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Cathedral Energy Services
Survey Report

AUG 30 2013

WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Company:	Chesapeake Energy Corp	Local Co-ordinate Reference:	Well: George Gantzer OHI 1H
Project:	Ohio County, WV	TMV Reference:	WELL @ 1262.0usft (Nomac 37)
Site:	George Gantzer OHI Pad	W.D Reference:	WELL @ 1262.0usft (Nomac 37)
Well:	George Gantzer OHI 1H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project:	Ohio County, 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		Using geodetic scale factor

Site:	George Gantzer OHI Pad				
Site Position:		Northing:	564,648.81 usft	Latitude:	40.045074
From:	Lat/Long	Easting:	1,691,907.90 usft	Longitude:	-80.600447
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-0.70 °

Well:	George Gantzer OHI 1H					
Well Position	+N/-S	0.0 usft	Northing:	564,648.80 usft	Latitude:	40.045074
	+E/-W	0.0 usft	Easting:	1,691,907.90 usft	Longitude:	-80.600447
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,244.0 usft

Wellbore:	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (mT)
	IGRF2010	4/9/2013	-8.73	67.49	52,799

Design:	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	323.32	

Survey Program	Date: 5/7/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	550.0	Surface Gyro (Hz)	Gyro	Gyro
659.0	13,236.0	Survey #2 (Hz)	MWD	Geolink MWD

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (%/100usft)	Build Rate (%/100)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.09	87.36	100.0	0.0	0.1	0.0	0.09	0.09	
200.0	0.10	324.11	200.0	0.1	0.1	0.0	0.17	0.01	
300.0	0.13	345.45	300.0	0.3	0.0	0.2	0.05	0.03	
400.0	0.14	28.84	400.0	0.5	0.1	0.3	0.10	0.01	
500.0	0.15	44.82	500.0	0.7	0.2	0.4	0.04	0.01	
550.0	0.16	43.55	550.0	0.8	0.3	0.4	0.02	0.02	Last Gyro Survey @ 550' MD
659.0	0.60	30.00	659.0	1.4	0.7	0.7	0.41	0.40	
722.0	0.40	93.90	722.0	1.6	1.1	0.7	0.88	-0.32	
785.0	1.30	81.00	785.0	1.7	2.0	0.2	1.45	1.43	
848.0	1.60	109.70	848.0	1.6	3.5	-0.9	1.23	0.48	
910.0	2.50	98.00	909.9	1.1	5.7	-2.5	1.59	1.45	

