

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

API 47 - 051 - 02411 County Marshall District Franklin
Quad Powhatan Point Pad Name MND23 Field/Pool Name Moundsville
Farm name HG Energy II Appalachia, LLC Well Number MND23 N-5H
Operator (as registered with the OOG) HG Energy II Appalachia, LLC
Address 5260 Dupont Rd. City Parkersburg State WV Zip 26101

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4407238.9 Easting 520041.9
Landing Point of Curve Northing 4407121.4 Easting 520112.8
Bottom Hole Northing 4409235.9 Easting 518560.3

Elevation (ft) 1238 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)
Air/ OBM

Barite, Lime, CaCL, base oil, Gilsonite, Asphalt, clay, Emulsifier, sulfatone, safevert FLG, safevert WA

Date permit issued 09/13/2021 Date drilling commenced 11/1/2021 Date drilling ceased 4/13/2022
Date completion activities began 5/23/2022 Date completion activities ceased 11/18/2022
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

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

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Freshwater depth(s) ft _____ Open mine(s) (Y/N) depths 862-868 WV Department of Environmental Protection
Salt water depth(s) ft Not observed Void(s) encountered (Y/N) depths N
Coal depth(s) ft 862,877 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

APPROVED

Reviewed by:
[Signature]
09/15/2023

API 47-051 - 02411 Farm name HG Energy II Appalachia, LLC Well number MND23 N-5H

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	28"	20"	40'	New	94 lbs/ft J-55		Yes
Surface	18.5"	13.375"	1196	New	54.5 lbs/ft J-55		Yes
Coal							
Intermediate 1	12.25"	9.625"	3154	New	40 lbs/ft J55		Yes
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	15512	New	20 lbs/ft P-110		Yes
Tubing	4.67	2.375	6996	New	4.7 lbs/ft J55		not cemented
Packer type and depth set							

Comment Details Conductor: 19.5 bbls cement to surface performed by Lightning Energy Services along with cellars

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	Class A	93				Surface	8
Surface	Class A	1280	15.6	1.19	1523	Surface	8
Coal							
Intermediate 1	Class A	1071	15.6	1.24	1328	Surface	8
Intermediate 2							
Intermediate 3							
Production	Class A	3826	16.0	1.13	4323	Surface	8
Tubing							

Drillers TD (ft) 15551 Loggers TD (ft) _____
 Deepest formation penetrated Marcellus Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 6621

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 _____

13.375" casing: Bow spring centralizers run on first 2 joints then placed every 3 joints to 100' from surface
 9.625" casing: Bow spring centralizers run every joint for first 12 joints then placed every 3 joints to 100' from surface
 5.5" casing: Spiral centralizer run every 3 joints from the 1st long joint to the top of the curve (KOP) Spiral centralizer run every 5 joints from the top of curve (KOP) to surface

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WV Department of
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WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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HG Energy II Appalachia, LLC
MND23 N-5H
Perforation Record

Stage #	Perf Date	Perf from depth	Perf to depth	Number of Perforations	Formation
Sleeve/1	10/15/2022	15461	15435	2	Marcellus
2	10/15/2022	15401	15233	28	Marcellus
3	10/16/2022	15205	15037	28	Marcellus
4	10/16/2022	15009	14841	28	Marcellus
5	10/16/2022	14813	14645	28	Marcellus
6	10/17/2022	14617	14449	28	Marcellus
7	10/17/2022	14421	14253	28	Marcellus
8	10/18/2022	14225	14057	28	Marcellus
9	10/18/2022	14029	13861	28	Marcellus
10	10/19/2022	13833	13665	28	Marcellus
11	10/19/2022	13637	13469	28	Marcellus
12	10/19/2022	13441	13273	28	Marcellus
13	10/20/2022	13245	13077	28	Marcellus
14	10/20/2022	13049	12881	28	Marcellus
15	10/21/2022	12853	12685	28	Marcellus
16A	10/21/2022	12657	12489	28	Marcellus
16B	10/22/2022	12657	12459	53	Marcellus
17	10/22/2022	12431	12278	28	Marcellus
18	10/23/2022	12250	12097	28	Marcellus
19	10/23/2022	12069	11901	28	Marcellus
20	10/23/2022	11873	11705	28	Marcellus
21	10/24/2022	11677	11509	28	Marcellus
22	10/24/2022	11481	11313	28	Marcellus
23	10/24/2022	11285	11117	28	Marcellus
24	10/25/2022	11089	10921	28	Marcellus
25	10/25/2022	10893	10725	28	Marcellus
26	10/26/2022	10697	10529	28	Marcellus
27	10/26/2022	10501	10333	28	Marcellus
28	10/26/2022	10305	10137	28	Marcellus
29	10/27/2022	10109	9941	28	Marcellus
30	10/27/2022	9913	9745	28	Marcellus
31	10/27/2022	9717	9549	28	Marcellus
32	10/28/2022	9521	9353	28	Marcellus
33	10/28/2022	9325	9157	28	Marcellus
34	10/28/2022	9129	8961	28	Marcellus
35	10/29/2022	8933	8765	28	Marcellus
36	10/29/2022	8737	8569	28	Marcellus
37	10/29/2022	8540	8372	28	Marcellus
38	10/30/2022	8342	8174	28	Marcellus
39	10/30/2022	8144	7976	28	Marcellus
40	10/30/2022	7946	7778	28	Marcellus
41	10/31/2022	7748	7580	28	Marcellus
42	10/31/2022	7550	7382	28	Marcellus
43	11/1/2022	7352	7184	28	Marcellus
44	11/1/2022	7154	7105	28	Marcellus

