

Chesapeake Energy

EOW DD Report

Well Name: Violet Coss BRK

Well Number: 8H

Date: 09/29/14

Prepared by Troy Lewis

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WV Department of
Environmental Protection

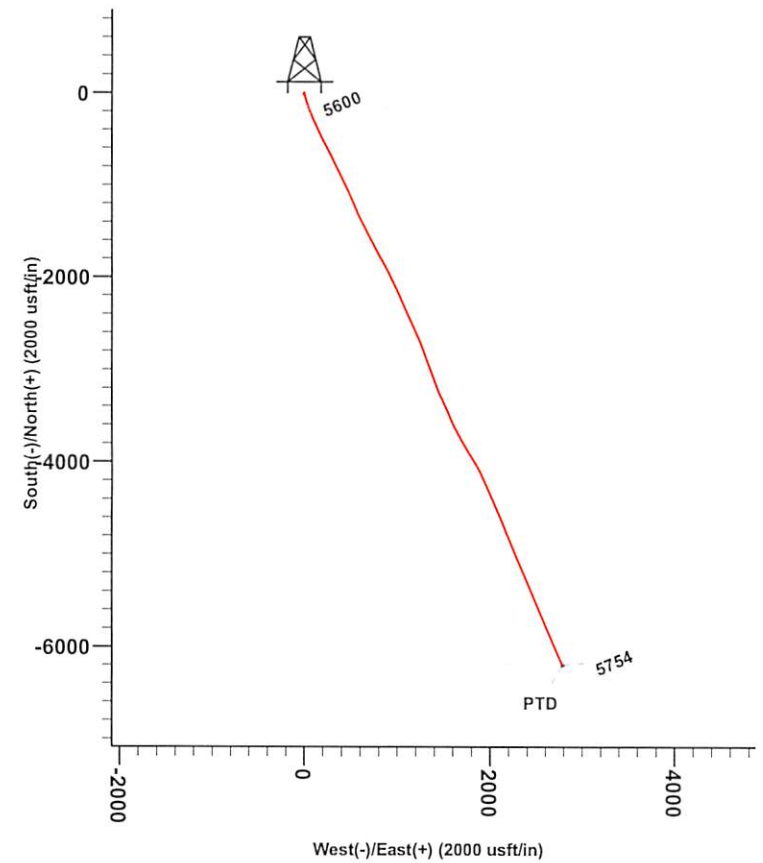




Chesapeake
 Project: Brooke, WV
 Site: Violet Coss BRK
 Well: 8H
 Wellbore: OH
 Design: OH

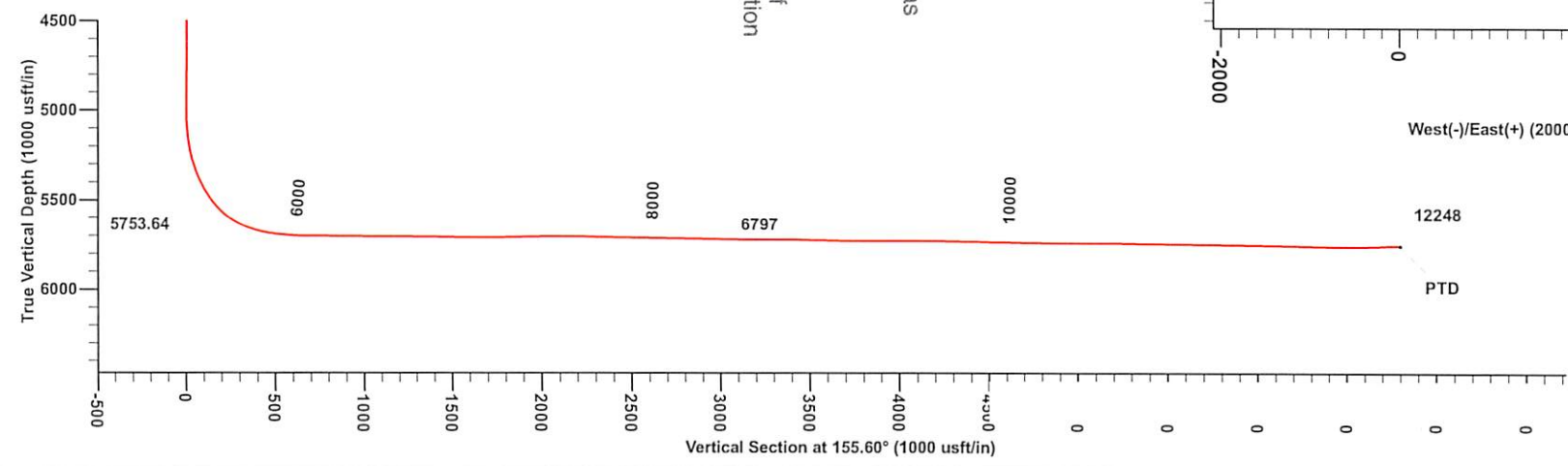


WELL DETAILS: 8H						
			GL 1172+RKB 20 @ 1192.00usft (Nomac 74)			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	639993.30	1686742.60	40° 15' 6.165 N	80° 37' 20.122 W	



Target Line=5687'TVD @ 89.4 Inc.@155.60 Azm.

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 Environmental Protection



Azimuths to Grid North
 True North: 0.72°
 Magnetic North: -8.05°
 Magnetic Field
 Strength: 52679.3snT
 Dip Angle: 67.56°
 Date: 09/26/2014
 Model: BGGM2014

Company:	Chesapeake	Local Co-ordinate Reference:	Well 8H
Project:	Brooke, WV	TVD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Site:	Violet Coss BRK	MD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Well:	8H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM LEWIS

Project	Brooke, WV		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		

Site	Violet Coss BRK				
Site Position:		Northing:	639,993.30 usft	Latitude:	40° 15' 6.165 N
From:	Map	Easting:	1,686,742.60 usft	Longitude:	80° 37' 20.122 W
Position Uncertainty:	0.00 usft	Slot Radius:	0 "	Grid Convergence:	-0.72 °

Well	8H					
Well Position	+N/-S	0.00 usft	Northing:	639,993.30 usft	Latitude:	40° 15' 6.165 N
	+E/-W	0.00 usft	Easting:	1,686,742.60 usft	Longitude:	80° 37' 20.122 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,172.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	09/26/14	-8.76	67.56	52,679

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	RECEIVED Direction Office of Oil and Gas
	0.00	0.00	0.00	155.60

JUN 21 2016

Survey Program	Date	09/29/14			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	WV Department of Environment Description	
100.00	4,570.00	Survey #1 (OH)	NS-GYRO-MS	North sensing gyrocompassing m	
4,637.00	12,248.00	Survey #2 (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.04	195.05	100.00	-0.03	-0.01	0.03	0.04	0.04	0.00	
200.00	0.08	189.77	200.00	-0.14	-0.03	0.11	0.04	0.04	-5.28	
300.00	0.46	171.05	300.00	-0.60	0.02	0.56	0.39	0.38	-18.72	
400.00	0.56	156.12	399.99	-1.44	0.28	1.43	0.17	0.10	-14.93	
500.00	0.61	153.07	499.99	-2.37	0.72	2.45	0.06	0.05	-3.05	
600.00	0.56	165.98	599.98	-3.32	1.08	3.46	0.14	-0.05	12.91	
700.00	0.65	167.26	699.98	-4.34	1.32	4.50	0.09	0.09	1.28	
800.00	0.69	156.79	799.97	-5.45	1.69	5.66	0.13	0.04	-10.47	
900.00	0.63	162.55	899.97	-6.53	2.09	6.81	0.09	-0.06	5.76	

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Site:	Violet Coss BRK	MD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Well:	8H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM LEWIS

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	0.48	186.81	999.96	-7.47	2.20	7.71	0.28	-0.15	24.26
1,100.00	0.41	185.41	1,099.96	-8.24	2.12	8.38	0.07	-0.07	-1.40
1,200.00	0.43	175.98	1,199.96	-8.97	2.11	9.04	0.07	0.02	-9.43
1,300.00	0.48	169.43	1,299.95	-9.76	2.21	9.80	0.07	0.05	-6.55
1,400.00	0.50	164.72	1,399.95	-10.59	2.41	10.64	0.04	0.02	-4.71
1,500.00	0.58	157.20	1,499.94	-11.48	2.72	11.57	0.11	0.08	-7.52
1,600.00	0.54	163.26	1,599.94	-12.39	3.05	12.55	0.07	-0.04	6.06
1,700.00	0.44	181.69	1,699.94	-13.23	3.17	13.36	0.19	-0.10	18.43
1,800.00	0.31	207.65	1,799.93	-13.85	3.04	13.87	0.21	-0.13	25.96
1,900.00	0.22	241.08	1,899.93	-14.19	2.74	14.05	0.18	-0.09	33.43
2,000.00	0.20	262.77	1,999.93	-14.30	2.40	14.01	0.08	-0.02	21.69
2,100.00	0.26	284.38	2,099.93	-14.27	2.01	13.82	0.10	0.06	21.61
2,200.00	0.30	288.50	2,199.93	-14.13	1.54	13.50	0.04	0.04	4.12
2,300.00	0.36	299.73	2,299.93	-13.89	1.02	13.07	0.09	0.06	11.23
2,400.00	0.27	283.02	2,399.93	-13.68	0.52	12.67	0.13	-0.09	-16.71
2,500.00	0.29	280.81	2,499.93	-13.58	0.04	12.38	0.02	0.02	-2.21
2,600.00	0.46	278.95	2,599.92	-13.47	-0.61	12.01	0.17	0.17	-1.86
2,700.00	0.34	287.85	2,699.92	-13.31	-1.28	11.59	0.13	-0.12	8.90
2,800.00	0.34	298.03	2,799.92	-13.08	-1.83	11.16	0.06	0.00	10.18
2,900.00	0.30	287.39	2,899.92	-12.87	-2.34	10.75	0.07	-0.04	-10.64
3,000.00	0.35	293.38	2,999.92	-12.67	-2.87	10.35	0.06	0.05	5.99
3,100.00	0.35	290.81	3,099.91	-12.44	-3.44	9.91	0.02	0.00	-2.57
3,200.00	0.33	270.83	3,199.91	-12.32	-4.01	9.57	0.12	-0.02	-19.98
3,300.00	0.27	257.68	3,299.91	-12.37	-4.53	9.39	0.09	-0.06	-13.15
3,400.00	0.31	282.24	3,399.91	-12.36	-5.02	9.18	0.13	0.04	24.56
3,500.00	0.31	299.92	3,499.91	-12.17	-5.52	8.80	0.10	0.00	17.68
3,600.00	0.29	296.22	3,599.91	-11.92	-5.98	8.39	0.03	-0.02	-3.70
3,700.00	0.16	300.74	3,699.91	-11.74	-6.33	8.08	0.13	-0.13	4.52
3,800.00	0.13	272.65	3,799.91	-11.66	-6.56	7.91	0.08	-0.03	-28.09
3,900.00	0.09	289.13	3,899.91	-11.63	-6.75	7.81	0.05	-0.04	16.48
4,000.00	0.14	293.34	3,999.91	-11.56	-6.94	7.66	0.05	0.05	4.21
4,100.00	0.32	280.83	4,099.90	-11.46	-7.32	7.41	0.19	0.18	-12.51
4,200.00	0.46	275.26	4,199.90	-11.37	-8.00	7.05	0.14	0.14	-5.57
4,300.00	0.49	260.68	4,299.90	-11.40	-8.82	6.74	0.12	0.03	-14.58
4,400.00	0.60	265.29	4,399.89	-11.51	-9.76	6.45	0.12	0.11	4.61
4,500.00	0.52	270.19	4,499.89	-11.56	-10.74	6.09	0.09	-0.08	4.90
4,570.00	0.43	288.48	4,569.89	-11.47	-11.31	5.78	0.25	-0.13	26.13
4,637.00	0.30	262.00	4,636.89	-11.42	-11.72	5.56	0.31	-0.19	-39.52
4,732.00	1.20	53.60	4,731.88	-10.86	-11.16	5.28	1.55	0.95	159.58
4,826.00	1.20	55.70	4,825.86	-9.72	-9.56	4.90	0.05	0.00	2.23
4,921.00	1.10	40.00	4,920.84	-8.46	-8.15	4.34	0.35	-0.11	-16.53
5,015.00	1.00	56.30	5,014.82	-7.32	-6.89	3.82	0.33	-0.11	17.34
5,047.00	1.80	126.50	5,046.82	-7.46	-6.25	4.21	5.43	2.50	219.38

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Project:	Brooke, WV	TVD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Site:	Violet Coss BRK	MD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Well:	8H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM LEWIS

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,078.00	3.80	148.10	5,077.78	-8.62	-5.32	5.66	7.18	6.45	69.68
5,110.00	5.00	148.20	5,109.68	-10.71	-4.02	8.09	3.75	3.75	0.31
5,141.00	6.60	151.60	5,140.52	-13.42	-2.46	11.21	5.28	5.16	10.97
5,173.00	8.50	154.80	5,172.25	-17.18	-0.58	15.41	6.08	5.94	10.00
5,204.00	10.50	158.20	5,202.82	-21.88	1.44	20.52	6.70	6.45	10.97
5,236.00	12.30	161.10	5,234.19	-27.81	3.63	26.83	5.90	5.63	9.06
5,267.00	14.50	162.50	5,264.34	-34.64	5.87	33.97	7.17	7.10	4.52
5,299.00	17.10	160.40	5,295.13	-42.89	8.65	42.63	8.32	8.13	-6.56
5,330.00	19.60	162.50	5,324.55	-52.14	11.74	52.34	8.34	8.06	6.77
5,362.00	22.20	162.60	5,354.44	-63.03	15.17	63.67	8.13	8.13	0.31
5,393.00	24.80	163.20	5,382.87	-74.85	18.80	75.93	8.42	8.39	1.94
5,425.00	28.00	163.10	5,411.53	-88.46	22.92	90.03	10.00	10.00	-0.31
5,457.00	30.90	162.90	5,439.39	-103.51	27.52	105.63	9.07	9.06	-0.63
5,488.00	33.70	160.90	5,465.59	-119.25	32.68	122.09	9.67	9.03	-6.45
5,520.00	36.30	161.20	5,491.80	-136.60	38.64	140.36	8.14	8.13	0.94
5,551.00	39.00	160.80	5,516.35	-154.51	44.80	159.21	8.75	8.71	-1.29
5,582.00	42.10	160.10	5,539.90	-173.49	51.55	179.29	10.11	10.00	-2.26
5,614.00	45.80	159.10	5,562.93	-194.30	59.30	201.44	11.76	11.56	-3.13
5,645.00	50.60	157.50	5,583.59	-215.76	67.85	224.52	15.95	15.48	-5.16
5,677.00	55.50	156.60	5,602.82	-239.30	77.82	250.08	15.48	15.31	-2.81
5,708.00	60.90	156.20	5,619.15	-263.44	88.37	276.41	17.45	17.42	-1.29
5,740.00	65.80	156.50	5,633.50	-289.63	99.84	305.00	15.34	15.31	0.94
5,772.00	68.70	156.90	5,645.87	-316.73	111.51	334.50	9.14	9.06	1.25
5,803.00	71.20	156.70	5,656.50	-343.49	122.98	363.61	8.09	8.06	-0.65
5,835.00	74.90	154.90	5,665.83	-371.40	135.53	394.22	12.75	11.56	-5.63
5,867.00	77.30	154.20	5,673.51	-399.45	148.88	425.27	7.79	7.50	-2.19
5,898.00	78.40	154.40	5,680.04	-426.76	162.02	455.57	3.60	3.55	0.65
5,930.00	80.90	154.10	5,685.79	-455.11	175.69	487.04	7.87	7.81	-0.94
5,961.00	84.50	153.30	5,689.73	-482.67	189.32	517.76	11.89	11.61	-2.58
6,056.00	86.80	153.60	5,696.93	-567.40	231.65	612.42	2.44	2.42	0.32
6,151.00	89.60	153.10	5,699.91	-652.26	274.24	707.29	2.99	2.95	-0.53
6,246.00	89.70	153.40	5,700.49	-737.09	317.00	802.21	0.33	0.11	0.32
6,341.00	89.90	154.20	5,700.83	-822.33	358.94	897.16	0.87	0.21	0.84
6,435.00	90.00	154.10	5,700.91	-906.92	399.93	991.13	0.15	0.11	-0.11
6,530.00	89.90	156.70	5,700.99	-993.29	439.47	1,086.12	2.74	-0.11	2.74
6,625.00	89.80	156.50	5,701.24	-1,080.48	477.20	1,181.10	0.24	-0.11	-0.21
6,719.00	89.30	156.50	5,701.98	-1,166.68	514.68	1,275.09	0.53	-0.53	0.00
6,814.00	89.20	158.00	5,703.22	-1,254.28	551.41	1,370.04	1.58	-0.11	1.58
6,908.00	89.10	153.10	5,704.62	-1,339.81	590.30	1,464.00	5.21	-0.11	-5.21
7,003.00	89.20	154.70	5,706.03	-1,425.11	632.09	1,558.94	1.69	0.11	1.68
7,098.00	88.70	153.40	5,707.77	-1,510.52	673.65	1,653.89	1.47	-0.53	-1.37
7,193.00	90.50	152.90	5,708.43	-1,595.27	716.56	1,748.80	1.97	1.89	-0.53
7,287.00	90.80	151.60	5,707.36	-1,678.45	760.32	1,842.00	0.32	0.32	-1.38

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Well:	8H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM LEWIS

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,382.00	91.30	152.90	5,705.62	-1,762.51	804.55	1,937.45	1.47	0.53	1.37
7,477.00	91.60	151.80	5,703.22	-1,846.63	848.62	2,032.27	1.20	0.32	-1.16
7,571.00	89.30	153.70	5,702.48	-1,930.19	891.65	2,126.14	3.17	-2.45	2.02
7,666.00	89.20	153.60	5,703.72	-2,015.31	933.82	2,221.07	0.15	-0.11	-0.11
7,760.00	89.10	154.60	5,705.12	-2,099.86	974.87	2,315.03	1.07	-0.11	1.06
7,854.00	89.20	155.50	5,706.51	-2,185.07	1,014.52	2,409.01	0.96	0.11	0.96
7,949.00	89.30	155.90	5,707.76	-2,271.65	1,053.61	2,504.01	0.43	0.11	0.42
8,044.00	88.90	155.20	5,709.25	-2,358.12	1,092.92	2,598.99	0.85	-0.42	-0.74
8,138.00	89.10	156.10	5,710.89	-2,443.74	1,131.67	2,692.98	0.98	0.21	0.96
8,233.00	89.10	156.20	5,712.38	-2,530.62	1,170.08	2,787.96	0.11	0.00	0.11
8,328.00	88.90	155.60	5,714.04	-2,617.33	1,208.87	2,882.94	0.67	-0.21	-0.63
8,423.00	88.70	156.00	5,716.03	-2,703.96	1,247.80	2,977.92	0.47	-0.21	0.42
8,518.00	89.90	160.20	5,717.19	-2,792.07	1,283.22	3,072.80	4.60	1.26	4.42
8,612.00	89.70	159.90	5,717.52	-2,880.43	1,315.30	3,166.52	0.38	-0.21	-0.32
8,707.00	89.40	160.00	5,718.27	-2,969.67	1,347.86	3,261.24	0.33	-0.32	0.11
8,802.00	89.40	159.20	5,719.26	-3,058.71	1,380.98	3,356.00	0.84	0.00	-0.84
8,896.00	88.90	160.50	5,720.65	-3,146.94	1,413.35	3,449.73	1.48	-0.53	1.38
8,991.00	88.10	158.80	5,723.14	-3,235.98	1,446.38	3,544.46	1.98	-0.84	-1.79
9,086.00	88.90	155.90	5,725.63	-3,323.61	1,482.95	3,639.37	3.17	0.84	-3.05
9,180.00	88.90	155.70	5,727.43	-3,409.34	1,521.47	3,733.35	0.21	0.00	-0.21
9,275.00	89.40	157.80	5,728.84	-3,496.61	1,558.97	3,828.32	2.27	0.53	2.21
9,370.00	90.50	155.40	5,728.93	-3,583.79	1,596.69	3,923.29	2.78	1.16	-2.53
9,464.00	90.40	151.00	5,728.19	-3,667.67	1,639.06	4,017.19	4.68	-0.11	-4.68
9,559.00	90.60	150.90	5,727.36	-3,750.71	1,685.19	4,111.87	0.24	0.21	-0.11
9,654.00	90.70	150.90	5,726.28	-3,833.71	1,731.39	4,206.54	0.11	0.11	0.00
9,749.00	89.10	147.80	5,726.45	-3,915.43	1,779.81	4,300.97	3.67	-1.68	-3.26
9,843.00	88.30	149.10	5,728.58	-3,995.51	1,828.98	4,394.21	1.62	-0.85	1.38
9,938.00	88.20	151.60	5,731.48	-4,078.03	1,875.95	4,488.76	2.63	-0.11	2.63
10,033.00	88.40	154.00	5,734.30	-4,162.48	1,919.35	4,583.60	2.53	0.21	2.53
10,127.00	89.60	157.90	5,735.94	-4,248.29	1,957.65	4,677.56	4.34	1.28	4.15
10,222.00	89.70	155.60	5,736.52	-4,335.56	1,995.15	4,772.53	2.42	0.11	-2.42
10,317.00	89.30	154.50	5,737.35	-4,421.69	2,035.22	4,867.52	1.23	-0.42	-1.16
10,412.00	89.60	157.00	5,738.26	-4,508.30	2,074.23	4,962.51	2.65	0.32	2.63
10,506.00	88.90	157.20	5,739.49	-4,594.88	2,110.80	5,056.47	0.77	-0.74	0.21
10,601.00	90.20	158.80	5,740.24	-4,682.96	2,146.39	5,151.38	2.17	1.37	1.68
10,696.00	89.80	158.20	5,740.24	-4,771.35	2,181.21	5,246.26	0.76	-0.42	-0.63
10,791.00	89.30	158.10	5,740.98	-4,859.52	2,216.56	5,341.16	0.54	-0.53	-0.11
10,886.00	88.70	157.70	5,742.64	-4,947.53	2,252.30	5,436.07	0.76	-0.63	-0.42
10,981.00	90.30	158.90	5,743.47	-5,035.79	2,287.42	5,530.95	2.11	1.68	1.26
11,075.00	89.00	157.40	5,744.05	-5,123.03	2,322.40	5,624.85	2.11	-1.38	-1.60
11,170.00	89.90	156.70	5,744.96	-5,210.50	2,359.44	5,719.82	1.20	0.95	-0.74
11,265.00	88.60	155.10	5,746.20	-5,297.21	2,398.23	5,814.80	2.17	-1.37	-1.68
11,359.00	89.80	156.70	5,747.51	-5,383.00	2,436.61	5,908.79	2.13	1.28	1.70
11,454.00	89.00	157.20	5,748.51	-5,470.41	2,473.80	6,003.75	0.99	-0.84	0.53

