

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

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WV Department of
Environmental Protection

API 47 - 033 - 05815 County Harrison District Union
Quad West Milford, WV 7.5' Pad Name KST5 Field/Pool Name _____
Farm name James Ivan McDonald Well Number KST5 BHS
Operator (as registered with the OOG) HG Energy II Appalachia, LLC
Address 5260 Dupont Road 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 4335850.14 Easting 545521.83
Landing Point of Curve Northing 4335619.34 Easting 545198.59
Bottom Hole Northing 4332671.67 Easting 546249.14

Elevation (ft) 1134 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)
Synthetic Oil Base Mud, Additives - Lime, Calcium Chloride, Gilsonite, Asphalt, Barite, Emulsifier, Base Oil

Date permit issued 03/06/2018 Date drilling commenced 3/19/2018 Date drilling ceased 6/18/18
Date completion activities began 7/29/2018 Date completion activities ceased 12/17/18
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

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

Freshwater depth(s) ft 521' Open mine(s) (Y/N) depths No
Salt water depth(s) ft Not observed Void(s) encountered (Y/N) depths No
Coal depth(s) ft 620, 692 Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) _____

Reviewed by:
SDWS/2020

API 47-033 - 05815 Farm name James Ivan McDonald Well number KST5 BHS

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	24"	20"	114'	N	J-55 94#		N - Drilled In
Surface	17 1/2"	13 3/8"	943'		J-55 54#	None	Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	2494'	N	J-55 40#	None	Y
Intermediate 2							
Intermediate 3							
Production	8 1/2"	5 1/2"	17499'	N	P-110 20#	None	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 ²)	Cement Top (MD)	WOC (hrs)
Conductor	Drilled In					Drilled In	
Surface	Class A	950	15.6	1.19		Surface	8
Coal							
Intermediate 1	Class A	903	15.4	1.14		Surface	8
Intermediate 2							
Intermediate 3							
Production	Class A	3660	13.5	1.41 lead - 1.16 tail		Surface	8
Tubing							

Drillers TD (ft) 17499' Loggers TD (ft) 17499'
 Deepest formation penetrated Marcellus Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 5400'

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 _____
Fresh Water - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface
Coal - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface
Intermediate - Bow spring centralizers on the first two joints and every fourth joint inside surface casing
Production - Run 1 spiral centralizer every 3 joints from the 1st 5.5" long joint to the top of the curve

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- 033 - 05815

Farm name James Ivan McDonald

Well number KST5 BHS

PERFORATION RECORD

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

Please insert additional pages as applicable.

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STIMULATION INFORMATION PER STAGE

WV Department of
Environmental Protection

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- 033 - 05815 Farm name James Ivan McDonald Well number KST5 BHS

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>6860' - 6700'</u> TVD	<u>7181' - 17416'</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3608 psi Bottom Hole _____ psi DURATION OF TEST 545 hrs

OPEN FLOW Gas 18251 mcfpd Oil _____ bpd NGL _____ bpd Water 864 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 ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	<u>0</u>		<u>0</u>		
					See Attached

Please insert additional pages as applicable.

Drilling Contractor Patterson Drilling
Address 2198 University Drive City Lemont Furnace State PA Zip 15456

Logging Company Schlumberger
Address 100 Gillingham Lane City Sugar Land State TX Zip 77478

Cementing Company C&J Energy Services
Address 3990 Rogerdale City Houston State TX Zip 77042

Stimulating Company Stingray
Address 14201 Caliber Drive City Oklahoma City State OK Zip 73134

Please insert additional pages as applicable.

Completed by Diane White Telephone 304-420-1119
Signature Diane White Title _____ Date 3/23/2020

