



Company: CHESAPEAKE  
 Lease/Well: ROY FERRELL OHI/205 H  
 Location:  
 Rig Name: NOMAC 37  
 State/County: WEST VIRGINIA/OHIO  
 Latitude: 40.04, Longitude: -80.53  
 GRID North is 0.66 Degrees West of True North  
 VS-Azi: 0.00 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB= 20'

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: e-line gyro-de\_01.ut  
 Minimum Curvature Method  
 Report Date/Time: 12/10/2013 / 17:05

Vaughn Energy Services  
 Conway, Arkansas  
 501-730-0602  
 Chris Ford

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.34	242.37	100.00	-0.14	-0.27	-0.14	0.30	242.37	0.34
200.00	0.20	243.57	200.00	-0.36	-0.69	-0.36	0.77	242.64	0.14
300.00	0.40	246.04	300.00	-0.58	-1.17	-0.58	1.30	243.69	0.20
400.00	0.20	267.85	400.00	-0.73	-1.66	-0.73	1.82	246.40	0.23
500.00	0.28	288.91	499.99	-0.65	-2.07	-0.65	2.17	252.45	0.12
600.00	0.48	257.25	599.99	-0.67	-2.71	-0.67	2.79	256.14	0.28
610.00	0.51	270.88	609.99	-0.68	-2.79	-0.68	2.88	256.39	1.23

HORIZONTAL DISPLACEMENT IS  
 2.88 FEET AT 256.39 DEGREES

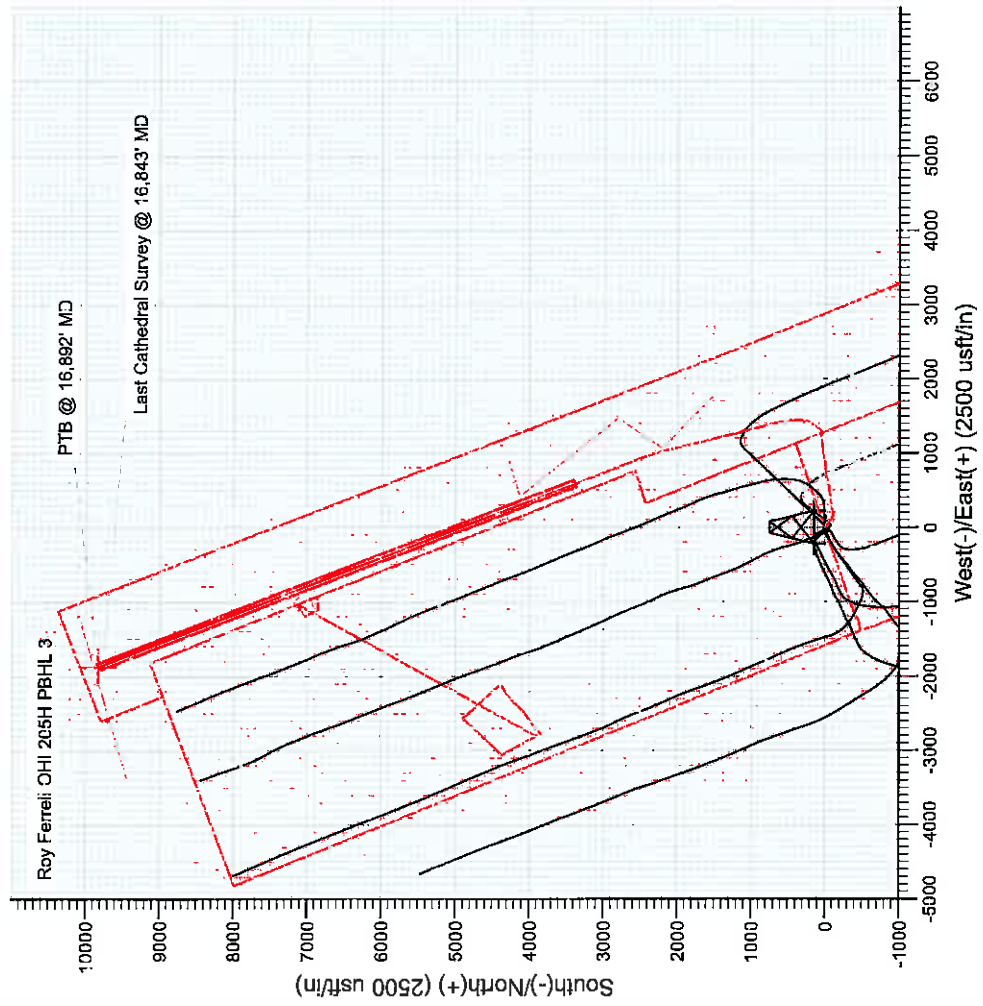
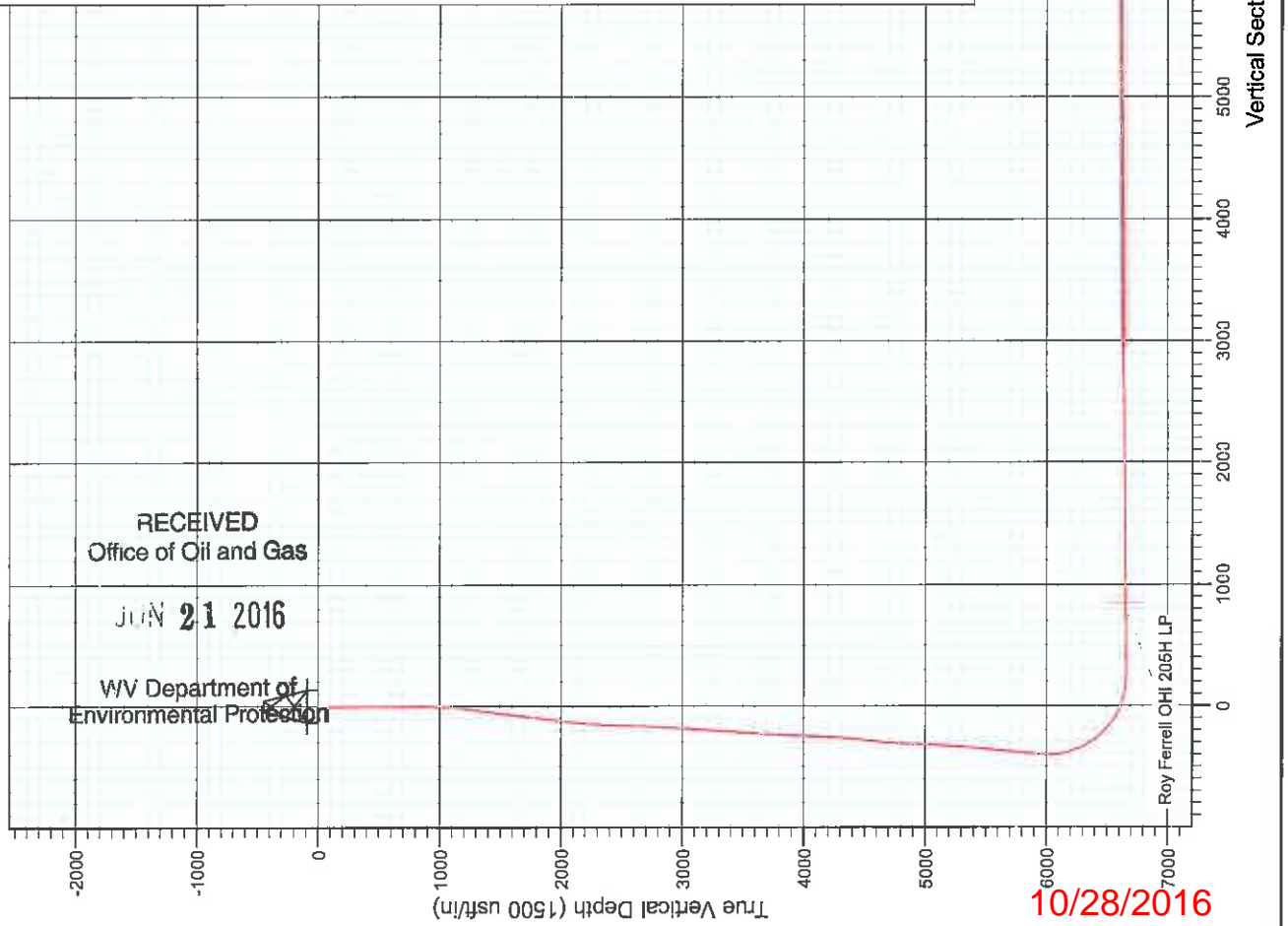
RECEIVED  
 Office of Oil and Gas

JUN 21 2016

WV Department of  
 Environmental Protection



Project: Ohio County, WV  
Site: Roy Ferrell OHI Pad  
Well: Roy Ferrell OHI 205H  
Wellbore: HZ  
Design: FINAL



**M G T**

Azimuths to Grid North  
True North: 0.66°  
Magnetic North: -8.13°

Magnetic Field  
Strength: 5274.75nT  
Dip Angle: 67.45°  
Date: 8/15/2013  
Model: IGRF2010

**FINAL**  
Roy Ferrell OHI 205H  
WELL @ 1214.0usft (Original Well Elev)  
Ground Elevation @ 1196.0  
NAD 1927 (NADCON CONUS)  
Well Roy Ferrell OHI 205H, Grid North

10/28/2016

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Well:</b>	Roy Ferrell OHI 205H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

<b>Project:</b>	Ohio County, WV		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	West Virginia North 4701		Using geodetic scale factor

<b>Site:</b>	Roy Ferrell OHI Pad				
<b>Site Position:</b>		<b>Northing:</b>	563,734.16 usft	<b>Latitude:</b>	40° 2' 35.50 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,711,287.79 usft	<b>Longitude:</b>	80° 31' 52.30 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16"	<b>Grid Convergence:</b>	-0.66 °

<b>Well:</b>	Roy Ferrell OHI 205H					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	563,733.97 usft	<b>Latitude:</b>	40° 2' 35.50 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,711,303.35 usft	<b>Longitude:</b>	80° 31' 52.10 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,196.0 usft

<b>Wellbore:</b>	HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	8/15/2013	-8.79	67.45	52,747

<b>Design:</b>	FINAL				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>		<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
		0.0	0.0	0.0	339.00