Company:	Chesapeake	Local Co-ordinate Reference:	Well 8H
Project:	Brooke, WV	TVD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Site:	Violet Coss BRK	MD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Well:	8H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM LEWIS

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,548.00	88.20	157.40	5,750.81	-5,557.11	2,510.06	6,097.68	0.88	-0.85	0.21
11,643.00	89.90	156.50	5,752.38	-5,644.50	2,547.25	6,192.64	2.02	1.79	-0.95
11,738.00	89.50	156.50	5,752.88	-5,731.62	2,585.13	6,287.63	0.42	-0.42	0.00
11,832.00	88.40	157.10	5,754.60	-5,818.01	2,622.16	6,381.59	1.33	-1.17	0.64
11,927.00	87.60	156.70	5,757.92	-5,905.34	2,659.41	6,476.50	0.94	-0.84	-0.42
12,022.00	91.10	156.40	5,758.99	-5,992.47	2,697.20	6,571.47	3.70	3.68	-0.32
12,117.00	91.80	156.00	5,756.59	-6,079.36	2,735.53	6,666.43	0.85	0.74	-0.42
12,188.00	91.10	156.70	5,754.79	-6,144.38	2,764.00	6,737.40	1.39	-0.99	0.99
12,248.00	91.10	156.70	5,753.64	-6,199.47	2,787.73	6,797.38	0.00	0.00	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
12,248.00	5,753.64	-6,199.47	2,787.73	PTD

Checked By: _____ Approved By: _____ Date: _____

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Environmental Protection

Company: Chesapeake	Local Co-ordinate Reference: Well 8H
Project: Brooke, WV	TVD Reference: GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Site: Violet Coss BRK	MD Reference: GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Well: 8H	North Reference: Grid
Wellbore: OH	Survey Calculation Method: Minimum Curvature
Design: OH	Database: EDM LEWIS

Project Brooke, WV	
Map System: US State Plane 1927 (Exact solution)	System Datum: Mean Sea Level
Geo Datum: NAD 1927 (NADCON CONUS)	
Map Zone: West Virginia North 4701	

Site Violet Coss BRK		
Site Position:	Northing: 639,993.30 usft	Latitude: 40° 15' 6.165 N
From: Map	Easting: 1,686,742.60 usft	Longitude: 80° 37' 20.122 W
Position Uncertainty: 0.00 usft	Slot Radius: 0 "	Grid Convergence: -0.72 °

Well 8H			
Well Position	+N/-S 0.00 usft	Northing: 639,993.30 usft	Latitude: 40° 15' 6.165 N
	+E/-W 0.00 usft	Easting: 1,686,742.60 usft	Longitude: 80° 37' 20.122 W
Position Uncertainty 0.00 usft	Wellhead Elevation: 0.00 usft	Ground Level: 1,172.00 usft	

Wellbore OH					
Magnetics	Model Name BGGM2014	Sample Date 09/26/14	Declination (°) -8.76	Dip Angle (°) 67.56	Field Strength (nT) 52,679

Design OH		
Audit Notes:		
Version: 1.0	Phase: ACTUAL	Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (usft) 0.00	+N/-S (usft) 0.00	+E/-W (usft) 0.00	Direction (°) 155.60
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Survey Program	Date 09/29/14			
From (usft) 100.00	To (usft) 4,570.00	Survey (Wellbore) Survey #1 (OH)	Tool Name NS-GYRO-MS	Description North sensing gyrocompassing m
4,637.00	12,248.00	Survey #2 (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	639,993.30	1,686,742.60	40° 15' 6.165 N	80° 37' 20.122 W
100.00	0.04	195.05	100.00	-0.03	-0.01	639,993.27	1,686,742.59	40° 15' 6.164 N	80° 37' 20.123 W
200.00	0.08	189.77	200.00	-0.14	-0.03	639,993.17	1,686,742.57	40° 15' 6.163 N	80° 37' 20.123 W
300.00	0.46	171.05	300.00	-0.60	0.02	639,992.70	1,686,742.62	40° 15' 6.159 N	80° 37' 20.122 W
400.00	0.56	156.12	399.99	-1.44	0.28	639,991.86	1,686,742.88	40° 15' 6.150 N	80° 37' 20.119 W
500.00	0.61	153.07	499.99	-2.37	0.72	639,990.94	1,686,743.32	40° 15' 6.141 N	80° 37' 20.113 W
600.00	0.56	165.98	599.98	-3.32	1.08	639,989.99	1,686,743.68	40° 15' 6.132 N	80° 37' 20.108 W
700.00	0.65	167.26	699.98	-4.34	1.32	639,988.96	1,686,743.92	40° 15' 6.122 N	80° 37' 20.105 W
800.00	0.69	156.79	799.97	-5.45	1.69	639,987.86	1,686,744.28	40° 15' 6.111 N	80° 37' 20.100 W
900.00	0.63	162.55	899.97	-6.53	2.09	639,986.78	1,686,744.69	40° 15' 6.100 N	80° 37' 20.094 W
1,000.00	0.48	186.81	999.96	-7.47	2.20	639,985.84	1,686,744.80	40° 15' 6.091 N	80° 37' 20.093 W

Company:	Chesapeake	Local Co-ordinate Reference:	Well 8H
Project:	Brooke, WV	TVD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Site:	Violet Coss BRK	MD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Well:	8H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM LEWIS

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,100.00	0.41	185.41	1,099.96	-8.24	2.12	639,985.06	1,686,744.72	40° 15' 6.083 N	80° 37' 20.094 W
1,200.00	0.43	175.98	1,199.96	-8.97	2.11	639,984.33	1,686,744.71	40° 15' 6.076 N	80° 37' 20.094 W
1,300.00	0.48	169.43	1,299.95	-9.76	2.21	639,983.55	1,686,744.81	40° 15' 6.069 N	80° 37' 20.092 W
1,400.00	0.50	164.72	1,399.95	-10.59	2.41	639,982.72	1,686,745.00	40° 15' 6.060 N	80° 37' 20.090 W
1,500.00	0.58	157.20	1,499.94	-11.48	2.72	639,981.83	1,686,745.32	40° 15' 6.052 N	80° 37' 20.085 W
1,600.00	0.54	163.26	1,599.94	-12.39	3.05	639,980.91	1,686,745.65	40° 15' 6.043 N	80° 37' 20.081 W
1,700.00	0.44	181.69	1,699.94	-13.23	3.17	639,980.08	1,686,745.77	40° 15' 6.034 N	80° 37' 20.079 W
1,800.00	0.31	207.65	1,799.93	-13.85	3.04	639,979.45	1,686,745.63	40° 15' 6.028 N	80° 37' 20.081 W
1,900.00	0.22	241.08	1,899.93	-14.19	2.74	639,979.12	1,686,745.34	40° 15' 6.025 N	80° 37' 20.085 W
2,000.00	0.20	262.77	1,999.93	-14.30	2.40	639,979.00	1,686,745.00	40° 15' 6.024 N	80° 37' 20.089 W
2,100.00	0.26	284.38	2,099.93	-14.27	2.01	639,979.04	1,686,744.61	40° 15' 6.024 N	80° 37' 20.094 W
2,200.00	0.30	288.50	2,199.93	-14.13	1.54	639,979.18	1,686,744.14	40° 15' 6.025 N	80° 37' 20.100 W
2,300.00	0.36	299.73	2,299.93	-13.89	1.02	639,979.42	1,686,743.62	40° 15' 6.028 N	80° 37' 20.107 W
2,400.00	0.27	283.02	2,399.93	-13.68	0.52	639,979.63	1,686,743.12	40° 15' 6.030 N	80° 37' 20.114 W
2,500.00	0.29	280.81	2,499.93	-13.58	0.04	639,979.73	1,686,742.64	40° 15' 6.030 N	80° 37' 20.120 W
2,600.00	0.46	278.95	2,599.92	-13.47	-0.61	639,979.84	1,686,741.99	40° 15' 6.031 N	80° 37' 20.128 W
2,700.00	0.34	287.85	2,699.92	-13.31	-1.28	639,979.99	1,686,741.31	40° 15' 6.033 N	80° 37' 20.137 W
2,800.00	0.34	298.03	2,799.92	-13.08	-1.83	639,980.22	1,686,740.77	40° 15' 6.035 N	80° 37' 20.144 W
2,900.00	0.30	287.39	2,899.92	-12.87	-2.34	639,980.44	1,686,740.26	40° 15' 6.037 N	80° 37' 20.151 W
3,000.00	0.35	293.38	2,999.92	-12.67	-2.87	639,980.64	1,686,739.73	40° 15' 6.039 N	80° 37' 20.157 W
3,100.00	0.35	290.81	3,099.91	-12.44	-3.44	639,980.87	1,686,739.16	40° 15' 6.041 N	80° 37' 20.165 W
3,200.00	0.33	270.83	3,199.91	-12.32	-4.01	639,980.98	1,686,738.59	40° 15' 6.042 N	80° 37' 20.172 W
3,300.00	0.27	257.68	3,299.91	-12.37	-4.53	639,980.93	1,686,738.07	40° 15' 6.042 N	80° 37' 20.179 W
3,400.00	0.31	282.24	3,399.91	-12.36	-5.02	639,980.94	1,686,737.58	40° 15' 6.042 N	80° 37' 20.185 W
3,500.00	0.31	299.92	3,499.91	-12.17	-5.52	639,981.13	1,686,737.08	40° 15' 6.044 N	80° 37' 20.192 W
3,600.00	0.29	296.22	3,599.91	-11.92	-5.98	639,981.38	1,686,736.61	40° 15' 6.046 N	80° 37' 20.198 W
3,700.00	0.16	300.74	3,699.91	-11.74	-6.33	639,981.56	1,686,736.27	40° 15' 6.048 N	80° 37' 20.202 W
3,800.00	0.13	272.65	3,799.91	-11.66	-6.56	639,981.64	1,686,736.03	40° 15' 6.049 N	80° 37' 20.205 W
3,900.00	0.09	289.13	3,899.91	-11.63	-6.75	639,981.67	1,686,735.85	40° 15' 6.049 N	80° 37' 20.208 W
4,000.00	0.14	293.34	3,999.91	-11.56	-6.94	639,981.74	1,686,735.66	40° 15' 6.050 N	80° 37' 20.210 W
4,100.00	0.32	280.83	4,099.90	-11.46	-7.32	639,981.85	1,686,735.27	40° 15' 6.051 N	80° 37' 20.215 W
4,200.00	0.46	275.26	4,199.90	-11.37	-8.00	639,981.93	1,686,734.60	40° 15' 6.051 N	80° 37' 20.224 W
4,300.00	0.49	260.68	4,299.90	-11.40	-8.82	639,981.90	1,686,733.78	40° 15' 6.051 N	80° 37' 20.234 W
4,400.00	0.60	265.29	4,399.89	-11.51	-9.76	639,981.79	1,686,732.83	40° 15' 6.050 N	80° 37' 20.246 W
4,500.00	0.52	270.19	4,499.89	-11.56	-10.74	639,981.75	1,686,731.86	40° 15' 6.049 N	80° 37' 20.259 W
4,570.00	0.43	288.48	4,569.89	-11.47	-11.31	639,981.83	1,686,731.29	40° 15' 6.050 N	80° 37' 20.266 W
4,637.00	0.30	262.00	4,636.89	-11.42	-11.72	639,981.89	1,686,730.88	40° 15' 6.050 N	80° 37' 20.272 W
4,732.00	1.20	53.60	4,731.88	-10.86	-11.16	639,982.44	1,686,731.43	40° 15' 6.056 N	80° 37' 20.265 W
4,826.00	1.20	55.70	4,825.86	-9.72	-9.56	639,983.58	1,686,733.04	40° 15' 6.067 N	80° 37' 20.244 W
4,921.00	1.10	40.00	4,920.84	-8.46	-8.15	639,984.84	1,686,734.45	40° 15' 6.080 N	80° 37' 20.226 W
5,015.00	1.00	56.30	5,014.82	-7.32	-6.89	639,985.99	1,686,735.71	40° 15' 6.091 N	80° 37' 20.210 W
5,047.00	1.80	126.50	5,046.82	-7.46	-6.25	639,985.84	1,686,736.35	40° 15' 6.090 N	80° 37' 20.202 W
5,078.00	3.80	148.10	5,077.78	-8.62	-5.32	639,984.68	1,686,737.28	40° 15' 6.079 N	80° 37' 20.190 W
5,110.00	5.00	148.20	5,109.68	-10.71	-4.02	639,982.60	1,686,738.58	40° 15' 6.058 N	80° 37' 20.173 W
5,141.00	6.60	151.60	5,140.52	-13.42	-2.46	639,979.88	1,686,740.14	40° 15' 6.032 N	80° 37' 20.152 W
5,173.00	8.50	154.80	5,172.25	-17.18	-0.58	639,976.12	1,686,742.02	40° 15' 5.995 N	80° 37' 20.127 W
5,204.00	10.50	158.20	5,202.82	-21.88	1.44	639,971.43	1,686,744.04	40° 15' 5.949 N	80° 37' 20.100 W
5,236.00	12.30	161.10	5,234.19	-27.81	3.63	639,965.49	1,686,746.23	40° 15' 5.890 N	80° 37' 20.071 W
5,267.00	14.50	162.50	5,264.34	-34.64	5.87	639,958.67	1,686,748.47	40° 15' 5.823 N	80° 37' 20.041 W
5,299.00	17.10	160.40	5,295.13	-42.89	8.65	639,950.41	1,686,751.25	40° 15' 5.742 N	80° 37' 20.004 W
5,330.00	19.60	162.50	5,324.55	-52.14	11.74	639,941.16	1,686,754.34	40° 15' 5.651 N	80° 37' 19.963 W
5,362.00	22.20	162.60	5,354.44	-63.03	15.17	639,930.27	1,686,757.76	40° 15' 5.544 N	80° 37' 19.917 W
5,393.00	24.80	163.20	5,382.87	-74.85	18.80	639,918.46	1,686,761.40	40° 15' 5.427 N	80° 37' 19.868 W
5,425.00	28.00	163.10	5,411.53	-88.46	22.92	639,904.84	1,686,765.52	40° 15' 5.293 N	80° 37' 19.813 W
5,457.00	30.90	162.90	5,439.39	-103.51	27.52	639,889.80	1,686,770.12	40° 15' 5.145 N	80° 37' 19.751 W

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Company: Chesapeake	RECEIVED	Local Co-ordinate Reference: Well 8H
Project: Brooke, WV		TVD Reference: GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Site: Violet Coss BRK	Office of Oil and Gas	MD Reference: GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Well: 8H	JUN 21 2016	North Reference: Grid
Wellbore: OH		Survey Calculation Method: Minimum Curvature
Design: OH		Database: EDM LEWIS