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HG Energy II Appalachia, LLC
MND23 N-5H
Stimulation Record

Stage #	Date	Avg Pump Rate (BPM)	Avg Treatment Press (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Proppant (LBS)	Water (BBLs)
Sleeve/1	10/15/2022	21.0	7733	9166	3858	0	1,449
2	10/15/2022	104.0	8,158	5,183	3,991	635000	13,619
3	10/16/2022	107.0	7,752	5,249	3,877	662000	12,841
4	10/16/2022	98.0	7,719	4,571	4,639	663300	11,126
5	10/16/2022	108.0	7,841	5,603	4,562	661000	9,631
6	10/17/2022	102.0	7,545	5,657	5,114	661000	10,155
7	10/17/2022	108.0	7,751	3,797	4,934	661000	9,462
8	10/18/2022	99.0	7,317	4,928	5,328	661000	9,537
9	10/18/2022	92.0	7,609	5,281	4,974	661000	13,104
10	10/19/2022	108.0	8,261	5,747	4,871	630000	10,282
11	10/19/2022	97.0	7,615	5,347	5,125	630000	8,592
12	10/19/2022	103.0	7,581	5,944	5,388	630000	10,310
13	10/20/2022	103.0	7,476	5,485	4,835	630000	9,097
14	10/20/2022	103.0	7,940	4,066	4,342	630300	11,618
15	10/21/2022	100.0	7,432	5,821	5,311	630000	9,304
16A	10/21/2022	42.7	8,048	5,276	4,515	1400	3,614
16B	10/22/2022	102.0	7,137	4,905	4,951	630300	9,440
17	10/22/2022	102.0	7,105	5,576	5,455	630000	9,722
18	10/23/2022	101.0	7,172	5,460	5,637	630200	9,404
19	10/23/2022	101.0	7,278	5,767	5,289	630000	9,314
20	10/23/2022	87.0	6,683	5,597	5,002	630000	9,336
21	10/24/2022	103.0	7,261	5,679	4,671	630300	9,158
22	10/24/2022	103.0	7,173	5,568	4,902	630200	9,037
23	10/24/2022	95.0	7,232	5,824	4,694	630200	8,944
24	10/25/2022	105.0	6,982	5,525	4,819	630300	9,310
25	10/25/2022	103.0	7,565	5,272	4,242	630200	10,982
26	10/26/2022	102.0	7,739	5,475	4,745	611800	12,308
27	10/26/2022	103.0	6,908	5,545	4,799	630300	9,334
28	10/26/2022	106.0	7,329	5,304	5,280	625000	8,706
29	10/27/2022	106.0	7,282	5,529	4,718	625000	8,830
30	10/27/2022	104.0	6,915	5,484	4,678	625000	10,579
31	10/27/2022	109.0	7,550	5,306	5,212	625000	10,082
32	10/28/2022	102.0	6,874	5,249	4,941	625000	9,709
33	10/28/2022	107.0	6,992	5,306	5,016	625000	9,615
34	10/28/2022	105.0	7,165	5,344	5,492	625000	9,418
35	10/29/2022	106.0	7,023	5,355	4,921	625000	8,838
36	10/29/2022	108.0	6,618	5,511	5,010	625000	9,240
37	10/29/2022	101.0	7,662	4,586	4,279	625000	10,632
38	10/30/2022	107.0	6,802	5,622	5,177	625000	9,252
39	10/30/2022	108.0	6,686	5,446	4,715	625000	9,096
40	10/30/2022	102.0	6,847	3,191	4,835	584700	11,539
41	10/31/2022	110.0	6,645	4,063	5,013	625000	8,866
42	10/31/2022	103.0	6,525	5,497	4,824	625000	9,845
43	11/1/2022	108.0	6,533	3,966	4,842	625000	9,039
44	11/1/2022	108.0	6,849	6,323	4,858	625000	10,589

