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west virginia department of environmental protection

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

Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

December 7, 2016  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / Horizontal 6A Well

TUG HILL OPERATING, LLC  
1320 SOUTH UNIVERSITY DRIVE, SUITE 500

FORT WORTH , TX 76107

Re: Permit Modification Approval for GREER 6H  
47-051-01758-00-00

**Well Bore Path Modification**

TUG HILL OPERATING, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before 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: GREER 6H  
Farm Name: PPG INDUSTRIES, INC.  
U.S. WELL NUMBER: 47-051-01758-00-00  
Horizontal 6A / Horizontal 6A Well  
Date Issued: December 7, 2016

Promoting a healthy environment.

12/09/2016

# PERMIT CONDITIONS

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

## CONDITIONS

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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. 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.
8. 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.
9. 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](mailto:DEPOOGNotify@wv.gov).

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    Franklin    Powhatan Point 7  
Operator ID    County    District    Quadrangle

2) Operator's Well Number: 6H    Well Pad Name: Greer

3) Farm Name/Surface Owner: PPG Industries, Inc.    Public Road Access: Waynes Ridge Rd. - County Route 78

4) Elevation, current ground: 1274'    Elevation, proposed post-construction: 1251'

5) Well Type (a) Gas     Oil \_\_\_\_\_    Underground Storage \_\_\_\_\_

Other \_\_\_\_\_

(b) If Gas Shallow     Deep \_\_\_\_\_

Horizontal  \_\_\_\_\_

*JU 10/2/16*

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 6350' - 6406', thickness of 56' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6506'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 14420'

11) Proposed Horizontal Leg Length: 7450'

12) Approximate Fresh Water Strata Depths: 70', 860'

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: 1740'

15) Approximate Coal Seam Depths: Sewickly Coal - 756' and Pittsburgh Coal - 850'

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: \_\_\_\_\_

Depth: \_\_\_\_\_

Seam: \_\_\_\_\_

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**Office of Oil and Gas**

OCT 24 2016

WW-6B  
(04/15)

API NO. 47- 051 - 01758 MCD  
 OPERATOR WELL NO. 6H  
 Well Pad Name: Greer

18)

**CASING AND TUBING PROGRAM**

<b>TYPE</b>	<b>Size (in)</b>	<b>New or Used</b>	<b>Grade</b>	<b>Weight per ft. (lb/ft)</b>	<b>FOOTAGE: For Drilling (ft)</b>	<b>INTERVALS: Left in Well (ft)</b>	<b>CEMENT: Fill-up (Cu. Ft.)/CTS</b>
Conductor	20"	NEW	PE	54.5#		120'	61FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	48#		1000'	870FT^3(CTS)
Coal	13 3/8"	NEW	H40	48#		1000'	870FT^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#		2600'	845FT^3(CTS)
Production	5 1/2"	NEW	P110	20#		14420'	3459FT^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6910'	
Liners							

*ju 10/6/16*

<b>TYPE</b>	<b>Size (in)</b>	<b>Wellbore Diameter (in)</b>	<b>Wall Thickness (in)</b>	<b>Burst Pressure (psi)</b>	<b>Anticipated Max. Internal Pressure (psi)</b>	<b>Cement Type</b>	<b>Cement Yield (cu. ft./k)</b>
Conductor	20"	26"	.25	880	700	Class A	1.2
Fresh Water	13 3/8"	17"	.33	1730	1384	See#24	1.2
Coal	13 3/8"	17"	.33	1730	1384	See#24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3520	2816	See#24	1.2
Production	5 1/2"	8 7/8_8 3/4	.361	12640	10112	See#24	1.17
Tubing	2 3/8"		.19	11200	8960		
Liners							

**PACKERS**

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

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OCT 24 2016

WV Department of  
 Environmental Protection

WW-6B  
(10/14)

API NO. 47- 051 - 01758 M6D  
OPERATOR WELL NO. 6H  
Well Pad Name: Greer

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

Drill through the Marcellus tagging less than 100' from the top of the Onondaga to get depths and log data. Plug back to proposed kick off point (TBD). Drill the horizontal section to planned and proposed TD. Run casing and cement to surface. Run Bond Log from app 60 deg to surface. make clean out run and stimulate

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

Well to be completed with approximately 18,625,500 lb proppant and 282,236 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 24.42 Acres

22) Area to be disturbed for well pad only, less access road (acres): 5.38 Acres

23) Describe centralizer placement for each casing string:

Will run 3 centralizers on surface casing at equal distance. Intermediate will have 7 centralizers at 300' spacing. 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:

Class A+2 CaCl<sub>2</sub>+1/4#Flake-Surface cement mixed 15.6ppg, CaCl<sub>2</sub>(calcium Chloride), Flake(cellophane flake)  
Class A+1 CaCl<sub>2</sub>+1/4#Flake-Intermediate Cement mixed 15.6ppb. 50:50 Class H .2 CD32 1.2 FL62, .1  
ASA301 >4 SMS-Long String mixes 14.5 ppg, CD32(cement dispersant) FL 62 (fluid loss)SMS (sodium metasilicate) ASA (minimizes free fluid) 50:50 Type1 .4 R3 1 FL62 .15 ASA301 .3 CD32-tali mixed 14.5 ppg

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

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**Office of Oil and Gas**

**OCT 24 2016**

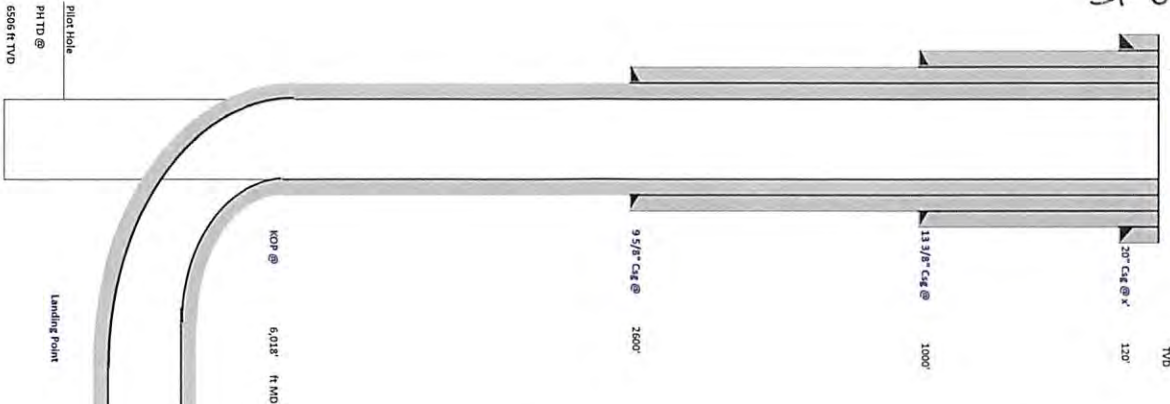
**WV Department of  
Environmental Protection**

\*Note: Attach additional sheets as needed.

