

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

API 47-051-01954 County Marshall District Franklin  
Quad Powhatan Point 7.5' Pad Name Greer Field/Pool Name \_\_\_\_\_  
Farm name PPG Industries, Inc. Well Number 1W-14HM  
Operator (as registered with the OOG) Tug Hill Operating, LLC  
Address 1320 South University Drive, Suite 500 City Ft. Worth State TX Zip 76107

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,400,809.12 Easting 514,034.22  
Landing Point of Curve Northing 4,400,166.43 Easting 513,032.94  
Bottom Hole Northing 4,402,084.53 Easting 511,931.15

Elevation (ft) 1,254' GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine  
Mud Type(s) and Additive(s)  
SOBM; Base oil, osmotic inhibitor, weighting agent, viscosifier, emulsifier, hardness buffer, fluid loss additive, LCM, shale inhibitor, de-foamer, soaping agent, coagulant, flocculant; Specific additives per WSSP and Permit.

Date permit issued 1/23/2017 Date drilling commenced 10/7/2017 Date drilling ceased 10/25/2017  
Date completion activities began 12/12/2017 Date completion activities ceased 2/26/2018  
Verbal plugging (Y/N) n/a Date permission granted n/a Granted by n/a

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 70' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1600' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft Sewickley 785' TVD, Pittsburgh 879' TVD Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

**Reviewed**  
*Janie Underhill*  
10/23/18

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Reviewed by: \_\_\_\_\_

API 47-051 - 01954 Farm name PPG Industries, Inc. Well number 1W-14HM

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	36	30	120	NEW	94.5#	N/A	YES
Surface	17 1/2	13 3/8	1004	NEW	54.5#	N/A	YES
Coal	17 1/2	13 3/8	1004	NEW	54.5#	N/A	YES
Intermediate 1	12 1/4	9 5/8	2750	NEW	36#	N/A	YES
Intermediate 2							
Intermediate 3							
Production	8 3/4	5 1/2	15,260	NEW	20#	N/A	YES
Tubing		2 3/8	7706	NEW	4.7#	N/A	
Packer type and depth set							

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	A		15.6	1.19		0	8
Surface	A	1070	15.6	1.19	1273	0	8
Coal	A	1070	15.6	1.19	1273	0	8
Intermediate 1	A	965	15.6	1.19	1148	0	8
Intermediate 2							
Intermediate 3							
Production	A	3040	14.5	1.17	3556	0	8
Tubing							

Drillers TD (ft) 15,284 Loggers TD (ft) \_\_\_\_\_  
 Deepest formation penetrated Marcellus Plug back to (ft) n/a  
 Plug back procedure n/a

Kick off depth (ft) 7163

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

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING 3 centralizers on surface casing at equal distance  
Intermediate - 1 centralizer every other joint.  
 Production - one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_

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**Greer 1W-14HM  
Perforation Record**

Stage	Date Perforated	Bottom Perf (ft)	Top Perf (ft)	Number of Perfs	Formation
1	12/12/2017	15,162	15,113	2	Marcellus
2	12/12/2017	14,976	17,845	48	Marcellus
3	12/12/2017	14,801	14,670	48	Marcellus
4	12/12/2017	14,626	14,495	48	Marcellus
5	12/13/2017	14,451	14,320	48	Marcellus
6	12/15/2017	14,276	14,145	48	Marcellus
7	12/18/2017	14,101	13,970	48	Marcellus
8	12/20/2017	13,926	13,795	48	Marcellus
9	12/23/2017	13,751	13,620	48	Marcellus
10	12/24/2017	13,576	13,445	48	Marcellus
11	12/29/2017	13,401	13,270	48	Marcellus
12	1/1/2018	13,226	13,095	48	Marcellus
13	1/4/2018	13,051	12,920	48	Marcellus
14	1/5/2018	12,876	12,745	48	Marcellus
15	1/8/2018	12,701	12,570	48	Marcellus
16	1/10/2018	12,526	12,395	48	Marcellus
17	1/11/2018	12,351	12,220	48	Marcellus
18	1/12/2018	12,176	12,045	48	Marcellus
19	1/14/2018	12,001	11,870	48	Marcellus
20	1/18/2018	11,826	11,695	48	Marcellus
21	1/20/2018	11,651	11,520	48	Marcellus
22	1/25/2018	11,476	11,345	48	Marcellus
23	1/27/2018	11,301	11,170	48	Marcellus
24	1/27/2018	11,126	10,995	48	Marcellus
25	1/30/2018	10,951	10,820	48	Marcellus
26	2/1/2018	10,776	10,645	48	Marcellus
27	2/3/2018	10,601	10,470	48	Marcellus
28	2/5/2018	10,426	10,295	48	Marcellus
29	2/6/2018	10,251	10,120	48	Marcellus
30	2/9/2018	10,076	9,945	48	Marcellus
31	2/11/2018	9,901	9,770	48	Marcellus
32	2/12/2018	9,726	9,595	48	Marcellus
33	2/13/2018	9,551	9,420	48	Marcellus
34	2/14/2018	9,376	9,245	48	Marcellus
35	2/16/2018	9,201	9,070	48	Marcellus
36	2/17/2018	9,026	8,895	48	Marcellus
37	2/18/2018	8,851	8,720	48	Marcellus
38	2/20/2018	8,676	8,545	48	Marcellus
39	2/22/2018	8,501	8,370	48	Marcellus
40	2/23/2018	8,326	8,195	48	Marcellus
41	2/24/2018	8,151	8,020	48	Marcellus

