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west virginia department of environmental protection

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Office of Oil and Gas  
601 57th Street SE  
Charleston, WV 25304  
(304) 926-0450  
(304) 926-0452 fax

Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

## PERMIT MODIFICATION APPROVAL

December 06, 2013

CHESAPEAKE APPALACHIA, L.L.C.  
POST OFFICE BOX 6070  
CHARLESTON, WV 25362

Re: Permit Modification Approval for API Number 5101611 , Well #: FORK RIDGE MSH 1H 8:

Oil and Gas Operator:

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,

Gene Smith  
Regulatory/Compliance Manager  
Office of Oil and Gas

Preliminary Report

WR-35  
Rev (9-11)

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

DATE: 7-22-2013  
API #: 47-051-01611

Farm name: Fork Ridge MSH 1H Operator Well No.: 836621

LOCATION: Elevation: 1,260' Quadrangle: Glen Easton 7.5

District: Cameron County: Marshall  
Latitude: 6,470' Feet South of 39 Deg. 52 Min. 30 Sec.  
Longitude 11,378' Feet West of 80 Deg. 37 Min. 30 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"	120'	120'	364 Cu. Ft.
Agent: Eric Gillespie	13 3/8"	783'	783'	859 Cu. Ft.
Inspector: Derek Haught	9 5/8"	2,450'	2,450'	1,139 Cu. Ft.
Date Permit Issued: 1-4-2013	5 1/2"	12,071'	12,071'	2,767 Cu. Ft.
Date Well Work Commenced: 2-25-2013				
Date Well Work Completed: 3-14-2013(Rig release date)				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 6,749'				
Total Measured Depth (ft): 12,076'				
Fresh Water Depth (ft.): 661'				
Salt Water Depth (ft.): 1,047'				
Is coal being mined in area (N/Y)? Y				
Coal Depths (ft.): 961'				
Void(s) encountered (N/Y) Depth(s) N				

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

Producing formation Marcellus Pay zone depth (ft) Completing  
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

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

Received

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.

Marlon Williams  
Signature

7-22-2013  
Office of Oil and Gas  
Date: Dept. of Environmental Protection

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 MWD Gamma from 6087-12076

**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:

TIL 6/1/2014

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

Formations Encountered:	Top Depth	/	Bottom Depth
Surface:			

See attached

Received

23 2013

51-01611

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

**Maximum TVD of wellbore: 6749 ft TVD @ 12076 ft MD**

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
SILTSTONE/LS	0	0	959	959
PITTSBURG COAL	959	959	969	969
SHALE W/ MINOR SS	969	969	1600	1600
SHALE W/ LS	1600	1600	2020	2020
BIG LIME	2020	2020	2094	2094
BIG INJUN (SS)	2094	2094	2316	2316
SHALE W/ SS	2316	2316	6718	6641
GENESEO (SH)	6718	6641	6744	6658
TULLY (LS)	6744	6658	6783	6681
HAMILTON (SH)	6783	6681	7010	6775
MARCELLUS (SH)	7010	6775		
TD OF LATERAL			12076	6749

Received

2 3 2010

Office of Oil and Gas  
WV Dept. of Environmental Protection



# Weatherford International Ltd.

## DIRECTIONAL REPORT



# Weatherford

51-01611

<b>Company:</b> CHESAPEAKE <b>Field:</b> MARSHALL COUNTY (NAD 27) <b>Site:</b> FORK RIDGE PAD <b>Well:</b> 1H <b>Wellpath:</b> HORIZONTAL	<b>Date:</b> 3/14/2013 <b>Time:</b> 10:38:56 <b>Page:</b> 1 <b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North <b>Vertical (TVD) Reference:</b> SITE 1413.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,339.97Azi) <b>Survey Calculation Method:</b> Minimum Curvature <b>Db:</b> Sybase																																																																																																																																																																																																																																																		
<b>Plan:</b> <b>Principal:</b>	<b>Date Composed:</b> <b>Version:</b> <b>Tied-to:</b>																																																																																																																																																																																																																																																		
<b>Field:</b> MARSHALL COUNTY (NAD 27)																																																																																																																																																																																																																																																			
<b>Map System:</b> US State Plane Coordinate System 1927 <b>Geo Datum:</b> NAD27 (Clarke 1866) <b>Sys Datum:</b> Mean Sea Level	<b>Map Zone:</b> West Virginia, Northern Zone <b>Coordinate System:</b> Well Centre <b>Geomagnetic Model:</b> IGRF2010																																																																																																																																																																																																																																																		
<b>Site:</b> FORK RIDGE PAD																																																																																																																																																																																																																																																			
<b>Site Position:</b> <b>From:</b> Map <b>Position Uncertainty:</b> 0.00 ft <b>Ground Level:</b> 1391.00 ft	<b>Northing:</b> 501556.11 ft <b>Easting:</b> 1680438.31 ft <b>Latitude:</b> 39 52 17.357 N <b>Longitude:</b> 80 38 18.794 W <b>North Reference:</b> Grid <b>Grid Convergence:</b> -0.73 deg																																																																																																																																																																																																																																																		
<b>Well:</b> 1H <b>Slot Name:</b>																																																																																																																																																																																																																																																			
<b>Well Position:</b> +N/-S -8.11 ft <b>Northing:</b> 501548.00 ft +E/-W -11.51 ft <b>Easting:</b> 1680426.80 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Latitude:</b> 39 52 17.275 N <b>Longitude:</b> 80 38 18.941 W																																																																																																																																																																																																																																																		
<b>Wellpath:</b> HORIZONTAL <b>Current Datum:</b> SITE <b>Height:</b> 1413.00 ft <b>Magnetic Data:</b> 1/23/2013 <b>Field Strength:</b> 52752 nT <b>Vertical Section: Depth From (TVD)</b>	<b>Drilled From:</b> Surface <b>Tie-on Depth:</b> 0.00 ft <b>Above System Datum:</b> Mean Sea Level <b>Declination:</b> -8.66 deg <b>Mag Dip Angle:</b> 67.38 deg <b>+N/-S</b> <b>+E/-W</b> <b>Direction</b> ft                   ft                   deg																																																																																																																																																																																																																																																		
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SVY	867.00	1.01	352.18	866.99	2.35	2.19	1.46	2.61	501550.35	1680428.99		899.00	1.98	329.02	898.98	3.11	1.87	2.28	3.51	501551.11	1680429.67		930.00	3.32	328.76	929.95	4.33	1.13	3.69	4.32	501552.33	1680427.93		962.00	4.52	324.86	961.87	6.16	-0.08	5.81	3.84	501554.16	1680426.72		993.00	4.83	312.01	992.77	8.03	-1.75	8.14	3.51	501556.03	1680425.05		1025.00	5.07	306.23	1024.65	9.77	-3.89	10.51	1.73	501557.77	1680422.91		1056.00	5.30	303.71	1055.52	11.37	-6.19	12.80	1.04	501559.37	1680420.61		1088.00	6.01	300.97	1087.37	13.05	-8.86	15.30	2.37	501561.05	1680417.94		1119.00	6.60	298.63	1118.18	14.74	-11.81	17.90	2.08	501562.74	1680414.99		1151.00	6.71	299.64	1149.96	16.55	-15.05	20.70	0.50	501564.55	1680411.75		
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MARCH 20 2013

