

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

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Office of Oil and Gas

JAN 26 2023

WV Department of  
Environmental Protection

API 47-051-02208 County Marshall District Franklin  
Quad Powhatan Point 7.5' Pad Name Old Crow Field/Pool Name \_\_\_\_\_  
Farm name Donna Yoho Well Number Old Crow N-5HM  
Operator (as registered with the OOG) Tug Hill Operating, LLC  
Address 380 Southpointe Boulevard, Plaza II, Suite 200 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,403,204.44 Easting 520,285.60  
Landing Point of Curve Northing 4,404,162.6 Easting 520,769.6  
Bottom Hole Northing 4,406,759.1 Easting 519,254.6

Elevation (ft) 1,264.99' 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 6/10/2019 Date drilling commenced spud: 1/24/21 big rig: 9/16/2021 Date drilling ceased 5/4/2022  
Date completion activities began 9/14/2022 Date completion activities ceased 9/30/2022  
Verbal plugging (Y/N) n Date permission granted n/a Granted by n/a

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

Freshwater depth(s) ft 919' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1,353' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 821-827', 913-919' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by:  
[Signature]  
**03/17/2023**  
2-1-23

API 47- 051 - 02208 Farm name Donna Yoho Well number Old Crow N-5HM

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	Y
Surface	17 1/2"	13 3/8"	1,014'	NEW	54.5#	N/A	Y
Coal	17 1/2"	13 3/8"	1,014'	NEW	54.5#	N/A	Y
Intermediate 1	12 1/4"	9 5/8"	2,952'	NEW	36#	N/A	Y
Intermediate 2							Y
Intermediate 3							
Production	8 1/2"	5 1/2"	17,822'	NEW	20#	N/A	Y
Tubing		2 7/8"	8,911'	NEW	4.7#	N/A	Y
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	65	15.6	1.21	78	0	8
Surface	A	1080	15.6	1.2	900	0	8
Coal	A	1080	15.6	1.2	900	0	8
Intermediate 1	A	860	15	1.4	614	0	8
Intermediate 2							
Intermediate 3							
Production	A	4235	14.5	1.16	3,651	0	8
Tubing							

Drillers TD (ft) 17,857' Loggers TD (ft) n/a  
 Deepest formation penetrated Marcellus Plug back to (ft) n/a  
 Plug back procedure n/a

Kick off depth (ft) 7,057'

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 \_\_\_\_\_





**OLD CROW N-5HM  
PERFORATION RECORD**

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Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
1	9/14/2022	17,637	17,685	16	Marcellus
2	9/14/2022	17,435	17,583	48	Marcellus
3	9/15/2022	17,259	17,407	48	Marcellus
4	9/15/2022	17,083	17,231	48	Marcellus
5	9/15/2022	16,906	17,054	48	Marcellus
6	9/15/2022	16,730	16,878	48	Marcellus
7	9/16/2022	16,553	16,701	48	Marcellus
8	9/16/2022	16,377	16,525	48	Marcellus
9	9/16/2022	16,200	16,348	48	Marcellus
10	9/17/2022	16,024	16,172	48	Marcellus
11	9/17/2022	15,848	15,996	48	Marcellus
12	9/17/2022	15,671	15,819	48	Marcellus
13	9/18/2022	15,495	15,643	48	Marcellus
14	9/18/2022	15,318	15,466	48	Marcellus
15	9/19/2022	15,142	15,290	48	Marcellus
16	9/19/2022	14,966	15,114	48	Marcellus
17	9/19/2022	14,789	14,937	48	Marcellus
18	9/19/2022	14,613	14,761	48	Marcellus
19	9/20/2022	14,436	14,584	48	Marcellus
20	9/20/2022	14,260	14,408	48	Marcellus
21	9/20/2022	14,084	14,232	48	Marcellus
22	9/20/2022	13,907	14,055	48	Marcellus
23	9/21/2022	13,731	13,879	48	Marcellus
24	9/21/2022	13,554	13,702	48	Marcellus
25	9/21/2022	13,378	13,526	48	Marcellus
26	9/22/2022	13,202	13,350	48	Marcellus
27	9/22/2022	13,025	13,173	48	Marcellus
28	9/22/2022	12,849	12,997	48	Marcellus
29	9/23/2022	12,672	12,820	48	Marcellus
30	9/23/2022	12,496	12,644	48	Marcellus
31	9/23/2022	12,320	12,468	48	Marcellus
32	9/23/2022	12,143	12,291	48	Marcellus
33	9/24/2022	11,967	12,115	48	Marcellus
34	9/24/2022	11,791	11,938	48	Marcellus
35	9/24/2022	11,614	11,762	48	Marcellus
36	9/25/2022	11,438	11,586	48	Marcellus
37	9/25/2022	11,261	11,409	48	Marcellus
38	9/25/2022	11,085	11,233	48	Marcellus
39	9/25/2022	10,909	11,057	48	Marcellus
40	9/26/2022	10,732	10,880	48	Marcellus
41	9/26/2022	10,556	10,704	48	Marcellus