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Site	George Gantzer OHI Pad	MD Reference	Well	@ 1262.0usft (Nomac 37)
Well	George Gantzer OHI 1H	North Reference	Grid	
Wellbore	HZ	Survey Calculation Method	Minimum Curvature	
Design	FINAL	Database	USA EDM 5000 Multi Users DB	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (/100usft)	Build Rate (/1000)	Formations/Comments
974.0	3.20	115.80	973.8	0.1	8.7	-5.1	1.75	1.09	
1,036.0	4.40	125.10	1,035.7	-2.0	12.2	-8.9	2.17	1.94	
1,099.0	5.50	124.40	1,098.5	-5.1	16.7	-14.0	1.75	1.75	
1,161.0	6.60	130.40	1,160.1	-9.1	21.8	-20.3	2.04	1.77	
1,223.0	7.30	138.10	1,221.7	-14.3	27.2	-27.7	1.88	1.13	
1,284.0	7.10	145.10	1,282.2	-20.3	31.9	-35.4	1.47	-0.33	
1,348.0	7.60	149.70	1,345.7	-27.2	36.3	-43.5	1.21	0.78	
1,410.0	7.90	157.50	1,407.1	-34.7	40.0	-51.7	1.76	0.48	
1,473.0	8.00	166.30	1,469.5	-42.9	42.7	-60.0	1.94	0.16	
1,535.0	7.70	168.50	1,530.9	-51.2	44.5	-67.7	0.68	-0.48	
1,599.0	7.50	173.60	1,594.4	-59.6	45.9	-75.2	1.10	-0.31	
1,662.0	7.20	181.20	1,656.8	-67.6	46.2	-81.8	1.61	-0.48	
1,725.0	6.10	193.50	1,719.4	-74.8	45.4	-87.1	2.85	-1.75	
1,788.0	4.90	199.70	1,782.1	-80.6	43.7	-90.7	2.12	-1.90	
1,852.0	3.80	203.30	1,845.9	-85.1	41.9	-93.3	1.77	-1.72	
1,914.0	2.60	205.60	1,907.8	-88.3	40.5	-95.0	1.95	-1.94	
1,977.0	1.90	215.90	1,970.8	-90.4	39.3	-96.0	1.28	-1.11	
2,039.0	1.90	219.60	2,032.8	-92.0	38.0	-96.5	0.20	0.00	
2,065.0	1.90	219.30	2,058.7	-92.7	37.5	-96.7	0.04	0.00	
2,180.0	1.40	218.80	2,173.7	-95.3	35.4	-97.5	0.43	-0.43	
2,305.0	1.00	245.90	2,298.7	-96.9	33.4	-97.7	0.55	-0.32	
2,428.0	0.40	269.40	2,421.7	-97.3	32.0	-97.2	0.53	-0.49	
2,554.0	0.40	305.60	2,547.7	-97.1	31.2	-96.5	0.20	0.00	
3,054.0	0.60	329.70	3,047.6	-93.8	28.5	-92.3	0.06	0.04	
3,432.0	0.20	309.20	3,425.6	-91.7	27.0	-89.6	0.11	-0.11	
3,494.0	0.70	276.50	3,487.6	-91.6	26.5	-89.3	0.88	0.81	
3,557.0	0.50	275.20	3,550.6	-91.5	25.9	-88.8	0.32	-0.32	
3,618.0	0.40	278.30	3,611.6	-91.4	25.4	-88.5	0.17	-0.16	
3,680.0	0.20	278.60	3,673.6	-91.4	25.1	-88.3	0.32	-0.32	
3,742.0	0.40	267.90	3,735.6	-91.4	24.7	-88.1	0.33	0.32	
3,806.0	0.40	321.20	3,799.6	-91.2	24.4	-87.7	0.56	0.00	
3,867.0	0.40	11.30	3,860.6	-90.9	24.3	-87.4	0.56	0.00	
3,929.0	0.40	323.00	3,922.6	-90.5	24.2	-87.0	0.53	0.00	
4,115.0	0.70	310.70	4,108.6	-89.2	22.9	-85.3	0.17	0.16	
4,240.0	0.60	296.20	4,233.6	-88.4	21.8	-83.9	0.15	-0.08	
4,365.0	0.20	324.80	4,358.6	-88.0	21.1	-83.1	0.35	-0.32	
4,491.0	0.50	337.90	4,484.6	-87.3	20.7	-82.4	0.24	0.24	
4,615.0	0.20	354.30	4,608.6	-86.5	20.5	-81.7	0.25	-0.24	
4,740.0	0.00	212.30	4,733.6	-86.3	20.5	-81.5	0.16	-0.16	
4,866.0	0.40	251.80	4,859.6	-86.5	20.1	-81.3	0.32	0.32	
4,993.0	0.20	13.30	4,986.6	-86.4	19.7	-81.1	0.42	-0.16	
5,118.0	0.20	171.00	5,111.6	-86.4	19.8	-81.1	0.31	0.00	
5,243.0	0.80	288.90	5,236.6	-86.3	19.0	-80.6	0.73	0.48	
5,366.0	0.40	311.70	5,359.6	-85.8	17.9	-79.4	0.37	-0.33	
5,491.0	0.10	301.00	5,484.6	-85.4	17.4	-78.9	0.24	-0.24	
5,618.0	0.40	179.90	5,611.6	-85.8	17.3	-79.2	0.36	0.24	
5,659.0	0.40	243.80	5,652.6	-86.0	17.2	-79.3	1.03	0.00	
5,698.0	0.60	244.70	5,691.6	-86.2	16.9	-79.2	0.51	0.51	
5,730.0	2.40	230.20	5,723.6	-86.7	16.2	-79.2	5.70	5.63	
5,762.0	3.90	235.70	5,755.5	-87.7	14.8	-79.2	4.78	4.69	
5,793.0	5.90	244.20	5,786.4	-89.0	12.5	-78.8	6.85	6.45	
5,824.0	7.60	245.50	5,817.2	-90.5	9.2	-78.1	5.51	5.48	
5,856.0	9.40	244.90	5,848.8	-92.5	4.9	-77.1	5.63	5.63	