Office of Oil and Gas  
WV Dept. of Environmental Protection

51-0160



# Weatherford International Ltd. DIRECTIONAL REPORT



## Weatherford

<b>Company:</b> CHESAPEAKE	<b>Date:</b> 3/14/2013	<b>Time:</b> 10:38:56	<b>Page:</b> 2
<b>Field:</b> MARSHALL COUNTY (NAD 27)	<b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North		
<b>Site:</b> FORK RIDGE PAD	<b>Vertical (TVD) Reference:</b> SITE 1413.0		
<b>Well:</b> 1H	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,339.97Azi)		
<b>Wellpath:</b> HORIZONTAL	<b>Survey Calculation Method:</b> Minimum Curvature		<b>Db:</b> Sybase

### Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
1245.00	7.90	306.16	1243.20	23.08	-25.04	30.26	1.54	501571.08	1680401.76	
1339.00	8.49	298.17	1336.24	30.16	-36.37	40.80	1.36	501578.16	1680390.43	
1432.00	7.63	296.62	1428.32	36.17	-47.94	50.41	0.95	501584.17	1680378.86	
1526.00	7.25	294.61	1521.53	41.44	-58.92	59.11	0.49	501589.44	1680367.88	
1621.00	6.82	294.02	1615.82	46.23	-69.52	67.24	0.46	501594.23	1680357.28	
1716.00	6.35	300.89	1710.19	51.22	-79.18	75.24	0.96	501599.22	1680347.62	
1811.00	6.34	306.50	1804.61	57.04	-87.90	83.70	0.65	501605.04	1680338.90	
1903.00	6.55	309.52	1896.03	63.40	-96.03	92.46	0.43	501611.40	1680330.77	
1998.00	6.54	303.64	1990.41	69.85	-104.72	101.49	0.71	501617.85	1680322.08	
2092.00	7.35	299.07	2083.72	75.73	-114.43	110.35	1.04	501623.73	1680312.37	
2186.00	7.40	294.95	2176.94	81.21	-125.17	119.17	0.56	501629.21	1680301.63	
2279.00	6.60	288.04	2269.25	85.39	-135.69	126.70	1.25	501633.39	1680291.11	
2374.00	3.39	280.37	2363.88	87.59	-143.64	131.49	3.44	501635.59	1680283.16	
2395.00	2.50	276.00	2384.85	87.75	-144.71	132.00	4.37	501635.75	1680282.09	
2500.00	1.19	273.37	2489.80	88.05	-148.08	133.44	1.25	501636.05	1680278.72	
2600.00	0.75	274.07	2589.78	88.16	-149.77	134.12	0.44	501636.16	1680277.03	
2700.00	0.71	277.23	2689.77	88.28	-151.03	134.67	0.06	501636.28	1680275.77	
2800.00	0.51	291.12	2789.77	88.52	-152.06	135.25	0.25	501636.52	1680274.74	
2900.00	0.41	282.35	2889.76	88.76	-152.83	135.73	0.12	501636.76	1680273.97	
3000.00	0.31	296.54	2989.76	88.95	-153.42	136.12	0.13	501636.95	1680273.38	
3100.00	0.36	294.92	3089.76	89.21	-153.95	136.54	0.05	501637.21	1680272.85	
3200.00	0.44	248.97	3189.76	89.20	-154.59	136.76	0.32	501637.20	1680272.21	
3300.00	0.49	318.21	3289.76	89.38	-155.23	137.15	0.53	501637.38	1680271.57	
3400.00	0.72	280.03	3389.75	89.81	-156.14	137.86	0.45	501637.81	1680270.66	
3500.00	0.66	277.00	3489.74	89.99	-157.33	138.43	0.07	501637.99	1680269.47	
3600.00	0.20	347.22	3589.74	90.23	-157.94	138.87	0.62	501638.23	1680268.86	
3700.00	0.33	352.51	3689.74	90.69	-158.01	139.32	0.13	501638.69	1680268.79	
3800.00	0.49	334.03	3789.74	91.36	-158.24	140.03	0.21	501639.36	1680268.56	
3900.00	0.37	330.10	3889.73	92.02	-158.59	140.77	0.12	501640.02	1680268.21	
4000.00	0.43	327.37	3989.73	92.62	-158.95	141.46	0.06	501640.62	1680267.85	
4100.00	0.43	314.56	4089.73	93.20	-159.42	142.16	0.10	501641.20	1680267.38	
4200.00	0.43	291.92	4189.73	93.60	-160.03	142.75	0.17	501641.60	1680266.77	
4300.00	0.51	221.25	4289.72	93.41	-160.68	142.79	0.55	501641.41	1680266.12	
4400.00	0.22	163.32	4389.72	92.89	-160.91	142.38	0.44	501640.89	1680265.89	
4500.00	0.36	281.34	4489.72	92.77	-161.17	142.36	0.50	501640.77	1680265.63	
4600.00	0.46	219.43	4589.72	92.52	-161.73	142.32	0.43	501640.52	1680265.07	
4700.00	0.20	58.34	4689.72	92.30	-161.84	142.15	0.65	501640.30	1680264.96	
4800.00	0.14	19.90	4789.72	92.50	-161.65	142.28	0.13	501640.50	1680265.15	
4900.00	0.49	196.56	4889.72	92.21	-161.73	142.03	0.63	501640.21	1680265.07	
5000.00	0.82	142.44	4989.71	91.23	-161.41	141.00	0.66	501639.23	1680265.39	
5100.00	1.04	136.09	5089.70	90.01	-160.35	139.49	0.24	501638.01	1680266.45	
5200.00	0.87	176.71	5189.68	88.60	-159.67	137.93	0.68	501636.60	1680267.13	
5300.00	0.57	182.92	5289.68	87.35	-159.66	136.75	0.31	501635.35	1680267.14	
5400.00	1.06	184.58	5389.67	85.93	-159.75	135.45	0.49	501633.93	1680267.05	
5500.00	0.69	195.85	5489.65	84.43	-159.99	134.12	0.41	501632.43	1680266.81	
5600.00	0.29	191.42	5589.65	83.60	-160.21	133.41	0.40	501631.60	1680266.59	
5700.00	0.67	181.92	5689.65	82.77	-160.28	132.66	0.39	501630.77	1680266.52	
5800.00	0.72	207.71	5789.64	81.63	-160.59	131.69	0.31	501629.63	1680266.21	
5900.00	0.84	232.94	5889.63	80.63	-161.47	131.05	0.36	501628.63	1680265.33	
5935.00	0.77	233.80	5924.63	80.33	-161.86	130.91	0.20	501628.33	1680264.94	
6036.00	0.36	263.76	6025.62	79.90	-162.72	130.80	0.49	501627.90	1680264.08	
6068.00	0.42	239.60	6057.62	79.83	-162.92	130.80	0.54	501627.83	1680263.88	

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Office of Oil and Gas  
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## DIRECTIONAL REPORT