WV Department of Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,488.00	33.70	160.90	5,465.59	-119.25	32.68	639,874.06	1,686,775.28	40° 15' 4.990 N	80° 37' 19.682 W
5,520.00	36.30	161.20	5,491.80	-136.60	38.64	639,856.70	1,686,781.24	40° 15' 4.820 N	80° 37' 19.602 W
5,551.00	39.00	160.80	5,516.35	-154.51	44.80	639,838.80	1,686,787.40	40° 15' 4.643 N	80° 37' 19.520 W
5,582.00	42.10	160.10	5,539.90	-173.49	51.55	639,819.81	1,686,794.15	40° 15' 4.457 N	80° 37' 19.430 W
5,614.00	45.80	159.10	5,562.93	-194.30	59.30	639,799.00	1,686,801.89	40° 15' 4.252 N	80° 37' 19.326 W
5,645.00	50.60	157.50	5,583.59	-215.76	67.85	639,777.54	1,686,810.45	40° 15' 4.041 N	80° 37' 19.213 W
5,677.00	55.50	156.60	5,602.82	-239.30	77.82	639,754.00	1,686,820.42	40° 15' 3.810 N	80° 37' 19.080 W
5,708.00	60.90	156.20	5,619.15	-263.44	88.37	639,729.87	1,686,830.97	40° 15' 3.572 N	80° 37' 18.940 W
5,740.00	65.80	156.50	5,633.50	-289.63	99.84	639,703.68	1,686,842.44	40° 15' 3.315 N	80° 37' 18.788 W
5,772.00	68.70	156.90	5,645.87	-316.73	111.51	639,676.58	1,686,854.11	40° 15' 3.049 N	80° 37' 18.633 W
5,803.00	71.20	156.70	5,656.50	-343.49	122.98	639,649.81	1,686,865.58	40° 15' 2.786 N	80° 37' 18.481 W
5,835.00	74.90	154.90	5,665.83	-371.40	135.53	639,621.90	1,686,878.13	40° 15' 2.511 N	80° 37' 18.315 W
5,867.00	77.30	154.20	5,673.51	-399.45	148.88	639,593.86	1,686,891.48	40° 15' 2.236 N	80° 37' 18.138 W
5,898.00	78.40	154.40	5,680.04	-426.76	162.02	639,566.55	1,686,904.62	40° 15' 1.968 N	80° 37' 17.964 W
5,930.00	80.90	154.10	5,685.79	-455.11	175.69	639,538.20	1,686,918.29	40° 15' 1.689 N	80° 37' 17.783 W
5,961.00	84.50	153.30	5,689.73	-482.67	189.32	639,510.64	1,686,931.91	40° 15' 1.419 N	80° 37' 17.603 W
6,056.00	86.80	153.60	5,696.93	-567.40	231.65	639,425.91	1,686,974.25	40° 15' 0.587 N	80° 37' 17.044 W
6,151.00	89.60	153.10	5,699.91	-652.26	274.24	639,341.05	1,687,016.84	40° 14' 59.753 N	80° 37' 16.481 W
6,246.00	89.70	153.40	5,700.49	-737.09	317.00	639,256.22	1,687,059.60	40° 14' 58.920 N	80° 37' 15.916 W
6,341.00	89.90	154.20	5,700.83	-822.33	358.94	639,170.98	1,687,101.54	40° 14' 58.083 N	80° 37' 15.361 W
6,435.00	90.00	154.10	5,700.91	-906.92	399.93	639,086.38	1,687,142.52	40° 14' 57.252 N	80° 37' 14.819 W
6,530.00	89.90	156.70	5,700.99	-993.29	439.47	639,000.01	1,687,182.07	40° 14' 56.404 N	80° 37' 14.295 W
6,625.00	89.80	156.50	5,701.24	-1,080.48	477.20	638,912.83	1,687,219.80	40° 14' 55.547 N	80° 37' 13.795 W
6,719.00	89.30	156.50	5,701.98	-1,166.68	514.68	638,826.63	1,687,257.28	40° 14' 54.700 N	80° 37' 13.298 W
6,814.00	89.20	158.00	5,703.22	-1,254.28	551.41	638,739.03	1,687,294.01	40° 14' 53.839 N	80° 37' 12.810 W
6,908.00	89.10	153.10	5,704.62	-1,339.81	590.30	638,653.49	1,687,332.90	40° 14' 52.998 N	80° 37' 12.295 W
7,003.00	89.20	154.70	5,706.03	-1,425.11	632.09	638,568.19	1,687,374.69	40° 14' 52.161 N	80° 37' 11.742 W
7,098.00	88.70	153.40	5,707.77	-1,510.52	673.65	638,482.79	1,687,416.25	40° 14' 51.322 N	80° 37' 11.192 W
7,193.00	90.50	152.90	5,708.43	-1,595.27	716.56	638,398.04	1,687,459.16	40° 14' 50.490 N	80° 37' 10.625 W
7,287.00	90.80	151.60	5,707.36	-1,678.45	760.32	638,314.85	1,687,502.92	40° 14' 49.673 N	80° 37' 10.048 W
7,382.00	91.30	152.90	5,705.62	-1,762.51	804.55	638,230.80	1,687,547.15	40° 14' 48.848 N	80° 37' 9.464 W
7,477.00	91.60	151.80	5,703.22	-1,846.63	848.62	638,146.67	1,687,591.22	40° 14' 48.022 N	80° 37' 8.882 W
7,571.00	89.30	153.70	5,702.48	-1,930.19	891.65	638,063.12	1,687,634.25	40° 14' 47.202 N	80° 37' 8.314 W
7,666.00	89.20	153.60	5,703.72	-2,015.31	933.82	637,978.00	1,687,676.41	40° 14' 46.366 N	80° 37' 7.756 W
7,760.00	89.10	154.60	5,705.12	-2,099.86	974.87	637,893.45	1,687,717.47	40° 14' 45.535 N	80° 37' 7.213 W
7,854.00	89.20	155.50	5,706.51	-2,185.07	1,014.52	637,808.23	1,687,757.12	40° 14' 44.698 N	80° 37' 6.689 W
7,949.00	89.30	155.90	5,707.76	-2,271.65	1,053.61	637,721.65	1,687,796.21	40° 14' 43.848 N	80° 37' 6.171 W
8,044.00	88.90	155.20	5,709.25	-2,358.12	1,092.92	637,635.19	1,687,835.52	40° 14' 42.998 N	80° 37' 5.650 W
8,138.00	89.10	156.10	5,710.89	-2,443.74	1,131.67	637,549.56	1,687,874.27	40° 14' 42.157 N	80° 37' 5.136 W
8,233.00	89.10	156.20	5,712.38	-2,530.62	1,170.08	637,462.68	1,687,912.68	40° 14' 41.303 N	80° 37' 4.627 W
8,328.00	88.90	155.60	5,714.04	-2,617.33	1,208.87	637,375.98	1,687,951.46	40° 14' 40.451 N	80° 37' 4.113 W
8,423.00	88.70	156.00	5,716.03	-2,703.96	1,247.80	637,289.35	1,687,990.40	40° 14' 39.600 N	80° 37' 3.597 W
8,518.00	89.90	160.20	5,717.19	-2,792.07	1,283.22	637,201.23	1,688,025.82	40° 14' 38.733 N	80° 37' 3.126 W
8,612.00	89.70	159.90	5,717.52	-2,880.43	1,315.30	637,112.87	1,688,057.89	40° 14' 37.864 N	80° 37' 2.699 W
8,707.00	89.40	160.00	5,718.27	-2,969.67	1,347.86	637,023.63	1,688,090.46	40° 14' 36.986 N	80° 37' 2.264 W
8,802.00	89.40	159.20	5,719.26	-3,058.71	1,380.98	636,934.60	1,688,123.57	40° 14' 36.111 N	80° 37' 1.823 W
8,896.00	88.90	160.50	5,720.65	-3,146.94	1,413.35	636,846.36	1,688,155.95	40° 14' 35.243 N	80° 37' 1.391 W
8,991.00	88.10	158.80	5,723.14	-3,235.98	1,446.38	636,757.32	1,688,188.97	40° 14' 34.367 N	80° 37' 0.951 W
9,086.00	88.90	155.90	5,725.63	-3,323.61	1,482.95	636,669.69	1,688,225.54	40° 14' 33.506 N	80° 37' 0.466 W
9,180.00	88.90	155.70	5,727.43	-3,409.34	1,521.47	636,583.97	1,688,264.07	40° 14' 32.663 N	80° 36' 59.955 W
9,275.00	89.40	157.80	5,728.84	-3,496.61	1,558.97	636,496.70	1,688,301.56	40° 14' 31.805 N	80° 36' 59.458 W
9,370.00	90.50	155.40	5,728.93	-3,583.79	1,596.69	636,409.52	1,688,339.29	40° 14' 30.949 N	80° 36' 58.957 W
9,464.00	90.40	151.00	5,728.19	-3,667.67	1,639.06	636,325.64	1,688,381.66	40° 14' 30.125 N	80° 36' 58.398 W
9,559.00	90.60	150.90	5,727.36	-3,750.71	1,685.19	636,242.59	1,688,427.79	40° 14' 29.310 N	80° 36' 57.790 W
9,654.00	90.70	150.90	5,726.28	-3,833.71	1,731.39	636,159.59	1,688,473.99	40° 14' 28.496 N	80° 36' 57.181 W

Company:	Chesapeake	Local Co-ordinate Reference:	Well 8H
Project:	Brooke, WV	TVD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Site:	Violet Coss BRK	MD Reference:	GL 1172+RKB 20 @ 1192.00usft (Nomac 74)
Well:	8H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM LEWIS

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,749.00	89.10	147.80	5,726.45	-3,915.43	1,779.81	636,077.88	1,688,522.41	40° 14' 27.694 N	80° 36' 56.543 W
9,843.00	88.30	149.10	5,728.58	-3,995.51	1,828.98	635,997.79	1,688,571.58	40° 14' 26.909 N	80° 36' 55.896 W
9,938.00	88.20	151.60	5,731.48	-4,078.03	1,875.95	635,915.28	1,688,618.55	40° 14' 26.099 N	80° 36' 55.278 W
10,033.00	88.40	154.00	5,734.30	-4,162.48	1,919.35	635,830.83	1,688,661.95	40° 14' 25.270 N	80° 36' 54.704 W
10,127.00	89.60	157.90	5,735.94	-4,248.29	1,957.65	635,745.02	1,688,700.25	40° 14' 24.427 N	80° 36' 54.197 W
10,222.00	89.70	155.60	5,736.52	-4,335.56	1,995.15	635,657.74	1,688,737.74	40° 14' 23.569 N	80° 36' 53.699 W
10,317.00	89.30	154.50	5,737.35	-4,421.69	2,035.22	635,571.61	1,688,777.81	40° 14' 22.723 N	80° 36' 53.169 W
10,412.00	89.60	157.00	5,738.26	-4,508.30	2,074.23	635,485.00	1,688,816.83	40° 14' 21.872 N	80° 36' 52.652 W
10,506.00	88.90	157.20	5,739.49	-4,594.88	2,110.80	635,398.42	1,688,853.40	40° 14' 21.021 N	80° 36' 52.167 W
10,601.00	90.20	158.80	5,740.24	-4,682.96	2,146.39	635,310.34	1,688,888.99	40° 14' 20.155 N	80° 36' 51.694 W
10,696.00	89.80	158.20	5,740.24	-4,771.35	2,181.21	635,221.96	1,688,923.80	40° 14' 19.286 N	80° 36' 51.231 W
10,791.00	89.30	158.10	5,740.98	-4,859.52	2,216.56	635,133.78	1,688,959.16	40° 14' 18.419 N	80° 36' 50.761 W
10,886.00	88.70	157.70	5,742.64	-4,947.53	2,252.30	635,045.78	1,688,994.90	40° 14' 17.553 N	80° 36' 50.286 W
10,981.00	90.30	158.90	5,743.47	-5,035.79	2,287.42	634,957.52	1,689,030.02	40° 14' 16.686 N	80° 36' 49.819 W
11,075.00	89.00	157.40	5,744.05	-5,123.03	2,322.40	634,870.28	1,689,065.00	40° 14' 15.828 N	80° 36' 49.354 W
11,170.00	89.90	156.70	5,744.96	-5,210.50	2,359.44	634,782.80	1,689,102.04	40° 14' 14.968 N	80° 36' 48.863 W
11,265.00	88.60	155.10	5,746.20	-5,297.21	2,398.23	634,696.09	1,689,140.83	40° 14' 14.116 N	80° 36' 48.349 W
11,359.00	89.80	156.70	5,747.51	-5,383.00	2,436.61	634,610.30	1,689,179.20	40° 14' 13.273 N	80° 36' 47.840 W
11,454.00	89.00	157.20	5,748.51	-5,470.41	2,473.80	634,522.89	1,689,216.40	40° 14' 12.414 N	80° 36' 47.347 W
11,548.00	88.20	157.40	5,750.81	-5,557.11	2,510.06	634,436.20	1,689,252.66	40° 14' 11.562 N	80° 36' 46.865 W
11,643.00	89.90	156.50	5,752.38	-5,644.50	2,547.25	634,348.80	1,689,289.85	40° 14' 10.702 N	80° 36' 46.372 W
11,738.00	89.50	156.50	5,752.88	-5,731.62	2,585.13	634,261.68	1,689,327.73	40° 14' 9.846 N	80° 36' 45.869 W
11,832.00	88.40	157.10	5,754.60	-5,818.01	2,622.16	634,175.30	1,689,364.75	40° 14' 8.997 N	80° 36' 45.378 W
11,927.00	87.60	156.70	5,757.92	-5,905.34	2,659.41	634,087.97	1,689,402.00	40° 14' 8.139 N	80° 36' 44.884 W
12,022.00	91.10	156.40	5,758.99	-5,992.47	2,697.20	634,000.83	1,689,439.80	40° 14' 7.282 N	80° 36' 44.383 W
12,117.00	91.80	156.00	5,756.59	-6,079.36	2,735.53	633,913.94	1,689,478.12	40° 14' 6.429 N	80° 36' 43.875 W
12,188.00	91.10	156.70	5,754.79	-6,144.38	2,764.00	633,848.93	1,689,506.60	40° 14' 5.790 N	80° 36' 43.497 W
12,248.00	91.10	156.70	5,753.64	-6,199.47	2,787.73	633,793.83	1,689,530.33	40° 14' 5.248 N	80° 36' 43.183 W

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
12,248.00	5,753.64	-6,199.47	2,787.73	PTD

Checked By: _____ Approved By: _____ Date: _____

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Well Information

BHA # 1



JOB NO.: 210914D195966 **FIELD:** Marcellus South
Company: CHESAPEAKE OPERATING INC. **Township:**
LOCATION: Brooke County, WV **SECT. RANGE:**
RIG NAME: Nomac 74 **Lead DD:** Ben Robbins
STATE: West Virginia **Co. Man:** Michael Rawson / Michael Vanston
COUNTY: Brooke County **BHA TYPE:** Steerable Assembly
WELL NAME: Violet Coss BRK 8H

BHA Summary Information

TIME IN - OUT		Rotary Hours	3.42	Start Depth	4627.00	RPM	Flow
Start Time	End Time	Circ Hrs Tot/Only	23.67 / 4.75	End Depth	5609.00	Range	Rate
22-Sep-14 @ 22:25	24-Sep-14 @ 09:30	Slide Hours	15.50	Percent Rotary:	41.65	0 -50	291 -523
		Below Rotary Hrs.	35.08	Percent Slide:	58.35		
Total Drilled:		982.00	Avg. Total ROP:	51.91	Incl. Azimuth		
Total Rotary Drilled:		409.00	Avg. Rotary ROP:	119.71	IN	OUT	OUT
Total Drilled Sliding:		573.00	Avg. Slide ROP:	36.97	.0	.0	.00
SPP	0 -3000	Weights	SO 0 -156	PU 0 -157	RAB 0 -156	Reason POOH	

Bit Data				MOTOR DATA				Mud Data					
SMITH 8 1/2" PDC Bit (Smith SDi 516)				6.5 Motor / 4:5 Lobe - 7.0 Stage FBH				Type					
Type Bit		PDC		Model: Titan II		Pad OD		WT 0 GAS 0 Solids 0					
TFA 2.248				MFG. Scientific		.50		Vis 0 SAND 0 T° 0					
JETS		22	22	22	22	Bend ° 1.83 Stator/Rotor 4:5		PV 0 PH 0 Chlor 0					
		16	16	0	0	Bit to Bend 5.25 Motor Diff		YP 0 WL 0 Oil % 0					
Bit Coding		IADC#		Rev/GAL 0.5				BHT° 0					
IR	OR	DL	Loc	BS	G	ODL	PUMPS		PUMP1		PUMP1		
0	0		CVI ext				NAME						
Bit Drop:		0 PSI @ 523 GPM		Sensor Offsets		Type							
		Sensor	57	Sonic	0	Liner							
		Gamma	56	DNCS	5022	Stroke							
		Restiv	0	GYRO	0	Efficiency							

8 1/2" Smith (SDi 516) PDC Bit / Serial #JJ 3543 / Bit #5 / Jet's 5x22's, 2X16's / TFA - 2.248
 6 1/2" Mud Motor / 4:5 Lobe - 7.0 Stage / 1.83 FBH / BTB - 63" / RPG - 0.50
 Max Operating Torque - 6500 ft lb
 Survey Package - 57
 Gamma - 56
 4R Float Valve in Top of Motor

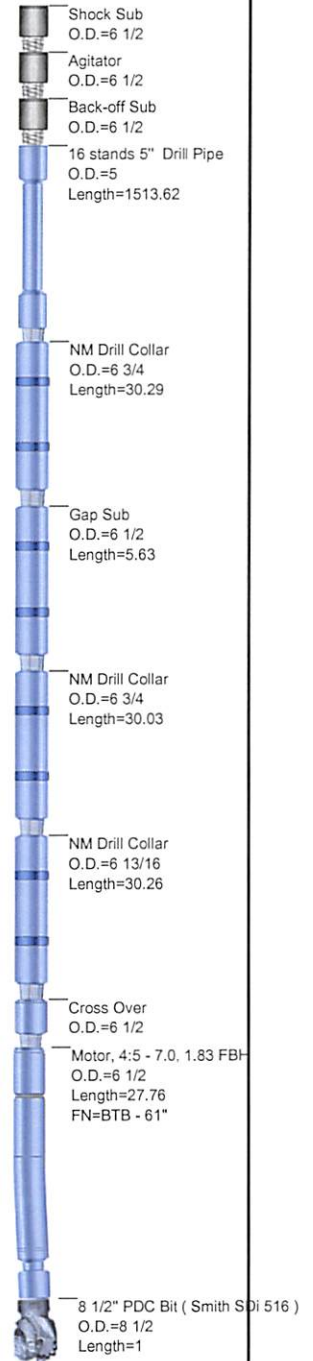
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Pulled this BHA Due to low build rates

BHA Detail

#	Description	Serial #	I.D.	O.D.	Length	Sum	Top Conn
1	8 1/2" PDC Bit (Smith SDi 516)	JJ 3543		8 1/2	1.00	1.00	4 1/2 REGP
2	Motor, 4:5 - 7.0, 1.83 FBH	6404		6 1/2	27.76	28.76	4 1/2 XHB
3	Cross Over	BT650581	2 13/16	6 1/2	2.81	31.57	4 1/2 IFB
4	NM Drill Collar	675-30-1855	2 13/16	6 13/16	30.26	61.83	4 1/2 IFB
5	NM Drill Collar	675-30-3071	2 13/16	6 3/4	30.03	91.86	4 1/2 IFB
6	Gap Sub	650-1130	3 1/8	6 1/2	5.63	97.49	4 1/2 IFB
7	NM Drill Collar	675-30-2483	2 13/16	6 3/4	30.29	127.78	4 1/2 IFB
8	16 stands 5" Drill Pipe	Rig	4.276	5	1,513.62	1641.40	4 1/2 IFB
9	Back-off Sub	SNA 1192291	3 3/4	6 1/2	2.51	1643.91	4 1/2 IFB
10	Agitator	AGAR 0675-0086	3 3/4	6 1/2	15.09	1659.00	4 1/2 IFB
11	Shock Sub	150-65362	3 3/4	6 1/2	8.66	1667.66	4 1/2 IFB
12					0.00	1667.66	

8 1/2" PDC Bit (Smith SDi 516)
 O.D.=8 1/2
 Length=1





JOB NO.: 210914D195966
 Company: CHESAPEAKE OPERATING INC.
 LOCATION: Brooke County, WV
 RIG NAME: Nomac 74
 STATE: West Virginia
 COUNTY: Country
 WELL NAME: Violet Coss BRK 8H

FIELD: Marcellus South
 Township:
 Range

MOTOR INFORMATION	
Desc: 6.5 Motor / 4:5 Lobe - 7.0 Stage FBH	
Bent Hsg/Sub: 1.83/ 0	Bit to Bend: 5.25
Pad OD: .50	NB Stab:

Slide Report for BHA # 1

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
1	23-Sep	Drilling	03:20	03:25	0.08	4627	4632	5	10	60.0	50	3000	523	2690		0.31	264.67	0.31	
1	23-Sep	Drilling	05:25	05:55	0.50	4632	4695	63	10	126.0	50	3000	523	3000		0.63	48.56	1.55	
1	23-Sep	Sliding	06:05	06:50	0.75	4695	4713	18	10	24.0	50	3000	523	2390	60M	0.91	51.80	1.55	
1	23-Sep	Drilling	06:50	07:20	0.50	4713	4790	77	10	154.0	50	3000	523	3000		1.20	54.90	0.05	
1	23-Sep	Drilling	07:25	08:00	0.58	4790	4884	94	10	161.1	50	3000	523	3000		1.13	46.43	0.35	
1	23-Sep	Drilling	08:05	08:50	0.75	4884	4979	95	10	126.7	50	3000	523	3000		1.03	49.70	0.33	
1	23-Sep	Drilling	08:55	09:35	0.67	4979	5023	44	10	66.0	50	3000	523	3000		1.00	81.43	5.43	
1	23-Sep	Sliding	09:35	11:40	2.08	5023	5073	50	4	24.0	0	0	523	2440	155M	3.46	146.33	7.18	
1	23-Sep	Sliding	11:45	13:00	1.25	5073	5105	32	4	25.6	0	0	523	2440	155M	4.81	148.19	3.75	
1	23-Sep	Drilling	13:05	13:25	0.33	5105	5136	31	10	93.0	50	3000	523	2900		6.34	151.17	5.25	
1	23-Sep	Sliding	13:30	14:45	1.25	5136	5168	32	4	25.6	0	0	523	2450	160M	8.20	154.40	6.00	
1	23-Sep	Sliding	14:55	15:35	0.67	5168	5199	31	4	46.5	0	0	523	2450	180M	10.18	157.74	6.75	
1	23-Sep	Sliding	15:40	16:15	0.58	5199	5231	32	6	54.9	0	0	523	2600	1R	12.02	160.70	5.90	
1	23-Sep	Sliding	16:20	16:55	0.58	5231	5262	31	6	53.1	0	0	523	2600	1R	14.14	162.30	7.10	
1	23-Sep	Sliding	17:40	18:25	0.75	5262	5294	32	6	42.7	0	0	448	2070	10L	16.69	160.69	8.30	
1	23-Sep	Sliding	18:30	19:20	0.83	5294	5325	31	6	37.2	0	0	448	2070	10L	19.20	162.20	8.30	
1	23-Sep	Sliding	19:30	20:10	0.67	5325	5357	32	6	48.0	0	0	448	2070	10L	21.79	162.59	8.13	
1	23-Sep	Sliding	20:20	21:00	0.67	5357	5388	31	6	46.5	0	0	448	2100	0G	24.38	163.11	8.42	
1	23-Sep	Sliding	21:10	21:45	0.58	5388	5420	32	6	54.9	0	0	448	2100	15L	27.50	163.11	10.00	
1	23-Sep	Sliding	21:55	22:30	0.58	5420	5451	31	6	53.1	0	0	448	2100	15L	30.36	162.93	9.07	
1	23-Sep	Sliding	22:40	23:15	0.58	5451	5483	32	6	54.9	0	0	448	2100	15L	33.25	161.20	9.67	
1	23-Sep	Sliding	23:20	24:00	0.67	5483	5514	31	6	46.5	0	0	448	2100	20L	35.81	161.15	8.14	
1	24-Sep	Sliding	00:00	00:05	0.08	5514	5515	1	6	12.0	0	0	448	2100	20L	35.89	161.16	8.14	
1	24-Sep	Sliding	00:10	00:55	0.75	5515	5546	31	6	41.3	0	0	448	2100	20L	38.56	160.86	8.75	
1	24-Sep	Sliding	01:05	02:00	0.92	5546	5578	32	9	34.9	0	0	448	2200	15L	41.70	160.19	10.11	
1	24-Sep	Sliding	02:30	03:45	1.25	5578	5609	31	12	24.8	0	0	448	2250	15L	45.22	159.25	11.76	