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Site	George Gantzer OHI Pad	MD Reference	WELL @ -1262.0usft (Nomac 37)
Well	George Gantzer OHI 1H	North Reference	Grid
Wellbore	HZ	Survey Calculation Method	Minimum Curvature
Design	FINAL	Database	USA EDM 5000 Multi Users DB

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	-N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments
5,887.0	12.40	241.20	5,879.3	-95.2	-0.3	-76.2	9.93	9.68	
5,919.0	15.50	239.70	5,910.3	-99.0	-7.0	-75.2	9.75	9.69	
5,950.0	18.70	239.50	5,939.9	-103.6	-14.8	-74.2	10.32	10.32	
5,981.0	21.80	240.40	5,969.0	-109.0	-24.1	-73.0	10.05	10.00	
6,012.0	23.40	241.90	5,997.6	-114.7	-34.6	-71.4	5.48	5.16	
6,044.0	25.80	243.00	6,026.7	-120.9	-46.4	-69.2	7.63	7.50	
6,075.0	27.20	242.30	6,054.5	-127.2	-58.7	-67.0	4.63	4.52	
6,107.0	31.20	240.40	6,082.4	-134.7	-72.4	-64.8	12.83	12.50	
6,138.0	34.10	239.80	6,108.5	-143.1	-86.8	-62.9	9.41	9.35	
6,168.0	37.80	241.20	6,132.8	-151.7	-102.2	-60.7	12.63	12.33	
6,200.0	39.40	242.50	6,157.8	-161.2	-119.8	-57.7	5.61	5.00	
6,232.0	43.10	242.90	6,181.9	-170.8	-138.5	-54.3	11.59	11.56	
6,263.0	44.80	243.90	6,204.2	-180.5	-157.8	-50.5	5.93	5.49	
6,295.0	47.60	244.70	6,226.3	-190.5	-178.6	-46.1	8.93	8.75	
6,325.0	49.60	244.70	6,246.2	-200.1	-198.9	-41.6	6.67	6.67	
6,357.0	53.60	245.10	6,266.0	-210.7	-221.6	-36.6	12.54	12.50	
6,389.0	57.90	245.90	6,284.0	-221.7	-245.7	-31.0	13.60	13.44	
6,421.0	61.00	247.80	6,300.3	-232.5	-271.0	-24.6	10.95	9.69	
6,452.0	64.20	251.30	6,314.6	-242.1	-296.8	-16.9	14.39	10.32	
6,484.0	66.90	252.00	6,327.8	-251.3	-324.5	-7.7	8.67	8.44	
6,515.0	71.20	254.20	6,338.9	-259.7	-352.1	2.1	15.37	13.87	
6,547.0	75.80	256.30	6,348.0	-267.5	-381.8	13.6	15.69	14.38	
6,578.0	78.80	259.80	6,354.8	-273.7	-411.4	26.2	14.66	9.68	
6,610.0	80.60	263.00	6,360.5	-278.4	-442.5	41.0	11.33	5.63	
6,640.0	81.80	266.70	6,365.1	-281.1	-472.0	56.5	12.83	4.00	
6,672.0	83.10	270.10	6,369.3	-282.0	-503.7	74.8	11.29	4.06	
6,704.0	85.00	273.50	6,372.6	-281.0	-535.5	94.6	12.12	5.94	
6,735.0	85.50	277.40	6,375.2	-278.1	-566.3	115.3	12.64	1.61	
6,766.0	85.30	281.60	6,377.7	-273.0	-596.8	137.6	13.52	-0.65	
6,797.0	85.10	286.50	6,380.3	-265.5	-626.7	161.5	15.76	-0.65	
6,829.0	86.70	291.00	6,382.6	-255.2	-656.9	187.8	14.89	5.00	
6,861.0	87.40	294.40	6,384.2	-242.9	-686.4	215.2	10.83	2.19	
6,892.0	87.30	296.70	6,385.7	-229.5	-714.3	242.6	7.42	-0.32	
6,954.0	89.80	301.30	6,387.2	-199.5	-768.5	299.1	8.44	4.03	
7,017.0	89.40	303.90	6,387.7	-165.5	-821.6	358.0	4.18	-0.63	
7,080.0	91.80	307.90	6,387.0	-128.6	-872.6	418.1	7.40	3.81	
7,143.0	91.60	308.60	6,385.1	-89.6	-922.1	478.9	1.16	-0.32	
7,204.0	90.60	307.10	6,384.0	-52.2	-970.2	537.7	2.95	-1.64	
7,267.0	89.50	306.70	6,383.9	-14.4	-1,020.6	598.1	1.86	-1.75	
7,328.0	88.80	305.60	6,384.8	21.6	-1,069.9	656.4	2.14	-1.15	
7,391.0	89.70	306.30	6,385.6	58.6	-1,120.9	716.5	1.81	1.43	
7,454.0	90.40	308.10	6,385.6	96.7	-1,171.0	777.0	3.07	1.11	
7,518.0	91.40	310.20	6,384.6	137.1	-1,220.7	839.1	3.63	1.56	
7,581.0	91.90	310.20	6,382.8	177.7	-1,268.8	900.4	0.79	0.79	
7,644.0	91.50	310.20	6,380.9	218.4	-1,316.9	961.7	0.63	-0.63	
7,708.0	89.00	309.60	6,380.6	259.4	-1,365.9	1,024.0	4.02	-3.91	
7,770.0	89.70	309.50	6,381.3	298.9	-1,413.7	1,084.2	1.14	1.13	
7,833.0	90.00	311.10	6,381.5	339.6	-1,461.8	1,145.6	2.58	0.48	
7,895.0	89.40	312.10	6,381.8	380.8	-1,508.2	1,206.3	1.88	-0.97	
7,958.0	90.10	312.10	6,382.1	423.0	-1,554.9	1,268.1	1.11	1.11	
8,021.0	90.60	312.20	6,381.7	465.3	-1,601.6	1,329.9	0.81	0.79	
8,085.0	91.50	313.10	6,380.5	508.7	-1,648.7	1,392.8	1.99	1.41	
8,147.0	92.70	315.80	6,378.2	552.0	-1,692.9	1,454.0	4.76	1.94	



