

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

API 47 - 051 - 01907 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 2-3HM
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 4,406,716.3 Easting 524,574.0
Landing Point of Curve Northing 4,406,682.7 Easting 524,568.0
Bottom Hole Northing 4,404,314.3 Easting 525,940.4

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

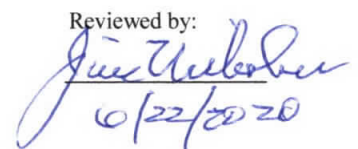
Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

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 perm WSSP and Permit.

Date permit issued 2/14/2017 Date drilling commenced 8/5/2017 Date drilling ceased 7/9/2018
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 1,595' Void(s) encountered (Y/N) depths N
Coal depth(s) ft Sewickley 974' TVD, Pittsburgh 1064' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

10/22/2020

API 47-051 - 01907 Farm name Charles R. Hagedorn, Jr., Et Ux Well number Heaven Hill 2-3HM

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	RECEIVED Office of Oil and Gas Y
Surface	17 1/2"	13 3/8"	1,148'	NEW	54.5#	N/A	JUN 10 2020 Y
Coal	17 1/2"	13 3/8"	1,148'	NEW	54.5#	N/A	WV Department of Environmental Protection Y
Intermediate 1	12 1/4"	9 5/8"	2,843'	NEW	36#	N/A	
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	16,413'	NEW	20#	N/A	Y
Tubing							
Packer type and depth set							

Comment Details _____

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	1175	15.6	1.19	1410	0	8
Coal	A	1175	15.6	1.19	1410	0	8
Intermediate 1	A	902	15.6	1.19	1127	0	8
Intermediate 2							
Intermediate 3							
Production	A	2776	14.5	1.17	4835	0	8
Tubing							

Drillers TD (ft) 16,435' Loggers TD (ft) n/a
 Deepest formation penetrated Marcellus Plug back to (ft) n/a
 Plug back procedure n/a

Kick off depth (ft) 6,243'

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 - 01907 Farm name Charles R. Hagedorn, Jr., Et Ux Well number Heaven Hill 2-3HM

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	*See attached				

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Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	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)
			*see attached					

Please insert additional pages as applicable.

API 47- 051 - 01907 Farm name Charles R. Hagedorn, Jr., Et Ux Well number Heaven Hill 2-3HM

PRODUCING FORMATION(S)	DEPTHS
Marcellus	6,808'-6,896' TVD 7,177'-16,435' 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 Photo

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

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA
Address 505 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 Halliburton 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 *Amy L. Miller* Title Permitting Specialist Date 3/23/2020

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Heaven Hill 2-3HM PEFORATION RECORD

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
1	9/27/2018	16268	16316	12	Marcellus
2	9/27/2018	16025	16171	48	Marcellus
3	9/28/2018	15850	15996	48	Marcellus
4	9/28/2018	15675	15821	48	Marcellus
5	9/29/2018	15500	15646	48	Marcellus
6	9/30/2018	15325	15471	48	Marcellus
7	9/30/2018	15150	15296	48	Marcellus
8	10/1/2018	14975	15121	48	Marcellus
9	10/2/2018	14800	14946	48	Marcellus
10	10/2/2018	14625	14771	48	Marcellus
11	10/3/2018	14450	14596	48	Marcellus
12	10/4/2018	14275	14421	48	Marcellus
13	10/4/2018	14100	14246	48	Marcellus
14	10/5/2018	13924	14071	48	Marcellus
15	10/6/2018	13750	13896	48	Marcellus
16	10/7/2018	13575	13721	48	Marcellus
17	10/7/2018	13400	13546	48	Marcellus
18	10/8/2018	13225	13371	48	Marcellus
19	10/9/2018	13050	13196	48	Marcellus
20	10/9/2018	12875	13021	48	Marcellus
21	10/10/2018	12700	12846	48	Marcellus
22	10/10/2018	12525	12671	48	Marcellus
23	10/11/2018	12350	12496	48	Marcellus
24	10/12/2018	12175	12321	48	Marcellus
25	10/12/2018	12000	12146	48	Marcellus
26	10/13/2018	11825	11971	48	Marcellus
27	10/13/2018	11650	11796	48	Marcellus
28	10/14/2018	11475	11621	48	Marcellus
29	10/14/2018	11300	11446	48	Marcellus
30	10/15/2018	11125	11271	48	Marcellus
31	10/15/2018	10950	11096	48	Marcellus
32	10/16/2018	10775	10921	48	Marcellus
33	10/16/2018	10600	10746	48	Marcellus
34	10/17/2018	10425	10571	48	Marcellus
35	10/17/2018	10250	10396	48	Marcellus
36	10/19/2018	10075	10221	48	Marcellus
37	10/19/2018	9900	10046	48	Marcellus
38	10/20/2018	9725	9871	48	Marcellus
39	10/20/2018	9550	9696	48	Marcellus
40	10/21/2018	9375	9521	48	Marcellus
41	10/21/2018	9200	9346	48	Marcellus

