

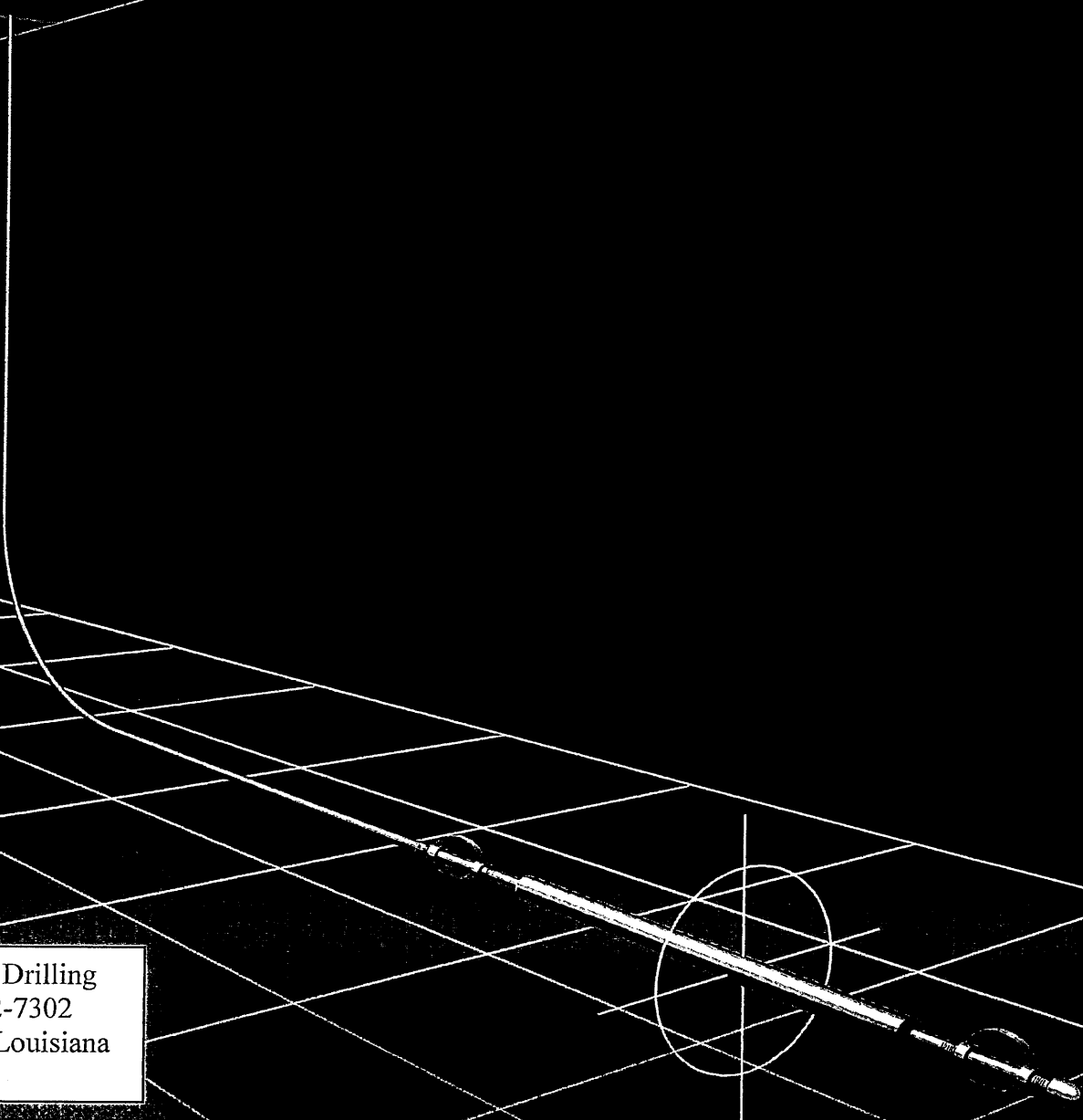
# **SCIENTIFIC DRILLING**

End of Well Report for

**Chesapeake Operating, Inc.**

**Tall Trees 8H (831679)**

**Upshur, WV**



Scientific Drilling  
337-232-7302  
Lafayette, Louisiana

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Scientific Drilling  
Directional Drilling Operations

CHESAPEAKE OPERATING, INC.

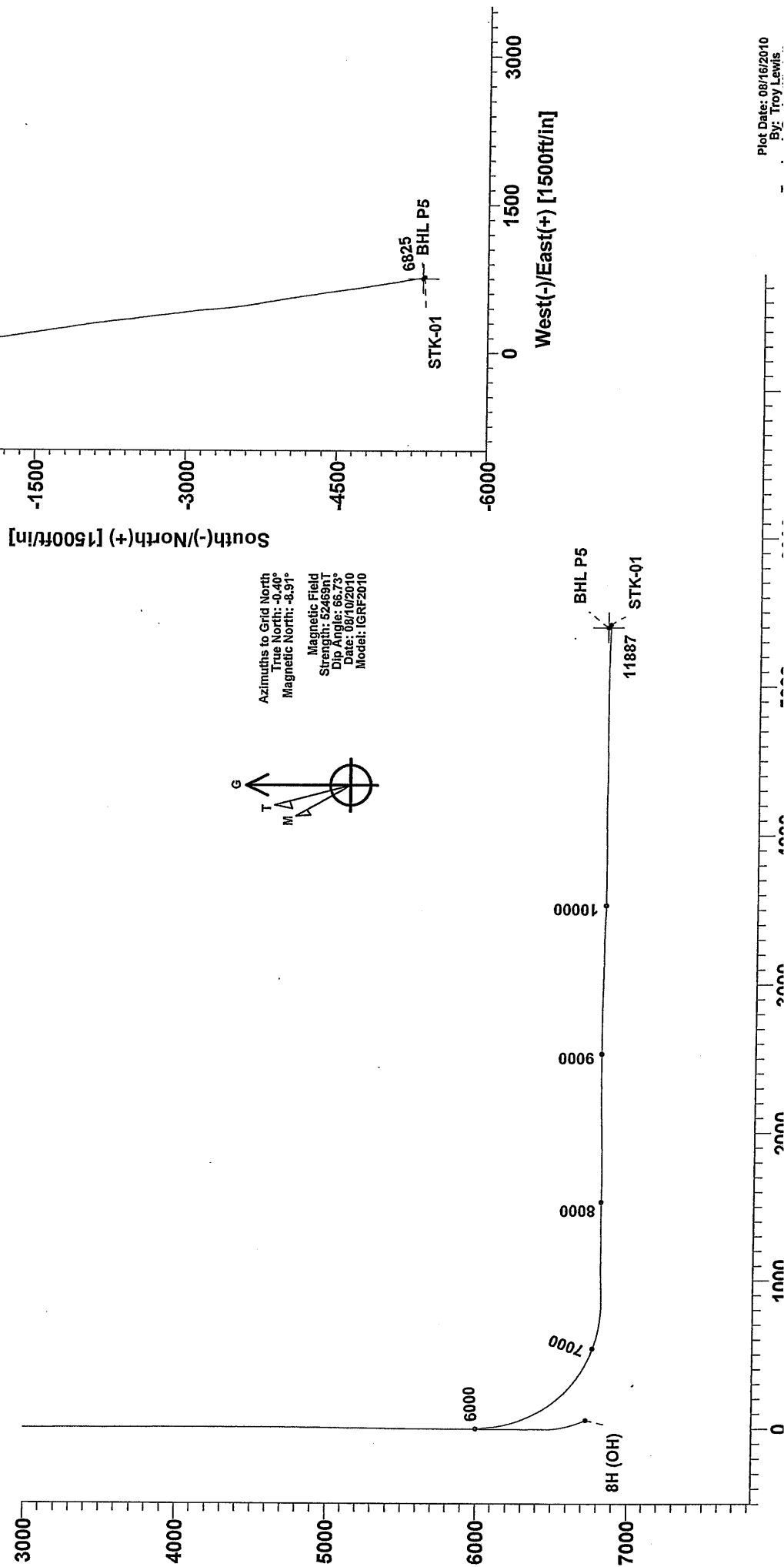
Field: Upshur, WV  
Site: Tall Trees  
Well: 8H  
Wellpath: STK-01

WV GEOLOGICAL SURVEY  
NORTH TOWN, WV



TARGET DETAILS						
Name	TVD	N/S	E/W	North	East	Point
BHL P5	6807.58	-5347.70	751.30	648155.00	2186620.00	Point

WELL DETAILS						
Name	N/S	E/W	North	East	Longitude	Slot
8H	0.00	0.00	663502.70	2185868.70	38°47'34.283N 080°20'52.460W	N/A



Plot Date: 08/16/2010  
By: Troy Lewis

# SDI Survey Report

WV GEOLOGICAL SURVEY  
MORGANTOWN, WV

<b>Company:</b> CHESAPEAKE OPERATING, INC.	<b>Date:</b> 08/16/2010	<b>Time:</b> 09:26:52	<b>Page:</b> 1
<b>Field:</b> Upshur, WV	<b>Co-ordinate(NE) Reference:</b> Well: 8H, Grid North		
<b>Site:</b> Tall Trees	<b>Vertical (TVD) Reference:</b> SITE 1679.0		
<b>Well:</b> 8H	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,172.00Azi)		
<b>Wellpath:</b> OH	<b>Survey Calculation Method:</b> Minimum Curvature	<b>Db:</b> Sybase	

<b>Field:</b> Upshur, WV	
<b>Map System:</b> US State Plane Coordinate System 1927	<b>Map Zone:</b> West Virginia, Southern Zone
<b>Geo Datum:</b> NAD27 (Clarke 1866)	<b>Coordinate System:</b> Well Centre
<b>Sys Datum:</b> Mean Sea Level	<b>Geomagnetic Model:</b> IGRF2010

<b>Site:</b> Tall Trees	
<b>Site Position:</b>	<b>Northing:</b> 653502.70 ft
<b>From: Map</b>	<b>Easting:</b> 2185868.70 ft
<b>Position Uncertainty:</b> 0.00 ft	<b>Latitude:</b> 38 47 34.283 N
<b>Ground Level:</b> 1664.00 ft	<b>Longitude:</b> 80 20 52.460 W
	<b>North Reference:</b> Grid
	<b>Grid Convergence:</b> 0.40 deg

<b>Well:</b> 8H	<b>Slot Name:</b>
<b>Well Position:</b>	<b>Latitude:</b> 38 47 34.283 N
<b>Position Uncertainty:</b> 0.00 ft	<b>Longitude:</b> 80 20 52.460 W
	<b>North Reference:</b> Grid
	<b>Grid Convergence:</b> 0.40 deg

