

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 - 01956 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-11HM
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 4,406,720.12 Easting 524,569.86
Landing Point of Curve Northing 4,408,022.9 Easting 523,632.2
Bottom Hole Northing 4,403,861.9 Easting 524,876.6

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, viscosifer, 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 12/10/2017 Date drilling ceased 8/25/2018
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:
Juan Hernandez
6/22/2020

API 47-051 - 01956 Farm name Charles R. Hagedorn, Jr., Et Ux Well number Heaven Hill 2W-11HM

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"	1203'	NEW	54.5#	N/A	YES
Coal	17 1/2"	13 3/8"	1203'	NEW	54.5#	N/A	YES
Intermediate 1	12 1/4"	9 5/8"	2838'	NEW	36#	N/A	YES
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	17221'	NEW	20#	N/A	YES
Tubing		2 3/8"		NEW	4.7#	N/A	
Packer type and depth set							

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Comment Details _____

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CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	A		15.6	1.19		0	8
Surface	A	1342	15.6	1.19	1610	0	8
Coal	A	1342	15.6	1.19	1610	0	8
Intermediate 1	A	987	15.6	1.19	1174	0	8
Intermediate 2							
Intermediate 3							
Production	A	4327	14.5	1.17	5081	0	8
Tubing							

Drillers TD (ft) 17,241' Loggers TD (ft) _____
 Deepest formation penetrated Marcellus Plug back to (ft) n/a
 Plug back procedure n/a

Kick off depth (ft) 7,648'

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 _____

**Heaven Hill 2W-11HM
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	17076	17124	2	Marcellus
2	11/2/2018	16833	16979	48	Marcellus
3	11/2/2018	16658	16804	48	Marcellus
4	11/3/2018	16483	16629	48	Marcellus
5	11/3/2018	16308	16454	48	Marcellus
6	11/4/2018	16133	16279	48	Marcellus
7	11/4/2018	15958	16104	48	Marcellus
8	11/5/2018	15783	15929	48	Marcellus
9	11/6/2018	15608	15754	48	Marcellus
10	11/6/2018	15433	15579	48	Marcellus
11	11/7/2018	15258	15404	48	Marcellus
12	11/8/2018	15083	15229	48	Marcellus
13	11/8/2018	14908	15054	48	Marcellus
14	11/9/2018	14733	14879	48	Marcellus
15	11/10/2018	14558	14704	48	Marcellus
16	11/10/2018	14383	14529	48	Marcellus
17	11/12/2018	14208	14354	48	Marcellus
18	11/12/2018	14033	14179	48	Marcellus
19	11/13/2018	13858	14004	48	Marcellus
20	11/14/2018	13683	13829	48	Marcellus
21	11/14/2018	13508	13654	48	Marcellus
22	11/15/2018	13333	13479	48	Marcellus
23	11/16/2018	13158	13304	48	Marcellus
24	11/16/2018	12983	13129	48	Marcellus
25	11/17/2018	12808	12954	48	Marcellus
26	11/18/2018	12633	12779	48	Marcellus
27	11/18/2018	12458	12604	48	Marcellus
28	11/19/2018	12283	12429	48	Marcellus
29	11/19/2018	12108	12254	48	Marcellus
30	11/20/2018	11933	12079	48	Marcellus
31	11/21/2018	11758	11904	48	Marcellus
32	11/21/2018	11583	11729	48	Marcellus
33	11/22/2018	11408	11554	48	Marcellus
34	11/23/2018	11233	11379	48	Marcellus
35	11/23/2018	11058	11204	48	Marcellus
36	11/24/2018	10883	11029	48	Marcellus
37	11/25/2018	10708	10854	48	Marcellus
38	11/26/2018	10533	10679	48	Marcellus
39	11/26/2018	10358	10504	48	Marcellus
40	11/27/2018	10183	10329	48	Marcellus
41	11/27/2018	10008	10154	48	Marcellus

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
42	11/28/2018	9833	9979	48	Marcellus
43	11/29/2018	9658	9804	48	Marcellus
44	11/30/2018	9483	9629	48	Marcellus
45	11/30/2018	9308	9454	48	Marcellus
46	11/30/2018	9133	9279	48	Marcellus
47	12/1/2018	8958	9104	48	Marcellus
48	12/1/2018	8783	8929	48	Marcellus

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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 (bbbls)	Amount of Nitrogen/other (units)
1	81.2	8022	4347	3651	351485	9057	0
2	82.2	8167	5051	4581	436605	7440	0
3	81.1	7901	5089	4394	433260	7325	0
4	80.7	7701	5019	4536	437220	7464	0
5	81.7	7686	4980	4652	458520	7701	0
6	82.9	7947	5087	4273	434445	7426	0
7	80.6	7384	5052	4408	443790	7814	0
8	81.2	7628	5069	4774	439810	7435	0
9	80.6	7677	5012	4613	441720	7658	0
10	80.7	7569	4959	4234	441870	7322	0
11	83.6	7648	5330	4204	435230	7577	0
12	83.4	7143	4892	4482	442750	7587	0
13	85.5	7233	4917	4336	438690	7878	0
14	88.3	7584	5207	4030	443060	7694	0
15	89.3	7450	5060	4742	429800	7518	0
16	89.3	7775	5150	4181	436250	7764	0
17	84.5	7189	5178	4284	437720	7585	0
18	89.2	7367	5179	4242	430970	8017	0
19	88.8	7508	5340	4527	434970	7785	0
20	88	7220	5006	4546	437330	7722	0
21	89.3	7455	5225	4751	436620	7741	0
22	83.4	7461	5074	4729	439890	11993	0
23	89.3	7897	5175	4400	441160	7717	0
24	88.1	7337	4922	4705	430040	7628	0
25	88.3	7460	5138	4902	438300	7654	0
26	85.4	7078	4942	4487	440490	7490	0
27	85.7	7207	5100	4612	437470	8120	0
28	86.2	7278	5219	4547	439330	7492	0
29	86.1	7270	5272	4769	437330	7546	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 (bbbls)	Amount of Nitrogen/other (units)
30	89.2	7333	5491	4226	438270	7627	0
31	89.1	7389	5335	4442	439410	8278	0
32	85	7031	5285	4699	436260	7272	0
33	88.6	7445	5222	4219	439400	7294	0
34	85.8	7110	5322	4267	436610	7161	0
35	88.5	7248	5137	4317	442050	7317	0
36	85.7	7158	5320	3640	436740	7251	0
37	86	6993	5498	3690	397870	6570	0
38	80.3	6423	5266	4878	440740	7973	0
39	80.6	6450	5298	4262	438060	7338	0
40	85.5	6544	4915	4708	438860	7121	0
41	89.2	6913	5663	4446	439800	7731	0
42	86.9	7001	5539	4512	440500	7887	0
43	89.4	6797	5472	4295	437920	8130	0
44	88.8	6758	5872	4468	436780	8068	0
45	88.8	6904	5825	4511	428290	7922	0
46	87	6839	5727	4148	439460	7886	0
47	87.9	6865	5721	4269	440790	7993	0
48	88.9	6890	5674	4243	433950	7410	0

