196 Lon. NAD 83: -80.68098361 Lat. NAD 27: 39.80666705 Lon. NAD 27: -80.68117682 UTM 17 NAD 83 (m) N: 4406356.83 UTM 17 NAD 83 (m) E: 527307.78 | WV-NAD 83 N: 478128.39 WV-NAD 83 E: 1636794.94 WV-NAD 27 N: 478098.56 WV-NAD 27 E: 1668177.61 Lat. NAD 83: 39.80673722 Lon. NAD 83: -80.68094026 Lat. NAD 27: 39.80665931 Lon. NAD 27: -80.68113347 UTM 17 NAD 83 (m) N: 4406355.98 UTM 17 NAD 83 (m) E: 527311.49 | WV-NAD 83 N: 478125.41 WV-NAD 83 E: 1636753.08 WV-NAD 27 N: 478095.59 WV-NAD 27 E: 1668189.75 Lat. NAD 83: 39.80672949 Lon. NAD 83: -80.68096991 Lat. NAD 27: 39.80665158 Lon. NAD 27: -80.68109013 UTM 17 NAD 83 (m) N: 4406355.14 UTM 17 NAD 83 (m) E: 527315.21 | WV-NAD 83 N: 478122.43 WV-NAD 83 E: 1636765.22 WV-NAD 27 N: 478092.61 WV-NAD 27 E: 1668201.89 Lat. NAD 83: 39.80672195 Lon. NAD 83: -80.68083536 Lat. NAD 27: 39.80664384 Lon. NAD 27: -80.68104678 UTM 17 NAD 83 (m) N: 4406354.29 UTM 17 NAD 83 (m) E: 527318.92 | WV-NAD 83 N: 478119.36 WV-NAD 83 E: 1636777.36 WV-NAD 27 N: 478089.63 WV-NAD 27 E: 1668214.03 Lat. NAD 83: 39.80671422 Lon. NAD 83: -80.68081021 Lat. NAD 27: 39.80664311 Lon. NAD 27: -80.68100343 UTM 17 NAD 83 (m) N: 4406353.45 UTM 17 NAD 83 (m) E: 527322.64 |

| Project Contacts | Survey and Engineer | Gretechnical Enginerr |
|--|--|--|
| Tug Hill Operating Jonathan White - Regulatory Analyst 724-483-2000 Off. 304-689-7676 Cell Geoff Radler - V.P. Production 817-632-5200 Off. | Survey and Engineer Kenneth Kelly 304-338-6983 Off. John P. See 304-442-0220 Off. Zackary Summerfield 304-338-6987 Off. | Gretechnical Enginerr American Geotech. Inc. Kamit Patel 304-340-4277 Off. |

Approach Routes:

From the intersection of WV Rt 2 and OH Rt 7 near New Martinsville, WV. Travel North on WV Rt 2 for 13.8 mi. Turn Right onto Co Rt 7/4 (Fish Creek). Follow Co Rt 7/4 for 262 ft. Turn Left onto Co Rt 2/1 (Taylors Ridge Rd). Follow Co Rt 2/1 for 3.7 mi. Turn Left to continue on Co Rt 2/1. Follow Co Rt 2/1 for 1.2 mi. Turn Right onto Co Rt 21 (Roberts Ridge St Joseph Rd). Follow Co Rt 21 for 5.3 mi. Turn Right onto Co Rt 21/9 (Shepherds Ridge). Follow Co Rt 21/9 for 0.9 mi. The site entrance will be on the Left (East) side of the road.

| Site Locations (NAD 27) | | |
|-------------------------|---------------|----------------|
| Structure | Latitude (DD) | Longitude (DD) |
| Site Entrance | 39.81009921 | -80.68113476 |
| Center of Well Pad | 39.80688611 | -80.68103406 |



08/11/2017

| Floodplain Conditions | |
|---|--------------|
| Do site construction activities take place in a floodplain: | NO |
| Permit needed from county floodplain 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 0175E |
| Areas of construction in floodplain: | N/A |

MISS UTILITY OF WEST VIRGINIA
 1-800-245-4848
 West Virginia State Law
 Section 21-2-2, Chapter 24-C requires
 that you call 811 before
 you dig in the State of West Virginia.
IT'S THE LAW

**Know what's below.
 Call before you dig.**

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

The WV Mines Website was consulted. Previous (Current) mining activities are within the AOI.

WVDEP Website files show that there are no active and/or abandoned gas wells within the AOI

Tug Hill Well Site

Construction Plan, &
Erosion and Sediment Control Plans
Well Operating
Marshall County
Meade District
39.80696402°
-80.68086081°
Middle Fish Creek Watershed

Pertinent Site Information

Ten High Well Site
Emergency Number: 304-845-1920
Meade District, Marshall County, WV
Watershed: Middle Fish Creek Watershed
Tug Hill Contact Number: 1-817-632-3400

Design: Issue for Permitting

4705101934



WV State Plane Coordinate System
North Zone, NAD 83
Elevations Based on NAV88
Established By Survey Grade GPS
and OPUS Post-Processing

