

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 #: 47-069-00118

Farm name: George Gantzer OHI 5H Operator Well No.: 834921

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

District: Triadelphia County: Ohio  
Latitude: 4,750' Feet South of 40 Deg. 05 Min. 00 Sec.  
Longitude 13,900' 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"	630'	630'	701 Cu. Ft.
Inspector: <b>Bill Hendershot</b>	9 5/8"	2,074'	2,074'	926 Cu. Ft.
Date Permit Issued: 6-8-2012	5 1/2"	11,689'	11,689'	2,773 Cu. Ft.
Date Well Work Commenced: 5-11-2013				
Date Well Work Completed: 10-20-2013				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 6,402'				
Total Measured Depth (ft): 11,694'				
Fresh Water Depth (ft.): 30'				
Salt Water Depth (ft.): 1,135'				
Is coal being mined in area (N/Y)? N				
Coal Depths (ft.): 576'				
Void(s) encountered (N/Y) Depth(s) Y 576'				

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

Producing formation Marcellus Pay zone depth (ft) 7,080-11,542

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

Final open flow 1,974\* MCF/d Final open flow 180 Bbl/d

Time of open flow between initial and final tests 48 Hours

Static rock Pressure 4,148\* psig (surface pressure) after 48 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 submitted 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.

Marlene Williams  
Signature

12-3-2013  
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 5580-11894' 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: 834921 George Gantzer OHI 5H

PERFORATION RECORD			STIMULATION RECORD							
Date	Interval Perforated		Date	Interval Treated	Type	Fluid		Propping Agent		Average Injection
	From	To				Amount	Type	Amount		
7/25/2013	11,367	11,542	9/15/2013	11,367	11,542	Sik wtr	7,516	Sand	400,340	78
9/15/2013	11,163	11,318	9/16/2013	11,163	11,318	Sik wtr	7,390	Sand	399,620	75
9/16/2013	10,959	11,114	9/16/2013	10,959	11,114	Sik wtr	9,439	Sand	399,920	67
9/16/2013	10,754	10,910	9/16/2013	10,754	10,910	Sik wtr	7,525	Sand	402,240	77
9/16/2013	10,550	10,700	9/16/2013	10,550	10,700	Sik wtr	7,380	Sand	399,520	75
9/16/2013	10,346	10,501	9/16/2013	10,346	10,501	Sik wtr	7,348	Sand	402,780	75
9/16/2013	10,146	10,297	9/17/2013	10,146	10,297	Sik wtr	7,573	Sand	401,200	79
9/17/2013	9,938	10,089	9/17/2013	9,938	10,089	Sik wtr	7,301	Sand	398,780	76
9/17/2013	9,734	9,889	9/17/2013	9,734	9,889	Sik wtr	7,250	Sand	399,440	75
9/17/2013	9,536	9,685	9/17/2013	9,536	9,685	Sik wtr	7,458	Sand	400,800	80
9/17/2013	9,326	9,481	9/18/2013	9,326	9,481	Sik wtr	7,687	Sand	400,600	80
9/18/2013	9,121	9,277	9/18/2013	9,121	9,277	Sik wtr	8,121	Sand	400,220	78
9/18/2013	8,917	9,072	9/18/2013	8,917	9,072	Sik wtr	7,877	Sand	332,320	69
9/18/2013	8,713	8,868	9/18/2013	8,713	8,868	Sik wtr	7,317	Sand	399,400	77.1
9/18/2013	8,510	8,664	9/18/2013	8,510	8,664	Sik wtr	7,335	Sand	400,860	79.4
9/18/2013	8,305	8,465	9/19/2013	8,305	8,465	Sik wtr	7,180	Sand	397,200	79
9/19/2013	8,101	8,256	9/19/2013	8,101	8,256	Sik wtr	7,258	Sand	402,200	80
9/19/2013	7,901	8,052	9/19/2013	7,901	8,052	Sik wtr	8,025	Sand	401,520	80.1
9/19/2013	7,692	7,847	9/20/2013	7,692	7,847	Sik wtr	7,190	Sand	400,880	76
9/20/2013	7,488	7,643	9/20/2013	7,488	7,643	Sik wtr	7,288	Sand	400,700	80
9/20/2013	7,284	7,439	9/20/2013	7,284	7,439	Sik wtr	7,140	Sand	361,340	76
9/20/2013	7,080	7,235	9/20/2013	7,080	7,235	Sik wtr	8,283	Sand	396,140	78