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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	2213	Limestone
Big Injun	2209	2503	2213	2509	Sandstone
Weir	2503	2701	2509	2708	Sandstone
Berea	2701	2963	2708	2973	Sandstone
Gordon	2963	3033	2973	3044	Sandstone
Fifty Foot	3033	3615	3044	3650	Sandstone
Speechley	3615	5125	3650	5703	Sandstone
Benson	5125	5448	5703	6243	Sandstone
Alexander	5448	6059	6243	7299	Siltstone
Rhinestreet	6059	6560	7299	8145	Black shale
Middlesex	6560	6646	8145	8320	Black shale
Geneseo/Burkett	6646	6664	8320	8359	Black shale
Tully	6664	6701	8359	8441	Limestone
Hamilton	6701	6770	8441	8632	Grey shale
Marcellus	6770	-	8632	-	Black shale

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W.D. Sp...
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Well: Heaven Hill 2W-11 HM (slot L)
Site: Heaven Hill 2
Project: Marshall County, West Virginia
Design: rev6



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VFace	Annotation
1	7574.00	53.78	248.63	6224.25	-1177.50	-2958.15	0.00	0.00	Survey @ 7574.00 MD 6224.25 TVD
2	7674.00	53.78	248.63	6263.33	-1206.90	-3033.28	0.00	0.00	KOP Begin 8'100' build/turn
3	8571.41	70.00	167.00	6766.93	-1833.91	-3313.15	8.00	-101.85	Begin 10'100' build/turn
4	8818.91	86.00	147.82	6818.69	-2054.92	-3219.42	10.00	-52.25	Begin 10'100' build
5	8848.91	89.00	147.82	6820.00	-2080.23	-3203.37	10.00	0.00	Begin 89.00° lateral section
6	9223.91	89.00	147.82	6826.55	-2396.87	-3002.58	0.00	0.00	Begin 2'100' turn
7	9342.69	89.00	150.00	6828.62	-2498.46	-2941.08	2.00	89.99	Begin 89.00° lateral section
8	17280.89	89.00	150.00	6967.00	-9371.82	1027.91	0.00	0.00	PBHL/TD 17280.89 MD 6967.00 TVD

ANNOTATIONS

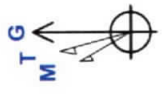
MD	Inc	Azi	TVD	+N/-S	+E/-W	VFace	Annotation
60.00	0.11	47.19	60.00	0.04	0.04	-0.03	Gyro
899.00	0.31	120.68	899.00	1.52	-0.94	-1.61	EM surveys
17189.00	91.52	151.49	6824.32	-9330.63	980.94	9382.05	Survey @ 17189.00 MD 6823.68 TVD
17242.00	91.52	151.49	6822.91	-9377.18	1006.23	9431.00	Survey projected to 17242.00 MD 6822.28 TVD

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

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

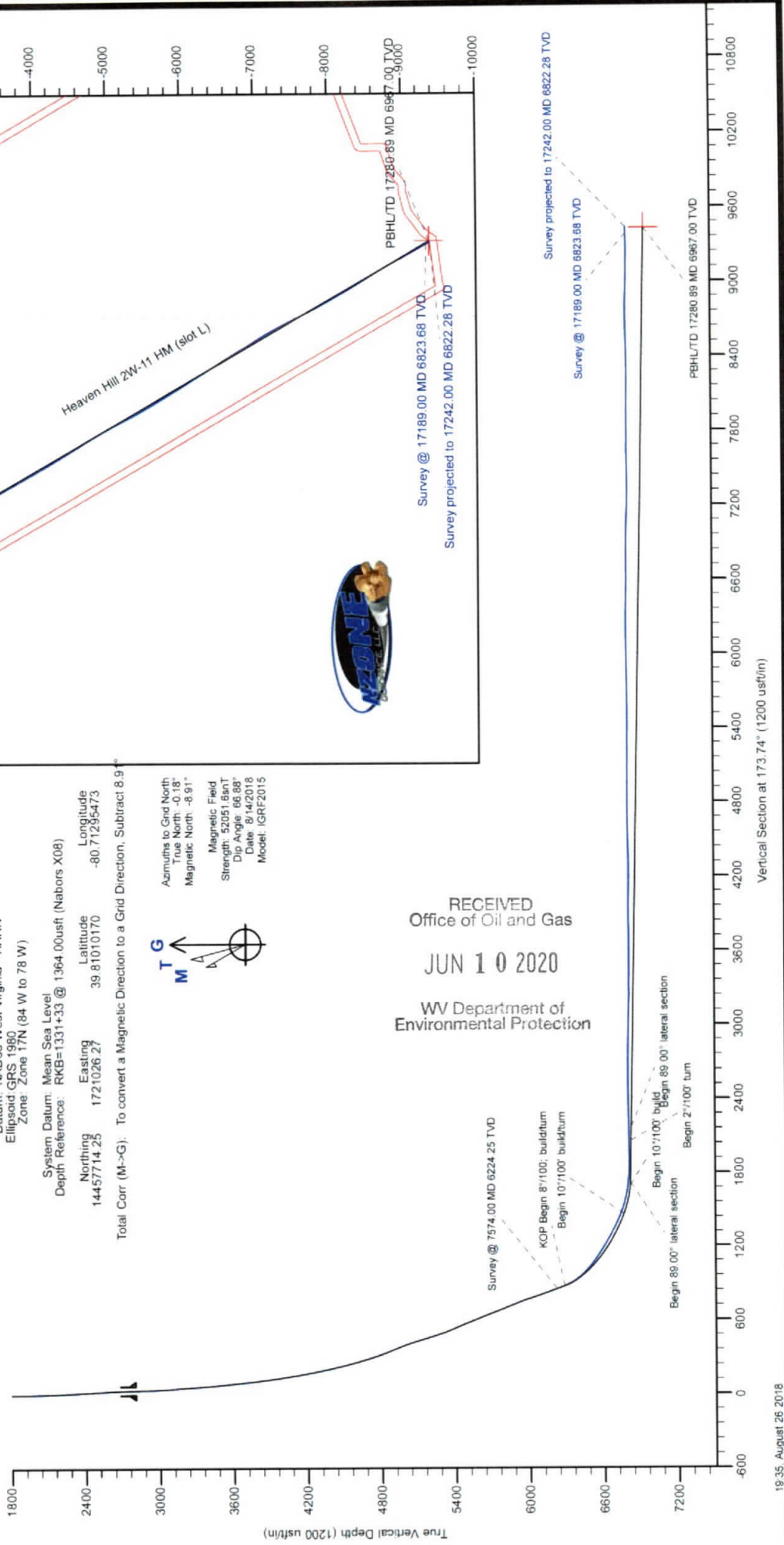
Northing: 14457714.25
 Easting: 1721026.27
 Latitude: 39.81010170
 Longitude: -80.71295473