SI-01758400



WELL NAME:	Greer GH	COUNTRY:	Marshall
STATE:	WV	GL Elev:	1251 ft
DISTRICT:	Franklin		
Dr Elev:	1276 ft		
TD:	14420 ft		
TH Latitude:	39.73702		
TH Longitude:	-80.836431		
BH Latitude:	39.73439		
BH Longitude:	-80.834960		



FORMATION TOPS	Depth TVD
Deepest Fresh Water	860
Seawidely Coal	756
Pittsburgh Coal	850
Big Lime	1236
Wv Sandstone	2325
Berens Sandstone	2515
Gordon Sandstone	2875
Rhinestreet Shale	5772
Genesee Shale	6290
Tully Limestone	6304
Hamilton Shale	6318
Marcellus Shale	6350
Landing Depth	6362
Onondaga	6406

CASING SUMMARY						
Type	Hole Size (in)	Csg Size (in)	Depth (ft)	Weight (lb/ft)	Grade	Top of Cement
Conductor	26	20	120'	54.5	PE	Surface
Surface	17	13 3/8	1000'	48	H40	Surface
Intermediate 1	12 1/4	9 5/8	2600'	36	J55	Surface
Production	8 7/8, 8 3/4	5 1/2	14,420'	20	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Sacks	Class	Density	Fluid Type	Centralizer	Notes
51	A	15.6	Air	None	
725	A	15.6	Air		3 Centralizers at equal distance
704	A	15.6	Air		7 centralizers at 300' spacing
2,956	A	14.5	Air / SOBIM		1 every other joint in lateral; 1 per joint in curve; 1 every other ft to sf

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AUG 24 2016

WV Department of  
Environmental Protection

12/09/2016

*Handwritten signature and date: 8/19/16*

Pilot Hole  
PHTD @  
6506 ft TVD

Landing Point

6362 ft TVD  
6959 ft MD

KOP @  
6,018' ft MD

Lateral TD @

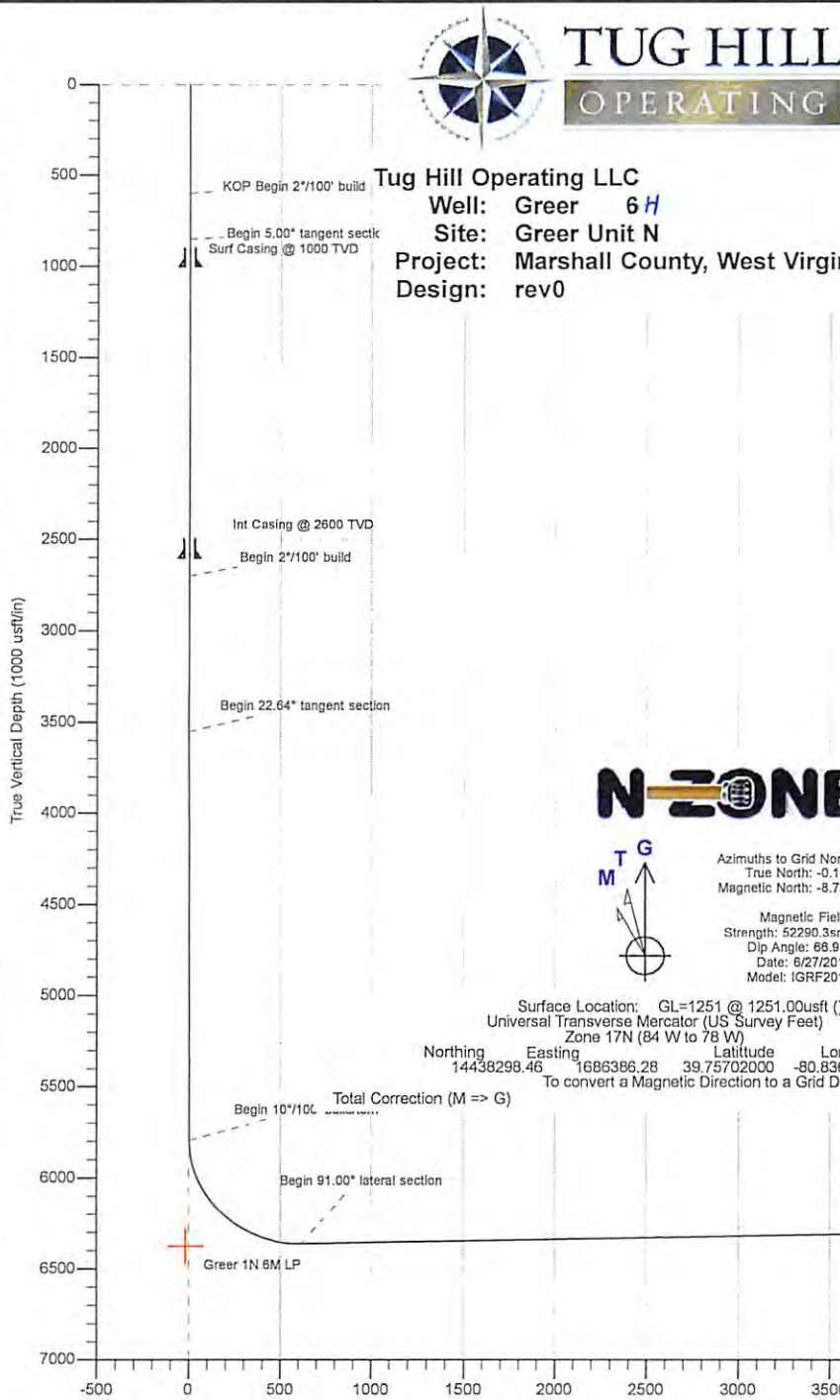
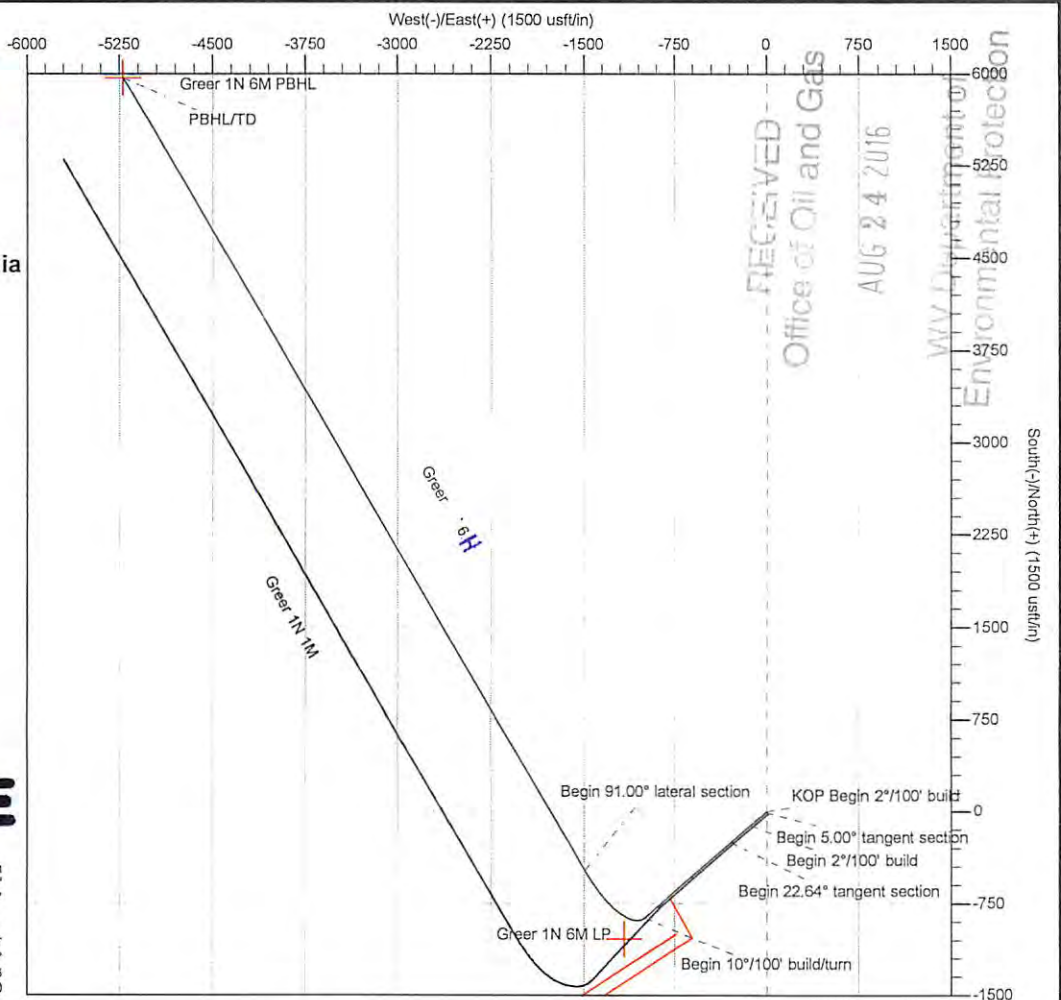
6233 ft TVD  
14420 ft MD