03/17/2023

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
42	9/26/2022	10,379	10,527	48	Marcellus
43	9/27/2022	10,203	10,351	48	Marcellus
44	9/27/2022	10,027	10,175	48	Marcellus
45	9/27/2022	9,850	9,998	48	Marcellus
46	9/27/2022	9,674	9,822	48	Marcellus
47	9/28/2022	9,497	9,645	48	Marcellus
48	9/28/2022	9,321	9,469	48	Marcellus
49	9/28/2022	9,144	9,292	48	Marcellus
50	9/28/2022	8,968	9,116	48	Marcellus
51	9/29/2022	8,792	8,940	48	Marcellus
52	9/29/2022	8,615	8,763	48	Marcellus
53	9/29/2022	8,439	8,587	48	Marcellus
54	9/29/2022	8,262	8,410	48	Marcellus
55	9/30/2022	8,086	8,234	48	Marcellus

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Old Crow N-5HM  
 STIMULATION INFORMATION PER STAGE

Stage No.	Ave. Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
1	84.00	7333	7082	3679	253480	6,593	0
2	84.00	6998	4972	4567	445300	8,607	0
3	84.00	7101	5074	4803	446220	8,541	0
4	84.00	7121	5032	4885	445800	8,558	0
5	83.00	6979	5100	4420	439580	8,562	0
6	84.00	6814	4807	4679	447220	8,596	0
7	84.00	6771	4940	4664	446480	8,537	0
8	84.00	6759	4575	5070	446420	8,556	0
9	84.00	6936	4891	4289	451720	8,610	0
10	84.00	6807	5237	5026	437280	8,342	0
11	84.00	6978	4503	4851	445900	8,497	0
12	84.00	6842	4981	4553	439100	8,464	0
13	84.00	6949	4862	4742	440440	8,338	0
14	84.00	6714	5119	4628	442760	8,453	0
15	84.00	6636	4617	4842	447180	8,406	0
16	85.00	6562	4871	5254	443380	8,406	0
17	84.00	6614	4873	5376	445920	8,440	0
18	83.00	6626	4160	4683	431360	11,833	0
19	84.00	6625	4529	5523	446720	8,447	0
20	84.00	6551	4942	5075	448600	8,369	0
21	84.00	6493	4899	4780	436300	8,226	0
22	84.00	6503	4632	4781	443400	8,293	0
23	84.00	6458	4660	5003	443750	8,390	0
24	85.00	6579	4906	4854	444440	8,479	0
25	85.00	6487	5086	4799	447640	8,457	0
26	85.00	6397	4729	4819	443980	8,352	0
27	84.00	6479	4886	4609	445800	8,351	0
28	85.00	6492	4930	4854	448480	8,364	0
29	84.00	6434	4571	5465	438260	8,344	0
30	85.00	6524	5107	4850	446540	8,396	0
31	85.00	6406	4811	5006	443740	8,275	0
32	84.00	6288	4810	4988	447280	8,311	0