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD. Ft.	Number of Perforations	Formation(s)
42	10/22/2018	9025	9171	48	Marcellus
43	10/22/2018	8850	8996	48	Marcellus
44	10/23/2018	8675	8821	48	Marcellus
45	10/24/2018	8500	8646	48	Marcellus
46	10/26/2018	8325	8471	48	Marcellus
47	10/27/2018	8150	8296	48	Marcellus
48	10/27/2018	7975	8121	48	Marcellus
49	10/28/2018	7800	7946	48	Marcellus
50	10/29/2018	7625	7771	48	Marcellus
51	10/29/2018	7450	7596	48	Marcellus
52	10/29/2018	7275	7421	48	Marcellus

Heaven Hill 2-3HM

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	81.3	7499	5123	4145	346910	338752	0
2	88.1	7839	4906	4506	435125	326287	0
3	85.8	7787	4547	4627	431040	334475	0
4	88.7	7990	5326	4706	426870	311961	0
5	80.7	7393	5030	4876	437245	314286	0
6	80.6	7353	5528	4817	428100	305917	0
7	80.8	7306	5189	4916	436702	310677	0
8	80.7	7388	5032	4804	433650	313309	0
9	80.7	7358	5520	4690	408690	298199	0
10	80	7881	5515	4359	411160	305675	0
11	80.7	7139	7737	4614	435668	315930	0
12	80.4	7229	5009	4358	443650	311230	0
13	80.7	7322	5144	4380	437960	314012	0
14	80.8	7322	5375	4504	433810	312242	0
15	80.5	7207	5323	4730	439380	309629	0
16	80.8	7579	5669	4829	442060	321071	0
17	80.9	7387	5844	4755	437960	307117	0
18	80.6	7325	5353	4874	438280	317507	0
19	80.8	7348	5181	4714	438630	306367	0
20	80.8	7350	5629	4765	460910	321988	0
21	80.7	7227	5990	4807	429700	299498	0
22	80.2	6827	5360	4844	436360	309805	0
23	80.6	6892	5409	4246	443590	323170	0
24	80.7	6735	5303	4422	440490	304426	0
25	80.4	6893	5627	4843	436040	351601	0
26	80.8	6728	5840	4259	439450	310554	0
27	80.7	6492	6204	4746	438360	309825	0
28	80.6	6519	5944	4676	439250	302843	0
29	80.3	6556	5653	4719	437520	309166	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	80.8	6620	5386	5113	437520	317165	0
31	80.3	6510	5608	4960	438040	327221	0
32	80.8	6483	5712	4862	442940	308453	0
33	80.8	6627	5280	4958	439350	314479	0
34	80.3	6645	6114	4647	444000	305873	0
35	80.8	6740	5681	4525	438710	301728	0
36	80.6	6984	5407	5053	438280	334149	0
37	80.3	6688	6212	5024	442950	312962	0
38	80.1	6862	5788	4463	431580	381229	0
39	79.9	6764	5554	4309	441450	346831	0
40	80.8	6107	6107	4504	437290	306923	0
41	80.7	6370	5647	4577	437580	320061	0
42	80.5	6464	5628	4868	440990	305662	0
43	89.3	7071	5794	4412	440250	325267	0
44	87.1	6974	5924	5089	436030	384266	0
45	87.2	6842	6346	4085	437080	359607	0
46	89.8	6805	5281	4893	437910	315433	0
47	89.7	6973	5880	4841	440080	303694	0
48	89.3	6917	5858	4321	436830	295355	0
49	89.3	6635	6135	4494	445480	311033	0
50	82.2	6731	5985	4926	438440	350716	0
51	89.8	6805	6805	5004	443890	309586	0
52	89.4	6735	6119	5163	440910	303440	0