<b>Wellpath:</b> OH	<b>Drilled From:</b> Surface
<b>Current Datum:</b> SITE	<b>Tie-on Depth:</b> 0.00 ft
<b>Magnetic Data:</b> 07/07/2010	<b>Above System Datum:</b> Mean Sea Level
<b>Field Strength:</b> 52480 nT	<b>Declination:</b> -8.50 deg
<b>Vertical Section:</b> Depth From (TVD)	<b>Mag Dip Angle:</b> 66.74 deg
	<b>Direction:</b> deg
	<b>Height:</b> 1679.00 ft
	<b>+N/-S:</b> ft
	<b>+E/-W:</b> ft
	<b>0.00</b>
	<b>0.00</b>
	<b>0.00</b>
	<b>172.00</b>

Survey Program for Definitive Wellpath					
<b>Date:</b> 08/02/2010		<b>Validated:</b> No		<b>Version:</b> 1	
<b>Actual From</b>	<b>To</b>	<b>Survey</b>	<b>Toolcode</b>	<b>Tool Name</b>	
ft	ft				
0.00	6417.00	Survey #1 (0.00-6417.00)	NS-GYRO-MS	North sensing gyrocompassing m	
6417.00	6738.00	Survey #2 (6417.00-6738.00)	MWD	MWD - SDI	

Survey										
MD	Incl	Azim	TVD	+N/-S	+E/-W	VS	DLS	Build	Turn	Tool/Comment
ft	deg	deg	ft	ft	ft	ft	deg/100ft	deg/100ft	deg/100ft	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
200.00	0.25	217.30	200.00	-0.35	-0.26	0.31	0.12	0.12	0.00	NS-GYRO-MS
400.00	0.25	45.23	400.00	-0.39	-0.22	0.35	0.25	0.00	-86.03	NS-GYRO-MS
600.00	0.25	307.16	600.00	0.18	-0.26	-0.22	0.19	0.00	-49.04	NS-GYRO-MS
800.00	0.50	74.08	800.00	0.69	0.23	-0.65	0.34	0.12	63.46	NS-GYRO-MS
1000.00	0.25	296.01	999.99	1.12	0.68	-1.01	0.35	-0.12	-69.04	NS-GYRO-MS
1200.00	0.25	352.93	1199.99	1.74	0.24	-1.69	0.12	0.00	28.46	NS-GYRO-MS
1400.00	0.25	336.86	1399.99	2.58	0.01	-2.55	0.03	0.00	-8.03	NS-GYRO-MS
1600.00	0.25	2.79	1599.99	3.41	-0.14	-3.40	0.06	0.00	12.97	NS-GYRO-MS
1800.00	0.50	133.71	1799.99	3.25	0.51	-3.14	0.35	0.12	65.46	NS-GYRO-MS
2000.00	0.50	154.64	1999.98	1.85	1.52	-1.63	0.09	0.00	10.46	NS-GYRO-MS
2200.00	0.25	353.56	2199.98	1.50	1.84	-1.23	0.37	-0.12	-80.54	NS-GYRO-MS
2400.00	0.50	204.49	2399.97	1.14	1.43	-0.93	0.36	0.12	-74.53	NS-GYRO-MS
2600.00	0.50	233.12	2599.97	-0.18	0.37	0.23	0.12	0.00	14.31	NS-GYRO-MS
2800.00	0.50	168.05	2799.96	-1.56	-0.15	1.52	0.27	0.00	-32.53	NS-GYRO-MS
3000.00	0.50	170.97	2999.95	-3.27	0.17	3.26	0.01	0.00	1.46	NS-GYRO-MS
3200.00	0.50	250.90	3199.95	-4.42	-0.52	4.30	0.32	0.00	39.96	NS-GYRO-MS
3400.00	0.50	219.83	3399.94	-5.38	-1.90	5.06	0.13	0.00	-15.53	NS-GYRO-MS
3600.00	0.50	215.75	3599.93	-6.75	-2.97	6.27	0.02	0.00	-2.04	NS-GYRO-MS
3800.00	0.25	165.68	3799.93	-7.88	-3.37	7.34	0.19	-0.12	-25.03	NS-GYRO-MS
4000.00	0.50	275.60	3999.93	-8.22	-4.13	7.57	0.32	0.12	54.96	NS-GYRO-MS
4200.00	0.50	252.53	4199.92	-8.40	-5.83	7.51	0.10	0.00	-11.53	NS-GYRO-MS

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# SDI Survey Report

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WV GEOLOGICAL SURVEY

<b>Company:</b> CHESAPEAKE OPERATING, INC.	<b>Date:</b> 08/16/2010	<b>Time:</b> 09:26:52	<b>Page:</b> 2
<b>Field:</b> Upshur, WV	<b>Co-ordinate(NE) Reference:</b> Well: 8H, Grid North		
<b>Site:</b> Tall Trees	<b>Vertical (TVD) Reference:</b> SITE 1679.0		
<b>Well:</b> 8H	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,172.00Azi)		
<b>Wellpath:</b> OH	<b>Survey Calculation Method:</b> Minimum Curvature	<b>Db:</b> Sybase	

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
4400.00	0.75	265.46	4399.91	-8.76	-7.97	7.57	0.14	0.12	6.46	NS-GYRO-MS
4600.00	1.00	254.39	4599.88	-9.34	-10.95	7.72	0.15	0.12	-5.53	NS-GYRO-MS
4800.00	0.75	273.33	4799.86	-9.73	-13.94	7.70	0.19	-0.12	9.47	NS-GYRO-MS
5000.00	1.00	342.26	4999.84	-7.99	-15.78	5.72	0.51	0.12	34.46	NS-GYRO-MS
5200.00	0.75	291.20	5199.82	-5.86	-17.53	3.36	0.39	-0.12	-25.53	NS-GYRO-MS
5400.00	1.00	355.14	5399.80	-3.64	-18.90	0.98	0.48	0.12	31.97	NS-GYRO-MS
5600.00	0.50	291.08	5599.79	-1.59	-19.86	-1.19	0.45	-0.25	-32.03	NS-GYRO-MS
5800.00	0.25	77.02	5799.78	-1.18	-20.25	-1.65	0.36	-0.12	72.97	NS-GYRO-MS
6000.00	0.50	34.96	5999.78	-0.37	-19.33	-2.33	0.18	0.12	-21.03	NS-GYRO-MS
6200.00	0.50	23.90	6199.77	1.15	-18.47	-3.71	0.05	0.00	-5.53	NS-GYRO-MS
6400.00	0.25	174.77	6399.77	1.51	-18.08	-4.01	0.36	-0.12	75.43	NS-GYRO-MS
6417.00	0.25	141.40	6416.77	1.44	-18.05	-3.94	0.84	0.00	-196.29	NS-GYRO-MS
6450.00	0.26	75.61	6449.77	1.41	-17.94	-3.89	0.84	0.03	-199.36	MWD
6481.00	2.16	158.46	6480.76	0.88	-17.65	-3.33	6.91	6.13	267.26	MWD
6513.00	5.58	164.78	6512.68	-1.18	-17.02	-1.20	10.75	10.69	19.75	MWD
6544.00	9.10	165.79	6543.43	-5.01	-16.03	2.74	11.36	11.35	3.26	MWD
6576.00	11.66	170.64	6574.90	-10.66	-14.88	8.49	8.45	8.00	15.16	MWD
6608.00	14.39	172.54	6606.07	-17.79	-13.84	15.70	8.63	8.53	5.94	MWD
6640.00	16.70	175.71	6636.90	-26.32	-12.98	24.26	7.69	7.22	9.91	MWD
6671.00	19.14	177.28	6666.40	-35.84	-12.40	33.77	8.02	7.87	5.06	MWD
6738.00	24.50	176.50	6728.57	-60.70	-11.03	58.57	8.01	8.00	-1.16	Projected to TD

**Annotation**

MD ft	TVD ft	
6738.00	6728.57	Projected to TD

# SDI

## Survey Report - Geographic

APR 3 2012

WV GEOLOGICAL SURVEY  
MASON TOWN, WV  
Page: 1

<b>Company:</b> CHESAPEAKE OPERATING, INC.	<b>Date:</b> 08/16/2010	<b>Time:</b> 09:27:47	<b>Page:</b> 1
<b>Field:</b> Upshur, WV	<b>Co-ordinate(NE) Reference:</b> Well: 8H, Grid North		
<b>Site:</b> Tall Trees	<b>Vertical (TVD) Reference:</b> SITE 1679.0		
<b>Well:</b> 8H	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,172.00Azi)		
<b>Wellpath:</b> OH	<b>Survey Calculation Method:</b> Minimum Curvature	<b>Db:</b> Sybase	

<b>Field:</b> Upshur, WV	
<b>Map System:</b> US State Plane Coordinate System 1927	<b>Map Zone:</b> West Virginia, Southern Zone
<b>Geo Datum:</b> NAD27 (Clarke 1866)	<b>Coordinate System:</b> Well Centre
<b>Sys Datum:</b> Mean Sea Level	<b>Geomagnetic Model:</b> IGRF2010

<b>Site:</b> Tall Trees			
<b>Site Position:</b>	<b>Northing:</b> 653502.70 ft	<b>Latitude:</b> 38 47 34.283 N	
<b>From:</b> Map	<b>Easting:</b> 2185868.70 ft	<b>Longitude:</b> 80 20 52.460 W	
<b>Position Uncertainty:</b> 0.00 ft		<b>North Reference:</b> Grid	
<b>Ground Level:</b> 1664.00 ft		<b>Grid Convergence:</b> 0.40 deg	

<b>Well:</b> 8H		<b>Slot Name:</b>	
<b>Well Position:</b>	<b>+N/-S</b> 0.00 ft	<b>Northing:</b> 653502.70 ft	<b>Latitude:</b> 38 47 34.283 N
	<b>+E/-W</b> 0.00 ft	<b>Easting:</b> 2185868.70 ft	<b>Longitude:</b> 80 20 52.460 W
<b>Position Uncertainty:</b> 0.00 ft			

<b>Wellpath:</b> OH		<b>Drilled From:</b> Surface
<b>Current Datum:</b> SITE	<b>Height</b> 1679.00 ft	<b>Tie-on Depth:</b> 0.00 ft
<b>Magnetic Data:</b> 07/07/2010		<b>Above System Datum:</b> Mean Sea Level
<b>Field Strength:</b> 52480 nT		<b>Declination:</b> -8.50 deg
<b>Vertical Section:</b> Depth From (TVD)	<b>+N/-S</b>	<b>Mag Dip Angle:</b> 66.74 deg
ft	ft	<b>+E/-W</b>
		ft
0.00	0.00	0.00
		<b>Direction</b>
		deg
		172.00