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**Stimulation Summary  
Greer 1W-14HM**

Stage	Avg. Pump Rate (BPM)	Avg. Treating Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Proppant Total (lbs)	Water Total (bbls)	N2 Volume (scf)
1	87.2	8,014	4,803	2,726	345,852	7,797	0
2	88	8,219	4,741	3,317	349,987	7,771	0
3	88.2	8,290	5,606	3,028	349,166	7,820	0
4	89.9	8,162	5,951	3,270	451,499	8,621	0
5	89.3	8,324	6,158	2,611	451,023	8,597	0
6	89.5	8,036	7,499	4,130	451,504	8,707	0
7	88.6	8,141	5,319	3,859	452,762	8,608	0
8	89.4	8,058	5,494	3,748	451,206	8,668	0
9	89.1	8,096	5,028	3,654	449,136	8,691	0
10	87.7	8,191	5,113	3,690	450,272	8,564	0
11	86.5	7,927	4,845	4,353	451,891	8,784	0
12	88.3	8,300	7,612	3,470	450,277	9,489	0
13	81	7,547	4,644	3,773	448,900	8,567	0
14	87.7	7,989	5,194	3,859	451,090	8,649	0
15	83.3	8,237	6,177	3,701	452,262	8,542	0
16	82.9	8,051	5,836	3,653	448,400	8,572	0
17	77.7	8,083	6,206	4,194	347,814	8,223	0
18	83.2	8,389	5,645	4,318	283,519	8,683	0
19	87.2	7,839	5,935	3,282	364,135	8,546	0
20	84.4	7,785	5,589	3,642	450,930	9,533	0
21	83.8	7,695	5,212	8,996	450,600	8,207	0
22	84.4	7,610	5,869	4,472	450,321	8,497	0
23	83	7,677	5,790	3,345	450,970	8,611	0
24	85.5	7,513	5,683	3,253	450,407	8,453	0
25	85.8	7,551	6,083	3,649	449,774	8,177	0
26	85.1	7,751	5,513	4,063	260,959	8,120	0
27	88.4	7,419	5,067	3,456	453,140	10,302	0
28	88.4	7,414	5,419	3,204	450,217	9,454	0
29	88.3	7,263	5,575	3,614	411,273	8,780	0
30	87.2	7,172	5,188	3,530	449,989	8,804	0
31	87.4	7,026	4,679	4,005	435,663	8,539	0
32	89.3	6,960	4,927	3,771	449,315	8,511	0
33	88	6,901	4,885	3,828	449,827	8,566	0
34	89.5	6,989	4,741	4,067	449,782	8,565	0
35	89.7	6,676	4,294	3,391	449,908	8,353	0
36	88.7	6,406	4,336	3,260	450,017	8,579	0
37	89.5	6,026	4,067	3,365	450,771	8,396	0

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Stimulation Summary  
Greer 1W-14HM

38	87.8	5,884	4,139	3,277	452,705	8,468	0
39	89.3	5,633	3,650	2,856	450,533	8,290	0
40	88.8	5,142	3,383	2,413	448,494	8,545	0
41	89.1	4,687	2,959	2,171	449,870	8,104	0

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**Greer 1W-14HM  
Lithology/Formation Information**

<b>FORMATION</b>	<b>TOP TVD</b>	<b>BASE TVD</b>	<b>TOP MD</b>	<b>BASE MD</b>	<b>DESCRIBE ROCKY TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H2S ETC)</b>
Maxton	1857	1929	1872	1950	Sandstone
Big Lime	1929	2038	1950	2072	Limestone
Big Injun	2038	2346	2072	2436	Sandstone
Weir	2346	2536	2436	2665	Sandstone
Berea	2536	2854	2665	3081	Sandstone
Gordon	2854	2956	3081	3223	Sandstone
Fifty Foot	2956	3529	3223	3981	Sandstone
Speechley	3529	4865	3981	5771	Sandstone
Benson	4865	5234	5771	6257	Sandstone
Alexander	5234	5854	6257	7085	Siltstone
Rhinestreet	5854	6216	7085	7541	Black shale
Middlesex	6216	6302	7541	7698	Black shale
Geneseo/Burkett	6302	6326	7698	7754	Black shale
Tully	6326	6341	7754	7791	Limestone
Hamilton	6341	6347	7791	7807	Grey shale
Marcellus	6347	-	7807	-	Black shale

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

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Job Start Date:	12/11/2017
Job End Date:	3/6/2018
State:	West Virginia
County:	Marshall
API Number:	47-051-01954-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Greer 1W-14HM
Latitude:	39.75708218
Longitude:	-80.83616643
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,409
Total Base Water Volume (gal):	1,501,781
Total Base Non Water Volume:	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	40.90913	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	1.36435	