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Slide Report for BHA # 1

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
---	------	------------	------------	----------	-------	----------	--------	---------------	-----	-----	-----	--------------	-----------	-----	-----	-----	-----	-----	------

Total Drilled:						982	Avg. Total ROP:				51.91	DEPTH% - TIME %									
Total Rotary Drilled:						409	Avg. Rotary ROP:				119.71	Percent Rotary:		41.65 - 18.06							
Total Drilled Sliding:						573	Avg. Slide ROP:				36.97	Percent Slide:		58.35 - 81.94							

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Well Information

BHA # 2



JOB NO.: 210914D195966 FIELD: Marcellus South
 Company: CHESAPEAKE OPERATING INC. Township:
 LOCATION: Brooke County, WV SECT. RANGE:
 RIG NAME: Nomac 74 Lead DD: Ben Robbins
 STATE: West Virginia Co. Man: Michael Rawson / Michael Vanston
 COUNTY: Brooke County BHA TYPE: Slick Assembly
 WELL NAME: Violet Coss BRK 8H

BHA Summary Information

TIME IN - OUT		Rotary Hours	2.75	Start Depth	5609.00	RPM	Flow
Start Time	End Time	Circ Hrs Tot/Only	15.75 / 6.83	End Depth	6018.00	Range	Rate
24-Sep-14 @ 09:30	25-Sep-14 @ 09:30	Slide Hours	6.17	Percent Rotary:	35.94	0 -30	350 -448
		Below Rotary Hrs.	24.00	Percent Slide:	64.06		
Total Drilled:		409.00	Avg. Total ROP:	45.87	Incl. Azimuth		
Total Rotary Drilled:		147.00	Avg. Rotary ROP:	53.45	IN	OUT	IN
Total Drilled Sliding:		262.00	Avg. Slide ROP:	42.49	.0	.0	.00
SPP	1600 -2570	Weights	SO 150 -156	PU 157 -170	RAB 156 -160	Reason POOH	

Bit Data				MOTOR DATA				Mud Data					
SMITH	8 1/2" PDC Bit (Smith SDiz 516)			2.38 ABH, Talon II, Mud Motor				Type	OBM				
Type Bit	PDC			Model:	Talon II			WT	12.1	GAS	0	Solids	18.6
TFA	2.597			MFG.	Scientific			Vis	48	SAND	0	T °	94
JETS	22	22	22	Bend °	2.38	Stator/Rotor	7:8	PV	14	PH	0	Chlor	56000
	22	22	0	Bit to Bend	78	Motor Diff		YP	14	WL	0	Oil %	70
Bit Coding		IADC#		Rev/GAL	0.5			BHT°		108			
IR	OR	DL	Loc	NB Stab	0			PUMPS		PUMP1			
0	0			Rotor Jet	0			NAME					
Bit Drop:		33 PSI @ 448 GPM		Sensor Offsets				Model					
				Sensor	56	Sonic	0	Type					
				Gamma	55	DNCS	5609	Liner		.00			
				Restiv	0	GYRO	0	Stroke		.00			
								Efficiency		.00			

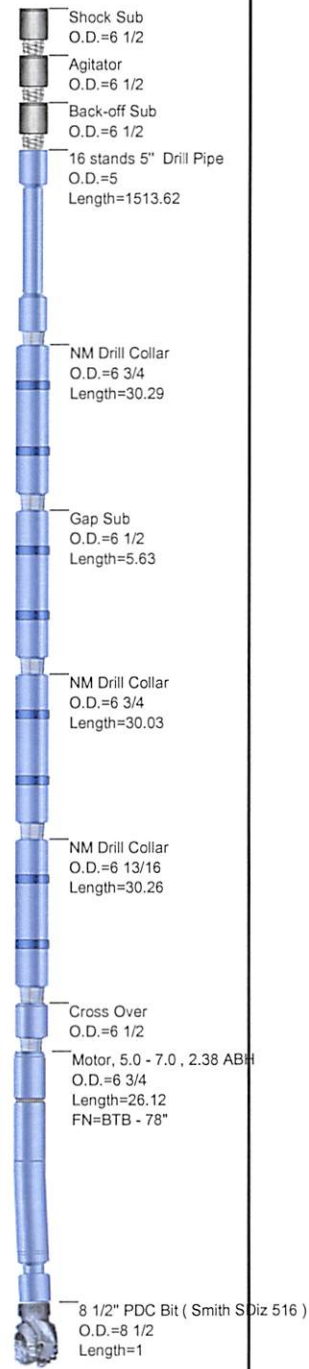
Comments: 8 1/2" Smith (SDiz 516) PDC Bit / Serial #JH 9470 / Bit #6 / Jet's 7x22's, / TFA - 2.597
 6 1/2" Mud Motor / 7.8 Lobe - 5.0 Stage / 2.38 ABH / BTB - 78" / RPG - 0.28
 Max Operating Torque - 6500 ft lb
 Survey Package - 56
 Gamma - 55
 4R Float Valve in Top of Motor

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Landed curve with this BHA, POOH to P/up Lateral BHA

BHA Detail

#	Description	Serial #	I.D.	O.D.	Length	Sum	Top Conn
1	8 1/2" PDC Bit (Smith SDiz 516)	JH 9470		8 1/2	1.00	1.00	4 1/2 REGP
2	Motor, 5.0 - 7.0 , 2.38 ABH	65132		6 3/4	26.12	27.12	4 1/2 REGB
3	Cross Over	BT650581	2 13/16	6 1/2	2.81	29.93	4 1/2 IFB
4	NM Drill Collar	675-30-1855	2 13/16	6 13/16	30.26	60.19	4 1/2 IFB
5	NM Drill Collar	675-30-3071	2 13/16	6 3/4	30.03	90.22	4 1/2 IFB
6	Gap Sub	650-1130	3 1/8	6 1/2	5.63	95.85	4 1/2 IFB
7	NM Drill Collar	675-30-2483	2 13/16	6 3/4	30.29	126.14	4 1/2 IFB
8	16 stands 5" Drill Pipe	Rig	4.276	5	1,513.62	1639.76	4 1/2 IFB
9	Back-off Sub	SNA 1192291	3 3/4	6 1/2	2.51	1642.27	4 1/2 IFB
10	Agitator	AGAR 0675-0086	3 3/4	6 1/2	15.09	1657.36	4 1/2 IFB
11	Shock Sub	150-65362	3 3/4	6 1/2	8.66	1666.02	4 1/2 IFB
12					0.00	1666.02	





JOB NO.: 210914D195966
Company: CHESAPEAKE OPERATING INC.
LOCATION: Brooke County, WV
RIG NAME: Nomac 74
STATE: West Virginia
COUNTY: Country
WELL NAME: Violet Coss BRK 8H

FIELD: Marcellus South
Township:
Range

MOTOR INFORMATION	
Desc: 2.38 ABH, Talon II, Mud Motor	
Bent Hsg/Sub: 2.38/ 0	Bit to Bend: 78
Pad OD: .50	NB Stab:

Slide Report for BHA # 2

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
2	24-Sep	Sliding	16:45	17:55	1.17	5609	5639	30	20	25.7	0	0	448	2450	10L	49.67	157.79	15.95	
2	24-Sep	Sliding	18:05	18:55	0.83	5639	5671	32	20	38.4	0	0	448	2450	10L	54.58	156.76	15.48	
2	24-Sep	Sliding	19:00	19:35	0.58	5671	5702	31	20	53.1	0	0	448	2480	10L	59.85	156.27	17.45	
2	24-Sep	Sliding	19:45	20:15	0.50	5702	5734	32	20	64.0	0	0	448	2520	5L	64.88	156.45	15.34	
2	24-Sep	Sliding	20:20	20:40	0.33	5734	5756	22	20	66.0	0	0	448	2545	5L	67.25	156.70	9.14	
2	24-Sep	Drilling	20:40	20:50	0.17	5756	5765	9	12	54.0	30	10000	448	2570		68.07	156.81	9.14	
2	24-Sep	Sliding	20:55	21:05	0.17	5765	5776	11	15	66.0	0	0	448	2545	5L	69.02	156.87	8.09	
2	24-Sep	Drilling	21:05	21:30	0.42	5776	5797	21	6	50.4	30	6000	448	2570		70.72	156.74	8.09	
2	24-Sep	Sliding	21:35	21:45	0.17	5797	5807	10	15	60.0	30	6000	448	2545	15L	71.66	156.47	12.75	
2	24-Sep	Sliding	22:30	22:45	0.25	5807	5819	12	15	48.0	30	0	448	2190	15L	73.05	155.79	12.75	
2	24-Sep	Drilling	22:45	23:00	0.25	5819	5829	10	6	40.0	30	6000	448	2190		74.21	155.23	12.75	
2	24-Sep	Sliding	23:10	24:00	0.83	5829	5845	16	13	19.2	30	6000	448	2440	15L	75.65	154.68	7.79	
2	25-Sep	Drilling	00:00	00:20	0.33	5845	5860	15	10	45.0	30	7000	448	2550		76.77	154.35	7.79	
2	25-Sep	Sliding	00:25	00:40	0.25	5860	5870	10	13	40.0	0	0	448	2500	15L	77.41	154.22	3.60	
2	25-Sep	Drilling	00:40	01:00	0.33	5870	5892	22	10	66.0	30	7000	448	2550		78.19	154.36	3.60	
2	25-Sep	Sliding	01:10	01:25	0.25	5892	5902	10	13	40.0	0	7000	448	2500	20L	78.71	154.36	7.87	
2	25-Sep	Drilling	01:25	01:45	0.33	5902	5924	22	10	66.0	30	7000	448	2500		80.43	154.16	7.87	
2	25-Sep	Sliding	01:55	02:20	0.42	5924	5949	25	13	60.0	0	0	448	2500	0G	83.11	153.61	11.89	
2	25-Sep	Drilling	02:20	02:30	0.17	5949	5955	6	10	36.0	30	7000	448	2500		83.80	153.45	11.89	
2	25-Sep	Sliding	02:40	02:50	0.17	5955	5966	11	10	66.0	0	0	448	2500	10L	84.62	153.32	2.44	
2	25-Sep	Drilling	02:50	03:10	0.33	5966	5987	21	10	63.0	30	7000	448	2500		85.13	153.38	2.44	
2	25-Sep	Sliding	03:20	03:35	0.25	5987	5997	10	10	40.0	0	0	448	2500	5L	85.37	153.41	2.44	
2	25-Sep	Drilling	03:35	04:00	0.42	5997	6018	21	10	50.4	30	7000	448	2500		85.88	153.48	2.44	

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Slide Report for BHA # 2

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
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Total Drilled:						409	Avg. Total ROP:				45.87	DEPTH% - TIME %									
Total Rotary Drilled:						147	Avg. Rotary ROP:				53.45	Percent Rotary:		35.94 - 30.84							
Total Drilled Sliding:						262	Avg. Slide ROP:				42.49	Percent Slide:		64.06 - 69.16							

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Well Information

BHA # 3



JOB NO.: 210914D195966 FIELD: Marcellus South
 Company: CHESAPEAKE OPERATING INC. Township:
 LOCATION: Brooke County, WV SECT. RANGE:
 RIG NAME: Nomac 74 Lead DD: Ben Robbins
 STATE: West Virginia Co. Man: Michael Rawson / Michael Vanston
 COUNTY: Brooke County BHA TYPE: Steerable Assembly
 WELL NAME: Violet Coss BRK 8H

BHA Summary Information

TIME IN - OUT		Rotary Hours	19.17	Start Depth	6018.00	RPM	Flow Rate
Start Time	End Time	Circ Hrs Tot/Only	31.08 / 6.50	End Depth	12248.00	Range	
25-Sep-14 @ 09:30	27-Sep-14 @ 16:00	Slide Hours	5.42	Percent Rotary:	93.19	0 -95	524 -524
		Below Rotary Hrs.	54.50	Percent Slide:	6.81		
Total Drilled:		6230.00	Avg. Total ROP:	253.42	Incl.	Azimuth	
Total Rotary Drilled:		5806.00	Avg. Rotary ROP:	302.92	IN	OUT	
Total Drilled Sliding:		424.00	Avg. Slide ROP:	78.28	.0	.0	.00
SPP	3050 -4300	Weights	SO 60 -150	PU	161 -270	RAB	140 -158
Reason POOH							

Bit Data				MOTOR DATA				Mud Data					
SMITH	8 1/2 PDC Smith SDiz 516			6.5 Motor / 4:5 Lobe - 7.0 Stage FBH				Type	OBM				
Type Bit		PDC		Model:	Titan II			WT	12.6	GAS	0	Solids	22.2
TFA	2.597			MFG.	Scientific			Vis	56	SAND	0	T°	113
JETS		22	22	Bend °	1.83	Stator/Rotor	4:5	PV	20	PH	0	Chlor	57000
		22	22	Bit to Bend	5.25	Motor Diff		YP	18	WL	0	Oil %	72
Bit Coding		IADC#		Rev/GAL	0.5			BHT°		160			
IR	OR	DL	Loc	NB Stab	0			PUMPS		PUMP1		PUMP1	
0	0			Rotor Jet	0			NAME					
Bit Drop:		47 PSI @ 524 GPM		Sensor Offsets				Model					
		Sensor	56	Sonic	0			Type					
		Gamma	55	DNSC	6018			Liner					
		Restiv	0	GYRO	0			Stroke					
				Efficiency									

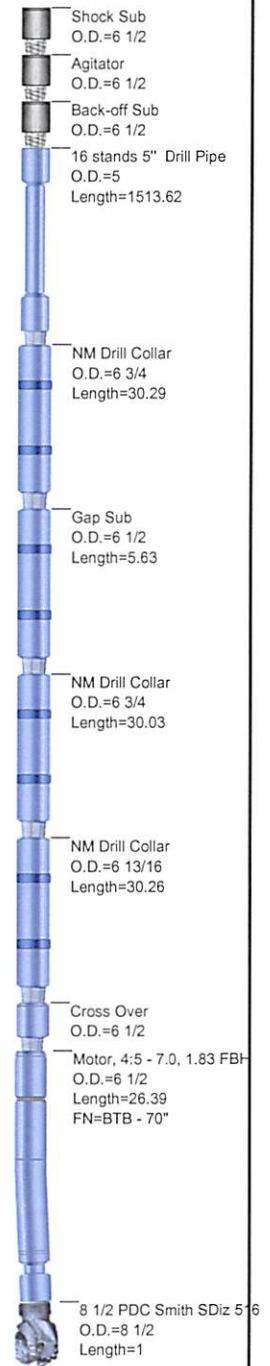
Comments
 8 1/2" Smith (SDiz 516) PDC Bit / Serial #JH 9470 / Bit # RR 6 / Jet's 7x22's, / TFA - 2.597 of Oil and Gas
 6 1/2" Mud Motor / 4:5 Lobe - 7.0 Stage / 1.83 FBH / BTB - 63" / RPG - 0.50
 Max Operating Torque - 6500 ft lb
 Survey Package - 56
 Gamma - 55
 4R Float Valve in Top of Motor

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BHA Detail

#	Description	Serial #	I.D.	O.D.	Length	Sum	Top Conn
1	8 1/2 PDC Smith SDiz 516	JH 9470		8 1/2	1.00	1.00	4 1/2 REGP
2	Motor, 4:5 - 7.0, 1.83 FBH	6688		6 1/2	26.39	27.39	4 1/2 XHB
3	Cross Over	BT650581	2 13/16	6 1/2	2.81	30.20	4 1/2 IFB
4	NM Drill Collar	675-30-1855	2 13/16	6 13/16	30.26	60.46	4 1/2 IFB
5	NM Drill Collar	675-30-3071	2 13/16	6 3/4	30.03	90.49	4 1/2 IFB
6	Gap Sub	650-1130	3 1/8	6 1/2	5.63	96.12	4 1/2 IFB
7	NM Drill Collar	675-30-2483	2 13/16	6 3/4	30.29	126.41	4 1/2 IFB
8	16 stands 5" Drill Pipe	Rig	4.276	5	1,513.62	1640.03	4 1/2 IFB
9	Back-off Sub	SNA 1192291	3 3/4	6 1/2	2.51	1642.54	4 1/2 IFB
10	Agitator	AGAR 0675-0086	3 3/4	6 1/2	15.09	1657.63	4 1/2 IFB
11	Shock Sub	150-65362	3 3/4	6 1/2	8.66	1666.29	4 1/2 IFB
12					0.00	1666.29	





JOB NO.: 210914D195966
 Company: CHESAPEAKE OPERATING INC.
 LOCATION: Brooke County, WV
 RIG NAME: Nomac 74
 STATE: West Virginia
 COUNTY: Country
 WELL NAME: Violet Coss BRK 8H

FIELD: Marcellus South
 Township:
 Range

MOTOR INFORMATION	
Desc: 6.5 Motor / 4:5 Lobe - 7.0 Stage FBH	
Bent Hsg/Sub: 1.83/ 0	Bit to Bend: 5.25
Pad OD: .50	NB Stab:

Slide Report for BHA # 3

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
3	25-Sep	Drilling	13:00	13:30	0.50	6018	6113	95	20	190.0	90	7000	524	3500		88.48	153.30	2.99	
3	25-Sep	Sliding	13:35	13:45	0.17	6113	6138	25	10	150.0	0	0	524	3100	10L	89.22	153.17	2.99	
3	25-Sep	Drilling	13:45	13:55	0.17	6138	6208	70	20	420.0	90	7000	524	3500		89.66	153.28	0.33	
3	25-Sep	Drilling	14:00	14:10	0.17	6208	6303	95	20	570.0	90	7000	524	3500		89.82	153.88	0.87	
3	25-Sep	Drilling	14:15	14:30	0.25	6303	6398	95	20	380.0	90	7000	524	3500		89.96	154.14	0.15	
3	25-Sep	Drilling	14:35	14:50	0.25	6398	6492	94	20	376.0	90	7000	524	3500		89.94	155.66	2.74	
3	25-Sep	Drilling	14:55	15:05	0.17	6492	6587	95	20	570.0	90	7000	524	3500		89.84	156.58	0.25	
3	25-Sep	Drilling	15:10	15:25	0.25	6587	6682	95	20	380.0	90	7000	524	3500		89.50	156.50	0.55	
3	25-Sep	Drilling	15:30	15:45	0.25	6682	6776	94	20	376.0	90	7000	524	3500		89.24	157.40	1.55	
3	25-Sep	Drilling	15:50	16:05	0.25	6776	6871	95	20	380.0	90	7000	524	3500		89.14	155.03	5.22	
3	25-Sep	Sliding	16:10	16:15	0.08	6871	6889	18	13	216.0	0	0	524	3150	80L	89.12	154.09	5.22	
3	25-Sep	Drilling	16:15	16:30	0.25	6889	6965	76	25	304.0	90	7000	524	3500		89.16	154.06	1.66	
3	25-Sep	Drilling	16:35	17:00	0.42	6965	7060	95	15	228.0	90	7000	524	3500		88.90	153.92	1.44	
3	25-Sep	Drilling	17:05	17:25	0.33	7060	7155	95	15	285.0	90	7000	524	3400		89.78	153.10	1.97	
3	25-Sep	Sliding	17:30	17:40	0.17	7155	7170	15	10	90.0	0	0	524	3100	0G	90.06	153.02	1.97	
3	25-Sep	Drilling	17:40	18:00	0.33	7170	7250	80	18	240.0	90	7000	524	3200		90.68	152.11	1.42	
3	25-Sep	Drilling	18:05	18:25	0.33	7250	7344	94	22	282.0	90	7000	524	3300		91.10	152.38	1.47	
3	25-Sep	Drilling	18:30	18:50	0.33	7344	7439	95	22	285.0	90	7500	524	3350		91.48	152.24	1.20	
3	25-Sep	Drilling	18:55	19:15	0.33	7439	7534	95	22	285.0	90	7500	524	3350		90.21	152.95	3.17	
3	25-Sep	Sliding	19:20	19:30	0.17	7534	7549	15	12	90.0	0	0	524	3050	135R	89.84	153.26	3.17	
3	25-Sep	Drilling	19:30	19:45	0.25	7549	7628	79	22	316.0	90	7500	524	3050		89.24	153.64	0.15	
3	25-Sep	Drilling	19:50	20:10	0.33	7628	7723	95	22	285.0	90	7500	524	3250		89.14	154.21	1.07	
3	25-Sep	Drilling	20:15	20:35	0.33	7723	7817	94	22	282.0	90	7500	524	3250		89.16	155.15	0.96	
3	25-Sep	Drilling	20:40	21:00	0.33	7817	7911	94	22	282.0	90	7500	524	3460		89.26	155.74	0.43	
3	25-Sep	Drilling	21:05	21:25	0.33	7911	8006	95	20	285.0	90	7500	524	3460		89.06	155.48	0.85	
3	25-Sep	Drilling	21:30	21:50	0.33	8006	8101	95	20	285.0	90	7500	524	3460		89.02	155.75	0.98	