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

Stage	Top Perf	Bottom Perf	TVD	Plug Depth
1st	17,315	17,365	6,701	
2nd	17,088	17,286	6,702	17,295
3rd	16,872	17,070	6,706	17,079
4th	16,656	16,854	6,707	16,863
5th	16,440	16,638	6,710	16,647
6th	16,145	16,325	6,712	16,334
7th	15,947	16,127	6,715	16,136
8th	15,749	15,929	6,722	15,938
9th	15,551	15,731	6,727	15,740
10th	15,353	15,533	6,734	15,542
11th	15,155	15,335	6,745	15,344
12th	14,957	15,137	6,755	15,146
13th	14,759	14,939	6,763	14,948
14th	14,561	14,741	6,774	14,750
15th	14,363	14,543	6,784	14,552
16th	14,165	14,345	6,793	14,354
17th	13,967	14,147	6,797	14,156
18th	13,769	13,949	6,805	13,958
19th	13,571	13,751	6,813	13,760
20th	13,373	13,553	6,822	13,562
21st	13,175	13,355	6,829	13,364
22nd	12,977	13,157	6,836	13,166
23rd	12,779	12,959	6,843	12,968
24th	12,581	12,761	6,847	12,770
25th	12,383	12,563	6,853	12,572
26th	12,185	12,365	6,860	12,374
27th	11,987	12,167	6,865	12,176
28th	11,789	11,969	6,872	11,978
29th	11,591	11,771	6,876	11,780
30th	11,393	11,573	6,881	11,582
31st	11,195	11,375	6,887	11,384
32nd	10,997	11,177	6,894	11,186
33rd	10,799	10,979	6,901	10,988
34th	10,601	10,781	6,906	10,790
35th	10,403	10,583	6,911	10,592
36th	10,205	10,385	6,913	10,394
37th	10,016	10,187	6,916	10,196
38th	9,827	9,998	6,917	10,007
39th	9,638	9,809	6,917	9,818
40th	9,449	9,620	6,917	9,629
41st	9,260	9,431	6,918	9,440
42nd	9,071	9,242	6,918	9,251
43rd	8,882	9,053	6,918	9,062
44th	8,693	8,864	6,919	8,873
45th	8,504	8,675	6,919	8,684
46th	8,315	8,486	6,919	8,495
47th	8,126	8,297	6,919	8,306
48th	7,937	8,108	6,919	8,117
49th	7,748	7,919	6,918	7,928
50th	7,559	7,730	6,914	7,739
51st	7,370	7,541	6,911	7,550
52nd	7,181	7,352	6,903	7,361

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Well: KETS 815
 Owner: State of Texas
 Location: West Virginia / Harrison County
 Formation: Marcellus
 API Number: 47-033-05815

Testment Summary

Well	Owner	Location	Formation	API Number	Test Date	Flow Rate (gpm)	Pressure (psi)	Temperature (°F)	Gas (scf)	Water (bbl)	Oil (bbl)	Separator	Notes				
1	10/21/2018	13,303	8,912	9,588	73.4	83.5	38,540	298,760	17,915	17,385	2,058	na	3,925	3,899	17,462	1.02	2.00
2	10/21/2018	11,143	9,068	9,585	85.0	82.3	40,290	605,950	16,872	17,070	2,058	na	4,950	4,899	18,525	1.17	3.38
3	10/22/2018	12,883	9,305	9,986	84.7	88.1	38,000	574,180	16,858	17,070	2,058	na	5,170	5,170	17,978	1.21	2.70
4	10/22/2018	14,311	8,970	9,530	85.0	84.0	39,040	583,360	16,858	16,858	2,058	na	5,190	5,190	18,740	1.20	3.14
5	10/22/2018	8,500	8,477	10,114	84.3	86.1	39,440	624,140	15,447	16,232	2,058	na	6,197	6,197	18,682	1.24	3.32
6	10/22/2018	14,782	9,018	11,087	80.8	86.1	38,340	584,180	15,447	16,232	2,058	na	5,480	5,480	19,430	1.24	2.16
7	10/22/2018	14,713	9,244	11,087	84.6	86.1	38,400	612,180	15,447	15,935	2,058	na	6,433	6,433	17,858	1.18	3.59
8	10/22/2018	14,814	9,210	10,184	80.1	82.5	38,400	619,480	15,447	15,335	2,058	na	6,550	6,550	19,155	1.18	3.50
9	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
10	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
11	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
12	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
13	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
14	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
15	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
16	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
17	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
18	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
19	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
20	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
21	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
22	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
23	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
24	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
25	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
26	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
27	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
28	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
29	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
30	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
31	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
32	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
33	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
34	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
35	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
36	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
37	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
38	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
39	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
40	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
41	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
42	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
43	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
44	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
45	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
46	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
47	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
48	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
49	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
50	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
51	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19
52	10/22/2018	14,355	9,281	9,958	87.4	90.8	40,000	634,960	15,447	15,335	2,058	na	5,210	5,210	20,927	1.22	3.19