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5-01611

<b>Company:</b> CHESAPEAKE	<b>Date:</b> 3/14/2013	<b>Time:</b> 10:38:56	<b>Page:</b> 3
<b>Field:</b> MARSHALL COUNTY (NAD 27)	<b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North		
<b>Site:</b> FORK RIDGE PAD	<b>Vertical (TVD) Reference:</b> SITE 1413.0		
<b>Well:</b> 1H	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,339.97Azi)		
<b>Wellpath:</b> HORIZONTAL	<b>Survey Calculation Method:</b> Minimum Curvature		<b>Db:</b> Sybase

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
6099.00	0.51	244.48	6088.62	79.71	-163.15	130.77	0.32	501627.71	1680263.65	
6131.00	1.50	268.93	6120.61	79.64	-163.69	130.89	3.30	501627.64	1680263.11	
6162.00	4.21	275.31	6151.57	79.74	-165.23	131.51	8.79	501627.74	1680261.57	
6193.00	6.11	279.73	6182.45	80.12	-167.99	132.82	6.26	501628.12	1680258.81	
6225.00	8.35	287.63	6214.19	81.12	-171.89	135.08	7.64	501629.12	1680254.91	
6256.00	10.71	292.73	6244.76	82.91	-176.69	138.41	8.08	501630.91	1680250.11	
6288.00	12.63	291.72	6276.10	85.35	-182.68	142.76	6.03	501633.35	1680244.12	
6319.00	15.32	290.14	6306.18	88.02	-189.68	147.66	8.76	501636.02	1680237.12	
6351.00	18.25	287.50	6336.81	90.98	-198.43	153.44	9.46	501638.98	1680228.37	
6382.00	21.07	285.15	6366.00	93.90	-208.44	159.61	9.45	501641.90	1680218.36	
6414.00	23.37	283.81	6395.62	96.92	-220.15	166.46	7.36	501644.92	1680206.65	
6445.00	24.84	283.23	6423.92	99.88	-232.46	173.46	4.80	501647.88	1680194.34	
6463.00	26.97	282.58	6440.11	101.63	-240.13	177.73	11.94	501649.63	1680186.67	
6494.00	29.85	281.87	6467.37	104.75	-254.54	185.60	9.35	501652.75	1680172.26	
6525.00	32.14	284.91	6493.95	108.46	-270.06	194.40	8.95	501656.46	1680156.74	
6557.00	34.99	290.86	6520.62	113.92	-286.87	205.28	13.59	501661.92	1680139.93	
6588.00	37.98	295.58	6545.54	121.20	-303.79	217.92	13.22	501669.20	1680123.01	
6620.00	40.55	300.92	6570.32	130.80	-321.60	233.04	13.26	501678.80	1680105.20	
6651.00	43.00	305.99	6593.45	142.20	-338.80	249.64	13.46	501690.20	1680088.00	
6683.00	44.58	308.89	6616.55	155.66	-356.38	268.31	7.98	501703.66	1680070.42	
6714.00	46.67	311.94	6638.23	170.03	-373.24	287.59	9.74	501718.03	1680053.56	
6746.00	49.78	312.87	6659.55	186.13	-390.85	308.74	9.96	501734.13	1680035.95	
6777.00	53.82	314.30	6678.71	202.93	-408.49	330.56	13.53	501750.93	1680018.31	
6809.00	58.21	316.26	6696.60	221.78	-427.14	354.67	14.63	501769.78	1679999.66	
6840.00	61.31	317.37	6712.21	241.31	-445.47	379.29	10.47	501789.31	1679981.33	
6872.00	64.59	318.61	6726.76	262.49	-464.53	405.72	10.82	501810.49	1679962.27	
6903.00	67.42	319.61	6739.37	283.89	-483.07	432.18	9.59	501831.89	1679943.73	
6935.00	68.79	320.02	6751.30	306.58	-502.23	460.05	4.44	501854.58	1679924.57	
6966.00	70.93	320.40	6761.97	328.94	-520.85	487.44	7.00	501876.94	1679905.95	
6998.00	73.25	322.40	6771.81	352.74	-539.84	516.30	9.38	501900.74	1679886.96	
7029.00	75.28	324.19	6780.22	376.66	-557.67	544.88	8.59	501924.66	1679869.13	
7060.00	76.72	324.97	6787.72	401.17	-575.11	573.88	5.25	501949.17	1679851.69	
7092.00	79.04	324.93	6794.44	426.78	-593.07	604.10	7.25	501974.78	1679833.73	
7123.00	81.72	325.76	6799.62	451.92	-610.45	633.67	9.04	501999.92	1679816.35	
7155.00	84.88	327.55	6803.35	478.47	-627.91	664.59	11.33	502026.47	1679798.89	
7186.00	86.43	328.19	6805.70	504.64	-644.35	694.82	5.41	502052.64	1679782.45	
7279.00	88.81	328.83	6809.56	583.87	-692.89	785.88	2.65	502131.87	1679733.91	
7374.00	88.88	328.14	6811.48	664.84	-742.53	878.96	0.73	502212.84	1679684.27	
7469.00	90.28	329.86	6812.17	746.27	-791.46	972.21	2.33	502294.27	1679635.34	
7564.00	90.21	329.46	6811.77	828.25	-839.45	1065.68	0.43	502376.25	1679587.35	
7659.00	92.03	330.84	6809.91	910.63	-886.72	1159.26	2.40	502458.63	1679540.08	
7753.00	92.17	330.85	6806.46	992.66	-932.48	1252.01	0.15	502540.66	1679494.32	
7848.00	90.42	332.04	6804.32	1076.08	-977.88	1345.93	2.23	502624.08	1679448.92	
7947.00	88.88	335.71	6804.92	1164.95	-1021.46	1444.35	4.02	502712.95	1679405.34	
8037.00	90.00	337.93	6805.80	1247.67	-1056.88	1534.20	2.76	502795.67	1679369.92	
8131.00	90.07	338.24	6805.74	1334.88	-1091.97	1628.15	0.34	502882.88	1679334.83	
8226.00	89.72	338.29	6805.92	1423.13	-1127.15	1723.11	0.37	502971.13	1679299.65	
8320.00	90.98	340.53	6805.34	1511.11	-1160.20	1817.09	2.73	503059.11	1679266.60	
8414.00	91.19	340.73	6803.56	1599.78	-1191.37	1911.07	0.31	503147.78	1679235.43	
8509.00	90.70	339.94	6802.00	1689.22	-1223.34	2006.05	0.98	503237.22	1679203.46	
8602.00	90.63	339.67	6800.92	1776.50	-1255.44	2099.05	0.30	503324.50	1679171.36	
8696.00	90.28	339.35	6800.17	1864.55	-1288.34	2193.04	0.50	503412.55	1679138.46	
8790.00	90.28	338.96	6799.71	1952.39	-1321.79	2287.03	0.41	503500.39	1679105.01	

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## DIRECTIONAL REPORT



<b>Company:</b> CHESAPEAKE	<b>Date:</b> 3/14/2013	<b>Time:</b> 10:38:56	<b>Page:</b> 4
<b>Field:</b> MARSHALL COUNTY (NAD 27)	<b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North		
<b>Site:</b> FORK RIDGE PAD	<b>Vertical (TVD) Reference:</b> SITE 1413.0		
<b>Well:</b> 1H	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,339.97Azi)		
<b>Wellpath:</b> HORIZONTAL	<b>Survey Calculation Method:</b> Minimum Curvature		<b>Db:</b> Sybase