SAND-PREMIUM WHITE-30/50, BULK	Halliburton	Proppant					RECEIVED Office of Oil and Gas  SEP 10 2018
				Listed Below			WV Department of Environmental Protection
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
SAND-COMMON WHITE-100 MESH, BULK	Halliburton	Proppant					
				Listed Below			
SP BREAKER	Halliburton	Breaker					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
Scalechek LP-70	Halliburton	Scale Inhibitor					
				Listed Below			
OILPERM A	Halliburton	Non-ionic Surfactant					
				Listed Below			
FR-76	Halliburton	Friction Reducer					
				Listed Below			



HYDROCHLORIC ACID	Halliburton	Solvent					
				Listed Below			RECEIVED Office of Oil and Gas
MC B-8614	Halliburton	Biocide					SEP 10 2018
				Listed Below			WV Department of Environmental Protection
Scalechek LP-50	Halliburton	Scale Inhibitor					
				Listed Below			
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Crystalline silica, quartz	14808-60-7	100.00000	57.44443	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.16137	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.16137	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Inorganic salt	Proprietary	30.00000	0.16137	
			Hydrochloric acid	7647-01-0	15.00000	0.12903	
			Glutaraldehyde	111-30-8	30.00000	0.03712	
			Methanol	67-56-1	60.00000	0.02624	
			Phosphonate of a Diamine, Sodium Salt	Proprietary	30.00000	0.02424	
			Ethylene Glycol	107-21-1	60.00000	0.01543	
			Guar gum	9000-30-0	100.00000	0.01274	

			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00619	
			Sodium chloride	7647-14-5	5.00000	0.00404	
			Ethanol	64-17-5	60.00000	0.00310	
			Neutralized Polyacrylic Emulsion	Proprietary	10.00000	0.00257	
			Oxyalkylated phenolic resin	Proprietary	30.00000	0.00124	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00093	
			Fatty acids, tall oil	Proprietary	30.00000	0.00092	
			Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1	30.00000	0.00092	
			Ethoxylated alcohols	Proprietary	30.00000	0.00092	
			Sodium persulfate	7775-27-1	100.00000	0.00055	
			Olefins	Proprietary	5.00000	0.00037	
			Propargyl alcohol	107-19-7	10.00000	0.00031	
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00016	
			Naphthalene	91-20-3	5.00000	0.00016	
			Phosphoric acid	7664-38-2	0.10000	0.00012	
			Formaldehyde	50-00-0	0.09000	0.00007	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00003	
			Sodium sulfate	7757-82-6	0.10000	0.00000	

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

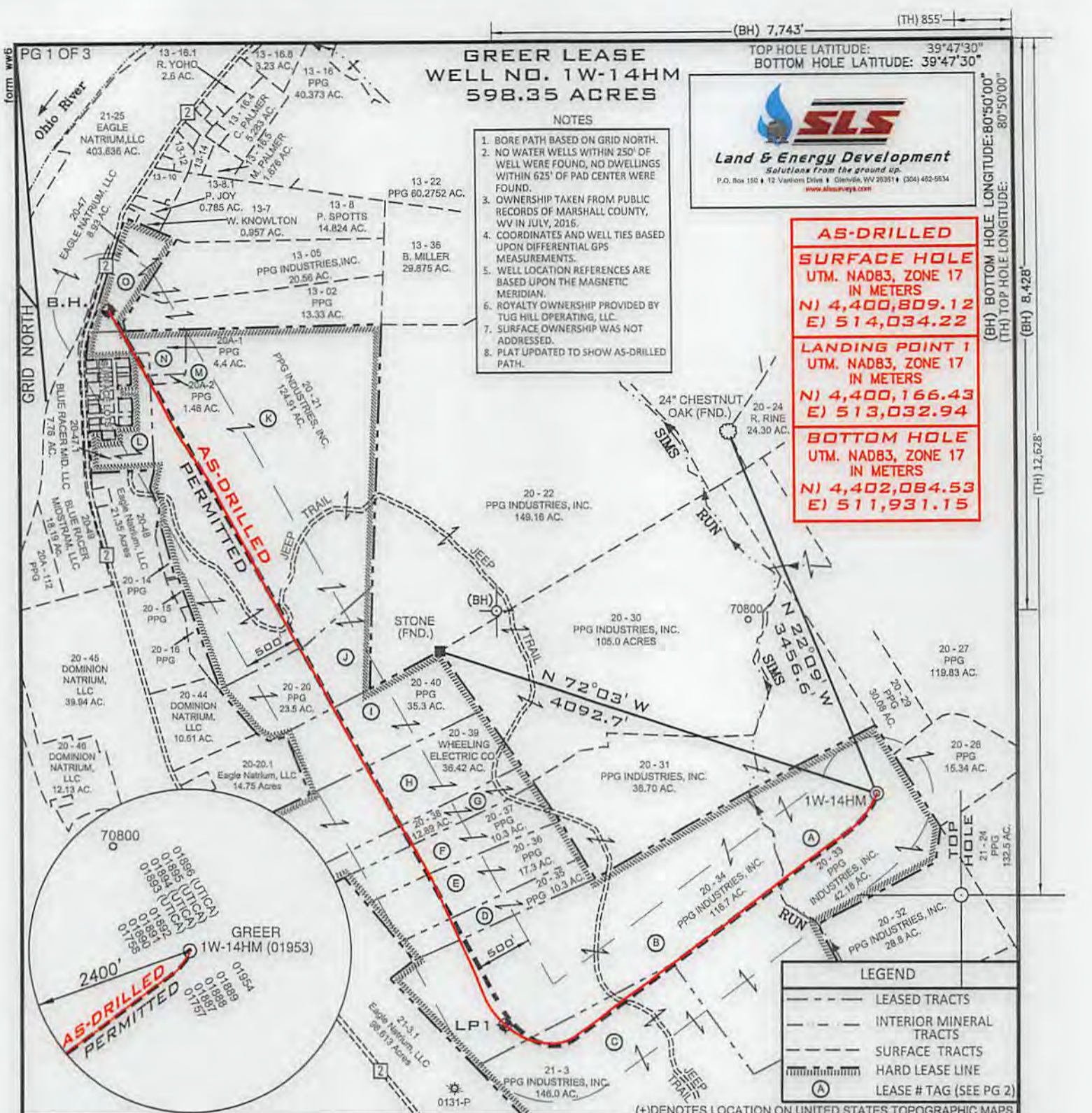
\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