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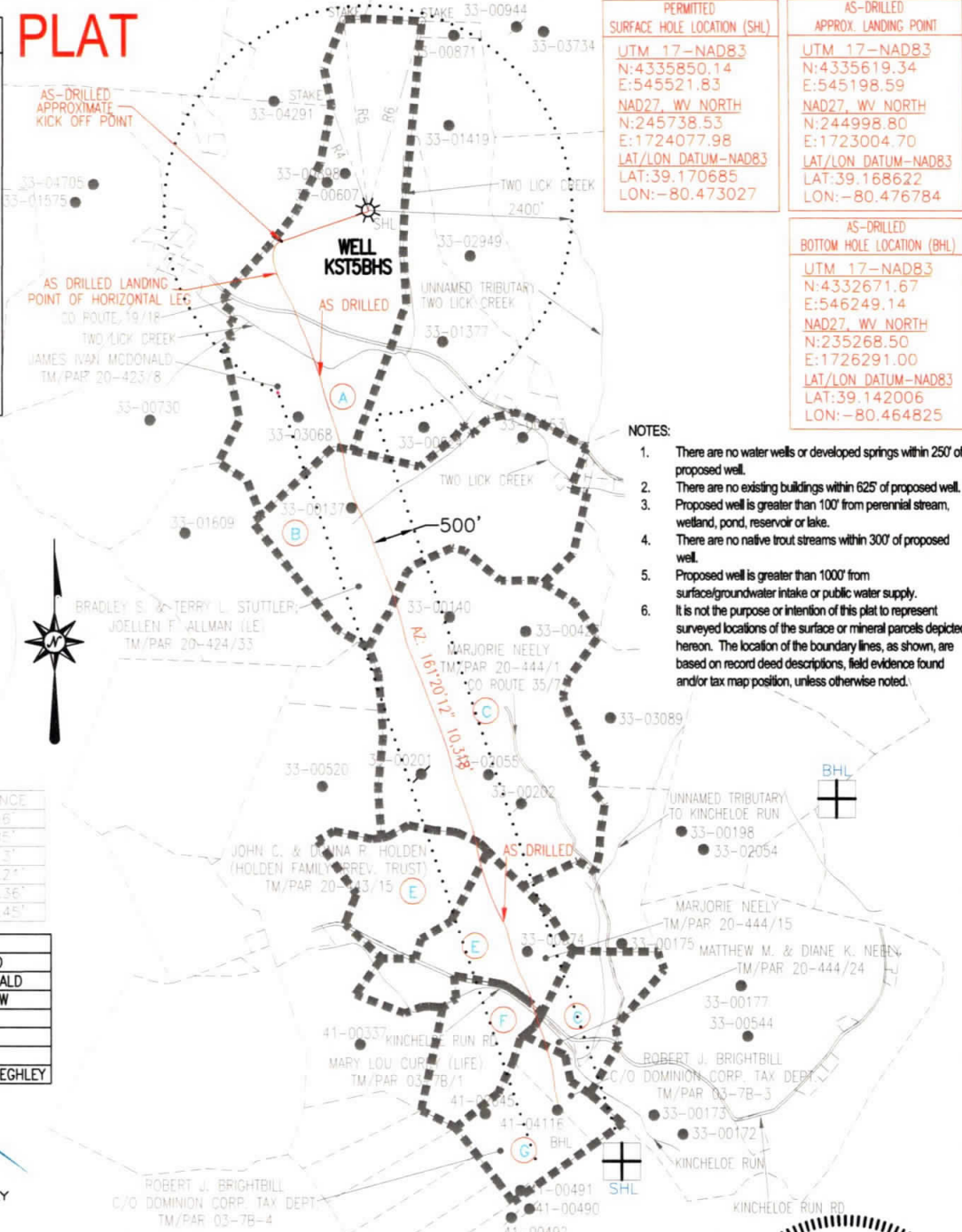
AS DRILLED BHL is located on topo map 9,470 feet south of Latitude: 39° 10' 00"
 SHL is located on topo map 13,713 feet south of Latitude: 39° 12' 30"

BHL is located on topo map 1,633 feet west of Longitude: 80° 27' 30"
 SHL is located on topo map 4,166 feet west of Longitude: 80° 27' 30"

LEGEND

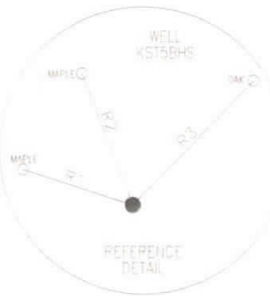
- TOPO MAP POINT
- WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED
- MINERAL TRACT BOUNDARY
- LESSORS
- PARCEL LINES
- LEASE BOUNDARY
- WELL REFERENCE
- AS-DRILLED
- ROAD
- STREAM CENTER LINE
- WELLS WITHIN 2400'
- EXISTING WELLS
- PLUGGED WELL

PLAT



PERMITTED SURFACE HOLE LOCATION (SHL)	AS-DRILLED APPROX. LANDING POINT
UTM 17-NAD83 N:4335850.14 E:545521.83	UTM 17-NAD83 N:4335619.34 E:545198.59
NAD27 WV NORTH N:245738.53 E:1724077.98	NAD27 WV NORTH N:244998.80 E:1723004.70
LAT/LON DATUM-NAD83 LAT:39.170685 LON:-80.473027	LAT/LON DATUM-NAD83 LAT:39.168622 LON:-80.476784
AS-DRILLED BOTTOM HOLE LOCATION (BHL)	
UTM 17-NAD83 N:4332671.67 E:546249.14	
NAD27 WV NORTH N:235268.50 E:1726291.00	
LAT/LON DATUM-NAD83 LAT:39.142006 LON:-80.464825	

- NOTES:**
- There are no water wells or developed springs within 250' of proposed well.
 - There are no existing buildings within 625' of proposed well.
 - Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
 - There are no native trout streams within 300' of proposed well.
 - Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
 - It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.