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Slide Report for BHA # 3

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
3	25-Sep	Drilling	21:55	22:10	0.25	8101	8195	94	20	376.0	90	8500	524	3510		89.10	156.16	0.11	
3	25-Sep	Drilling	22:15	22:35	0.33	8195	8291	96	20	288.0	90	8500	524	3510		88.98	155.83	0.67	
3	25-Sep	Drilling	22:40	23:00	0.33	8291	8385	94	20	282.0	90	8500	524	3510		88.78	155.84	0.47	
3	25-Sep	Drilling	23:05	23:25	0.33	8385	8480	95	20	285.0	90	8500	524	3510		89.42	158.52	4.60	
3	25-Sep	Drilling	23:30	23:45	0.25	8480	8575	95	20	380.0	90	9000	524	3750		89.78	160.02	0.38	
3	25-Sep	Drilling	23:50	24:00	0.17	8575	8642	67	20	402.0	90	9000	524	3650		89.61	159.93	0.33	
3	26-Sep	Drilling	00:00	00:05	0.08	8642	8669	27	20	324.0	90	9000	524	3650		89.52	159.96	0.33	
3	26-Sep	Drilling	00:10	00:30	0.33	8669	8764	95	20	285.0	90	9000	524	3650		89.40	159.52	0.84	
3	26-Sep	Drilling	00:35	00:50	0.25	8764	8859	95	20	380.0	90	9000	524	3650		89.10	159.99	1.48	
3	26-Sep	Drilling	00:55	01:15	0.33	8859	8953	94	20	282.0	90	9000	524	3650		88.42	159.48	1.98	
3	26-Sep	Drilling	01:20	01:40	0.33	8953	9048	95	20	285.0	90	9000	524	3650		88.58	157.06	3.17	
3	26-Sep	Sliding	01:50	02:10	0.33	9048	9070	22	24	66.0	0	0	524	3380	70L	88.77	156.39	3.17	
3	26-Sep	Drilling	02:10	02:25	0.25	9070	9143	73	20	292.0	90	9000	524	3680		88.90	155.78	0.21	
3	26-Sep	Drilling	02:30	02:45	0.25	9143	9237	94	20	376.0	90	9000	524	3680		89.20	156.96	2.27	
3	26-Sep	Drilling	02:50	03:15	0.42	9237	9332	95	20	228.0	90	9000	524	3750		90.06	156.36	2.78	
3	26-Sep	Sliding	03:20	03:35	0.25	9332	9357	25	35	100.0	0	0	524	3500	70L	90.35	155.73	2.78	
3	26-Sep	Drilling	03:35	03:55	0.33	9357	9427	70	20	210.0	90	9700	524	3775		90.44	152.73	4.68	
3	26-Sep	Sliding	04:05	04:25	0.33	9427	9447	20	35	60.0	0	0	524	3525	70L	90.42	151.80	4.68	
3	26-Sep	Drilling	04:25	04:40	0.25	9447	9522	75	20	300.0	90	9700	524	3775		90.52	150.94	0.24	
3	26-Sep	Drilling	04:45	05:00	0.25	9522	9616	94	20	376.0	90	9700	524	3775		90.66	150.90	0.11	
3	26-Sep	Drilling	05:05	05:25	0.33	9616	9711	95	20	285.0	90	9700	524	3775		89.74	149.04	3.67	
3	26-Sep	Drilling	05:30	05:55	0.42	9711	9806	95	20	228.0	90	9700	524	3775		88.61	148.59	1.62	
3	26-Sep	Sliding	06:00	06:20	0.33	9806	9831	25	35	75.0	0	0	524	3475	70R	88.40	148.93	1.62	
3	26-Sep	Drilling	06:20	06:35	0.25	9831	9900	69	20	276.0	90	9700	524	3775		88.24	150.60	2.63	
3	26-Sep	Sliding	06:40	06:55	0.25	9900	9925	25	35	100.0	0	0	524	3475	70R	88.21	151.26	2.63	
3	26-Sep	Drilling	06:55	07:10	0.25	9925	9995	70	20	280.0	90	9700	524	3775		88.32	153.04	2.53	
3	26-Sep	Sliding	07:15	07:30	0.25	9995	10020	25	35	100.0	0	0	524	3500	65R	88.37	153.67	2.53	
3	26-Sep	Drilling	07:30	07:40	0.17	10020	10090	70	20	420.0	90	9700	524	3775		89.13	156.37	4.34	
3	26-Sep	Sliding	07:45	08:05	0.33	10090	10124	34	35	102.0	0	0	524	3500	65R	89.56	157.78	4.34	
3	26-Sep	Drilling	08:05	08:15	0.17	10124	10184	60	20	360.0	90	9700	524	3775		89.66	156.52	2.42	
3	26-Sep	Drilling	08:20	08:40	0.33	10184	10279	95	20	285.0	90	9700	524	3775		89.46	154.94	1.23	
3	26-Sep	Drilling	08:45	09:00	0.25	10279	10374	95	20	380.0	90	9700	524	3775		89.48	156.00	2.65	
3	26-Sep	Sliding	09:05	09:25	0.33	10374	10399	25	35	75.0	0	0	524	3500	45R	89.56	156.66	2.65	
3	26-Sep	Drilling	09:25	09:35	0.17	10399	10469	70	20	420.0	90	9700	524	3775		89.18	157.12	0.77	

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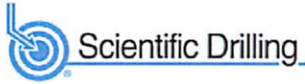
Slide Report for BHA # 3

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
3	26-Sep	Drilling	09:40	09:55	0.25	10469	10563	94	20	376.0	90	9700	524	3775		89.68	158.16	2.17	
3	26-Sep	Sliding	10:00	10:15	0.25	10563	10588	25	35	100.0	0	0	524	3475	1R	90.02	158.58	2.17	
3	26-Sep	Drilling	10:15	10:30	0.25	10588	10659	71	20	284.0	90	9700	524	3775		89.96	158.43	0.76	
3	26-Sep	Drilling	10:35	10:50	0.25	10659	10753	94	20	376.0	90	9700	524	3775		89.50	158.14	0.54	
3	26-Sep	Drilling	10:55	11:05	0.17	10753	10848	95	20	570.0	90	9700	524	3775		88.94	157.86	0.76	
3	26-Sep	Drilling	11:10	11:30	0.33	10848	10943	95	20	285.0	90	9700	524	3775		89.66	158.42	2.11	
3	26-Sep	Sliding	11:35	11:55	0.33	10943	10968	25	35	75.0	0	0	524	3425	1R	90.08	158.74	2.11	
3	26-Sep	Drilling	11:55	12:10	0.25	10968	11038	70	20	280.0	90	9700	524	3775		89.51	157.99	2.11	
3	26-Sep	Drilling	12:15	12:30	0.25	11038	11132	94	20	376.0	90	9700	524	3775		89.54	156.98	1.20	
3	26-Sep	Drilling	12:35	12:45	0.17	11132	11141	9	20	54.0	90	9700	524	3775		89.63	156.91	1.20	
3	26-Sep	Sliding	12:45	13:05	0.33	11141	11161	20	35	60.0	0	0	524	3375	1R	89.81	156.77	1.20	
3	26-Sep	Drilling	13:05	13:20	0.25	11161	11227	66	20	264.0	90	9700	524	3775		89.12	155.74	2.17	
3	26-Sep	Drilling	13:25	13:40	0.25	11227	11322	95	20	380.0	90	9700	524	3775		89.33	156.07	2.13	
3	26-Sep	Drilling	13:45	13:55	0.17	11322	11332	10	20	60.0	90	9700	524	3775		89.46	156.24	2.13	
3	26-Sep	Sliding	13:55	14:10	0.25	11332	11357	25	35	100.0	0	0	524	3375	30R	89.77	156.67	2.13	
3	26-Sep	Drilling	14:10	14:20	0.17	11357	11416	59	20	354.0	90	9700	524	3775		89.32	157.00	0.99	
3	26-Sep	Drilling	14:25	14:45	0.33	11416	11511	95	20	285.0	90	11000	524	3775		88.51	157.32	0.88	
3	26-Sep	Drilling	14:50	15:05	0.25	11511	11605	94	20	376.0	90	11000	524	3775		89.22	156.86	2.02	
3	26-Sep	Drilling	15:10	15:20	0.17	11605	11616	11	20	66.0	90	11000	524	3775		89.42	156.76	2.02	
3	26-Sep	Sliding	15:20	15:50	0.50	11616	11641	25	35	50.0	0	0	524	3375	30L	89.86	156.52	2.02	
3	26-Sep	Drilling	15:50	16:00	0.17	11641	11700	59	20	354.0	90	11000	524	3775		89.66	156.50	0.42	
3	26-Sep	Drilling	16:20	16:35	0.25	11700	11795	95	20	380.0	90	11000	524	3775		88.83	156.86	1.33	
3	26-Sep	Drilling	16:40	17:00	0.33	11795	11889	94	20	282.0	90	11000	524	3775		87.92	156.86	0.94	
3	26-Sep	Drilling	17:05	17:20	0.25	11889	11984	95	20	380.0	90	11000	524	3775		89.70	156.52	3.70	
3	26-Sep	Drilling	17:25	17:35	0.17	11984	11995	11	20	66.0	90	12000	524	4300		90.11	156.49	3.70	
3	26-Sep	Sliding	17:35	18:20	0.75	11995	12025	30	30	40.0	0	0	524	3950	30L	91.12	156.39	0.85	
3	26-Sep	Drilling	18:20	18:35	0.25	12025	12079	54	20	216.0	90	12000	524	4300		91.52	156.16	0.85	
3	26-Sep	Drilling	18:40	19:00	0.33	12079	12174	95	20	285.0	90	12000	524	4300		91.24	156.56	1.39	
3	26-Sep	Drilling	19:05	19:25	0.33	12174	12248	74	20	222.0	90	12000	524	4300		91.10	156.70	0.00	

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Total Drilled:	6230	Avg. Total ROP:	253.42	DEPTH% - TIME %
Total Rotary Drilled:	5806	Avg. Rotary ROP:	302.92	Percent Rotary: 93.19 - 77.97
Total Drilled Sliding:	424	Avg. Slide ROP:	78.28	Percent Slide: 6.81 - 22.03



JOB NO.:	210914D195966	Report Time:	2400	1 of 8
Company:	CHESAPEAKE OPERATING INC.	API JOB #	47-009-00146	
LOCATION:	Brooke County, WV	WORK ORDER#	195966	
RIG NAME:	Nomac 74	FIELD:	Marcellus South	
STATE:	West Virginia	Township:		
COUNTY:	Brooke County	SECT\ RANGE:		
WELL NAME:	Violet Coss BRK 8H			

From Sunday, September 21, 2014 at 0000 to Sunday, September 21, 2014 at 2400

DRILLING SUMMARY				Drilling Parameters									
Start Depth	1640.00	Rotary Hours	1.50	WOB	0	Pick UP	0	Slack Off	0	SPM			
End Depth	1640.00	Circulating Hours	0.00	RAB	0	SPP	0	FlowRate	0 - 2340		0		
Total Drilled:	0.00	Avg. Total ROP:	.00	Mud Data									
Total Rotary Drilled:	0.00	Avg. Rotary ROP:	.00	Type		PV	0	SOLID		0			
Total Drilled Sliding:	0.00	Avg. Slide ROP:	NA	Weight	0	GAS	0	YP	0	BHT°		0	
Slide Hours:	0.00	Percent Rotary:	NA	Viscosity	0	SAND	0	PH	0	Flow T°		0	
Below Rotary Hrs.	19.00	Percent Slide:	NA	Chlorides	0	WL	0			Oil %		0	

PERSONNEL				CASING				BHA					
Lead Directional :	Ben Robbins			Size	Lb/ft	Set Depth	N/A						
Second Directional :	Steve Miller			Signature:				RECEIVED Office of Oil and Gas JUN 21 2016 WV Department of Environmental Protection					
MWD Operator1													
MWD Operator2													
Directional Company:	Scientific Drilling												
Geologist:													
Company Man:	Michael Rawson / Michael Vanston			Incl. In:	0	Azm. In:	0	Incl. Out:	0	Azm. Out:	0		

GENERAL COMMENT

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
21-Sep-14	05:00	14:00	9.00	0	0	Other	Hands traveling to rig location.
21-Sep-14	14:00	19:00	5.00	0	0	Other	Wait on cement. M/U BHA and P/U drill pipe.
21-Sep-14	19:00	21:00	2.00	0	1640	TIH	TIH to 1564'. Unload hole
21-Sep-14	21:00	22:30	1.50	1640	1640	Drilling	Drill cement and shoe track
21-Sep-14	22:30	24:00	1.50	1640	1640	Other	Load hole with H2O, perform FIT, unload hole.



JOB NO.:	210914D195966	Report Time:	2400	2 of 8
Company:	CHESAPEAKE OPERATING INC.	API JOB #	47-009-00146	
LOCATION:	Brooke County, WV	WORK ORDER#	195966	
RIG NAME:	Nomac 74	FIELD:	Marcellus South	
STATE:	West Virginia	Township:		
COUNTY:	Brooke County	SECT\ RANGE:		
WELL NAME:	Violet Coss BRK 8H			

From Monday, September 22, 2014 at 0000 to Monday, September 22, 2014 at 2400

DRILLING SUMMARY				Drilling Parameters									
Start Depth	1640.00	Rotary Hours	16.00	WOB	0	Pick UP	0	Slack Off	0	SPM			
End Depth	4627.00	Circulating Hours	1.00	RAB	0	SPP	0	FlowRate	0 - 3510	130			
Total Drilled:	2987.00	Avg. Total ROP:	186.69	Mud Data									
Total Rotary Drilled:	2987.00	Avg. Rotary ROP:	186.69	Type		PV	0	SOLID	0				
Total Drilled Sliding:	0.00	Avg. Slide ROP:	NA	Weight	0	GAS	0	YP	0	BHT°	0		
Slide Hours:	0.00	Percent Rotary:	100.00	Viscosity	0	SAND	0	PH	0	Flow T°	0		
Below Rotary Hrs.	24.00	Percent Slide:	.00	Chlorides	0	WL	0			Oil %	0		

PERSONNEL				CASING			BHA
Lead Directional :	Ben Robbins			Size	Lb/ft	Set Depth	BHA # 1:8 1/2" PDC Bit (Smith SDi 516), Motor, 4:5 - 7.0, 1.83 FBH, Cross Over, NM Drill Collar, NM Drill Collar, Gap Sub, NM Drill Collar, 16 stands 5" Drill Pipe, Back-off Sub, Agitator, Shock Sub, ,
Second Directional :	Steve Miller						
MWD Operator1							
MWD Operator2							
Directional Company:	Scientific Drilling						
Geologist:							
Company Man:	Michael Rawson / Michael Vanston			Signature:			
Incl. In:	0	Azm. In:	0	Incl. Out:	0	Azm. Out:	0

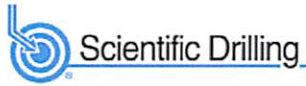
GENERAL COMMENT

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
22-Sep-14	00:00	16:00	16.00	1640	4627	Drilling	Drilling - (WOB:4;GPM :3510;RPM:45)
22-Sep-14	16:00	18:00	2.00	4627	4627	Other	Run VES wireline gyro surveys
22-Sep-14	18:00	19:30	1.50	4627	4627	POOH	POOH
22-Sep-14	19:30	20:45	1.25	4627	4627	POOH	L/D 15 jts HWDP
22-Sep-14	20:45	22:25	1.67	4627	4627	Change BHA	P/U BHA #1 - Curve and lateral
22-Sep-14	22:25	22:35	0.17	4627	4627	Other	Install rotating head
22-Sep-14	22:35	23:00	0.42	4627	4627	TIH	TIH 16 stands
22-Sep-14	23:00	24:00	1.00	4627	4627	Circulating	Load hole with OBM

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JOB NO.:	210914D195966	Report Time:	2400	3 of 8
Company:	CHESAPEAKE OPERATING INC.	API JOB #	47-009-00146	
LOCATION:	Brooke County, WV	WORK ORDER#	195966	
RIG NAME:	Nomac 74	FIELD:	Marcellus South	
STATE:	West Virginia	Township:		
COUNTY:	Brooke County	SECTRANGE:		
WELL NAME:	Violet Coss BRK 8H			

From Tuesday, September 23, 2014 at 0000 to Tuesday, September 23, 2014 at 2400

DRILLING SUMMARY				Drilling Parameters							
Start Depth	4627.00	Rotary Hours	3.42	WOB	6	Pick UP	150	Slack Off	143	SPM	
End Depth	5514.00	Circulating Hours	2.42	RAB	146	SPP	2100	FlowRate	0 - 523	154	
Total Drilled:	887.00	Avg. Total ROP:	55.73	Mud Data							
Total Rotary Drilled:	409.00	Avg. Rotary ROP:	119.71	Type		PV	0	SOLID	0		
Total Drilled Sliding:	478.00	Avg. Slide ROP:	38.24	Weight	0	GAS	0	YP	0	BHT°	0
Slide Hours:	12.50	Percent Rotary:	46.11	Viscosity	0	SAND	0	PH	0	Flow T°	0
Below Rotary Hrs.	24.00	Percent Slide:	53.89	Chlorides	0	WL	0	Oil %	0		

PERSONNEL				CASING			BHA
Lead Directional :	Ben Robbins			Size	Lb/ft	Set Depth	BHA # 1:8 1/2" PDC Bit (Smith SDi 516), Motor, 4:5 - 7.0, 1.83 FBH, Cross Over, NM Drill Collar, NM Drill Collar, Gap Sub, NM Drill Collar, 16 stands 5" Drill Pipe, Back-off Sub, Agitator, Shock Sub, ,
Second Directional :	Steve Miller			<p style="text-align: center;">RECEIVED Office of Oil and Gas</p> <p style="text-align: center;">JUN 21 2016</p>			
MWD Operator1							
MWD Operator2							
Directional Company:	Scientific Drilling						
Geologist:							
Company Man:	Michael Rawson / Michael Vanston			Signature:			
Incl. In:	0	Azm. In:	0	Incl. Out:	28	Azm. Out:	163.1

GENERAL COMMENT WV Department of Environmental Protection

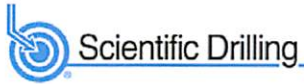
Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
23-Sep-14	00:00	00:10	0.17	4627	4627	Circulating	Circulating
23-Sep-14	00:10	00:20	0.17	4627	4627	Other	P/U agitator assembly
23-Sep-14	00:20	01:30	1.17	4627	4627	TIH	TIH to 4317'
23-Sep-14	01:30	02:00	0.50	4627	4627	Circulating	Wash 4317' - 4600'
23-Sep-14	02:00	03:10	1.17	4627	4627	Other	Swivel pack leaking
23-Sep-14	03:10	03:20	0.17	4627	4627	Circulating	Wash 4600' - 4627'
23-Sep-14	03:20	03:25	0.08	4627	4632	Drilling	Drilling - (WOB:10;GPM :523;RPM:50)
23-Sep-14	03:25	05:25	2.00	4632	4632	Rig repair	Change out swivel packing.
23-Sep-14	05:25	05:55	0.50	4632	4695	Drilling	Drilling - (WOB:10;GPM :523;RPM:50)
23-Sep-14	05:55	06:05	0.17	4695	4695	Survey & Conn.	Survey & Conn.@4637' Inc 0.3° Azm 262°
23-Sep-14	06:05	06:50	0.75	4695	4713	Sliding	Drilling - (WOB:10;GPM :523;RPM:50)
23-Sep-14	06:50	07:20	0.50	4713	4790	Drilling	Drilling - (WOB:10;GPM :523;RPM:50)
23-Sep-14	07:20	07:25	0.08	4790	4790	Survey & Conn.	Survey & Conn.@4732' Inc 1.2° Azm 53.6°
23-Sep-14	07:25	08:00	0.58	4790	4884	Drilling	Drilling - (WOB:10;GPM :523;RPM:50)
23-Sep-14	08:00	08:05	0.08	4884	4884	Survey & Conn.	Survey & Conn.@4826' Inc 1.2° Azm 55.7°
23-Sep-14	08:05	08:50	0.75	4884	4979	Drilling	Drilling - (WOB:10;GPM :523;RPM:50)
23-Sep-14	08:50	08:55	0.08	4979	4979	Survey & Conn.	Survey & Conn.@4921' Inc 1.1° Azm 40°