Stage No.	Ave. Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
33	84.00	6300	4658	5262	446660	8,374	0
34	84.00	6232	4881	4850	441300	8,363	0
35	85.00	6273	5108	5086	434760	8,094	0
36	83.00	6120	4900	4939	446700	8,213	0
37	85.00	6358	5075	5282	446510	8,303	0
38	82.00	6242	4804	4743	445460	8,271	0
39	82.00	6191	4838	5126	446980	8,200	0
40	83.00	6346	4709	5083	443640	8,179	0
41	83.00	6236	4569	5215	446200	8,159	0
42	83.00	6237	4689	4857	437420	8,060	0
43	83.00	6247	4837	4730	440840	8,054	0
44	84.00	6244	5081	5205	438940	8,131	0
45	84.00	6193	4913	4646	442600	8,147	0
46	83.00	6190	4885	5019	447300	8,275	0
47	84.00	6206	4792	5168	442940	8,255	0
48	85.00	6143	4832	5250	435380	8,089	0
49	84.00	6109	4982	5122	445260	8,166	0
50	84.00	6143	5096	4967	433960	8,076	0
51	84.00	6146	4696	4895	444880	8,284	0
52	83.00	6125	4767	5129	446290	8,457	0
53	84.00	6264	5048	5248	441800	8,075	0
54	84.00	6066	5009	4965	438920	8,094	0
55	83.00	5985	5005	5290	445240	8,600	0



Old Crow N-5HM

LITHOLOGY/FORMATION	TOP DEPTH IN FT/ Name TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID
Maxton	2015	2105	2037	2134	Sandstone
Big Lime	2105	2175	2134	2211	Limestone
Big Injun	2175	2459	2211	2537	Sandstone
Weir	2459	2654	2537	2757	Sandstone
Berea	2654	2999	2757	3158	Sandstone
Gordon	2999	3053	3158	3224	Sandstone
Fifty Foot	3053	3601	3224	3905	Sandstone
Speechley	3601	5023	3905	5659	Sandstone
Benson	5023	5378	5659	6099	Sandstone
Alexander	5378	5969	6099	6823	Siltstone
Rhinestreet	5969	6398	6823	7383	Black Shale
Middlesex	6398	6471	7383	7502	Black Shale
Geneseo/Burkett	6471	6498	7502	7552	Black Shale
Tully	6498	6538	7552	7640	Limestone
Hamilton	6538	6589	7640	7797	Gray Shale
Marcellus	6589	-	7797	-	Black Shale

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/14/2022
Job End Date:	9/30/2022
State:	West Virginia
County:	Marshall
API Number:	47-051-02208-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Old Crow N 5HM
Latitude:	39.77853828
Longitude:	-80.76311519
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,567
Total Base Water Volume (gal):	19,333,104
Total Base Non Water Volume:	0

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## 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
Water	Tug Hill Operating	Carrier/Base Fluid	Water	7732-18-5	100.00000	86.60940	None
Sand (40/70 White Proppant)	Tug Hill Operating	Proppant	Silica Substrate	14808-60-7	100.00000	8.73605	None
Sand (100 Mesh Proppant)	Tug Hill Operating	Proppant	Silica Substrate	14808-60-7	100.00000	3.08403	None
Sand (30/50 White Proppant)	Tug Hill Operating	Proppant	Silica Substrate	14808-60-7	100.00000	1.17147	None
Hydrochloric Acid (7.5%)	CNR	Acidizing	Water	7732-18-5	85.00000	0.23359	None
			Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	37.00000	0.10168	None
StimStream FR 9800	Chemstream	Friction Reducer	Alkanes, C16-20-iso-	90622-59-6	25.00000	0.01932	None
			Butene, homopolymer	9003-29-6	25.00000	0.01932	None
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00232	None