<b>Survey Program for Definitive Wellpath</b>			
<b>Date:</b> 08/02/2010	<b>Validated:</b> No	<b>Version:</b> 1	
<b>Actual From</b> ft	<b>To</b> ft	<b>Survey</b>	<b>Toolcode</b> <b>Tool Name</b>
0.00	6417.00	Survey #1 (0.00-6417.00)	NS-GYRO-MS      North sensing gyrocompassing m
6417.00	6738.00	Survey #2 (6417.00-6738.00)	MWD      MWD - SDI

Survey													
MD	Incl	Azim	TVD	+N/-S	+E/-W	Map	Map	<--- Latitude --->		<--- Longitude --->			
ft	deg	deg	ft	ft	ft	Northing	Easting	Deg	Min	Sec	Deg	Min	Sec
0.00	0.00	0.00	0.00	0.00	0.00	653502.70	2185868.70	38	47	34.283 N	80	20	52.460 W
200.00	0.25	217.30	200.00	-0.35	-0.26	653502.35	2185868.44	38	47	34.280 N	80	20	52.463 W
400.00	0.25	45.23	400.00	-0.39	-0.22	653502.31	2185868.48	38	47	34.280 N	80	20	52.463 W
600.00	0.25	307.16	600.00	0.18	-0.26	653502.88	2185868.44	38	47	34.285 N	80	20	52.463 W
800.00	0.50	74.08	800.00	0.69	0.23	653503.39	2185868.93	38	47	34.290 N	80	20	52.457 W
1000.00	0.25	296.01	999.99	1.12	0.68	653503.82	2185869.38	38	47	34.294 N	80	20	52.451 W
1200.00	0.25	352.93	1199.99	1.74	0.24	653504.44	2185868.94	38	47	34.301 N	80	20	52.457 W
1400.00	0.25	336.86	1399.99	2.58	0.01	653505.28	2185868.71	38	47	34.309 N	80	20	52.460 W
1600.00	0.25	2.79	1599.99	3.41	-0.14	653506.11	2185868.56	38	47	34.317 N	80	20	52.461 W
1800.00	0.50	133.71	1799.99	3.25	0.51	653505.95	2185869.21	38	47	34.315 N	80	20	52.453 W
2000.00	0.50	154.64	1999.98	1.85	1.52	653504.55	2185870.22	38	47	34.302 N	80	20	52.441 W
2200.00	0.25	353.56	2199.98	1.50	1.84	653504.20	2185870.54	38	47	34.298 N	80	20	52.436 W
2400.00	0.50	204.49	2399.97	1.14	1.43	653503.84	2185870.13	38	47	34.295 N	80	20	52.442 W
2600.00	0.50	233.12	2599.97	-0.18	0.37	653502.52	2185869.07	38	47	34.282 N	80	20	52.455 W
2800.00	0.50	168.05	2799.96	-1.56	-0.15	653501.14	2185868.55	38	47	34.268 N	80	20	52.462 W
3000.00	0.50	170.97	2999.95	-3.27	0.17	653499.43	2185868.87	38	47	34.251 N	80	20	52.458 W
3200.00	0.50	250.90	3199.95	-4.42	-0.52	653498.28	2185868.18	38	47	34.240 N	80	20	52.467 W
3400.00	0.50	219.83	3399.94	-5.38	-1.90	653497.32	2185866.80	38	47	34.230 N	80	20	52.484 W
3600.00	0.50	215.75	3599.93	-6.75	-2.97	653495.95	2185865.73	38	47	34.217 N	80	20	52.498 W
3800.00	0.25	165.68	3799.93	-7.88	-3.37	653494.82	2185865.33	38	47	34.206 N	80	20	52.503 W
4000.00	0.50	275.60	3999.93	-8.22	-4.13	653494.48	2185864.57	38	47	34.202 N	80	20	52.513 W

# SDI

## Survey Report - Geographic

<b>Company:</b> CHESAPEAKE OPERATING, INC.	<b>Date:</b> 08/16/2010	<b>Time:</b> 09:27:47	<b>Page:</b> 2
<b>Field:</b> Upshur, WV	<b>Co-ordinate(NE) Reference:</b>	<b>Well:</b> 8H, Grid North	
<b>Site:</b> Tall Trees	<b>Vertical (TVD) Reference:</b>	SITE 1679.0	
<b>Well:</b> 8H	<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,172.00Azi)	
<b>Wellpath:</b> OH	<b>Survey Calculation Method:</b>	Minimum Curvature	<b>Db:</b> Sybase

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<--- Latitude --->			<--- Longitude --->				
								Deg	Min	Sec	Deg	Min	Sec		
4200.00	0.50	252.53	4199.92	-8.40	-5.83	653494.30	2185862.87	38	47	34.201	N	80	20	52.534	W
4400.00	0.75	265.46	4399.91	-8.76	-7.97	653493.94	2185860.73	38	47	34.197	N	80	20	52.561	W
4600.00	1.00	254.39	4599.88	-9.34	-10.95	653493.36	2185857.75	38	47	34.192	N	80	20	52.599	W
4800.00	0.75	273.33	4799.86	-9.73	-13.94	653492.97	2185854.76	38	47	34.188	N	80	20	52.637	W
5000.00	1.00	342.26	4999.84	-7.99	-15.78	653494.71	2185852.92	38	47	34.206	N	80	20	52.660	W
5200.00	0.75	291.20	5199.82	-5.86	-17.53	653496.84	2185851.17	38	47	34.227	N	80	20	52.682	W
5400.00	1.00	355.14	5399.80	-3.64	-18.90	653499.06	2185849.80	38	47	34.249	N	80	20	52.699	W
5600.00	0.50	291.08	5599.79	-1.59	-19.86	653501.11	2185848.84	38	47	34.269	N	80	20	52.711	W
5800.00	0.25	77.02	5799.78	-1.18	-20.25	653501.52	2185848.45	38	47	34.273	N	80	20	52.716	W
6000.00	0.50	34.96	5999.78	-0.37	-19.33	653502.33	2185849.37	38	47	34.281	N	80	20	52.704	W
6200.00	0.50	23.90	6199.77	1.15	-18.47	653503.85	2185850.23	38	47	34.296	N	80	20	52.693	W
6400.00	0.25	174.77	6399.77	1.51	-18.08	653504.21	2185850.62	38	47	34.300	N	80	20	52.688	W
6417.00	0.25	141.40	6416.77	1.44	-18.05	653504.14	2185850.65	38	47	34.299	N	80	20	52.688	W
6450.00	0.26	75.61	6449.77	1.41	-17.94	653504.11	2185850.76	38	47	34.299	N	80	20	52.686	W
6481.00	2.16	158.46	6480.76	0.88	-17.65	653503.58	2185851.05	38	47	34.293	N	80	20	52.683	W
6513.00	5.58	164.78	6512.68	-1.18	-17.02	653501.52	2185851.68	38	47	34.273	N	80	20	52.675	W
6544.00	9.10	165.79	6543.43	-5.01	-16.03	653497.69	2185852.67	38	47	34.235	N	80	20	52.663	W
6576.00	11.66	170.64	6574.90	-10.66	-14.88	653492.04	2185853.82	38	47	34.179	N	80	20	52.649	W
6608.00	14.39	172.54	6606.07	-17.79	-13.84	653484.91	2185854.86	38	47	34.109	N	80	20	52.636	W
6640.00	16.70	175.71	6636.90	-26.32	-12.98	653476.38	2185855.72	38	47	34.024	N	80	20	52.626	W
6671.00	19.14	177.28	6666.40	-35.84	-12.40	653466.86	2185856.30	38	47	33.930	N	80	20	52.620	W
6738.00	24.50	176.50	6728.57	-60.70	-11.03	653442.00	2185857.67	38	47	33.684	N	80	20	52.605	W

**Annotation**

MD ft	TVD ft	
6738.00	6728.57	Projected to TD

# SDI Survey Report

APR 8 2012

WV GEOLOGICAL SURVEY

MORGANTOWN, WV

<b>Company:</b> CHESAPEAKE OPERATING, INC.	<b>Date:</b> 08/16/2010	<b>Time:</b> 09:25:07	<b>Page:</b> 1
<b>Field:</b> Upshur, WV	<b>Co-ordinate(NE) Reference:</b> Well: 8H, Grid North		
<b>Site:</b> Tall Trees	<b>Vertical (TVD) Reference:</b> SITE 1679.0		
<b>Well:</b> 8H	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,172.00Azi)		
<b>Wellpath:</b> STK-01	<b>Survey Calculation Method:</b> Minimum Curvature	<b>Db:</b> Sybase	

<b>Field:</b> Upshur, WV			
<b>Map System:</b> US State Plane Coordinate System 1927		<b>Map Zone:</b> West Virginia, Southern Zone	
<b>Geo Datum:</b> NAD27 (Clarke 1866)		<b>Coordinate System:</b> Well Centre	
<b>Sys Datum:</b> Mean Sea Level		<b>Geomagnetic Model:</b> IGRF2010	

<b>Site:</b> Tall Trees			
<b>Site Position:</b>	<b>Northing:</b> 653502.70 ft	<b>Latitude:</b> 38 47 34.283 N	
<b>From:</b> Map	<b>Easting:</b> 2185868.70 ft	<b>Longitude:</b> 80 20 52.460 W	
<b>Position Uncertainty:</b> 0.00 ft		<b>North Reference:</b> Grid	
<b>Ground Level:</b> 1664.00 ft		<b>Grid Convergence:</b> 0.40 deg	

<b>Well:</b> 8H				<b>Slot Name:</b>			
<b>Well Position:</b>	<b>+N/-S</b> 0.00 ft	<b>Northing:</b> 653502.70 ft	<b>Latitude:</b> 38 47 34.283 N	<b>+E/-W</b> 0.00 ft	<b>Easting:</b> 2185868.70 ft	<b>Longitude:</b> 80 20 52.460 W	
<b>Position Uncertainty:</b> 0.00 ft							

<b>Wellpath:</b> STK-01				<b>Drilled From:</b> OH			
<b>Current Datum:</b> SITE		<b>Height</b> 1679.00 ft		<b>Tie-on Depth:</b> 9077.00 ft		<b>Above System Datum:</b> Mean Sea Level	
<b>Magnetic Data:</b> 08/10/2010				<b>Declination:</b> -8.51 deg			
<b>Field Strength:</b> 52469 nT				<b>Mag Dip Angle:</b> 66.73 deg			
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>			
	ft	ft	ft	deg			
	0.00	0.00	0.00	172.00			

