

WR-35  
Rev. 8/23/13

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

API 47-051-01919 County Marshall District Franklin  
Quad New Martinsville Pad Name Brine Well #14 Field/Pool Name #1 Brine Field  
Farm name Eagle Natrium, LLC Well Number Brine Well #14  
Operator (as registered with the OOG) Eagle Natrium, LLC  
Address PO Box 191 City New Martinsville State WV Zip 26155

As Drilled location - NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,398,859.80 Easting 513,447.73  
Landing Point of Curve Northing 4,399,235.89 Easting 513,422.07  
Bottom Hole Northing 4,399,584.07 Easting 513,153.42

Elevation (ft) 643 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)  
Saturated Salt Polymer w/ AquaBloc, Bicarb, NewArmor, NewPac R, NewZan D, NoFoam A, Sodium Hydroxide, CaCO3

Date permit issued 4/5/17 Date drilling commenced 6/28/17 Date drilling ceased 3/30/18  
Date completion activities began 3/29/18 Date completion activities ceased 3/30/18  
Verbal plugging (Y/N) N/A 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 12' & 110' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 274',873',948',1026',1048',1292',1554' (tops) Cavern(s) encountered (Y/N) depths 8810 ft. MD/ 6751 ft. TVD  
Is coal being mined in area (Y/N) N

Reviewed

6/15/18

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WV Department of Environmental Protection

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CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	26.5	26	97'GL	N	.625" wall	N/A	Drilled in hole
Surface	24	20	308'GL	N	J55/94#	55'	Y
Coal	17 1/2	13 3/8	2123'GL	N	J55/54.5#	238'	Y
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	12 1/4"	9 5/8"	6182'GL	N	HCL80/53.5#	1941'	N
Tubing	7-7/8"	7"	1698'	N	L80/32#		N/A
Packer type and depth set		(see comments below)					

Comment Details 7 in. x 32 lb/ft x 9-5/8 in. x 53.5 lb/ft, Weatherford Blackcat Retrievable Sealbore Packer/ Hanger, Hydraulic Set with Hydril 521 Pin Down, Mandrel to be 13 Chrome. Weatherford Product No. 1197311. Top of packer set @ 5450 ft.

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	n/a						
Surface	Class A	265	15.6	1.18	313	0	8
Coal	Class A	447 lead/1135 tail	15 lead/15.6 tail	1.31 lead/1.19 tail	1936	0	8
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	Class A	1017 lead/401 tail	14.2 lead/15.6 tail	1.49 lead/1.18 tail	1988	2600'	8
Tubing							

Drillers TD (ft) 8810' MD/ 6751' TVD Loggers TD (ft) N/A  
 Deepest formation penetrated Syracuse Salt Plug back to (ft) \_\_\_\_\_  
 Plug back procedure N/A

Kick off depth (ft) 6230' MD

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 \_\_\_\_\_

20" casing (centralizers on js #1, 8, & 13)  
 13 3/8" casing (centralizers on js #1, 7, 13, 19, 25, 31, 37, 43, & 48)  
 9 5/8" casing (solid body centralizers on js #1, 3, 10, 16, & 26) (bow spring centralizers on js #32, 38, 44, 50, 56, 62, 68, 74, 80, 86, 92, 98, 104, 110, 116, 122, 128, 134, 140, & 146)

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

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS Completed open hole from 7170' MD to 8810' MD. Holes size is 7-7/8" diameter.

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

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API 47- 051 - 01919 Farm name Eagle Natrium, LLC Well number Brine Well #14

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
Syracuse Salt	6707' KB	TVD 6867' MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 444 psi Bottom Hole 3931 psi DURATION OF TEST 12 hrs

OPEN FLOW Gas \_\_\_\_\_ Oil \_\_\_\_\_ NGL \_\_\_\_\_ Water 10368 bpd  
 mcfpd  bpd  bpd  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)
	0		0		
Fresh Water	12				
Fresh Water	110				
Big Injun	1398	1471	1402	1476	(See Reservoir Group Lithology Log for #14 Brine Well)
Berea	1972	1985	1980	1993	
Shale	1985	5623	1993	5656	
Marcellus	5623	5820	5656	5854	
Onondaga	5820	6043	5854	6078	
Oriskany	6043	6118	6078	6154	
Heiderberg	6118	6441	6154	6493	
Keyser	6441	6610	6493	6702	
Salina Group	6610	6707	6702	6867	
Syracuse Salt	6707 KB	6812 KB approx.	6867	-	

Please insert additional pages as applicable.

Drilling Contractor Precision Drilling Company Rig 539  
 Address 10360 Richmond Ave City Houston State TX Zip 77042

Logging Company Weatherford  
 Address 121 Hillpointe Dr City Canonsburg State Pa Zip 15317

Cementing Company BJ Services  
 Address 2228 Phillipi Pike City Clarksburg State WV Zip 26301

Stimulating Company N/A  
 Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Please insert additional pages as applicable.