51-0175 & Mod



# TUG HILL OPERATING

**Tug Hill Operating LLC**  
**Well: Greer 6H**  
**Site: Greer Unit N**  
**Project: Marshall County, West Virginia**  
**Design: rev0**



**M T G**  
**M** ↑  
**T** →  
**G** ↓

Azimuths to Grid North  
 True North: -0.10°  
 Magnetic North: -8.73°

Magnetic Field  
 Strength: 52290.3snT  
 Dip Angle: 68.99°  
 Date: 6/27/2016  
 Model: IGRF2010

Surface Location: GL=1251 @ 1251.00usft ( )  
 Universal Transverse Mercator (US Survey Feet)  
 Zone 17N (84 W to 78 W)

Northing	Easting	Latitude	Longitude
14438298.46	1686386.28	39.75702000	-80.83643100

To convert a Magnetic Direction to a Grid Direction, Subtract 8.73°

**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	600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	850.00	5.00	229.00	849.68	-7.15	-8.23	2.00	229.00	0.03	Begin 5.00° tangent section
4	2707.39	5.00	229.00	2700.00	-113.36	-130.40	0.00	0.00	0.46	Begin 2°/100' build
5	3589.39	22.64	229.00	3553.09	-251.03	-288.78	2.00	0.00	1.01	Begin 22.64° tangent section
6	6018.48	22.64	229.00	5795.00	-864.48	-994.47	0.00	0.00	3.49	Begin 10°/100' build/turn
7	6969.73	91.00	329.98	6362.47	-480.25	-1490.01	10.00	99.77	618.89	Begin 91.00° lateral section
8	14420.14	91.00	329.98	6233.00	5969.61	-5217.09	0.00	0.00	7928.07	PBHL/TD

**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](mailto:dducoeur@dpslandservices.com) DPS GIS (7/15/2016) 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

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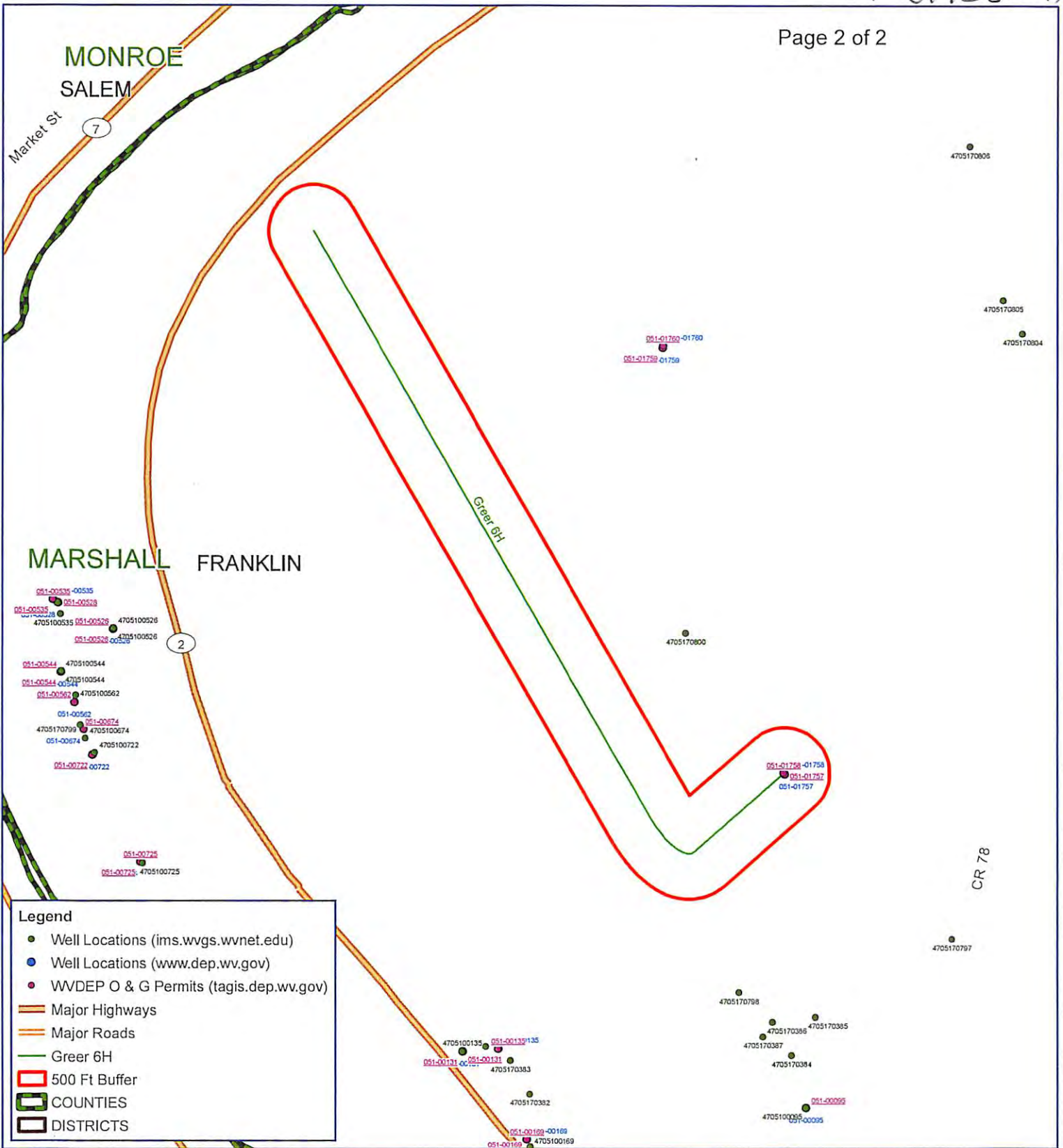
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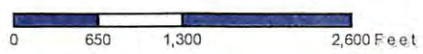


**Legend**

- Well Locations (ims.wvgs.wvnet.edu)
- Well Locations (www.dep.wv.gov)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Greer 6H
- 500 Ft Buffer
- ▭ COUNTIES
- ▭ DISTRICTS



## Greer 6H Franklin District Marshall County, WV



Map Created: July 15, 2016  
Map Current As Of: July 27, 2016

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

Map Prepared by:

12/09/2016

51-01758M00

Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	Deed Book/Pg	Assignment	Assignment
WV16-0076-001	A	5-20-33	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC ✓
WV16-0076-001	B	5-20-34	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC ✓
WV16-0076-001	C	5-20-31	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-001	D	5-20-30	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-068	D	5-20-30	DAN J. SWOVELAND	GASTAR EXPLORATION INC.	1/8+	827 523	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-069	D	5-20-30	CARRIE E METZGER FKA CARRIE ELIZABETH CHAMBERS	GASTAR EXPLORATION INC.	1/8+	833 527	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-070	D	5-20-30	CHRISTINA CHAMBERS	GASTAR EXPLORATION INC.	1/8+	836 123	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-071	D	5-20-30	JOSEPH LONG	GASTAR EXPLORATION INC.	1/8+	836 106	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-117	D	5-20-30	DAVID C WHITE, ESQ., SPECIAL COMMISSIONER ON BEHALF OF D.W. CHESS OR HIS HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES	GASTAR EXPLORATION INC.	1/8+	872 217	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-063	D	5-20-30	ALLEN D. MASON	GASTAR EXPLORATION INC.	1/8+	827 276	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-064	D	5-20-30	RODNEY K. CHAMBERS	GASTAR EXPLORATION INC.	1/8+	827 271	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-065	D	5-20-30	CAROLYN STARKEY	GASTAR EXPLORATION INC.	1/8+	827 226	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-066	D	5-20-30	CHRISTINA I. CHILCOTE	GASTAR EXPLORATION INC.	1/8+	827 525	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-067	D	5-20-30	DAWN M. LAEMMIE	GASTAR EXPLORATION INC.	1/8+	827 521	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-058	D	5-20-30	GLENN L. MASON & SANDRA K. MASON	GASTAR EXPLORATION INC.	1/8+	822 256	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-059	D	5-20-30	FREDRIC RICHTER & BETTY RICHTER	GASTAR EXPLORATION USA, INC.	1/8+	822 270	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-060	D	5-20-30	JORLENE POST	GASTAR EXPLORATION INC.	1/8+	827 280	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-061	D	5-20-30	CHRIS H. STEVENSON	GASTAR EXPLORATION INC.	1/8+	827 282	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-062	D	5-20-30	LUCYBELLE WELDON	GASTAR EXPLORATION INC.	1/8+	827 278	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-053	D	5-20-30	NORA WEBB	GASTAR EXPLORATION USA, INC.	1/8+	805 78	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-054	D	5-20-30	BRIAN K. MARMIE & CAROL L. MARMIE	GASTAR EXPLORATION USA, INC.	1/8+	805 76	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-055	D	5-20-30	KARI B. MARMIE	GASTAR EXPLORATION USA, INC.	1/8+	809 515	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-056	D	5-20-30	TRAVIS D. MARMIE	GASTAR EXPLORATION USA, INC.	1/8+	808 491	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-057	D	5-20-30	DEWAYNE STARKEY	GASTAR EXPLORATION USA, INC.	1/8+	815 228	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-047	D	5-20-30	SHARON D. GREEN	GASTAR EXPLORATION USA, INC.	1/8+	799 463	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-048	D	5-20-30	LAURA GLASSNER	GASTAR EXPLORATION USA, INC.	1/8+	800 406	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-049	D	5-20-30	TERRY I. CHAMBERS	GASTAR EXPLORATION USA, INC.	1/8+	800 404	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-050	D	5-20-30	GEORGEANN TIPPY	GASTAR EXPLORATION USA, INC.	1/8+	803 152	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-051	D	5-20-30	HOWARD A. BROWN	GASTAR EXPLORATION USA, INC.	1/8+	805 98	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC

ALL OIL AND GAS  
 DEPARTMENT OF  
 ENVIRONMENTAL PROTECTION  
 8-4-2016  
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Environmental Protection

12/09/2016

51-01758

Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	Deed Book/Pg	Assignment	Assignment
WV16-0076-052	D	5-20-30	RAE JEAN NAMETH	GASTAR EXPLORATION USA, INC.	1/8+	805 80	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-041	D	5-20-30	JOANN FRAZIER	GASTAR EXPLORATION USA, INC.	1/8+	799 59	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-042	D	5-20-30	JOSEPH CHAMBERS	GASTAR EXPLORATION USA, INC.	1/8+	799 450	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-043	D	5-20-30	ROBERT MARMIE	GASTAR EXPLORATION USA, INC.	1/8+	799 455	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-044	D	5-20-30	FLORENCE L. MYERS	GASTAR EXPLORATION USA, INC.	1/8+	799 457	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-045	D	5-20-30	BARBARA METZNER	GASTAR EXPLORATION USA, INC.	1/8+	799 459	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-046	D	5-20-30	LYNNETTE L. KUGLER	GASTAR EXPLORATION USA, INC.	1/8+	799 461	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-012	D	5-20-30	COLLIN A. WILLISON III	GASTAR EXPLORATION USA, INC.	1/8+	789 577	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-032	D	5-20-30	LETITIA TEMPLE	GASTAR EXPLORATION USA, INC.	1/8+	799 465	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-037	D	5-20-30	MARY C. JOSEPH	GASTAR EXPLORATION USA, INC.	1/8+	797 196	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-038	D	5-20-30	MARSHA L. SCHON	GASTAR EXPLORATION USA, INC.	1/8+	797 198	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-039	D	5-20-30	WILLIAM M. DOYLE	GASTAR EXPLORATION USA, INC.	1/8+	797 187	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-040	D	5-20-30	LOIS JEAN MYERS	GASTAR EXPLORATION USA, INC.	1/8+	797 189	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-001	E	5-20-22	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0185-001	E	5-20-22	ROGER R WEESE, SPECIAL COMMISSIONER ON BEHALF OF EMMA W STANDIFORD, MARY WILSON CRAMER, JANE TAYLOR, MAY BRIDENBECKER, ROSEBERRY L WILSON, ANNIE WILSON, BEATRICE WILSON KERLIN, COURTNEY T WILSON, GUY WILSON, CALLIE WILSON GATES, JAMES C WILSON, H L WILSON	GASTAR EXPLORATION INC.	1/8+	836 488	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-001	F	5-13-36	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-002	F	5-13-36	JACK L. MASON	GASTAR EXPLORATION USA, INC.	1/8+	737 229	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-003	F	5-13-36	MARILYN SUE BUMER	GASTAR EXPLORATION USA, INC.	1/8+	739 413	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-004	F	5-13-36	VIRGINIA R BOHRER STEVEN A BOHRER, AGENT AND AIF	GASTAR EXPLORATION USA, INC.	1/8+	746 321	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-072	F	5-13-36	TIMOTHY B MILLER	GASTAR EXPLORATION INC.	1/8+	844 87	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-073	F	5-13-36	JAMES SLAWINSKI	GASTAR EXPLORATION INC.	1/8+	842 370	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-001	F	5-13-36	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-001	G	5-13-2	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-001	H	5-13-5	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725 123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0142-000	I	5-13-8	PAUL F. SPOTTS	GASTAR EXPLORATION USA, INC.	1/8+	779 482	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC

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April 24 2016  
WV Department of Environmental Protection