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



Azimuths to Grid North
 True North: -0.08°
 Magnetic North: -8.91°
 Magnetic Field
 Strength: 52051.65nT
 Declination: 66.88°
 Date: 8/14/2018
 Model: IGRF2015

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/1/2018
Job End Date:	12/1/2018
State:	West Virginia
County:	Marshall
API Number:	47-051-01956-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Heaven Hill 2W-11HM
Latitude:	39.81012904
Longitude:	-80.71292784
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,826
Total Base Water Volume (gal):	15,974,986
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	76.06454	Density = 8.330
Produced Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	9.83367	Density = 9.000

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Ingredients	Listed Above	Listed Above	Water	7732-18-5	100.00000	0.60337
HYDROCHLORIC ACID	Halliburton	Solvent		Listed Below		
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant		Listed Below		
SAND-PREMIUM WHITE-30/50, BULK	Halliburton	Proppant		Listed Below		
FDP-S1296-17	Halliburton	Corrosion Inhibitor		Listed Below		
MC MX 5-2402	MultiChem	Additive		Listed Below		
LD-2850	MultiChem	Friction Reducer		Listed Below		
SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant		Listed Below		

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OILPERM A	Halliburton	Non-ionic Surfactant			Listed Below			
MC MX 8-4543	MultiChem	Biocide			Listed Below			
FR-A12	Halliburton	Additive			Listed Below			
MC MX 2-2822	MultiChem	Scale Inhibitor			Listed Below			
Items above are Trade Names with the exception of Base Water. Items below are the individual ingredients.								
					14808-60-7	100.00000	13.38114	
					Crystalline silica, quartz			
					7647-01-0	7.50000	0.04525	
					Hydrochloric acid			
					7631-99-4	60.00000	0.02084	
					Sodium Nitrate			
					64742-47-8	30.00000	0.01702	
					Hydrotreated light petroleum distillate			
					69418-26-4	30.00000	0.01702	
					Ethylamine			
					67-56-1	100.00000	0.00719	
					Methanol			
					7647-14-5	10.00000	0.00680	
					Sodium Chloride			
					70900-16-2	30.00000	0.00675	
					Amines			
					12125-02-9	10.00000	0.00567	
					Ammonium Chloride			
					93-83-4	5.00000	0.00284	
					9-Octadecenamide			
					Proprietary	100.00000	0.00240	
					Proprietary			
					64-17-5	60.00000	0.00028	
					Ethanol			
					Proprietary	30.00000	0.00019	
					Oxyalkylated phenolic resin			

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			64742-94-5	30.00000	0.00014	
	Heavy aromatic petroleum naphtha					
	Modified thiourea polymer		Proprietary	30.00000	0.00013	
	Naphthalene		91-20-3	5.00000	0.00002	
	Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched		127087-87-0	5.00000	0.00002	
	Ethoxylated alcohols		Proprietary	5.00000	0.00002	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
	Propargyl alcohol		107-19-7	5.00000	0.00002	
	Proprietary Component		Proprietary	60.00000	0.00001	
	1,2,4 Trimethylbenzene		95-63-6	1.00000	0.00000	
	Sodium chloride		7647-14-5	10.00000	0.00000	
	Glycerine		56-81-5	5.00000	0.00000	

* 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 11HM TUG HILL OPERATING

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

No.	Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Deed Book/Page
1	10*15521	A	9-7-12	VENANGO 21ST CENTURY ENERGY INC	722 283
2	10*15498	A	4-7-12	C HAWKES R HAGEDORN JR	816 433
3	10*47051 073 1	A	7-7-12	VENANGO 21ST CENTURY ENERGY INC	888 618
4	10*47051 073 2	A	7-7-12	PATRIOT RESTORATIONS LLC	908 541
5	10*47051 073 3	A	7-7-12	ENERGY HOLDINGS, LLC	818 320
6	10*17229	B	4-4-10	STEPHEN MENENDEZ	911 46
7	10*15661	C	4-6-5	CHIENYU HOLDINGS LLC	839 170
8	10*15661	D	7-6-4	ROBERT LUC CARNEY AND BONNE ANNE CARNEY	692 255
9	10*15507	E	9-8-11	RAY C. HARTZELL AND CAROL J. HARTZELL, HUSBAND AND WIFE	689 182
10	10*15525	F	9-8-12	RONALD RUTH MASON ET UX	772 445
11	10*15513	F	9-8-12	ASBY BETH FROHNAPFEL	781 312
12	10*15542	F	9-8-12	KENNETH D. SMURT	781 218
13	10*15542	F	9-8-12	SANDRA FLOWEN	781 307
14	10*15544	F	9-8-12	VICKI J. CHERRY A/K/A VICKIE L. CHERRY	781 318
15	10*15545	F	9-8-12	JAMES B. SMURT ET UX	793 332
16	10*15546	F	9-8-12	ALAN K. SMURT ET UX	793 325
17	10*15547	F	9-8-12	RODNEY L. SMURT	793 346
18	10*15504	G	9-8-14	JAMES MASON ET UX	692 461
19	10*15510	H	9-8-10	ELAINE PHELPS ET VR	718 326
20	10*15511	H	9-8-10	DAVID E. CROW	718 376
21	10*15512	H	9-8-10	FRANCIS COFFEY	718 378
22	10*15513	H	9-8-10	KAY KETES	718 320
23	10*15514	H	9-8-10	PAUL CROW	718 326
24	10*15515	H	9-8-10	DEBBIE L. CROW	718 314
25	10*15516	H	9-8-10	ROSE MARIE RUSKIEWSKI	718 354
26	10*15517	H	9-8-10	DIANNE GELLNER & GARY GELLNER	718 345
27	10*15518	H	9-8-10	JAMES J. HOLLIDAY AND JACQUELINE HOLLIDAY	718 347
28	10*15519	H	9-8-10	JOHN CROW	726 580
29	10*15520	H	9-8-10	TIMOTHY CROW	726 582
30	10*47051 123 1	H	7-5-10	LLOYD G. BAKER	865 280
31	10*47051 123 2	H	7-5-10	JAMES J. HOLLIDAY AND JACQUELINE HOLLIDAY	873 142
32	10*15510	I	9-10-11	ELAINE PHELPS ET VR	718 326
33	10*15511	I	9-10-11	DAVID E. CROW	718 376
34	10*15512	I	9-10-11	FRANCIS COFFEY	718 378
35	10*15513	I	9-10-11	KAY KETES	718 320
36	10*15514	I	9-10-11	PAUL CROW	718 326
37	10*15515	I	9-10-11	DEBBIE L. CROW	718 314
38	10*15516	I	9-10-11	ROSE MARIE RUSKIEWSKI	718 354
39	10*15517	I	9-10-11	DIANNE GELLNER & GARY GELLNER	718 345
40	10*15518	I	9-10-11	JAMES J. HOLLIDAY AND JACQUELINE HOLLIDAY	718 347
41	10*15519	I	9-10-11	JOHN CROW	726 580
42	10*15520	I	9-10-11	TIMOTHY CROW	726 582
43	10*47051 123 1	I	9-10-11	LLOYD G. BAKER	865 280
44	10*47051 123 2	I	9-10-11	JAMES J. HOLLIDAY AND JACQUELINE HOLLIDAY	873 142
45	10*15567	J	9-10-13	VICKIE MASON	680 407
46	10*15568	J	9-10-13	MARY A. SOUTH	681 410
47	10*15569	J	9-10-13	MARK L. WHEZEL	682 560
48	10*15570	J	9-10-13	RAY A. WHEZEL JR	682 558
49	10*15571	J	9-10-13	SHARON Y. WHEZEL	682 560
50	10*15572	J	9-10-13	ROBERT L. WHEZEL	682 560
51	10*15724	J	9-10-13	JAMES RODNEY BRIGGS	901 327
52	10*15725	J	9-10-13	ROGER JACOB BRIGGS	901 318
53	10*15726	J	9-10-13	JOHN DEAN BRIGGS AND PATTY KAY BRIGGS	901 323
54	10*16079	J	9-10-13	LORI ASTON DOON	908 668
55	10*16216	J	9-10-13	FRANCIS Y. RIGG	907 156
56	10*16237	J	9-10-13	GREGORY J. ASTON AND TAMMY E. ASTON	907 147
57	10*16276	J	9-10-13	JEFFREY A. WHEZEL	907 157
58	10*47051 108 1	J	9-10-13	MARIE A. WHEZEL	905 51
59	10*47051 108 29	J	9-10-13	PATRICIA ANN MCDOUGAL	901 306
60	10*47051 108 30	J	9-10-13	STEVEN L. ASTON	901 308
61	10*47051 108 31	J	9-10-13	FRED T. KERNS	901 298
62	10*47051 108 36	J	9-10-13	YVONNE J. ROBERT	901 309
63	10*47051 108 37	J	9-10-13	CARLE ASTON	901 304
64	10*47051 108 38	J	9-10-13	CAROLAN SUE WELLS	901 310
65	10*47051 108 41	J	9-10-13	ELMER ASTON	901 286
66	10*47051 108 48	J	9-10-13	WILLIAM ASTON	901 312
67	10*47051 108 51	J	9-10-13	BRENDA J. WHEZEL	855 55
68	10*47051 108 50	J	9-10-13	DAVID U. ASTON ESTATE BY EXECUTOR DAWN R. MARKS	901 314
69	10*47051 108 52	J	9-10-13	CONBIT N. ASTON	901 316
70	10*47051 108 53	J	9-10-13	MARY JANE EYLE	901 318

