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

API 47-069-00110 County Ohio District Triadelphia  
Quad Valley Grove Pad Name Chad Glauser OHI Field/Pool Name Sand Hill  
Farm name Chad Glauser OHI 6H Well Number 834478  
Operator (as registered with the OOG) Chesapeake Appalachia, L.L.C.  
Address P.O. Box 18496 City Oklahoma City State OK Zip 73154-0496

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4431151.2 Easting 534355.1  
Landing Point of Curve Northing \_\_\_\_\_ Easting \_\_\_\_\_  
Bottom Hole Northing 4429378.5 Easting 535196.6

Elevation (ft) 1,240 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)  
Synthetic Oil Based Mud

Date permit issued 5-25-2012 Date drilling commenced 7-4-2013 Date drilling ceased 7-17-2013  
Date completion activities began 10-4-2013 Date completion activities ceased 11-7-2013  
Verbal plugging (Y/N) N/A 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 30', 300' Open mine(s) (Y/N) depths \_\_\_\_\_  
Salt water depth(s) ft 1,135 Void(s) encountered (Y/N) depths \_\_\_\_\_  
Coal depth(s) ft 678' Cavern(s) encountered (Y/N) depths \_\_\_\_\_  
Is coal being mined in area (Y/N) Y

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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		20"	118'	New	J-55/94#		Y to surface
Surface		13 3/8"	762'	New	J-55/54.50#		Y to surface
Coal							
Intermediate 1		9 5/8"	2,115'	New	J-55/40#		Y to surface
Intermediate 2							
Intermediate 3							
Production		5 1/2"	12,943'	New	P-110/20#		Y 500' intermediate csg
Tubing							
Packer type and depth set							

Comment Details \_\_\_\_\_

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	A						
Surface	A	680		1.20	814 Cu. Ft.	24'	
Coal							
Intermediate 1	A	715		1.24	898 Cu. Ft.	20.2'	
Intermediate 2							
Intermediate 3							
Production	A	2,534		2.56	3,104 Cu. Ft.	1,207'	
Tubing							

Drillers TD (ft) 12,943' Loggers TD (ft) 12,943'  
 Deepest formation penetrated Marcellus Plug back to (ft) \_\_\_\_\_  
 Plug back procedure \_\_\_\_\_

Kick off depth (ft) 5,590.7'

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 Surface and Intermediate - run centralizers in the middle and top of the first joint, top of the third joint and every fourth joint. Production - Run first centralizer 3' from Shoe, second at top of the first joint and then one every third joint to top of curve.

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

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

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

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PERFORATION RECORD ATTACHMENT

Well Number and Name: 834478 Chad Glauser OHI 6H

PERFORATION RECORD					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	10/4/2013	12,564	12,776	7	Marcellus Shale
2	10/4/2013	12,303	12,515	7	Marcellus Shale
3	10/5/2013	12,042	12,254	7	Marcellus Shale
4	10/5/2013	11,781	11,993	7	Marcellus Shale
5	10/5/2013	11,520	11,732	7	Marcellus Shale
6	10/5/2013	11,258	11,471	7	Marcellus Shale
7	10/5/2013	10,997	11,210	7	Marcellus Shale
8	10/6/2013	10,736	10,949	7	Marcellus Shale
9	10/6/2013	10,481	10,688	7	Marcellus Shale
10	10/6/2013	10,218	10,427	7	Marcellus Shale
11	10/6/2013	9,953	10,164	7	Marcellus Shale
12	10/6/2013	9,692	9,897	7	Marcellus Shale
13	10/6/2013	9,431	9,638	7	Marcellus Shale
14	10/7/2013	9,170	9,382	7	Marcellus Shale
15	10/7/2013	8,909	9,121	7	Marcellus Shale
16	10/7/2013	8,648	8,860	7	Marcellus Shale
17	10/7/2013	8,387	8,599	7	Marcellus Shale
18	10/7/2013	8,125	8,338	7	Marcellus Shale
19	10/7/2013	7,864	8,077	7	Marcellus Shale
20	10/8/2013	7,603	7,816	7	Marcellus Shale
21	10/8/2013	7,342	7,555	7	Marcellus Shale
22	10/8/2013	7,081	7,294	7	Marcellus Shale
23	10/8/2013	6,820	7,032	7	Marcellus Shale

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**STIMULATION INFORMATION PER STAGE**

Well Number and Name: 834478 Chad Glauser OHI 6H

STIMULATION RECORD							
Stage No.	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbbls)
1	10/4/2013	75	7,542	6,238	3,893	388,940	8,829
2	10/4/2013	77	7,294	6,664	3,806	390,780	7,333
3	10/5/2013	79	7,035	6,479	4,144	392,160	7,287
4	10/5/2013	70	7,138	6,514	4,229	391,260	7,269
5	10/5/2013	80	7,204	5,922	4,818	390,780	7,166
6	10/5/2013	79	7,140	5,881	4,327	390,760	7,219
7	10/5/2013	79	7,244	6,405	4,639	390,660	7,070
8	10/6/2013	80	6,979	6,951	4,354	390,900	7,315
9	10/6/2013	79	6,999	6,098	4,101	390,680	8,196
10	10/6/2013	77	7,254	6,030	4,113	390,400	7,722
11	10/6/2013	79	6,923	5,310	4,403	389,720	7,134
12	10/6/2013	79	6,766	6,652	4,484	390,780	6,998
13	10/7/2013	80	6,683	6,325	4,101	390,680	7,206
14	10/7/2013	80	6,639	6,203	4,144	390,720	7,243
15	10/7/2013	79	6,720	6,105	4,145	390,300	6,932
16	10/7/2013	79	6,871	7,738	4,329	389,020	7,015
17	10/7/2013	80	6,629	5,753	4,170	388,700	7,038
18	10/7/2013	80	6,479	6,161	4,185	389,900	6,959
19	10/8/2013	80	6,519	6,525	4,185	390,800	7,030
20	10/8/2013	79	6,612	7,010	4,270	390,220	6,969
21	10/8/2013	80	6,362	6,213	4,270	390,980	6,999
22	10/8/2013	79	6,948	7,566	4,223	389,320	6,926
23	10/8/2013	79	6,550	5,287	4,079	393,400	7,162

