

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

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JUN 10 2020

WV Department of  
Environmental Protection

API 47 - 051 - 01955 County Marshall District Meade  
Quad Glen Easton 7.5' Pad Name Heaven Hill 2 Field/Pool Name \_\_\_\_\_  
Farm name Charles R. Hagedorn, Jr., Et Ux Well Number Heaven Hill 2W-10HM  
Operator (as registered with the OOG) Tug Hill Operating, LLC  
Address 1320 S. University Drive, Suite 215 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 4,406,723.2 Easting 524,572.1  
Landing Point of Curve Northing 4,406,125.6 Easting 523,824.2  
Bottom Hole Northing 4,403,996.7 Easting 525,084.3

Elevation (ft) 1331' 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 9/22/2017 Date drilling commenced 12/2/2017 Date drilling ceased 8/14/2018  
Date completion activities began 9/24/2018 Date completion activities ceased 2/9/2019  
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 70' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 2,167' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft Sewickley - 974', Pittsburgh - 1064' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by:  
*Jan Ushakov*  
6/22/2020

API 47-051 - 01955 Farm name Charles R. Hagedorn, Jr., Et Ux Well number Heaven Hill 2W-10HM

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"	1,098'	NEW	54.5#	N/A	YES
Coal	17 1/2"	13 3/8"	1,098'	NEW	54.5#	N/A	YES
Intermediate 1	12 1/4"	9 5/8"	2,798'	NEW	36#	N/A	YES
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5.5"	16,668'	NEW	20#	N/A	YES
Tubing		2 3/8"	8,334'	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	1054	15.6	1.19	1264	0	8
Coal	A	1054	15.6	1.19	1264	0	8
Intermediate 1	A	929	15.6	1.19	1161	0	8
Intermediate 2							
Intermediate 3							
Production	A	3949	14.5	1.17	4637	0	8
Tubing							

Drillers TD (ft) 16,687' Loggers TD (ft) \_\_\_\_\_ RECEIVED \_\_\_\_\_  
 Deepest formation penetrated Marcellus Plug back to (ft) n/a Office of Oil and Gas  
 Plug back procedure n/a JUN 10 2020

Kick off depth (ft) 6,877' WV Department of Environmental Protection

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 \_\_\_\_\_



API 47- 051 - 01955 Farm name Charles R. Hagedorn, Jr., Et Ux Well number Heaven Hill 2W-10HM

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6,791'-6,840'	TVD 8,140'-16,687' MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 1132 psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 0 mcfpd Oil 0 bpd NGL 0 bpd Water 600 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
*attached					

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Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA  
Address 505 West Greens Road, Suite 1000 City Houston State TX Zip 77067

Logging Company n/a  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Cementing Company C&J Well Services  
Address 380 Southpointe Boulevard, Suite 210 City Canonsburg State PA Zip 15317

Stimulating Company Haliburton Energy Services, Inc.  
Address 121 Champion Way, Suite 200 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Amy L. Miller Telephone 304-376-0111  
Signature  Title Permitting Specialist Date 3-23-2020

**Heaven Hill 2W-10HM  
PEFORATION RECORD**

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Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
1	11/1/2018	16350	16460	2	Marcellus
2	11/2/2018	16161	16307	48	Marcellus
3	11/2/2018	15986	16132	48	Marcellus
4	11/3/2018	15811	15957	48	Marcellus
5	11/3/2018	15636	15782	48	Marcellus
6	11/4/2018	15461	15607	48	Marcellus
7	11/5/2018	15286	15432	48	Marcellus
8	11/6/2018	15111	15257	48	Marcellus
9	11/6/2018	14936	15082	48	Marcellus
10	11/7/2018	14761	14907	48	Marcellus
11	11/8/2018	14586	14732	48	Marcellus
12	11/8/2018	14411	14557	48	Marcellus
13	11/9/2018	14236	14382	48	Marcellus
14	11/9/2018	14061	14207	48	Marcellus
15	11/11/2018	13886	14032	48	Marcellus
16	11/11/2018	13711	13857	48	Marcellus
17	11/12/2018	13536	13682	48	Marcellus
18	11/13/2018	13361	13507	48	Marcellus
19	11/13/2018	13186	13332	48	Marcellus
20	11/14/2018	13011	13157	48	Marcellus
21	11/15/2018	12836	12982	48	Marcellus
22	11/16/2018	12661	12807	48	Marcellus
23	11/16/2018	12486	12632	48	Marcellus
24	11/17/2018	12311	12457	48	Marcellus
25	11/18/2018	12136	12282	48	Marcellus
26	11/18/2018	11961	12107	48	Marcellus
27	11/19/2018	11786	11932	48	Marcellus
28	11/19/2018	11611	11757	48	Marcellus
29	11/20/2018	11436	11582	48	Marcellus
30	11/20/2018	11261	11407	48	Marcellus
31	11/21/2018	11086	11232	48	Marcellus
32	11/22/2018	10911	11057	48	Marcellus
33	11/22/2018	10736	10882	48	Marcellus
34	11/23/2018	10561	10707	48	Marcellus
35	11/24/2018	10386	10532	48	Marcellus
36	11/25/2018	10211	10357	48	Marcellus
37	11/25/2018	10036	10182	48	Marcellus
38	11/28/2018	9807	10007	48	Marcellus
39	11/29/2018	9686	9832	48	Marcellus
40	11/29/2018	9511	9657	48	Marcellus
41	11/29/2018	9336	9482	48	Marcellus