<b>Survey Program</b>	<b>Date</b>	12/27/2013			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
100.0	610.0	Gyro (HZ)	Gyro	Gyro	
835.0	16,892.0	Survey #1 (HZ)	MWD	Geolink MWD	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
610.0	0.51	270.88	610.0	-0.7	-2.8	0.4	0.00	0.00	
835.0	0.60	68.10	835.0	-0.2	-2.7	0.8	0.48	0.04	
868.0	1.10	81.00	868.0	-0.1	-2.2	0.7	1.61	1.52	
900.0	1.60	92.30	900.0	-0.1	-1.5	0.5	1.76	1.56	
931.0	2.60	104.00	931.0	-0.3	-0.4	-0.1	3.49	3.23	
963.0	3.30	107.30	962.9	-0.7	1.2	-1.1	2.25	2.19	
994.0	4.00	107.90	993.8	-1.3	3.1	-2.3	2.26	2.26	
1,026.0	4.80	108.60	1,025.8	-2.1	5.4	-3.9	2.51	2.50	
1,057.0	5.80	109.50	1,056.6	-3.0	8.1	-5.7	3.24	3.23	
1,088.0	6.60	111.10	1,087.4	-4.2	11.3	-7.9	2.64	2.58	
1,152.0	8.00	118.50	1,150.9	-7.6	18.6	-13.8	2.63	2.19	
1,214.0	8.90	118.70	1,212.2	-12.0	26.6	-20.7	1.45	1.45	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Well:</b>	Roy Ferrell OHI 205H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,277.0	9.30	121.60	1,274.5	-17.0	35.2	-28.5	0.97	0.63	
1,339.0	9.20	125.40	1,335.6	-22.5	43.5	-36.6	1.00	-0.16	
1,402.0	9.70	123.40	1,397.8	-28.3	52.1	-45.1	0.95	0.79	
1,465.0	10.10	124.00	1,459.9	-34.3	61.1	-54.0	0.66	0.63	
1,525.0	9.00	129.20	1,519.0	-40.2	69.1	-62.3	2.33	-1.83	
1,588.0	7.50	130.30	1,581.4	-46.0	76.1	-70.2	2.39	-2.38	
1,651.0	7.50	126.10	1,643.8	-51.1	82.5	-77.3	0.87	0.00	
1,714.0	7.10	123.80	1,706.3	-55.7	89.1	-83.9	0.79	-0.63	
1,777.0	7.80	123.40	1,768.8	-60.2	95.9	-90.6	1.11	1.11	
1,840.0	8.70	125.00	1,831.1	-65.3	103.3	-98.0	1.47	1.43	
1,903.0	9.10	125.60	1,893.4	-70.9	111.3	-106.1	0.65	0.63	
1,967.0	9.30	123.60	1,956.6	-76.7	119.7	-114.5	0.59	0.31	
2,030.0	8.60	119.40	2,018.8	-81.9	128.1	-122.3	1.52	-1.11	
2,092.0	8.30	117.70	2,080.1	-86.2	136.1	-129.3	0.63	-0.48	
2,140.0	8.30	115.50	2,127.6	-89.3	142.3	-134.4	0.66	0.00	
2,246.0	8.00	111.00	2,232.5	-95.3	156.0	-144.9	0.66	-0.28	
2,309.0	6.90	106.30	2,295.0	-97.9	163.8	-150.1	1.99	-1.75	
2,373.0	6.80	91.70	2,358.6	-99.1	171.3	-153.9	2.72	-0.16	
2,436.0	7.90	82.40	2,421.0	-98.6	179.3	-156.3	2.57	1.75	
2,499.0	9.70	76.90	2,483.3	-96.9	188.7	-158.1	3.15	2.86	
2,562.0	11.00	74.60	2,545.3	-94.1	199.7	-159.4	2.16	2.06	
2,625.0	12.00	76.20	2,607.0	-90.9	211.9	-160.8	1.67	1.59	
2,688.0	12.90	78.20	2,668.5	-87.9	225.1	-162.7	1.58	1.43	
2,752.0	14.00	78.30	2,730.8	-84.9	239.7	-165.1	1.72	1.72	
2,815.0	14.80	80.80	2,791.8	-82.0	255.1	-168.0	1.56	1.27	
2,878.0	15.60	83.00	2,852.6	-79.7	271.4	-171.6	1.62	1.27	
2,941.0	16.80	80.80	2,913.1	-77.2	288.8	-175.5	2.14	1.90	
3,004.0	16.90	77.90	2,973.4	-73.8	306.8	-178.8	1.34	0.16	
3,067.0	18.00	79.40	3,033.5	-70.1	325.3	-182.0	1.89	1.75	
3,130.0	19.30	82.30	3,093.2	-66.9	345.2	-186.2	2.53	2.06	
3,192.0	20.00	84.50	3,151.6	-64.5	365.9	-191.3	1.84	1.13	
3,254.0	18.80	82.20	3,210.0	-62.1	386.3	-196.5	2.29	-1.94	
3,316.0	17.70	80.70	3,268.9	-59.3	405.5	-200.6	1.93	-1.77	
3,441.0	20.00	81.40	3,387.2	-53.0	445.4	-209.1	1.85	1.84	
3,503.0	19.00	81.20	3,445.6	-49.9	465.9	-213.5	1.62	-1.61	
3,565.0	18.20	78.30	3,504.4	-46.4	485.3	-217.2	1.97	-1.29	
3,629.0	18.60	81.90	3,565.1	-42.9	505.2	-221.1	1.88	0.63	
3,691.0	19.60	83.30	3,623.7	-40.3	525.3	-225.9	1.77	1.61	
3,754.0	18.70	81.70	3,683.2	-37.6	545.8	-230.7	1.65	-1.43	
3,817.0	17.60	79.60	3,743.1	-34.4	565.2	-234.7	2.03	-1.75	
3,881.0	18.30	76.30	3,804.0	-30.3	584.5	-237.7	1.93	1.09	
3,943.0	18.70	78.50	3,862.8	-26.0	603.7	-240.6	1.30	0.65	
4,005.0	16.60	75.20	3,921.9	-21.8	622.0	-243.2	3.75	-3.39	
4,068.0	15.00	71.80	3,982.5	-16.9	638.4	-244.6	2.93	-2.54	
4,130.0	15.30	76.20	4,042.3	-12.5	654.0	-246.0	1.92	0.48	
4,193.0	16.40	78.50	4,102.9	-8.7	670.8	-248.5	2.01	1.75	
4,256.0	17.60	79.70	4,163.2	-5.2	688.9	-251.7	1.98	1.90	
4,318.0	18.10	78.60	4,222.2	-1.6	707.5	-255.1	0.97	0.81	
4,380.0	18.00	79.00	4,281.1	2.1	726.4	-258.4	0.26	-0.16	
4,443.0	18.50	81.90	4,341.0	5.4	745.8	-262.3	1.65	0.79	
4,503.0	19.40	82.40	4,397.7	8.0	765.1	-266.7	1.52	1.50	
4,566.0	19.60	85.30	4,457.1	10.3	786.0	-272.1	1.57	0.32	
4,629.0	20.00	89.50	4,516.4	11.2	807.3	-278.8	2.35	0.63	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Well:</b>	Roy Ferrell OHI 205H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
4,693.0	20.00	91.60	4,576.5	11.0	829.2	-286.9	1.12	0.00	
4,756.0	17.50	89.20	4,636.2	10.8	849.5	-294.3	4.15	-3.97	
4,817.0	15.60	86.00	4,694.7	11.5	866.8	-299.9	3.45	-3.11	
4,879.0	15.40	81.90	4,754.4	13.3	883.3	-304.1	1.80	-0.32	
4,941.0	16.00	81.20	4,814.1	15.8	899.9	-307.8	1.01	0.97	
5,005.0	16.50	81.90	4,875.5	18.4	917.6	-311.7	0.84	0.78	
5,068.0	17.20	76.80	4,935.8	21.8	935.5	-314.9	2.60	1.11	
5,130.0	18.10	73.70	4,994.9	26.6	953.7	-317.0	2.10	1.45	
5,193.0	18.30	77.20	5,054.8	31.5	972.7	-319.2	1.76	0.32	
5,257.0	17.60	81.50	5,115.7	35.2	992.1	-322.7	2.34	-1.09	
5,319.0	17.10	81.80	5,174.8	37.9	1,010.4	-326.8	0.82	-0.81	
5,382.0	17.40	80.80	5,235.0	40.7	1,028.9	-330.7	0.67	0.48	
5,445.0	17.80	83.10	5,295.0	43.3	1,047.7	-335.0	1.27	0.63	
5,508.0	17.90	86.40	5,355.0	45.1	1,066.9	-340.2	1.61	0.16	
5,570.0	18.10	86.40	5,414.0	46.3	1,086.1	-346.0	0.32	0.32	
5,632.0	18.50	87.10	5,472.8	47.4	1,105.5	-351.9	0.74	0.65	
5,696.0	19.00	86.30	5,533.4	48.6	1,126.0	-358.2	0.88	0.78	
5,759.0	19.00	85.10	5,593.0	50.1	1,146.5	-364.1	0.62	0.00	
5,820.0	18.70	82.90	5,650.7	52.2	1,166.1	-369.2	1.26	-0.49	
5,883.0	19.10	82.80	5,710.3	54.7	1,186.3	-374.0	0.64	0.63	
5,946.0	18.90	82.80	5,769.9	57.3	1,206.7	-378.9	0.32	-0.32	
6,007.0	18.70	84.30	5,827.7	59.5	1,226.2	-383.9	0.86	-0.33	
6,070.0	19.10	85.90	5,887.3	61.3	1,246.5	-389.5	1.04	0.63	
6,119.0	18.50	83.30	5,933.7	62.7	1,262.3	-393.8	2.10	-1.22	
6,201.0	18.50	78.30	6,011.4	66.9	1,287.9	-399.1	1.93	0.00	
6,233.0	17.60	64.00	6,041.9	70.0	1,297.2	-399.5	14.09	-2.81	
6,264.0	18.90	50.70	6,071.3	75.3	1,305.3	-397.5	14.04	4.19	
6,296.0	22.00	46.50	6,101.3	82.7	1,313.7	-393.6	10.71	9.69	
6,328.0	24.10	39.30	6,130.7	91.9	1,322.2	-388.1	10.97	6.56	
6,360.0	27.10	38.40	6,159.6	102.6	1,330.9	-381.1	9.45	9.38	
6,390.0	29.70	38.40	6,186.0	113.8	1,339.7	-373.8	8.67	8.67	
6,422.0	32.70	39.10	6,213.4	126.7	1,350.1	-365.5	9.44	9.38	
6,453.0	35.50	40.10	6,239.0	140.1	1,361.2	-357.0	9.21	9.03	
6,484.0	37.50	37.90	6,263.9	154.5	1,372.8	-347.8	7.71	6.45	
6,516.0	39.20	33.20	6,289.0	170.6	1,384.3	-336.8	10.55	5.31	
6,547.0	40.90	30.70	6,312.8	187.5	1,394.8	-324.8	7.55	5.48	
6,578.0	42.70	27.50	6,335.9	205.6	1,404.9	-311.5	9.00	5.81	
6,609.0	43.50	24.10	6,358.5	224.7	1,414.1	-297.0	7.93	2.58	
6,640.0	42.70	20.30	6,381.2	244.3	1,422.1	-281.6	8.76	-2.58	
6,671.0	43.60	16.00	6,403.8	264.4	1,428.7	-265.2	9.92	2.90	
6,703.0	46.40	12.30	6,426.4	286.3	1,434.2	-246.7	11.97	8.75	
6,734.0	47.70	9.10	6,447.5	308.6	1,438.4	-227.3	8.64	4.19	
6,765.0	47.50	5.80	6,468.4	331.3	1,441.4	-207.2	7.89	-0.65	
6,797.0	48.10	3.00	6,489.9	355.0	1,443.2	-185.8	6.75	1.88	
6,828.0	50.80	1.00	6,510.1	378.5	1,444.0	-164.1	9.99	8.71	
6,859.0	53.30	359.20	6,529.2	402.9	1,444.0	-141.3	9.27	8.06	
6,890.0	56.30	356.60	6,547.0	428.2	1,443.1	-117.4	11.86	9.68	
6,922.0	60.10	354.80	6,563.9	455.4	1,441.1	-91.3	12.80	11.88	
6,954.0	63.50	354.30	6,579.0	483.4	1,438.4	-64.2	10.71	10.63	
6,986.0	65.70	353.00	6,592.7	512.1	1,435.2	-36.2	7.79	6.88	
7,017.0	67.90	352.30	6,604.9	540.4	1,431.5	-8.5	7.39	7.10	
7,049.0	70.90	351.20	6,616.2	570.0	1,427.2	20.7	9.91	9.38	
7,080.0	73.60	349.20	6,625.6	599.1	1,422.2	49.7	10.66	6.71	