71	10*47051 108 56	J	9-10-13	PAULA HUND	901 347
72	10*47051 108 57	J	9-10-13	ROBERT B. KERNS	901 349
73	10*47051 108 58	J	9-10-13	RONALD W. KERNS	901 341
74	10*47051 108 59	J	9-10-13	PAUL ULYSSES KERNS ESTATE SALVATORE P. PUGUSI, EXECUTOR	901 343
75	10*47051 108 6	J	9-10-13	BERNARD CARLE	895 23
76	10*47051 108 61	J	9-10-13	AMANDA REHM	901 345
77	10*47051 108 7	J	9-10-13	GARY FRANCIS WHEZEL	895 26
78	10*47051 108 75	J	9-10-13	JOHN ASTON JR	901 355
79	10*47051 108 77	J	9-10-13	SHONDA WOOD	901 356
80	10*47051 108 78	J	9-10-13	DONNA WOODS MOODY	901 358
81	10*47051 108 79	J	9-10-13	MARY A. SOUTH	899 20
82	10*47051 108 74	J	9-10-13	KENNETH CHIFFS	897 25
83	10*15574	K	9-10-12	MARY A. SOUTH	680 407
84	10*15575	K	9-10-12	MARK L. WHEZEL	681 414
85	10*15576	K	9-10-12	RAY A. WHEZEL JR	682 559
86	10*15577	K	9-10-12	ROBERT L. WHEZEL	682 560
87	10*15578	K	9-10-12	SHARON Y. WHEZEL	681 410
88	10*15579	K	9-10-12	JAMES RODNEY BRIGGS	901 327
89	10*15725	K	9-10-12	ROGER JACOB BRIGGS	901 318
90	10*15726	K	9-10-12	JOHN DEAN BRIGGS AND PATTY KAY BRIGGS	901 323
91	10*16079	K	9-10-12	LORI ASTON DOON	908 668
92	10*16216	K	9-10-12	FRANCIS Y. RIGG	907 156
93	10*16237	K	9-10-12	GREGORY J. ASTON AND TAMMY E. ASTON	907 147
94	10*16276	K	9-10-12	JEFFREY A. WHEZEL	907 157
95	10*16276	K	9-10-12	MARY JANE EYLE	901 318
96	10*47051 108 29	K	9-10-12	PATRICIA ANN MCDOUGAL	901 306
97	10*47051 108 30	K	9-10-12	STEVEN L. ASTON	901 308
98	10*47051 108 31	K	9-10-12	FRED T. KERNS	901 298
99	10*47051 108 36	K	9-10-12	YVONNE J. ROBERT	901 309
100	10*47051 108 37	K	9-10-12	CARLE ASTON	901 304
101	10*47051 108 38	K	9-10-12	CAROLAN SUE WELLS	901 310
102	10*47051 108 41	K	9-10-12	ELMER ASTON	901 286
103	10*47051 108 48	K	9-10-12	WILLIAM ASTON	901 312
104	10*47051 108 51	K	9-10-12	BRENDA J. WHEZEL	855 55
105	10*47051 108 50	K	9-10-12	DAVID U. ASTON ESTATE BY EXECUTOR DAWN R. MARKS	901 314
106	10*47051 108 52	K	9-10-12	CONBIT N. ASTON	901 316
107	10*47051 108 53	K	9-10-12	MARY JANE EYLE	901 318
108	10*47051 108 56	K	9-10-12	PAULA HUND	901 347
109	10*47051 108 57	K	9-10-12	ROBERT B. KERNS	901 349
110	10*47051 108 58	K	9-10-12	RONALD W. KERNS	901 341
111	10*47051 108 59	K	9-10-12	PAUL ULYSSES KERNS ESTATE SALVATORE P. PUGUSI, EXECUTOR	901 343
112	10*47051 108 6	K	9-10-12	BERNARD CARLE	895 23
113	10*47051 108 61	K	9-10-12	AMANDA REHM	895 26
114	10*47051 108 6	K	9-10-12	GARY FRANCIS WHEZEL	895 26
115	10*47051 108 7	K	9-10-12	JOHN ASTON JR	901 355
116	10*47051 108 75	K	9-10-12	JOHN ASTON JR	901 355
117	10*47051 108 77	K	9-10-12	SHONDA WOOD	901 356
118	10*47051 108 78	K	9-10-12	DONNA WOODS MOODY	901 358
119	10*47051 108 79	K	9-10-12	MARY A. SOUTH	899 20
120	10*47051 108 74	K	9-10-12	KENNETH CHIFFS	897 25
121	10*47051 248 1	L	9-11-2	MARY A. KERK	879 252
122	10*47051 248 2	L	9-11-2	PAUL G. FOR	879 253
123	10*47051 248 3	L	9-11-2	ASBY BETH	879 254
124	10*47051 248 4	L	9-11-2	DAY G. FOX	876 25
125	10*47051 248 5	L	9-11-2	LOUIS J. FOX	876 26
126	10*47051 248 6	L	9-11-2	THOMAS J. FOX	876 27
127	10*15510	M	9-10-9	ELAINE PHELPS ET VR	718 326
128	10*15511	M	9-10-9	DAVID E. CROW	718 376
129	10*15512	M	9-10-9	FRANCIS COFFEY	718 378
130	10*15513	M	9-10-9	KAY KETES	718 320
131	10*15514	M	9-10-9	PAUL CROW	718 326
132	10*15515	M	9-10-9	DEBBIE L. CROW	718 314
133	10*15516	M	9-10-9	ROSE MARIE RUSKIEWSKI	718 354
134	10*15517	M	9-10-9	DIANNE GELLNER & GARY GELLNER	718 345
135	10*15518	M	9-10-9	JAMES J. HOLLIDAY AND JACQUELINE HOLLIDAY	718 347
136	10*15519	M	9-10-9	JOHN CROW	726 580
137	10*15520	M	9-10-9	TIMOTHY CROW	726 582
138	10*47051 123 1	M	9-10-9	LLOYD G. BAKER	865 280
139	10*47051 123 2	M	9-10-9	JAMES J. HOLLIDAY AND JACQUELINE HOLLIDAY	873 142