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Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
42	11/29/2018	9161	9307	48	Marcellus
43	11/30/2018	8991	9051	48	Marcellus
44	11/30/2018	8811	8957	48	Marcellus
45	12/1/2018	8636	8782	48	Marcellus
46	12/1/2018	8461	8607	48	Marcellus
47	12/1/2018	8286	8432	48	Marcellus



Heaven Hill 2W-10HM

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	81.9	7824	5861	4276	290640	7433	0
2	85	7866	5551	4376	436820	7441	0
3	83.6	7790	6946	4566	442440	7552	0
4	89.5	8124	5186	4645	448940	7459	0
5	88.9	8133	5342	4589	444320	7415	0
6	81.5	7573	5609	4674	438120	7353	0
7	89	7710	5580	4744	437060	7361	0
8	86.3	7526	5342	4409	432100	7320	0
9	89.4	7815	7475	4716	444740	7575	0
10	86.2	7633	5287	4332	441660	7466	0
11	85.1	7343	5429	4198	434780	7575	0
12	89.5	7808	5823	4589	443080	7854	0
13	86.8	7450	5478	4458	444940	7832	0
14	86.3	7213	6146	4490	439100	7474	0
15	89.3	7407	4787	4240	378840	7064	0
16	82.9	7184	6825	4450	442240	7690	0
17	88.9	7894	5622	4519	427320	7583	0
18	89.2	7355	5277	4395	441380	7765	0
19	87.2	7196	5114	4591	434780	7423	0
20	89.4	7349	5481	4686	441720	7881	0
21	89.5	7386	5588	4581	441745	7653	0
22	82.8	7446	5557	4815	443260	7512	0
23	84.8	7223	5527	4696	440180	7634	0
24	85.5	7398	5876	4898	440420	7488	0
25	86.3	7206	5379	4741	439460	8031	0
26	87.4	7450	5612	4784	443460	7690	0
27	86.8	7167	5744	4921	442540	7413	0
28	84.5	7115	5737	4876	439820	7295	0
29	89.1	7573	5675	4610	442040	7623	0

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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)
30	84.7	7240	5564	4757	439140	7493	0
31	89.7	7488	5620	4325	441320	7318	0
32	83.8	6823	6509	4602	441920	7236	0
33	89.2	7115	5104	4446	446820	7188	0
34	88.9	6788	5280	4411	441420	7240	0
35	85	6657	5455	4532	437920	7098	0
36	88.7	6830	5982	4859	446180	7088	0
37	88.8	6921	6020	4729	436380	7029	0
38	87.3	6550	5290	4371	629750	13374	0
39	86.8	6924	6933	4654	311100	6615	0
40	89.5	6802	5551	4652	440160	7263	0
41	89	6874	5461	4873	437880	7188	0
42	89.4	6770	5645	4707	436780	7299	0
43	88.9	6833	5778	4620	432080	8709	0
44	87.7	6717	5700	4784	436540	7604	0
45	86.6	6653	5433	4629	440980	7684	0
46	88.7	6850	5909	4626	440360	7273	0
47	88.2	6515	5702	4579	439100	7681	0