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8,210.0	93.00	317.40	6,375.1	597.8	-1,736.1	1,516.5	2.58	0.48	
8,273.0	92.20	319.00	6,372.3	644.7	-1,778.1	1,579.1	2.84	-1.27	
8,335.0	91.70	320.30	6,370.1	691.9	-1,818.2	1,641.0	2.25	-0.81	
8,398.0	90.60	322.40	6,368.9	741.1	-1,857.5	1,703.9	3.76	-1.75	
8,462.0	89.90	323.80	6,368.6	792.3	-1,896.0	1,767.9	2.45	-1.09	
8,525.0	89.30	325.20	6,369.0	843.6	-1,932.5	1,830.9	2.42	-0.95	
8,588.0	89.30	326.20	6,369.8	895.6	-1,968.0	1,893.8	1.59	0.00	
8,651.0	89.30	327.20	6,370.6	948.2	-2,002.6	1,956.7	1.59	0.00	
8,714.0	88.60	326.00	6,371.7	1,000.8	-2,037.3	2,019.6	2.20	-1.11	
8,778.0	89.50	325.60	6,372.8	1,053.8	-2,073.3	2,083.5	1.54	1.41	
8,841.0	91.20	326.70	6,372.4	1,106.1	-2,108.3	2,146.5	3.21	2.70	
8,903.0	92.00	324.90	6,370.7	1,157.3	-2,143.2	2,208.4	3.18	1.29	
8,966.0	91.30	325.20	6,368.9	1,208.9	-2,179.3	2,271.3	1.21	-1.11	
9,026.0	90.80	325.50	6,367.8	1,258.3	-2,213.4	2,331.3	0.97	-0.83	
9,090.0	90.60	326.20	6,367.0	1,311.3	-2,249.3	2,395.2	1.14	-0.31	
9,152.0	90.70	324.90	6,366.3	1,362.4	-2,284.4	2,457.2	2.10	0.16	
9,214.0	89.60	324.60	6,366.1	1,413.0	-2,320.1	2,519.1	1.84	-1.77	
9,277.0	88.90	323.10	6,366.9	1,463.9	-2,357.3	2,582.1	2.63	-1.11	
9,340.0	88.80	322.40	6,368.2	1,514.0	-2,395.4	2,645.1	1.12	-0.16	
9,404.0	89.30	321.80	6,369.3	1,564.5	-2,434.7	2,709.1	1.22	0.78	
9,466.0	90.70	321.70	6,369.3	1,613.2	-2,473.1	2,771.1	2.26	2.26	
9,529.0	90.20	322.40	6,368.8	1,662.9	-2,511.9	2,834.0	1.37	-0.79	
9,592.0	89.60	323.10	6,368.9	1,713.0	-2,550.0	2,897.0	1.46	-0.95	
9,656.0	90.50	324.50	6,368.8	1,764.7	-2,587.8	2,961.0	2.60	1.41	
9,720.0	91.30	326.00	6,366.9	1,868.2	-2,659.6	3,086.9	1.35	0.63	
9,846.0	89.20	325.40	6,366.6	1,921.0	-2,695.7	3,150.9	3.41	-3.28	