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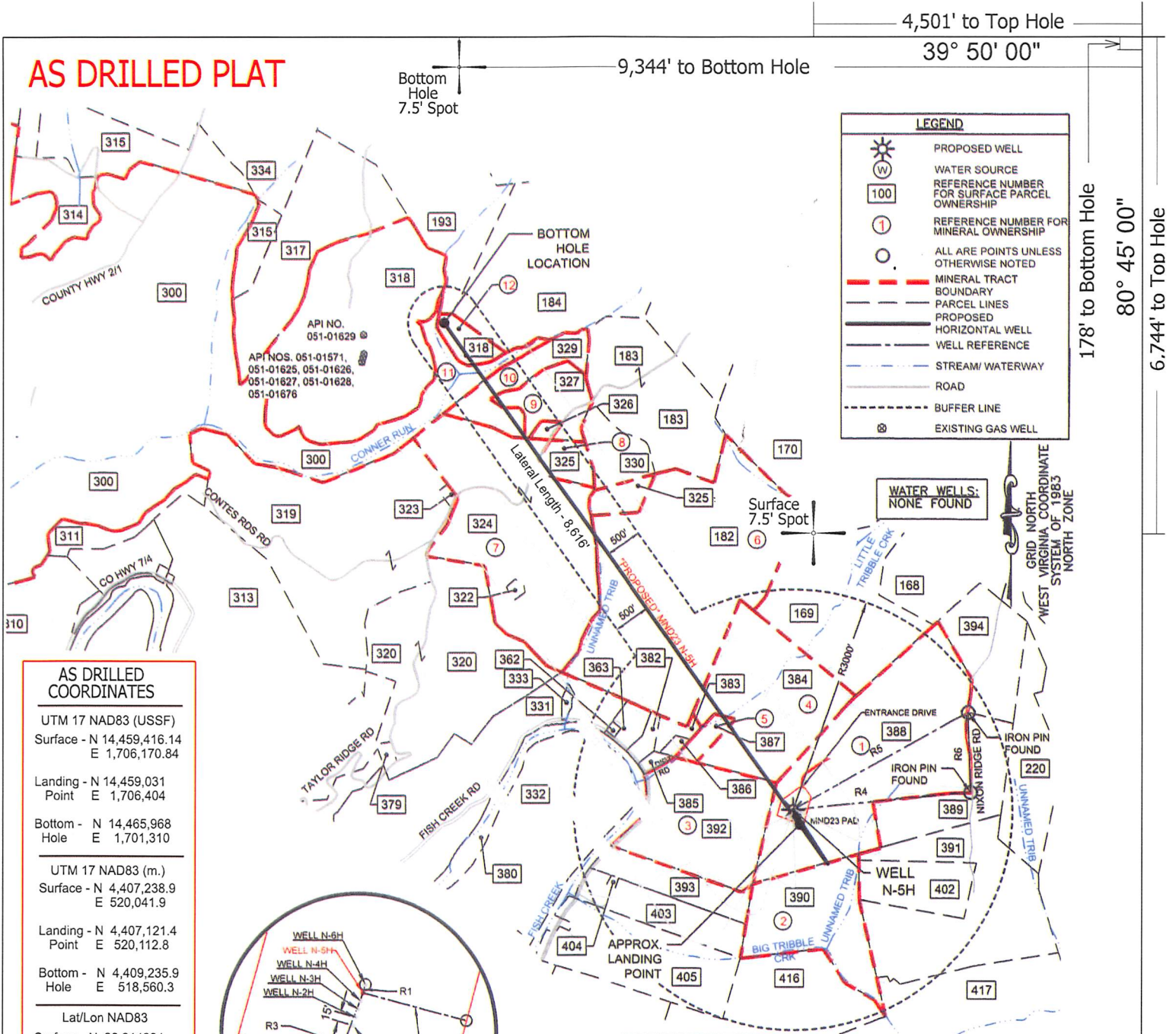
Actual Tops MND23 N5H

GI	1238			
PD110	1265			
	Base		Base	
Formation	MD	TVD	MD	TVD
Pittsburgh Coal	862	862	868	868
Coal	877	877	880	880
Surface casing	1155	set		
Big lime	1966	1960	2049	2049
Big Injun	2049	2049	2131	2131
Pocono Big Injun	2131	2131	2243	2243
5th Sand/weir	2410	2410	2430	2430
berea	2587	2586	2633	2632
gordon	2837	2836	2856	2855
50'	2938	2937	2970	2969
Casing	3154	set	3195	drill
speechley	3540	3538	3616	3612
Benson	5178	5063	5194	5075
Alexander	5224	5102	5533	5372
Rhinestreet	6114	5929	6473	6260
Cashaqua	6473	6260	6559	6325
Middlesex	6559	6325	6592	6348
West River	6592	6348	6688	6400
Burket	6688	6400	6712	6421
Tully	6712	6421	6799	6463
Hamilton	6799	6463	6935	6506
Marcellus	6935	6506	15551	6394