HEAVEN HILL 2W-10HM

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	1905	2077	1906	2079	Sandstone
Big Lime	2077	2209	2079	2212	Limestone
Big Injun	2209	2503	2212	2507	Sandstone
Weir	2503	2701	2507	2707	Sandstone
Berea	2701	2963	2707	2971	Sandstone
Gordon	2963	3043	2971	3054	Sandstone
Fifty Foot	3043	3625	3054	3748	Sandstone
Speechley	3625	5135	3748	5729	Sandstone
Benson	5135	5458	5729	6153	Sandstone
Alexander	5458	6079	6153	6966	Siltstone
Rhinestreet	6079	6581	6966	7672	Black shale
Middlesex	6581	6666	7672	7826	Black shale
Geneseo/Burkett	6666	6685	7826	7862	Black shale
Tully	6685	6722	7862	7938	Limestone
Hamilton	6722	6791	7938	8140	Grey shale
Marcellus	6791	-	8140	-	Black shale

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**Well:** Heaven Hill 2W-10 HM (slot K)  
**Site:** Heaven Hill 2  
**Project:** Marshall County, West Virginia  
**Design:** rev4  
**Rig:** Nabors X08

**SECTION DETAILS**

Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	V/Sect	Annotation
1	6758.00	39.20	254.21	5920.81	-676.82	2376.88	0.00	0.00	Survey @ 6758.00 MD 5920.81 TVD
2	6878.00	39.20	254.21	6013.80	-597.46	2451.86	0.00	0.00	Proj. Begin 5'100' buildturm
3	7078.00	40.26	238.62	6168.01	-748.43	2586.14	5.00	-9.00	Begin 40.26' tangent
4	7206.50	40.26	238.62	6266.07	-791.67	2659.03	0.00	0.00	Begin 8'100' buildturm
5	7842.74	55.00	170.00	6721.68	-1181.30	2778.58	8.00	-10.00	Begin 10'100' buildturm
6	8230.61	89.00	149.96	6840.01	-1518.99	2848.92	10.00	-33.16	Begin 89.00' lateral section
7	16819.61	89.00	149.96	6991.40	-8952.47	1650.56	0.00	0.00	PBHLTD 16819.61 MD 6991.40 TVD

**ANNOTATIONS**

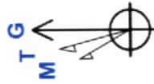
MD	Inc	Azi	+N/S	+E/W	V/Sect	Annotation
60.00	0.13	55.91	0.04	0.06	-0.03	Gyro
928.00	0.40	215.91	0.65	1.12	0.84	MWD surveys
16633.00	88.04	146.83	6638.16	-8899.98	1650.79	9051.78 Survey @ 16633.00 MD 6838.16 TVD
16687.00	88.04	146.83	6840.01	-8945.16	1680.31	9101.56 Survey Projected to 16687.00 MD 6840.01 TVD

Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: NAD83 West Virginia - HARN  
 Ellipsoid: GRS 1980  
 Zone: 17N (84 W to 78 W)

System Datum: Mean Sea Level  
 Depth Reference: RKB=1331+33 @ 1364.00usft (Nabors X08)

Northing 14457724.23  
 Easting 1721033.79  
 Latitude 39.81012904  
 Longitude -80.71292784