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HEAVEN HILL 2-3HM

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	1903	2075	1903	2075	Sandstone
Big Lime	2075	2207	2075	2208	Limestone
Big Injun	2207	2501	2208	2503	Sandstone
Weir	2501	2699	2503	2702	Sandstone
Berea	2699	2961	2702	2965	Sandstone
Gordon	2961	3046	2965	3050	Sandstone
Fifty Foot	3046	3628	3050	3634	Sandstone
Speechley	3628	5138	3634	5213	Sandstone
Benson	5138	5461	5213	5548	Sandstone
Alexander	5461	6167	5548	6262	Siltstone
Rhinestreet	6167	6598	6262	6737	Black shale
Middlesex	6598	6684	6737	6869	Black shale
Geneseo/Burkett	6684	6694	6869	6888	Black shale
Tully	6694	6730	6888	6959	Limestone
Hamilton	6730	6808	6959	7177	Grey shale
Marcellus	6808	-	7177	-	Black shale

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/27/2018
Job End Date:	10/29/2018
State:	West Virginia
County:	Marshall
API Number:	47-051-01907-00-00
Operator Name:	Tug Hill Operating, LLC
Well Name and Number:	Heaven Hill Unit 2-3HM
Latitude:	39.81006685
Longitude:	-80.71289518
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,898
Total Base Water Volume (gal):	16,970,006
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	86.07559	Density = 8.340
Ingredients	Listed Above	Listed Above	Water	7732-18-5	100.00000	0.13644	

SAND-COMMON WHITE-30/50, BULK	Halliburton	Proppant								
FDP-S1296-17	Halliburton	Additive				Listed Below				
MC MX 2-2822	Halliburton	Scale Inhibitor				Listed Below				
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant				Listed Below				
MX 8-4543	Halliburton	Biocide				Listed Below				
MX 5-2402	Halliburton	Biocide				Listed Below				
SAND-COMMON WHITE - 100 MESH, 3307 LB BAG	Halliburton	Proppant				Listed Below				
LD-2850	Halliburton	Friction Reducer				Listed Below				

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HYDROCHLORIC ACID	Halliburton	Solvent							
					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	13.67821		
			Sodium chloride	7647-14-5		30.00000	0.02127		
			Sodium Nitrate	7631-99-4		60.00000	0.02113		
			Hydrotreated light Petroleum Distillate	64742-47-8		30.00000	0.02014		
			Hydrochloric acid	7647-01-0		7.50000	0.00890		
			Methanol	67-56-1		100.00000	0.00723		
			Amines, polyethylenepoly-, ethoxylated, phosphonomethylated, sodium salts	70900-16-2		30.00000	0.00678		
			Alcohols C12-16	68551-12-2		5.00000	0.00336		
			Ammonium Chloride	12125-02-9		5.00000	0.00336		
			9-Octadecenamide	93-83-4		5.00000	0.00336		
			Contains no hazardous substances	CAS Not Assigned		100.00000	0.00244		
			Modified Thiourea Polymer	Proprietary		30.00000	0.00013		
			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		
			Formaldehyde	50-00-0		0.09000	0.00002		

* 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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Well: Heaven Hill 2-03 HM (slot D)
 Site: Heaven Hill 2
 Project: Marshall County, West Virginia
 Design: rev7
 Rig: Nabors X08

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Annotation
1	5664.00	11.52	335.34	5674.29	594.36	-373.93	0.00	0.00	-703.70	Survey @ 5664.00 MD 5574.29 TVD
2	5742.00	8.40	335.34	5750.03	605.62	-379.56	4.00	180.00	-715.13	
3	5842.00	8.40	335.34	5797.37	619.92	-385.66	0.00	0.00	-729.68	Proj. Begin 5'100' drophturn
4	6110.00	5.00	155.00	6236.37	627.14	-388.90	5.00	179.87	-732.57	Begin 5.00' tangent
5	6330.00	5.00	155.00	6256.47	659.76	-390.80	0.00	0.00	-718.47	Begin 8'100' build
6	6593.62	34.09	155.00	6295.47	500.69	-329.94	8.00	0.00	-598.58	Begin 10'100' buildturn
7	7244.19	89.00	150.00	6828.00	90.42	-109.91	10.00	-6.10	-133.26	Begin 89.00' lateral
8	16443.98	89.00	150.00	6989.00	-7875.55	4489.37	0.00	0.00	9065.12	PBHL/TD 16443.97 MD/6989.00 TVD