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
8885.00	90.42	339.30	6799.13	2041.16	-1355.63	2382.02	0.39	503589.16	1679071.17	
8978.00	90.98	339.91	6798.00	2128.32	-1388.04	2475.01	0.89	503676.32	1679038.76	
9073.00	91.26	339.75	6796.14	2217.48	-1420.79	2569.99	0.34	503765.48	1679006.01	
9167.00	91.12	339.20	6794.19	2305.49	-1453.74	2663.97	0.60	503853.49	1678973.06	
9262.00	92.17	339.22	6791.46	2394.27	-1487.45	2758.92	1.11	503942.27	1678939.35	
9356.00	91.12	338.50	6788.76	2481.91	-1521.33	2852.86	1.35	504029.91	1678905.47	
9451.00	89.23	338.68	6788.47	2570.35	-1556.01	2947.83	2.00	504118.35	1678870.79	
9546.00	89.51	338.56	6789.52	2658.80	-1590.64	3042.79	0.32	504206.80	1678836.16	
9640.00	89.02	340.33	6790.72	2746.81	-1623.64	3136.78	1.95	504294.81	1678803.16	
9735.00	89.65	340.59	6791.82	2836.33	-1655.41	3231.77	0.72	504384.33	1678771.39	
9829.00	89.72	339.89	6792.34	2924.79	-1687.19	3325.76	0.75	504472.79	1678739.61	
9923.00	91.75	341.45	6791.14	3013.48	-1718.30	3419.74	2.72	504561.48	1678708.50	
10018.00	90.21	338.86	6789.51	3102.81	-1750.54	3514.72	3.17	504650.81	1678676.26	
10112.00	90.63	338.82	6788.82	3190.47	-1784.47	3608.70	0.45	504738.47	1678642.33	PLAN 6 TIE IN
10207.00	90.28	340.68	6788.07	3279.59	-1817.35	3703.69	1.99	504827.59	1678609.45	
10301.00	90.63	340.73	6787.32	3368.31	-1848.41	3797.68	0.38	504916.31	1678578.39	
10395.00	90.84	339.74	6786.11	3456.76	-1880.20	3891.67	1.08	505004.76	1678546.60	
10490.00	91.75	339.75	6783.97	3545.87	-1913.08	3986.64	0.96	505093.87	1678513.72	
10584.00	92.73	339.53	6780.29	3633.93	-1945.76	4080.57	1.07	505181.93	1678481.04	
10679.00	91.26	339.23	6776.99	3722.78	-1979.19	4175.50	1.58	505270.78	1678447.61	
10774.00	90.49	337.58	6775.54	3811.10	-2014.15	4270.45	1.92	505359.10	1678412.65	
10868.00	88.67	339.23	6776.22	3898.49	-2048.74	4364.41	2.61	505446.49	1678378.06	
10963.00	90.91	341.96	6776.57	3988.08	-2080.30	4459.38	3.72	505536.08	1678346.50	
11057.00	91.54	341.00	6774.56	4077.19	-2110.15	4553.33	1.22	505625.19	1678316.65	
11152.00	92.73	341.24	6771.02	4167.02	-2140.87	4648.24	1.28	505715.02	1678285.93	
11247.00	92.09	340.80	6767.03	4256.77	-2171.74	4743.14	0.82	505804.77	1678255.06	
11342.00	90.49	342.11	6764.89	4346.81	-2201.94	4838.08	2.18	505894.81	1678224.86	
11436.00	90.42	342.15	6764.14	4436.27	-2230.79	4932.01	0.09	505984.27	1678196.01	
11530.00	90.63	342.30	6763.28	4525.78	-2259.48	5025.93	0.27	506073.78	1678167.32	
11623.00	90.84	342.02	6762.09	4614.30	-2287.97	5118.86	0.38	506162.30	1678138.83	
11715.00	91.40	342.52	6760.29	4701.92	-2315.98	5210.77	0.82	506249.92	1678110.82	
11810.00	92.03	342.60	6757.45	4792.51	-2344.44	5305.63	0.67	506340.51	1678082.36	
11904.00	91.68	342.67	6754.41	4882.18	-2372.48	5399.47	0.38	506430.18	1678054.32	
12017.00	92.87	343.07	6749.92	4990.08	-2405.74	5512.24	1.11	506538.08	1678021.06	LAST MWD SVY
12076.00	92.87	343.07	6746.97	5046.45	-2422.90	5571.08	0.00	506594.45	1678003.90	PROJ TO BIT

**Targets**

Name	Description Dip.	Dir.	TVD	+N/-S	+E/-W	Map Northing	Map Easting	<---- Latitude ----><--- Longitude --->					
								Deg	Min	Sec	Deg	Min	Sec

**Casing Points**

MD ft	TVD ft	Diameter in	Hole Size in	Name
761.00	760.99	13.375	17.500	SURFACE
2450.00	2439.81	9.625	12.250	INTERMEDIATE

Received

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Office of Oil and Gas  
WV Dept. of Environmental Protection



51-01611



# Weatherford International Ltd. DIRECTIONAL REPORT



<b>Company:</b> CHESAPEAKE	<b>Date:</b> 3/14/2013	<b>Time:</b> 10:38:56	<b>Page:</b> 5
<b>Field:</b> MARSHALL COUNTY (NAD 27)	<b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North		
<b>Site:</b> FORK RIDGE PAD	<b>Vertical (TVD) Reference:</b> SITE 1413.0		
<b>Well:</b> 1H	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,339.97Azi)		
<b>Wellpath:</b> HORIZONTAL	<b>Survey Calculation Method:</b> Minimum Curvature		<b>Db:</b> Sybase

### Annotation

MD ft	TVD ft	
836.00	835.99	FIRST MWD SVY
12017.00	6749.92	LAST MWD SVY
12076.00	6746.97	PROJ TO BIT
10112.00	6788.82	PLAN 6 TIE IN

### Formations

MD ft	TVD ft	Formations	Lithology	Dip Angle deg	Dip Direction deg
6620.89	6571.00	MIDDLESEX		0.00	0.00
6720.99	6643.00	GENESEO		0.00	0.00
6765.82	6672.00	TULLY		0.00	0.00
7125.70	6800.00	MARCELLUS		0.00	0.00
	0.00	ONONDAGA		0.00	0.00

## Received

JUL 23 2013

Office of Oil and Gas  
WV Dept. of Environmental Protection

WR-35  
Rev (9-11)

