

CB

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




API 47-15-02897 County CLAY District UNION
Quad ELKHURST 7.5' Pad Name _____ Field/Pool Name _____
Farm name CHESSIE CONNER, ET AL Well Number J.S. COCHRAN #4H
Operator (as registered with the OOG) CUNNINGHAM ENERGY, LLC
Address 3230 PENNSYLVANIA AVENUE City CHARLESTON State WV Zip 25302

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

Elevation (ft) 1,215' 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)
SOAP

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Date permit issued 3/20/2014 Date drilling commenced 3/25/2014 Date drilling ceased 4/30/2014
Date completion activities began NONE 9/7/14 Date completion activities ceased NONE 9/8/14
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft 200' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1475' - 1525' Void(s) encountered (Y/N) depths N
Coal depth(s) ft NO COAL LISTED ON TITLE Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: _____

01/23/2015

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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	14 1/4"	13 3/8"	30'	NEW	LS	NONE	YES - CEMENTED BY RIG
Surface	12 1/4"	9 5/8"	350'	NEW	LS	90'	YES
Coal							
Intermediate 1	8 3/4"	7"	1750'	NEW	J-55	350'	YES
Intermediate 2							
Intermediate 3							
Production	6 1/4"	4 1/2"	4832'	NEW	N-80	950'	YES
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 ³)	Cement Top (MD)	WOC (hrs)
Conductor	CLASS I	10 - CEMENTED BY RIG				GROUND LEVEL	8
Surface	CLASS I	150	15.6	1.18	177	GROUND LEVEL	8
Coal							
Intermediate 1	CLASS I	300	14.8	1.40	420	GROUND LEVEL	8
Intermediate 2							
Intermediate 3							
Production	CLASS I	450	14.4	1.29	451.29	GROUND LEVEL	12
Tubing							

Drillers TD (ft) 4861' Loggers TD (ft) 4861'
 Deepest formation penetrated INJUN Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 1510'

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 9 5/8" - 1st JOINT; Basket was 2 joints down hole.
7" - 2 Joints down from top.

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 _____

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	9/7/2014	4832'	4798'	NOSE	INJUN
2	9/7/2014	4798'	4658'	16	INJUN
3	9/7/2014	4658'	4484'	16	INJUN
4	9/7/2014	4484'	4310'	16	INJUN
5	9/7/2014	4310'	4136'	16	INJUN
6	9/7/2014	4136'	3962'	16	INJUN
7	9/8/2014	3962'	3788'	16	INJUN
8	9/8/2014	3788'	3614'	16	INJUN
9	9/8/2014	3416'	3440'	16	INJUN
10	9/8/2014	3440'	3266'	16	INJUN
11	9/8/2014	3266'	3090'	16	INJUN
12	9/8/2014	2471'	2300'	16	INJUN
13	9/8/2014	2315'	2150'	16	INJUN

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	9/7/2014	38	2250	2730	1380	8,700	356	0
2	9/7/2014	34	1950	2542	1384	6,400	330	0
3	9/7/2014	38.5	2100	2241	1223	6,500	354	0
4	9/7/2014	38.2	2140	2800	1318	5,300	305	0
5	9/7/2014	38	2500	2739	1355	7,400	322	0
6	9/7/2014	38	2150	2520	1340	7,200	349	0
7	9/8/2014	37.9	2400	2849	1384	8,000	365	0
8	9/8/2014	36.5	2680	2937	1355	7,500	301	0
9	9/8/2014	34	3200	4116	1282	100	300	0
10	9/8/2014	29	4100	3464	1282	900	297	0
11	9/8/2014	37.7	3420	3420	1267	300	244	0
12	9/8/2014	38.3	2700	2585	1326	7,100	298	0
13	9/8/2014	38	2275	2542	2981	5,500	294	0

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PRODUCING FORMATION(S)	DEPTHS	TVD	MD
INJUN	4832' - 2150'		

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 150 psi Bottom Hole psi DURATION OF TEST 12 hrs

OPEN FLOW Gas 35 mcfpd Oil 40 bpd NGL 0 bpd Water 5 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)
SAND/SHALE	0	330'	0		
SAND	330'	525'			
SAND/SHALE	525'	1250'			
SALT SAND	1250'	1735'			
SHALE	1735'	1880'			
MAXTON	1880'	1925'			
LITTLE LIME	1925'	1940'			
BIG LIME	1940'	2000'			
BIG INJUN	2000'	2100'	2100'	4861'	
SQUAW	2100'	2250'			
SHALE	2150'	2360'			

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Drilling Contractor CUNNINGHAM ENERGY, LLC
Address 3230 PENNSYLVANIA AVENUE City CHARLESTON State WV Zip 25302

Logging Company PRECISE WELL ANALYSIS
Address 1426 BARTH ROAD City BELPRE State OH Zip 45714

Cementing Company UNIVERSAL WELL SERVICES
Address 5 HALL RUN ROAD City BUCKHANNON State WV Zip 25201

Stimulating Company NABORS WELL SERVICE
Address 1650 HACKERS CREEK ROAD City JANE LEW State WV Zip 26378

Please insert additional pages as applicable.

Completed by Danielle N. Boggs Telephone 304-344-9291
Signature *Danielle N. Boggs* Title Operations Manager Date 1/9/2015

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

01/23/2015