<b>Survey Program for Definitive Wellpath</b>				
<b>Date:</b> 08/16/2010		<b>Validated:</b> No		<b>Version:</b> 3
<b>Actual From</b>	<b>To</b>	<b>Survey</b>	<b>Toolcode</b>	<b>Tool Name</b>
ft	ft			
0.00	5800.00	Survey #1 (0.00-6417.00) (0)	NS-GYRO-MS	North sensing gyrocompassing m
5800.00	11887.00	Survey #2 (5800.00-11887.00)	MWD	MWD - SDI

Survey										
MD	Incl	Azim	TVD	+N/-S	+E/-W	VS	DLS	Build	Turn	Tool/Comment
ft	deg	deg	ft	ft	ft	ft	deg/100ft	deg/100ft	deg/100ft	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
200.00	0.25	217.30	200.00	-0.35	-0.26	0.31	0.12	0.12	0.00	NS-GYRO-MS
400.00	0.25	45.23	400.00	-0.39	-0.22	0.35	0.25	0.00	-86.03	NS-GYRO-MS
600.00	0.25	307.16	600.00	0.18	-0.26	-0.22	0.19	0.00	-49.04	NS-GYRO-MS
800.00	0.50	74.08	800.00	0.69	0.23	-0.65	0.34	0.12	63.46	NS-GYRO-MS
1000.00	0.25	296.01	999.99	1.12	0.68	-1.01	0.35	-0.12	-69.04	NS-GYRO-MS
1200.00	0.25	352.93	1199.99	1.74	0.24	-1.69	0.12	0.00	28.46	NS-GYRO-MS
1400.00	0.25	336.86	1399.99	2.58	0.01	-2.55	0.03	0.00	-8.03	NS-GYRO-MS
1600.00	0.25	2.79	1599.99	3.41	-0.14	-3.40	0.06	0.00	12.97	NS-GYRO-MS
1800.00	0.50	133.71	1799.99	3.25	0.51	-3.14	0.35	0.12	65.46	NS-GYRO-MS
2000.00	0.50	154.64	1999.98	1.85	1.52	-1.63	0.09	0.00	10.46	NS-GYRO-MS
2200.00	0.25	353.56	2199.98	1.50	1.84	-1.23	0.37	-0.12	-80.54	NS-GYRO-MS
2400.00	0.50	204.49	2399.97	1.14	1.43	-0.93	0.36	0.12	-74.53	NS-GYRO-MS
2600.00	0.50	233.12	2599.97	-0.18	0.37	0.23	0.12	0.00	14.31	NS-GYRO-MS
2800.00	0.50	168.05	2799.96	-1.56	-0.15	1.52	0.27	0.00	-32.53	NS-GYRO-MS
3000.00	0.50	170.97	2999.95	-3.27	0.17	3.26	0.01	0.00	1.46	NS-GYRO-MS
3200.00	0.50	250.90	3199.95	-4.42	-0.52	4.30	0.32	0.00	39.96	NS-GYRO-MS
3400.00	0.50	219.83	3399.94	-5.38	-1.90	5.06	0.13	0.00	-15.53	NS-GYRO-MS
3600.00	0.50	215.75	3599.93	-6.75	-2.97	6.27	0.02	0.00	-2.04	NS-GYRO-MS
3800.00	0.25	165.68	3799.93	-7.88	-3.37	7.34	0.19	-0.12	-25.03	NS-GYRO-MS
4000.00	0.50	275.60	3999.93	-8.22	-4.13	7.57	0.32	0.12	54.96	NS-GYRO-MS
4200.00	0.50	252.53	4199.92	-8.40	-5.83	7.51	0.10	0.00	-11.53	NS-GYRO-MS

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<b>Company:</b> CHESAPEAKE OPERATING, INC.	<b>Date:</b> 08/16/2010	<b>Time:</b> 09:25:07	<b>Page:</b> 2
<b>Field:</b> Upshur, WV	<b>Co-ordinate(NE) Reference:</b>	<b>Well:</b> 8H, Grid North	
<b>Site:</b> Tall Trees	<b>Vertical (TVD) Reference:</b>	SITE 1679.0	
<b>Well:</b> 8H	<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,172.00Azi)	
<b>Wellpath:</b> STK-01	<b>Survey Calculation Method:</b>	Minimum Curvature	<b>Db:</b> Sybase

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
4400.00	0.75	265.46	4399.91	-8.76	-7.97	7.57	0.14	0.12	6.46	NS-GYRO-MS
4600.00	1.00	254.39	4599.88	-9.34	-10.95	7.72	0.15	0.12	-5.53	NS-GYRO-MS
4800.00	0.75	273.33	4799.86	-9.73	-13.94	7.70	0.19	-0.12	9.47	NS-GYRO-MS
5000.00	1.00	342.26	4999.84	-7.99	-15.78	5.72	0.51	0.12	34.46	NS-GYRO-MS
5200.00	0.75	291.20	5199.82	-5.86	-17.53	3.36	0.39	-0.12	-25.53	NS-GYRO-MS
5400.00	1.00	355.14	5399.80	-3.64	-18.90	0.98	0.48	0.12	31.97	NS-GYRO-MS
5600.00	0.50	291.08	5599.79	-1.59	-19.86	-1.19	0.45	-0.25	-32.03	NS-GYRO-MS
5800.00	0.25	77.02	5799.78	-1.18	-20.25	-1.65	0.36	-0.12	72.97	NS-GYRO-MS
5887.00	0.29	49.54	5886.78	-0.99	-19.90	-1.78	0.15	0.05	-31.59	MWD
5948.00	0.38	133.12	5947.78	-1.03	-19.64	-1.71	0.74	0.15	137.02	MWD
5980.00	2.47	166.47	5979.77	-1.78	-19.40	-0.94	6.76	6.53	104.22	MWD
6011.00	5.48	170.51	6010.69	-3.89	-19.00	1.21	9.75	9.71	13.03	MWD
6043.00	5.95	170.37	6042.53	-7.03	-18.47	4.39	1.47	1.47	-0.44	MWD
6074.00	5.74	167.88	6073.37	-10.13	-17.87	7.54	1.06	-0.68	-8.03	MWD
6105.00	5.37	165.75	6104.23	-13.05	-17.19	10.53	1.37	-1.19	-6.87	MWD
6137.00	7.82	165.13	6136.01	-16.61	-16.26	14.18	7.66	7.66	-1.94	MWD
6168.00	11.31	168.04	6166.58	-21.62	-15.09	19.31	11.36	11.26	9.39	MWD
6200.00	13.83	169.93	6197.81	-28.46	-13.77	26.26	7.98	7.87	5.91	MWD
6231.00	16.19	170.37	6227.75	-36.37	-12.40	34.29	7.62	7.61	1.42	MWD
6256.00	17.88	170.60	6251.65	-43.59	-11.19	41.61	6.75	6.74	0.92	STK KOP
6262.00	18.28	170.65	6257.35	-45.42	-10.89	43.47	6.75	6.74	0.82	MWD
6293.00	20.23	170.33	6286.62	-55.51	-9.20	53.69	6.30	6.29	-1.03	MWD
6325.00	21.86	170.44	6316.48	-66.84	-7.28	65.17	5.10	5.09	0.34	MWD
6357.00	24.19	170.96	6345.93	-79.19	-5.26	77.69	7.31	7.28	1.62	MWD
6388.00	26.49	170.98	6373.95	-92.29	-3.18	90.95	7.42	7.42	0.06	MWD
6419.00	28.34	171.58	6401.47	-106.40	-1.01	105.22	6.03	5.97	1.94	MWD
6450.00	30.68	171.11	6428.44	-121.49	1.29	120.49	7.59	7.55	-1.52	MWD
6481.00	32.91	170.82	6454.79	-137.62	3.85	136.82	7.21	7.19	-0.94	MWD
6513.00	35.44	171.02	6481.26	-155.37	6.69	154.79	7.91	7.91	0.62	MWD
6544.00	37.88	170.99	6506.13	-173.65	9.58	173.29	7.87	7.87	-0.10	MWD
6576.00	40.31	171.12	6530.96	-193.58	12.72	193.47	7.60	7.59	0.41	MWD
6608.00	42.21	171.88	6555.01	-214.45	15.83	214.57	6.14	5.94	2.37	MWD
6640.00	44.50	172.34	6578.28	-236.21	18.85	236.54	7.22	7.16	1.44	MWD
6672.00	47.31	172.76	6600.55	-259.00	21.82	259.52	8.83	8.78	1.31	MWD
6703.00	49.65	172.61	6621.09	-282.02	24.78	282.72	7.56	7.55	-0.48	MWD
6734.00	51.99	172.69	6640.68	-305.85	27.85	306.75	7.55	7.55	0.26	MWD
6766.00	54.20	172.76	6659.89	-331.23	31.09	332.33	6.91	6.91	0.22	MWD
6797.00	56.66	172.92	6677.48	-356.56	34.27	357.86	7.95	7.94	0.52	MWD
6829.00	59.11	172.63	6694.49	-383.44	37.68	384.96	7.69	7.66	-0.91	MWD
6860.00	61.63	172.56	6709.82	-410.16	41.16	411.90	8.13	8.13	-0.23	MWD
6891.00	63.21	172.41	6724.17	-437.40	44.75	439.37	5.11	5.10	-0.48	MWD
6923.00	65.03	172.09	6738.13	-465.93	48.63	468.16	5.76	5.69	-1.00	MWD
6955.00	67.64	171.70	6750.98	-494.94	52.77	497.47	8.23	8.16	-1.22	MWD
6986.00	69.83	171.67	6762.22	-523.53	56.94	526.36	7.07	7.06	-0.10	MWD
7018.00	70.69	171.53	6773.03	-553.32	61.34	556.47	2.72	2.69	-0.44	MWD
7049.00	72.63	171.70	6782.78	-582.43	65.63	585.90	6.28	6.26	0.55	MWD
7081.00	75.42	172.24	6791.59	-612.89	69.93	616.66	8.87	8.72	1.69	MWD
7102.00	77.07	172.80	6796.58	-633.11	72.59	637.06	8.27	7.86	2.67	MWD
7133.00	79.21	173.14	6802.95	-663.22	76.30	667.39	6.99	6.90	1.10	MWD
7164.00	81.30	173.17	6808.20	-693.56	79.94	697.93	6.74	6.74	0.10	MWD
7196.00	82.69	172.80	6812.66	-725.01	83.81	729.61	4.49	4.34	-1.16	MWD
7227.00	84.61	172.03	6816.08	-755.54	87.88	760.42	6.67	6.19	-2.48	MWD
7259.00	86.13	171.98	6818.67	-787.13	92.31	792.32	4.75	4.75	-0.16	MWD