LINE	BEARING	DISTANCE
R1	N 2°02'36" W	145.46'
R2	N 20°58'05" W	177.85'
R3	N 44°12'42" E	219.13'
R4	N 10°16'58" W	1302.27'
R5	N 57°11'36" W	2254.36'
R6	N 16°04'52" E	2309.45'

PARCEL	LESSOR
A	R. C. & M. B. MCDONALD
	A. M. & LYDIA D. MCDONALD
B	JAMES S. & SUSANNA LAW
C	GUINN & JANE MINTER
E	W. R. & L. E. NEELY
F	GUINN & JANE MINTER
G	WILLIAM E. & HARRIET BEEGHLEY

Blue Mountain
 11023 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: KST5BHS-AS DRILLED
 DRAWING #: KST5BHS-AS DRILLED
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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.

Signed: George D. Six
 R.P.E.: _____ L.L.S.: P.S. No. 2000

GEORGE D. SIX
 LICENSED
 No. 2000
 STATE OF WEST VIRGINIA
 PROFESSIONAL SURVEYOR

PLACE SEAL HERE

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

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 Office of Oil and Gas
APR 03 2020
 WV Department of Environmental Protection

DATE: JANUARY 25, 2019
 OPERATOR'S WELL #: KST5BHS-AS DRILLED
 API WELL #: 47 33 05815
 STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: MIDDLE WEST FORK CREEK ELEVATION: 1,134'±
 COUNTY/DISTRICT: HARRISON / UNION QUADRANGLE: WEST MILFORD, WV 7.5'
 SURFACE OWNER: JAMES IVAN MCDONALD ACREAGE: 176.000±
 OIL & GAS ROYALTY OWNER: R. C. MCDONALD & M. B. MCDONALD; A. M. MCDONALD & LYDIA D. MCDONALD ACREAGE: 1328.95±

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): AS-DRILLED PLAT

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: AS-DRILLED TVD: 6,699'± TMD: 17,499±
 WELL OPERATOR HG ENERGY II APPALACHIA, LLC DESIGNATED AGENT DIANE C. WHITE
 Address 5260 DUPONT ROAD Address 5260 DUPONT ROAD
 City PARKERSBURG State WV Zip Code 26101 City PARKERSBURG State WV Zip Code 26101



(e.g. XY-XXY-XXXXX-0000)

Fracture Start Date/Time:	10/21/18 2:37
Fracture End Date/Time:	11/11/18 3:03
State:	West Virginia
County:	Harrison
API Number:	47-033-05815-0000
Operator Number:	HG Energy
Well Name:	BHS
Federal Well:	Yes
Tribal Well:	No
Longitude:	-80.473034
Latitude:	39.170668
Long/Lat Projection:	WGS84
True Vertical Depth (TVD):	6,839'
Total Clean Fluid Volume* (gal):	30,330,510

Additive	Specific Gravity	Additive Quantity	Mass (lbs)
Water	1.00	30,330,510	253,108,106
Sand (Silica)	2.65	35,830,720	35,830,720
Hydrochloric Acid (28%)	1.16	30,747	30,747
NEFE-180	0.99	215	1,779
Total Slurry Mass (Lbs)			288,971,332

Ingredients Section:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Mass per Component (LBS)	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Gulfport Energy	Carrier/Base Fluid	Water	7732-18-5	100.00%	253,108,106	87.58934%	
Sand (Silica)	Muskie	Proppant	Silica Substrate	14808-60-7	100.00%	35,830,720	12.39940%	
Hydrochloric Acid (28%)	Oxy	Acidizing	Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	28.00%	8,609	0.00298%	
NEFE-180	Chemplex	Corrosion Inhibitor/Iron Control	Acetic acid	64-19-7	65.00%	1,156	0.00040%	
			Methanol	67-56-1	35.00%	623	0.00022%	
			2-Ethylhexanol	104-76-7	10.00%	178	0.00006%	
			Olefin	Proprietary	5.00%	89	0.00003%	
			Fatty acids, tall oil	61790-12-3	5.00%	89	0.00003%	
			Coconut oil acid diethanolamine	68603-42-9	5.00%	89	0.00003%	
			Alcohols, C14-15, ethoxylated	68951-67-7	5.00%	89	0.00003%	
			2-Propyn-1-ol	107-19-7	5.00%	89	0.00003%	

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