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

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)





**GREER LEASE  
WELL NO. 1W-14HM  
598.35 ACRES**

TOP HOLE LATITUDE: 39°47'30"  
BOTTOM HOLE LATITUDE: 39°47'30"



- NOTES**
1. BORE PATH BASED ON GRID NORTH.
  2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
  3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN JULY, 2018.
  4. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
  5. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.
  6. ROYALTY OWNERSHIP PROVIDED BY TUG HILL OPERATING, LLC.
  7. SURFACE OWNERSHIP WAS NOT ADDRESSED.
  8. PLAT UPDATED TO SHOW AS-DRILLED PATH.

<b>AS-DRILLED</b>
<b>SURFACE HOLE</b> UTM. NAD83, ZONE 17 IN METERS N) 4,400,809.12 E) 514,034.22
<b>LANDING POINT 1</b> UTM. NAD83, ZONE 17 IN METERS N) 4,400,166.43 E) 513,032.94
<b>BOTTOM HOLE</b> UTM. NAD83, ZONE 17 IN METERS N) 4,402,084.53 E) 511,931.15

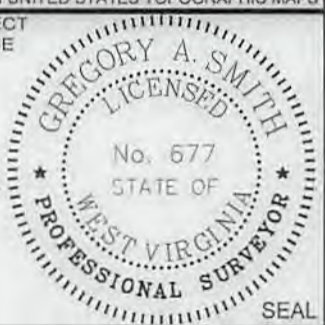
**LEGEND**

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

FILE NUMBER	8837
DRAWING NUMBER	8837ADG1W14HM.dwg
SCALE	1" = 1200'
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. 677 *Gregory A. Smith*



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



DATE: JULY 17, 2018  
OPERATORS WELL NO. GREER 1W-14HM (AS-DRILLED)  
API WELL NO. 47-051-01954  
STATE COUNTY PERMIT

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

LOCATION ELEVATION 1254' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER (UNDEFINDED)  
DISTRICT FRANKLIN COUNTY MARSHALL  
QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER SEE ATTACHED PG 2 THROUGH 3

SURFACE OWNER PPG INDUSTRIES, INC. ACREAGE 42.18  
OIL & GAS ROYALTY OWNER PPG INDUSTRIES, INC., ET AL LEASE ACREAGE 598.35  
PROPOSED WORK: DRILL  CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION \_\_\_  
PERFORATE NEW FORMATION \_\_\_ OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_  
PLUG & ABANDON \_\_\_ CLEAN OUT & REPLUG \_\_\_

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD: 6,290' TMD: 15,284'

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

COUNTY NAME  
PERMIT



WELL OPERATOR TUG HILL OPERATING, LLC  
 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 25312

TARGET FORMATION MARCELLUS  
 ESTIMATED DEPTH TVD: 6,290', TMD: 15,284'  
 PLUG & ABANDON \_\_\_\_\_ CLEAN OUT & REPLUG \_\_\_\_\_  
 PERMIT

PURPOSE NEW FORMATION \_\_\_\_\_  
 OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_\_\_  
 FRACURE OR STIMULATE  PLUG OFF OLD FORMATION \_\_\_\_\_  
 PROPOSED WORK: DRILL  CONVERT \_\_\_\_\_  
 DRILL DEEPER \_\_\_\_\_ REBILT \_\_\_\_\_  
 OIL & GAS ROYALTY OWNER PPG INDUSTRIES, INC. ET AL  
 LEASE ACREAGE 598.35  
 SURFACE OWNER PPG INDUSTRIES, INC.  
 ACREAGE 45.18  
 QUADRANGLE POWHATAN POINT 7.5', LEASE NUMBER SEE ATTACHED PG 2 THROUGH 3  
 DISTRICT FRANKLIN COUNTY MARSHALL  
 LOCATION ELEVATION 1254', WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER (UNDEFINED)  
 STATE COUNTY PERMIT 47-051-01954  
 API WELL NO. \_\_\_\_\_  
 OPERATORS WELL NO. GREER IW-14HM (AS-DRILLED)  
 DATE: JULY 17, 2018