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
23-Sep-14	08:55	09:35	0.67	4979	5023	Drilling	Drilling - (WOB:10;GPM :523;RPM:50)
23-Sep-14	09:35	11:40	2.08	5023	5073	Sliding	Sliding - (WOB:10;GPM :523;TFO:155M))
23-Sep-14	11:40	11:45	0.08	5073	5073	Survey & Conn.	Survey & Conn.@5015' Inc 1° Azm 56.3°
23-Sep-14	11:45	13:00	1.25	5073	5105	Sliding	Sliding - (WOB:10;GPM :523;TFO:155M))
23-Sep-14	13:00	13:05	0.08	5105	5105	MWD Survey	MWD Survey@5047' Inc 1.8° Azm 126.5°
23-Sep-14	13:05	13:25	0.33	5105	5136	Drilling	Drilling - (WOB:10;GPM :523;RPM:50)
23-Sep-14	13:25	13:30	0.08	5136	5136	MWD Survey	MWD Survey@5078' Inc 3.8° Azm 148.1°
23-Sep-14	13:30	14:45	1.25	5136	5168	Sliding	Sliding - (WOB:10;GPM :523;TFO:160M))
23-Sep-14	14:45	14:55	0.17	5168	5168	Survey & Conn.	Survey & Conn.@5110' Inc 5° Azm 148.2°
23-Sep-14	14:55	15:35	0.67	5168	5199	Sliding	Sliding - (WOB:4;GPM :523;TFO:180M))
23-Sep-14	15:35	15:40	0.08	5199	5199	MWD Survey	MWD Survey@5141' Inc 6.6° Azm 151.6°
23-Sep-14	15:40	16:15	0.58	5199	5231	Sliding	Sliding - (WOB:6;GPM :523;TFO:1R))
23-Sep-14	16:15	16:20	0.08	5231	5231	MWD Survey	MWD Survey@5173' Inc 8.5° Azm 154.8°
23-Sep-14	16:20	16:55	0.58	5231	5262	Sliding	Sliding - (WOB:6;GPM :523;TFO:1R))
23-Sep-14	16:55	17:30	0.58	5262	5262	Rig Service-Inhole	Rig Service-Inhole
23-Sep-14	17:30	17:40	0.17	5262	5262	Survey & Conn.	Survey & Conn.@5204' Inc 10.5° Azm 158.2°
23-Sep-14	17:40	18:25	0.75	5262	5294	Sliding	Sliding - (WOB:6;GPM :448;TFO:10L))
23-Sep-14	18:25	18:30	0.08	5294	5294	MWD Survey	MWD Survey@5236' Inc 12.3° Azm 161.1°
23-Sep-14	18:30	19:20	0.83	5294	5325	Sliding	Sliding - (WOB:6;GPM :448;TFO:10L))
23-Sep-14	19:20	19:30	0.17	5325	5325	MWD Survey	MWD Survey@5267' Inc 14.5° Azm 162.5°
23-Sep-14	19:30	20:10	0.67	5325	5357	Sliding	Sliding - (WOB:6;GPM :448;TFO:10L))
23-Sep-14	20:10	20:20	0.17	5357	5357	Survey & Conn.	Survey & Conn.@5299' Inc 17.1° Azm 160.4°
23-Sep-14	20:20	21:00	0.67	5357	5388	Sliding	Sliding - (WOB:6;GPM :448;TFO:0G))
23-Sep-14	21:00	21:10	0.17	5388	5388	MWD Survey	MWD Survey@5330' Inc 19.6° Azm 162.5°
23-Sep-14	21:10	21:45	0.58	5388	5420	Sliding	Sliding - (WOB:6;GPM :448;TFO:0G))
23-Sep-14	21:45	21:55	0.17	5420	5420	MWD Survey	MWD Survey@5362' Inc 22.2° Azm 162.6°
23-Sep-14	21:55	22:30	0.58	5420	5451	Sliding	Sliding - (WOB:6;GPM :448;TFO:15L))
23-Sep-14	22:30	22:40	0.17	5451	5451	Survey & Conn.	Survey & Conn.@5393' Inc 24.8° Azm 163.2°
23-Sep-14	22:40	23:15	0.58	5451	5483	Sliding	Sliding - (WOB:6;GPM :448;TFO:15L))
23-Sep-14	23:15	23:20	0.08	5483	5483	MWD Survey	MWD Survey@5425' Inc 28° Azm 163.1°
23-Sep-14	23:20	24:00	0.67	5483	5514	Sliding	Sliding - (WOB:6;GPM :448;TFO:20L))

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JOB NO.:	210914D195966	Report Time:	2400	4 of 8
Company:	CHESAPEAKE OPERATING INC.	API JOB #	47-009-00146	
LOCATION:	Brooke County, WV	WORK ORDER#	195966	
RIG NAME:	Nomac 74	FIELD:	Marcellus South	
STATE:	West Virginia	Township:		
COUNTY:	Brooke County	SECTRANGE:		
WELL NAME:	Violet Coss BRK 8H			

From Wednesday, September 24, 2014 at 0000 to Wednesday, September 24, 2014 at 2400

DRILLING SUMMARY				Drilling Parameters							
Start Depth	5514.00	Rotary Hours	0.83	WOB	13	Pick UP	170	Slack Off	151	SPM	
End Depth	5845.00	Circulating Hours	6.58	RAB	160	SPP	2440	FlowRate	0-448	154	
Total Drilled:	331.00	Avg. Total ROP:	38.19	Mud Data							
Total Rotary Drilled:	40.00	Avg. Rotary ROP:	48.00	Type	OBM	PV	14	SOLID	18.6		
Total Drilled Sliding:	291.00	Avg. Slide ROP:	37.15	Weight	12.1	GAS	0	YP	14	BHT°	108
Slide Hours:	7.83	Percent Rotary:	12.08	Viscosity	48	SAND	0	PH	0	Flow T°	94
Below Rotary Hrs.	24.00	Percent Slide:	87.92	Chlorides	56000	WL	0	Oil %	70		

PERSONNEL				CASING			BHA
Lead Directional :	Ben Robbins			Size	Lb/ft	Set Depth	BHA # 2:8 1/2" PDC Bit (Smith SDiz 516), Motor, 5.0 - 7.0 , 2.38 ABH , Cross Over, NM Drill Collar, NM Drill Collar, Gap Sub, NM Drill Collar, 16 stands 5" Drill Pipe, Back-off Sub, Agitator, Shock Sub, ,
Second Directional :	Steve Miller			Signature:			
MWD Operator1							
MWD Operator2							
Directional Company:	Scientific Drilling						
Geologist:							
Company Man:	Michael Rawson / Michael Vanston			RECEIVED Office of Oil and Gas JUN 21 2016			
Incl. In:	28	Azm. In:	163.1	Incl. Out:	68.7	Azm. Out:	156.9

GENERAL COMMENT

WV Department of Environmental Protection

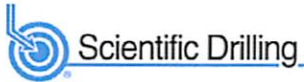
Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
24-Sep-14	00:00	00:05	0.08	5514	5515	Sliding	Sliding - (WOB:6;GPM :448;TFO:15L))
24-Sep-14	00:05	00:10	0.08	5515	5515	MWD Survey	MWD Survey@5457' Inc 30.9° Azm 162.9°
24-Sep-14	00:10	00:55	0.75	5515	5546	Sliding	Sliding - (WOB:6;GPM :448;TFO:20L))
24-Sep-14	00:55	01:05	0.17	5546	5546	Survey & Conn.	Survey & Conn.@5488' Inc 33.7° Azm 160.9°
24-Sep-14	01:05	02:00	0.92	5546	5578	Sliding	Sliding - (WOB:9;GPM :448;TFO:15L))
24-Sep-14	02:00	02:05	0.08	5578	5578	MWD Survey	MWD Survey@5520' Inc 36.3° Azm 161.2°
24-Sep-14	02:05	02:30	0.42	5578	5578	Circulating	Circulating - Wait on orders
24-Sep-14	02:30	03:45	1.25	5578	5609	Sliding	Sliding - (WOB:12;GPM :448;TFO:15L))
24-Sep-14	03:45	03:50	0.08	5609	5609	MWD Survey	MWD Survey@5551' Inc 39° Azm 160.8°
24-Sep-14	03:50	04:30	0.67	5609	5609	Circulating	Circulate and pump slug
24-Sep-14	04:30	07:10	2.67	5609	5609	POOH	POOH due to low motor yield.
24-Sep-14	07:10	07:40	0.50	5609	5609	POOH	POOH, L/DN Bit and Motor
24-Sep-14	07:40	09:30	1.83	5609	5609	Change BHA	P/up New ABH Motor and adjust same to 2.38
24-Sep-14	09:30	12:40	3.17	5609	5609	TIH	TIH to 4970'.
24-Sep-14	12:40	15:00	2.33	5609	5609	Circulating	Wash and ream f 4970 to 5368
24-Sep-14	15:00	15:20	0.33	5609	5609	Rig Service-Inhole	Rig Service-Inhole
24-Sep-14	15:20	16:45	1.42	5609	5609	Circulating	Wash and ream 5368 to 5609

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
24-Sep-14	16:45	17:55	1.17	5609	5639	Sliding	Sliding - (WOB:20;GPM :448;TFO:15L))
24-Sep-14	17:55	18:05	0.17	5639	5639	Survey & Conn.	Survey & Conn.@5582' Inc 42.1° Azm 160.1°
24-Sep-14	18:05	18:55	0.83	5639	5671	Sliding	Sliding - (WOB:20;GPM :448;TFO:10L))
24-Sep-14	18:55	19:00	0.08	5671	5671	MWD Survey	MWD Survey@5614' Inc 45.8° Azm 159.1°
24-Sep-14	19:00	19:35	0.58	5671	5702	Sliding	Sliding - (WOB:20;GPM :448;TFO:10L))
24-Sep-14	19:35	19:45	0.17	5702	5702	MWD Survey	MWD Survey@5645' Inc 50.6° Azm 157.5°
24-Sep-14	19:45	20:15	0.50	5702	5734	Sliding	Sliding - (WOB:20;GPM :448;TFO:5L))
24-Sep-14	20:15	20:20	0.08	5734	5734	Survey & Conn.	Survey & Conn.@5677' Inc 55.5° Azm 156.6°
24-Sep-14	20:20	20:40	0.33	5734	5756	Sliding	Sliding - (WOB:20;GPM :448;TFO:5L))
24-Sep-14	20:40	20:50	0.17	5756	5765	Drilling	Drilling - (WOB:12;GPM :448;RPM:30)
24-Sep-14	20:50	20:55	0.08	5765	5765	MWD Survey	MWD Survey@5708' Inc 60.9° Azm 156.2°
24-Sep-14	20:55	21:05	0.17	5765	5776	Sliding	Sliding - (WOB:15;GPM :448;TFO:5L))
24-Sep-14	21:05	21:30	0.42	5776	5797	Drilling	Drilling - (WOB:6;GPM :448;RPM:30)
24-Sep-14	21:30	21:35	0.08	5797	5797	MWD Survey	MWD Survey@5740' Inc 65.8° Azm 156.5°
24-Sep-14	21:35	21:45	0.17	5797	5807	Sliding	Sliding - (WOB:15;GPM :448;TFO:15L))
24-Sep-14	21:45	22:30	0.75	5807	5807	Circulating	Circulating - Lost 80 psi. Change washed 2" valve.
24-Sep-14	22:30	22:45	0.25	5807	5819	Sliding	Sliding - (WOB:20;GPM :448;TFO:15L))
24-Sep-14	22:45	23:00	0.25	5819	5829	Drilling	Drilling - (WOB:6;GPM :448;RPM:30)
24-Sep-14	23:00	23:10	0.17	5829	5829	Survey & Conn.	Survey & Conn.@5772' Inc 68.7° Azm 156.9°
24-Sep-14	23:10	24:00	0.83	5829	5845	Sliding	Sliding - (WOB:13;GPM :448;TFO:15L))

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JUN 21 2016

WV Department of
Environmental Protection



JOB NO.:	210914D195966	Report Time:	2400	5 of 8
Company:	CHESAPEAKE OPERATING INC.	API JOB #	47-009-00146	
LOCATION:	Brooke County, WV	WORK ORDER#	195966	
RIG NAME:	Nomac 74	FIELD:	Marcellus South	
STATE:	West Virginia	Township:		
COUNTY:	Brooke County	SECT/RANGE:		
WELL NAME:	Violet Coss BRK 8H			

From Thursday, September 25, 2014 at 0000 to Thursday, September 25, 2014 at 2400

DRILLING SUMMARY				Drilling Parameters							
Start Depth	5845.00	Rotary Hours	10.08	WOB	20	Pick UP	190	Slack Off	90	SPM	
End Depth	8642.00	Circulating Hours	1.58	RAB	142	SPP	3650	FlowRate	0 - 524	180	
Total Drilled:	2797.00	Avg. Total ROP:	233.08	Mud Data							
Total Rotary Drilled:	2658.00	Avg. Rotary ROP:	263.60	Type	OBM	PV	14	SOLID	18.6		
Total Drilled Sliding:	139.00	Avg. Slide ROP:	72.52	Weight	12.1	GAS	0	YP	14	BHT°	108
Slide Hours:	1.92	Percent Rotary:	95.03	Viscosity	48	SAND	0	PH	0	Flow T°	94
Below Rotary Hrs.	24.00	Percent Slide:	4.97	Chlorides	56000	WL	0			Oil %	70

PERSONNEL				CASING			BHA				
Lead Directional :	Ben Robbins			Size	Lb/ft	Set Depth	BHA # 3:8 1/2 PDC Smith SDiz 516, Motor, 4:5 - 7.0, 1.83 FBH, Cross Over, NM Drill Collar, NM Drill Collar, Gap Sub, NM Drill Collar, 16 stands 5" Drill Pipe, Back-off Sub, Agitator, Shock Sub, ,				
Second Directional :	Steve Miller			Signature: RECEIVED Office of Oil and Gas JUN 21 2016							
MWD Operator1											
MWD Operator2											
Directional Company:	Scientific Drilling										
Geologist:											
Company Man:	Michael Rawson / Michael Vanston			Incl. In:	68.7	Azm. In:	156.9	Incl. Out:	89.9	Azm. Out:	160.2

GENERAL COMMENT

WV Department of Environmental Protection

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
25-Sep-14	00:00	00:20	0.33	5845	5860	Drilling	Drilling - (WOB:10;GPM :448;RPM:30)
25-Sep-14	00:20	00:25	0.08	5860	5860	MWD Survey	MWD Survey@5803' Inc 71.2° Azm 156.7°
25-Sep-14	00:25	00:40	0.25	5860	5870	Sliding	Sliding - (WOB:13;GPM :448;TFO:15L))
25-Sep-14	00:40	01:00	0.33	5870	5892	Drilling	Drilling - (WOB:10;GPM :448;RPM:30)
25-Sep-14	01:00	01:10	0.17	5892	5892	MWD Survey	MWD Survey@5835' Inc 74.9° Azm 154.9°
25-Sep-14	01:10	01:25	0.25	5892	5902	Sliding	Sliding - (WOB:13;GPM :448;TFO:20L))
25-Sep-14	01:25	01:45	0.33	5902	5924	Drilling	Drilling - (WOB:10;GPM :448;RPM:30)
25-Sep-14	01:45	01:55	0.17	5924	5924	Survey & Conn.	Survey & Conn.@5867' Inc 77.3° Azm 154.2°
25-Sep-14	01:55	02:20	0.42	5924	5949	Sliding	Sliding - (WOB:13;GPM :448;TFO:0G))
25-Sep-14	02:20	02:30	0.17	5949	5955	Drilling	Drilling - (WOB:10;GPM :448;RPM:30)
25-Sep-14	02:30	02:40	0.17	5955	5955	MWD Survey	MWD Survey@5898' Inc 78.4° Azm 154.4°
25-Sep-14	02:40	02:50	0.17	5955	5966	Sliding	Sliding - (WOB:10;GPM :448;TFO:0G))
25-Sep-14	02:50	03:10	0.33	5966	5987	Drilling	Drilling - (WOB:10;GPM :448;RPM:30)
25-Sep-14	03:10	03:20	0.17	5987	5987	MWD Survey	MWD Survey@5930' Inc 80.9° Azm 154.1°
25-Sep-14	03:20	03:35	0.25	5987	5997	Sliding	Sliding - (WOB:10;GPM :448;TFO:5L))
25-Sep-14	03:35	04:00	0.42	5997	6018	Drilling	Drilling - (WOB:10;GPM :448;RPM:30)
25-Sep-14	04:00	04:05	0.08	6018	6018	MWD Survey	MWD Survey@5961' Inc 84.5° Azm 153.3°

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
25-Sep-14	04:05	05:00	0.92	6018	6018	Circulating	Circulating
25-Sep-14	05:00	08:20	3.33	6018	6018	POOH	POOH
25-Sep-14	08:20	09:30	1.17	6018	6018	Change BHA	Change BHA
25-Sep-14	09:30	13:00	3.50	6018	6018	TIH	TIH to 6018
25-Sep-14	13:00	13:30	0.50	6018	6113	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	13:30	13:35	0.08	6113	6113	Survey & Conn.	Survey & Conn.@6056' Inc 86.8° Azm 153.6°
25-Sep-14	13:35	13:45	0.17	6113	6138	Sliding	Sliding - (WOB:10;GPM :524;TFO:10L))
25-Sep-14	13:45	13:55	0.17	6138	6208	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	13:55	14:00	0.08	6208	6208	Survey & Conn.	Survey & Conn.@6151' Inc 89.6° Azm 153.1°
25-Sep-14	14:00	14:10	0.17	6208	6303	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	14:10	14:15	0.08	6303	6303	Survey & Conn.	Survey & Conn.@6246' Inc 89.7° Azm 153.4°
25-Sep-14	14:15	14:30	0.25	6303	6398	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	14:30	14:35	0.08	6398	6398	Survey & Conn.	Survey & Conn.@6341' Inc 89.9° Azm 154.2°
25-Sep-14	14:35	14:50	0.25	6398	6492	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	14:50	14:55	0.08	6492	6492	Survey & Conn.	Survey & Conn.@6435' Inc 90° Azm 154.1°
25-Sep-14	14:55	15:05	0.17	6492	6587	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	15:05	15:10	0.08	6587	6587	Survey & Conn.	Survey & Conn.@6530' Inc 89.9° Azm 156.7°
25-Sep-14	15:10	15:25	0.25	6587	6682	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	15:25	15:30	0.08	6682	6682	Survey & Conn.	Survey & Conn.@6625' Inc 89.8° Azm 156.5°
25-Sep-14	15:30	15:45	0.25	6682	6776	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	15:45	15:50	0.08	6776	6776	Survey & Conn.	Survey & Conn.@6719' Inc 89.3° Azm 156.5°
25-Sep-14	15:50	16:05	0.25	6776	6871	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	16:05	16:10	0.08	6871	6871	Survey & Conn.	Survey & Conn.@6814' Inc 89.2° Azm 158°
25-Sep-14	16:10	16:15	0.08	6871	6889	Sliding	Sliding - (WOB:13;GPM :524;TFO:80L))
25-Sep-14	16:15	16:30	0.25	6889	6965	Drilling	Drilling - (WOB:25;GPM :524;RPM:90)
25-Sep-14	16:30	16:35	0.08	6965	6965	Survey & Conn.	Survey & Conn.@6908' Inc 89.1° Azm 153.1°
25-Sep-14	16:35	17:00	0.42	6965	7060	Drilling	Drilling - (WOB:25;GPM :524;RPM:90)
25-Sep-14	17:00	17:05	0.08	7060	7060	Survey & Conn.	Survey & Conn.@7003' Inc 89.2° Azm 154.7°
25-Sep-14	17:05	17:25	0.33	7060	7155	Drilling	Drilling - (WOB:15;GPM :524;RPM:90)
25-Sep-14	17:25	17:30	0.08	7155	7155	Survey & Conn.	Survey & Conn.@7098' Inc 88.7° Azm 153.4°
25-Sep-14	17:30	17:40	0.17	7155	7170	Sliding	Sliding - (WOB:10;GPM :524;TFO:0G))
25-Sep-14	17:40	18:00	0.33	7170	7250	Drilling	Drilling - (WOB:18;GPM :524;RPM:90)
25-Sep-14	18:00	18:05	0.08	7250	7250	Survey & Conn.	Survey & Conn.@7193' Inc 90.5° Azm 152.9°
25-Sep-14	18:05	18:25	0.33	7250	7344	Drilling	Drilling - (WOB:15;GPM :524;RPM:90)
25-Sep-14	18:25	18:30	0.08	7344	7344	Survey & Conn.	Survey & Conn.@7287' Inc 90.8° Azm 151.6°
25-Sep-14	18:30	18:50	0.33	7344	7439	Drilling	Drilling - (WOB:22;GPM :524;RPM:90)
25-Sep-14	18:50	18:55	0.08	7439	7439	Survey & Conn.	Survey & Conn.@7382' Inc 91.3° Azm 152.9°
25-Sep-14	18:55	19:15	0.33	7439	7534	Drilling	Drilling - (WOB:22;GPM :524;RPM:90)
25-Sep-14	19:15	19:20	0.08	7534	7534	Survey & Conn.	Survey & Conn.@7477' Inc 91.6° Azm 151.8°
25-Sep-14	19:20	19:30	0.17	7534	7549	Sliding	Sliding - (WOB:12;GPM :524;TFO:135R))
25-Sep-14	19:30	19:45	0.25	7549	7628	Drilling	Drilling - (WOB:22;GPM :524;RPM:90)
25-Sep-14	19:45	19:50	0.08	7628	7628	Survey & Conn.	Survey & Conn.@7571' Inc 89.3° Azm 153.7°
25-Sep-14	19:50	20:10	0.33	7628	7723	Drilling	Drilling - (WOB:22;GPM :524;RPM:90)
25-Sep-14	20:10	20:15	0.08	7723	7723	Survey & Conn.	Survey & Conn.@7666' Inc 89.2° Azm 153.6°
25-Sep-14	20:15	20:35	0.33	7723	7817	Drilling	Drilling - (WOB:22;GPM :524;RPM:90)
25-Sep-14	20:35	20:40	0.08	7817	7817	Survey & Conn.	Survey & Conn.@7760' Inc 89.1° Azm 154.6°