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Well:</b>	Roy Ferrell OHI 205H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
7,111.0	75.60	348.10	6,633.9	628.4	1,416.3	79.1	7.30	6.45	
7,142.0	78.30	348.20	6,640.9	658.0	1,410.1	108.9	8.72	8.71	
7,174.0	81.00	346.90	6,646.6	688.7	1,403.3	140.1	9.34	8.44	
7,205.0	83.30	346.40	6,650.9	718.6	1,396.2	170.5	7.59	7.42	
7,236.0	84.20	345.80	6,654.2	748.5	1,388.8	201.1	3.48	2.90	
7,267.0	87.00	345.40	6,656.6	778.4	1,381.2	231.8	9.12	9.03	
7,330.0	91.70	344.70	6,657.3	839.3	1,364.9	294.4	7.54	7.46	
7,393.0	90.10	345.40	6,656.3	900.2	1,348.7	357.0	2.77	-2.54	
7,456.0	89.70	345.20	6,656.5	961.1	1,332.7	419.7	0.71	-0.63	
7,520.0	89.80	345.20	6,656.7	1,023.0	1,316.3	483.3	0.16	0.16	
7,582.0	89.90	345.50	6,656.9	1,082.9	1,300.6	544.9	0.51	0.16	
7,644.0	90.30	346.20	6,656.8	1,143.1	1,285.5	606.5	1.30	0.65	
7,706.0	91.00	346.40	6,656.1	1,203.3	1,270.8	668.0	1.17	1.13	
7,768.0	90.90	346.40	6,655.1	1,263.6	1,256.2	729.4	0.16	-0.16	
7,830.0	91.10	346.80	6,654.0	1,323.9	1,241.9	790.9	0.72	0.32	
7,894.0	90.30	345.30	6,653.2	1,386.0	1,226.4	854.4	2.66	-1.25	
7,956.0	90.40	345.40	6,652.8	1,445.9	1,210.8	916.0	0.23	0.16	
8,018.0	90.80	345.90	6,652.2	1,506.0	1,195.4	977.6	1.03	0.65	
8,081.0	90.80	345.90	6,651.3	1,567.1	1,180.0	1,040.1	0.00	0.00	
8,143.0	91.10	346.40	6,650.3	1,627.3	1,165.2	1,101.6	0.94	0.48	
8,205.0	90.90	346.40	6,649.2	1,687.5	1,150.6	1,163.1	0.32	-0.32	
8,268.0	90.80	346.90	6,648.2	1,748.8	1,136.1	1,225.5	0.81	-0.16	
8,331.0	91.10	347.80	6,647.2	1,810.3	1,122.3	1,287.9	1.51	0.48	
8,394.0	89.70	346.40	6,646.8	1,871.7	1,108.2	1,350.2	3.14	-2.22	
8,455.0	90.00	346.80	6,646.9	1,931.0	1,094.1	1,410.7	0.82	0.49	
8,519.0	89.70	346.20	6,647.1	1,993.3	1,079.1	1,474.1	1.05	-0.47	
8,582.0	89.80	346.20	6,647.4	2,054.4	1,064.1	1,536.6	0.16	0.16	
8,645.0	90.00	346.90	6,647.5	2,115.7	1,049.5	1,599.1	1.16	0.32	
8,707.0	89.80	346.70	6,647.6	2,176.1	1,035.3	1,660.5	0.46	-0.32	
8,770.0	90.80	345.30	6,647.2	2,237.2	1,020.1	1,723.1	2.73	1.59	
8,833.0	91.10	345.00	6,646.2	2,298.1	1,003.9	1,785.7	0.67	0.48	
8,897.0	89.90	341.40	6,645.6	2,359.3	985.4	1,849.5	5.93	-1.88	
8,959.0	89.50	338.50	6,646.0	2,417.6	964.2	1,911.5	4.72	-0.65	
9,023.0	90.50	338.90	6,646.0	2,477.2	940.9	1,975.5	1.68	1.56	
9,086.0	90.90	338.90	6,645.2	2,536.0	918.3	2,038.5	0.63	0.63	
9,150.0	91.10	338.10	6,644.1	2,595.5	894.8	2,102.5	1.29	0.31	
9,212.0	91.70	338.60	6,642.6	2,653.1	871.9	2,164.4	1.26	0.97	
9,273.0	90.30	338.90	6,641.5	2,710.0	849.8	2,225.4	2.35	-2.30	
9,335.0	90.40	339.10	6,641.1	2,767.9	827.6	2,287.4	0.36	0.16	
9,398.0	90.20	339.00	6,640.8	2,826.7	805.1	2,350.4	0.35	-0.32	
9,461.0	90.20	338.30	6,640.6	2,885.4	782.1	2,413.4	1.11	0.00	
9,524.0	90.20	338.20	6,640.3	2,943.9	758.8	2,476.4	0.16	0.00	
9,587.0	90.80	338.40	6,639.8	3,002.4	735.5	2,539.4	1.00	0.95	
9,650.0	91.30	338.20	6,638.6	3,060.9	712.2	2,602.4	0.85	0.79	
9,712.0	92.10	338.80	6,636.8	3,118.6	689.5	2,664.4	1.61	1.29	
9,776.0	91.40	339.60	6,634.9	3,178.4	666.8	2,728.3	1.66	-1.09	
9,839.0	91.60	339.60	6,633.2	3,237.4	644.8	2,791.3	0.32	0.32	
9,902.0	91.10	339.10	6,631.7	3,296.4	622.6	2,854.3	1.12	-0.79	
9,965.0	89.30	336.70	6,631.5	3,354.7	598.9	2,917.3	4.76	-2.86	
10,029.0	88.90	338.00	6,632.5	3,413.8	574.3	2,981.2	2.12	-0.63	
10,092.0	89.20	340.30	6,633.5	3,472.6	551.9	3,044.2	3.68	0.48	
10,155.0	89.50	339.60	6,634.3	3,531.8	530.3	3,107.2	1.21	0.48	
10,218.0	89.70	339.70	6,634.7	3,590.9	508.4	3,170.2	0.35	0.32	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Well:</b>	Roy Ferrell OHI 205H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

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
10,281.0	90.10	340.10	6,634.8	3,650.0	486.7	3,233.2	0.90	0.63	
10,344.0	90.80	340.40	6,634.3	3,709.3	465.4	3,296.2	1.21	1.11	
10,407.0	89.60	339.20	6,634.1	3,768.5	443.7	3,359.2	2.89	-1.90	
10,471.0	89.60	339.80	6,634.5	3,828.4	421.3	3,423.2	0.94	0.00	
10,535.0	89.30	339.00	6,635.2	3,888.3	398.7	3,487.2	1.33	-0.47	
10,598.0	90.00	339.70	6,635.5	3,947.3	376.5	3,550.1	1.57	1.11	
10,658.0	89.70	339.30	6,635.7	4,003.5	355.5	3,610.1	0.83	-0.50	
10,721.0	90.10	339.00	6,635.8	4,062.3	333.1	3,673.1	0.79	0.63	
10,785.0	90.40	339.30	6,635.5	4,122.1	310.3	3,737.1	0.66	0.47	
10,847.0	90.30	338.70	6,635.2	4,180.0	288.1	3,799.1	0.98	-0.16	
10,910.0	90.50	337.90	6,634.7	4,238.6	264.8	3,862.1	1.31	0.32	
10,973.0	89.80	339.20	6,634.5	4,297.2	241.8	3,925.1	2.34	-1.11	
11,036.0	90.10	339.60	6,634.6	4,356.2	219.6	3,988.1	0.79	0.48	
11,099.0	90.20	339.90	6,634.4	4,415.3	197.8	4,051.1	0.50	0.16	
11,161.0	90.40	340.00	6,634.1	4,473.5	176.5	4,113.1	0.36	0.32	
11,223.0	90.60	339.00	6,633.6	4,531.6	154.8	4,175.1	1.64	0.32	
11,286.0	91.20	339.90	6,632.6	4,590.6	132.7	4,238.1	1.72	0.95	
11,349.0	90.40	341.10	6,631.7	4,649.9	111.7	4,301.1	2.29	-1.27	
11,412.0	90.80	341.20	6,631.0	4,709.6	91.3	4,364.0	0.65	0.63	
11,475.0	91.00	342.00	6,630.1	4,769.3	71.4	4,426.9	1.31	0.32	
11,539.0	90.40	340.60	6,629.3	4,829.9	50.9	4,490.9	2.38	-0.94	
11,602.0	90.40	341.10	6,628.8	4,889.5	30.3	4,553.9	0.79	0.00	
11,666.0	91.10	341.00	6,628.0	4,950.0	9.5	4,617.8	1.10	1.09	
11,728.0	91.30	338.90	6,626.7	5,008.2	-11.8	4,679.8	3.40	0.32	
11,792.0	91.10	337.80	6,625.4	5,067.7	-35.4	4,743.8	1.75	-0.31	
11,855.0	90.20	337.50	6,624.6	5,125.9	-59.3	4,806.7	1.51	-1.43	
11,919.0	90.80	338.00	6,624.1	5,185.2	-83.6	4,870.7	1.22	0.94	
11,981.0	90.60	337.50	6,623.3	5,242.6	-107.0	4,932.7	0.87	-0.32	
12,045.0	91.00	338.20	6,622.4	5,301.8	-131.2	4,996.7	1.26	0.63	
12,108.0	91.20	338.20	6,621.2	5,360.3	-154.6	5,059.7	0.32	0.32	
12,171.0	91.70	337.90	6,619.6	5,418.7	-178.1	5,122.6	0.93	0.79	
12,234.0	90.60	337.50	6,618.4	5,477.0	-202.0	5,185.6	1.86	-1.75	
12,298.0	89.00	337.50	6,618.6	5,536.1	-226.5	5,249.6	2.50	-2.50	
12,360.0	89.80	338.40	6,619.2	5,593.6	-249.8	5,311.6	1.94	1.29	
12,422.0	89.30	338.10	6,619.7	5,651.2	-272.7	5,373.6	0.94	-0.81	
12,486.0	89.10	338.10	6,620.6	5,710.5	-296.6	5,437.5	0.31	-0.31	
12,548.0	89.70	338.30	6,621.3	5,768.1	-319.6	5,499.5	1.02	0.97	
12,611.0	90.00	338.90	6,621.4	5,826.8	-342.6	5,562.5	1.06	0.48	
12,674.0	90.20	339.60	6,621.3	5,885.7	-364.9	5,625.5	1.16	0.32	
12,737.0	90.60	340.90	6,620.9	5,945.0	-386.2	5,688.5	2.16	0.63	
12,800.0	91.20	341.20	6,619.9	6,004.5	-406.7	5,751.5	1.06	0.95	
12,864.0	90.20	341.50	6,619.1	6,065.2	-427.1	5,815.4	1.63	-1.56	
12,925.0	89.80	340.80	6,619.1	6,122.9	-446.9	5,876.4	1.32	-0.66	
12,989.0	88.80	338.60	6,619.9	6,182.9	-469.1	5,940.3	3.78	-1.56	
13,052.0	89.30	338.20	6,620.9	6,241.5	-492.2	6,003.3	1.02	0.79	
13,115.0	90.00	338.70	6,621.3	6,300.1	-515.4	6,066.3	1.37	1.11	
13,177.0	90.70	339.40	6,620.9	6,358.0	-537.5	6,128.3	1.60	1.13	
13,240.0	91.10	339.70	6,620.0	6,417.0	-559.6	6,191.3	0.79	0.63	
13,302.0	90.40	339.30	6,619.1	6,475.1	-581.3	6,253.3	1.30	-1.13	
13,363.0	90.60	339.70	6,618.6	6,532.2	-602.6	6,314.3	0.73	0.33	
13,425.0	91.10	340.20	6,617.7	6,590.4	-623.9	6,376.3	1.14	0.81	
13,488.0	90.10	339.60	6,617.0	6,649.6	-645.5	6,439.3	1.85	-1.59	
13,551.0	90.90	339.90	6,616.5	6,708.7	-667.3	6,502.3	1.36	1.27	