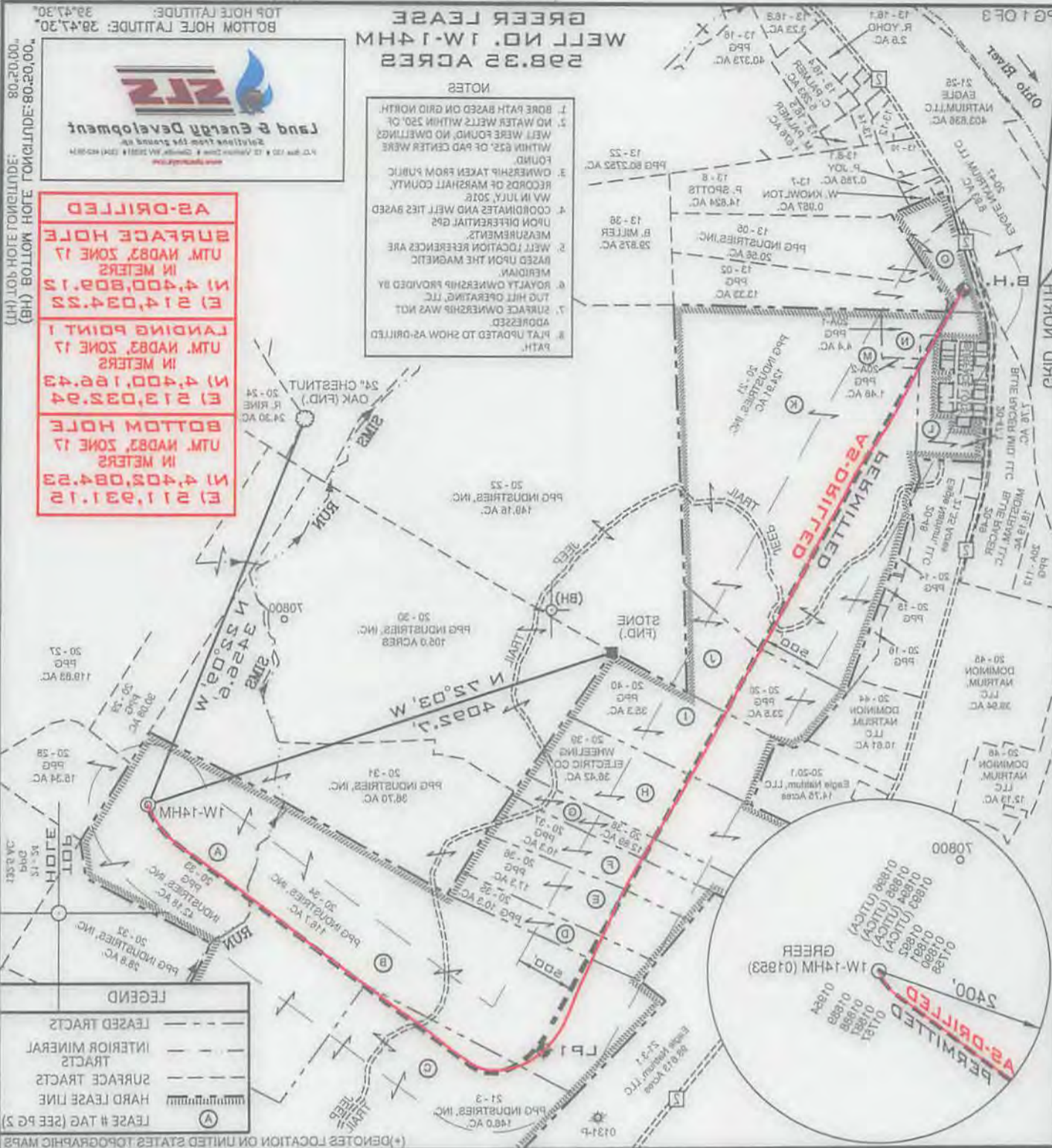
GRADE GPS
OF ELEVATION SUBMETER MAPPING
PROVEN SOURCE
OF ACCURACY 1/2500
MINIMUM DEGREE
SCALE 1" = 1200'
DRAWING NUMBER 8837ADG1W14HM.dwg
FILE NUMBER 8837

*Gregory A. Smith*  
 P. 2  
 677



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

LEASING # TAG (SEE PG 2)
HARD LEASE LINE
SURFACE TRACTS
INTERIOR MINERAL TRACTS
LEASING TRACTS



- NOTES
1. BORE PATH BASED ON GRID NORTH
  2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
  3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN JULY, 2018
  4. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
  5. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.
  6. ROYALTY OWNERSHIP PROVIDED BY TUG HILL OPERATING, LLC
  7. SURFACE OWNERSHIP WAS NOT ADDRESSED.
  8. PLAN UPDATED TO SHOW AS-DRILLED PATH.

