

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

API 47-091-01201 County Taylor District Courthouse
Quad Grafton 7.5' Pad Name Coaltrain Field/Pool Name _____
Farm name Patriot Mining Company, Inc Well Number 2HM
Operator (as registered with the OOG) Arsenal Resources
Address 6031 Wallace Rd, Suite 300 City Wexford State PA Zip 15090

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 39 17' 49.44" Easting 80 06' 38.53"
Landing Point of Curve Northing NA Easting NA
Bottom Hole Northing _____ Easting _____

Elevation (ft) 1273' 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)
NA Production string not drilled.

Date permit issued 12/10/2010 Date drilling commenced 12/19/2011 Date drilling ceased 12/26/2011
Date completion activities began NA Date completion activities ceased NA
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 197' Open mine(s) (Y/N) depths N
Salt water depth(s) ft None Void(s) encountered (Y/N) depths N
Coal depth(s) ft 78' & 783' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:
REC

Reviewed by

Approved [Signature]
10-23-18

API 47-091 - 01201

Farm name Patriot Mining Company, Inc

Well number 2HM

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"	40'	New		NA	Y
Surface	17.5"	13 3/8"	470'	New	54.5lb	80'	Y
Coal	NA	NA	NA	NA	NA	NA	NA
Intermediate 1	12.25"	9 5/8"	2813'GL	New	36lb	NA	Y
Intermediate 2	NA	NA	NA	NA	NA	NA	NA
Intermediate 3	NA	NA	NA	NA	NA	NA	NA
Production	NA	NA	NA	NA	NA	NA	NA
Tubing	NA	NA	NA	NA	NA	NA	NA
Packer type and depth set		NA					

Comment Details Cement to surface on Conductor, and Surface. Initial intermediate cement not successful due to plugged shoe. Perforated from 2,900 to 2,903, squeezed cement (205 S105 TYPE I CEMENT, 2% CACL). CBL showed cement 2,620'. Perforated 2,587'-2588', could not break circulation. Re-ran CBL, cement 1,920'. Perforated 1,880-1,882, cement with 600sxs Class A neat, cement to surface.

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					Surface	8+
Surface	A	370	15.2	1.26	466.2	Surface	8+
Coal							
Intermediate 1	A	420/420	14.6/15.2	1.38/1.26	579.6/529.2	Surface	8
Intermediate 2							
Intermediate 3							
Production							
Tubing							

Drillers TD (ft) 2818'GL

Loggers TD (ft) NA

Deepest formation penetrated

Plug back to (ft)

Plug back procedure

Kick off depth (ft) NA KOP was not reached

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

Conductor: None; Surface: 5 centralizers placed at 40', 100', and 913' and 1 basket 948.79';

Intermediate: 9 centralizers placed at 42', 331', 627', 822', 1218', 1604' and 2361' and one basket at 2623.74'; No production string was drilled.

WAS WELL COMPLETED AS SHOT HOLE Yes No

DETAILS NA

WAS WELL COMPLETED OPEN HOLE? Yes No

DETAILS NA

WERE TRACERS USED Yes No

TYPE OF TRACER(S) USED NA

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PERFORATION RECORD

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

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)
	NA							

Please insert additional pages as applicable.

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PRODUCING FORMATION(S)

DEPTHS

NA _____ TVD _____ MD _____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

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

OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ 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	
sand, shale	0	78	0	78	Estimated Well Permit
Coal	78	80	78	80	Estimated Well Permit
sand, shale	80	783	80	783	Estimated Well Permit
Coal	783	788	783	788	Estimated Well Permit
sand, shale	788	1522	788	1522	Estimated from 4709100707
Little Lime	1551	1572	1551	1572	Estimated from 4709100707
Big Lime	1586	1663	1586	1663	Estimated from 4709100707
Gantz	2062	2101	2062	2101	Estimated from 4709100707
Fifty-Foot	2101	2180	2101	2180	Estimated from 4709100707
Thirty-Foot	2195	2227	2195	2227	Estimated from 4709100707
Gordon	2289	2307	2289	2307	Estimated from 4709100707
Fourth	2539	2609	2539	2609	Estimated from 4709100707
Fifth	2679	2726	2679	2726	Estimated from 4709100707
Shale	2726	2881	2726	2881	TD

Please insert additional pages as applicable.

Drilling Contractor _____
 Address _____ City _____ State _____ Zip _____

Logging Company NA
 Address _____ City _____ State _____ Zip _____

Cementing Company Allied
 Address 1000 Harris Street City Charlottesville State VA Zip 22903

Stimulating Company NA
 Address _____ City _____ State _____ Zip _____

Please insert additional pages as applicable.

Completed by Arsenal Resources Telephone 304-629-6309
 Signature [Signature] Title Permitting Manager Date 10/23/18

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