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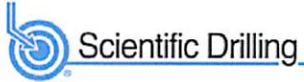
JUN 21 2016

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
25-Sep-14	20:40	21:00	0.33	7817	7911	Drilling	Drilling - (WOB:22;GPM :524;RPM:90)
25-Sep-14	21:00	21:05	0.08	7911	7911	Survey & Conn.	Survey & Conn.@7854' Inc 89.2° Azm 155.5°
25-Sep-14	21:05	21:25	0.33	7911	8006	Drilling	Drilling - (WOB:22;GPM :524;RPM:90)
25-Sep-14	21:25	21:30	0.08	8006	8006	Survey & Conn.	Survey & Conn.@7949' Inc 89.3° Azm 155.9°
25-Sep-14	21:30	21:50	0.33	8006	8101	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	21:50	21:55	0.08	8101	8101	Survey & Conn.	Survey & Conn.@8044' Inc 88.9° Azm 155.2°
25-Sep-14	21:55	22:10	0.25	8101	8195	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	22:10	22:15	0.08	8195	8195	Survey & Conn.	Survey & Conn.@8138' Inc 89.1° Azm 156.1°
25-Sep-14	22:15	22:35	0.33	8195	8291	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	22:35	22:40	0.08	8291	8291	Survey & Conn.	Survey & Conn.@8233' Inc 89.1° Azm 156.2°
25-Sep-14	22:40	23:00	0.33	8291	8385	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	23:00	23:05	0.08	8385	8385	Survey & Conn.	Survey & Conn.@8328' Inc 88.9° Azm 155.6°
25-Sep-14	23:05	23:25	0.33	8385	8480	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	23:25	23:30	0.08	8480	8480	Survey & Conn.	Survey & Conn.@8423' Inc 88.7° Azm 156°
25-Sep-14	23:30	23:45	0.25	8480	8575	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
25-Sep-14	23:45	23:50	0.08	8575	8575	Survey & Conn.	Survey & Conn.@8518' Inc 89.9° Azm 160.2°
25-Sep-14	23:50	24:00	0.17	8575	8642	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)

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JUN 21 2016

WV Department of
Environmental Protection



JOB NO.:	210914D195966	Report Time:	2400	6 of 8
Company:	CHESAPEAKE OPERATING INC.	API JOB #	47-009-00146	
LOCATION:	Brooke County, WV	WORK ORDER#	195966	
RIG NAME:	Nomac 74	FIELD:	Marcellus South	
STATE:	West Virginia	Township:		
COUNTY:	Brooke County	SECT/RANGE:		
WELL NAME:	Violet Coss BRK 8H			

From Friday, September 26, 2014 at 0000 to Friday, September 26, 2014 at 2400

DRILLING SUMMARY				Drilling Parameters							
Start Depth	8642.00	Rotary Hours	11.00	WOB	0	Pick UP	270	Slack Off	60	SPM	
End Depth	12248.00	Circulating Hours	4.83	RAB	143	SPP	3800	FlowRate	524 - 524	180	
Total Drilled:	3606.00	Avg. Total ROP:	227.75	Mud Data							
Total Rotary Drilled:	3255.00	Avg. Rotary ROP:	295.91	Type	OBM	PV	20	SOLID	22.2		
Total Drilled Sliding:	351.00	Avg. Slide ROP:	72.62	Weight	12.6	GAS	0	YP	18	BHT°	160
Slide Hours:	4.83	Percent Rotary:	90.27	Viscosity	56	SAND	0	PH	0	Flow T°	113
Below Rotary Hrs.	24.00	Percent Slide:	9.73	Chlorides	57000	WL	0			Oil %	72

PERSONNEL				CASING			BHA	
Lead Directional :	Ben Robbins			Size	Lb/ft	Set Depth	BHA # 3:8 1/2 PDC Smith SDiz 516, Motor, 4:5 - 7.0, 1.83 FBH, Cross Over, NM Drill Collar, NM Drill Collar, Gap Sub, NM Drill Collar, 16 stands 5" Drill Pipe, Back-off Sub, Agitator, Shock Sub, ,	
Second Directional :	Steve Miller							
MWD Operator1	Pat Laquatra							
MWD Operator2	Brad Laber							
Directional Company:	Scientific Drilling							
Geologist:								
Company Man:	Michael Rawson / Michael Vanston			Signature:			RECEIVED Office of Oil and Gas	
Incl. In:	89.9	Azm. In:	160.2	Incl. Out:	91.1	Azm. Out:	156.7	JUN 21 2016

GENERAL COMMENT

WV Department of Environmental Protection

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
26-Sep-14	00:00	00:05	0.08	8642	8669	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	00:05	00:10	0.08	8669	8669	Survey & Conn.	Survey & Conn.@8612' Inc 89.7° Azm 159.9°
26-Sep-14	00:10	00:30	0.33	8669	8764	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	00:30	00:35	0.08	8764	8764	Survey & Conn.	Survey & Conn.@8707' Inc 89.4° Azm 160°
26-Sep-14	00:35	00:50	0.25	8764	8859	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	00:50	00:55	0.08	8859	8859	Survey & Conn.	Survey & Conn.@8802' Inc 89.4° Azm 159.2°
26-Sep-14	00:55	01:15	0.33	8859	8953	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	01:15	01:20	0.08	8953	8953	Survey & Conn.	Survey & Conn.@8896' Inc 88.9° Azm 160.5°
26-Sep-14	01:20	01:40	0.33	8953	9048	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	01:40	01:50	0.17	9048	9048	Survey & Conn.	Survey & Conn.@8991' Inc 88.1° Azm 158.8°
26-Sep-14	01:50	02:10	0.33	9048	9070	Sliding	Sliding - (WOB:24;GPM :524;TFO:70L))
26-Sep-14	02:10	02:25	0.25	9070	9143	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	02:25	02:30	0.08	9143	9143	Survey & Conn.	Survey & Conn.@9086' Inc 88.9° Azm 155.9°
26-Sep-14	02:30	02:45	0.25	9143	9237	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	02:45	02:50	0.08	9237	9237	Survey & Conn.	Survey & Conn.@9180' Inc 88.9° Azm 155.7°
26-Sep-14	02:50	03:15	0.42	9237	9332	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	03:15	03:20	0.08	9332	9332	Survey & Conn.	Survey & Conn.@9275' Inc 89.4° Azm 157.8°

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
26-Sep-14	03:20	03:35	0.25	9332	9357	Sliding	Sliding - (WOB:35;GPM :524;TFO:70L))
26-Sep-14	03:35	03:55	0.33	9357	9427	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	03:55	04:05	0.17	9427	9427	Survey & Conn.	Survey & Conn.@9370' Inc 90.5° Azm 155.4°
26-Sep-14	04:05	04:25	0.33	9427	9447	Sliding	Sliding - (WOB:35;GPM :524;TFO:70L))
26-Sep-14	04:25	04:40	0.25	9447	9522	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	04:40	04:45	0.08	9522	9522	Survey & Conn.	Survey & Conn.@9464' Inc 90.4° Azm 151°
26-Sep-14	04:45	05:00	0.25	9522	9616	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	05:00	05:05	0.08	9616	9616	Survey & Conn.	Survey & Conn.@9559' Inc 90.6° Azm 150.9°
26-Sep-14	05:05	05:25	0.33	9616	9711	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	05:25	05:30	0.08	9711	9711	Survey & Conn.	Survey & Conn.@9654' Inc 90.7° Azm 150.9°
26-Sep-14	05:30	05:55	0.42	9711	9806	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	05:55	06:00	0.08	9806	9806	Survey & Conn.	Survey & Conn.@9749' Inc 89.1° Azm 147.8°
26-Sep-14	06:00	06:20	0.33	9806	9831	Sliding	Sliding - (WOB:35;GPM :524;TFO:70R))
26-Sep-14	06:20	06:35	0.25	9831	9900	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	06:35	06:40	0.08	9900	9900	Survey & Conn.	Survey & Conn.@9843' Inc 88.3° Azm 149.1°
26-Sep-14	06:40	06:55	0.25	9900	9925	Sliding	Sliding - (WOB:35;GPM :524;TFO:70R))
26-Sep-14	06:55	07:10	0.25	9925	9995	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	07:10	07:15	0.08	9995	9995	Survey & Conn.	Survey & Conn.@9938' Inc 88.2° Azm 151.6°
26-Sep-14	07:15	07:30	0.25	9995	10020	Sliding	Sliding - (WOB:35;GPM :524;TFO:65R))
26-Sep-14	07:30	07:40	0.17	10020	10090	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	07:40	07:45	0.08	10090	10090	Survey & Conn.	Survey & Conn.@10033' Inc 88.4° Azm 154°
26-Sep-14	07:45	08:05	0.33	10090	10124	Sliding	Sliding - (WOB:35;GPM :524;TFO:65R))
26-Sep-14	08:05	08:15	0.17	10124	10184	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	08:15	08:20	0.08	10184	10184	Survey & Conn.	Survey & Conn.@10127' Inc 89.6° Azm 157.9°
26-Sep-14	08:20	08:40	0.33	10184	10279	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	08:40	08:45	0.08	10279	10279	Survey & Conn.	Survey & Conn.@10222' Inc 89.7° Azm 155.6°
26-Sep-14	08:45	09:00	0.25	10279	10374	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	09:00	09:05	0.08	10374	10374	Survey & Conn.	Survey & Conn.@10317' Inc 89.3° Azm 154.5°
26-Sep-14	09:05	09:25	0.33	10374	10399	Sliding	Sliding - (WOB:35;GPM :524;TFO:45R))
26-Sep-14	09:25	09:35	0.17	10399	10469	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	09:35	09:40	0.08	10469	10469	Survey & Conn.	Survey & Conn.@10412' Inc 89.6° Azm 157°
26-Sep-14	09:40	09:55	0.25	10469	10563	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	09:55	10:00	0.08	10563	10563	Survey & Conn.	Survey & Conn.@10506' Inc 88.9° Azm 157.2°
26-Sep-14	10:00	10:15	0.25	10563	10588	Sliding	Sliding - (WOB:35;GPM :524;TFO:1R))
26-Sep-14	10:15	10:30	0.25	10588	10659	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	10:30	10:35	0.08	10659	10659	Survey & Conn.	Survey & Conn.@10601' Inc 90.2° Azm 158.8°
26-Sep-14	10:35	10:50	0.25	10659	10753	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	10:50	10:55	0.08	10753	10753	Survey & Conn.	Survey & Conn.@10696' Inc 89.8° Azm 158.2°
26-Sep-14	10:55	11:05	0.17	10753	10848	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	11:05	11:10	0.08	10848	10848	Survey & Conn.	Survey & Conn.@10791' Inc 89.3° Azm 158.1°
26-Sep-14	11:10	11:30	0.33	10848	10943	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	11:30	11:35	0.08	10943	10943	Survey & Conn.	Survey & Conn.@10886' Inc 88.7° Azm 157.7°
26-Sep-14	11:35	11:55	0.33	10943	10968	Sliding	Sliding - (WOB:35;GPM :524;TFO:1R))
26-Sep-14	11:55	12:10	0.25	10968	11038	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	12:10	12:15	0.08	11038	11038	Survey & Conn.	Survey & Conn.@10981' Inc 90.3° Azm 158.9°
26-Sep-14	12:15	12:30	0.25	11038	11132	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)

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Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
26-Sep-14	12:30	12:35	0.08	11132	11132	Survey & Conn.	Survey & Conn.@11075' Inc 89° Azm 157.4°
26-Sep-14	12:35	12:45	0.17	11132	11141	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	12:45	13:05	0.33	11141	11161	Sliding	Sliding - (WOB:35;GPM :524;TFO:1R))
26-Sep-14	13:05	13:20	0.25	11161	11227	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	13:20	13:25	0.08	11227	11227	Survey & Conn.	Survey & Conn.@11170' Inc 89.9° Azm 156.7°
26-Sep-14	13:25	13:40	0.25	11227	11322	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	13:40	13:45	0.08	11322	11322	Survey & Conn.	Survey & Conn.@11265' Inc 88.6° Azm 155.1°
26-Sep-14	13:45	13:55	0.17	11322	11332	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	13:55	14:10	0.25	11332	11357	Sliding	Sliding - (WOB:35;GPM :524;TFO:30R))
26-Sep-14	14:10	14:20	0.17	11357	11416	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	14:20	14:25	0.08	11416	11416	Survey & Conn.	Survey & Conn.@11359' Inc 89.8° Azm 156.7°
26-Sep-14	14:25	14:45	0.33	11416	11511	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	14:45	14:50	0.08	11511	11511	Survey & Conn.	Survey & Conn.@11454' Inc 89° Azm 157.2°
26-Sep-14	14:50	15:05	0.25	11511	11605	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	15:05	15:10	0.08	11605	11605	Survey & Conn.	Survey & Conn.@11548' Inc 88.2° Azm 157.4°
26-Sep-14	15:10	15:20	0.17	11605	11616	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	15:20	15:50	0.50	11616	11641	Sliding	Sliding - (WOB:35;GPM :524;TFO:30L))
26-Sep-14	15:50	16:00	0.17	11641	11700	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	16:00	16:15	0.25	11700	11700	Rig Service-Inhole	Rig Service-Inhole
26-Sep-14	16:15	16:20	0.08	11700	11700	Survey & Conn.	Survey & Conn.@11643' Inc 89.9° Azm 156.5°
26-Sep-14	16:20	16:35	0.25	11700	11795	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	16:35	16:40	0.08	11795	11795	Survey & Conn.	Survey & Conn.@11738' Inc 89.5° Azm 156.5°
26-Sep-14	16:40	17:00	0.33	11795	11889	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	17:00	17:05	0.08	11889	11889	Survey & Conn.	Survey & Conn.@11832' Inc 88.4° Azm 157.1°
26-Sep-14	17:05	17:20	0.25	11889	11984	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	17:20	17:25	0.08	11984	11984	Survey & Conn.	Survey & Conn.@11927' Inc 87.6° Azm 156.7°
26-Sep-14	17:25	17:35	0.17	11984	11995	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	17:35	18:20	0.75	11995	12025	Sliding	Sliding - (WOB:35;GPM :524;TFO:30L))
26-Sep-14	18:20	18:35	0.25	12025	12079	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	18:35	18:40	0.08	12079	12079	Survey & Conn.	Survey & Conn.@12022' Inc 91.1° Azm 156.4°
26-Sep-14	18:40	19:00	0.33	12079	12174	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	19:00	19:05	0.08	12174	12174	Survey & Conn.	Survey & Conn.@12117' Inc 91.8° Azm 156°
26-Sep-14	19:05	19:25	0.33	12174	12248	Drilling	Drilling - (WOB:20;GPM :524;RPM:90)
26-Sep-14	19:25	19:30	0.08	12248	12248	MWD Survey	MWD Survey@12188' Inc 91.1° Azm 156.7°
26-Sep-14	19:30	24:00	4.50	12248	12248	Circulating	Circulating / Clean up hole

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JOB NO.:	210914D195966	Report Time:	2400	7 of 8
Company:	CHESAPEAKE OPERATING INC.	API JOB #	47-009-00146	
LOCATION:	Brooke County, WV	WORK ORDER#	195966	
RIG NAME:	Nomac 74	FIELD:	Marcellus South	
STATE:	West Virginia	Township:		
COUNTY:	Brooke County	SECT/RANGE:		
WELL NAME:	Violet Coss BRK 8H			

From Saturday, September 27, 2014 at 0000 to Saturday, September 27, 2014 at 2400

DRILLING SUMMARY				Drilling Parameters							
Start Depth	0.00	Rotary Hours	0.00	WOB	0	Pick UP	250	Slack Off	60	SPM	
End Depth	0.00	Circulating Hours	1.67	RAB	143	SPP	0	FlowRate	0 - 524	0	
Total Drilled:	0.00	Avg. Total ROP:	NA	Mud Data							
Total Rotary Drilled:	0.00	Avg. Rotary ROP:	NA	Type	OBM	PV	20	SOLID	22.2		
Total Drilled Sliding:	0.00	Avg. Slide ROP:	NA	Weight	12.6	GAS	0	YP	18	BHT°	160
Slide Hours:	0.00	Percent Rotary:	NA	Viscosity	56	SAND	0	PH	0	Flow T°	113
Below Rotary Hrs.	24.00	Percent Slide:	NA	Chlorides	57000	WL	0	Oil %	72		

PERSONNEL				CASING			BHA
Lead Directional :	Ben Robbins			Size	Lb/ft	Set Depth	BHA # 3:8 1/2 PDC Smith SDiz 516, Motor, 4:5 - 7.0, 1.83 FBH, Cross Over, NM Drill Collar, NM Drill Collar, Gap Sub, NM Drill Collar, 16 stands 5" Drill Pipe, Back-off Sub, Agitator, Shock Sub, ,
Second Directional :	Steve Miller			Signature:			
MWD Operator1	Pat Laquatra						
MWD Operator2	Brad Laber						
Directional Company:	Scientific Drilling						
Geologist:							
Company Man:	Michael Rawson / Michael Vanston						
Incl. In:	91.1	Azm. In:	156.7	Incl. Out:	0	Azm. Out:	0

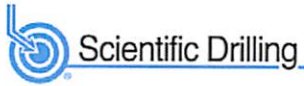
GENERAL COMMENT

Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
27-Sep-14	00:00	01:40	1.67	12248	12248	Circulating	Circulating
27-Sep-14	01:40	14:15	12.58	12248	12248	POOH	POOH L/dn 5" DP
27-Sep-14	14:15	15:30	1.25	12248	12248	POOH	POOH L/dn BHA # 3
27-Sep-14	15:30	16:00	0.50	12248	12248	Change BHA	Pull wear bushing
27-Sep-14	16:00	24:00	0.00	12248	12248	Other	R/up and run 5 1/2" production casing

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JOB NO.:	210914D195966	Report Time:	2400	8 of 8
Company:	CHESAPEAKE OPERATING INC.	API JOB #	47-009-00146	
LOCATION:	Brooke County, WV	WORK ORDER#	195966	
RIG NAME:	Nomac 74	FIELD:	Marcellus South	
STATE:	West Virginia	Township:		
COUNTY:	Brooke County	SECT/RANGE:		
WELL NAME:	Violet Coss BRK 8H			

From Sunday, September 28, 2014 at 0000 to Sunday, September 28, 2014 at 2400

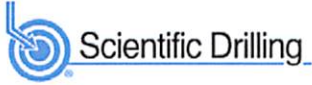
DRILLING SUMMARY				Drilling Parameters							
Start Depth	0.00	Rotary Hours	0.00	WOB	0	Pick UP	250	Slack Off	60	SPM	
End Depth	0.00	Circulating Hours	0.00	RAB	143	SPP	0	FlowRate	0-0	0	
Total Drilled:	0.00	Avg. Total ROP:	NA	Mud Data							
Total Rotary Drilled:	0.00	Avg. Rotary ROP:	NA	Type	OBM	PV	20	SOLID	22.2		
Total Drilled Sliding:	0.00	Avg. Slide ROP:	NA	Weight	12.6	GAS	0	YP	18	BHT°	160
Slide Hours:	0.00	Percent Rotary:	NA	Viscosity	56	SAND	0	PH	0	Flow T°	113
Below Rotary Hrs.	7.00	Percent Slide:	NA	Chlorides	57000	WL	0	Oil %	72		

PERSONNEL		CASING			BHA				
Lead Directional :	Ben Robbins	Size	Lb/ft	Set Depth	N/A				
Second Directional :	Steve Miller	Signature:							
MWD Operator1	Pat Laquatra								
MWD Operator2	Brad Laber								
Directional Company:	Scientific Drilling								
Geologist:									
Company Man:	Michael Rawson / Michael Vanston	Incl. In:	0	Azm. In:	0	Incl. Out:	0	Azm. Out:	0

GENERAL COMMENT

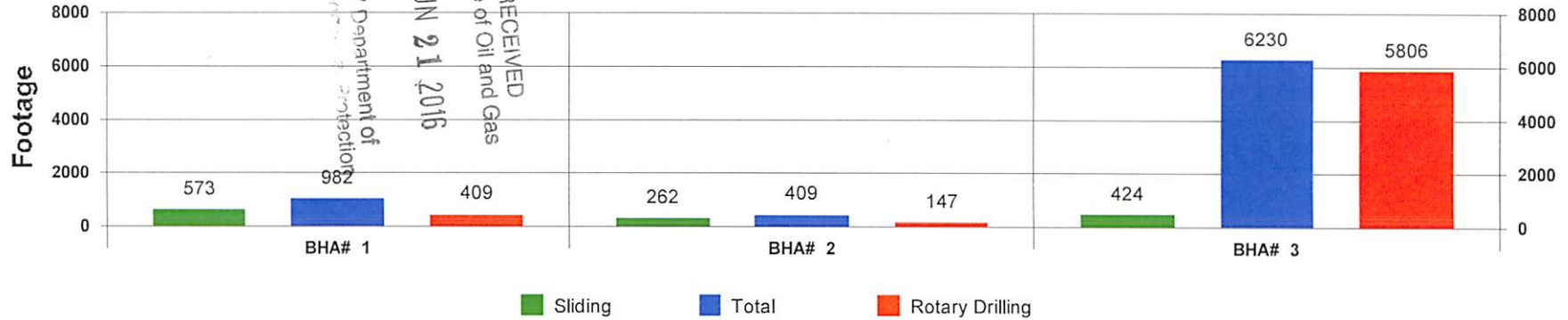
Date	Start Time	End Time	Hours	Start Depth	End Depth	Activity Code	COMMENT
28-Sep-14	00:00	06:00	0.00	12248	12248	Other	continue running 5 1/2" casing
28-Sep-14	06:00	07:00	0.00	12248	12248	Other	Crews traveling home.