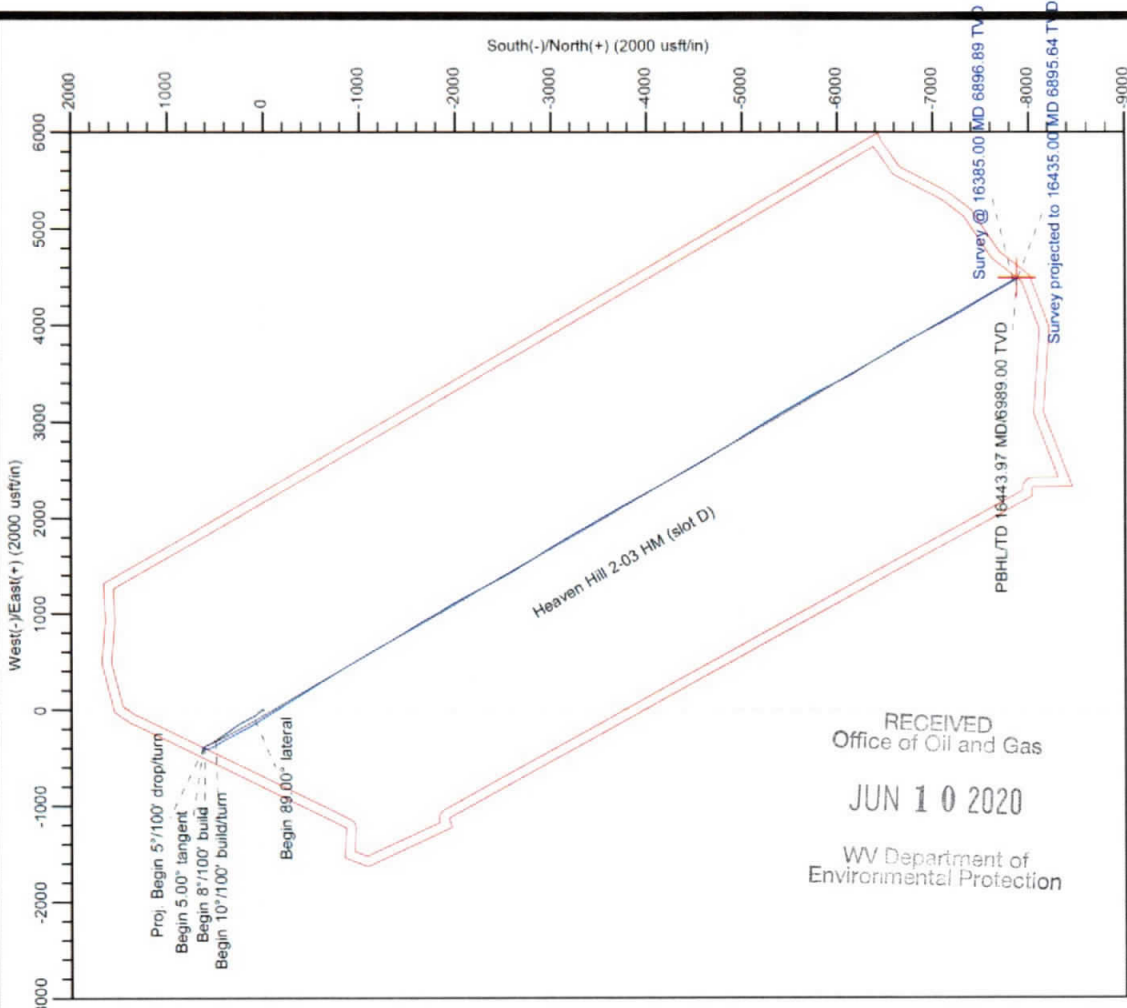
ANNOTATIONS

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

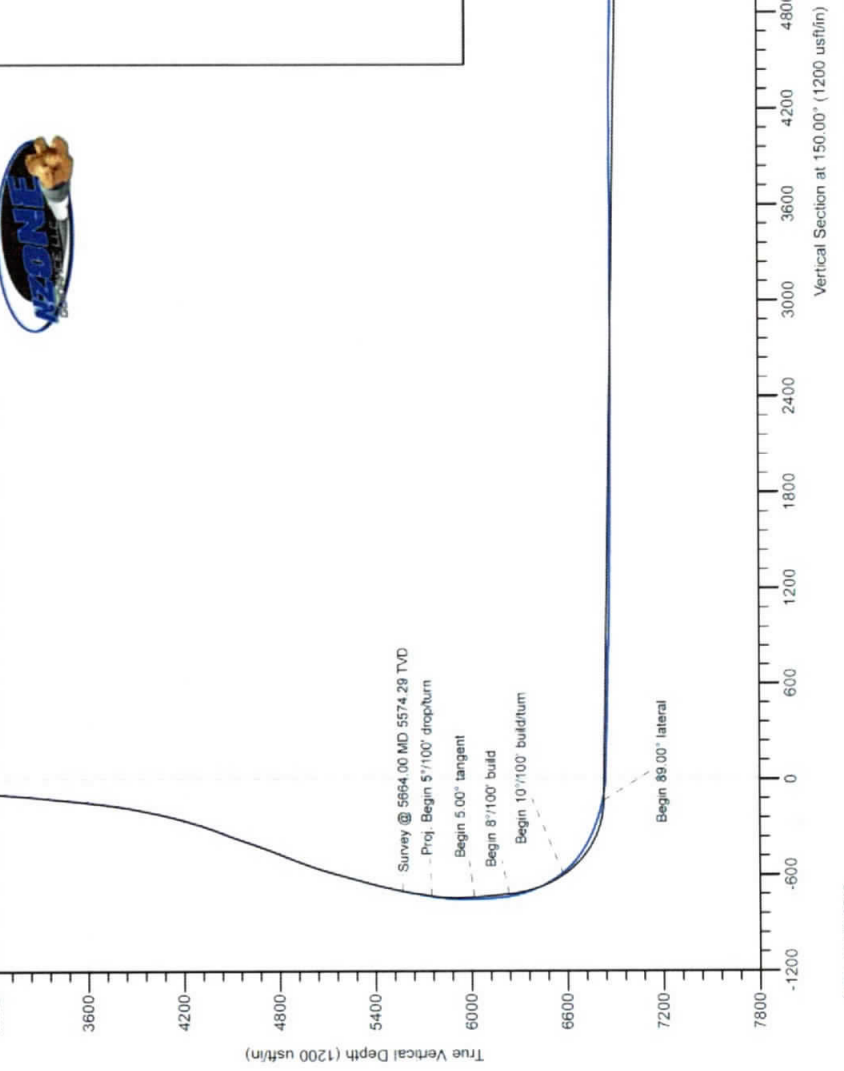
System Datum: Mean Sea Level
 Depth Reference: RKB=1331+33 @ 1364.00usft (Nabors X08)
 Northing: 14457701.63
 Easting: 1721043.02
 Latitude: 39.81006690
 Longitude: -80.71289520
 14457701.63

Azimuths to Grid North
 True Norm -0.18°
 Magnetic Norm -3.90°

Magnetic Field
 Strength: 52066.15nT
 Dip Angle: 66.99°
 Date: 02/26/2018
 Model: IGRF2015