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.9°



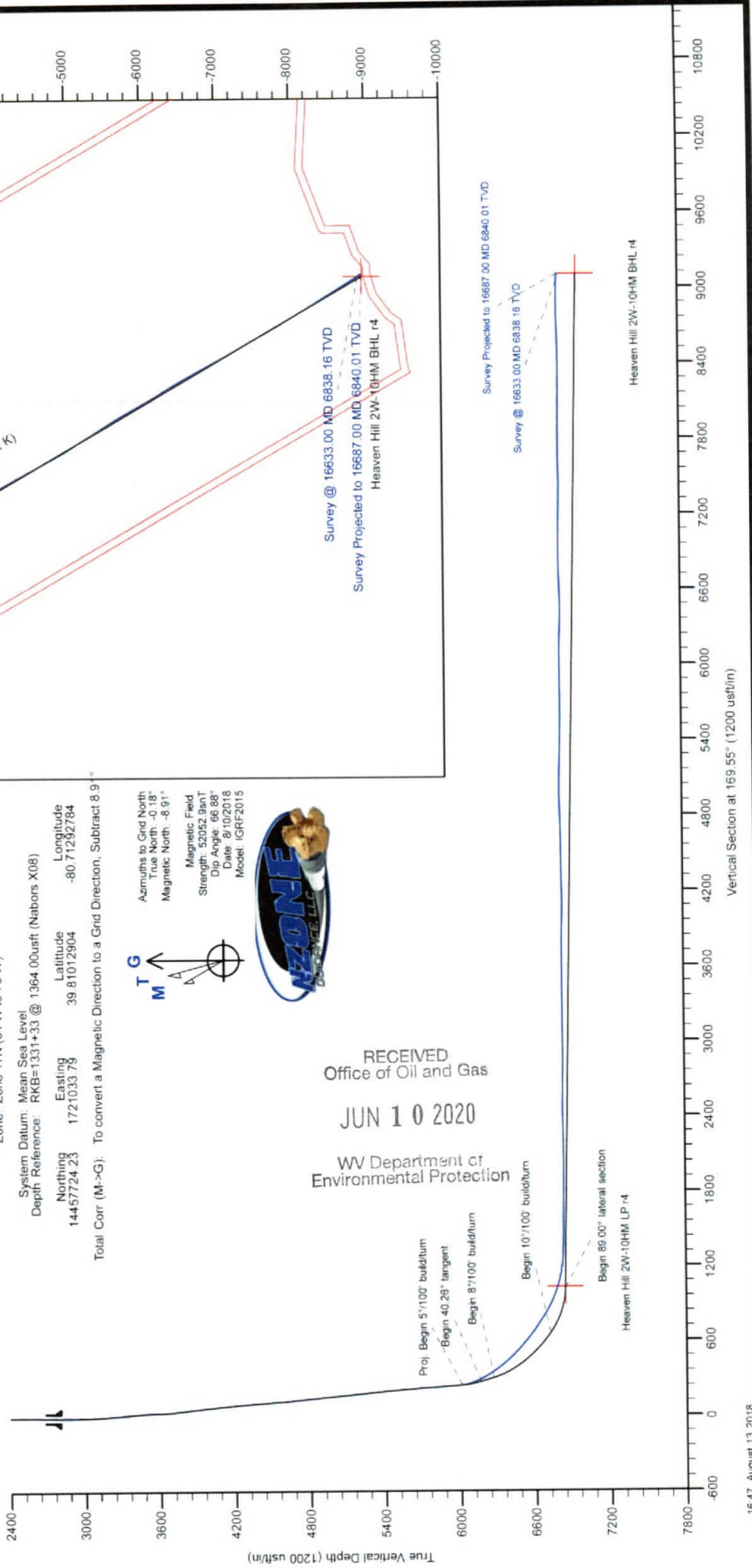
Azimuths to Grid North  
 True North: -0.18°  
 Magnetic North: -8.91°  
 Magnetic Field  
 Strength: 52052.9anT  
 Dip Angle: 66.88°  
 Date: 8/10/2018  
 Model: IGRF2015



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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/5/2018
Job End Date:	12/1/2018
State:	West Virginia
County:	Marshall
API Number:	47-051-01955-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Heaven Hill 2W-10HM
Latitude:	39.81010170
Longitude:	-80.71295473
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,843
Total Base Water Volume (gal):	15,366,646
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
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	76.15147	Density = 8.340
Produced Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	9.49299	Density = 9.000

Ingredients	Listed Above	Listed Above							
			Water		7732-18-5	100.00000	0.64285		
MX 8-4543	Halliburton	Biocide			Listed Below				
MC MX 2-2822	Halliburton	Scale Inhibitor							
LD-2850	Halliburton	Friction Reducer			Listed Below				
					Listed Below				
MX 5-2402	Halliburton	Biocide							
					Listed Below				
FDP-S1296-17	Halliburton	Surfactant							
					Listed Below				
SAND- PREMIUM WHITE-40/70, BULK	Halliburton	Proppant							
					Listed Below				
OILPERM A	Halliburton	Non-ionic Surfactant							
					Listed Below				
HYDROCHLORI C ACID	Halliburton	Solvent							

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					Listed Below			
SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant						
					Listed Below			
SAND- PREMIUM WHITE-30/50, BULK	Halliburton	Proppant						
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	13.61068	
				Hydrochloric acid	7647-01-0	7.50000	0.04689	
				Calcium nitrate	13477-34-4	100.00000	0.03500	
				Methanol	67-56-1	100.00000	0.00720	
				Amines, polyethylenepoly-, ethoxylated, phosphonomethylated, sodium salts	70900-16-2	30.00000	0.00674	
				Sodium chloride	7647-14-5	5.00000	0.00112	
				Ethanol	64-17-5	60.00000	0.00029	
				Oxyalkylated phenolic resin	Proprietary	30.00000	0.00019	
				Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00014	
				Modified thioures polymer	Proprietary	30.00000	0.00014	
				Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)- omega-hydroxy-, branched	127087-87-0	5.00000	0.00002	
				Naphthalene	91-20-3	5.00000	0.00002	
				Propargyl alcohol	107-19-7	5.00000	0.00002	