51-01758

Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	Deed Book/Pg		Assignment	Assignment
WV16-0076-122	J	5-13-22	CROSSROAD CHILD AND FAMILY SERVICES, INC	GASTAR EXPLORATION INC.	1/8+	887	105	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-119	J	5-13-22	KATHERINE ANN WILLIAMS COTHRAN	GASTAR EXPLORATION INC.	1/8+	879	1	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-115	J	5-13-22	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO, AN OHIO CORPORATION	GASTAR EXPLORATION INC.	1/8+	872	203	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-116	J	5-13-22	JUANITA SANDIFER	GASTAR EXPLORATION INC.	1/8+	872	206	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-113	J	5-13-22	HENRY T LONG	GASTAR EXPLORATION INC.	1/8+	867	385	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-114	J	5-13-22	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER, ON BEHALF OF JOHN EDWARD HARRIS JR, ET AL: MARION LUCILLE ROBINSON, REVEREND FATHER J F BEAVER, ELOISE CARTER, EVALENA SCHAEFFER, ELEANOR SHUTT, HELEN MARTIN, MARGERY MOORE, CHARLES MOORE, TILLE ISCHY, LELIA TAYL	GASTAR EXPLORATION INC.	1/8+	870	34	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-111	J	5-13-22	LORNA M LONG MORGAN	GASTAR EXPLORATION INC.	1/8+	864	323	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-112	J	5-13-22	JAMES C LONG AND PATTI LONG	GASTAR EXPLORATION INC.	1/8+	864	326	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-108	J	5-13-22	JOHN WHITE	GASTAR EXPLORATION INC.	1/8+	862	423	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-109	J	5-13-22	WILLIAM V BUCKNOR	GASTAR EXPLORATION INC.	1/8+	862	421	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-110	J	5-13-22	LESLIE F BUCKNOR	GASTAR EXPLORATION INC.	1/8+	862	419	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-106	J	5-13-22	SUE WHITE	GASTAR EXPLORATION INC.	1/8+	862	429	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-107	J	5-13-22	DON FORGRAVES	GASTAR EXPLORATION INC.	1/8+	862	426	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-108	J	5-13-22	JOHN WHITE	GASTAR EXPLORATION INC.	1/8+	862	423	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-104	J	5-13-22	IMELDA J SCURLOCK	GASTAR EXPLORATION INC.	1/8+	860	443	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-105	J	5-13-22	CAROL F WILSON AND RICHARD WILSON	GASTAR EXPLORATION INC.	1/8+	860	446	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-106	J	5-13-22	SUE WHITE	GASTAR EXPLORATION INC.	1/8+	862	429	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-102	J	5-13-22	RITA ANN DOEBERT AND RONALD DOEBERT	GASTAR EXPLORATION INC.	1/8+	860	437	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-103	J	5-13-22	COLEEN SLAGLE AND FRANKLIN SLAGLE JR	GASTAR EXPLORATION INC.	1/8+	860	440	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-104	J	5-13-22	IMELDA J SCURLOCK	GASTAR EXPLORATION INC.	1/8+	860	443	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-091	J	5-13-22	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO	GASTAR EXPLORATION INC.	1/8+	849	513	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-101	J	5-13-22	JAN KAFFENBERGER	GASTAR EXPLORATION INC.	1/8+	860	434	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-102	J	5-13-22	RITA ANN DOEBERT AND RONALD DOEBERT	GASTAR EXPLORATION INC.	1/8+	860	437	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-080	J	5-13-22	JOSEPH A LONG	GASTAR EXPLORATION INC.	1/8+	849	519	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-090	J	5-13-22	JOHN F LONG AND PAM LONG	GASTAR EXPLORATION INC.	1/8+	849	542	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-091	J	5-13-22	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO	GASTAR EXPLORATION INC.	1/8+	849	513	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-074	J	5-13-22	THOMAS F LONG AND JENNIFER LONG	GASTAR EXPLORATION INC.	1/8+	842	398	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-075	J	5-13-22	UNITED CHURCH HOMES INC	GASTAR EXPLORATION INC.	1/8+	846	408	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-080	J	5-13-22	JOSEPH A LONG	GASTAR EXPLORATION INC.	1/8+	849	519	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
WV16-0076-033	J	5-13-22	CHRISTINA JEAN RIOUX	GASTAR EXPLORATION USA, INC.	1/8+	796	70	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-034	J	5-13-22	MICHAEL EDWARD BARTH	GASTAR EXPLORATION USA, INC.	1/8+	796	68	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-035	J	5-13-22	DEAN ROTHENBUHLER	GASTAR EXPLORATION USA, INC.	1/8+	796	42	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC

51-01758

Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	Deed Book/Pg		Assignment	Assignment
WV16-0076-036	J	5-13-22	STANLEY RICHMOND	GASTAR EXPLORATION USA, INC.	1/8+	796	62	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-029	J	5-13-22	ROBERT D. OKEY	GASTAR EXPLORATION USA, INC.	1/8+	792	646	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-030	J	5-13-22	RAE ELLEN STUART	GASTAR EXPLORATION USA, INC.	1/8+	796	38	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-031	J	5-13-22	TONDA ROTHENBUHLER	GASTAR EXPLORATION USA, INC.	1/8+	796	40	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-033	J	5-13-22	CHRISTINA JEAN RIOUX	GASTAR EXPLORATION USA, INC.	1/8+	796	70	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-026	J	5-13-22	RUTH E. BASSETT MEADOWS	GASTAR EXPLORATION USA, INC.	1/8+	792	100	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-027	J	5-13-22	ELIZABETH ANN STRAUSBAUGH	GASTAR EXPLORATION USA, INC.	1/8+	792	104	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-028	J	5-13-22	JANET LEA BLANKENSHIP	GASTAR EXPLORATION USA, INC.	1/8+	792	580	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-029	J	5-13-22	ROBERT D. OKEY	GASTAR EXPLORATION USA, INC.	1/8+	792	646	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-023	J	5-13-22	LOIS KAY MORFORD	GASTAR EXPLORATION USA, INC.	1/8+	792	110	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-024	J	5-13-22	JODY ELIZONDO	GASTAR EXPLORATION USA, INC.	1/8+	792	93	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-025	J	5-13-22	WILLIAM LONG	GASTAR EXPLORATION USA, INC.	1/8+	792	95	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-026	J	5-13-22	RUTH E. BASSETT MEADOWS	GASTAR EXPLORATION USA, INC.	1/8+	792	100	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-020	J	5-13-22	JACK J. PFALZGRAF	GASTAR EXPLORATION USA, INC.	1/8+	792	118	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-021	J	5-13-22	SANDRA CHEYNEY	GASTAR EXPLORATION USA, INC.	1/8+	792	91	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-022	J	5-13-22	HERBERT BLACHLY	GASTAR EXPLORATION USA, INC.	1/8+	792	102	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-017	J	5-13-22	ANDREW GERST	GASTAR EXPLORATION USA, INC.	1/8+	791	645	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-018	J	5-13-22	HAROLD BLACHLY	GASTAR EXPLORATION USA, INC.	1/8+	791	643	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-019	J	5-13-22	MARTHA BLACHLY-CROSS	GASTAR EXPLORATION USA, INC.	1/8+	792	112	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-014	J	5-13-22	TERRI JEAN GODDARD	GASTAR EXPLORATION USA, INC.	1/8+	790	585	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-015	J	5-13-22	RALPH BLACHLY	GASTAR EXPLORATION USA, INC.	1/8+	790	529	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-016	J	5-13-22	MARGARET ROSS	GASTAR EXPLORATION USA, INC.	1/8+	790	527	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-001	J	5-13-22	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-013	J	5-13-22	JAMIE LU BENSON	GASTAR EXPLORATION USA, INC.	1/8+	790	531	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
WV16-0076-001	K	5-13-16	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA, INC.	1/8+	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC

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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 NIS
Pages Recorded 1
Book-Page 28-62
Recording Fee \$5.00
Additional \$6.00

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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.

RECEIVED Office of Oil and Gas
Notary Public, State of Texas
Comm. Expires 10-05-2020
Notary ID 12915336
Signature Public: Robin Bock
Name/Notary Public (Print): Robin Bock
Commission Expires: 10-05-2020
OCT 24 2016

51-01758



August 12, 2016

WVDEP-Office of Oil & Gas  
Attn: Laura Adkins  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304

VIA: Registered mail

Subject: Greer Well No.6H API# 47-051-01758 (Permit Modification), located in Meade District, Marshall County, WV

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Greer Well No.6H (Permit Modification) well plat. If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 304-689-7676, or by email at [Jwhite@tug-hilop.com](mailto:Jwhite@tug-hilop.com).

Sincerely,

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

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WV Department of  
Environmental Protection

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§ SS
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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

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.

RECEIVED Office of Oil and Gas
Notary Public, State of Texas
Comm. Expires 10-05-2020
Notary ID 12915336
Name/Notary Public (Print): Robin Bock



51-01758



August 12, 2016

WVDEP-Office of Oil & Gas  
Attn: Laura Adkins  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304

VIA: Registered mail

Subject: Greer Well No.6H API# 47-051-01758 (Permit Modification), located in Meade District, Marshall County, WV

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Greer Well No.6H (Permit Modification) well plat. If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 304-689-7676, or by email at [Jwhite@tug-hilop.com](mailto:Jwhite@tug-hilop.com).