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

Maximum TVD of wellbore: 6402 ft TVD @ 7265 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	6400	6213
GENESEO (SH)	6400	6213	6460	6235
TULLY (LS)	6460	6235	6263	6271
HAMILTON (SH)	6263	6271	6985	6376
MARCELLUS (SH)	6985	6376		
TD OF LATERAL			11694	6362

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	9/15/2013
State:	WEST VIRGINIA
County:	OHIO
API Number:	4706900118
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	GEORGE GANTZER OH1 5H
Longitude:	-80.600497
Latitude:	40.045113
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	7,050
Total Water Volume (gal)**:	7,225,092

## 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%	76.61147%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	10.36965%	
EC6110A	NALCO	Anti-Bacterial Agent	Ethanol Glutaraldehyde (Pentanediol) Quaternary Ammonium Compounds	000064-17-5 000111-30-8 NA	5.00% 60.00% 10.00%	0.00132% 0.01585% 0.00264%	
EC6629A	NALCO	Scale Inhibitor	No Hazardous Components	NONE		0.00000%	
A264, J218, J475, J580, J609, J610, L058, Acid, Hydrochloric 15pct, Northern White Sand, 100 Mesh Sand	SCHLUMBERGER	Breaker, Corrosion Inhibitor, Cross Linker, Friction Reducer, Gelling Agent, Iron Control Agent, Acid, Proppant - Natural	Crystalline silica Hydrogen chloride Guar gum Acrylamide, 2-acrylamido-2-Ammonium sulfate Sodium sulfate Diammonium peroxodisulphate Potassium borate	14808-60-7 7647-01-0 9000-30-0 38193-60-1 7783-20-2 7757-82-6 7727-54-0 1332-77-0	98.19957% 1.22074% 0.31265% 0.08190% 0.07740% 0.03346% 0.01967% 0.01643%	12.78448% 0.15893% 0.04070% 0.01066% 0.01008% 0.00436% 0.00256% 0.00214%	

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Polymer of 2-acrylamido-2-	136793-29-8	0.00878%	0.00114%
Potassium hydroxide	1310-58-3	0.00607%	0.00079%
Urea	57-13-6	0.00539%	0.00070%
Glycerol	56-81-5	0.00536%	0.00070%
Sodium erythorbate	6381-77-7	0.00457%	0.00060%
Methanol	67-56-1	0.00384%	0.00050%
Fatty acids, tall-oil	61790-12-3	0.00282%	0.00037%
Thiourea, polymer with	68527-49-1	0.00232%	0.00030%
Non-crystalline silica	7631-86-9	0.00163%	0.00021%
Alcohols, C14-15, ethoxylated	68951-67-7	0.00108%	0.00014%
Prop-2-yn-1-ol	107-19-7	0.00072%	0.00009%
Vinylidene chloride/methylacrylate	25038-72-6	0.00060%	0.00008%
Alkenes, C>10 a-	64743-02-8	0.00048%	0.00006%
Polypropylene glycol	25322-69-4	0.00047%	0.00006%
Tetrasodium	64-02-8	0.00017%	0.00002%
Dimethyl siloxanes and silicones	63148-62-9	0.00008%	0.00001%
Magnesium silicate hydrate (talc)	14807-96-6	0.00002%	< 0.00001%
Siloxanes and Silicones, di-Me,	67762-90-7	0.00001%	< 0.00001%
Octamethylcyclotetrasiloxane	556-67-2	0.00001%	< 0.00001%
Sodium hydroxide	1310-73-2	0.00001%	< 0.00001%
poly(tetrafluoroethylene)	9002-84-0	0.00001%	< 0.00001%
Decamethyl cyclopentasiloxane	541-02-6	0.00001%	< 0.00001%
Dodecamethylcyclohexasiloxane	540-97-6	< 0.00001%	< 0.00001%

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Additional Ingredients Not Listed on MSDS			
EC6110A, EC6629A	NALCO	Anti-Bacterial Agent, Scale Inhibitor	
		Methanol (Methyl Alcohol)	0.00580%
		Proprietary Acrylate Polymer	0.00580%
		Proprietary Quaternary Ammonium Salt	0.00580%
		Water	0.02509%

\* 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.