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			Ethoxylated alcohols	Proprietary	5.00000	0.00002	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Formaldehyde	50-00-0	0.09000	0.00002	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00000	
			Ethanaminum, N,N,N-trimethyl 1-2-[(1-oxo-2-propen-1-yl)oxy]-, chloride (1:1), polymer with 2-propenamide	69418-26-4			
			Contains no hazardous substances	CAS Not Assigned			
			9-Octadecenamide, n,n-bis-2(hydroxy-ethyl)-(Z)	93-83-4			
			Hydrotreated light petroleum distillate	64742-47-8			
			Amonium chloride	12125-02-9			

\* 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)

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HEAVEN HILL 2W LEASE  
WELL 10HM  
TUG HILL OPERATING

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

T.H. LONGITUDE 80°42'30"  
B.H. LONGITUDE 80°40'00"

AS-DRILLED

AS-DRILLED

AS-DRILLED

A.D. B.H.

A.D. T.H.

Table with columns: No., Lease Name or No., Trg, Parcel, Grantor, Lessee, etc., and Deed Book/Page. Lists various land parcels and their owners.

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
NAD'83 S.P.C.(FT) N. 479,490.49 E. 1,627,771.95  
NAD'83 GEO. LAT-(N) 39.810129 LONG-(W) 80.712928  
NAD'83 UTM (M) N. 4,406,723.16 E. 524,572.15  
LANDING POINT  
NAD'83 S.P.C.(FT) N. 478,091.3 E. 1,625,055.8  
NAD'83 GEO. LAT-(N) 39.806187 LONG-(W) 80.722528  
NAD'83 UTM (M) N. 4,406,283.1 E. 523,751.8  
BOTTOM HOLE  
NAD'83 S.P.C.(FT) N. 470,508.7 E. 1,629,273.2  
NAD'83 GEO. LAT-(N) 39.785529 LONG-(W) 80.707155  
NAD'83 UTM (M) N. 4,403,994.4 E. 525,075.2

NOTES ON SURVEY

- 1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.  
2. WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'  
3. ROYALTY OWNERSHIP PROVIDED BY TUG HILL OPERATING, LLC.  
4. SURFACE OWNERSHIP PROVIDED WAS NOT ADDRESSED  
5. AS-DRILLED DATA PROVIDED BY TUG HILL OPERATING, LLC.  
6. PLAT UPDATED TO SHOW AS-DRILLED PATH.



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. 849 *C. Victor Moyers*

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
DATE OCTOBER 17, 20 18  
REVISED OCTOBER 17, 20 19  
OPERATORS WELL NO. HEAVEN HILL 2W-10HM  
API WELL NO. 47 - 051 - 01955  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8703AD10HMR.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  LIQUID INJECTION  WASTE DISPOSAL  IF "GAS" PRODUCTION  STORAGE  DEEP  SHALLOW   
LOCATION: GROUND = 1,350.0' ELEVATION PROPOSED = 1,331.26' WATERSHED WEST FORK OF LOWER BOWMAN RUN OF FISH CREEK (HUC 10)  
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'  
SURFACE OWNER C.R. JR. & A.H. HAGEDORN ACREAGE 203.07±  
ROYALTY OWNER C.R. JR. & A.H. HAGEDORN ET AL (SEE ABOVE) ACREAGE 203.07±  
PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG AND ABANDON  CLEAN OUT AND REPLUG  OTHER   
PHYSICAL CHANGE IN WELL (SPECIFY) TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD: 6,879' / TMD: 16,799'