300ft/Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.90°



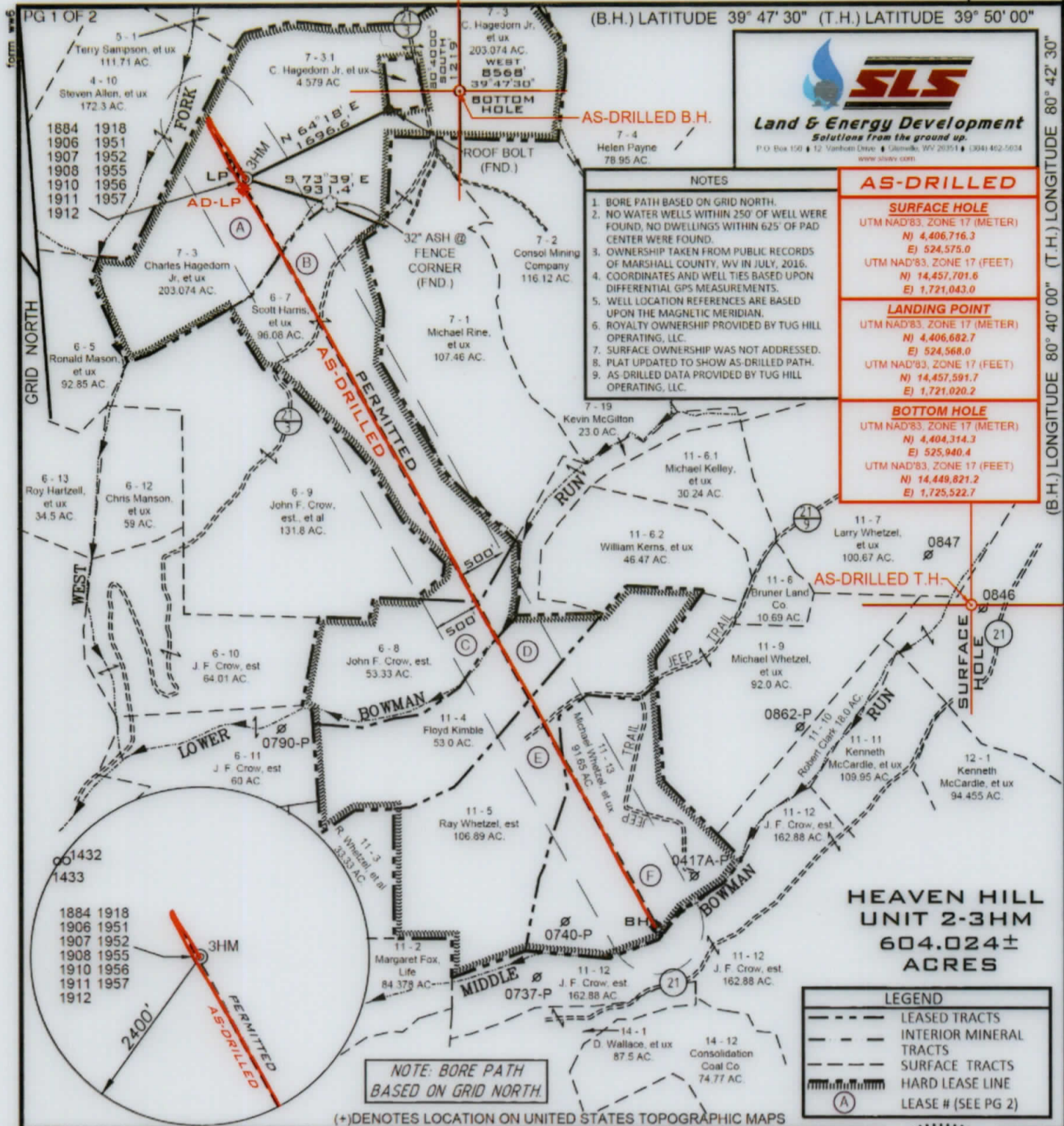
AS-DRILLED B.H.

8,589'

AS-DRILLED T.H.

1,335'

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



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, 2016.
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.
9. AS-DRILLED DATA PROVIDED BY TUG HILL OPERATING, LLC.

AS-DRILLED

SURFACE HOLE

UTM NAD'83, ZONE 17 (METER)
 N) 4,406,716.3
 E) 524,575.0
 UTM NAD'83, ZONE 17 (FEET)
 N) 14,457,701.6
 E) 1,721,043.0

LANDING POINT

UTM NAD'83, ZONE 17 (METER)
 N) 4,406,682.7
 E) 524,568.0
 UTM NAD'83, ZONE 17 (FEET)
 N) 14,457,591.7
 E) 1,721,020.2

BOTTOM HOLE

UTM NAD'83, ZONE 17 (METER)
 N) 4,404,314.3
 E) 525,940.4
 UTM NAD'83, ZONE 17 (FEET)
 N) 14,449,821.2
 E) 1,725,522.7

HEAVEN HILL
 UNIT 2-3HM
 604.024±
 ACRES

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

NOTE: BORE PATH BASED ON GRID NORTH.