Sincerely,

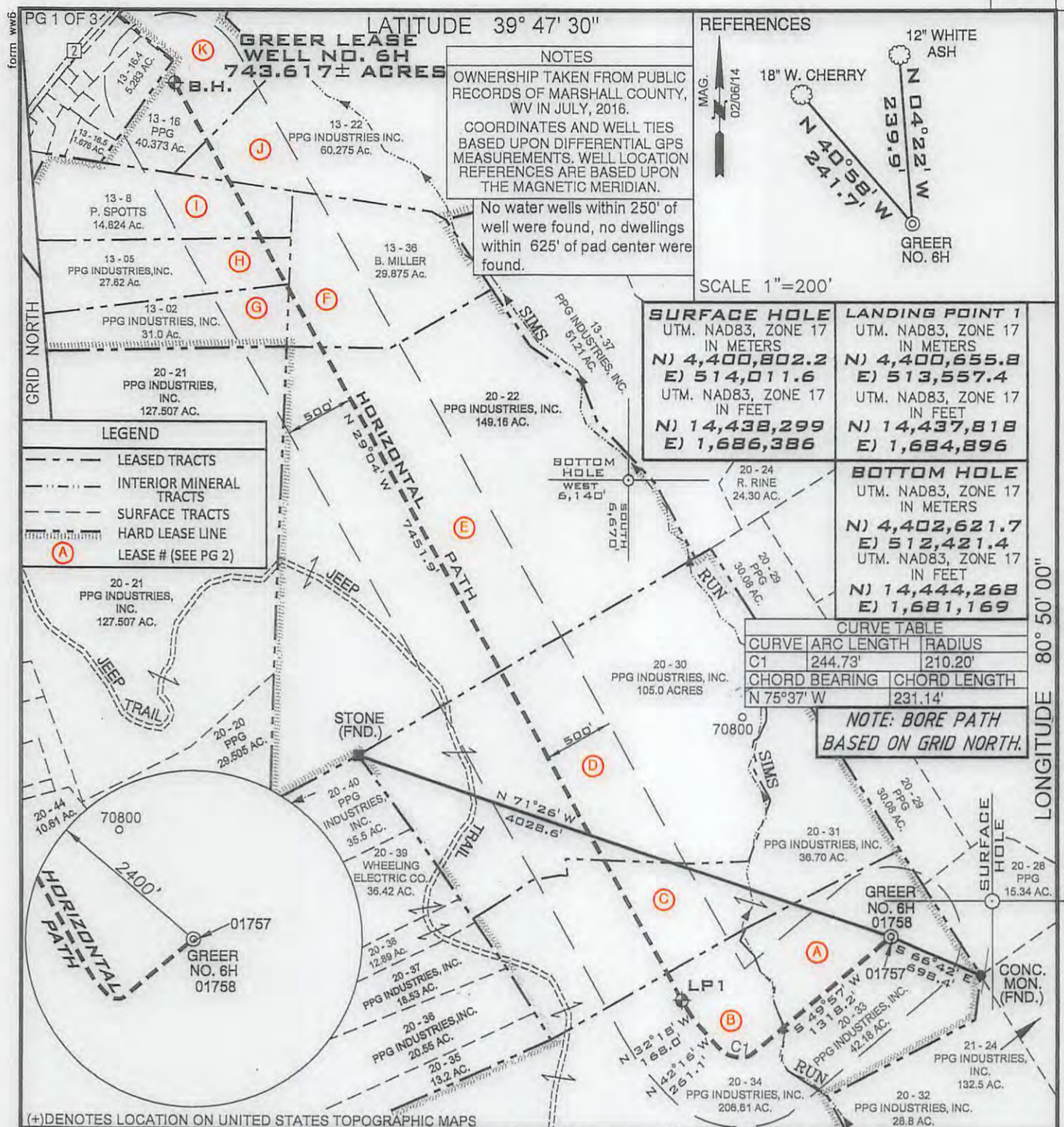
Jonathan White  
Regulatory Analyst – Appalachia Region  
Cell 304-689-7676  
Email: [jwhite@tug-hilop.com](mailto:jwhite@tug-hilop.com)

RECEIVED  
Office of Oil and Gas

AUG 24 2016

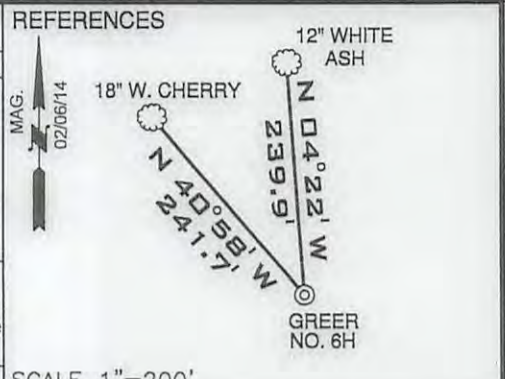
WV Department of  
Environmental Protection

930'



**NOTES**  
 OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN JULY, 2016.  
 COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

No water wells within 250' of well were found, no dwellings within 625' of pad center were found.



<b>SURFACE HOLE</b> UTM. NAD83, ZONE 17 IN METERS N) 4,400,802.2 E) 514,011.6 UTM. NAD83, ZONE 17 IN FEET N) 14,438,299 E) 1,686,386	<b>LANDING POINT 1</b> UTM. NAD83, ZONE 17 IN METERS N) 4,400,655.8 E) 513,557.4 UTM. NAD83, ZONE 17 IN FEET N) 14,437,818 E) 1,684,896
--	---

<b>BOTTOM HOLE</b> UTM. NAD83, ZONE 17 IN METERS N) 4,402,621.7 E) 512,421.4 UTM. NAD83, ZONE 17 IN FEET N) 14,444,268 E) 1,681,169
---

CURVE TABLE		
CURVE	ARC LENGTH	RADIUS
C1	244.73'	210.20'
CHORD BEARING		CHORD LENGTH
N 75°37' W		231.14'

**NOTE: BORE PATH BASED ON GRID NORTH.**

**LEGEND**

- LEASED TRACTS
- INTERIOR MINERAL TRACTS
- SURFACE TRACTS
- HARD LEASE LINE
- (A) LEASE # (SEE PG 2)

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

FILE NUMBER W0120319 (WB1-76)

DRAWING NUMBER GREER\_WP\_6H\_REV1

SCALE 1" = 1000'

MINIMUM DEGREE OF ACCURACY 1/2500

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING GRADE GPS

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

P.S. 2122 *Jonathan N. White*



WVDEP  
 OFFICE OF OIL & GAS  
 601 57TH STREET, SE  
 CHARLESTON, WV 25304

MARCH 14, 2014  
 DATE: JULY 25, 2016 REV1  
 OPERATORS WELL NO. GREER NO. 6H  
 API WELL NO. 47-051-01758 MOD  
 STATE COUNTY PERMIT

WELL TYPE: OIL \_\_\_ GAS X LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
 (IF "GAS") PRODUCTION X STORAGE \_\_\_ DEEP \_\_\_ SHALLOW X

LOCATION ELEVATION 1251' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER (UNDEFINDED)

DISTRICT FRANKLIN COUNTY MARSHALL

QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER SEE ATTACHED PG 2 OF 3 AND PG 3 OF 3

SURFACE OWNER PPG INDUSTRIES, INC. ACREAGE 42.18

OIL & GAS ROYALTY OWNER PPG INDUSTRIES, INC., ET AL LEASE ACREAGE 743.617

PROPOSED WORK: DRILL X CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION \_\_\_  
 PERFORATE NEW FORMATION \_\_\_ OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_

PLUG & ABANDON \_\_\_ CLEAN OUT & REPLUG \_\_\_

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 6,506' TMD: 14,420'