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

COUNTY NAME PERMIT

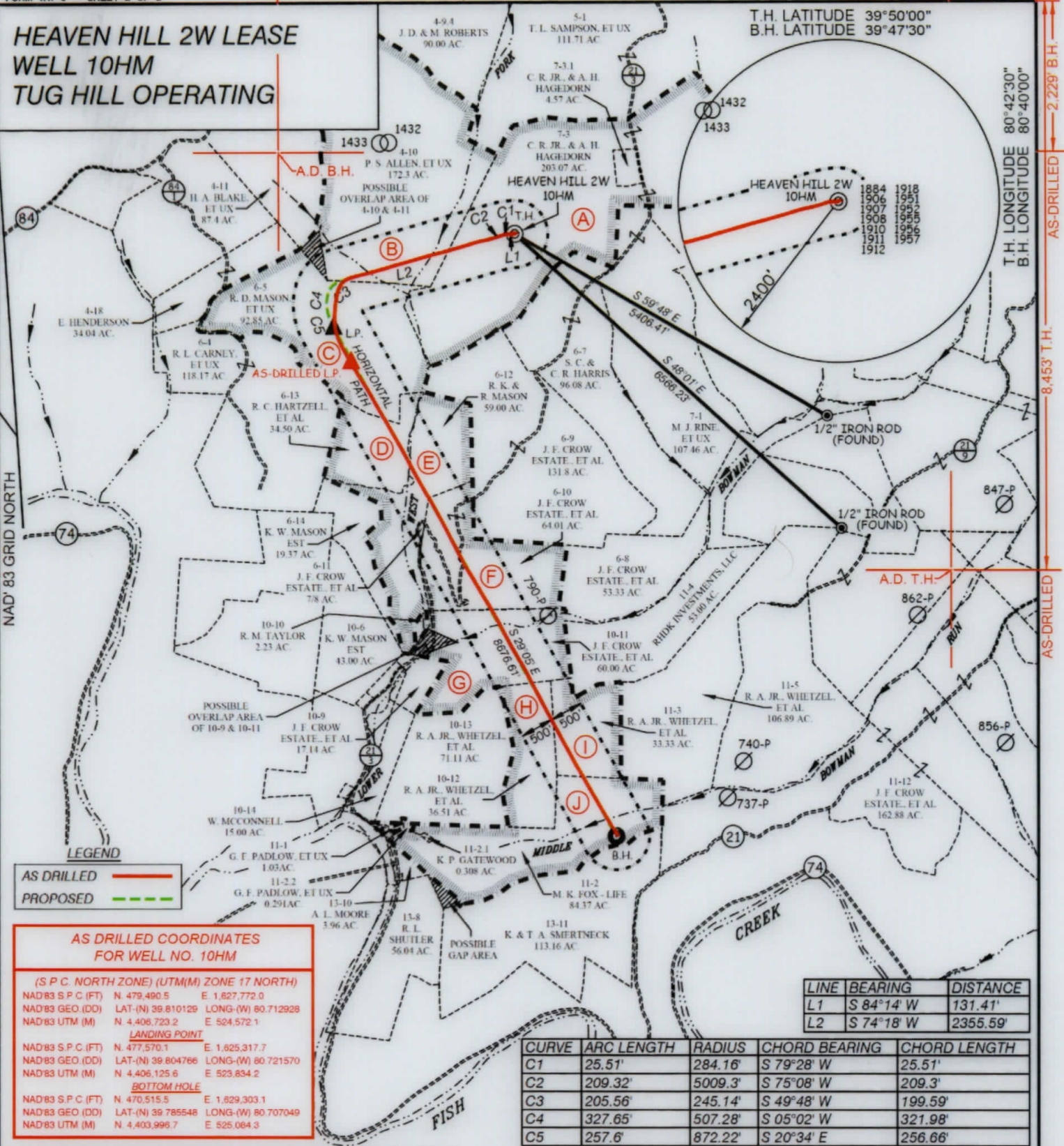






**HEAVEN HILL 2W LEASE  
WELL 10HM  
TUG HILL OPERATING**

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



**LEGEND**

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

**AS DRILLED COORDINATES FOR WELL NO. 10HM**

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

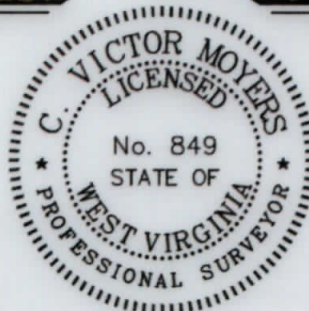
NAD83 S.P.C.(FT)	N. 479,490.5	E. 1,627,772.0
NAD83 GEO.(DD)	LAT.-(N) 39.810129	LONG.-(W) 80.712928
NAD83 UTM (M)	N. 4,406,723.2	E. 524,572.1