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**LATERAL SIDETRACK WELLBORE (no vertical pilot hole associated with this well)**

**Maximum TVD of wellbore: 6488 ft TVD @ 12567 ft MD**

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
SS	0	0	480	480
LS/SILT	480	480	648	648
PITTSBURG COAL	648	648	652	652
LS	652	652	710	710
SHALE/SS/SILT	710	710	1700	1700
BIG LIME (LS)	1700	1700	1796	1796
BIG INJUN (SS)	1796	1796	1974	1974
SHALE	1974	1974	6393	6233
GENESEO (SH)	6393	6233	6423	6252
TULLY (LS)	6423	6252	6476	6284
HAMILTON (SH)	6476	6284	6727	6393
MARCELLUS (SH)	6727	6393		
TD OF LATERAL			12943	6473

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	10/4/2013
State:	WEST VIRGINIA
County:	OHIO
API Number:	4706900110
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	CHAD GLAUSER OHI 6H
Longitude:	-80.597554
Latitude:	40.029806
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	6,488
Total Water Volume (gal)*:	7,213,752

## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by Mass)**	Maximum Ingredient Concentration in HF Fluid (% by Mass)**	Comments
Fresh Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	81.39723%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	6.28461%	
EC6110A	NALCO	Anti-Bacterial Agent	Ethanol	000064-17-5	5.00%	0.00111%	
			Glutaraldehyde (Pentanediol)	000111-30-8	60.00%	0.01326%	
			Quaternary Ammonium Compounds	NA	10.00%	0.00221%	
EC6629A	NALCO	Scale Inhibitor	No Hazardous Components	NONE		0.00000%	
A264, J218, J580, J609, L058, U028, Acid, Hydrochloric 15pct, Northern White Sand, 100 Mesh Sand	SCHLUMBERGER	Breaker, Corrosion Inhibitor, Friction Reducer, Gelling Agent, Iron Control Agent, Acid, Proppant - Natural	Crystalline silica	14808-60-7	98.02921%	12.07540%	
			Hydrogen chloride	7647-01-0	1.44112%	0.17752%	
			Guar gum	9000-30-0	0.13152%	0.01620%	
			Acrylamide, 2-acrylamido-2-	38193-60-1	0.10750%	0.01324%	
			Ammonium sulfate	7783-20-2	0.10160%	0.01252%	
			Sodium erythorbate	6381-77-7	0.08217%	0.01012%	



Sodium sulfate	7757-82-6	0.04391%	0.00541%	
Sodium hydroxide	1310-73-2	0.02091%	0.00258%	
Polymer of 2-acrylamido-2-	136793-29-8	0.01152%	0.00142%	
Diammonium peroxidisulphate	7727-54-0	0.00814%	0.00100%	
Urea	57-13-6	0.00708%	0.00087%	
Methanol	67-56-1	0.00428%	0.00053%	
Fatty acids, tall-oil	61790-12-3	0.00314%	0.00039%	
Thiourea, polymer with	68527-49-1	0.00259%	0.00032%	
Non-crystalline silica	7631-86-9	0.00138%	0.00017%	
Alcohols, C14-15, ethoxylated	68951-67-7	0.00120%	0.00015%	
Prop-2-yn-1-ol	107-19-7	0.00080%	0.00010%	
Alkenes, C>10 a-	64743-02-8	0.00053%	0.00007%	
Tetrasodium	64-02-8	0.00022%	0.00003%	
Dimethyl siloxanes and silicones	63148-62-9	0.00010%	0.00001%	
Siloxanes and Silicones, di-Me,	67762-90-7	0.00001%	< 0.00001%	
Octamethylcyclotetrasiloxane	556-67-2	0.00001%	< 0.00001%	
Decamethyl cyclopentasiloxane	541-02-6	0.00001%	< 0.00001%	
Dodecamethylcyclohexasiloxane	540-97-6	< 0.00001%	< 0.00001%	

#### Additional Ingredients Not Listed on MSDS

EC6110A, EC6629A	NALCO	Anti-Bacterial Agent, Scale Inhibitor	Methanol (Methyl Alcohol)	000067-56-1		0.00636%	
			Proprietary Acrylate Polymer	TRADE SECRET		0.00636%	
			Proprietary Quaternary Ammonium Salt	TRADE SECRET		0.00636%	
			Water	007732-18-5		0.02257%	

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

"Additional Ingredients Not Listed on MSDS" component information were obtained directly from the supplier. As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of this information should be directed to the supplier who provided it.