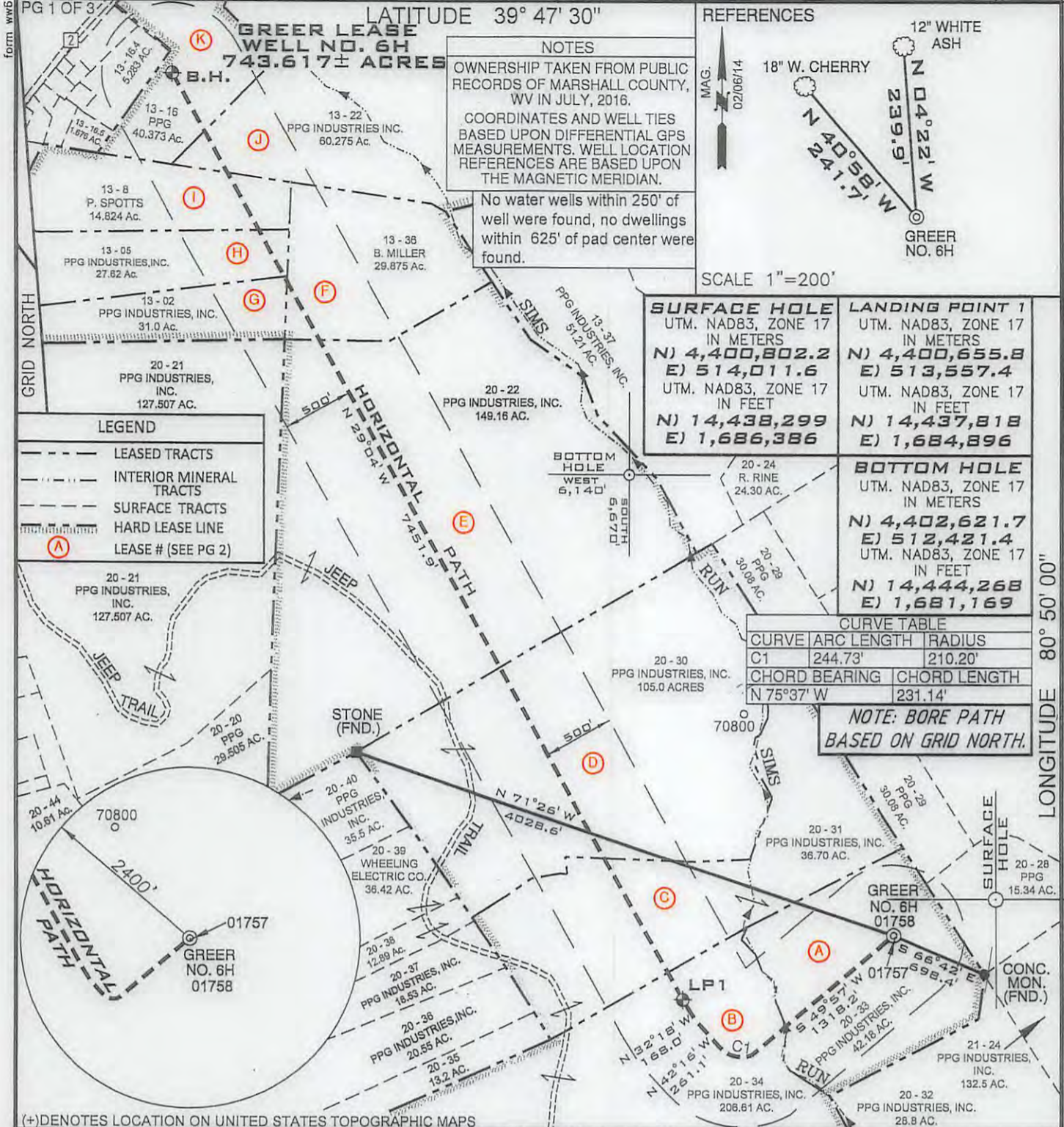
WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER  
 CT CORPORATION SYSTEM

ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD  
 FORT WORTH TX, 76107 CHARLESTON WV, 25313

12/09/2016

COUNTY NAME PERMIT

930'



LATITUDE 39° 47' 30"

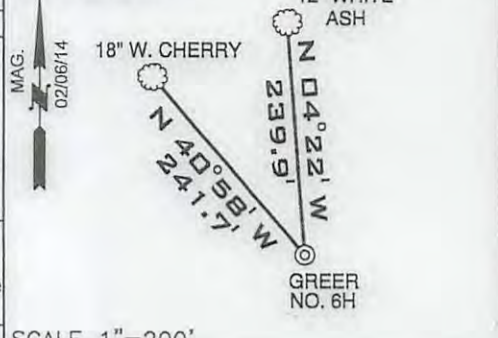
REFERENCES

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(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

FILE NUMBER W0120319 (WB1-76)

DRAWING NUMBER GREER\_WP\_6H\_REV1

SCALE 1" = 1000'

MINIMUM DEGREE OF ACCURACY 1/2500

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING  
GRADE GPS

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

P.S. 2122 *Jonathan N. White*



WVDEP  
OFFICE OF OIL & GAS  
601 57TH STREET, SE  
CHARLESTON, WV 25304

MARCH 14, 2014  
DATE: JULY 25, 2016 REV1

OPERATORS WELL NO. GREER NO. 6H

API WELL NO. 47-051-01758 MOD

STATE COUNTY PERMIT

LOCATION ELEVATION 1251' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER (UNDEFINDED)

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PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_\_\_

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 6,506' TMD:14,420'

PLUG & ABANDON  CLEAN OUT & REPLUG

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER

ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH TX, 76107 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON WV, 25313

LONGITUDE 120° 05' 08"

PERMIT

12/09/2016

form wwg

**GREER WELL NO. 6H  
WELL PLAT LEASE INFORMATION**

Lease_No	Tag	Parcel	Oil & Gas Royalty Owner	Deed Book/Pg	
WV16-0076-001	A	5-20-33	PPG INDUSTRIES, INC.	725	123
WV16-0076-001	B	5-20-34	PPG INDUSTRIES, INC.	725	123
WV16-0076-001	C	5-20-31	PPG INDUSTRIES, INC.	725	123
WV16-0076-001	D	5-20-30	PPG INDUSTRIES, INC.	725	123
WV16-0076-068	D	5-20-30	DAN J. SWOVELAND	827	523
WV16-0076-069	D	5-20-30	CARRIE E METZGER FKA CARRIE ELIZABETH CHAMBERS	833	527
WV16-0076-070	D	5-20-30	CHRISTINA CHAMBERS	836	123
WV16-0076-071	D	5-20-30	JOSEPH LONG	836	106
WV16-0076-117	D	5-20-30	DAVID C WHITE, ESQ., SPECIAL COMMISSIONER ON BEHALF OF D.W. CHESSE OR HIS HEIRS, SUCCESSORS, ASSIGNS, DEVISEES, OR DISTRIBUTEES	872	217
WV16-0076-063	D	5-20-30	ALLEN D. MASON	827	276
WV16-0076-064	D	5-20-30	RODNEY K. CHAMBERS	827	271
WV16-0076-065	D	5-20-30	CAROLYN STARKEY	827	226
WV16-0076-066	D	5-20-30	CHRISTINA I. CHILCOTE	827	525
WV16-0076-067	D	5-20-30	DAWN M. LAEMMIE	827	521
WV16-0076-058	D	5-20-30	GLENN L. MASON & SANDRA K. MASON	822	256
WV16-0076-059	D	5-20-30	FREDRIC RICHTER & BETTY RICHTER	822	270
WV16-0076-060	D	5-20-30	JORLENE POST	827	280
WV16-0076-061	D	5-20-30	CHRIS H. STEVENSON	827	282
WV16-0076-062	D	5-20-30	LUCYBELLE WELDON	827	278
WV16-0076-053	D	5-20-30	NORA WEBB	805	78
WV16-0076-054	D	5-20-30	BRIAN K. MARMIE & CAROL L. MARMIE	805	76
WV16-0076-055	D	5-20-30	KARI B. MARMIE	809	515
WV16-0076-056	D	5-20-30	TRAVIS D. MARMIE	808	491
WV16-0076-057	D	5-20-30	DEWAYNE STARKEY	815	228
WV16-0076-047	D	5-20-30	SHARON D. GREEN	799	463
WV16-0076-048	D	5-20-30	LAURA GLASSNER	800	406
WV16-0076-049	D	5-20-30	TERRY I. CHAMBERS	800	404
WV16-0076-050	D	5-20-30	GEORGEANN TIPPY	803	152
WV16-0076-051	D	5-20-30	HOWARD A. BROWN	805	98
WV16-0076-052	D	5-20-30	RAE JEAN NAMETH	805	80
WV16-0076-041	D	5-20-30	JOANN FRAZIER	799	59
WV16-0076-042	D	5-20-30	JOSEPH CHAMBERS	799	450
WV16-0076-043	D	5-20-30	ROBERT MARMIE	799	455
WV16-0076-044	D	5-20-30	FLORENCE L. MYERS	799	457
WV16-0076-045	D	5-20-30	BARBARA METZNER	799	459
WV16-0076-046	D	5-20-30	LYNNETTE L. KUGLER	799	461
WV16-0076-012	D	5-20-30	COLLIN A. WILLISON III	789	577
WV16-0076-032	D	5-20-30	LETTITIA TEMPLE	799	465
WV16-0076-037	D	5-20-30	MARY C. JOSEPH	797	196
WV16-0076-038	D	5-20-30	MARSHA L. SCHON	797	198
WV16-0076-039	D	5-20-30	WILLIAM M. DOYLE	797	187
WV16-0076-040	D	5-20-30	LOIS JEAN MYERS	797	189
WV16-0076-001	E	5-20-22	PPG INDUSTRIES, INC.	725	123
WV16-0185-001	E	5-20-22	ROGER R WEESE, SPECIAL COMMISSIONER ON BEHALF OF EMMA W STANDIFORD, MARY WILSON CRAMER, JANE TAYLOR, MAY BRIDENBECKER, ROSEBERRY L WILSON, ANNIE WILSON, BEATRICE WILSON KERLIN, COURTNEY T WILSON, GUY WILSON, CALLIE WILSON GATES, JAMES C WILSON, H L WILSO	836	488
WV16-0076-001	F	5-13-36	PPG INDUSTRIES, INC.	725	123
WV16-0076-002	F	5-13-36	JACK L. MASON	737	229
WV16-0076-003	F	5-13-36	MARILYN SUE BUMER	739	413
WV16-0076-004	F	5-13-36	VIRGINIA R BOHRER STEVEN A BOHRER, AGENT AND AIF	746	321
WV16-0076-072	F	5-13-36	TIMOTHY B MILLER	844	87
WV16-0076-073	F	5-13-36	JAMES SLAWINSKI	842	370
WV16-0076-001	F	5-13-36	PPG INDUSTRIES, INC.	725	123
WV16-0076-001	G	5-13-2	PPG INDUSTRIES, INC.	725	123
WV16-0076-001	H	5-13-5	PPG INDUSTRIES, INC.	725	123
WV16-0142-000	I	5-13-8	PAUL F. SPOTTS	779	482
WV16-0076-122	J	5-13-22	CROSSROAD CHILD AND FAMILY SERVICES, INC	881	12/09/2016