**LANDING POINT**

NAD83 S.P.C.(FT)	N. 477,570.1	E. 1,625,317.7
NAD83 GEO.(DD)	LAT.-(N) 39.804766	LONG.-(W) 80.721570
NAD83 UTM (M)	N. 4,406,125.6	E. 523,834.2

**BOTTOM HOLE**

NAD83 S.P.C.(FT)	N. 470,515.5	E. 1,629,303.1
NAD83 GEO.(DD)	LAT.-(N) 39.785548	LONG.-(W) 80.707049
NAD83 UTM (M)	N. 4,403,996.7	E. 525,064.3



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

FILE NO. 8703AD10HMR.dwg SCALE 1" = 2000'

DATE OCTOBER 17, 2018

REVISED OCTOBER 17, 2019

OPERATORS WELL NO. HEAVEN HILL 2W-10HM


API WELL NO. **47 - 051 - 01955**

STATE COUNTY PERMIT

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P.S. 849 *C. Victor Moyers*

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



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

NAD83 S.P.C.(FT)	N. 479,490.49	E. 1,627,771.95
NAD83 GEO.	LAT.-(N) 39.810129	LONG.-(W) 80.712928
NAD83 UTM (M)	N. 4,406,723.16	E. 524,572.15

**LANDING POINT**

NAD83 S.P.C.(FT)	N. 478,091.3	E. 1,625,055.8
NAD83 GEO.	LAT.-(N) 39.806187	LONG.-(W) 80.722528
NAD83 UTM (M)	N. 4,406,283.1	E. 523,751.8

**BOTTOM HOLE**

NAD83 S.P.C.(FT)	N. 470,508.7	E. 1,629,273.2
NAD83 GEO.	LAT.-(N) 39.785529	LONG.-(W) 80.707155
NAD83 UTM (M)	N. 4,403,994.4	E. 525,075.2

**LEGEND**

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

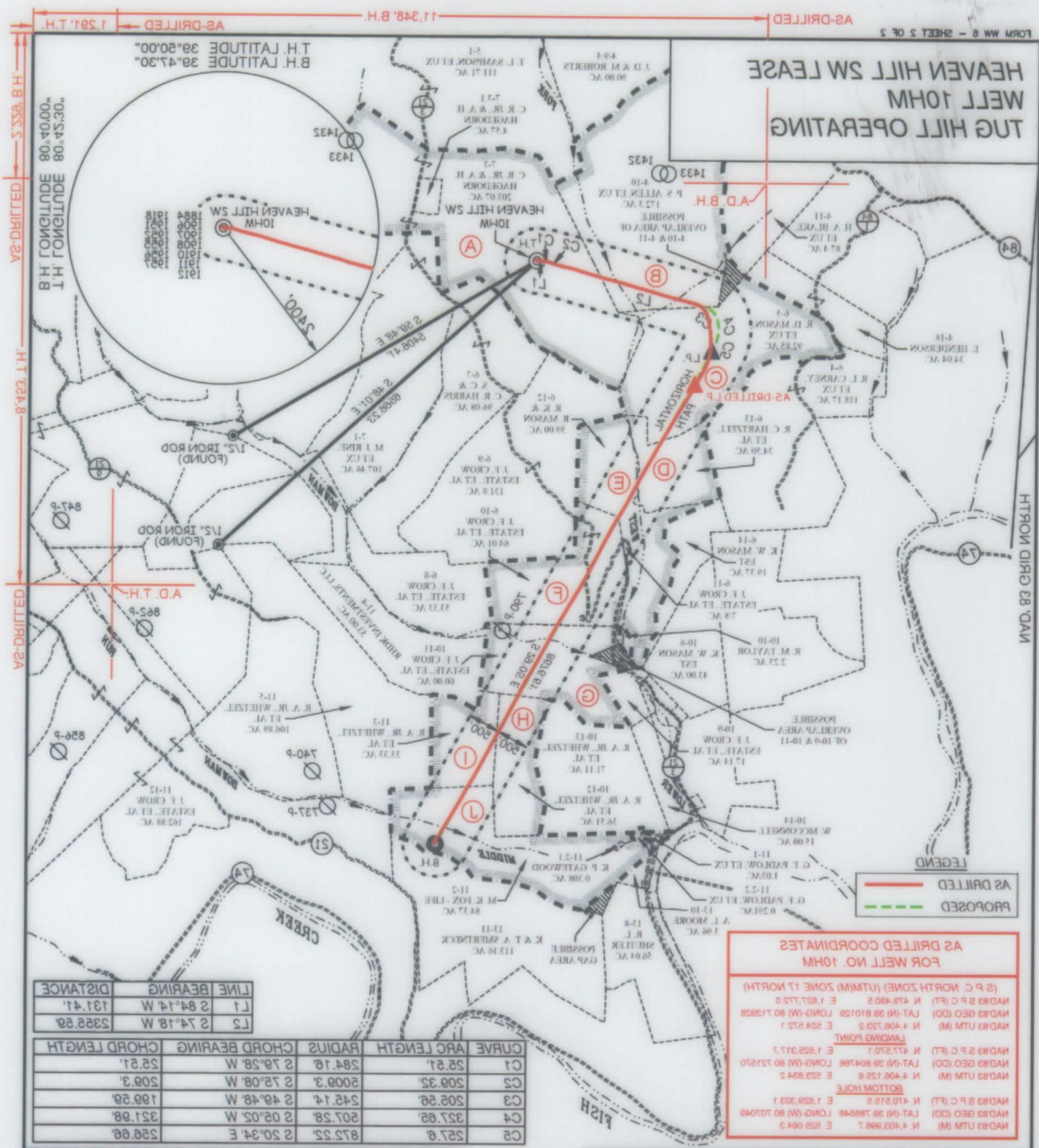
WELL OPERATOR TUG HILL OPERATING, LLC  
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107