**AS-DRILLED SURFACE HOLE**  
 UTM NAD83, ZONE 17  
 IN METERS  
 (E) 214,034.23  
 (N) 4,400,809.13

**BOTTOM HOLE**  
 UTM NAD83, ZONE 17  
 IN METERS  
 (E) 211,931.12  
 (N) 4,402,084.23

**LANDING POINT 1**  
 UTM NAD83, ZONE 17  
 IN METERS  
 (E) 213,032.94  
 (N) 4,400,166.43



TOP HOLE LATITUDE: 39.4730°  
 BOTTOM HOLE LATITUDE: 39.4730°  
 (BH) 7.743°  
 (LH) 822'

(BH) BOTTOM HOLE TOWNSHIP: 80-20-00,  
 80-20-00,  
 80-20-00

(LH) 175 058'

(BH) 824 B (BH)



GREER WELL NO. 1W-14HM  
WELL PLAT LEASE INFORMATION

LEASE NO.	TAG	PARCEL	OIL & GAS ROYALTY OWNER	BOOK	PAGE
10*14300	A	5-20-33	PPG INDUSTRIES, INC.	725	123
10*14312	A	5-20-33	JAMIE LU BENSON	790	531
10*14313	A	5-20-33	TERRI JEAN GODDARD	790	585
10*14314	A	5-20-33	RALPH BLACHLY	790	529
10*14315	A	5-20-33	MARGARET ROSS	790	527
10*14316	A	5-20-33	ANDREW GERST	791	645
10*14317	A	5-20-33	HAROLD BLACHLY	791	643
10*14318	A	5-20-33	MARTHA BLACHLY-CROSS	792	112
10*14319	A	5-20-33	JACK J. PFALZGRAF	792	118
10*14320	A	5-20-33	SANDRA CHEYNEY	792	91
10*14321	A	5-20-33	HERBERT BLACHLY	792	102
10*14322	A	5-20-33	LOIS KAY MORFORD	792	110
10*14327	A	5-20-33	ROBERT D. OKEY	792	646
10*14328	A	5-20-33	RAE ELLEN STUART	796	38
10*14329	A	5-20-33	TONDA ROTHENBUHLER	796	40
10*14331	A	5-20-33	CHRISTINA JEAN RIOUX	796	70
10*14332	A	5-20-33	MICHAEL EDWARD BARTH	796	68
10*14333	A	5-20-33	DEAN ROTHENBUHLER	796	42
10*14355	A	5-20-33	DEWAYNE STARKEY	815	228
10*14356	A	5-20-33	FREDRIC RICHTER & BETTY RICHTER	822	270
10*14362	A	5-20-33	CAROLYN STARKEY	827	226
10*14368	A	5-20-33	JOSEPH LONG	836	106
10*14371	A	5-20-33	THOMAS F LONG AND JENNIFER LONG	842	398
10*14372	A	5-20-33	UNITED CHURCH HOMES INC	846	408
10*14377	A	5-20-33	JOSEPH A LONG	849	519
10*14387	A	5-20-33	JOHN F LONG AND PAM LONG	849	542
10*14388	A	5-20-33	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO	849	513
10*14398	A	5-20-33	JAN KAFFENBERGER	860	434
10*14399	A	5-20-33	RITA ANN DOEBERT AND RONALD DOLBERT	860	437
10*14400	A	5-20-33	COLEEN SLAGLE AND FRANKLIN SLAGLE	860	440
10*14401	A	5-20-33	IMELDA J SCURLOCK	860	443
10*14402	A	5-20-33	CAROL F WILSON AND RICHARD WILSON	860	446
10*14403	A	5-20-33	SUE WHITE	862	429
10*14404	A	5-20-33	DON FORGRAVES	862	426
10*14405	A	5-20-33	JOHN WHITE	862	423
10*14406	A	5-20-33	WILLIAM V BUCKNOR	862	421
10*14407	A	5-20-33	LESLIE F BUCKNOR	862	419
10*14408	A	5-20-33	LORNA M LONG MORGAN	864	323
10*14409	A	5-20-33	JAMES C LONG AND PATTI LONG	864	326
10*14410	A	5-20-33	HENRY T LONG	867	385
10*14411	A	5-20-33	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER	870	34
10*14412	A	5-20-33	THE VILLAGE NETWORK, F/K/A BOYS VILLAGE OF SMITHVILLE, OHIO	872	203
10*14413	A	5-20-33	JUANITA SANDIFER	872	206
10*14416	A	5-20-33	KATHERINE ANN WILLIAMS COTHRAN	879	1
10*14419	A	5-20-33	CROSSROAD CHILD AND FAMILY SERVICES, INC	887	105
10*15734	A	5-20-33	GENEVIEVE L LONG	904	13
10*15760	A	5-20-33	DEIRDRE L WINGER AND DANIEL W WINGER	903	645