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<b>Well:</b> 8H	<b>Section (VS) Reference:</b>	<b>Well</b> (0.00N,0.00E,172.00Azi)	
<b>Wellpath:</b> STK-01	<b>Survey Calculation Method:</b>	<b>Minimum Curvature</b>	<b>Db:</b> Sybase

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
7291.00	88.25	171.73	6820.24	-818.77	96.84	824.28	6.67	6.62	-0.78	MWD
7322.00	89.93	170.59	6820.73	-849.39	101.60	855.27	6.55	5.42	-3.68	MWD
7354.00	91.01	170.21	6820.47	-880.94	106.94	887.25	3.58	3.37	-1.19	MWD
7385.00	91.28	170.15	6819.85	-911.48	112.23	918.23	0.89	0.87	-0.19	MWD
7448.00	92.52	170.04	6817.76	-973.51	123.06	981.16	1.98	1.97	-0.17	MWD
7511.00	91.01	170.66	6815.82	-1035.58	133.61	1044.10	2.59	-2.40	0.98	MWD
7573.00	89.93	171.98	6815.31	-1096.87	142.97	1106.09	2.75	-1.74	2.13	MWD
7636.00	90.27	171.73	6815.20	-1159.23	151.89	1169.09	0.67	0.54	-0.40	MWD
7700.00	90.27	171.74	6814.90	-1222.57	161.09	1233.09	0.02	0.00	0.02	MWD
7762.00	90.70	171.60	6814.37	-1283.91	170.08	1295.09	0.73	0.69	-0.23	MWD
7825.00	90.17	171.68	6813.89	-1346.24	179.24	1358.08	0.85	-0.84	0.13	MWD
7888.00	89.83	170.78	6813.89	-1408.50	188.84	1421.08	1.53	-0.54	-1.43	MWD
7951.00	90.07	171.19	6813.95	-1470.73	198.71	1484.07	0.75	0.38	0.65	MWD
8014.00	90.00	171.25	6813.91	-1532.99	208.33	1547.06	0.15	-0.11	0.10	MWD
8077.00	89.53	170.98	6814.17	-1595.23	218.06	1610.05	0.86	-0.75	-0.43	MWD
8140.00	89.63	171.08	6814.63	-1657.46	227.88	1673.04	0.22	0.16	0.16	MWD
8203.00	90.67	170.88	6814.47	-1719.68	237.76	1736.03	1.68	1.65	-0.32	MWD
8265.00	90.50	170.32	6813.83	-1780.84	247.88	1798.01	0.94	-0.27	-0.90	MWD
8328.00	90.91	170.71	6813.06	-1842.98	258.26	1860.98	0.90	0.65	0.62	MWD
8392.00	90.71	169.63	6812.15	-1906.03	269.19	1924.94	1.72	-0.31	-1.69	MWD
8454.00	91.38	171.02	6811.02	-1967.14	279.61	1986.90	2.49	1.08	2.24	MWD
8517.00	91.95	171.89	6809.19	-2029.41	288.96	2049.87	1.65	0.90	1.38	MWD
8579.00	91.51	172.48	6807.32	-2090.80	297.39	2111.85	1.19	-0.71	0.95	MWD
8642.00	90.91	172.88	6805.99	-2153.28	305.42	2174.83	1.14	-0.95	0.63	MWD
8705.00	90.23	171.64	6805.36	-2215.70	313.90	2237.82	2.24	-1.08	-1.97	MWD
8768.00	91.08	174.20	6804.64	-2278.21	321.66	2300.80	4.28	1.35	4.06	MWD
8831.00	90.87	173.57	6803.57	-2340.84	328.37	2363.76	1.05	-0.33	-1.00	MWD
8894.00	90.20	173.01	6802.98	-2403.41	335.74	2426.74	1.39	-1.06	-0.89	MWD
8958.00	89.70	172.90	6803.04	-2466.92	343.58	2490.73	0.80	-0.78	-0.17	MWD
9021.00	90.03	172.77	6803.19	-2529.43	351.44	2553.72	0.56	0.52	-0.21	MWD
9083.00	90.37	172.08	6802.97	-2590.89	359.62	2615.72	1.24	0.55	-1.11	MWD
9146.00	89.70	172.67	6802.93	-2653.33	367.97	2678.72	1.42	-1.06	0.94	MWD
9208.00	89.73	173.88	6803.24	-2714.90	375.23	2740.70	1.95	0.05	1.95	MWD
9271.00	89.40	172.91	6803.72	-2777.48	382.48	2803.68	1.63	-0.52	-1.54	MWD
9331.00	89.06	172.79	6804.52	-2837.01	389.95	2863.67	0.60	-0.57	-0.20	MWD
9394.00	89.09	172.62	6805.54	-2899.49	397.95	2926.66	0.27	0.05	-0.27	MWD
9455.00	88.93	172.51	6806.59	-2959.97	405.84	2987.64	0.32	-0.26	-0.18	MWD
9518.00	88.69	171.97	6807.90	-3022.38	414.34	3050.63	0.94	-0.38	-0.86	MWD
9581.00	89.23	172.07	6809.05	-3084.76	423.09	3113.62	0.87	0.86	0.16	MWD
9644.00	89.66	173.74	6809.66	-3147.27	430.87	3176.61	2.74	0.68	2.65	MWD
9704.00	89.70	175.89	6809.99	-3207.02	436.29	3236.53	3.58	0.07	3.58	MWD
9766.00	89.09	175.05	6810.65	-3268.82	441.19	3298.41	1.67	-0.98	-1.35	MWD
9829.00	88.89	174.11	6811.76	-3331.53	447.14	3361.34	1.53	-0.32	-1.49	MWD
9892.00	88.02	173.71	6813.46	-3394.15	453.82	3424.28	1.52	-1.38	-0.63	MWD
9955.00	87.78	173.40	6815.76	-3456.71	460.89	3487.21	0.62	-0.38	-0.49	MWD
10019.00	90.13	171.85	6816.93	-3520.16	469.10	3551.19	4.40	3.67	-2.42	MWD
10082.00	90.27	171.27	6816.71	-3582.48	478.35	3614.19	0.95	0.22	-0.92	MWD
10144.00	89.87	170.94	6816.64	-3643.73	487.93	3676.18	0.84	-0.65	-0.53	MWD
10208.00	89.97	170.76	6816.73	-3706.92	498.11	3740.17	0.32	0.16	-0.28	MWD
10271.00	89.90	170.17	6816.80	-3769.05	508.55	3803.15	0.94	-0.11	-0.94	MWD
10334.00	90.34	170.65	6816.66	-3831.17	519.04	3866.12	1.03	0.70	0.76	MWD
10396.00	90.70	170.33	6816.10	-3892.31	529.28	3928.10	0.78	0.58	-0.52	MWD
10459.00	91.21	170.51	6815.05	-3954.43	539.77	3991.06	0.86	0.81	0.29	MWD
10522.00	90.50	170.81	6814.11	-4016.58	549.99	4054.04	1.22	-1.13	0.48	MWD

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# SDI Survey Report

APR 8 2012

WV GEOLOGICAL SURVEY  
MORGANTOWN, WV

<b>Company:</b> CHESAPEAKE OPERATING, INC.	<b>Date:</b> 08/16/2010	<b>Time:</b> 09:25:07	<b>Page:</b> 4
<b>Field:</b> Upshur, WV	<b>Co-ordinate(NE) Reference:</b>	<b>Well:</b> 8H, Grid North	
<b>Site:</b> Tall Trees	<b>Vertical (TVD) Reference:</b>	SITE 1679.0	
<b>Well:</b> 8H	<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,172.00Azi)	
<b>Wellpath:</b> STK-01	<b>Survey Calculation Method:</b>	Minimum Curvature	<b>Db:</b> Sybase

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
10585.00	90.71	171.55	6813.45	-4078.83	559.65	4117.03	1.22	0.33	1.17	MWD
10647.00	90.07	171.26	6813.02	-4140.14	568.92	4179.02	1.13	-1.03	-0.47	MWD
10710.00	88.96	170.80	6813.56	-4202.36	578.74	4242.01	1.91	-1.76	-0.73	MWD
10773.00	88.59	170.14	6814.90	-4264.48	589.17	4304.97	1.20	-0.59	-1.05	MWD
10836.00	89.13	170.24	6816.16	-4326.55	599.90	4367.93	0.87	0.86	0.16	MWD
10899.00	90.13	170.84	6816.57	-4388.69	610.25	4430.91	1.85	1.59	0.95	MWD
10962.00	90.37	171.52	6816.29	-4450.94	619.91	4493.90	1.14	0.38	1.08	MWD
11025.00	90.37	172.57	6815.88	-4513.33	628.63	4556.90	1.67	0.00	1.67	MWD
11088.00	90.10	171.72	6815.62	-4575.74	637.24	4619.90	1.42	-0.43	-1.35	MWD
11151.00	90.74	172.14	6815.16	-4638.11	646.08	4682.89	1.22	1.02	0.67	MWD
11214.00	90.27	171.59	6814.61	-4700.48	655.00	4745.89	1.15	-0.75	-0.87	MWD
11278.00	89.46	170.98	6814.76	-4763.74	664.70	4809.88	1.58	-1.27	-0.95	MWD
11341.00	89.30	170.26	6815.44	-4825.89	674.96	4872.86	1.17	-0.25	-1.14	MWD
11403.00	90.17	171.31	6815.73	-4887.09	684.89	4934.85	2.20	1.40	1.69	MWD
11465.00	89.36	170.75	6815.98	-4948.33	694.56	4996.84	1.59	-1.31	-0.90	MWD
11528.00	89.56	170.23	6816.58	-5010.46	704.97	5059.81	0.88	0.32	-0.83	MWD
11591.00	89.06	170.08	6817.33	-5072.53	715.74	5122.77	0.83	-0.79	-0.24	MWD
11654.00	89.40	170.17	6818.18	-5134.59	726.54	5185.73	0.56	0.54	0.14	MWD
11718.00	88.49	169.81	6819.36	-5197.60	737.66	5249.68	1.53	-1.42	-0.56	MWD
11781.00	88.05	169.86	6821.26	-5259.59	748.78	5312.61	0.70	-0.70	0.08	MWD
11829.00	87.95	169.90	6822.94	-5306.81	757.20	5360.55	0.22	-0.21	0.08	MWD
11887.00	87.95	169.90	6825.01	-5363.87	767.37	5418.47	0.00	0.00	0.00	Projection to TD