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

COUNTY NAME PERMIT



**HEAVEN HILL SW LEASE  
WELL 10HM  
TUG HILL OPERATING**



**AS-DRIILLED**  
**PROPOSED**

**AS DRIILLED COORDINATES FOR WELL NO. 10HM**

<b>LANDING POINT</b>			
NAD83 UTM (M)	N 408°23.18	E 524°27.12	
NAD83 GEO. (DD)	LAT (N) 38.81028	LONG (W) 80.712828	
NAD83 S.P.C. (FT)	N 478.0913	E 1,652,082.8	
<b>BOTTOM HOLE</b>			
NAD83 UTM (M)	N 408°28.1	E 523°21.8	
NAD83 GEO. (DD)	LAT (N) 38.78828	LONG (W) 80.707125	
NAD83 S.P.C. (FT)	N 470.2125	E 1,629,212.5	

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	252.87	284.18	S 79°28' W	252.87
C2	208.35	208.3	S 75°08' W	208.3
C3	208.88	242.14	S 49°48' W	198.58
C4	327.88	207.28	S 05°02' W	327.98
C5	257.8	872.22	S 20°34' E	258.88

LINE BEARING	DISTANCE
L1 S 84°14' W	131.41
L2 S 74°18' W	2382.88

AS-DRIILLED 8'423' T.H.  
AS-DRIILLED 5'358.8'H  
AS-DRIILLED 1'581'T.H.

HTIRON DRIP (NO. 88) ROAD

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

NO. **47-051-01955** PERMIT  
WELL  
API

OPERATORS WELL NO. HEAVEN HILL SW-10HM  
REVISED OCTOBER 17, 2019  
DATE OCTOBER 17, 2018  
FILE NO. 8703AD10HMR.dwg SCALE 1" = 2000'

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



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*C. Victor Moyers*  
849 P.S.

<b>LANDING POINT</b>			
NAD83 UTM (M)	N 408°23.18	E 524°27.12	
NAD83 GEO. (DD)	LAT (N) 38.81028	LONG (W) 80.712828	
NAD83 S.P.C. (FT)	N 478.0913	E 1,652,082.8	
<b>BOTTOM HOLE</b>			
NAD83 UTM (M)	N 408°28.1	E 523°21.8	
NAD83 GEO. (DD)	LAT (N) 38.78828	LONG (W) 80.707125	
NAD83 S.P.C. (FT)	N 470.2125	E 1,629,212.5	

**LEGEND**

	COUNTY ROUTE
	PROPOSED WELL
	EXISTING WELL
	PERMITTED WELL
	TAX MAP-PARCEL
	LEASE # (SEE P.C. 1)
	SURFACE OWNER (SEE TABLE)
	ROAD
	CREEK
	LINE
	OFFSET LINE
	WELL LATERAL
	SURFACE LINE
	LEASE LINE

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

WELL OPERATOR TUG HILL OPERATING, LLC  
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500  
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COUNTY NAME  
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