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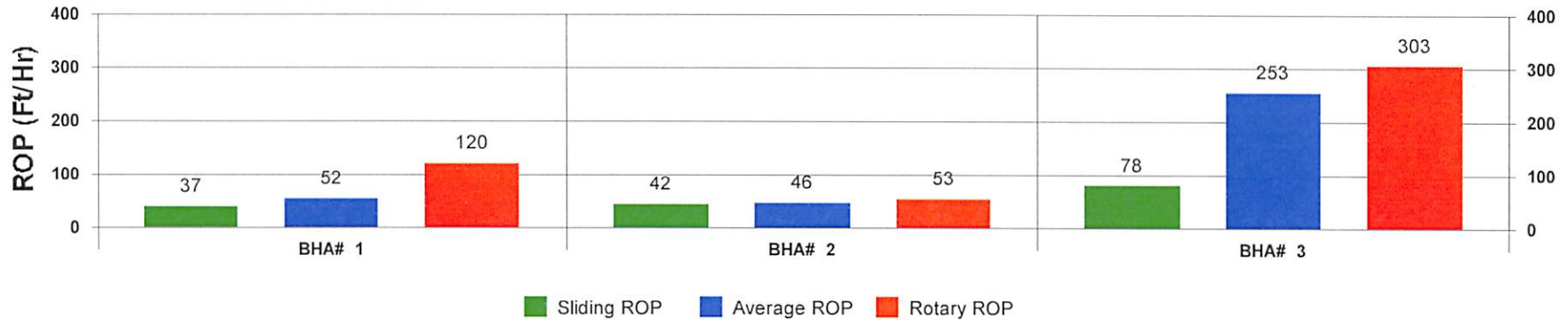


JOB NO.:	210914D195966	FIELD:	Marcellus South
Company:	CHESAPEAKE OPERATING INC.	Township:	
LOCATION:	Brooke County, WV	SECT/RANGE:	
RIG NAME:	Nomac 74	COMMENT	
STATE:	West Virginia		
COUNTY:	Brooke County		
WELL NAME:	Violet Coss BRK 8H		

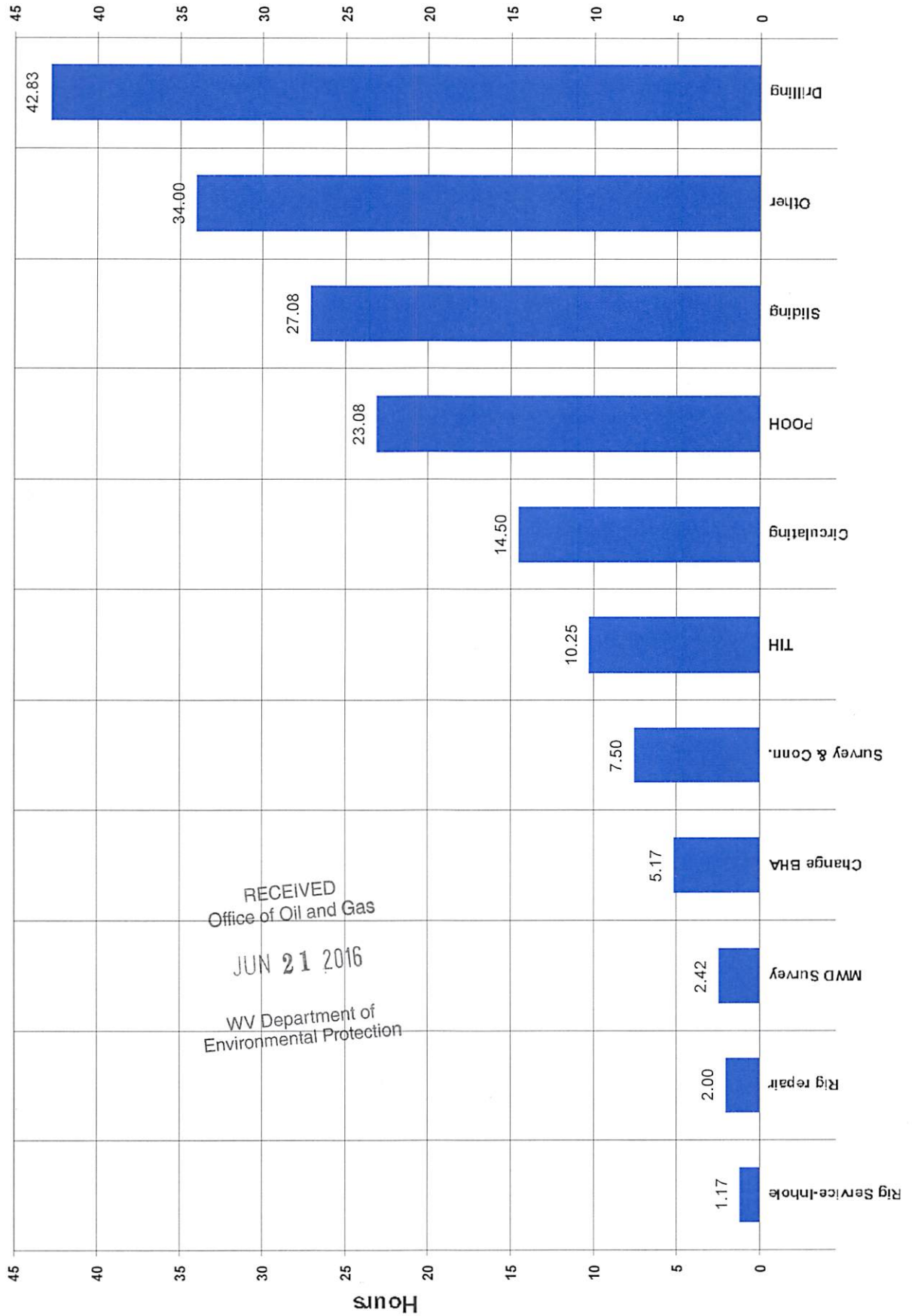
Footage Drilled with BHA



ROP vs BHA

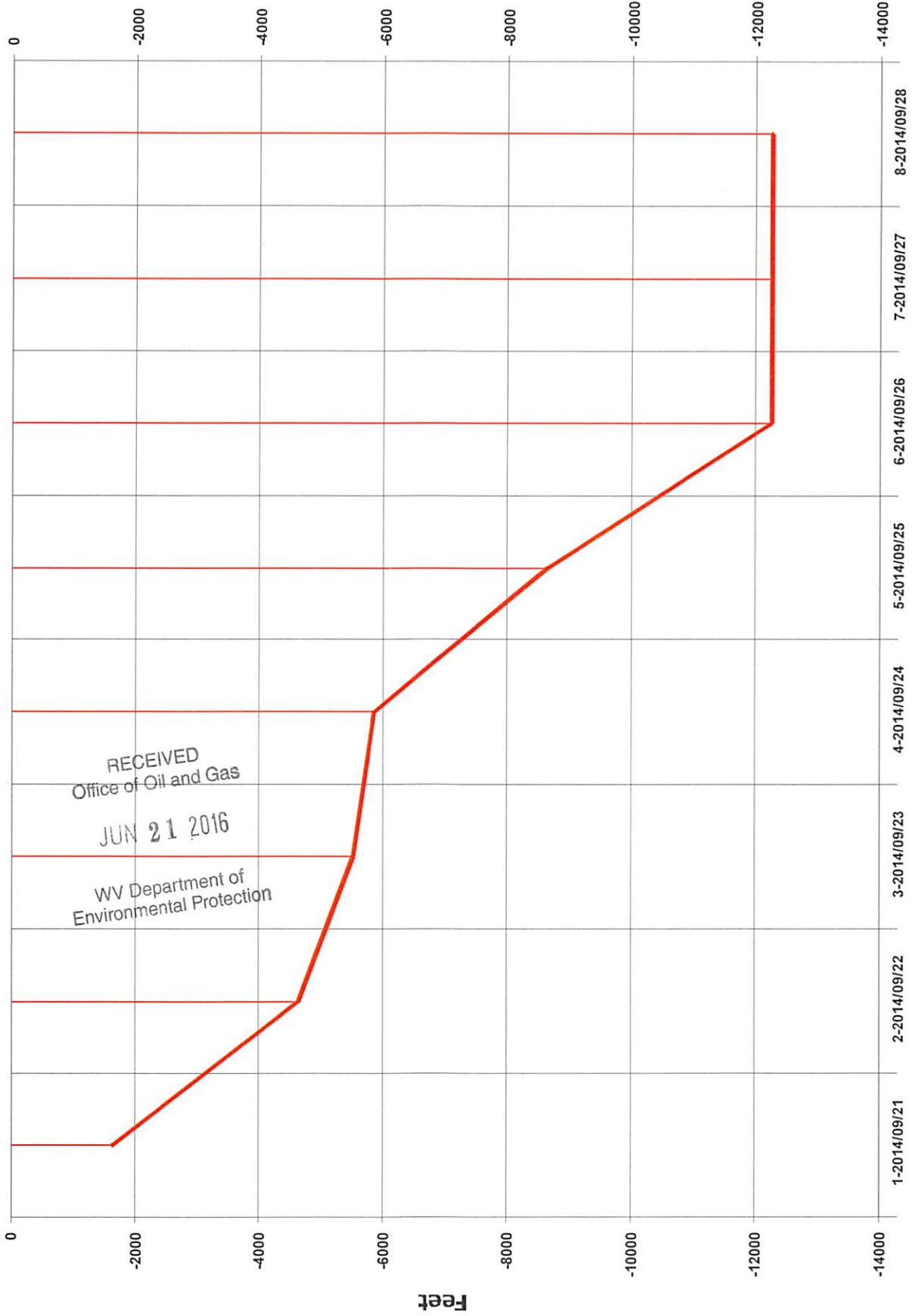


Activity Histogram

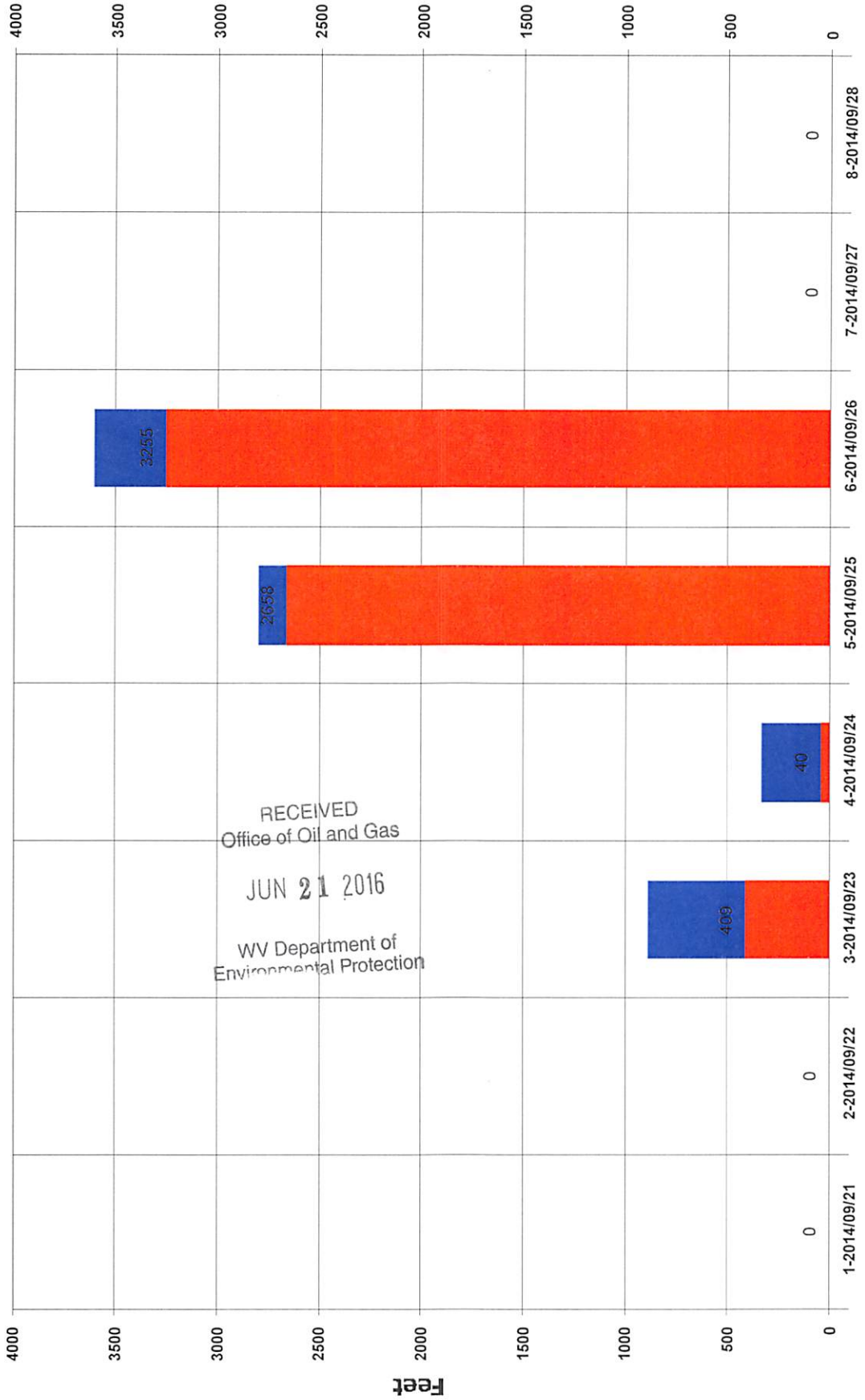


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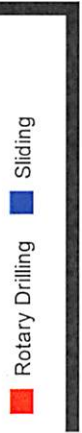
Measured Depth vs Days



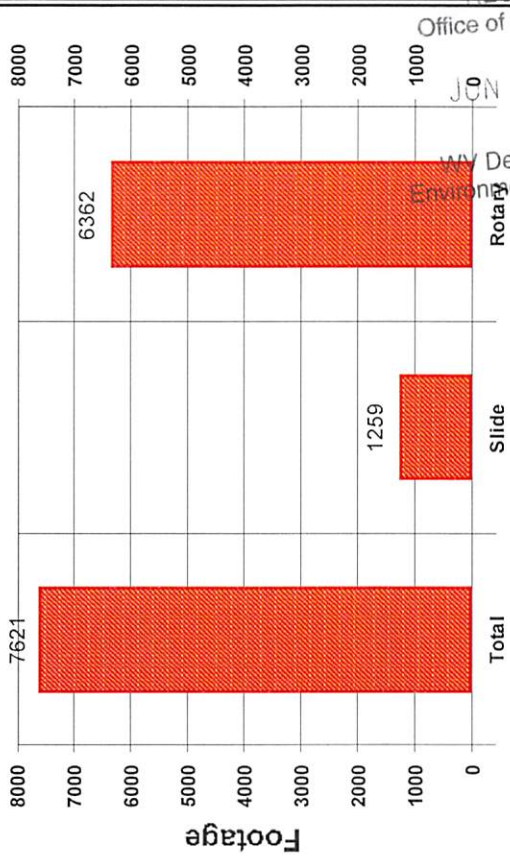
Daily Footage



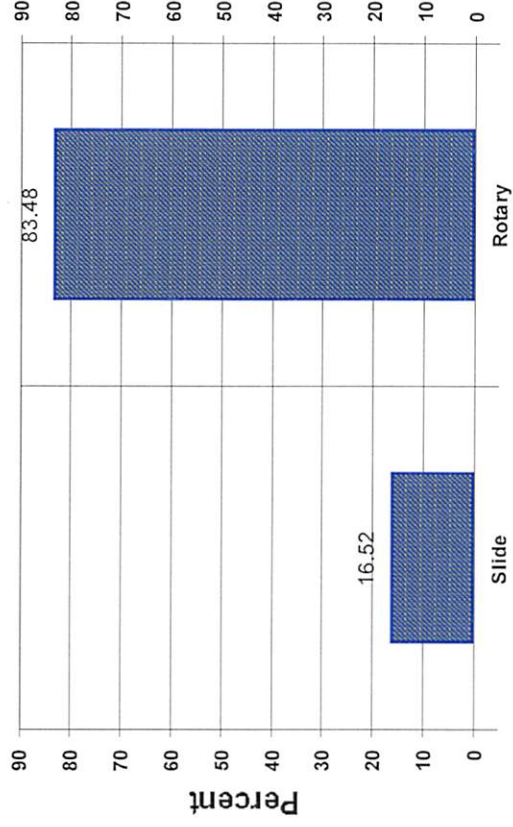
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Footage Drilled Totals



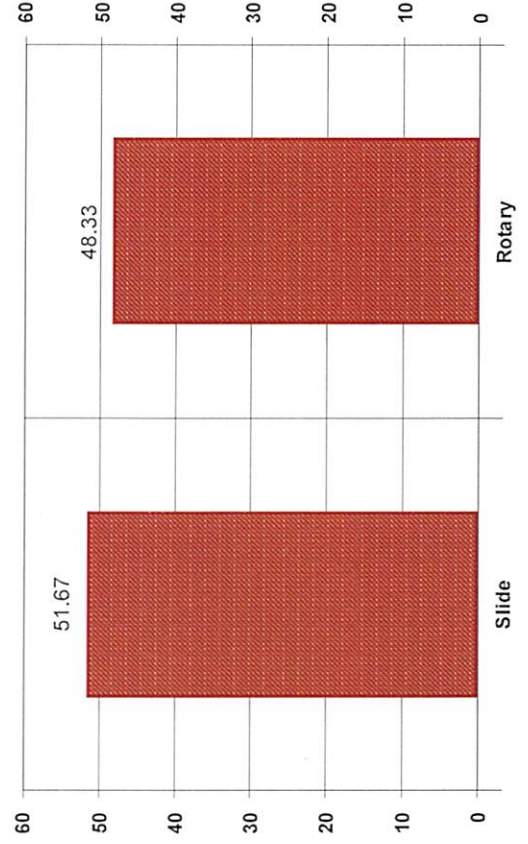
Footage Percent



Rate of Penetration Totals



Time Percent



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SUPPORT STAFF



Scientific
Drilling

David Fontenot
Gulf Coast Operations Manager
Highway 723, Box 500
Lafayette, LA 70592
(337) 232-7302

Mike Long
Directional Drilling Coordinator
Highway 723, Box 500
Lafayette, LA 70592
(337) 232-7302

Directional Drillers:
Ben Robbins, Steve Miller

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