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

DATE: 7-22-2013  
API #: 47-051-01611

Farm name: Fork Ridge MSH 1H Operator Well No.: 836621

LOCATION: Elevation: 1,260' Quadrangle: Glen Easton 7.5

District: Cameron County: Marshall  
Latitude: 6.470' Feet South of 39 Deg. 52 Min. 30 Sec.  
Longitude 11.378' Feet West of 80 Deg. 37 Min. 30 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"	120'	120'	364 Cu. Ft.
Agent: Eric Gillespie	13 3/8"	783'	783'	859 Cu. Ft.
Inspector: <b>Derek Haught</b>	9 5/8"	2,450'	2,450'	1,139 Cu. Ft.
Date Permit Issued: 1-4-2013	5 1/2"	12,071'	12,071'	2,767 Cu. Ft.
Date Well Work Commenced: 2-25-2013				
Date Well Work Completed: 3-14-2013(Rig release date)				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 6,749'				
Total Measured Depth (ft): 12,076'				
Fresh Water Depth (ft.): 661'				
Salt Water Depth (ft.): 1,047'				
Is coal being mined in area (N/Y)? Y				
Coal Depths (ft.): 961'				
Void(s) encountered (N/Y) Depth(s) N				

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

Producing formation Marcellus Pay zone depth (ft) Completing  
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

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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23 2013

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WV Dept. of Environmental Protection

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

7-22-2013  
Date

5101611

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 MWD Gamma from 6087-12076

**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:

TIL 6/1/2014

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

<u>Formations Encountered:</u>	<u>Top Depth</u>	<u>Bottom Depth</u>
<u>Surface:</u>		

See attached

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51-01611

**LATERAL WELLBORE (no vertical pilot hole associated with this well)****Maximum TVD of wellbore: 6749 ft TVD @ 12076 ft MD**

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
SILTSTONE/LS	0	0	959	959
PITTSBURG COAL	959	959	969	969
SHALE W/ MINOR SS	969	969	1600	1600
SHALE W/ LS	1600	1600	2020	2020
BIG LIME	2020	2020	2094	2094
BIG INJUN (SS)	2094	2094	2316	2316
SHALE W/ SS	2316	2316	6718	6641
GENESEO (SH)	6718	6641	6744	6658
TULLY (LS)	6744	6658	6783	6681
HAMILTON (SH)	6783	6681	7010	6775
MARCELLUS (SH)	7010	6775		
TD OF LATERAL			12076	6749

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23 2010

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WV Dept. of Environmental Protection

5101611



# Weatherford International Ltd.

## DIRECTIONAL REPORT



Company: CHESAPEAKE	Date: 3/14/2013	Time: 10:38:56	Page: 1
Field: MARSHALL COUNTY (NAD 27)	Co-ordinate(NE) Reference: Well: 1H, Grid North		
Site: FORK RIDGE PAD	Vertical (TVD) Reference: SITE 1413.0		
Well: 1H	Section (VS) Reference: Well (0.00N,0.00E,339.97Azi)		
Wellpath: HORIZONTAL	Survey Calculation Method: Minimum Curvature		Db: Sybase

Plan:	Date Composed:
Principal:	Version:
	Tied-to:

Field: MARSHALL COUNTY (NAD 27)	
Map System: US State Plane Coordinate System 1927	Map Zone: West Virginia, Northern Zone
Geo Datum: NAD27 (Clarke 1866)	Coordinate System: Well Centre
Sys Datum: Mean Sea Level	Geomagnetic Model: IGRF2010

Site: FORK RIDGE PAD			
Site Position:	Northing: 501556.11 ft	Latitude: 39 52 17.357 N	
From: Map	Easting: 1680438.31 ft	Longitude: 80 38 18.794 W	
Position Uncertainty: 0.00 ft		North Reference: Grid	
Ground Level: 1391.00 ft		Grid Convergence: -0.73 deg	

Well: 1H	Slot Name:
Well Position: +N/-S -8.11 ft	Northing: 501548.00 ft
+E/-W -11.51 ft	Easting: 1680426.80 ft
Position Uncertainty: 0.00 ft	Latitude: 39 52 17.275 N
	Longitude: 80 38 18.941 W

Wellpath: HORIZONTAL	Drilled From: Surface
Current Datum: SITE	Tie-on Depth: 0.00 ft
Magnetic Data: 1/23/2013	Above System Datum: Mean Sea Level
Field Strength: 52752 nT	Declination: -8.66 deg
Vertical Section: Depth From (TVD)	Mag Dip Angle: 67.38 deg
ft	+N/-S ft
0.00	ft
	+E/-W ft
	ft
	Direction deg
	0.00
	339.97

Plan Section Information											
MD	Incl	Azim	TVD	+N/-S	+E/-W	DLS	Build	Turn	TFO	Target	

Survey											
MD	Incl	Azim	TVD	N/S	E/W	VS	DLS	MapN	MapE	Comment	
ft	deg	deg	ft	ft	ft	ft	deg/100ft	ft	ft		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	501548.00	1680426.80		
100.00	0.10	49.75	100.00	0.06	0.07	0.03	0.10	501548.06	1680426.87		
200.00	0.11	75.29	200.00	0.14	0.23	0.05	0.05	501548.14	1680427.03		
300.00	0.14	46.37	300.00	0.25	0.41	0.09	0.07	501548.25	1680427.21		
400.00	0.15	42.91	400.00	0.43	0.58	0.20	0.01	501548.43	1680427.38		
500.00	0.24	49.71	500.00	0.66	0.83	0.33	0.09	501548.66	1680427.63		
600.00	0.31	33.88	600.00	1.02	1.14	0.56	0.10	501549.02	1680427.94		
700.00	0.37	49.02	700.00	1.45	1.54	0.84	0.11	501549.45	1680428.34		
760.00	0.32	52.95	759.99	1.68	1.82	0.96	0.09	501549.68	1680428.62		
836.00	0.39	41.16	835.99	2.00	2.16	1.14	0.13	501550.00	1680428.96	FIRST MWD SVY	
867.00	1.01	352.18	866.99	2.35	2.19	1.46	2.61	501550.35	1680428.99		
899.00	1.98	329.02	898.98	3.11	1.87	2.28	3.51	501551.11	1680428.67		
930.00	3.32	328.76	929.95	4.33	1.13	3.69	4.32	501552.35	1680427.93		
962.00	4.52	324.86	961.87	6.16	-0.08	5.81	3.84	501554.16	1680426.72		
993.00	4.83	312.01	992.77	8.03	-1.75	8.14	3.51	501556.03	1680425.05		
1025.00	5.07	306.23	1024.65	9.77	-3.89	10.51	1.73	501557.77	1680422.91		
1056.00	5.30	303.71	1055.52	11.37	-6.19	12.80	1.04	501559.37	1680420.61		
1088.00	6.01	300.97	1087.37	13.05	-8.86	15.30	2.37	501561.05	1680417.94		
1119.00	6.60	298.63	1118.18	14.74	-11.81	17.90	2.08	501562.74	1680414.99		
1151.00	6.71	299.64	1149.96	16.55	-15.05	20.70	0.50	501564.55	1680409.5		

Office of Oil and Gas  
WV Dept. of Environmental Protection



# Weatherford International Ltd.

## DIRECTIONAL REPORT



51-01611

Company: CHESAPEAKE	Date: 3/14/2013	Time: 10:38:56	Page: 2
Field: MARSHALL COUNTY (NAD 27)	Co-ordinate(NE) Reference: Well: 1H, Grid North	Vertical (TVD) Reference: SITE 1413.0	
Site: FORK RIDGE PAD	Section (VS) Reference: Well (0.00N,0.00E,339.97Azi)	Survey Calculation Method: Minimum Curvature	Db: Sybase
Well: 1H			
Wellpath: HORIZONTAL			

