

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

DATE: 11-25-2013  
API #: 47-069-00119

Farm name: George Gantzer OHI 1H Operator Well No.: 834920

LOCATION: Elevation: 1,244' Quadrangle: Valley Grove

District: Tridelpia County: Ohio  
Latitude: 4,790' Feet South of 40 Deg. 05 Min. 00 Sec.  
Longitude 13,940' Feet West of 80 Deg. 35 Min. 00 Sec.

Company: Chesapeake Appalachia, L.L.C.

Address:	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
P.O. Box 18496 Oklahoma City, OK 73154-0496	20"	118'	118'	365 Cu. Ft.
Agent: Eric Gillespie	13 3/8"	615'	615'	421 Cu. Ft.
Inspector: Gayne J. Knitowski & Bill Hendershot	9 5/8"	2,115'	2,115'	920 Cu. Ft.
Date Permit Issued: 4-1-2013	5 1/2"	13,232'	13,232'	3,171 Cu. Ft.
Date Well Work Commenced: 4-22-2013				
Date Well Work Completed: 10-8-2013				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 6,508'				
Total Measured Depth (ft): 13,236'				
Fresh Water Depth (ft.): 178'				
Salt Water Depth (ft.): 750'				
Is coal being mined in area (N/Y)?				
Coal Depths (ft.): No				
Void(s) encountered (N/Y) Depth(s) <u>Y 576'</u>				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation Marcellus Pay zone depth (ft) 8,823-13,085

Gas: Initial open flow \_\_\_\_\_ MCF/d Oil: Initial open flow \_\_\_\_\_ Bbl/d

Final open flow 1,632 MCF/d Final open flow 128 Bbl/d

Time of open flow between initial and final tests 120 Hours

Static rock Pressure 4,122 psig (surface pressure) after 120 Hours \*Calculated

Second producing formation \_\_\_\_\_ Pay zone depth (ft) \_\_\_\_\_

Gas: Initial open flow \_\_\_\_\_ MCF/d Oil: Initial open flow \_\_\_\_\_ Bbl/d

Final open flow \_\_\_\_\_ MCF/d Final open flow \_\_\_\_\_ Bbl/d

Time of open flow between initial and final tests \_\_\_\_\_ Hours

Static rock Pressure \_\_\_\_\_ psig (surface pressure) after \_\_\_\_\_ Hours

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I certify under penalty of law that I have personally examined and am familiar with the information furnished on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

Mark Williams  
Signature

11-25-2013  
Date

Were core samples taken? Yes \_\_\_\_\_ No N

Were cuttings caught during drilling? Yes Y No \_\_\_\_\_

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list \_\_\_\_\_  
LWD GR from 5552-13238' MD.

**NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.**

Perforated Intervals, Fracturing, or Stimulating:

See attachment

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Plug Back Details Including Plug Type and Depth(s):

\_\_\_\_\_  
\_\_\_\_\_

Formations Encountered: \_\_\_\_\_ Top Depth \_\_\_\_\_ / \_\_\_\_\_ Bottom Depth  
Surface:

See attachment

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## PERFORATION RECORD ATTACHMENT

Well Number and Name: 834920 George Gantzer OHI 1H

PERFORATION RECORD			STIMULATION RECORD							
Date	Interval Perforated		Date	Interval	Treated	Fluid		Propping Agent		Average Injection
	From	To				Type	Amount	Type	Amount	
8/30/2013	12,778	13,061	9/3/2013	12,778	13,061	Sik wtr	12,206	Sand	526,400	77
9/3/2013	12,436	12,719	9/3/2013	12,436	12,719	Sik wtr	9,652	Sand	528,200	77
9/3/2013	12,094	12,377	9/3/2013	12,094	12,377	Sik wtr	9,331	Sand	524,060	78
9/3/2013	11,752	12,035	9/3/2013	11,752	12,035	Sik wtr	9,508	Sand	526,460	79
9/3/2013	11,409	11,693	9/4/2013	11,409	11,693	Sik wtr	9,464	Sand	523,440	80
9/4/2013	11,067	11,351	9/4/2013	11,067	11,351	Sik wtr	9,471	Sand	526,380	80
9/4/2013	10,730	11,007	9/5/2013	10,730	11,007	Sik wtr	9,609	Sand	523,980	76
9/5/2013	10,383	10,667	9/5/2013	10,383	10,667	Sik wtr	9,199	Sand	521,440	80
9/5/2013	10,041	10,325	9/5/2013	10,041	10,325	Sik wtr	9,630	Sand	529,400	80
9/5/2013	9,699	9,982	9/6/2013	9,699	9,982	Sik wtr	10,899	Sand	526,740	76
9/6/2013	9,357	9,640	9/6/2013	9,357	9,640	Sik wtr	11,093	Sand	524,980	74
9/6/2013	9,015	9,298	9/6/2013	9,015	9,298	Sik wtr	11,278	Sand	526,740	74
9/6/2013	8,673	8,956	9/6/2013	8,673	8,956	Sik wtr	11,468	Sand	527,920	73
9/7/2013	8,331	8,614	9/7/2013	8,331	8,614	Sik wtr	9,605	Sand	524,540	75.8
9/7/2013	7,988	8,272	9/7/2013	7,988	8,272	Sik wtr	9,749	Sand	525,140	79.4
9/7/2013	7,646	7,930	9/8/2013	7,646	7,930	Sik wtr	9,439	Sand	526,740	79
9/8/2013	7,304	7,588	9/8/2013	7,304	7,588	Sik wtr	9,474	Sand	526,360	77
9/8/2013	6,962	7,246	9/8/2013	6,962	7,246	Sik wtr	9,495	Sand	523,200	77
9/8/2013	6,623	6,906	9/8/2013	6,623	6,906	Sik wtr	9,272	Sand	527,620	79.5