80°42'30"
 80°42'30"
 A.D. B.H.
 T.H. LONGITUDE
 B.H. LONGITUDE
 2,669' B.H.
 AS-DRILLED
 8,463' T.H.
 AS-DRILLED

NOTES ON SURVEY

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

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

NAD'83 S.P.C. (FT)	N. 479,480.83	E. 1,627,764.28
NAD'83 GEO.	LAT-(N) 39.810102	LONG-(W) 80.712955
NAD'83 UTM (M)	N. 4,406,720.12	E. 524,569.86
<u>LANDING POINT</u>		
NAD'83 S.P.C. (FT)	N. 477,558.7	E. 1,624,487.8
NAD'83 GEO.	LAT-(N) 39.804704	LONG-(W) 80.724524
NAD'83 UTM (M)	N. 4,406,117.9	E. 523,581.4
<u>BOTTOM HOLE</u>		
NAD'83 S.P.C. (FT)	N. 470,170.5	E. 1,628,592.0
NAD'83 GEO.	LAT-(N) 39.784575	LONG-(W) 80.709562
NAD'83 UTM (M)	N. 4,403,888.0	E. 524,869.4



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

P.S. 849 *C. Victor Moyers*



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

DATE OCTOBER 29, 20 18
 REVISED OCTOBER 17, 20 19
 OPERATORS WELL NO. HEAVEN HILL 2W-11HM
 API WELL NO. 47 - 051 - 01956
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8703AD11HMR.dwg
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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' 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: LEASE NO. SEE ABOVE

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

HEAVEN HILL SW LEASE WELL 11HM TUG HILL OPERATING

AS-DRIILLED TO H. 355'
AS-DRIILLED TO H. 358'

B.H. LATITUDE 39°47.30"
T.H. LATITUDE 39°50.00"

H. 358.0' B.H. 355.0'
A.D. H. 357.5'
H. 357.5' T.H. 357.5'
A.D. H. 357.5'

80°45.30' H. 357.5'
80°45.30' T.H. 357.5'
A.D. H. 357.5'

Well No.	Depth (ft)	Interval	Formation	Notes
11	100	100-110	WATER	
12	110	110-120	WATER	
13	120	120-130	WATER	
14	130	130-140	WATER	
15	140	140-150	WATER	
16	150	150-160	WATER	
17	160	160-170	WATER	
18	170	170-180	WATER	
19	180	180-190	WATER	
20	190	190-200	WATER	
21	200	200-210	WATER	
22	210	210-220	WATER	
23	220	220-230	WATER	
24	230	230-240	WATER	
25	240	240-250	WATER	
26	250	250-260	WATER	
27	260	260-270	WATER	
28	270	270-280	WATER	
29	280	280-290	WATER	
30	290	290-300	WATER	
31	300	300-310	WATER	
32	310	310-320	WATER	
33	320	320-330	WATER	
34	330	330-340	WATER	
35	340	340-350	WATER	
36	350	350-360	WATER	
37	360	360-370	WATER	
38	370	370-380	WATER	
39	380	380-390	WATER	
40	390	390-400	WATER	
41	400	400-410	WATER	
42	410	410-420	WATER	
43	420	420-430	WATER	
44	430	430-440	WATER	
45	440	440-450	WATER	
46	450	450-460	WATER	
47	460	460-470	WATER	
48	470	470-480	WATER	
49	480	480-490	WATER	
50	490	490-500	WATER	
51	500	500-510	WATER	
52	510	510-520	WATER	
53	520	520-530	WATER	
54	530	530-540	WATER	
55	540	540-550	WATER	
56	550	550-560	WATER	
57	560	560-570	WATER	
58	570	570-580	WATER	
59	580	580-590	WATER	
60	590	590-600	WATER	
61	600	600-610	WATER	
62	610	610-620	WATER	
63	620	620-630	WATER	
64	630	630-640	WATER	
65	640	640-650	WATER	
66	650	650-660	WATER	
67	660	660-670	WATER	
68	670	670-680	WATER	
69	680	680-690	WATER	
70	690	690-700	WATER	
71	700	700-710	WATER	
72	710	710-720	WATER	
73	720	720-730	WATER	
74	730	730-740	WATER	
75	740	740-750	WATER	
76	750	750-760	WATER	
77	760	760-770	WATER	
78	770	770-780	WATER	
79	780	780-790	WATER	
80	790	790-800	WATER	
81	800	800-810	WATER	
82	810	810-820	WATER	
83	820	820-830	WATER	
84	830	830-840	WATER	
85	840	840-850	WATER	
86	850	850-860	WATER	
87	860	860-870	WATER	
88	870	870-880	WATER	
89	880	880-890	WATER	
90	890	890-900	WATER	
91	900	900-910	WATER	
92	910	910-920	WATER	
93	920	920-930	WATER	
94	930	930-940	WATER	
95	940	940-950	WATER	
96	950	950-960	WATER	
97	960	960-970	WATER	
98	970	970-980	WATER	
99	980	980-990	WATER	
100	990	990-1000	WATER	