**Annotation**

MD ft	TVD ft	
6256.00	6251.65	STK KOP
11887.00	6825.01	Projection to TD

# SDI

## Survey Report - Geographic

APR 8 2012

WV GEOLOGICAL SURVEY

<b>Company:</b> CHESAPEAKE OPERATING, INC.	<b>Date:</b> 08/16/2010	<b>Time:</b> 09:24:06	<b>Page:</b> 1
<b>Field:</b> Upshur, WV	<b>Co-ordinate(NE) Reference:</b> Well: 8H, Grid North		
<b>Site:</b> Tall Trees	<b>Vertical (TVD) Reference:</b> SITE 1679.0		
<b>Well:</b> 8H	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,172.00Azi)		
<b>Wellpath:</b> STK-01	<b>Survey Calculation Method:</b> Minimum Curvature	<b>Db:</b> Sybase	

<b>Field:</b> Upshur, WV	
<b>Map System:</b> US State Plane Coordinate System 1927	<b>Map Zone:</b> West Virginia, Southern Zone
<b>Geo Datum:</b> NAD27 (Clarke 1866)	<b>Coordinate System:</b> Well Centre
<b>Sys Datum:</b> Mean Sea Level	<b>Geomagnetic Model:</b> IGRF2010

<b>Site:</b> Tall Trees			
<b>Site Position:</b>	<b>Northing:</b> 653502.70 ft	<b>Latitude:</b> 38 47 34.283 N	
<b>From: Map</b>	<b>Easting:</b> 2185868.70 ft	<b>Longitude:</b> 80 20 52.460 W	
<b>Position Uncertainty:</b> 0.00 ft		<b>North Reference:</b> Grid	
<b>Ground Level:</b> 1664.00 ft		<b>Grid Convergence:</b> 0.40 deg	

<b>Well:</b> 8H		<b>Slot Name:</b>	
<b>Well Position:</b>	<b>+N/-S</b> 0.00 ft	<b>Northing:</b> 653502.70 ft	<b>Latitude:</b> 38 47 34.283 N
	<b>+E/-W</b> 0.00 ft	<b>Easting:</b> 2185868.70 ft	<b>Longitude:</b> 80 20 52.460 W
<b>Position Uncertainty:</b> 0.00 ft			

<b>Wellpath:</b> STK-01		<b>Drilled From:</b> OH	
<b>Current Datum:</b> SITE	<b>Height</b> 1679.00 ft	<b>Tie-on Depth:</b> 9077.00 ft	
<b>Magnetic Data:</b> 08/10/2010		<b>Above System Datum:</b> Mean Sea Level	
<b>Field Strength:</b> 52469 nT		<b>Declination:</b> -8.51 deg	
<b>Vertical Section:</b> Depth From (TVD)	<b>+N/-S</b>	<b>Mag Dip Angle:</b> 66.73 deg	
ft	ft	<b>+E/-W</b>	<b>Direction</b>
		ft	deg
0.00	0.00	0.00	172.00

<b>Survey Program for Definitive Wellpath</b>				
<b>Date:</b> 08/16/2010	<b>Validated:</b> No	<b>Version:</b> 3		
<b>Actual From</b> ft	<b>To</b> ft	<b>Survey</b>	<b>Toolcode</b>	<b>Tool Name</b>
0.00	5800.00	Survey #1 (0.00-6417.00) (0)	NS-GYRO-MS	North sensing gyrocompassing m
5800.00	11887.00	Survey #2 (5800.00-11887.00)	MWD	MWD - SDI

Survey													
MD	Incl	Azim	TVD	+N/-S	+E/-W	Map	Map	<--- Latitude --->			<--- Longitude --->		
ft	deg	deg	ft	ft	ft	Northing	Easting	Deg	Min	Sec	Deg	Min	Sec
						ft	ft						
0.00	0.00	0.00	0.00	0.00	0.00	653502.70	2185868.70	38	47	34.283 N	80	20	52.460 W
200.00	0.25	217.30	200.00	-0.35	-0.26	653502.35	2185868.44	38	47	34.280 N	80	20	52.463 W
400.00	0.25	45.23	400.00	-0.39	-0.22	653502.31	2185868.48	38	47	34.280 N	80	20	52.463 W
600.00	0.25	307.16	600.00	0.18	-0.26	653502.88	2185868.44	38	47	34.285 N	80	20	52.463 W
800.00	0.50	74.08	800.00	0.69	0.23	653503.39	2185868.93	38	47	34.290 N	80	20	52.457 W
1000.00	0.25	296.01	999.99	1.12	0.68	653503.82	2185869.38	38	47	34.294 N	80	20	52.451 W
1200.00	0.25	352.93	1199.99	1.74	0.24	653504.44	2185868.94	38	47	34.301 N	80	20	52.457 W
1400.00	0.25	336.86	1399.99	2.58	0.01	653505.28	2185868.71	38	47	34.309 N	80	20	52.460 W
1600.00	0.25	2.79	1599.99	3.41	-0.14	653506.11	2185868.56	38	47	34.317 N	80	20	52.461 W
1800.00	0.50	133.71	1799.99	3.25	0.51	653505.95	2185869.21	38	47	34.315 N	80	20	52.453 W
2000.00	0.50	154.64	1999.98	1.85	1.52	653504.55	2185870.22	38	47	34.302 N	80	20	52.441 W
2200.00	0.25	353.56	2199.98	1.50	1.84	653504.20	2185870.54	38	47	34.298 N	80	20	52.436 W
2400.00	0.50	204.49	2399.97	1.14	1.43	653503.84	2185870.13	38	47	34.295 N	80	20	52.442 W
2600.00	0.50	233.12	2599.97	-0.18	0.37	653502.52	2185869.07	38	47	34.282 N	80	20	52.455 W
2800.00	0.50	168.05	2799.96	-1.56	-0.15	653501.14	2185868.55	38	47	34.268 N	80	20	52.462 W
3000.00	0.50	170.97	2999.95	-3.27	0.17	653499.43	2185868.87	38	47	34.251 N	80	20	52.458 W
3200.00	0.50	250.90	3199.95	-4.42	-0.52	653498.28	2185868.18	38	47	34.240 N	80	20	52.467 W
3400.00	0.50	219.83	3399.94	-5.38	-1.90	653497.32	2185866.80	38	47	34.230 N	80	20	52.484 W
3600.00	0.50	215.75	3599.93	-6.75	-2.97	653495.95	2185865.73	38	47	34.217 N	80	20	52.498 W
3800.00	0.25	165.68	3799.93	-7.88	-3.37	653494.82	2185865.33	38	47	34.206 N	80	20	52.503 W
4000.00	0.50	275.60	3999.93	-8.22	-4.13	653494.48	2185864.57	38	47	34.202 N	80	20	52.513 W

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## Survey Report - Geographic

<b>Company:</b> CHESAPEAKE OPERATING, INC.	<b>Date:</b> 08/16/2010	<b>Time:</b> 09:24:06	<b>Page:</b> 2
<b>Field:</b> Upshur, WV	<b>Co-ordinate(NE) Reference:</b>	<b>Well:</b> 8H, Grid North	
<b>Site:</b> Tall Trees	<b>Vertical (TVD) Reference:</b>	SITE 1679.0	
<b>Well:</b> 8H	<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,172.00Azi)	
<b>Wellpath:</b> STK-01	<b>Survey Calculation Method:</b>	Minimum Curvature	<b>Db:</b> Sybase