RECEIVED

Office of Oil and Gas

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Well:</b>	Roy Ferrell OHI 205H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
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
13,612.0	89.70	338.90	6,616.2	6,765.8	-688.8	6,563.3	2.56	-1.97	
13,676.0	90.50	339.30	6,616.0	6,825.6	-711.6	6,627.3	1.40	1.25	
13,739.0	90.00	337.40	6,615.8	6,884.1	-734.9	6,690.3	3.12	-0.79	
13,802.0	89.90	336.40	6,615.8	6,942.1	-759.6	6,753.2	1.60	-0.16	
13,865.0	91.00	337.40	6,615.3	7,000.0	-784.3	6,816.2	2.36	1.75	
13,927.0	89.70	336.70	6,615.0	7,057.1	-808.5	6,878.1	2.38	-2.10	
13,990.0	90.90	338.50	6,614.6	7,115.4	-832.5	6,941.1	3.43	1.90	
14,053.0	91.40	338.40	6,613.4	7,173.9	-855.6	7,004.1	0.81	0.79	
14,115.0	90.10	338.40	6,612.5	7,231.6	-878.4	7,066.1	2.10	-2.10	
14,178.0	90.70	339.10	6,612.1	7,290.3	-901.3	7,129.1	1.46	0.95	
14,241.0	91.70	340.40	6,610.8	7,349.4	-923.1	7,192.1	2.60	1.59	
14,303.0	89.80	340.10	6,610.0	7,407.8	-944.0	7,254.1	3.10	-3.06	
14,367.0	89.60	338.90	6,610.3	7,467.7	-966.4	7,318.1	1.90	-0.31	
14,428.0	90.00	339.50	6,610.5	7,524.7	-988.1	7,379.0	1.18	0.66	
14,490.0	90.40	339.60	6,610.3	7,582.8	-1,009.8	7,441.0	0.67	0.65	
14,553.0	90.70	339.40	6,609.7	7,641.8	-1,031.8	7,504.0	0.57	0.48	
14,616.0	91.20	340.80	6,608.7	7,701.1	-1,053.3	7,567.0	2.36	0.79	
14,679.0	91.60	340.40	6,607.1	7,760.5	-1,074.2	7,630.0	0.90	0.63	
14,742.0	90.60	340.20	6,605.9	7,819.8	-1,095.4	7,692.9	1.62	-1.59	
14,805.0	91.00	340.10	6,605.0	7,879.0	-1,116.8	7,755.9	0.65	0.63	
14,868.0	91.90	341.00	6,603.4	7,938.4	-1,137.8	7,818.9	2.02	1.43	
14,930.0	90.50	339.90	6,602.1	7,996.8	-1,158.5	7,880.8	2.87	-2.26	
14,992.0	90.40	339.80	6,601.7	8,055.0	-1,179.9	7,942.8	0.23	-0.16	
15,053.0	90.70	338.90	6,601.1	8,112.1	-1,201.4	8,003.8	1.56	0.49	
15,115.0	90.80	338.90	6,600.3	8,169.9	-1,223.7	8,065.8	0.16	0.16	
15,178.0	90.90	339.40	6,599.3	8,228.8	-1,246.1	8,128.8	0.81	0.16	
15,241.0	91.50	339.30	6,598.0	8,287.7	-1,268.3	8,191.8	0.97	0.95	
15,303.0	92.00	339.60	6,596.1	8,345.8	-1,290.1	8,253.8	0.94	0.81	
15,367.0	93.80	338.50	6,592.2	8,418.5	-1,317.9	8,331.6	2.70	2.31	
15,443.0	92.10	339.20	6,589.0	8,476.2	-1,340.3	8,393.6	2.96	-2.74	
15,506.0	90.10	338.20	6,587.8	8,534.9	-1,363.2	8,456.5	3.55	-3.17	
15,569.0	88.90	338.50	6,588.3	8,593.5	-1,386.4	8,519.5	1.96	-1.90	
15,632.0	89.30	338.40	6,589.3	8,652.1	-1,409.5	8,582.5	0.65	0.63	
15,696.0	90.10	339.00	6,589.6	8,711.7	-1,432.8	8,646.5	1.56	1.25	
15,760.0	89.50	338.90	6,589.9	8,771.4	-1,455.8	8,710.5	0.95	-0.94	
15,823.0	90.00	339.70	6,590.1	8,830.3	-1,478.0	8,773.5	1.50	0.79	
15,887.0	89.20	338.70	6,590.6	8,890.2	-1,500.8	8,837.5	2.00	-1.25	
15,950.0	89.40	339.10	6,591.4	8,948.9	-1,523.4	8,900.5	0.71	0.32	
16,013.0	90.40	339.60	6,591.5	9,007.9	-1,545.7	8,963.5	1.77	1.59	
16,076.0	91.60	340.80	6,590.4	9,067.2	-1,567.0	9,026.5	2.69	1.90	
16,139.0	90.40	341.10	6,589.3	9,126.7	-1,587.6	9,089.4	1.96	-1.90	
16,203.0	89.90	341.90	6,589.1	9,187.4	-1,607.9	9,153.4	1.47	-0.78	
16,265.0	89.20	341.10	6,589.6	9,246.2	-1,627.5	9,215.3	1.71	-1.13	
16,329.0	87.10	339.80	6,591.6	9,306.5	-1,648.9	9,279.2	3.86	-3.28	
16,392.0	87.60	340.30	6,594.6	9,365.6	-1,670.4	9,342.2	1.12	0.79	
16,454.0	86.70	338.10	6,597.6	9,423.5	-1,692.4	9,404.1	3.83	-1.45	
16,518.0	88.70	337.40	6,600.2	9,482.7	-1,716.6	9,468.0	3.31	3.13	
16,581.0	90.20	337.40	6,600.8	9,540.8	-1,740.8	9,531.0	2.38	2.38	
16,643.0	92.20	336.00	6,599.5	9,597.8	-1,765.3	9,592.9	3.94	3.23	
16,705.0	93.10	335.90	6,596.7	9,654.3	-1,790.6	9,654.8	1.46	1.45	
16,767.0	93.90	335.90	6,592.9	9,710.8	-1,815.8	9,716.6	1.29	1.29	
16,843.0	95.10	336.60	6,586.9	9,780.2	-1,846.4	9,792.3	1.83	1.58	Last Cathedral Survey @ 16,843' MD
16,892.0	95.10	336.60	6,582.5	9,824.9	-1,865.7	9,841.0	0.00	0.00	PTB @ 16,892' MD



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Well:</b>	Roy Ferrell OHI 205H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Roy Ferrell OHI 205H PI - survey misses target center by 27.7usft at 16892.0usft MD (6582.5 TVD, 9824.9 N, -1865.7 E) - Point	0.00	0.00	6,555.2	9,827.5	-1,869.8	573,561.15	1,709,433.56	40° 4' 12.40 N	80° 32' 17.60 W
Roy Ferrell OHI 205H PI - survey misses target center by 15.9usft at 16892.0usft MD (6582.5 TVD, 9824.9 N, -1865.7 E) - Point	0.00	0.00	6,567.4	9,827.5	-1,869.8	573,561.15	1,709,433.56	40° 4' 12.40 N	80° 32' 17.60 W
Roy Ferrell OHI 205H PI - survey misses target center by 6.0usft at 16892.0usft MD (6582.5 TVD, 9824.9 N, -1865.7 E) - Rectangle (sides W30.0 H100.0 D6,891.0)	89.50	339.04	6,586.1	9,827.5	-1,869.8	573,561.15	1,709,433.56	40° 4' 12.40 N	80° 32' 17.60 W
Roy Ferrell OHI 205H LF - survey misses target center by 128.3usft at 7908.0usft MD (6653.1 TVD, 1399.5 N, 1222.9 E) - Point	0.00	360.00	6,640.0	1,431.7	1,346.4	565,165.62	1,712,649.72	40° 2' 49.80 N	80° 31' 35.00 W

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
16,843.0	6,586.9	9,780.2	-1,846.4	Last Cathedral Survey @ 16,843' MD
16,892.0	6,582.5	9,824.9	-1,865.7	PTB @ 16,892' MD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

# **Chesapeake Energy Corp**

**Ohio County, WV**

**Roy Ferrell OHI Pad**

**Roy Ferrell OHI 205H**

**HZ**

**Survey: Survey #1**

## **Anticollision Report**

**27 December, 2013**

**10/28/2016**

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b> Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b> Well Roy Ferrell OHI 205H
<b>Project:</b> Ohio County, WV	<b>TVD Reference:</b> WELL @ 1214.0usft (Original Well Elev)
<b>Reference Site:</b> Roy Ferrell OHI Pad	<b>MD Reference:</b> WELL @ 1214.0usft (Original Well Elev)
<b>Site Error:</b> 0.0usft	<b>North Reference:</b> Grid
<b>Reference Well:</b> Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Well Error:</b> 0.0usft	<b>Output errors are at:</b> 2.00 sigma
<b>Reference Wellbore:</b> HZ	<b>Database:</b> USA EDM 5000 Multi Users DB
<b>Reference Design:</b> Survey: Survey #1	<b>Offset TVD Reference:</b> Offset Datum

<b>Reference:</b> Survey: Survey #1	
<b>Filter type:</b> NO GLOBAL FILTER: Using user defined selection & filtering criteria	
<b>Interpolation Method:</b> Stations	<b>Error Model:</b> Systematic Ellipse
<b>Depth Range:</b> Unlimited	<b>Scan Method:</b> Closest Approach 3D
<b>Results Limited by:</b> Maximum center-center distance of 1,356.1usft	<b>Error Surface:</b> Elliptical Conic
<b>Warning Levels Evaluated at:</b> 2.00 Sigma	

<b>Survey Program</b>	<b>Date</b> 12/27/2013			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
100.0	610.0	Gyro (HZ)	Gyro	Gyro
835.0	16,892.0	Survey #1 (HZ)	MWD	Geolink MWD

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
<b>Offset Well - Wellbore - Design</b>						
Roy Ferrell OHI Pad						
Roy Ferrell OHI 1H - HZ - FINAL	0.0	0.0	21.7			
Roy Ferrell OHI 1H - HZ - FINAL	868.0	867.9	22.7	20.9	13.256	ES
Roy Ferrell OHI 1H - HZ - FINAL	963.0	962.9	24.3	22.4	12.401	SF
Roy Ferrell OHI 201H - HZ - FINAL	657.1	657.1	13.6	12.4	11.558	CC, ES
Roy Ferrell OHI 201H - HZ - FINAL	868.0	867.8	15.8	13.8	8.244	SF
Roy Ferrell OHI 205H - HZ - Plan #5	9,902.0	9,902.0	0.0	0.0	0.000	Level 1, CC, SF
Roy Ferrell OHI 205H - HZ - Plan #5	16,843.0	16,840.1	5.1	-278.7	0.018	Level 1, ES
Roy Ferrell OHI 206H - HZ - FINAL	654.4	654.3	23.6	22.4	19.690	CC, ES
Roy Ferrell OHI 206H - HZ - FINAL	868.0	867.4	26.7	24.8	13.723	SF
Roy Ferrell OHI 3H (Existing) - Existing - Existing	755.9	768.1	41.0	38.9	19.660	CC
Roy Ferrell OHI 3H (Existing) - Existing - Existing	835.0	847.2	41.2	38.8	17.442	ES
Roy Ferrell OHI 3H (Existing) - Existing - Existing	1,057.0	1,068.8	46.2	43.1	14.707	SF
Roy Ferrell OHI 5H - HZ - FINAL	0.0	0.0	12.8			
Roy Ferrell OHI 5H - HZ - FINAL	16,139.0	15,832.1	953.6	613.0	2.799	SF
Roy Ferrell OHI 6H - HZ - FINAL	658.2	658.1	27.8	26.6	23.416	CC
Roy Ferrell OHI 6H - HZ - FINAL	963.0	964.0	28.6	26.4	12.661	ES
Roy Ferrell OHI 6H - HZ - FINAL	1,026.0	1,027.0	29.5	27.0	11.835	SF
Roy Ferrell OHI 8H (Existing) - Existing - Existing	645.8	656.7	41.8	40.1	24.589	CC, ES
Roy Ferrell OHI 8H (Existing) - Existing - Existing	1,152.0	1,162.1	48.4	44.9	13.782	SF