Well No.	Depth (ft)	Interval	Formation	Notes
1	100	100-110	WATER	
2	110	110-120	WATER	
3	120	120-130	WATER	
4	130	130-140	WATER	
5	140	140-150	WATER	
6	150	150-160	WATER	
7	160	160-170	WATER	
8	170	170-180	WATER	
9	180	180-190	WATER	
10	190	190-200	WATER	
11	200	200-210	WATER	
12	210	210-220	WATER	
13	220	220-230	WATER	
14	230	230-240	WATER	
15	240	240-250	WATER	
16	250	250-260	WATER	
17	260	260-270	WATER	
18	270	270-280	WATER	
19	280	280-290	WATER	
20	290	290-300	WATER	
21	300	300-310	WATER	
22	310	310-320	WATER	
23	320	320-330	WATER	
24	330	330-340	WATER	
25	340	340-350	WATER	
26	350	350-360	WATER	
27	360	360-370	WATER	
28	370	370-380	WATER	
29	380	380-390	WATER	
30	390	390-400	WATER	
31	400	400-410	WATER	
32	410	410-420	WATER	
33	420	420-430	WATER	
34	430	430-440	WATER	
35	440	440-450	WATER	
36	450	450-460	WATER	
37	460	460-470	WATER	
38	470	470-480	WATER	
39	480	480-490	WATER	
40	490	490-500	WATER	
41	500	500-510	WATER	
42	510	510-520	WATER	
43	520	520-530	WATER	
44	530	530-540	WATER	
45	540	540-550	WATER	
46	550	550-560	WATER	
47	560	560-570	WATER	
48	570	570-580	WATER	
49	580	580-590	WATER	
50	590	590-600	WATER	
51	600	600-610	WATER	
52	610	610-620	WATER	
53	620	620-630	WATER	
54	630	630-640	WATER	
55	640	640-650	WATER	
56	650	650-660	WATER	
57	660	660-670	WATER	
58	670	670-680	WATER	
59	680	680-690	WATER	
60	690	690-700	WATER	
61	700	700-710	WATER	
62	710	710-720	WATER	
63	720	720-730	WATER	
64	730	730-740	WATER	
65	740	740-750	WATER	
66	750	750-760	WATER	
67	760	760-770	WATER	
68	770	770-780	WATER	
69	780	780-790	WATER	
70	790	790-800	WATER	
71	800	800-810	WATER	
72	810	810-820	WATER	
73	820	820-830	WATER	
74	830	830-840	WATER	
75	840	840-850	WATER	
76	850	850-860	WATER	
77	860	860-870	WATER	
78	870	870-880	WATER	
79	880	880-890	WATER	
80	890	890-900	WATER	
81	900	900-910	WATER	
82	910	910-920	WATER	
83	920	920-930	WATER	
84	930	930-940	WATER	
85	940	940-950	WATER	
86	950	950-960	WATER	
87	960	960-970	WATER	
88	970	970-980	WATER	
89	980	980-990	WATER	
90	990	990-1000	WATER	

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD83 S.P.C. (FT) N 479,480.83 E. 1,827,764.28
 NAD83 GEO. LAT (N) 39 810102 LONG (W) 80 712952
 NAD83 UTM (M) N 4,408,720.12 E 524,589.88
LANDING POINT
 NAD83 S.P.C. (FT) N 477,228.7 E. 1,824,487.8
 NAD83 GEO. LAT (N) 39 804704 LONG (W) 80 724254
 NAD83 UTM (M) N 4,408,117.9 E 523,281.4
BOTTOM HOLE
 NAD83 S.P.C. (FT) N 470,170.5 E. 1,828,562.0
 NAD83 GEO. LAT (N) 39 784575 LONG (W) 80 709882
 NAD83 UTM (M) N 4,403,888.0 E 524,889.4

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"=200'
 3. ROYALTY OWNERSHIP PROVIDED BY TUG HILL OPERATING, LLC.
 4. SURFACE OWNERSHIP PROVIDED WAS NOT ADDRESSED.
 5. AS-DRIILLED DATA PROVIDED BY TUG HILL OPERATING, LLC.
 6. PLAT UPDATED TO SHOW AS-DRIILLED PATH.

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 www.landenergy.com

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
 DATE OCTOBER 29 20 18
 REVISED OCTOBER 17 20 19
 OPERATORS WELL NO. HEAVEN HILL SW-11HM
 APRI
 WELL NO. 47
 STATE COUNTY PERMIT NO. 01956