Completed by Stephen M. Clark, P.E. Telephone 304-266-8264  
 Signature Stephen M. Clark, P.E. Title Engineer Sr. Date 4/18/18  
 WV Department of Environmental Protection

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



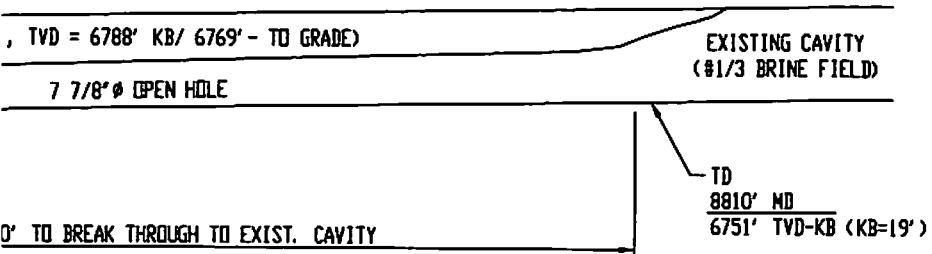


- CONDUCTOR PIPE - 26' A53 GR. B CARBON STEEL, 169 LB/FT, 97', ERW, RANGE 1, WELDED CONN.
- FRESH WATER PIPE - 20' J-55, 94 LB/FT, 308' ERW, RANGE 1, WELDED CONN., CEMENTED.
- INTERMEDIATE - 13 3/8' J-55, 54.5 LB/FT, 2123' CEMENTED TO SURFACE, STC, RANGE 3, ERW.
- PRODUCTION - 9 5/8' /HCL-80, 53.5 LB/FT, 6182', CEMENTED TO 2500', 8 ROUND - THREADED & LONG COUPLED, RANGE 3, SEAMLESS.
- LINER - 7' L-80, 32 LB/FT, 1698', NOT CEMENTED, HYDRIL 521 THREADED, RANGE 3, SEAMLESS. (34 JOINTS)
- VALVE - GATE VALVE, 10' DIA. (API 11 IN. x 5M), FULL PORT, RTJ, EXPANDING GATE, ANSI CLASS 1500, ENP TRIM, VITON SEALS, WCC BODY, GEAR OPERATED, AND FIRESAFE.
- NUTS & BOLTS - (24) 1 7/8"  $\phi$  x 14 1/4" LG. STUD BOLT - ASTM A-193, GR. B-7 (FOR 10' VALVE) NUTS: ASTM A-194, CLASS 2H, ANSI B1.1
- OUTLET VALVE - 2' - 3000 LB. - THREADED BALL VALVE - 2 REQ'D.
- PACKER/HANGER - 7' 32 LB/FT x 9 5/8' 53.5 LB/FT, WEATHERFORD BLACKCAT RETRIEVABLE SEALBORE PACKER/HANGER, HYDRAULIC SET WITH HYDRIL 521 PIN DOWN. MANDREL TO BE 13 CHROME. PRODUCT NO. 1197311
- TOP FLANGE (C) - 10' DIA. x ANSI CLASS 1500 RTJ WELD NECK FLANGE W/ SCH. 80 BORE, ANSI B 16.5/A105-4130
- PACKOFF SPOOL (B) - 13 5/8' x 3M x 11' x 5M W/2 EA. 2' x 5M VALVES. ALSO INCLUDED: PACKOFF, PE ASSEMBLY AND 10 3/4' x 9 5/8' GBI W/HSN RUBBER.
- WELLHEAD (A) - (BRADEN HEAD) CASING 13 5/8' x 9 5/8' W/HANGER SLIPS, TOP PACKING WITH (2 EACH) 2' DIA. LPD'S. HEAD TO BE WELDED TO CASING.
- RING JOINT GASKET - R54 CAD PLATED RING GASKET FOR 10' x ANSI CLASS 1500, RTJ FLANGE (6 EACH).

±  
±

±  
±  
±  
1471' ±  
±

820' ±  
343' ±  
18' ±



△		
△		
△	DMV	AS-BUILT PER PROJECT COMPLETION
REV. BY	DATE	DESCRIPTION

DEPT: 70 - BRINE	
TITLE: #14 BRINE WELL (API #47-051-1919)	
PROPOSED CONFIGURATION (SCHEMATIC)	
DRAWING TYPE: MECHANICAL PROCESS EQUIPMENT	MPE
EQUIPMENT No: 7000-115-57	
 NATRIUM	DRAWN D. WAYT DATE 12/05/16
	CHECKED DATE
	APP' VD S. CLARK DATE -
	SCALE NONE ACAD YES
	JOB No P-240-H
	DWG 70-2678
REV	1