9,909.0	87.90	323.60	6,368.2	1,972.3	-2,732.2	3,213.8	3.52	-2.06	
9,971.0	88.60	323.70	6,370.1	2,022.2	-2,769.0	3,275.8	1.14	1.13	
10,034.0	89.60	323.80	6,371.1	2,073.0	-2,806.2	3,338.8	1.60	1.59	
10,097.0	88.70	323.90	6,372.0	2,123.9	-2,843.4	3,401.8	1.44	-1.43	
10,161.0	89.40	324.00	6,373.0	2,175.6	-2,881.0	3,465.8	1.10	1.09	
10,223.0	90.40	323.90	6,373.2	2,225.8	-2,917.5	3,527.8	1.62	1.61	
10,287.0	91.20	323.90	6,372.3	2,277.5	-2,955.2	3,591.8	1.25	1.25	
10,350.0	90.50	323.60	6,371.3	2,328.3	-2,992.5	3,654.8	1.21	-1.11	
10,412.0	91.50	323.40	6,370.2	2,378.1	-3,029.4	3,716.8	1.64	1.61	
10,475.0	91.20	323.50	6,368.8	2,428.7	-3,066.9	3,779.7	0.50	-0.48	
10,538.0	90.20	322.90	6,368.0	2,479.1	-3,104.6	3,842.7	1.85	-1.59	
10,601.0	90.90	322.00	6,367.4	2,529.1	-3,143.0	3,905.7	1.81	1.11	
10,665.0	90.40	321.20	6,366.7	2,579.2	-3,182.7	3,969.7	1.47	-0.78	
10,727.0	91.00	320.40	6,365.9	2,627.3	-3,221.9	4,031.6	1.61	0.97	
10,791.0	90.70	321.50	6,365.0	2,677.0	-3,262.2	4,095.6	1.78	-0.47	
10,853.0	91.30	321.30	6,363.9	2,725.4	-3,300.9	4,157.5	1.02	0.97	
10,915.0	92.50	321.40	6,361.8	2,773.8	-3,339.6	4,219.5	1.94	1.94	
10,977.0	93.10	323.30	6,358.8	2,822.8	-3,377.4	4,281.4	3.21	0.97	
11,039.0	92.40	323.90	6,355.8	2,872.7	-3,414.2	4,343.3	1.49	-1.13	
11,102.0	91.90	325.10	6,353.4	2,923.9	-3,450.7	4,406.2	2.06	-0.79	
11,165.0	90.50	325.40	6,352.1	2,975.7	-3,486.6	4,469.2	2.27	-2.22	
11,226.0	89.70	324.30	6,352.0	3,025.5	-3,521.7	4,530.1	2.23	-1.31	
11,289.0	88.90	323.90	6,352.8	3,076.6	-3,558.7	4,593.1	1.42	-1.27	
11,350.0	89.70	323.80	6,353.5	3,125.8	-3,594.7	4,654.1	1.32	1.31	
11,414.0	89.60	323.60	6,353.9	3,177.4	-3,632.6	4,718.1	0.35	-0.16	
11,477.0	90.60	323.90	6,353.8	3,228.2	-3,669.8	4,781.1	1.66	1.59	
11,539.0	89.90	323.40	6,353.5	3,278.1	-3,706.6	4,843.1	1.39	-1.13	