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
Victor Moyers

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

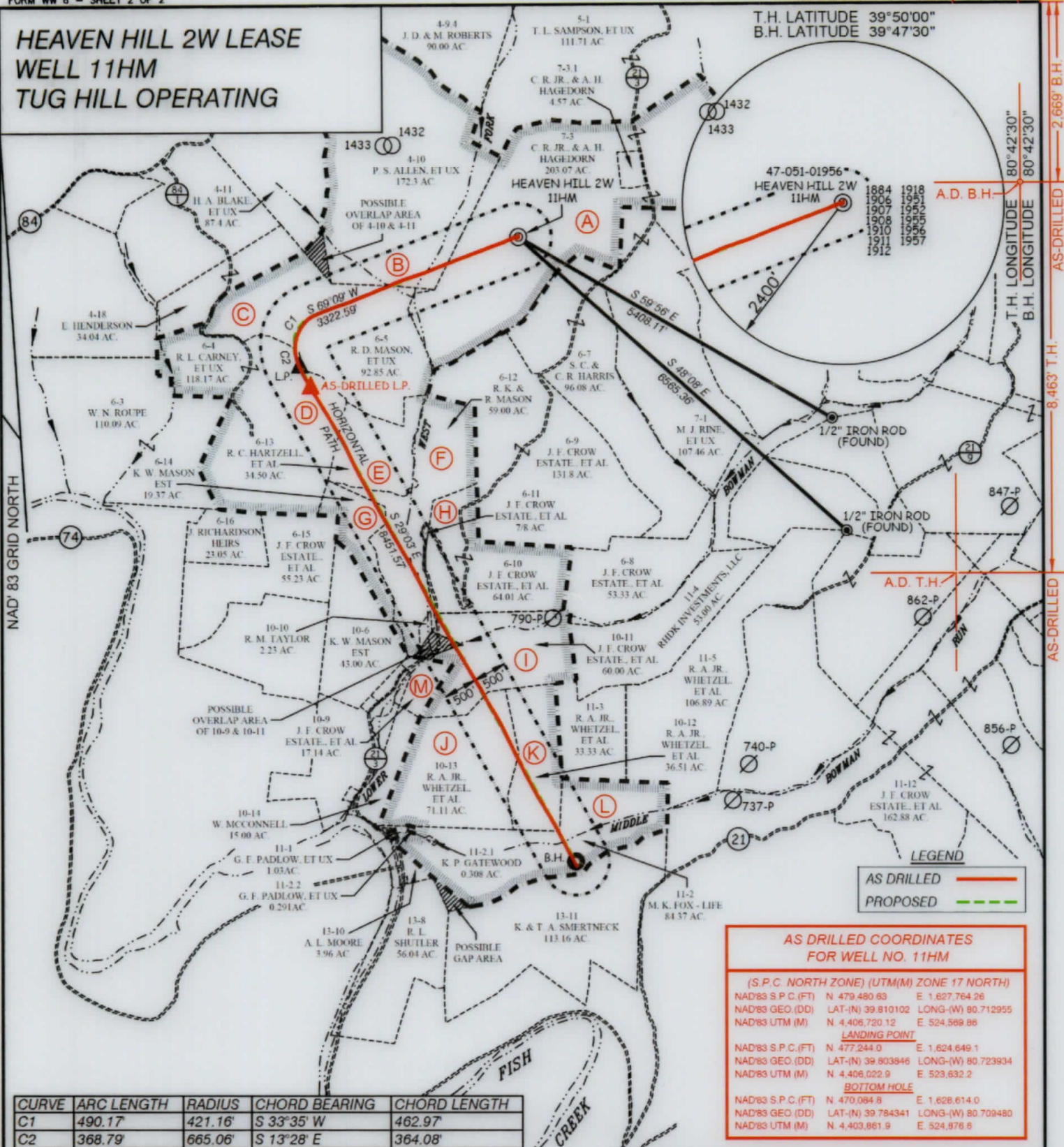
DESIGNATED AGENT DIANNA STAMPER
 CT CORPORATION SYSTEM
 Address 2400 D BIG TYLER ROAD
 CHARLESTON, WV 25313

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

PROPOSED WORK:
 SURFACE OWNER C.R. JR. & A.H. HAGEDORN
 ROYALTY OWNER C.R. JR. & A.H. HAGEDORN ET AL (SEE ABOVE)
 DISTRICT MEADE COUNTY MARSHALL
 ELEVATION PROPOSED = 1,331.28'
 WEST FORK OF LOWER BOWMAN RUN OF FISH CREEK (HUC 10)
 LOCATION: GROUND = 1,350.0'
 TYPE: OIL GAS X INJECTION WASTE DISPOSAL "GAS" PRODUCTION X STORAGE DEEP SHALLOW X
 IF WASTE DISPOSAL "GAS" PRODUCTION X STORAGE DEEP SHALLOW X
 DRILL CONVERT X DRILL DEEPER REDRILL
 FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER
 PHYSICAL CHANGE IN WELL (SPECIFY) TARGET FORMATION MARCELLUS
 ESTIMATED DEPTH TVD: 8,879' TMD: 17,164'
 PERMIT MARCELLUS
 LEASE NO. SEE ABOVE
 ACREAGE 203.07±
 SURFACE OWNER C.R. JR. & A.H. HAGEDORN
 ROYALTY OWNER C.R. JR. & A.H. HAGEDORN ET AL (SEE ABOVE)
 DISTRICT MEADE COUNTY MARSHALL
 ELEVATION PROPOSED = 1,331.28'
 WEST FORK OF LOWER BOWMAN RUN OF FISH CREEK (HUC 10)
 LOCATION: GROUND = 1,350.0'
 TYPE: OIL GAS X INJECTION WASTE DISPOSAL "GAS" PRODUCTION X STORAGE DEEP SHALLOW X

MINIMUM DEGREE OF ACCURACY 1/2500
 SCALE 1" = 2000'
 FILE NO. 8703AD11HM.R.dwg

**HEAVEN HILL 2W LEASE
WELL 11HM
TUG HILL OPERATING**



CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	490.17	421.16'	S 33°35' W	462.97'
C2	368.79	665.06'	S 13°28' E	364.08'

AS DRILLED COORDINATES FOR WELL NO. 11HM

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

NAD'83 S.P.C.(FT)	N 479,480.63	E 1,627,764.26
NAD'83 GEO.(DD)	LAT-(N) 39.810102	LONG-(W) 80.712955
NAD'83 UTM (M)	N 4,406,720.12	E 524,569.86

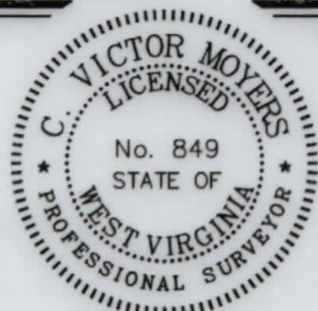
LANDING POINT

NAD'83 S.P.C.(FT)	N 477,244.0	E 1,624,649.1
NAD'83 GEO.(DD)	LAT-(N) 39.803846	LONG-(W) 80.723934
NAD'83 UTM (M)	N 4,406,022.9	E 523,632.2

BOTTOM HOLE

NAD'83 S.P.C.(FT)	N 470,084.8	E 1,628,614.0
NAD'83 GEO.(DD)	LAT-(N) 39.784341	LONG-(W) 80.709480
NAD'83 UTM (M)	N 4,403,861.9	E 524,876.6

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Verrinton Drive • Glenville, WV 26351 • (304) 462-5634
www.slsenv.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. 849 C. Victor Moyers

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

FILE NO. 8703AD11HMR.dwg SCALE 1" = 2000'
 DATE OCTOBER 29, 20 18
 REVISED OCTOBER 17, 20 19
 OPERATORS WELL NO. HEAVEN HILL 2W-11HM
 API WELL NO. 47 - 051 - 01956
 STATE COUNTY PERMIT

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

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

NAD'83 S.P.C.(FT)	N 479,480.63	E 1,627,764.26
NAD'83 GEO.	LAT-(N) 39.810102	LONG-(W) 80.712955
NAD'83 UTM (M)	N 4,406,720.12	E 524,569.86

LANDING POINT

NAD'83 S.P.C.(FT)	N 477,558.7	E 1,624,487.8
NAD'83 GEO.	LAT-(N) 39.804704	LONG-(W) 80.724524
NAD'83 UTM (M)	N 4,406,117.9	E 523,581.4