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
1245.00	7.90	306.16	1243.20	23.08	-25.04	30.26	1.54	501571.08	1680401.76	
1339.00	8.49	298.17	1336.24	30.16	-36.37	40.80	1.36	501578.16	1680390.43	
1432.00	7.63	296.62	1428.32	36.17	-47.94	50.41	0.95	501584.17	1680378.86	
1526.00	7.25	294.61	1521.53	41.44	-58.92	59.11	0.49	501589.44	1680367.88	
1621.00	6.82	294.02	1615.82	46.23	-69.52	67.24	0.46	501594.23	1680357.28	
1716.00	6.35	300.89	1710.19	51.22	-79.18	75.24	0.96	501599.22	1680347.62	
1811.00	6.34	306.50	1804.61	57.04	-87.90	83.70	0.65	501605.04	1680338.90	
1903.00	6.55	309.52	1896.03	63.40	-96.03	92.46	0.43	501611.40	1680330.77	
1998.00	6.54	303.64	1990.41	69.85	-104.72	101.49	0.71	501617.85	1680322.08	
2092.00	7.35	299.07	2083.72	75.73	-114.43	110.35	1.04	501623.73	1680312.37	
2186.00	7.40	294.95	2176.94	81.21	-125.17	119.17	0.56	501629.21	1680301.63	
2279.00	6.60	288.04	2269.25	85.39	-135.69	126.70	1.25	501633.39	1680291.11	
2374.00	3.39	280.37	2363.88	87.59	-143.64	131.49	3.44	501635.59	1680283.16	
2395.00	2.50	276.00	2384.85	87.75	-144.71	132.00	4.37	501635.75	1680282.09	
2500.00	1.19	273.37	2489.80	88.05	-148.08	133.44	1.25	501636.05	1680278.72	
2600.00	0.75	274.07	2589.78	88.16	-149.77	134.12	0.44	501636.16	1680277.03	
2700.00	0.71	277.23	2689.77	88.28	-151.03	134.67	0.06	501636.28	1680275.77	
2800.00	0.51	291.12	2789.77	88.52	-152.06	135.25	0.25	501636.52	1680274.74	
2900.00	0.41	282.35	2889.76	88.76	-152.83	135.73	0.12	501636.76	1680273.97	
3000.00	0.31	296.54	2989.76	88.95	-153.42	136.12	0.13	501636.95	1680273.38	
3100.00	0.36	294.92	3089.76	89.21	-153.95	136.54	0.05	501637.21	1680272.85	
3200.00	0.44	248.97	3189.76	89.20	-154.59	136.76	0.32	501637.20	1680272.21	
3300.00	0.49	318.21	3289.76	89.38	-155.23	137.15	0.53	501637.38	1680271.57	
3400.00	0.72	280.03	3389.75	89.81	-156.14	137.86	0.45	501637.81	1680270.66	
3500.00	0.66	277.00	3489.74	89.99	-157.33	138.43	0.07	501637.99	1680269.47	
3600.00	0.20	347.22	3589.74	90.23	-157.94	138.87	0.62	501638.23	1680268.86	
3700.00	0.33	352.51	3689.74	90.69	-158.01	139.32	0.13	501638.69	1680268.79	
3800.00	0.49	334.03	3789.74	91.36	-158.24	140.03	0.21	501639.36	1680268.56	
3900.00	0.37	330.10	3889.73	92.02	-158.59	140.77	0.12	501640.02	1680268.21	
4000.00	0.43	327.37	3989.73	92.62	-158.95	141.46	0.06	501640.62	1680267.85	
4100.00	0.43	314.56	4089.73	93.20	-159.42	142.16	0.10	501641.20	1680267.38	
4200.00	0.43	291.92	4189.73	93.60	-160.03	142.75	0.17	501641.60	1680266.77	
4300.00	0.51	221.25	4289.72	93.41	-160.68	142.79	0.55	501641.41	1680266.12	
4400.00	0.22	163.32	4389.72	92.89	-160.91	142.38	0.44	501640.89	1680265.89	
4500.00	0.36	281.34	4489.72	92.77	-161.17	142.36	0.50	501640.77	1680265.63	
4600.00	0.46	219.43	4589.72	92.52	-161.73	142.32	0.43	501640.52	1680265.07	
4700.00	0.20	58.34	4689.72	92.30	-161.84	142.15	0.65	501640.30	1680264.96	
4800.00	0.14	19.90	4789.72	92.50	-161.65	142.28	0.13	501640.50	1680265.15	
4900.00	0.49	196.56	4889.72	92.21	-161.73	142.03	0.63	501640.21	1680265.07	
5000.00	0.82	142.44	4989.71	91.23	-161.41	141.00	0.66	501639.23	1680265.39	
5100.00	1.04	136.09	5089.70	90.01	-160.35	139.49	0.24	501638.01	1680266.45	
5200.00	0.87	176.71	5189.68	88.60	-159.67	137.93	0.68	501636.60	1680267.13	
5300.00	0.57	182.92	5289.68	87.35	-159.66	136.75	0.31	501635.95	1680267.14	
5400.00	1.06	184.58	5389.67	85.93	-159.75	135.45	0.49	501635.09	1680267.09	
5500.00	0.69	195.85	5489.65	84.43	-159.99	134.12	0.41	501632.43	1680266.81	
5600.00	0.29	191.42	5589.65	83.60	-160.21	133.41	0.40	501631.60	1680266.59	
5700.00	0.67	181.92	5689.65	82.77	-160.28	132.66	0.39	501630.77	1680266.52	
5800.00	0.72	207.71	5789.64	81.63	-160.59	131.69	0.31	501629.63	1680266.21	
5900.00	0.84	232.94	5889.63	80.63	-161.47	131.05	0.36	501628.63	1680265.33	
5935.00	0.77	233.80	5924.63	80.33	-161.86	130.91	0.20	501628.33	1680264.94	
6036.00	0.36	263.76	6025.62	79.90	-162.72	130.80	0.49	501627.83	1680264.08	
6068.00	0.42	239.60	6057.62	79.83	-162.92	130.80	0.54	501627.83	1680263.88	

Received

Office of Oil and Gas  
West Virginia Department of Environmental Protection



# Weatherford International Ltd.

## DIRECTIONAL REPORT



# Weatherford

51-01611

Company: CHESAPEAKE  
 Field: MARSHALL COUNTY (NAD 27)  
 Site: FORK RIDGE PAD  
 Well: 1H  
 Wellpath: HORIZONTAL

Date: 3/14/2013 Time: 10:38:56 Page: 3  
 Co-ordinate(NE) Reference: Well: 1H, Grid North  
 Vertical (TVD) Reference: SITE 1413.0  
 Section (VS) Reference: Well (0.00N,0.00E,339.97Azi)  
 Survey Calculation Method: Minimum Curvature Db: Sybase