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV



Cathedral Energy Services
Survey Report

Company	Chesapeake Energy Corp	Local Coordinate Reference	Well: George Gantzer OHI 1H
Project	Ohio County, WV	TVD Reference	WELL @ 1262.0usft (Nomac 37)
Site	George Gantzer OHI Pad	MD Reference	WELL @ 1262.0usft (Nomac 37)
Well	George Gantzer OHI 1H	North Reference	Grid
Wellbore	HZ	Survey Calculation Method	Minimum Curvature
Design	FINAL	Database	USA EDM 5000 Multi Users DB

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations/Comments
11,602.0	90.60	323.50	6,353.3	3,328.8	-3,744.1	4,906.1	1.12	1.11	
11,664.0	89.70	322.80	6,353.1	3,378.4	-3,781.3	4,968.1	1.84	-1.45	
11,726.0	90.80	322.60	6,352.8	3,427.7	-3,818.8	5,030.1	1.80	1.77	
11,789.0	90.60	322.70	6,352.1	3,477.8	-3,857.0	5,093.1	0.35	-0.32	
11,851.0	89.10	322.70	6,352.2	3,527.1	-3,894.6	5,155.1	2.42	-2.42	
11,913.0	89.90	323.90	6,352.8	3,576.8	-3,931.7	5,217.1	2.33	1.29	
11,975.0	90.80	326.70	6,352.4	3,627.7	-3,967.0	5,279.0	4.74	1.45	
12,038.0	90.60	325.50	6,351.6	3,680.0	-4,002.1	5,342.0	1.93	-0.32	
12,102.0	89.60	325.30	6,351.5	3,732.7	-4,038.4	5,405.9	1.59	-1.56	
12,164.0	89.00	324.40	6,352.3	3,783.4	-4,074.1	5,467.9	1.74	-0.97	
12,226.0	89.70	323.80	6,353.0	3,833.6	-4,110.5	5,529.9	1.49	1.13	
12,289.0	89.30	323.50	6,353.5	3,884.4	-4,147.8	5,592.9	0.79	-0.63	
12,351.0	91.20	323.50	6,353.3	3,934.2	-4,184.7	5,654.9	3.06	3.06	
12,414.0	90.30	323.30	6,352.4	3,984.8	-4,222.2	5,717.9	1.46	-1.43	
12,476.0	88.90	324.20	6,352.9	4,034.8	-4,258.9	5,779.9	2.68	-2.26	
12,540.0	90.20	325.50	6,353.4	4,087.1	-4,295.7	5,843.8	2.87	2.03	
12,602.0	89.90	325.40	6,353.3	4,138.2	-4,330.9	5,905.8	0.51	-0.48	
12,666.0	91.20	325.30	6,352.7	4,190.8	-4,367.3	5,969.7	2.04	2.03	
12,729.0	88.90	324.40	6,352.6	4,242.3	-4,403.6	6,032.7	3.92	-3.65	
12,792.0	90.40	324.50	6,353.0	4,293.6	-4,440.2	6,095.7	2.39	2.38	
12,856.0	89.80	323.30	6,352.9	4,345.3	-4,477.9	6,159.7	2.10	-0.94	
12,919.0	90.70	323.80	6,352.6	4,396.0	-4,515.3	6,222.7	1.63	1.43	
12,982.0	90.30	322.50	6,352.1	4,446.4	-4,553.1	6,285.7	2.16	-0.63	
13,045.0	91.10	321.70	6,351.3	4,496.1	-4,591.8	6,348.7	1.80	1.27	
13,107.0	92.20	321.20	6,349.5	4,544.5	-4,630.4	6,410.6	1.95	1.77	
13,168.0	93.50	321.00	6,346.5	4,591.9	-4,668.7	6,471.5	2.16	2.13	
13,190.0	94.20	321.30	6,345.0	4,609.1	-4,682.5	6,493.4	3.46	3.18	Last Cathedral Survey @ 13190' MD
13,236.0	95.60	321.90	6,341.1	4,645.0	-4,710.9	6,539.2	3.31	3.05	Projection to Bit @ 13236' MD