MC MX 9-4743	Multi-Chem	Biocide					
			Sodium Nitrate	7631-99-4	60.00000	0.02207	None
LD-7750W	Multi-Chem	Scale Inhibitor					
			Methanol	67-56-1	60.00000	0.00501	None
			Phosphonic Acid Salt	Proprietary	5.00000	0.00042	None
ProHib 100	CNR	Acid Inhibitor					
			2-Butoxyethanol	111-76-2	60.00000	0.00051	None
			Proprietary material	Proprietary	30.00000	0.00025	None
			Proprietary non-ionic surfactant	Proprietary	20.00000	0.00017	None
			Proprietary ethoxylated alcohol	Proprietary	10.00000	0.00008	None
			Proprietary corrosion inhibitor	Proprietary	10.00000	0.00008	None
ProFE 105	CNR	Iron Control					
			Citric Acid	77-92-9	20.00000	0.00020	None
			Acetic Acid	64-19-7	5.00000	0.00005	None

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Water	7732-18-5	85.00000	0.23359	
			Butene, homopolymer	9003-29-6	25.00000	0.01932	
			Ethoxylated alcohols (C12-18)	68213-23-0	3.00000	0.00232	
			Phosphonic Acid Salt	Proprietary	5.00000	0.00042	
			Proprietary material	Proprietary	30.00000	0.00025	
			Proprietary non-ionic surfactant	Proprietary	20.00000	0.00017	
			Proprietary corrosion inhibitor	Proprietary	10.00000	0.00008	
			Proprietary ethoxylated alcohol	Proprietary	10.00000	0.00008	
			Acetic Acid	64-19-7	5.00000	0.00005	

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

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

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)



7,037' B.H. A.D. 3,686' T.H. A.D.

**OLD CROW N LEASE  
WELL 5HM  
TUG HILL OPERATING**

T.H. LATITUDE 39°47'30"  
B.H. LATITUDE 39°50'00"

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17)

NAD'83 S.P.C.(FT)	N. 468,178.88	E. 1,613,512.76
NAD'83 GEO.	LAT-(N) 39.778538	LONG-(W) 80.763115
NAD'83 UTM (M)	N. 4,403,204.44	E. 520,285.60

**LANDING POINT**

NAD'83 S.P.C.(FT)	N. 471,239.3	E. 1,615,179.6
NAD'83 GEO.	LAT-(N) 39.787004	LONG-(W) 80.757337
NAD'83 UTM (M)	N. 4,404,145.3	E. 520,777.8

**BOTTOM HOLE**

NAD'83 S.P.C.(FT)	N. 479,899.6	E. 1,610,321.1
NAD'83 GEO.	LAT-(N) 39.810589	LONG-(W) 80.775062
NAD'83 UTM (M)	N. 4,406,759.0	E. 519,253.6

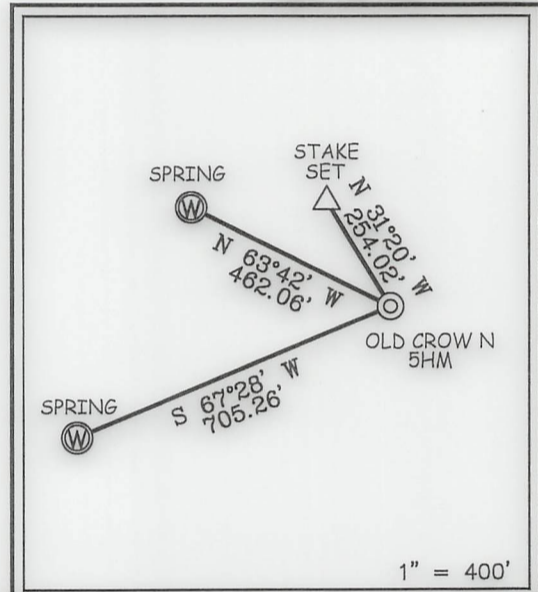
T.H. LONGITUDE 80°45'00"  
B.H. LONGITUDE 80°45'00"  
4,783' T.H. A.D.

MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
5-9-4.3	HARRY E. KARR, JR., ET UX	1.471
5-9-4.7	FRANCIS D. BARR, ET UX	0.481
5-9-4.8	THOMAS MIDCAP, ET UX	0.376
5-9-4.10	DEBORAH S. MIDCAP	0.819
5-9-4.11	GARY PORTER	1.00
5-9-4.14	PAUL G. BROWN	0.500
5-9-4.15	PAUL G. BROWN	0.500
5-9-4.18	PAUL G. BROWN	0.657
5-9-4.19	SAMUEL L. CANTERBURY, ET UX	2.078
5-9-13.1	DENNIS P. CADMUS	5.42
5-9-19	MARK STEPHEN STOCKLASK	2.38
5-9-21	ALBERT F. KAZEMKA	PARCEL 100'
5-9-25	DELBERT K. & LINDA K. MYERS	14.49
5-9-26	EDWIN C. MILLER	1.00
5-9-32	SANDRA J. BONNETTE	2.321
5-9-32.5	GARNET D. MIDCAP	PCL 270 x 390
5-9-32.8	TIMOTHY Q. HOYT, ET UX	0.711
5-9-32.9	LIONEL E. HENRY SR., ET AL	1.269
5-9-32.10	TIMOTHY Q. HOYT, ET UX	0.588
5-9-32.11	TIMOTHY Q. HOYT, ET UX	1.717
5-9-33.1	KEITH D. & BEVERLY A. DANIELS	1.00
5-9-33.2	KEITH D. DANIELS, ET UX	1.534
5-9-33.4	DAVID D. & CHRISTINE S. DANIELS	1.025
5-9-36	FRANK T. & ANNA M. WALKER	PARCEL
5-9-37	FRANK T. & ANNA M. WALKER	10.857
5-9-38	SHIRLEY A. HILL EST.	3.331

**NOTES ON SURVEY**

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS OR DWELLINGS > 2500 SQ. FT. WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'.
- PLAT UPDATED TO SHOW AS-DRILLED PATH.
- AS DRILLED DATA PROVIDED BY TUG HILL OPERATING.

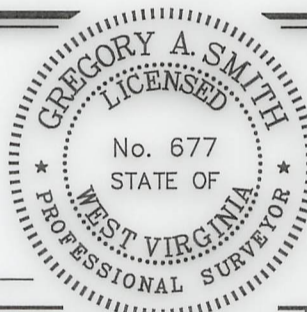
**REFERENCES**



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634  
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952  
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296  
slsvw.com

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 JANUARY 17, 20 23  
REVISED \_\_\_\_\_, 20 \_\_\_\_  
OPERATORS WELL NO. OLD CROW N-5HM  
API WELL NO. 47 - 051 - 02208  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8796P5HMAD.dwg  
SCALE 1" = 2000'  
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK)

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

WELL TYPE: OIL \_\_\_\_\_ GAS X LIQUID INJECTION \_\_\_\_\_ WASTE DISPOSAL \_\_\_\_\_ IF "GAS" PRODUCTION X STORAGE \_\_\_\_\_ DEEP \_\_\_\_\_ SHALLOW X  
LOCATION: GROUND = 1,286.20' ELEVATION PROPOSED = 1,264.99' WATERSHED TRIBUTARY OF FISH CREEK (HUC-10)  
DISTRICT FRANKLIN COUNTY MARSHALL QUADRANGLE POWHATAN POINT 7.5'  
SURFACE OWNER DONNA VIVIAN YOHO (TOD) GARY LANCE YOHO ACREAGE 71.205±  
ROYALTY OWNER DONNA VIVIAN YOHO, ET AL ACREAGE 71.205±  
PROPOSED WORK: LEASE NO. SEE WW-6A1  
DRILL X CONVERT \_\_\_\_\_ DRILL DEEPER \_\_\_\_\_ REDRILL \_\_\_\_\_ FRACTURE OR STIMULATE X 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: 6,701' / TMD: 17,796'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DARREN BROWN - CT CORPORATION  
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5098 WASHINGTON ST. W, STE 407  
FORT WORTH, TX 76107 CHARLESTON, WV 25313-1561