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

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

form. wv6

**GREER WELL NO. 6H  
WELL PLAT LEASE INFORMATION**

Lease_No	Tag	Parcel	Oil & Gas Royalty Owner	Deed Book/Pg	
WV16-0076-119	J	5-13-22	KATHERINE ANN WILLIAMS COTHRAN	879	1
WV16-0076-115	J	5-13-22	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO, AN OHIO CORPORATION	872	203
WV16-0076-116	J	5-13-22	JUANITA SANDIFER	872	206
WV16-0076-113	J	5-13-22	HENRY T LONG	867	385
WV16-0076-114	J	5-13-22	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER, ON BEHALF OF JOHN EDWARD HARRIS JR, ET AL: MARION LUCILLE ROBINSON, REVEREND FATHER J F BEAVER, ELOISE CARTER, EVALENA SCHAEFFER, ELEANOR SHUTT, HELEN MARTIN, MARGERY MOORE, CHARLES MOORE, TILLE ISCHY, LELIA TAYL	870	34
WV16-0076-111	J	5-13-22	LORNA M LONG MORGAN	864	323
WV16-0076-112	J	5-13-22	JAMES C LONG AND PATTI LONG	864	326
WV16-0076-108	J	5-13-22	JOHN WHITE	862	423
WV16-0076-109	J	5-13-22	WILLIAM V BUCKNOR	862	421
WV16-0076-110	J	5-13-22	LESLIE F BUCKNOR	862	419
WV16-0076-106	J	5-13-22	SUE WHITE	862	429
WV16-0076-107	J	5-13-22	DON FORGRAVES	862	426
WV16-0076-108	J	5-13-22	JOHN WHITE	862	423
WV16-0076-104	J	5-13-22	IMELDA J SCURLOCK	860	443
WV16-0076-105	J	5-13-22	CAROL F WILSON AND RICHARD WILSON	860	446
WV16-0076-106	J	5-13-22	SUE WHITE	862	429
WV16-0076-102	J	5-13-22	RITA ANN DOEBERT AND RONALD DOEBERT	860	437
WV16-0076-103	J	5-13-22	COLEEN SLAGLE AND FRANKLIN SLAGLE JR	860	440
WV16-0076-104	J	5-13-22	IMELDA J SCURLOCK	860	443
WV16-0076-091	J	5-13-22	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO	849	513
WV16-0076-101	J	5-13-22	JAN KAFFENBERGER	860	434
WV16-0076-102	J	5-13-22	RITA ANN DOEBERT AND RONALD DOEBERT	860	437
WV16-0076-080	J	5-13-22	JOSEPH A LONG	849	519
WV16-0076-090	J	5-13-22	JOHN F LONG AND PAM LONG	849	542
WV16-0076-091	J	5-13-22	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO	849	513
WV16-0076-074	J	5-13-22	THOMAS F LONG AND JENNIFER LONG	842	398
WV16-0076-075	J	5-13-22	UNITED CHURCH HOMES INC	846	408
WV16-0076-080	J	5-13-22	JOSEPH A LONG	849	519
WV16-0076-033	J	5-13-22	CHRISTINA JEAN RIOUX	796	70
WV16-0076-034	J	5-13-22	MICHAEL EDWARD BARTH	796	68
WV16-0076-035	J	5-13-22	DEAN ROTHENBUHLER	796	42
WV16-0076-036	J	5-13-22	STANLEY RICHMOND	796	62
WV16-0076-029	J	5-13-22	ROBERT D. OKEY	792	646
WV16-0076-030	J	5-13-22	RAE ELLEN STUART	796	38
WV16-0076-031	J	5-13-22	TONDA ROTHENBUHLER	796	40
WV16-0076-033	J	5-13-22	CHRISTINA JEAN RIOUX	796	70
WV16-0076-026	J	5-13-22	RUTH E. BASSETT MEADOWS	792	100
WV16-0076-027	J	5-13-22	ELIZABETH ANN STRAUSBAUGH	792	104
WV16-0076-028	J	5-13-22	JANET LEA BLANKENSHIP	792	580
WV16-0076-029	J	5-13-22	ROBERT D. OKEY	792	646
WV16-0076-023	J	5-13-22	LOIS KAY MORFORD	792	110
WV16-0076-024	J	5-13-22	JODY ELIZONDO	792	93
WV16-0076-025	J	5-13-22	WILLIAM LONG	792	95
WV16-0076-026	J	5-13-22	RUTH E. BASSETT MEADOWS	792	100
WV16-0076-020	J	5-13-22	JACK J. PFALZGRAF	792	118
WV16-0076-021	J	5-13-22	SANDRA CHEYNEY	792	91
WV16-0076-022	J	5-13-22	HERBERT BLACHLY	792	102
WV16-0076-017	J	5-13-22	ANDREW GERST	791	645
WV16-0076-018	J	5-13-22	HAROLD BLACHLY	791	643
WV16-0076-019	J	5-13-22	MARTHA BLACHLY-CROSS	792	112
WV16-0076-014	J	5-13-22	TERRI JEAN GODDARD	790	585
WV16-0076-015	J	5-13-22	RALPH BLACHLY	790	529
WV16-0076-016	J	5-13-22	MARGARET ROSS	790	527
WV16-0076-001	J	5-13-22	PPG INDUSTRIES, INC.	725	123
WV16-0076-013	J	5-13-22	JAMIE LU BENSON	790	531
WV16-0076-001	K	5-13-16	PPG INDUSTRIES, INC.	725	123

12/09/2016

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