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
6099.00	0.51	244.48	6088.62	79.71	-163.15	130.77	0.32	501627.71	1680263.65	
6131.00	1.50	268.93	6120.61	79.64	-163.69	130.89	3.30	501627.64	1680263.11	
6162.00	4.21	275.31	6151.57	79.74	-165.23	131.51	8.79	501627.74	1680261.57	
6193.00	6.11	279.73	6182.45	80.12	-167.99	132.82	6.26	501628.12	1680258.81	
6225.00	8.35	287.63	6214.19	81.12	-171.89	135.08	7.64	501629.12	1680254.91	
6256.00	10.71	292.73	6244.76	82.91	-176.69	138.41	8.08	501630.91	1680250.11	
6288.00	12.63	291.72	6276.10	85.35	-182.68	142.76	6.03	501633.35	1680244.12	
6319.00	15.32	290.14	6306.18	88.02	-189.68	147.66	8.76	501636.02	1680237.12	
6351.00	18.25	287.50	6336.81	90.98	-198.43	153.44	9.46	501638.98	1680228.37	
6382.00	21.07	285.15	6366.00	93.90	-208.44	159.61	9.45	501641.90	1680218.36	
6414.00	23.37	283.81	6395.62	96.92	-220.15	166.46	7.36	501644.92	1680206.65	
6445.00	24.84	283.23	6423.92	99.88	-232.46	173.46	4.80	501647.88	1680194.34	
6463.00	26.97	282.58	6440.11	101.63	-240.13	177.73	11.94	501649.63	1680186.67	
6494.00	29.85	281.87	6467.37	104.75	-254.54	185.60	9.35	501652.75	1680172.26	
6525.00	32.14	284.91	6493.95	108.46	-270.06	194.40	8.95	501656.46	1680156.74	
6557.00	34.99	290.86	6520.62	113.92	-286.87	205.28	13.59	501661.92	1680139.93	
6588.00	37.98	295.58	6545.54	121.20	-303.79	217.92	13.22	501669.20	1680123.01	
6620.00	40.55	300.92	6570.32	130.80	-321.60	233.04	13.26	501678.80	1680105.20	
6651.00	43.00	305.99	6593.45	142.20	-338.80	249.64	13.46	501690.20	1680088.00	
6683.00	44.58	308.89	6616.55	155.66	-356.38	268.31	7.98	501703.66	1680070.42	
6714.00	46.67	311.94	6638.23	170.03	-373.24	287.59	9.74	501718.03	1680053.56	
6746.00	49.78	312.87	6659.55	186.13	-390.85	308.74	9.96	501734.13	1680035.95	
6777.00	53.82	314.30	6678.71	202.93	-408.49	330.56	13.53	501750.93	1680018.31	
6809.00	58.21	316.26	6696.60	221.78	-427.14	354.67	14.63	501769.78	1679999.66	
6840.00	61.31	317.37	6712.21	241.31	-445.47	379.29	10.47	501789.31	1679981.33	
6872.00	64.59	318.61	6726.76	262.49	-464.53	405.72	10.82	501810.49	1679962.27	
6903.00	67.42	319.61	6739.37	283.89	-483.07	432.18	9.59	501831.89	1679943.73	
6935.00	68.79	320.02	6751.30	306.58	-502.23	460.05	4.44	501854.58	1679924.57	
6966.00	70.93	320.40	6761.97	328.94	-520.85	487.44	7.00	501876.94	1679905.95	
6998.00	73.25	322.40	6771.81	352.74	-539.84	516.30	9.38	501900.74	1679886.96	
7029.00	75.28	324.19	6780.22	376.66	-557.67	544.88	8.59	501924.66	1679869.13	
7060.00	76.72	324.97	6787.72	401.17	-575.11	573.88	5.25	501949.17	1679851.69	
7092.00	79.04	324.93	6794.44	426.78	-593.07	604.10	7.25	501974.78	1679833.73	
7123.00	81.72	325.76	6799.62	451.92	-610.45	633.67	9.04	501999.92	1679816.35	
7155.00	84.88	327.55	6803.35	478.47	-627.91	664.59	11.33	502026.47	1679798.89	
7186.00	86.43	328.19	6805.70	504.64	-644.35	694.82	5.41	502052.64	1679782.45	
7279.00	88.81	328.83	6809.56	583.87	-692.89	785.88	2.65	502131.87	1679733.91	
7374.00	88.88	328.14	6811.48	664.84	-742.53	878.96	0.73	502212.84	1679684.27	
7469.00	90.28	329.86	6812.17	746.27	-791.46	972.21	2.33	502294.27	1679635.34	
7564.00	90.21	329.46	6811.77	828.25	-839.45	1065.68	0.43	502376.25	1679587.35	
7659.00	92.03	330.84	6809.91	910.63	-886.72	1159.26	2.40	502458.63	1679540.08	
7753.00	92.17	330.85	6806.46	992.66	-932.48	1252.01	0.15	502540.66	1679491.32	
7848.00	90.42	332.04	6804.32	1076.08	-977.88	1345.93	2.23	502622.08	1679441.92	
7947.00	88.88	335.71	6804.92	1164.95	-1021.46	1444.35	4.02	502712.95	1679405.34	
8037.00	90.00	337.93	6805.80	1247.67	-1056.88	1534.20	2.76	502795.67	1679369.92	
8131.00	90.07	338.24	6805.74	1334.88	-1091.97	1628.15	0.34	502882.88	1679334.83	
8226.00	89.72	338.29	6805.92	1423.13	-1127.15	1723.11	0.37	502971.13	1679299.65	
8320.00	90.98	340.53	6805.34	1511.11	-1160.20	1817.09	2.73	503059.11	1679266.60	
8414.00	91.19	340.73	6803.56	1599.78	-1191.37	1911.07	0.31	503147.78	1679235.43	
8509.00	90.70	339.94	6802.00	1689.22	-1223.34	2006.05	0.98	503236.45	1679203.46	
8602.00	90.63	339.67	6800.92	1776.50	-1255.44	2099.05	0.30	503324.50	1679171.36	
8696.00	90.28	339.35	6800.17	1864.55	-1288.34	2193.04	0.50	503412.55	1679138.46	
8790.00	90.28	338.96	6799.71	1952.39	-1321.79	2287.03	0.41	503500.39	1679105.01	

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Office of Oil and Gas  
 WV Dept of Environmental Protection

51-01611



# Weatherford International Ltd.

## DIRECTIONAL REPORT



Company: CHESAPEAKE	Date: 3/14/2013	Time: 10:38:56	Page: 4
Field: MARSHALL COUNTY (NAD 27)	Co-ordinate(NE) Reference: Well: 1H, Grid North		
Site: FORK RIDGE PAD	Vertical (TVD) Reference: SITE 1413.0		
Well: 1H	Section (VS) Reference: Well (0.00N,0.00E,339.97Azi)		Survey Calculation Method: Minimum Curvature
Wellpath: HORIZONTAL			Db: Sybase