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

WELL PLAT LEASE INFORMATION  
GREER WELL NO. 1W-14HM

LEASE NO.	TAG	PARCEL	OIL & GAS ROYALTY OWNER	BOOK	PAGE
10*12760	A	2-20-33	DEIDRE L WINGER AND DANIEL W WINGER	903	642
10*12734	A	2-20-33	GENEVIEVE L LONG	904	13
10*14419	A	2-20-33	CROSSROAD CHILD AND FAMILY SERVICES, INC	887	102
10*14416	A	2-20-33	KATHERINE ANN WILLIAMS COTHMAN	879	1
10*14413	A	2-20-33	JUANITA SANDIFER	872	206
10*14412	A	2-20-33	THE VILLAGE NETWORK, FKA BOYS VILLAGE OF SMITHVILLE, OHIO	872	203
10*14411	A	2-20-33	THOMAS WHITE, ESQ., SPECIAL COMMISSIONER	870	34
10*14410	A	2-20-33	HENRY T LONG	867	382
10*14409	A	2-20-33	JAMES C LONG AND PATTI LONG	864	326
10*14408	A	2-20-33	LORNA M LONG MORGAN	864	323
10*14407	A	2-20-33	LESLIE F BUCKNOR	862	419
10*14406	A	2-20-33	WILLIAM V BUCKNOR	862	421
10*14405	A	2-20-33	JOHN WHITE	862	423
10*14404	A	2-20-33	DON FORGRAVES	862	426
10*14403	A	2-20-33	SUE WHITE	862	429
10*14402	A	2-20-33	CAROL F WILSON AND RICHARD WILSON	860	446
10*14401	A	2-20-33	IMELDA I SCURLOCK	860	443
10*14400	A	2-20-33	COLEEN SLAGLE AND FRANKLIN SLAGLE	860	440
10*14399	A	2-20-33	RITA ANN DOBERT AND RONALD DOBERT	860	437
10*14398	A	2-20-33	JAN KAFFENBERGER	860	434
10*14388	A	2-20-33	IMMANUEL CHURCH OF THE UNITED CHURCH OF CHRIST OF SALEM TOWNSHIP, MONROE COUNTY, OHIO	849	213
10*14387	A	2-20-33	JOHN F LONG AND PAM LONG	849	242
10*14377	A	2-20-33	JOSEPH A LONG	849	219
10*14372	A	2-20-33	UNITED CHURCH HOMES INC	846	408
10*14371	A	2-20-33	THOMAS F LONG AND JENNIFER LONG	842	398
10*14368	A	2-20-33	JOSEPH LONG	836	106
10*14362	A	2-20-33	CAROLYN STARKEY	827	226
10*14356	A	2-20-33	FREDRIC RICHTER & BETTY RICHTER	822	220
10*14352	A	2-20-33	DEWAYNE STARKEY	812	228
10*14333	A	2-20-33	DEAN ROTHENBUEHLER	796	42
10*14332	A	2-20-33	MICHAEL EDWARD BARTH	796	68
10*14331	A	2-20-33	CHRISTINA JEAN RIOUX	796	70
10*14329	A	2-20-33	TONDA ROTHENBUEHLER	796	40
10*14328	A	2-20-33	RAE ELLEN STUART	796	38
10*14327	A	2-20-33	ROBERT D OKY	792	646
10*14322	A	2-20-33	LOIS KAY MORFORD	792	110
10*14321	A	2-20-33	HERBERT BLACHLY	792	102
10*14320	A	2-20-33	SANDRA CHEYNEY	792	91
10*14319	A	2-20-33	JACK L PFALZGRAF	792	118
10*14318	A	2-20-33	MARTHA BLACHLY-CROSS	792	112
10*14317	A	2-20-33	HAROLD BLACHLY	791	643
10*14316	A	2-20-33	ANDREW GERST	791	642
10*14312	A	2-20-33	MARGARET ROSS	790	227
10*14314	A	2-20-33	RALPH BLACHLY	790	229
10*14313	A	2-20-33	TERRI JEAN GODDARD	790	282
10*14312	A	2-20-33	JAMIE LU BENSON	790	231
10*14300	A	2-20-33	PPG INDUSTRIES, INC.	722	123

WELL OPERATOR TUG HILL OPERATING, LLC  
 1320 SOUTH UNIVERSITY DRIVE, SUITE 500  
 FORT WORTH, TX 76102  
 ADDRESS  
 DESIGNATED AGENT DIANA STAMPER  
 CT CORPORATION SYSTEM  
 5400 D BIG TYLER ROAD  
 CHARLESTON, WV 25313  
 ADDRESS