Cathedral Energy Services

Survey Report

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Company	Chesapeake Energy Corp	Local Co-ordinate Reference	Well	George Gantzer OHI 1H
Project	Ohio County, WV	TVD Reference	WELL @ 1262.0usft (Nomac 37)	
Site	George Gantzer OHI Pad	MD Reference	WELL @ 1262.0usft (Nomac 37)	
Well	George Gantzer OHI 1H	North Reference	Grid	
Wellbore	HZ	Survey Calculation Method	Minimum Curvature	
Design	FINAL	Database	USA EDM 5000 Multi Users DB	

Target Name	Hit/miss target Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/S (usft)	+E/W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
George Gantzer OHI 1H	- actual wellpath misses target center by 35.3usft at 13236.0usft MD (6341.1 TVD, 4645.0 N, -4710.9 E) - Point	0.00	360.00	6,306.5	4,640.5	-4,716.7	569,289.19	1,687,191.36	40.057652	-80.617498
George Gantzer OHI 1H	- actual wellpath misses target center by 27.0usft at 13236.0usft MD (6341.1 TVD, 4645.0 N, -4710.9 E) - Point	0.00	360.00	6,315.1	4,640.5	-4,716.7	569,289.19	1,687,191.36	40.057652	-80.617498
George Gantzer OHI 1H	- actual wellpath misses target center by 187.0usft at 7287.7usft MD (6384.1 TVD, -2.0 N, -1037.3 E) - Point	0.00	360.00	6,369.1	-152.4	-1,147.4	564,496.40	1,690,760.55	40.044617	-80.604538
George Gantzer OHI 1H	- actual wellpath misses target center by 12.0usft at 13236.0usft MD (6341.1 TVD, 4645.0 N, -4710.9 E) - Point	0.00	360.00	6,331.5	4,640.5	-4,716.7	569,289.19	1,687,191.36	40.057652	-80.617498
George Gantzer OHI 1H	- actual wellpath misses target center by 7.4usft at 13236.0usft MD (6341.1 TVD, 4645.0 N, -4710.9 E) - Point	0.00	360.00	6,339.9	4,640.5	-4,716.7	569,289.19	1,687,191.36	40.057652	-80.617498
George Gantzer OHI 1H	- actual wellpath misses target center by 12.7usft at 13235.2usft MD (6341.2 TVD, 4644.4 N, -4710.4 E) - Point	0.00	360.00	6,351.5	4,640.5	-4,716.7	569,289.19	1,687,191.36	40.057652	-80.617498

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/S (usft)	+E/W (usft)	
550.0	550.0	0.8	0.3	Last Gyro Survey @ 550' MD
13,190.0	6,345.0	4,609.1	-4,682.5	Last Cathedral Survey @ 13190' MD
13,236.0	6,341.1	4,645.0	-4,710.9	Projection to Bit @ 13236' MD

Checked By: _____ Approved By: _____ Date: _____