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

FILE NUMBER	163-697
DRAWING NUMBER	HHU2_WP_3HM
SCALE	1" = 1500'
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. 849 *C. Victor Moyers*



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



DATE: OCTOBER 17, 2018
 DATE REVISED: OCTOBER 17, 2019
 OPERATORS WELL NO. Heaven Hill Unit 2-3HM As-Drilled

WELL TYPE: OIL ___ GAS LIQUID INJECTION ___ WASTE DISPOSAL ___
 (IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW
 LOCATION ELEVATION 1331' WATERSHED (HUC 10) FISH CREEK

DISTRICT MEADE COUNTY MARSHALL
 QUADRANGLE GLEN EASTON 7.5' LEASE NUMBER SEE ATTACHED PG 2 OF 2

SURFACE OWNER CHARLES R. HAGEDORN, JR., ET UX ACREAGE 203.074
 OIL & GAS ROYALTY OWNER CHARLES R. HAGEDORN, JR., ET AL LEASE ACREAGE 604.024
 PROPOSED WORK: DRILL CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE PLUG OFF OLD FORMATION ___
 PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) ___

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 6,929' TMD:16,387'
 WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
 CT CORPORATION SYSTEM

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

COUNTY NAME PERMIT

WELL OPERATOR TUG HILL OPERATING, LLC
 DESIGNATED AGENT CT CORPORATION SYSTEM
 DIANNA STAMPER
 ESTIMATED DEPTH TVD 6,929' TMD: 16,387'
 PLUG & ABANDON CLEAN OUT & REPLUG

TARGET FORMATION MARCELLUS
 PERFORMATE NEW FORMATION OTHER PHYSICAL CHANGE (SPECIFY)
 OIL & GAS ROYALTY OWNER CHARLES R. HAGEDORN, JR., ET AL
 LEASE ACREAGE 604.024
 SURFACE OWNER CHARLES R. HAGEDORN, JR., ET UX
 ACREAGE 203.074

QUADRANGLE GLEN EASTON 7.5', LEASE NUMBER SEE ATTACHED PG 2 OF 2
 DISTRICT MEADE COUNTY MARSHALL
 LOCATION ELEVATION 1331' WATERSHED (HUC 10) FISH CREEK
 (IF "GAS") PRODUCTION X STORAGE X DEEP X SHALLOW X
 WELL TYPE: OIL X GAS X LIQUID INJECTION X WASTE DISPOSAL X

STATE COUNTY PERMIT
 47-051-01907
 DATE REVISION: OCTOBER 17, 2019
 DATE: OCTOBER 17, 2018
 OPERATORS WELL NO. Heaven Hill Unit 2-3HM As-Drilled

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

PROVEN SOURCE
 OF ELEVATION SUBMETER MAPPING
 GRADE GPS

849 P.S.
 C. Peter Morgan
 I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION



FILE NUMBER 163-697
 DRAWING NUMBER HHU2_WP_3HM
 SCALE 1" = 1500'
 MINIMUM DEGREE OF ACCURACY 1/2500

NOTE: BORE PATH BASED ON GRID NORTH
 (+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