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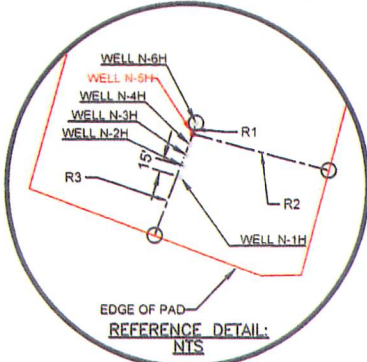
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AS DRILLED PLAT

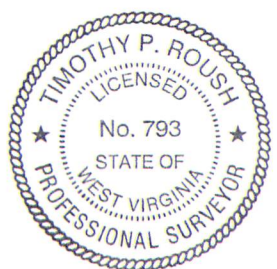


LEGEND	
	PROPOSED WELL
	WATER SOURCE
	REFERENCE NUMBER FOR SURFACE PARCEL OWNERSHIP
	REFERENCE NUMBER FOR MINERAL OWNERSHIP
	ALL ARE POINTS UNLESS OTHERWISE NOTED
	MINERAL TRACT
	BOUNDARY
	PARCEL LINES
	PROPOSED HORIZONTAL WELL
	WELL REFERENCE
	STREAM/WATERWAY
	ROAD
	BUFFER LINE
	EXISTING GAS WELL

AS DRILLED COORDINATES	
UTM 17 NAD83 (USSF)	
Surface - N	14,459,416.14
E	1,706,170.84
Landing - N 14,459,031	
Point	E 1,706,404
Bottom - N 14,465,968	
Hole	E 1,701,310
UTM 17 NAD83 (m.)	
Surface - N	4,407,238.9
E	520,041.9
Landing - N 4,407,121.4	
Point	E 520,112.8
Bottom - N 4,409,235.9	
Hole	E 518,560.3
Lat/Lon NAD83	
Surface - N	39.814894
E	80.765838
Landing - N 39.813834	
Point	E 80.765013
Bottom - N 39.832921	
Hole	E 80.783091



LINE TABLE		
LINE	BEARING	DISTANCE
R1	S15°36'10"W	15.00'
R2	N75°02'10"W	188.57'
R3	N20°19'49"E	144.66'
R4	S84°19'41"W	2440.91'
R5	S60°54'03"W	2744.81'
R6	N01°36'10"W	1094.04'



- NOTES ON PLAT**
- The purpose of this plat is to show coordinates for the subject well as drilled.
 - The drawing shown hereon is from the original drilling permit application plat dated 6/4/19 prepared by Adam J. Westfall, W.Va. PS #2269.
 - As drilled Landing Point, Bottom Hole Location and lateral length are calculated from gyro measurements taken while drilling the well.
 - Latitude/Longitude offset measurements are referenced to NAD 1927.

(SIGNED) *Timothy P. Roush*
TIMOTHY P. ROUSH PS 793

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

FILE NO. _____
SCALE: 1" = 2,000'
MINIMUM DEGREE OF ACCURACY: Sub-Meter
PROVEN SOURCE OF ELEVATION: DGPS Survey



WEST VIRGINIA
Department of Environmental Protection
Office of Oil and Gas
601 57th Street
Charleston, West Virginia 25301

DATE: November 9, 2022
WELL NAME: MND23 N-5H
API WELL NO.: 47 - 051 - 02411
State County Permit

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

LOCATION: ELEVATION 1,237' WATERSHED Big Tribble Creek
DISTRICT: Franklin COUNTY: Marshall QUADRANGLE: Powhatan Point 7.5'
SURFACE OWNER: HG Energy II, Appalachia ACREAGE: 126.6 Ac.
OIL & GAS ROYALTY OWNER: Charles W. Miller et al. LEASE ACREAGE: 190.4 Ac. LEASE NO. _____
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) Show As Drilled Coordinates and Lateral Length
PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION Marcellus Shale ESTIMATED DEPTH 6,394' TVD 15,551' TMD

WELL OPERATOR: HG Energy II Appalachia, LLC. DESIGNATED AGENT: Diane White
ADDRESS: 5260 DuPont Road ADDRESS: 5260 DuPont Road
Parkersburg, WV 26101 Parkersburg, WV 26101

09/15/2023