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
8885.00	90.42	339.30	6799.13	2041.16	-1355.63	2382.02	0.39	503589.16	1679071.17	
8978.00	90.98	339.91	6798.00	2128.32	-1388.04	2475.01	0.89	503676.32	1679038.76	
9073.00	91.26	339.75	6796.14	2217.48	-1420.79	2569.99	0.34	503765.48	1679006.01	
9167.00	91.12	339.20	6794.19	2305.49	-1453.74	2663.97	0.60	503853.49	1678973.06	
9262.00	92.17	339.22	6791.46	2394.27	-1487.45	2758.92	1.11	503942.27	1678939.35	
9356.00	91.12	338.50	6788.76	2481.91	-1521.33	2852.86	1.35	504029.91	1678905.47	
9451.00	89.23	338.68	6788.47	2570.35	-1556.01	2947.83	2.00	504118.35	1678870.79	
9546.00	89.51	338.56	6789.52	2658.80	-1590.64	3042.79	0.32	504206.80	1678836.16	
9640.00	89.02	340.33	6790.72	2746.81	-1623.64	3136.78	1.95	504294.81	1678803.16	
9735.00	89.65	340.59	6791.82	2836.33	-1655.41	3231.77	0.72	504384.33	1678771.39	
9829.00	89.72	339.89	6792.34	2924.79	-1687.19	3325.76	0.75	504472.79	1678739.61	
9923.00	91.75	341.45	6791.14	3013.48	-1718.30	3419.74	2.72	504561.48	1678708.50	
10018.00	90.21	338.86	6789.51	3102.81	-1750.54	3514.72	3.17	504650.81	1678676.26	
10112.00	90.63	338.82	6788.82	3190.47	-1784.47	3608.70	0.45	504738.47	1678642.33	PLAN 6 TIE IN
10207.00	90.28	340.68	6788.07	3279.59	-1817.35	3703.69	1.99	504827.59	1678609.45	
10301.00	90.63	340.73	6787.32	3368.31	-1848.41	3797.68	0.38	504916.31	1678578.39	
10395.00	90.84	339.74	6786.11	3456.76	-1880.20	3891.67	1.08	505004.76	1678546.60	
10490.00	91.75	339.75	6783.97	3545.87	-1913.08	3986.64	0.96	505093.87	1678513.72	
10584.00	92.73	339.53	6780.29	3633.93	-1945.76	4080.57	1.07	505181.93	1678481.04	
10679.00	91.26	339.23	6776.99	3722.78	-1979.19	4175.50	1.58	505270.78	1678447.61	
10774.00	90.49	337.58	6775.54	3811.10	-2014.15	4270.45	1.92	505359.10	1678412.65	
10868.00	88.67	339.23	6776.22	3898.49	-2048.74	4364.41	2.61	505446.49	1678378.06	
10963.00	90.91	341.96	6776.57	3988.08	-2080.30	4459.38	3.72	505536.08	1678346.50	
11057.00	91.54	341.00	6774.56	4077.19	-2110.15	4553.33	1.22	505625.19	1678316.65	
11152.00	92.73	341.24	6771.02	4167.02	-2140.87	4648.24	1.28	505715.02	1678285.93	
11247.00	92.09	340.80	6767.03	4256.77	-2171.74	4743.14	0.82	505804.77	1678255.06	
11342.00	90.49	342.11	6764.89	4346.81	-2201.94	4838.08	2.18	505894.81	1678224.86	
11436.00	90.42	342.15	6764.14	4436.27	-2230.79	4932.01	0.09	505984.27	1678196.01	
11530.00	90.63	342.30	6763.28	4525.78	-2259.48	5025.93	0.27	506073.78	1678167.32	
11623.00	90.84	342.02	6762.09	4614.30	-2287.97	5118.86	0.38	506162.30	1678138.83	
11715.00	91.40	342.52	6760.29	4701.92	-2315.98	5210.77	0.82	506249.92	1678110.82	
11810.00	92.03	342.60	6757.45	4792.51	-2344.44	5305.63	0.67	506340.51	1678082.36	
11904.00	91.68	342.67	6754.41	4882.18	-2372.48	5399.47	0.38	506430.18	1678054.32	
12017.00	92.87	343.07	6749.92	4990.08	-2405.74	5512.24	1.11	506538.08	1678021.06	LAST MWD SVY
12076.00	92.87	343.07	6746.97	5046.45	-2422.90	5571.08	0.00	506594.45	1678003.90	PROJ TO BIT

Name	Description Dip. Dir.	TVD	+N/-S	+E/-W	Map Northing	Map Easting	<--- Latitude ---> Deg Min Sec	<--- Longitude ---> Deg Min Sec

MD ft	TVD ft	Diameter in	Hole Size in	Name
761.00	760.99	13.375	17.500	SURFACE
2450.00	2439.81	9.625	12.250	INTERMEDIATE

Received





**Weatherford International Ltd.**  
**DIRECTIONAL REPORT**



**Weatherford**

5-01611

<b>Company:</b> CHESAPEAKE	<b>Date:</b> 3/14/2013	<b>Time:</b> 10:38:56	<b>Page:</b> 5
<b>Field:</b> MARSHALL COUNTY (NAD 27)	<b>Co-ordinate(NE) Reference:</b> Well: 1H, Grid North		
<b>Site:</b> FORK RIDGE PAD	<b>Vertical (TVD) Reference:</b> SITE 1413.0		
<b>Well:</b> 1H	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,339.97Azi)		
<b>Wellpath:</b> HORIZONTAL	<b>Survey Calculation Method:</b> Minimum Curvature		<b>Db:</b> Sybase

**Annotation**

MD ft	TVD ft	
836.00	835.99	FIRST MWD SVY
12017.00	6749.92	LAST MWD SVY
12076.00	6746.97	PROJ TO BIT
10112.00	6788.82	PLAN 6 TIE IN

**Formations**

MD ft	TVD ft	Formations	Lithology	Dip Angle deg	Dip Direction deg
6620.89	6571.00	MIDDLESEX		0.00	0.00
6720.99	6643.00	GENESECO		0.00	0.00
6765.82	6672.00	TULLY		0.00	0.00
7125.70	6800.00	MARCELLUS		0.00	0.00
	0.00	ONONDAGA		0.00	0.00

Received

Office of Oil and Gas  
WV Dept. of Environmental Protection



Regulatory Department

July 22, 2013

**VIA UPS NEXT DAY AIR**

Mr. Gene Smith  
West Virginia Department of Environmental Protection  
Office of Oil & Gas  
601 57<sup>th</sup> Street  
Charleston, WV 25304

Re: WR-35's Preliminary Reports – Fork Ridge MSH 1H (API #51-01611)  
Fork Ridge MSH 201H (API #51-01606)

Dear Mr. Smith:

Chesapeake Appalachia, L.L.C. submits the *Operator's Preliminary Reports of Well Work* for the above captioned well(s) located in Marshall County. If you have any questions or require additional information please feel free to contact me at (405)935-4158 or [marlene.williams@chk.com](mailto:marlene.williams@chk.com).

Sincerely,

Chesapeake Appalachia, L.L.C

A handwritten signature in cursive script that reads "Marlene Williams".

Marlene Williams  
Regulatory Analyst II

Enclosure(s)

cc: West Virginia Geological and Economic Survey

Received

JUL 23 2013

Office of Oil and Gas  
WV Dept. of Environmental Protection