COUNTY NAME PERMIT

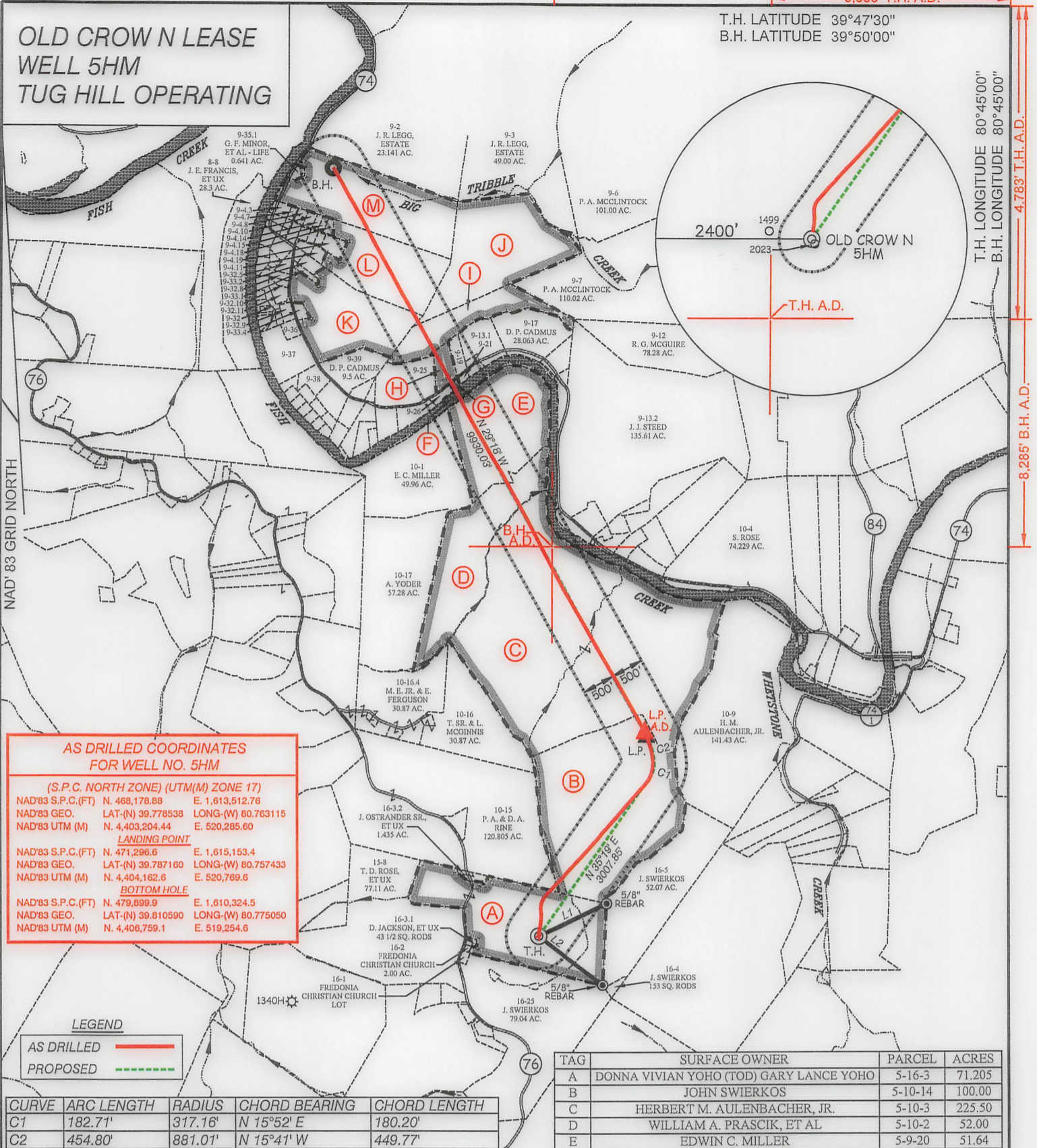
03/17/2023



**OLD CROW N LEASE  
WELL 5HM  
TUG HILL OPERATING**

T.H. LATITUDE 39°47'30"  
B.H. LATITUDE 39°50'00"