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	Latitude			Longitude				
								Deg	Min	Sec	Deg	Min	Sec		
4200.00	0.50	252.53	4199.92	-8.40	-5.83	653494.30	2185862.87	38	47	34.201	N	80	20	52.534	W
4400.00	0.75	265.46	4399.91	-8.76	-7.97	653493.94	2185860.73	38	47	34.197	N	80	20	52.561	W
4600.00	1.00	254.39	4599.88	-9.34	-10.95	653493.36	2185857.75	38	47	34.192	N	80	20	52.599	W
4800.00	0.75	273.33	4799.86	-9.73	-13.94	653492.97	2185854.76	38	47	34.188	N	80	20	52.637	W
5000.00	1.00	342.26	4999.84	-7.99	-15.78	653494.71	2185852.92	38	47	34.206	N	80	20	52.660	W
5200.00	0.75	291.20	5199.82	-5.86	-17.53	653496.84	2185851.17	38	47	34.227	N	80	20	52.682	W
5400.00	1.00	355.14	5399.80	-3.64	-18.90	653499.06	2185849.80	38	47	34.249	N	80	20	52.699	W
5600.00	0.50	291.08	5599.79	-1.59	-19.86	653501.11	2185848.84	38	47	34.269	N	80	20	52.711	W
5800.00	0.25	77.02	5799.78	-1.18	-20.25	653501.52	2185848.45	38	47	34.273	N	80	20	52.716	W
5887.00	0.29	49.54	5886.78	-0.99	-19.90	653501.71	2185848.80	38	47	34.275	N	80	20	52.711	W
5948.00	0.38	133.12	5947.78	-1.03	-19.64	653501.67	2185849.06	38	47	34.275	N	80	20	52.708	W
5980.00	2.47	166.47	5979.77	-1.78	-19.40	653500.92	2185849.30	38	47	34.267	N	80	20	52.705	W
6011.00	5.48	170.51	6010.69	-3.89	-19.00	653498.81	2185849.70	38	47	34.246	N	80	20	52.700	W
6043.00	5.95	170.37	6042.53	-7.03	-18.47	653495.67	2185850.23	38	47	34.215	N	80	20	52.694	W
6074.00	5.74	167.88	6073.37	-10.13	-17.87	653492.57	2185850.83	38	47	34.185	N	80	20	52.686	W
6105.00	5.37	165.75	6104.23	-13.05	-17.19	653489.65	2185851.51	38	47	34.156	N	80	20	52.678	W
6137.00	7.82	165.13	6136.01	-16.61	-16.26	653486.09	2185852.44	38	47	34.120	N	80	20	52.667	W
6168.00	11.31	168.04	6166.58	-21.62	-15.09	653481.08	2185853.61	38	47	34.071	N	80	20	52.652	W
6200.00	13.83	169.93	6197.81	-28.46	-13.77	653474.24	2185854.93	38	47	34.003	N	80	20	52.636	W
6231.00	16.19	170.37	6227.75	-36.37	-12.40	653466.33	2185856.30	38	47	33.925	N	80	20	52.620	W
6256.00	17.88	170.60	6251.65	-43.59	-11.19	653459.11	2185857.51	38	47	33.853	N	80	20	52.605	W
6262.00	18.28	170.65	6257.35	-45.42	-10.89	653457.28	2185857.81	38	47	33.835	N	80	20	52.601	W
6293.00	20.23	170.33	6286.62	-55.51	-9.20	653447.19	2185859.50	38	47	33.735	N	80	20	52.581	W
6325.00	21.86	170.44	6316.48	-66.84	-7.28	653435.86	2185861.42	38	47	33.623	N	80	20	52.558	W
6357.00	24.19	170.96	6345.93	-79.19	-5.26	653423.51	2185863.44	38	47	33.501	N	80	20	52.533	W
6388.00	26.49	170.98	6373.95	-92.29	-3.18	653410.41	2185865.52	38	47	33.371	N	80	20	52.508	W
6419.00	28.34	171.58	6401.47	-106.40	-1.01	653396.30	2185867.69	38	47	33.232	N	80	20	52.482	W
6450.00	30.68	171.11	6428.44	-121.49	1.29	653381.21	2185869.99	38	47	33.082	N	80	20	52.454	W
6481.00	32.91	170.82	6454.79	-137.62	3.85	653365.08	2185872.55	38	47	32.923	N	80	20	52.423	W
6513.00	35.44	171.02	6481.26	-155.37	6.69	653347.33	2185875.39	38	47	32.747	N	80	20	52.389	W
6544.00	37.88	170.99	6506.13	-173.65	9.58	653329.05	2185878.28	38	47	32.566	N	80	20	52.354	W
6576.00	40.31	171.12	6530.96	-193.58	12.72	653309.12	2185881.42	38	47	32.369	N	80	20	52.316	W
6608.00	42.21	171.88	6555.01	-214.45	15.83	653288.25	2185884.53	38	47	32.163	N	80	20	52.279	W
6640.00	44.50	172.34	6578.28	-236.21	18.85	653266.49	2185887.55	38	47	31.947	N	80	20	52.243	W
6672.00	47.31	172.76	6600.55	-259.00	21.82	653243.70	2185890.52	38	47	31.722	N	80	20	52.207	W
6703.00	49.65	172.61	6621.09	-282.02	24.78	653220.68	2185893.48	38	47	31.494	N	80	20	52.172	W
6734.00	51.99	172.69	6640.68	-305.85	27.85	653196.85	2185896.55	38	47	31.258	N	80	20	52.135	W
6766.00	54.20	172.76	6659.89	-331.23	31.09	653171.47	2185899.79	38	47	31.007	N	80	20	52.097	W
6797.00	56.66	172.92	6677.48	-356.56	34.27	653146.14	2185902.97	38	47	30.757	N	80	20	52.059	W
6829.00	59.11	172.63	6694.49	-383.44	37.68	653119.26	2185906.38	38	47	30.491	N	80	20	52.018	W
6860.00	61.63	172.56	6709.82	-410.16	41.16	653092.54	2185909.86	38	47	30.226	N	80	20	51.977	W
6891.00	63.21	172.41	6724.17	-437.40	44.75	653065.30	2185913.45	38	47	29.957	N	80	20	51.934	W
6923.00	65.03	172.09	6738.13	-465.93	48.63	653036.77	2185917.33	38	47	29.675	N	80	20	51.887	W
6955.00	67.64	171.70	6750.98	-494.94	52.77	653007.76	2185921.47	38	47	29.388	N	80	20	51.837	W
6986.00	69.83	171.67	6762.22	-523.53	56.94	652979.17	2185925.64	38	47	29.105	N	80	20	51.787	W
7018.00	70.69	171.53	6773.03	-553.32	61.34	652949.38	2185930.04	38	47	28.810	N	80	20	51.734	W
7049.00	72.63	171.70	6782.78	-582.43	65.63	652920.27	2185934.33	38	47	28.522	N	80	20	51.683	W
7081.00	75.42	172.24	6791.59	-612.89	69.93	652889.81	2185938.63	38	47	28.220	N	80	20	51.631	W
7102.00	77.07	172.80	6796.58	-633.11	72.59	652869.59	2185941.29	38	47	28.020	N	80	20	51.599	W
7133.00	79.21	173.14	6802.95	-663.22	76.30	652839.48	2185945.00	38	47	27.722	N	80	20	51.555	W
7164.00	81.30	173.17	6808.20	-693.56	79.94	652809.14	2185948.64	38	47	27.422	N	80	20	51.512	W
7196.00	82.69	172.80	6812.66	-725.01	83.81	652777.69	2185952.51	38	47	27.111	N	80	20	51.466	W
7227.00	84.61	172.03	6816.08	-755.54	87.88	652747.16	2185956.58	38	47	26.809	N	80	20	51.417	W

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# SDI

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## Survey Report - Geographic

WV GEOLOGICAL SURVEY  
INDEPENDENCE, WV

Company: CHESAPEAKE OPERATING, INC.  
Field: Upshur, WV  
Site: Tall Trees  
Well: 8H  
Wellpath: STK-01

Date: 08/16/2010 Time: 09:24:06 Page: 3  
Co-ordinate(NE) Reference: Well: 8H, Grid North  
Vertical (TVD) Reference: SITE 1679.0  
Section (VS) Reference: Well (0.00N,0.00E,172.00Azi)  
Survey Calculation Method: Minimum Curvature Db: Sybase

### Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	Latitude		Longitude	
								Deg	Min Sec	Deg	Min Sec
7259.00	86.13	171.98	6818.67	-787.13	92.31	652715.57	2185961.01	38 47	26.497 N	80 20	51.364 W
7291.00	88.25	171.73	6820.24	-818.77	96.84	652683.93	2185965.54	38 47	26.184 N	80 20	51.310 W
7322.00	89.93	170.59	6820.73	-849.39	101.60	652653.31	2185970.30	38 47	25.881 N	80 20	51.252 W
7354.00	91.01	170.21	6820.47	-880.94	106.94	652621.76	2185975.64	38 47	25.568 N	80 20	51.188 W
7385.00	91.28	170.15	6819.85	-911.48	112.23	652591.22	2185980.93	38 47	25.266 N	80 20	51.124 W
7448.00	92.52	170.04	6817.76	-973.51	123.06	652529.19	2185991.76	38 47	24.652 N	80 20	50.992 W
7511.00	91.01	170.66	6815.82	-1035.58	133.61	652467.12	2186002.31	38 47	24.038 N	80 20	50.864 W
7573.00	89.93	171.98	6815.31	-1096.87	142.97	652405.83	2186011.67	38 47	23.431 N	80 20	50.752 W
7636.00	90.27	171.73	6815.20	-1159.23	151.89	652343.47	2186020.59	38 47	22.814 N	80 20	50.645 W
7700.00	90.27	171.74	6814.90	-1222.57	161.09	652280.13	2186029.79	38 47	22.188 N	80 20	50.534 W
7762.00	90.70	171.60	6814.37	-1283.91	170.08	652218.79	2186038.78	38 47	21.581 N	80 20	50.426 W
7825.00	90.17	171.68	6813.89	-1346.24	179.24	652156.46	2186047.94	38 47	20.964 N	80 20	50.316 W
7888.00	89.83	170.78	6813.89	-1408.50	188.84	652094.20	2186057.54	38 47	20.348 N	80 20	50.200 W
7951.00	90.07	171.19	6813.95	-1470.73	198.71	652031.97	2186067.41	38 47	19.732 N	80 20	50.081 W
8014.00	90.00	171.25	6813.91	-1532.99	208.33	651969.71	2186077.03	38 47	19.116 N	80 20	49.965 W
8077.00	89.53	170.98	6814.17	-1595.23	218.06	651907.47	2186086.76	38 47	18.500 N	80 20	49.848 W
8140.00	89.63	171.08	6814.63	-1657.46	227.88	651845.24	2186096.58	38 47	17.884 N	80 20	49.729 W
8203.00	90.67	170.88	6814.47	-1719.68	237.76	651783.02	2186106.46	38 47	17.269 N	80 20	49.610 W
8265.00	90.50	170.32	6813.83	-1780.84	247.88	651721.86	2186116.58	38 47	16.663 N	80 20	49.488 W
8328.00	90.91	170.71	6813.06	-1842.98	258.26	651659.72	2186126.96	38 47	16.049 N	80 20	49.362 W
8392.00	90.71	169.63	6812.15	-1906.03	269.19	651596.67	2186137.89	38 47	15.424 N	80 20	49.230 W
8454.00	91.38	171.02	6811.02	-1967.14	279.61	651535.56	2186148.31	38 47	14.820 N	80 20	49.104 W
8517.00	91.95	171.89	6809.19	-2029.41	288.96	651473.29	2186157.66	38 47	14.204 N	80 20	48.991 W
8579.00	91.51	172.48	6807.32	-2090.80	297.39	651411.90	2186166.09	38 47	13.596 N	80 20	48.890 W
8642.00	90.91	172.88	6805.99	-2153.28	305.42	651349.42	2186174.12	38 47	12.978 N	80 20	48.794 W
8705.00	90.23	171.64	6805.36	-2215.70	313.90	651287.00	2186182.60	38 47	12.360 N	80 20	48.693 W
8768.00	91.08	174.20	6804.64	-2278.21	321.66	651224.49	2186190.36	38 47	11.742 N	80 20	48.600 W
8831.00	90.87	173.57	6803.57	-2340.84	328.37	651161.86	2186197.07	38 47	11.122 N	80 20	48.521 W
8894.00	90.20	173.01	6802.98	-2403.41	335.74	651099.29	2186204.44	38 47	10.504 N	80 20	48.434 W
8958.00	89.70	172.90	6803.04	-2466.92	343.58	651035.78	2186212.28	38 47	9.875 N	80 20	48.340 W
9021.00	90.03	172.77	6803.19	-2529.43	351.44	650973.27	2186220.14	38 47	9.257 N	80 20	48.246 W
9083.00	90.37	172.08	6802.97	-2590.89	359.62	650911.81	2186228.32	38 47	8.649 N	80 20	48.149 W
9146.00	89.70	172.67	6802.93	-2653.33	367.97	650849.37	2186236.67	38 47	8.031 N	80 20	48.049 W
9208.00	89.73	173.88	6803.24	-2714.90	375.23	650787.80	2186243.93	38 47	7.422 N	80 20	47.962 W
9271.00	89.40	172.91	6803.72	-2777.48	382.48	650725.22	2186251.18	38 47	6.803 N	80 20	47.877 W
9331.00	89.06	172.79	6804.52	-2837.01	389.95	650665.69	2186258.65	38 47	6.214 N	80 20	47.788 W
9394.00	89.09	172.62	6805.54	-2899.49	397.95	650603.21	2186266.65	38 47	5.596 N	80 20	47.692 W
9455.00	88.93	172.51	6806.59	-2959.97	405.84	650542.73	2186274.54	38 47	4.997 N	80 20	47.598 W
9518.00	88.69	171.97	6807.90	-3022.38	414.34	650480.32	2186283.04	38 47	4.380 N	80 20	47.496 W
9581.00	89.23	172.07	6809.05	-3084.76	423.09	650417.94	2186291.79	38 47	3.763 N	80 20	47.391 W
9644.00	89.66	173.74	6809.66	-3147.27	430.87	650355.43	2186299.57	38 47	3.144 N	80 20	47.298 W
9704.00	89.70	175.89	6809.99	-3207.02	436.29	650295.68	2186304.99	38 47	2.553 N	80 20	47.235 W
9766.00	89.09	175.05	6810.65	-3268.82	441.19	650233.88	2186309.89	38 47	1.942 N	80 20	47.179 W
9829.00	88.89	174.11	6811.76	-3331.53	447.14	650171.17	2186315.84	38 47	1.322 N	80 20	47.109 W
9892.00	88.02	173.71	6813.46	-3394.15	453.82	650108.55	2186322.52	38 47	0.702 N	80 20	47.031 W
9955.00	87.78	173.40	6815.76	-3456.71	460.89	650045.99	2186329.59	38 47	0.083 N	80 20	46.947 W
10019.00	90.13	171.85	6816.93	-3520.16	469.10	649982.54	2186337.80	38 46	59.456 N	80 20	46.849 W
10082.00	90.27	171.27	6816.71	-3582.48	478.35	649920.22	2186347.05	38 46	58.839 N	80 20	46.738 W
10144.00	89.87	170.94	6816.64	-3643.73	487.93	649858.97	2186356.63	38 46	58.233 N	80 20	46.622 W
10208.00	89.97	170.76	6816.73	-3706.92	498.11	649795.78	2186366.81	38 46	57.608 N	80 20	46.499 W
10271.00	89.90	170.17	6816.80	-3769.05	508.55	649733.65	2186377.25	38 46	56.993 N	80 20	46.373 W
10334.00	90.34	170.65	6816.66	-3831.17	519.04	649671.53	2186387.74	38 46	56.378 N	80 20	46.246 W