**GREER WELL NO. 1W-14HM  
WELL PLAT LEASE INFORMATION**

LEASE NO.	TAG	PARCEL	OIL & GAS ROYALTY OWNER	BOOK	PAGE
10*15761	A	5-20-33	CAMERON CEMETARY ASSOCIATION INC	903	642
10*15762	A	5-20-33	DAWN PETROVICH	904	4
10*15763	A	5-20-33	BONNIE J SELDERS	904	34
10*15764	A	5-20-33	JAMES E BUCKNOR	904	28
10*15765	A	5-20-33	JOHN A BUCKNOR AND RHONDA BUCKNOR	904	16
10*15766	A	5-20-33	JOHN J POZENEL	904	7
10*16220	A	5-20-33	WILLIAM LONG	792	95
10*16230	A	5-20-33	JAMES BRIAN YOHO	900	134
10*16355	A	5-20-33	JAMES P LONG AND LINDA L LONG	904	10
10*16356	A	5-20-33	DARYL S BUCKNOR AND JOYCE T BUCKNOR	904	31
10*16357	A	5-20-33	DEANNA M CAMPBELL	904	1
10*16358	A	5-20-33	ANNE MARIE KRAMER AND CHRISTOPHER E CUEVAS	903	648
10*16454	A	5-20-33	CHURCH OF CHRIST OF CAMERON OHIO	900	128
10*14300	B	5-20-34	PPG INDUSTRIES, INC.	725	123
10*14300	B	5-20-34	PPG INDUSTRIES, INC.	725	123
10*14300	C	5-21-3	PPG INDUSTRIES, INC.	725	123
10*14300	C	5-21-3	PPG INDUSTRIES, INC.	725	123
10*14300	D	5-20-35	PPG INDUSTRIES, INC.	725	123
10*14300	E	5-20-36	PPG INDUSTRIES, INC.	725	123
10*14300	F	5-20-37	PPG INDUSTRIES, INC.	725	123
10*14703	G	5-20-38	WHEELING POWER COMPANY AKA WHEELING ELECTRIC COMPANY	786	383
10*14703	H	5-20-39	WHEELING POWER COMPANY AKA WHEELING ELECTRIC COMPANY	786	383
10*14300	I	5-20-40	PPG INDUSTRIES, INC.	725	123
10*14300	J	5-20-20	PPG INDUSTRIES, INC.	725	123
10*14300	K	5-20-21	PPG INDUSTRIES, INC.	725	123
10*14300	L	5-20-47.1	PPG INDUSTRIES, INC.	725	123
10*14300	M	5-20A-2	PPG INDUSTRIES, INC.	725	123
10*14300	N	5-20A-1	PPG INDUSTRIES, INC.	725	123
10*14300	O	5-20-47	PPG INDUSTRIES, INC.	725	123

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WELL PLAT LEASE INFORMATION  
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LEASE NO.	TAG	PARCEL	OIL & GAS ROYALTY OWNER	BOOK	PAGE
10*14300	O	2-50-47	PPG INDUSTRIES, INC.	752	153
10*14300	N	2-50A-1	PPG INDUSTRIES, INC.	752	153
10*14300	M	2-50A-2	PPG INDUSTRIES, INC.	752	153
10*14300	L	2-50-47.1	PPG INDUSTRIES, INC.	752	153
10*14300	K	2-50-21	PPG INDUSTRIES, INC.	752	153
10*14300	J	2-50-20	PPG INDUSTRIES, INC.	752	153
10*14300	I	2-50-40	PPG INDUSTRIES, INC.	752	153
10*14703	H	2-50-39	WHEELING POWER COMPANY AKA WHEELING ELECTRIC COMPANY	786	383
10*14703	G	2-50-38	WHEELING POWER COMPANY AKA WHEELING ELECTRIC COMPANY	786	383
10*14300	F	2-50-37	PPG INDUSTRIES, INC.	752	153
10*14300	E	2-50-36	PPG INDUSTRIES, INC.	752	153
10*14300	D	2-50-35	PPG INDUSTRIES, INC.	752	153
10*14300	C	2-21-3	PPG INDUSTRIES, INC.	752	153
10*14300	C	2-21-3	PPG INDUSTRIES, INC.	752	153
10*14300	B	2-50-34	PPG INDUSTRIES, INC.	752	153
10*14300	B	2-50-34	PPG INDUSTRIES, INC.	752	153
10*16424	A	2-50-33	CHURCH OF CHRIST OF CAMERON OHIO	900	158
10*16328	A	2-50-33	ANNE MARIE KRAMER AND CHRISTOPHER E CUEVAS	903	648
10*16327	A	2-50-33	DEANNA M CAMPBELL	904	1
10*16326	A	2-50-33	DARYL S BUCKNOR AND JOYCE T BUCKNOR	904	31
10*16325	A	2-50-33	JAMES P LONG AND LINDA L LONG	904	10
10*16230	A	2-50-33	JAMES BRIAN YOHO	900	134
10*16220	A	2-50-33	WILLIAM LONG	792	92
10*12766	A	2-50-33	JOHN J POZANEL	904	7
10*12765	A	2-50-33	JOHN A BUCKNOR AND RHONDA BUCKNOR	904	16
10*12764	A	2-50-33	JAMES E BUCKNOR	904	28
10*12763	A	2-50-33	BONNIE J SELDERS	904	34
10*12762	A	2-50-33	DAWN PETROVICH	904	4
10*12761	A	2-50-33	CAMERON CEMETARY ASSOCIATION INC	903	642
10*14300			OIL & GAS ROYALTY OWNER		

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