

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

API 47-021-05765 County Gilmer District Glenville  
Quad Glenville 7.5' Pad Name na Field/Pool Name na  
Farm name Ernest L. Arbuckle Family Well Number Rinehart S-1  
Operator (as registered with the OOG) Energy Corporation of America  
Address 501 56th St. City Charleston State WV Zip 25304

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4310660.6 Easting 486971.7  
Landing Point of Curve Northing na Easting na  
Bottom Hole Northing na Easting na

Elevation (ft) 760 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)  
\_\_\_\_\_

Date permit issued 5/5/14 Date drilling commenced 5/28/14 Date drilling ceased 6/2/14  
Date completion activities began Well was completed as a natural Date completion activities ceased na  
Verbal plugging (Y/N) na Date permission granted na Granted by na

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

Freshwater depth(s) ft 360-388 ft., 466-483 ft., 552-574 ft. Open mine(s) (Y/N) depths N  
Salt water depth(s) ft NA Void(s) encountered (Y/N) depths N  
Coal depth(s) ft NA Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Office of Oil and Gas  
SEP 25 2014  
WV Department of  
Environmental Protection

Reviewed by:

10/31/2014

API 47-021 - 05765 Farm name Ernest L. Arbuckle Family Well number Rinehart S-1

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 1/2"	13 3/8"	40	N	43.6#/ft	na	Driven
Surface	8 7/8"	7"	675'	N	16#/ft	40'	Y
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	6 3/8"		2091'				
Tubing	6 3/8"	2 3/8"	764'	N	4.6#/ft J-55	na	NA
Packer type and depth set		4 1/2" X 5 7/8" Hydropac Mechanical Set Open Hole Packer set @ 764'					

Comment Details Drilled well to a TD of 2091' w/ 6.3/8" Bit, Logged well, well producing enough gas naturally to complete open hole, production casing was not run.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Driven						
Surface	Class A	155	15.6	1.20	186	Surface	8
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production							
Tubing							

Drillers TD (ft) 2091' Loggers TD (ft) 2069'  
 Deepest formation penetrated Berea Sandstone Plug back to (ft) na  
 Plug back procedure na

Kick off depth (ft) na

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 Centralizers placed on Shoe and every 200' to surface on surface casing. Production casing was not run.

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS Drilled well to a TD of 2091' w/ 6.3/8" Bit, Logged well, well producing enough gas naturally to complete openhole, production casing was not run.

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



API 47- 021 - 05765 Farm name Ernest L. Arbuckle Family Well number Rinehart S-1

PRODUCING FORMATION(S)	DEPTHS	
Salt Sands	1052-1194 ft. TVD	1052-1194 ft. MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump  
 SHUT-IN PRESSURE Surface 188 psi Bottom Hole na psi DURATION OF TEST 24 hrs  
 OPEN FLOW Gas 169 mcfpd Oil na bpd NGL na bpd Water na 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 <sub>2</sub> S, ETC)
Sandy Shale	0	510	0	510	Interbedded Sandstone and Shale
Sandstone	510	550	510	550	Sandstone with small amount of oil and a little freshwater
Shale	550	592	550	592	Shale with a little freshwater
Sandstone	592	792	592	792	Sandstone
Shale/Sandstone	792	1052	792	1052	Interbedded Sandstone and Shale
Salt Sands	1052	1194	1052	1194	Sandstone with 169 mcf/d Gas
Shale	1194	1264	1194	1264	Shale
Maxton	1264	1288	1264	1288	Sandstone
Shale	1288	1388	1288	1388	Shale
Sandstone/Lime	1388	1470	1388	1470	Interbedded Sandstone and Limestone
Big Lime	1470	1560	1470	1560	Limestone
Big Injun	1560	1628	1560	1628	Limey Sandstone
Shale	1628	1726	1628	1726	Shale
Weir	1726	1810	1726	1810	Sandstone

Please insert additional pages as applicable.

Drilling Contractor Waco Oil and Gas Co  
 Address 1595 U.S. 33 City Glenville State WV Zip 26351

Logging Company Baker Hughes  
 Address Rt. 4 Box 640 City Buckhannon State WV Zip 26201

Cementing Company Universal Well Services  
 Address RT. 5 Hall Road City Buckhannon State WV Zip 26201

Stimulating Company NA  
 Address City State Zip

Please insert additional pages as applicable.

Completed by Lowell Warden Telephone 304-925-6100  
 Signature *Tara White* Title Manager, Land Admin. Date 09-23-2014  
 Tara White

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PRODUCING FORMATION(S)	DEPTHS	
Salt Sands	1052-1194 ft. TVD	1052-1194 ft. MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 175 psi Bottom Hole na psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 169 mcfpd Oil na bpd NGL na bpd Water na 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 <sub>2</sub> S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
Shale	1801	2010	1801	2010	Shale
Berea	2010	2016	2010	2016	Sandstone
Shale	2016	2091	2016	2091	Shale

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