T.H. LONGITUDE 80°45'00"  
B.H. LONGITUDE 80°45'00"



**AS DRILLED COORDINATES FOR WELL NO. 5HM**

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17)

NAD'83 S.P.C.(FT)	N. 468,178.88	E. 1,613,512.76
NAD'83 GEO.	LAT-(N) 39.778538	LONG-(W) 80.763115
NAD'83 UTM (M)	N. 4,403,204.44	E. 520,285.60

**LANDING POINT**

NAD'83 S.P.C.(FT)	N. 471,296.6	E. 1,615,153.4
NAD'83 GEO.	LAT-(N) 39.787160	LONG-(W) 80.757433
NAD'83 UTM (M)	N. 4,404,162.6	E. 520,769.6

**BOTTOM HOLE**

NAD'83 S.P.C.(FT)	N. 479,899.9	E. 1,610,324.5
NAD'83 GEO.	LAT-(N) 39.810590	LONG-(W) 80.775050
NAD'83 UTM (M)	N. 4,406,759.1	E. 519,254.6

**LEGEND**

- AS DRILLED (Red solid line)
- PROPOSED (Green dashed line)

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	182.71'	317.16'	N 15°52' E	180.20'
C2	454.80'	881.01'	N 15°41' W	449.77'

TAG	SURFACE OWNER	PARCEL	ACRES
A	DONNA VIVIAN YOHO (TOD) GARY LANCE YOHO	5-16-3	71.205
B	JOHN SWIERKOS	5-10-14	100.00
C	HERBERT M. AULENBACHER, JR.	5-10-3	225.50
D	WILLIAM A. PRASCIK, ET AL	5-10-2	52.00
E	EDWIN C. MILLER	5-9-20	51.64
F	STATE OF WEST VIRGINIA (FISH CREEK)	N/A	N/A
G	ALBERT F. KAZEMKA	5-9-22	0.5
H	DELBERT K. & LINDA K. MYERS	5-9-23	7.00
I	DENNIS P. CADMUS	5-9-24	21 AC 49 P.
J	LLOYD C. & JUDITH C. ARNOLD	5-9-41	93.00
K	KEITH D. DANIELS, ET UX	5-9-33	40.331
L	LLOYD C. & JUDITH C. ARNOLD	5-9-4	18.854
M	LLOYD C. & JUDITH C. ARNOLD	5-9-35	47.00

LINE	BEARING	DISTANCE
L1	N 64°29' E	1164.44'
L2	S 52°46' E	1239.99'



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634  
 1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952  
 254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296  
 slswv.com



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

P.S. 677 *Gregory A. Smith*

**LEGEND**

- LEASE LINE (Dashed line)
- SURFACE LINE (Solid line)
- WELL LATERAL (Dotted line)
- OFFSET LINE (Long dashed line)
- TIE LINE (Short dashed line)
- CREEK (Wavy line)
- ROAD (Double line)
- COUNTY ROUTE (Line with 'R')
- PROPOSED WELL (Circle with 'P')
- EXISTING WELL (Circle with 'E')
- PERMITTED WELL (Circle with 'M')
- TAX MAP-PARCEL (Circle with '00-00')
- SURFACE OWNER (SEE TABLE) (Circle with 'A')
- LEASE # (SEE WW-6A1) (Circle with 'A')

SCALE 1" = 2000' FILE NO. 8796P5HMAD.dwg  
 OLD CROW NORTH 5HM REV1  
 DATE JANUARY 17, 20 23  
 REVISED \_\_\_\_\_, 20 \_\_\_\_\_  
 OPERATORS WELL NO. OLD CROW N-5HM  
 API WELL NO. 47 — 051 — 02208  
 NO. STATE COUNTY PERMIT

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

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