RECEIVED  
Office of Oil and Gas

JUN 21 2016

WV Department of  
Environmental Protection

# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey, Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214 0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214 0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 1H - HZ - FINAL													Offset Site Error	U 0 usft
Survey Program: 100-Gyro, 2262-MWD													Offset Well Error	0 0 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-20.36	20.3	-7.5	21.7					
100.0	100.0	100.0	100.0	0.1	0.1	98.70	20.5	-7.3	21.8	21.7	0.14	152.115		
200.0	200.0	199.9	199.9	0.2	0.2	99.42	20.8	-7.1	22.1	21.8	0.32	89.497		
300.0	300.0	300.0	300.0	0.2	0.2	98.48	21.0	-7.1	22.4	21.9	0.49	45.377		
400.0	400.0	400.0	400.0	0.3	0.3	78.19	21.1	-7.1	22.5	21.8	0.67	33.700		
500.0	500.0	499.9	499.9	0.4	0.4	58.04	21.2	-7.1	22.5	21.6	0.84	26.705		
519.4	519.4	519.4	519.4	0.4	0.4	67.35	21.3	-7.2	22.5	21.6	0.88	25.663		
600.0	600.0	599.9	599.9	0.5	0.5	91.30	21.5	-7.2	22.6	21.5	1.02	22.196		
610.0	610.0	609.9	609.9	0.5	0.5	77.91	21.5	-7.2	22.6	21.5	1.03	21.833		
835.0	835.0	834.9	834.9	0.9	0.7	-78.62	22.0	-8.8	22.6	21.0	1.62	13.935		
835.3	835.3	835.2	835.2	0.9	0.7	-78.83	22.0	-8.8	22.6	21.0	1.62	13.929		
868.0	868.0	867.9	867.9	1.0	0.7	-92.53	22.1	-6.7	22.7	20.9	1.71	13.256	ES	
900.0	900.0	899.9	899.9	1.0	0.8	-105.48	22.2	-6.7	22.8	21.1	1.79	12.742		
931.0	931.0	930.9	930.9	1.1	0.8	-119.51	22.3	-6.6	23.4	21.5	1.88	12.460		
963.0	962.9	962.9	962.9	1.1	0.8	-125.87	22.3	-6.5	24.3	22.4	1.96	12.401	SF	
994.0	993.8	993.8	993.8	1.2	0.9	-129.76	22.4	-6.4	25.6	23.5	2.04	12.509		
1,026.0	1,025.8	1,025.7	1,025.7	1.3	0.9	-134.10	22.5	-6.3	27.2	25.1	2.13	12.789		
1,057.0	1,056.8	1,056.6	1,056.6	1.3	0.9	-138.69	22.6	-6.2	29.4	27.1	2.21	13.257		
1,088.0	1,087.4	1,087.4	1,087.4	1.4	0.9	-143.90	22.7	-6.1	32.0	29.7	2.30	13.926		
1,152.0	1,150.9	1,150.9	1,150.9	1.5	1.0	-157.15	22.9	-6.0	39.2	36.7	2.47	15.873		
1,214.0	1,212.2	1,212.1	1,212.1	1.7	1.0	-161.16	23.2	-5.8	47.9	45.2	2.64	18.167		
1,277.0	1,274.5	1,274.3	1,274.3	1.9	1.1	-168.75	23.5	-5.7	57.6	54.8	2.80	20.581		
1,339.0	1,335.6	1,335.5	1,335.5	2.0	1.2	-172.08	23.8	-5.7	67.6	64.7	2.96	22.835		
1,402.0	1,397.8	1,397.7	1,397.7	2.2	1.2	-171.07	24.1	-5.7	78.0	74.9	3.13	24.936		
1,465.0	1,459.9	1,459.7	1,459.7	2.4	1.3	-172.57	24.3	-5.6	88.8	85.5	3.29	26.978		
1,525.0	1,519.0	1,518.7	1,518.7	2.6	1.3	-178.21	24.6	-5.6	98.9	95.4	3.45	28.884		
1,588.0	1,581.4	1,581.0	1,581.0	2.8	1.4	-179.31	24.9	-5.6	108.1	104.5	3.61	29.935		
1,651.0	1,643.8	1,643.6	1,643.6	2.9	1.4	-175.18	25.1	-5.6	116.5	112.7	3.78	30.843		
1,714.0	1,706.3	1,706.2	1,706.2	3.1	1.5	-173.16	25.3	-5.5	124.6	120.6	3.94	31.593		
1,777.0	1,768.8	1,768.6	1,768.6	3.3	1.5	-173.09	25.5	-5.4	132.7	128.8	4.11	32.314		
1,840.0	1,831.1	1,831.0	1,831.0	3.5	1.6	-174.99	25.8	-5.4	141.8	137.5	4.27	33.194		
1,903.0	1,893.4	1,893.4	1,893.4	3.7	1.6	-175.81	25.9	-5.2	151.5	147.1	4.44	34.156		
1,967.0	1,956.6	1,956.6	1,956.6	3.9	1.7	-174.04	26.1	-5.1	161.7	157.1	4.60	35.119		
2,030.0	2,018.6	2,018.9	2,018.9	4.1	1.7	-170.20	26.2	-5.0	171.4	166.6	4.77	35.928		
2,092.0	2,080.1	2,080.4	2,080.4	4.3	1.8	-168.96	26.3	-4.8	180.3	175.3	4.93	36.547		
2,140.0	2,127.6	2,128.1	2,128.1	4.4	1.8	-167.17	26.3	-4.7	187.0	181.9	5.06	36.956		
2,246.0	2,232.5	2,232.5	2,232.5	4.7	2.0	-163.61	26.6	-4.2	201.3	195.9	5.40	37.258		
2,309.0	2,295.0	2,294.2	2,294.2	4.9	2.1	-159.80	26.7	-4.2	209.2	203.5	5.62	37.213		
2,373.0	2,358.6	2,353.9	2,353.8	5.0	2.2	-145.94	26.7	-5.1	216.7	210.8	5.84	37.116		
2,436.0	2,421.0	2,410.6	2,410.5	5.2	2.3	-138.08	26.5	-7.6	226.1	219.1	6.05	37.231		
2,499.0	2,483.3	2,466.4	2,466.1	5.4	2.4	-134.49	26.0	-11.8	235.8	229.5	6.26	37.694		
2,562.0	2,545.3	2,522.6	2,522.2	5.6	2.5	-134.58	25.2	-17.7	249.0	242.6	6.46	38.526		
2,625.0	2,607.0	2,580.2	2,579.2	5.8	2.6	-138.78	24.3	-24.6	264.5	257.8	6.67	39.653		
2,688.0	2,668.5	2,638.7	2,637.2	6.0	2.8	-143.41	22.8	-32.3	281.9	275.0	6.88	40.982		
2,752.0	2,730.8	2,698.4	2,698.2	6.3	2.9	-146.16	19.7	-40.7	301.3	294.2	7.09	42.491		
2,815.0	2,791.8	2,755.0	2,752.1	6.5	3.0	-150.93	16.5	-48.8	321.9	314.6	7.29	44.144		
2,878.0	2,852.6	2,809.7	2,806.1	6.8	3.2	-155.50	13.5	-57.1	344.7	337.2	7.49	46.007		
2,941.0	2,913.1	2,865.5	2,861.1	7.1	3.3	-155.04	10.1	-65.9	368.9	361.2	7.70	47.928		
3,004.0	2,973.4	2,920.9	2,915.6	7.4	3.5	-153.99	6.2	-74.9	394.2	386.3	7.91	49.821		
3,067.0	3,033.5	2,972.8	2,966.7	7.7	3.6	-157.25	2.3	-83.7	420.6	412.5	8.10	51.900		
3,130.0	3,093.2	3,022.7	3,015.8	8.1	3.8	-161.85	-1.9	-92.7	449.4	441.1	8.29	54.239		
3,192.0	3,151.6	3,070.6	3,062.3	8.5	3.9	-165.69	-6.6	-101.9	479.7	471.3	8.47	56.555		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 1H - HZ - FINAL														Offset Site Error	0.0 usft
Survey Program 100-Gyro, 2252-MWD														Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Total	Separation	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis	Factor			
3,254.0	3,210.0	3,121.6	3,111.9	8.8	4.1	-164.76	-12.3	-112.2	510.5	501.8	8.70	58.682			
3,316.0	3,268.9	3,172.6	3,161.5	9.1	4.3	-164.68	-18.7	-122.6	540.5	531.6	8.93	60.524			
3,441.0	3,387.2	3,271.6	3,257.1	9.9	4.7	-167.81	-32.8	-143.7	603.6	594.3	9.32	64.752			
3,503.0	3,445.6	3,318.5	3,302.3	10.2	4.9	-168.89	-40.3	-154.1	636.4	626.6	9.55	66.523			
3,565.0	3,504.4	3,370.0	3,351.7	10.6	5.1	-166.91	-48.5	-166.6	668.6	658.8	9.80	68.258			
3,629.0	3,565.1	3,425.5	3,405.2	11.0	5.4	-172.11	-57.3	-178.0	701.9	691.9	10.02	70.077			
3,691.0	3,623.7	3,479.7	3,457.4	11.3	5.6	-174.59	-65.5	-190.0	734.9	724.6	10.22	71.884			
3,754.0	3,683.2	3,527.4	3,503.4	11.7	5.8	-173.55	-72.6	-200.5	768.5	758.0	10.46	73.447			
3,817.0	3,743.1	3,569.5	3,543.8	12.0	6.0	-171.89	-79.0	-210.2	801.9	791.2	10.69	74.978			
3,881.0	3,804.0	3,622.1	3,594.2	12.4	6.3	-168.89	-87.3	-222.7	835.9	825.0	10.92	76.576			
3,943.0	3,862.8	3,686.1	3,655.7	12.8	6.6	-172.35	-97.4	-237.5	869.3	858.1	11.15	77.940			
4,005.0	3,921.9	3,746.1	3,713.5	13.1	6.8	-169.80	-106.3	-250.7	901.2	889.8	11.45	78.741			
4,068.0	3,982.5	3,783.7	3,749.8	13.4	7.0	-168.49	-111.7	-259.1	932.1	920.4	11.87	79.874			
4,130.0	4,042.3	3,818.0	3,782.7	13.7	7.2	-171.74	-116.5	-267.5	963.1	951.2	11.84	81.371			
4,193.0	4,102.9	3,853.9	3,816.9	14.0	7.4	-174.62	-121.7	-277.0	996.4	984.4	12.00	83.053			
4,256.0	4,163.2	3,899.3	3,860.0	14.4	7.6	-176.38	-128.6	-289.5	1,031.7	1,019.5	12.18	84.708			
4,318.0	4,222.2	3,962.9	3,920.4	14.7	8.0	-175.72	-139.1	-308.4	1,068.8	1,054.3	12.42	85.879			
4,380.0	4,281.1	4,018.5	3,973.3	15.1	8.3	-178.73	-148.5	-320.7	1,101.8	1,089.1	12.66	87.012			
4,443.0	4,341.0	4,098.6	4,047.8	15.4	8.7	179.23	-162.0	-339.9	1,137.0	1,124.0	12.95	87.793			
4,503.0	4,397.7	4,181.8	4,110.4	15.6	9.0	178.14	-173.2	-354.4	1,169.9	1,156.7	13.19	88.722			
4,565.0	4,457.1	4,217.7	4,164.1	16.2	9.3	174.42	-182.4	-366.6	1,204.8	1,191.4	13.44	89.841			
4,629.0	4,516.4	4,288.4	4,232.3	16.6	9.6	169.23	-193.5	-381.6	1,239.4	1,225.7	13.75	90.140			
4,693.0	4,576.5	4,340.7	4,282.9	17.0	9.9	188.66	-201.8	-392.1	1,274.0	1,260.0	14.03	90.919			
4,756.0	4,636.2	4,384.0	4,324.7	17.4	10.1	169.63	-208.4	-401.4	1,307.6	1,293.3	14.30	91.416			
4,817.0	4,694.7	4,419.6	4,359.0	17.7	10.3	173.28	-213.6	-409.5	1,338.8	1,324.2	14.53	92.120			



# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grnd  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 201H - HZ - FINAL													Offset Site Error	0.0 usft
Survey Program: 200-Gyro, 829-MWD													Offset Well Error	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning	
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.0	0.0	0.0	0.0	0.0	0.0	-89.33	0.2	-15.6	15.6					
100.0	100.0	100.0	100.0	0.1	0.1	29.60	0.4	-15.5	15.2	15.1	0.15	100.699		
200.0	200.0	200.0	200.0	0.2	0.2	31.71	1.0	-15.3	14.7	14.4	0.32	46.098		
300.0	300.0	300.0	300.0	0.2	0.2	32.66	1.6	-15.3	14.3	13.8	0.49	28.979		
400.0	400.0	400.0	400.0	0.3	0.3	12.87	1.9	-15.5	14.1	13.4	0.67	21.099		
500.0	500.0	499.9	499.9	0.4	0.4	-7.75	2.1	-15.8	14.0	13.1	0.84	16.616		
600.0	600.0	599.9	599.9	0.5	0.5	24.52	2.1	-16.2	13.7	12.7	1.02	13.525		
610.0	610.0	609.9	609.9	0.5	0.5	11.01	2.2	-16.2	13.7	12.7	1.03	13.255		
657.1	657.1	657.1	657.1	0.6	0.6	1.69	2.2	-16.4	13.6	12.4	1.18	11.558 CC, ES		
635.0	635.0	634.9	634.9	0.9	0.9	-147.37	2.6	-17.4	15.0	13.2	1.80	8.345		
868.0	868.0	867.8	867.8	1.0	0.9	-181.40	2.5	-17.8	15.8	13.8	1.91	8.244 SF		
900.0	900.0	899.7	899.7	1.0	1.0	-174.24	2.3	-18.2	16.9	14.9	2.02	8.377		
931.0	931.0	930.5	930.4	1.1	1.1	172.69	1.9	-19.0	18.8	16.6	2.13	8.813		
963.0	962.9	962.1	962.0	1.1	1.1	168.30	1.4	-20.1	21.5	19.2	2.24	9.582		
994.0	993.8	992.5	992.4	1.2	1.2	166.77	0.8	-21.7	24.9	22.6	2.35	10.626		
1,026.0	1,025.8	1,023.6	1,023.4	1.3	1.2	165.24	0.0	-23.9	29.5	27.1	2.46	12.016		
1,057.0	1,056.6	1,053.6	1,053.3	1.3	1.3	163.81	-0.9	-26.6	35.0	32.4	2.56	13.637		
1,088.0	1,087.4	1,083.4	1,082.9	1.4	1.4	161.94	-1.8	-29.7	41.3	38.7	2.67	15.481		
1,152.0	1,150.9	1,144.8	1,143.8	1.5	1.5	154.34	-4.2	-37.2	56.3	53.4	2.89	19.466		
1,214.0	1,212.2	1,204.3	1,202.7	1.7	1.7	154.18	-7.4	-45.0	72.4	69.3	3.12	23.240		
1,277.0	1,274.5	1,264.8	1,262.5	1.9	1.8	151.31	-11.1	-53.3	89.5	86.2	3.36	26.711		
1,339.0	1,335.6	1,324.4	1,321.4	2.0	2.0	147.70	-15.0	-61.5	108.3	102.7	3.59	29.590		
1,402.0	1,397.8	1,385.3	1,381.6	2.2	2.1	149.89	-19.2	-69.9	123.4	119.5	3.84	32.154		
1,465.0	1,459.9	1,447.4	1,443.0	2.4	2.3	149.80	-23.1	-78.0	140.6	136.5	4.09	34.997		
1,525.0	1,519.0	1,505.6	1,500.7	2.6	2.5	145.12	-26.0	-85.1	156.0	151.8	4.33	36.015		
1,588.0	1,581.4	1,565.8	1,560.4	2.8	2.6	144.81	-28.7	-92.6	170.8	166.3	4.58	37.293		
1,651.0	1,643.8	1,624.4	1,618.4	2.9	2.8	149.35	-31.2	-100.5	185.8	181.0	4.82	38.547		
1,714.0	1,706.3	1,685.5	1,678.8	3.1	3.0	151.82	-33.9	-109.3	201.5	196.4	5.07	39.771		
1,777.0	1,768.8	1,748.1	1,740.7	3.3	3.2	152.09	-37.0	-118.0	217.0	211.6	5.31	40.826		
1,840.0	1,831.1	1,810.8	1,802.7	3.5	3.4	150.31	-40.6	-126.3	232.7	227.2	5.57	41.791		
1,903.0	1,893.4	1,874.7	1,866.1	3.7	3.5	149.75	-44.3	-134.2	248.4	242.6	5.83	42.824		
1,967.0	1,956.6	1,936.9	1,927.7	3.9	3.7	151.99	-47.6	-141.3	264.2	258.1	6.08	43.427		
2,030.0	2,018.8	1,998.2	1,986.6	4.1	3.9	156.51	-50.2	-148.2	279.9	273.6	6.33	44.251		
2,092.0	2,080.1	2,054.9	2,044.8	4.3	4.0	158.36	-52.3	-155.4	295.5	289.0	6.56	45.042		
2,140.0	2,127.6	2,101.5	2,091.0	4.4	4.2	160.63	-53.9	-161.2	307.7	301.0	6.74	45.641		
2,246.0	2,232.5	2,207.6	2,196.3	4.7	4.5	165.10	-57.9	-173.7	333.8	326.7	7.14	46.741		
2,309.0	2,295.0	2,269.7	2,257.9	4.9	4.6	169.73	-60.3	-180.7	348.5	341.1	7.38	47.202		
2,373.0	2,358.6	2,327.0	2,314.8	5.0	4.8	-175.85	-62.9	-187.3	363.1	355.5	7.60	47.765		
2,436.0	2,421.0	2,380.4	2,367.6	5.2	5.0	-167.10	-66.4	-194.6	379.1	371.3	7.80	48.604		
2,499.0	2,483.3	2,432.8	2,419.2	5.4	5.2	-162.36	-70.7	-202.9	397.7	389.7	7.98	49.820		
2,562.0	2,545.3	2,485.9	2,471.2	5.6	5.4	-161.06	-75.5	-212.2	418.9	410.7	8.17	51.286		
2,625.0	2,607.0	2,541.6	2,525.7	5.8	5.6	-163.86	-81.2	-222.3	441.8	433.5	8.36	52.863		
2,688.0	2,668.5	2,595.4	2,578.2	6.0	5.8	-167.26	-87.3	-232.5	466.4	457.9	8.55	54.566		
2,752.0	2,730.8	2,650.9	2,632.2	6.3	6.0	-168.50	-94.1	-243.3	493.0	484.3	8.74	56.400		
2,815.0	2,791.8	2,700.7	2,680.5	6.5	6.3	-171.99	-100.7	-253.3	520.7	511.8	8.93	58.332		
2,878.0	2,852.6	2,748.1	2,728.3	6.8	6.5	-175.53	-107.4	-263.4	550.2	541.1	9.11	60.385		
2,941.0	2,913.1	2,794.0	2,770.5	7.1	6.7	-173.88	-114.4	-273.6	581.8	572.3	9.29	62.632		
3,004.0	2,973.4	2,839.5	2,814.1	7.4	6.9	-171.52	-121.8	-284.6	614.3	604.9	9.49	64.733		
3,067.0	3,033.5	2,882.3	2,854.8	7.7	7.2	-174.02	-129.2	-295.3	648.5	638.8	9.65	67.198		
3,130.0	3,093.2	2,923.8	2,894.2	8.1	7.4	-178.11	-136.6	-308.3	684.7	674.9	9.80	69.863		
3,192.0	3,151.6	2,965.8	2,933.9	8.5	7.7	178.80	-144.3	-317.8	721.9	711.9	9.98	72.328		
3,254.0	3,210.0	3,008.4	2,973.9	8.8	7.9	-179.29	-152.6	-329.7	759.4	749.2	10.24	74.182		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation  
 Office of Oil and Gas

## Cathedral Energy Services Anticollision Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Reference Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Survey Survey #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error	0.0 usft
Roy Ferrell OHI Pad - Roy Ferrell OHI 201H - HZ - FINAL													Offset Well Error	0.0 usft
Survey Program 200-Gyro, 829-MWD														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning	
3,316.0	3,288.9	3,049.1	3,012.0	9.1	8.2	-178.17	-160.9	-341.4	796.4	785.9	10.48	75.965		
3,441.0	3,387.2	3,119.7	3,077.3	9.9	8.6	179.88	-176.9	-362.9	874.5	863.7	10.80	80.994		
3,503.0	3,445.6	3,154.1	3,108.7	10.2	8.9	179.53	-185.6	-373.9	914.9	903.9	11.04	82.868		
3,585.0	3,504.4	3,193.4	3,144.4	10.6	9.2	-177.61	-196.0	-386.7	955.2	943.9	11.29	84.599		
3,629.0	3,565.1	3,247.1	3,193.0	11.0	9.8	177.15	-210.4	-404.3	996.9	985.4	11.54	86.421		
3,691.0	3,623.7	3,312.1	3,252.3	11.3	10.0	174.52	-227.7	-424.4	1,036.9	1,025.1	11.79	87.916		
3,754.0	3,683.2	3,352.0	3,288.8	11.7	10.3	176.04	-238.4	-438.7	1,077.8	1,065.6	12.06	89.358		
3,817.0	3,743.1	3,385.5	3,319.2	12.0	10.6	178.21	-247.4	-447.3	1,118.1	1,105.8	12.31	90.808		
3,881.0	3,804.0	3,418.9	3,349.5	12.4	10.8	-178.21	-256.5	-458.3	1,159.8	1,147.3	12.49	92.076		
3,943.0	3,862.8	3,474.1	3,399.3	12.8	11.2	178.40	-271.5	-476.5	1,200.8	1,188.1	12.72	94.376		
4,005.0	3,921.9	3,510.4	3,432.2	13.1	11.5	-178.02	-281.2	-488.5	1,241.1	1,228.1	13.02	95.288		
4,068.0	3,982.5	3,550.9	3,468.7	13.4	11.8	-174.56	-292.0	-502.4	1,281.0	1,267.7	13.31	96.251		
4,130.0	4,042.3	3,619.0	3,530.3	13.7	12.3	179.56	-310.2	-525.1	1,319.5	1,305.9	13.57	97.205		

# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey: Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2 00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design														Offset Site Error
Roy Ferrell OHI Pad - Roy Ferrell OHI 205H - HZ - Plan #5														0 0 usft
Survey Program 100-Gyro, 835-MWD, 9902-MWD														Offset Well Error
														0 0 usft
Reference		Offset		Semi Major Axis			Distance					Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning	
9,902.0	6,631.7	9,902.0	6,631.7	0.0	0.0	0.00	3,296.4	622.6	0.0	0.0	0.00	0.000	Level 1, CC, SF	
9,938.3	6,631.3	9,938.3	6,631.0	0.6	0.6	53.13	3,330.3	609.7	0.5	-0.4	0.95	0.578	Level 1	
9,965.0	6,631.5	9,965.0	6,630.5	1.1	1.1	53.79	3,355.2	600.2	1.6	0.0	1.64	0.993	Level 1	
10,029.0	6,632.5	10,029.9	6,630.0	2.2	2.2	52.04	3,414.9	577.3	4.1	0.9	3.26	1.265	Level 3	
10,092.0	6,633.5	10,091.9	6,629.6	3.3	3.3	38.85	3,473.8	554.9	5.1	1.2	3.97	1.291	Level 3	
10,155.0	6,634.3	10,154.9	6,629.2	4.3	4.3	24.17	3,532.6	532.4	5.6	2.1	3.54	1.581		
10,218.0	6,634.7	10,217.9	6,628.8	5.4	5.4	15.95	3,591.5	510.0	6.2	3.0	3.15	1.988		
10,281.0	6,634.8	10,280.9	6,628.4	6.5	6.5	7.36	3,650.3	487.5	6.5	4.2	2.30	2.829		
10,344.0	6,634.3	10,343.8	6,627.9	7.6	7.6	-3.74	3,709.1	485.0	6.4	4.3	2.12	3.007		
10,360.7	6,634.1	10,360.5	6,627.8	7.9	7.9	-6.76	3,724.7	459.1	6.3	3.7	2.65	2.387		
10,407.0	6,634.1	10,406.8	6,627.5	8.7	8.7	-10.16	3,768.0	442.6	6.7	3.0	3.69	1.804		
10,471.0	6,634.5	10,470.8	6,627.1	9.8	9.8	-12.24	3,827.8	419.8	7.6	2.9	4.72	1.604		
10,535.0	6,635.2	10,534.8	6,626.7	10.9	10.9	-12.89	3,887.6	397.0	8.6	3.2	5.48	1.579		
10,598.0	6,635.5	10,597.8	6,626.3	12.0	12.0	-13.36	3,948.4	374.5	9.5	3.3	6.14	1.543		
10,658.0	6,635.7	10,657.8	6,625.9	13.1	13.1	-14.90	4,002.5	353.1	10.1	2.8	7.28	1.386	Level 3	
10,721.0	6,635.8	10,720.8	6,625.5	14.2	14.2	-14.41	4,061.3	330.6	10.6	2.9	7.66	1.385	Level 3	
10,785.0	6,635.5	10,784.8	6,625.1	15.3	15.3	-14.45	4,121.1	307.8	10.7	2.5	8.28	1.298	Level 3	
10,847.0	6,635.2	10,846.8	6,624.7	16.4	16.4	-13.80	4,179.0	285.7	10.7	2.2	8.58	1.251	Level 3	
10,910.0	6,634.7	10,909.8	6,624.3	17.5	17.5	-9.12	4,237.9	263.3	10.5	3.6	6.87	1.531		
10,930.8	6,634.6	10,930.7	6,624.2	17.9	17.9	-7.16	4,257.4	255.8	10.5	4.3	6.19	1.680		
10,973.0	6,634.5	10,972.8	6,623.9	18.7	18.7	-5.64	4,296.8	240.8	10.7	4.8	5.88	1.816		
11,036.0	6,634.6	11,035.8	6,623.5	19.8	19.8	-7.02	4,355.6	218.3	11.2	4.3	6.82	1.637		
11,099.0	6,634.4	11,098.8	6,623.1	21.0	21.0	-10.34	4,414.5	195.9	11.5	2.5	9.01	1.276	Level 3	
11,161.0	6,634.1	11,160.8	6,622.7	22.2	22.2	-14.62	4,472.4	173.8	11.8	-0.5	12.25	0.961	Level 1	
11,223.0	6,633.6	11,222.8	6,622.3	23.4	23.4	-16.79	4,530.3	151.7	11.7	-2.7	14.40	0.815	Level 1	
11,285.0	6,632.6	11,285.6	6,621.9	24.6	24.7	-19.45	4,589.2	129.2	11.3	-5.9	17.18	0.658	Level 1	
11,311.1	6,632.1	11,310.9	6,621.8	25.1	25.2	-22.12	4,612.6	120.3	11.2	-8.5	19.65	0.589	Level 1	
11,349.0	6,631.7	11,348.8	6,621.5	25.9	26.0	-27.43	4,648.0	106.8	11.5	-13.0	24.50	0.468	Level 1	
11,412.0	6,631.0	11,411.7	6,621.1	27.2	27.4	-37.16	4,706.8	84.3	12.5	-20.9	33.40	0.373	Level 1	
11,475.0	6,630.1	11,474.7	6,620.7	28.6	29.0	-47.65	4,765.6	61.9	13.9	-29.0	42.86	0.324	Level 1	
11,539.0	6,629.3	11,538.6	6,620.3	30.2	31.4	-54.79	4,825.4	39.1	15.5	-34.9	50.45	0.308	Level 1	
11,602.0	6,628.8	11,601.6	6,619.9	32.2	34.5	-58.57	4,884.2	16.6	17.1	-39.4	56.56	0.303	Level 1	
11,666.0	6,628.0	11,665.5	6,619.5	37.5	38.9	-63.11	4,943.9	-6.2	18.8	-47.5	66.28	0.264	Level 1	
11,728.0	6,626.7	11,727.5	6,619.1	40.9	42.3	-66.77	5,001.9	-28.3	19.2	-55.1	74.32	0.259	Level 1	
11,792.0	6,625.4	11,791.5	6,618.7	43.5	44.5	-68.43	5,061.6	-51.1	18.1	-61.4	79.54	0.228	Level 1	
11,855.0	6,624.6	11,854.5	6,618.3	45.6	48.4	-67.37	5,120.5	-73.5	16.5	-65.8	82.33	0.200	Level 1	
11,919.0	6,624.1	11,918.5	6,617.9	47.5	48.2	-65.67	5,180.2	-96.4	15.0	-59.3	84.36	0.178	Level 1	
11,981.0	6,623.3	11,980.4	6,617.5	49.3	49.8	-64.49	5,238.2	-118.5	13.6	-73.1	86.84	0.156	Level 1	
12,045.0	6,622.4	12,044.4	6,617.1	51.0	51.4	-63.69	5,297.9	-141.3	12.1	-76.6	88.63	0.136	Level 1	
12,108.0	6,621.2	12,107.4	6,616.7	52.5	52.9	-65.17	5,358.8	-163.7	10.8	-81.6	92.46	0.117	Level 1	
12,171.0	6,619.6	12,170.4	6,616.3	54.1	54.4	-68.84	5,415.6	-186.2	9.3	-88.6	97.91	0.095	Level 1	
12,234.0	6,618.4	12,233.4	6,615.9	55.6	55.8	-70.66	5,474.4	-208.6	7.5	-94.2	101.72	0.074	Level 1	
12,298.0	6,618.6	12,297.3	6,615.5	57.1	57.2	-69.45	5,534.2	-231.4	6.2	-88.8	94.96	0.065	Level 1	
12,360.0	6,619.2	12,359.3	6,615.1	59.5	58.6	-44.11	5,592.1	-253.5	5.8	-72.8	78.63	0.074	Level 1	
12,376.1	6,619.3	12,375.4	6,615.0	58.8	58.9	-41.40	5,607.1	-259.3	5.8	-69.4	75.19	0.077	Level 1	
12,422.0	6,619.7	12,421.3	6,614.7	59.8	59.9	-31.62	5,650.0	-275.6	5.9	-54.9	60.82	0.098	Level 1	
12,486.0	6,620.6	12,485.3	6,614.3	61.2	61.2	-17.32	5,709.8	-298.4	6.7	-29.5	36.15	0.184	Level 1	
12,548.0	6,621.3	12,547.3	6,613.9	62.5	62.5	-7.66	5,767.7	-320.5	7.5	-12.0	19.44	0.384	Level 1	
12,611.0	6,621.4	12,610.2	6,613.5	63.6	63.8	-3.10	5,826.6	-343.0	8.0	-5.4	13.34	0.599	Level 1	
12,674.0	6,621.3	12,673.2	6,613.1	65.1	65.1	-4.04	5,885.4	-365.5	8.3	-6.5	14.82	0.559	Level 1	
12,737.0	6,620.9	12,736.2	6,612.7	66.3	66.4	-12.55	5,944.3	-387.9	8.4	-21.9	30.35	0.278	Level 1	
12,800.0	6,619.9	12,799.2	6,612.3	67.5	67.7	-27.39	6,003.1	-410.4	8.6	-52.4	61.02	0.141	Level 1	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey: Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2 00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 205H - HZ - Plan #5													Offset Site Error	0.0 usft
Survey Program 100-GWR, 835-MWD, 9902-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance					Total Uncertainty	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Axis			
12,864.0	6,619.1	12,863.1	6,611.8	68.7	68.9	-41.61	6,062.8	-433.2	9.7	-77.8	87.36	0.111	Level 1	
12,925.0	6,619.1	12,924.1	6,611.5	69.9	70.1	-48.42	6,119.8	-454.9	11.5	-88.6	100.16	0.115	Level 1	
12,989.0	6,619.9	12,988.1	6,611.0	71.2	71.4	-46.40	6,179.6	-477.7	12.8	-88.8	99.67	0.129	Level 1	
13,052.0	6,620.9	13,051.1	6,610.6	72.4	72.6	-39.57	6,238.4	-500.2	13.4	-76.5	89.87	0.149	Level 1	
13,115.0	6,621.3	13,114.1	6,610.2	73.7	73.9	-35.07	6,297.2	-522.6	13.5	-69.3	82.87	0.163	Level 1	
13,177.0	6,620.9	13,176.1	6,609.8	74.9	75.1	-34.79	6,355.2	-544.7	13.5	-70.3	83.86	0.161	Level 1	
13,240.0	6,620.0	13,239.0	6,609.4	76.1	76.3	-37.92	6,414.0	-567.2	13.3	-76.4	91.77	0.145	Level 1	
13,280.9	6,619.3	13,280.0	6,609.2	76.9	77.1	-39.99	6,452.2	-581.8	13.3	-83.4	96.70	0.137	Level 1	
13,302.0	6,619.1	13,301.0	6,609.0	77.3	77.5	-40.46	6,471.9	-589.3	13.3	-84.8	98.09	0.135	Level 1	
13,363.0	6,618.6	13,362.0	6,608.7	78.4	78.6	-42.19	6,528.9	-611.0	13.4	-89.5	102.95	0.131	Level 1	
13,425.0	6,617.7	13,424.0	6,608.3	79.6	79.8	-46.46	6,586.8	-633.1	13.7	-98.9	112.62	0.122	Level 1	
13,488.0	6,617.0	13,487.0	6,607.9	80.8	81.0	-49.64	6,645.7	-655.6	14.2	-105.7	119.67	0.118	Level 1	
13,551.0	6,616.5	13,550.0	6,607.5	82.0	82.2	-51.85	6,704.5	-678.1	14.6	-111.1	125.77	0.116	Level 1	
13,612.0	6,616.2	13,611.0	6,607.1	83.1	83.4	-52.38	6,761.5	-699.8	14.9	-113.6	128.55	0.116	Level 1	
13,676.0	6,616.0	13,675.0	6,606.7	84.4	84.6	-51.45	6,821.3	-722.8	15.1	-114.0	129.04	0.117	Level 1	
13,739.0	6,615.8	13,738.0	6,606.2	85.6	85.8	-48.99	6,880.2	-745.1	14.5	-112.8	127.31	0.114	Level 1	
13,802.0	6,615.8	13,801.0	6,605.8	86.8	87.0	-40.47	6,939.0	-767.5	13.1	-96.6	111.89	0.117	Level 1	
13,865.0	6,615.3	13,863.9	6,605.4	88.0	88.1	-31.64	6,997.8	-790.0	11.8	-81.0	92.81	0.125	Level 1	
13,927.0	6,615.0	13,925.9	6,605.0	89.3	89.3	-21.28	7,055.7	-812.1	10.8	-55.2	65.86	0.161	Level 1	
13,990.0	6,614.6	13,988.8	6,604.6	90.5	90.5	-12.42	7,114.5	-834.5	10.2	-32.3	42.54	0.240	Level 1	
14,053.0	6,613.4	14,051.8	6,604.2	91.6	91.7	-9.16	7,173.4	-857.0	9.2	-25.3	34.51	0.268	Level 1	
14,105.5	6,612.6	14,104.3	6,603.9	92.6	92.6	-5.39	7,222.4	-875.7	8.7	-16.2	24.96	0.349	Level 1	
14,115.0	6,612.5	14,113.8	6,603.8	92.8	92.8	-4.60	7,231.3	-879.1	8.7	-14.5	23.25	0.376	Level 1	
14,178.0	6,612.1	14,176.8	6,603.4	94.0	94.0	-1.99	7,290.1	-901.5	8.7	-10.7	19.36	0.448	Level 1	
14,241.0	6,610.8	14,239.8	6,603.0	95.1	95.2	-7.36	7,349.0	-924.0	7.8	-23.4	31.19	0.251	Level 1	
14,275.8	6,610.1	14,274.6	6,602.8	95.8	95.8	-13.42	7,381.5	-936.4	7.5	-40.2	47.64	0.157	Level 1	
14,303.0	6,610.0	14,301.8	6,602.6	96.3	96.3	-16.84	7,406.9	-946.1	7.7	-49.9	57.56	0.133	Level 1	
14,367.0	6,610.3	14,365.8	6,602.2	97.5	97.5	-18.28	7,466.7	-968.9	8.5	-54.0	62.48	0.136	Level 1	
14,428.0	6,610.5	14,426.8	6,601.8	98.6	98.7	-17.64	7,523.7	-990.7	9.1	-52.4	61.47	0.148	Level 1	
14,490.0	6,610.3	14,488.8	6,601.4	99.8	99.8	-20.05	7,581.6	-1,012.8	9.4	-60.4	69.67	0.135	Level 1	
14,553.0	6,609.7	14,551.8	6,601.0	100.9	101.0	-22.92	7,640.5	-1,035.2	9.4	-70.4	79.80	0.118	Level 1	
14,600.8	6,609.0	14,599.6	6,600.7	101.8	101.9	-27.83	7,685.1	-1,052.3	9.3	-86.0	95.33	0.098	Level 1	
14,616.0	6,608.7	14,614.8	6,600.6	102.1	102.1	-30.81	7,699.3	-1,057.7	9.3	-84.4	103.70	0.090	Level 1	
14,679.0	6,607.1	14,677.8	6,600.2	103.2	103.3	-42.83	7,758.2	-1,080.1	9.4	-129.4	138.79	0.068	Level 1	
14,680.9	6,607.1	14,679.7	6,600.2	103.2	103.4	-43.19	7,759.9	-1,080.8	9.4	-130.3	139.72	0.067	Level 1	
14,742.0	6,605.9	14,740.7	6,599.8	104.3	104.5	-51.68	7,817.0	-1,102.6	9.8	-150.9	160.71	0.061	Level 1	
14,805.0	6,605.0	14,803.7	6,599.4	105.5	105.6	-57.62	7,875.8	-1,125.0	10.5	-184.5	174.92	0.060	Level 1	
14,868.0	6,603.4	14,866.7	6,599.0	106.6	106.8	-67.01	7,934.7	-1,147.5	11.3	-180.6	191.91	0.059	Level 1	
14,930.0	6,602.1	14,928.7	6,598.6	107.8	108.0	-73.54	7,992.6	-1,169.6	12.4	-190.0	202.37	0.061	Level 1	
14,992.0	6,601.7	14,990.7	6,598.2	108.9	109.1	-74.91	8,050.5	-1,191.7	13.1	-192.9	206.01	0.064	Level 1	
15,053.0	6,601.1	15,051.7	6,597.9	110.0	110.2	-76.01	8,107.5	-1,213.4	13.3	-196.8	210.07	0.063	Level 1	
15,115.0	6,600.3	15,113.7	6,597.5	111.2	111.4	-77.55	8,165.4	-1,235.5	13.0	-200.7	213.64	0.061	Level 1	
15,154.0	6,599.7	15,152.7	6,597.2	111.9	112.1	-78.88	8,201.8	-1,249.5	12.9	-202.9	215.82	0.060	Level 1	
15,178.0	6,599.3	15,176.7	6,597.1	112.4	112.5	-79.88	8,224.3	-1,258.0	12.9	-204.3	217.23	0.059	Level 1	
15,241.0	6,598.0	15,239.6	6,596.6	113.5	113.7	-84.05	8,283.1	-1,280.5	13.1	-208.8	221.84	0.059	Level 1	
15,303.0	6,596.1	15,301.6	6,596.3	114.7	114.9	-90.60	8,341.0	-1,302.6	13.3	-211.5	224.84	0.059	Level 1	
15,381.0	6,592.2	15,379.5	6,595.8	116.1	116.3	-105.16	8,413.8	-1,330.3	13.7	-206.2	219.91	0.062	Level 1	
15,443.0	6,589.0	15,441.5	6,595.4	117.2	117.4	-116.18	8,471.6	-1,352.4	14.5	-191.5	206.01	0.070	Level 1	
15,506.0	6,587.8	15,504.4	6,595.0	118.4	118.6	-119.87	8,530.5	-1,374.9	14.4	-188.2	202.68	0.071	Level 1	
15,589.0	6,588.3	15,587.4	6,594.6	119.6	119.8	-118.08	8,589.3	-1,397.3	13.3	-195.3	208.53	0.064	Level 1	
15,632.0	6,589.3	15,630.4	6,594.2	120.8	120.9	-113.85	8,648.2	-1,419.8	12.0	-206.1	216.14	0.055	Level 1	
15,696.0	6,589.6	15,694.4	6,593.7	122.0	122.1	-111.35	8,708.0	-1,442.6	11.3	-212.3	223.60	0.050	Level 1	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