# SDI

## Survey Report - Geographic

<b>Company:</b> CHESAPEAKE OPERATING, INC.	<b>Date:</b> 08/16/2010	<b>Time:</b> 09:24:06	<b>Page:</b> 4
<b>Field:</b> Upshur, WV	<b>Co-ordinate(NE) Reference:</b>	<b>Well:</b> 8H, Grid North	
<b>Site:</b> Tall Trees	<b>Vertical (TVD) Reference:</b>	SITE 1679.0	
<b>Well:</b> 8H	<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,172.00Azi)	
<b>Wellpath:</b> STK-01	<b>Survey Calculation Method:</b>	Minimum Curvature	<b>Db:</b> Sybase

**Survey**

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<--- Latitude --->			<--- Longitude --->		
								Deg	Min	Sec	Deg	Min	Sec
10396.00	90.70	170.33	6816.10	-3892.31	529.28	649610.39	2186397.98	38	46	55.773 N	80	20	46.122 W
10459.00	91.21	170.51	6815.05	-3954.43	539.77	649548.27	2186408.47	38	46	55.158 N	80	20	45.995 W
10522.00	90.50	170.81	6814.11	-4016.58	549.99	649486.12	2186418.69	38	46	54.543 N	80	20	45.872 W
10585.00	90.71	171.55	6813.45	-4078.83	559.65	649423.87	2186428.35	38	46	53.927 N	80	20	45.755 W
10647.00	90.07	171.26	6813.02	-4140.14	568.92	649362.56	2186437.62	38	46	53.320 N	80	20	45.644 W
10710.00	88.96	170.80	6813.56	-4202.36	578.74	649300.34	2186447.44	38	46	52.705 N	80	20	45.525 W
10773.00	88.59	170.14	6814.90	-4264.48	589.17	649238.22	2186457.87	38	46	52.090 N	80	20	45.399 W
10836.00	89.13	170.24	6816.16	-4326.55	599.90	649176.15	2186468.60	38	46	51.476 N	80	20	45.269 W
10899.00	90.13	170.84	6816.57	-4388.69	610.25	649114.01	2186478.95	38	46	50.861 N	80	20	45.144 W
10962.00	90.37	171.52	6816.29	-4450.94	619.91	649051.76	2186488.61	38	46	50.245 N	80	20	45.027 W
11025.00	90.37	172.57	6815.88	-4513.33	628.63	648989.37	2186497.33	38	46	49.627 N	80	20	44.923 W
11088.00	90.10	171.72	6815.62	-4575.74	637.24	648926.96	2186505.94	38	46	49.010 N	80	20	44.820 W
11151.00	90.74	172.14	6815.16	-4638.11	646.08	648864.59	2186514.78	38	46	48.393 N	80	20	44.714 W
11214.00	90.27	171.59	6814.61	-4700.48	655.00	648802.22	2186523.70	38	46	47.776 N	80	20	44.607 W
11278.00	89.46	170.98	6814.76	-4763.74	664.70	648738.96	2186533.40	38	46	47.150 N	80	20	44.490 W
11341.00	89.30	170.26	6815.44	-4825.89	674.96	648676.81	2186543.66	38	46	46.535 N	80	20	44.366 W
11403.00	90.17	171.31	6815.73	-4887.09	684.89	648615.61	2186553.59	38	46	45.929 N	80	20	44.246 W
11465.00	89.36	170.75	6815.98	-4948.33	694.56	648554.37	2186563.26	38	46	45.323 N	80	20	44.129 W
11528.00	89.56	170.23	6816.58	-5010.46	704.97	648492.24	2186573.67	38	46	44.708 N	80	20	44.003 W
11591.00	89.06	170.08	6817.33	-5072.53	715.74	648430.17	2186584.44	38	46	44.094 N	80	20	43.873 W
11654.00	89.40	170.17	6818.18	-5134.59	726.54	648368.11	2186595.24	38	46	43.480 N	80	20	43.742 W
11718.00	88.49	169.81	6819.36	-5197.60	737.66	648305.10	2186606.36	38	46	42.856 N	80	20	43.607 W
11781.00	88.05	169.86	6821.26	-5259.59	748.78	648243.11	2186617.48	38	46	42.243 N	80	20	43.472 W
11829.00	87.95	169.90	6822.94	-5306.81	757.20	648195.89	2186625.90	38	46	41.775 N	80	20	43.370 W
11887.00	87.95	169.90	6825.01	-5363.87	767.37	648138.83	2186636.07	38	46	41.210 N	80	20	43.247 W

**Annotation**

MD ft	TVD ft	
6256.00	6251.65	STK KOP
11887.00	6825.01	Projection to TD

# Offset Footage Calculation

## BOBBI 15-28N-17W

RECEIVED  
APR 3 2012  
WV GEOLOGICAL SURVEY  
RESTON, VA 20192

**WELL NAME**

**Directional Movement**

**Survey Readings**  
S E/W

<b>Entry, ft</b>	Upper Reading, ft	5702	397.4	34.1
	Lower Reading, ft	5734	424.5	37
<b>Terminus, ft</b>	Upper Reading, ft	9996	4676.4	50.5
	Lower reading, ft	10059	4739.2	49

FSL	FEL
417	36

FSL	FEL
4736	49

**NW-SW Pattern:**

NW (X,Y)	SW(X,Y)	SHL Footage		Terminus Perforation		Bottom Hole		N-S Footage
		FNL	FWL	South	E+/W-	South	E+/W-	
X	Y	X	Y	South	E+/W-	South	E+/W-	

**Case I, Positive Offset**

**Slope #DIV/0!**

Entry	#DIV/0!	Offset, ft		Bottom
		Terminus	#DIV/0!	
Entry Perforation	Terminus Perforation	Bottom Hole		
FNL	FWL	FSL	FWL	FSL
0	#DIV/0!	0	#DIV/0!	0

**NE-SE Pattern:**

NE (X,Y)	SE(X,Y)	SHL Footage		Terminus Perforation		Bottom Hole		N-S Footage
		FNL	FWL	South	E-/W+	South	E-/W+	
X	Y	X	Y	South <th>E-/W+</th> <td>South <th>E-/W+</th> <td></td> </td>	E-/W+	South <th>E-/W+</th> <td></td>	E-/W+	
1705884	698220	1705827	692943	417	36	4736	47	5278

**Case I, Positive Offset**

**Slope -0.010802**

Entry	#DIV/0!	Offset, ft		Bottom
		Terminus	#DIV/0!	
Entry Perforation	Terminus Perforation	Bottom Hole		
FNL	FWL	FSL	FWL	FSL
617	1681	342	1648	232

# Offset Footage Calculation

**WELL NAME**

**BOBBI 15-28N-17W**

Survey Readings  
S E/W

Directional Movement

<b>Entry, ft</b>	Upper Reading, ft	5725	5702	397.4	34.1
	Lower Reading, ft	5734	424.5	37	

FSL	FEL
417	36

<b>Terminus,ft</b>	Upper Reading, ft	10056	9996	4676.4	50.5
	Lower reading, ft	10059	4739.2	49	

FSL	FEL
4736	49

RECEIVED  
APR 8 2012  
WV GEOLOGICAL SURVEY  
NORTH CHARLOTTE, WV

**NW-SW Pattern:**

NW (X,Y)	Y	X	SW(X,Y)		SHL Footage		Terminus Perforation		Bottom Hole		N-S Footage
			Y	X	FNL	FWL	South	E+/W-	South	E+/W-	
X											

**Case I, Positive Offset**

Slope #DIV/0!

		Offset, ft	
Entry	Terminus	Bottom	
#DIV/0!	#DIV/0!	#DIV/0!	
Entry Perforation	Terminus Perforation	Bottom Hole	
FNL	FWL	FSL	FWL
0	#DIV/0!	0	#DIV/0!

**NE-SE Pattern:**

NE (X,Y)	Y	X	SE(X,Y)		SHL Footage		Terminus Perforation		Bottom Hole		N-S Footage
			Y	X	FNL	FWL	South	E-/W+	South	E-/W+	
X											
1705884	698220	1705827	692943	200	1650	417	36	4736	49	4846	47
											5278

**Case I, Positive Offset**

Slope -0.010802

		Offset, ft	
Entry	Terminus	Bottom	
-5	-51	-52	
Entry Perforation	Terminus Perforation	Bottom Hole	
FNL	FEL	FSL	FEL
617	1681	342	1648
			232
			1645