

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

API 47-085-10158 County Ritchie District Murphy
Quad Macfarlan 7.5' Pad Name 900 Field/Pool Name Hartley
Farm name Heartwood Forestland Fund IV Well Number 900 N-1H
Operator (as registered with the OOG) HG Energy, 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 4,322,077 Easting 483,466
Landing Point of Curve Northing 4,322,270 Easting 483,370
Bottom Hole Northing 4,322,466 Easting 483,118

Elevation (ft) 1116.5' 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)
N/A

Date permit issued 9/9/2014 Date drilling commenced 10/10/2014 Date drilling ceased 12/13/2014
Date completion activities began 12/19/2014 Date completion activities ceased 1/10/2015
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 NA Open mine(s) (Y/N) depths No
Salt water depth(s) ft NA Void(s) encountered (Y/N) depths No
Coal depth(s) ft NA Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

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Reviewed by:
A. 06/12/2015
W.S. 6/11/15

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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	17"	13 - 3/8"	40'	New	J55 / 54.5#	N/A	Grout to Surface
Surface	12.25"	9 - 5/8"	575'	New	J55 / 36#	N/A	Cement to Surface
Coal							
Intermediate 1	8.75"	7"	2223'	New	J55 / 20#	N/A	Cement to Surface
Intermediate 2							
Intermediate 3							
Production	6.25"	4.5"	5488'	New	P110 / 11.6#	N/A	See Detail Below
Tubing							
Packer type and depth set							

Comment Details Production String was run using a Packer Plus system, (Hydraulic Open Hole Packers), Upper "Safety" packer was run inside 7" casing @ 2,113' and 100 sacks of Class A grouted on the annulus, on top of this packer.

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	PNE-1 / 3% CaCl	50	15.6	1.17	53	0'	8 hrs
Surface	PNE-1 / 3% CaCl	193	15.6	1.20	232	0'	12 hrs
Coal							
Intermediate 1	PNE-1 / additives	372	15.6	1.20	446	0'	12 hrs
Intermediate 2							
Intermediate 3							
Production	Class A - Neat	100	15.6	1.20		Grout*	12 hrs
Tubing							

Drillers TD (ft) 5505' Loggers TD (ft) N/A
 Deepest formation penetrated Huron Shale Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 3,300'

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 Please see above in "Comment Details" section

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS Cased Hole - Packers Plus

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	12-19-2014	Frac Port @	5426'	Frac Port	Huron Shale
2	1-6-2015	Frac Port @	5330'	Frac Port	Huron Shale
3	1-9-2015	Frac Port @	5154'	Frac Port	Huron Shale
4	1-9-2015	Frac Port @	5019'	Frac Port	Huron Shale
5	1-9-2015	Frac Port @	4844'	Frac Port	Huron Shale
6	1-9-2015	Frac Port @	4709'	Frac Port	Huron Shale
7	1-10-2015	Frac Port @	4575'	Frac Port	Huron Shale
8	1-10-2015	Frac Port @	4399'	Frac Port	Huron Shale

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)
1	12-19-14	8.7	4951	8027	7500	8000	225	752,000 scf
2	1-6-15	5.5	6000	9248	4050	0	182	366,900 scf
3	1-9-15	0	6392	6702	4100	0	0	1,202,669 scf
4	1-9-15	0	5290	6108	4100	0	0	1,202,669 scf
5	1-9-15	0	5642	5940	4140	0	0	1,202,669 scf
6	1-9-15	0	4870	5345	3390	0	0	1,202,669 scf
7	1-10-15	0	4148	4180	2900	0	0	1,206,902 scf
8	1-10-15	0	3500	3516	2300	0	0	1,206,902 scf

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
Huron Shale	4079'	TVD 5505' MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 1400 psi Bottom Hole _____ psi DURATION OF TEST 24 hrs

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

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 (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
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Sand/Shale	0	441	0		
Shale	441	498			
Sand/Shale	498	557			
Shale	557	610			
Silty Shale	610	710			
Shale	710	808			
Sand/Shale	808	865			
Shale	865	1041			
Sand/Shale	1041	1095			
Shale	1095	1266			
Sand/Shale	1266	1350			
Shale	1350	1454			
Sand/Shale	1454	1507			
Shale	1507	1865			

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Please insert additional pages as applicable.

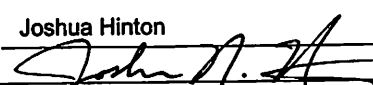
Drilling Contractor Highlands Drilling, LLC (Rig 7)
Address 900 Virginia Street City Charleston State WV Zip 25301

Logging Company N/A
Address _____ City _____ State _____ Zip _____

Cementing Company Baker Hughes
Address P.O. Box 301057 City Dallas State TX Zip 75303

Stimulating Company Nabors Completion & Production Services Co.
Address P. O. Box 975682 City Dallas State TX Zip 75397

Please insert additional pages as applicable.

Completed by Joshua Hinton Telephone 304-420-1103
Signature  Title Operations Manager Date 02-10-2015

Lithology/Formation - Continued

Lithology Formation	Top Depth in FT	Bottom Depth in FT
Sand/Shale	1865	2020
Big Lime	2020	2084
Big Injun	2084	2200
Shale	2200	2910
Sand/Shale	2910	4004
Huron Shale	4004	5488

TD Well @ 5488'

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