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**LATERAL SIDETRACK WELLBORE (no vertical pilot hole associated with this well)****Maximum TVD of wellbore: 6508 ft TVD @ 12677 ft MD**

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
LS/SS	0	0	575	575
PITTSBURG COAL	575	575	585	585
LS/SHALE	585	585	700	700
SS	700	700	1200	1200
SHALE	1200	1200	1290	1290
SS	1290	1290	1750	1750
BIG LIME (LS)	1750	1750	1800	1800
BIG INJUN (SS)	1800	1800	2011	2011
SHALE	2011	2011	6237	6206
GENESEO (SH)	6237	6206	6266	6230
TULLY (LS)	6266	6230	6310	6262
HAMILTON (SH)	6310	6262	6519	6374
MARCELLUS (SH)	6519	6374		
TD OF LATERAL			13236	6341

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	9/3/2013
State:	WEST VIRGINIA
County:	OHIO
API Number:	4706900119
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	GEORGE GANTZER OHI 1H
Longitude:	-80.600569
Latitude:	40.045059
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	6,388
Total Water Volume (gal)**:	8,245,331

## 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%	80.72326%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	6.11791%	
EC6110A	NALCO	Anti-Bacterial Agent	Ethanol Glutaraldehyde (Pentamediol) Quaternary Ammonium Compounds	000064-17-5 000111-30-8 NA	5.00% 60.00% 10.00%	0.00135% 0.01616% 0.00269%	
EC6629A	NALCO	Scale Inhibitor	No Hazardous Components Crystalline silica Hydrogen chloride Guar gum Acrylamide, 2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer Ammonium sulfate Sodium sulfate Diammonium peroxodisulphate	NONE 14808-60-7 7647-01-0 9000-30-0 38193-60-1	98.10440% 1.05127% 0.59495% 0.07461%	0.00000% 13.08848% 0.14025% 0.07937% 0.00995% 0.00941% 0.00407% 0.00395%	
Northern White Sand, 100 Mesh Sand, Hydrochloric Acid, J580, J609, J218, J610, L058, J475, A264	SCHLUMBERGER	Proppant - Natural, Acid, Gelling Agent, Friction Reducer, Breaker, Cross Linker, Iron Control Agent, Corrosion Inhibitor					

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Potassium borate	1332-77-0	0.01159%	0.00155%	
Polymer of 2-acrylamido-2-methylpropanesulfonic acid sodium salt and methyl acrylate	136793-29-8	0.00799%	0.00107%	
Urea	57-13-6	0.00491%	0.00066%	
Potassium hydroxide	1310-58-3	0.00428%	0.00057%	
Sodium erythorbate	6381-77-7	0.00408%	0.00054%	
Glycerol	56-81-5	0.00378%	0.00050%	
Methanol	67-56-1	0.00294%	0.00039%	
Non-crystalline silica	7631-86-9	0.00233%	0.00031%	
Fatty acids, tall-oil	61790-12-3	0.00216%	0.00029%	
Thiourea, polymer with formaldehyde and 1-phenylethanone	68527-49-1	0.00178%	0.00024%	
Alcohols, C14-15, ethoxylated (ZEO)	68951-67-7	0.00083%	0.00011%	
Vinylidene chloride/methylacrylate copolymer	25038-72-6	0.00062%	0.00008%	
Prop-2-yn-1-ol	107-19-7	0.00055%	0.00007%	
Alkenes, C>10 a-	64743-02-8	0.00037%	0.00005%	
Tetrasodium ethylenediaminetetraacetate	64-02-8	0.00015%	0.00002%	
Dimethyl siloxanes and silicones	63148-62-9	0.00007%	0.00001%	
Magnesium silicate hydrate (talc)	14807-96-6	0.00002%	< 0.00001%	
Siloxanes and Silicones, di-Me, reaction products with silica	67762-90-7	0.00001%	< 0.00001%	
poly(tetrafluoroethylene)	9002-84-0	0.00001%	< 0.00001%	
Octamethylcyclotetrasiloxane	556-67-2	0.00001%	< 0.00001%	
Sodium hydroxide	1310-73-2	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	0.00620%	
			Proprietary Acrylate Polymer	TRADE SECRET	0.00620%	
			Proprietary Quaternary Ammonium Salt	TRADE SECRET	0.00620%	
			Water	007732-18-5	0.02591%	

\* 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.

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