LEGEND

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

HEAVEN HILL UNIT 2-3HM
 604.024± ACRES

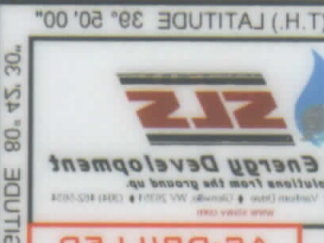
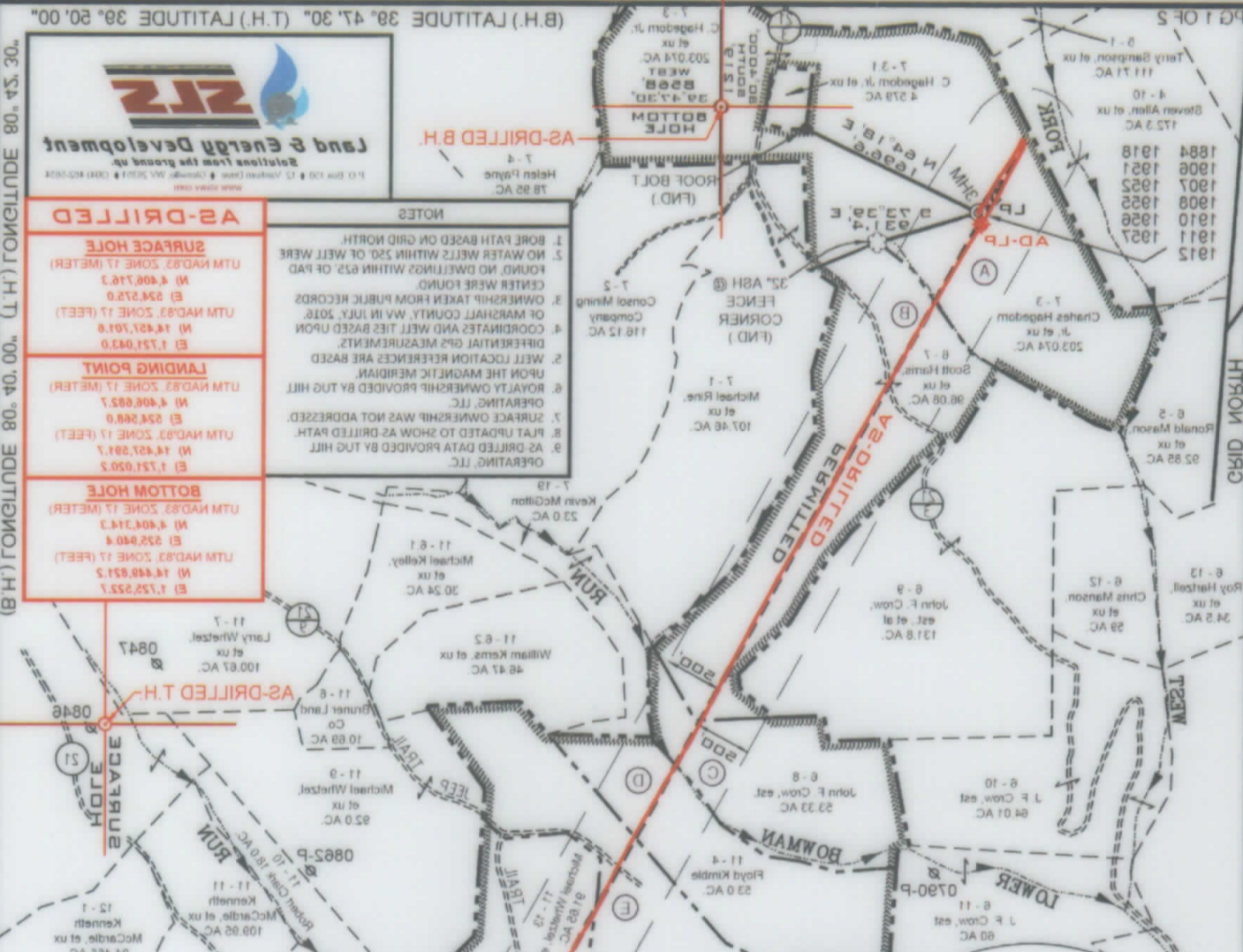
AS-DRILLED B.H. (B.H.) LATITUDE 39° 47' 30" (T.H.) LATITUDE 39° 50' 00"
 AS-DRILLED T.H. 8° 20' 3" AS-DRILLED B.H. 1° 33' 1" AS-DRILLED T.H. 8° 28' 9" AS-DRILLED B.H. 1° 33' 1"

NOTES

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

AS-DRILLED

BOTTOM HOLE	UTM NAD83, ZONE 17 (FEET)	E1 1732.9537
	UTM NAD83, ZONE 17 (FEET)	N1 1448.8215
	UTM NAD83, ZONE 17 (FEET)	E1 524.9699
LANDING POINT	UTM NAD83, ZONE 17 (FEET)	N1 4408.8827
	UTM NAD83, ZONE 17 (FEET)	E1 524.9699
SURFACE HOLE	UTM NAD83, ZONE 17 (FEET)	N1 4408.7163
	UTM NAD83, ZONE 17 (FEET)	E1 524.9699



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