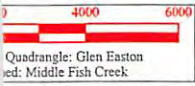
| Property Owner Information - Ten High Well Site | | | | | | |
|---|-------------|----------|-------------|----------------|---------------|-----------------|
| Meade District - Marshall County | | | | | | |
| Owner | TM - Parcel | Well Pad | Access Road | Topsoil/Excess | Add. Clearing | Total Disturbed |
| Robert Hobbs, et al | 7-12.1 | 0.50 | 0.46 | 0.00 | 0.57 | 1.03 |
| Lawrence Conkle, et al | 7-24 | 3.92 | 1.32 | 1.32 | 6.61 | 15.17 |
| Site Totals (Ac) | | 5.92 | 1.78 | 1.32 | 7.18 | 16.20 |

| Access Road | | | |
|------------------------|-------------|-------------|------------------------------|
| Surface Owner | TM - Parcel | Road Length | Type |
| Robert Hobbs, et al | 7-12.1 | 261.52' | New Access Road Construction |
| Lawrence Conkle, et al | 7-24 | 1,089.27' | New Access Road Construction |

| Disturbed Area | |
|----------------------------------|-----------|
| Well Pad Construction | 5.92 Ac |
| Access Road Construction | 1.78 Ac |
| Topsoil/Excess Material | 1.32 Ac |
| Additional Clearing | 7.18 Ac |
| Total Disturbed Area | 16.20 Ac |
| Additional Information | |
| Total Wooded Acres Disturbed | 2.70 Ac |
| Total Linear Feet of Access Road | 1,350.79' |

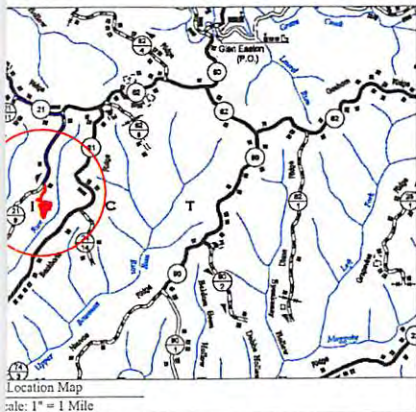
| Ten High Well Site Quantities | | | | | | |
|-----------------------------------|-----------|-----------|------------|-------------------------|------------|-----------------|
| Description | Cut (CY) | Fill (CY) | Spill (CY) | Borrow (CY) | Max. Slope | Length of Slope |
| Well Pad | 54,093.54 | 44,059.10 | 9,994.44 | | N/A | N/A |
| Well Pad Access Road | 2,558.18 | 3,782.18 | | 1,284.00 | 10.00% | 315.43' |
| Topsoil/Excess Material Stockpile | 0.00 | 12,500.73 | | 12,500.73 | N/A | N/A |
| Totals | 56,651.72 | 60,342.01 | 9,994.44 | 13,724.73 | | |
| Total Spill (CY) = | | -3,730.29 | | (Excess Spill Capacity) | | |

John
4/21/17



Quadrangle: Glen Easton
Watershed: Middle Fish Creek

| Site Locations (NAD 83) | | |
|-------------------------|---------------|----------------|
| Structure | Latitude (DD) | Longitude (DD) |
| Site Entrance | 39.81014704 | -80.68113476 |
| Center of Well Pad | 39.80696402 | -80.68086081 |

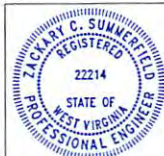


Well Location Restrictions

All Pad construction complies with the following restrictions.

- *250' from an existing well or developed spring used for human or domestic animals.
- *625' from an occupied dwelling or barn greater than 2,500 SF used for poultry or dairy measured from the center of the pad.
- *100' from the edge of disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir.
- *300' from the edge of disturbance to a naturally reproducing trout stream.
- *1,000' of a surface or ground water intake to a public water supply.

(Well Location Restrictions of WV Code 22-6-A-12)



Design Certifications
The drawings, calculation 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 Oil and Gas 502538.6
All Plans, Sheets, and/or Reference Diagrams included in this design constitute a complete set of plans. A complete set of plans is necessary to construct the site in accordance with the design.
Zackary C. Summerfield
RPE 22214
Kelly Surveying PLLC
CVA, CD4252-00
Zackary C. Summerfield
Date: 02-17-2017

| Sheet | Description |
|-------|--------------------------------------|
| 1 | Cover Sheet |
| V1 | Schedule of Quantities |
| N1-N3 | Site Notes |
| 2 | Pre-Construction Site Conditions |
| 3 | Site Soil Map |
| 4 | Clearing Exhibit |
| 5 | Overall Plan View |
| 6-7 | E&S Plan View |
| 8 | Toe Key Exhibit |
| 9-10 | Plan View |
| 11-12 | Cross Sections - Well Pad |
| 13 | Cross Sections - Access Road |
| G1-G2 | Geotechnical Exhibit |
| L1 | Landowner Disturbed Area Exhibit |
| S1 | Site Reclamation |
| M1-M2 | Production Exhibit |
| D1-D2 | Erosion and Sediment Control Details |
| R1 | Access Road Details |
| P1 | Pad Details |

Revision
Design

Date
02-17-2017

TUG HILL
OPERATING



THIS DOCUMENT
PREPARED FOR
TUG HILL
OPERATING

Kelly Surveying
P.O. Box 206
Fowler, WV 26239
(304)338-0983

Cover Sheet

Ten High Well Site
Meade District
Marshall County, WV

Date: 02/17/2017
Scale: As Shown
Designed By: ZS

08/11/2017