BOTTOM HOLE

NAD'83 S.P.C.(FT)	N 470,170.5	E 1,628,592.0
NAD'83 GEO.	LAT-(N) 39.784575	LONG-(W) 80.709562
NAD'83 UTM (M)	N 4,403,888.0	E 524,869.4

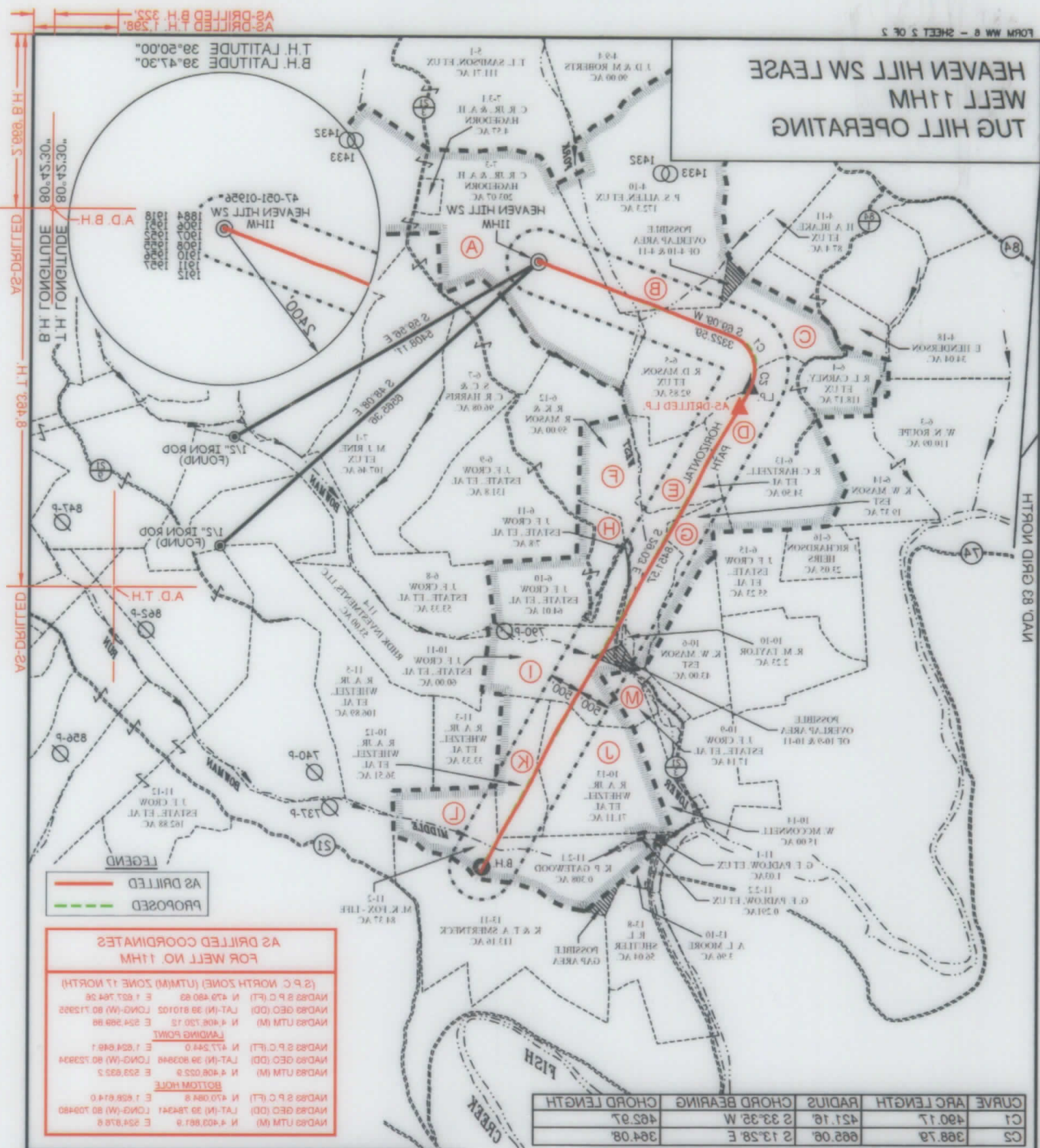
LEGEND

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	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

**HEAVEN HILL SW LEASE
WELL 11HM
TUG HILL OPERATING**

B.H. LATITUDE 39°47.30"
T.H. LATITUDE 39°50.00"



5'000.00" B.H. GONGITUDE
 8'483.11" T.H. GONGITUDE
 80°45.30"
 80°45.30"
 A.D. B.H.
 8'483.11" T.H. GONGITUDE
 5'000.00" B.H. GONGITUDE
 80°45.30"
 80°45.30"
 A.D. B.H.

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

AS DRILLED COORDINATES FOR WELL NO. 11HM

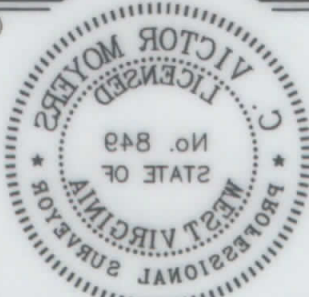
POINT	NAD83 UTM (M)	NAD83 GEO (DD)	NAD83 S.P.C. (FT)
BOTTOM HOLE	N 4403.888.0 E 254.868.4	LAT (-) 39.784571 LONG (-W) 80.709285	N 470.084.8 E 1.658.505.0
LANDING POINT	N 4408.025.9 E 253.832.3	LAT (-) 39.803948 LONG (-W) 80.723934	N 477.244.0 E 1.624.646.1
AS DRILLED UTM (M)	N 4408.025.9 E 253.832.3	LAT (-) 39.810102 LONG (-W) 80.712552	N 479.480.63 E 1.627.764.26
AS DRILLED GEO (DD)	N 4408.025.9 E 253.832.3	LAT (-) 39.810102 LONG (-W) 80.712552	
AS DRILLED S.P.C. (FT)	N 4408.025.9 E 253.832.3	LAT (-) 39.810102 LONG (-W) 80.712552	N 479.480.63 E 1.627.764.26

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	490.17	451.18	S 33°35' W	465.97
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STATE OF WEST VIRGINIA
 DIVISION OF ENVIRONMENTAL PROTECTION
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FILE NO. 8703AD11HMR.dwg SCALE 1" = 2000'
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C. Victor Moyers
 P. 2
 849



LEGEND

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

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

POINT	NAD83 UTM (M)	NAD83 GEO (DD)	NAD83 S.P.C. (FT)
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AS DRILLED GEO (DD)	N 4408.025.9 E 253.832.3	LAT (-) 39.810102 LONG (-W) 80.712552	
AS DRILLED S.P.C. (FT)	N 4408.025.9 E 253.832.3	LAT (-) 39.810102 LONG (-W) 80.712552	N 479.480.63 E 1.627.764.26

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

COUNTY NAME
 PERMIT