**Cathedral Energy Services**  
Anticollision Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214 0usft (Original Well Elev)
<b>Reference Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214 0usft (Original Well Elev)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Survey: Survey #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 205H - HZ - Plan #5													Offset Site Error	0.0 usft
Survey Program 100-Gyro, 835-MWD, 9902-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
15,760.0	6,589.9	15,758.4	6,593.3	123.1	123.3	-106.59	8,767.7	-1,465.4	10.9	-219.2	230.05	0.047	Level 1	
15,791.2	6,590.1	15,789.6	6,593.1	123.7	123.9	-106.56	8,796.9	-1,476.5	10.8	-222.6	233.33	0.046	Level 1	
15,823.0	6,590.1	15,821.4	6,592.9	124.3	124.4	-104.86	8,826.6	-1,487.9	10.9	-225.1	236.00	0.046	Level 1	
15,867.0	6,590.6	15,885.4	6,592.5	125.5	125.6	-100.33	8,886.4	-1,510.7	10.8	-232.8	243.57	0.044	Level 1	
15,950.0	6,591.4	15,948.4	6,592.1	126.6	126.8	-94.21	8,945.2	-1,533.2	10.4	-238.4	248.85	0.042	Level 1	
15,958.0	6,591.4	15,956.4	6,592.1	126.8	126.9	-93.52	8,952.7	-1,536.0	10.4	-238.9	249.28	0.042	Level 1	
16,013.0	6,591.5	16,011.4	6,591.7	127.8	128.0	-91.36	9,004.1	-1,555.6	10.7	-240.7	251.31	0.042	Level 1	
16,076.0	6,590.4	16,074.4	6,591.3	128.9	129.1	-94.54	9,062.9	-1,578.1	11.9	-239.7	251.57	0.047	Level 1	
16,139.0	6,589.3	16,137.3	6,590.9	130.1	130.3	-96.76	9,121.8	-1,600.5	14.0	-238.7	252.67	0.065	Level 1	
16,203.0	6,589.1	16,201.3	6,590.5	131.2	131.5	-94.67	9,181.5	-1,623.3	16.6	-238.4	255.03	0.065	Level 1	
16,265.0	6,589.6	16,263.2	6,590.1	132.3	132.6	-91.59	9,239.4	-1,645.4	19.1	-240.0	259.08	0.074	Level 1	
16,329.0	6,591.6	16,327.1	6,589.7	133.5	133.8	-84.63	9,299.1	-1,668.2	20.7	-240.8	261.53	0.079	Level 1	
16,392.0	6,594.6	16,390.0	6,589.3	134.6	134.9	-78.38	9,357.9	-1,690.6	22.3	-234.6	256.90	0.087	Level 1	
16,454.0	6,597.6	16,451.9	6,588.9	135.8	136.1	-68.07	9,415.7	-1,712.7	23.4	-225.5	248.96	0.094	Level 1	
16,518.0	6,600.2	16,515.8	6,588.5	137.0	137.3	-59.87	9,475.4	-1,735.5	23.4	-212.0	235.37	0.069	Level 1	
16,581.0	6,600.8	16,578.8	6,588.1	138.2	138.4	-55.22	9,534.2	-1,757.9	22.3	-203.9	226.22	0.099	Level 1	
16,643.0	6,599.5	16,640.7	6,587.7	139.4	139.6	-53.11	9,592.1	-1,780.0	19.7	-203.9	223.57	0.088	Level 1	
16,705.0	6,596.7	16,702.6	6,587.3	140.6	140.7	-52.87	9,649.9	-1,802.1	15.5	-209.6	225.04	0.069	Level 1	
16,767.0	6,592.9	16,764.4	6,586.9	141.7	141.8	-56.16	9,707.6	-1,824.1	10.7	-225.6	236.31	0.045	Level 1	
16,843.0	6,586.9	16,840.1	6,586.4	143.2	143.2	-84.72	9,778.3	-1,851.1	5.1	-278.7	283.82	0.018	Level 1, ES	
16,873.0	6,584.2	16,870.0	6,586.2	143.7	143.8	-118.05	9,806.3	-1,861.7	4.2	-246.6	250.80	0.017	Level 1	
16,892.0	6,582.5	16,888.9	6,586.1	144.1	144.1	-140.63	9,823.9	-1,868.5	4.6	-175.4	180.00	0.026	Level 1	

RECEIVED  
Office of Oil and Gas

21 2016

WV Department of  
Environmental Protection



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Reference Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design</b>	Survey: Survey #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 206H - HZ - FINAL														Offset Site Error	0 0 usft
Survey Program 100-Gyro, 675-MWD														Offset Well Error	0 0 usft
Reference		Offset		Semi Major Axis			Distance					Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	0.0	-112.79	-9.9	-23.4	25.4						
100.0	100.0	100.0	100.0	0.1	0.1	5.33	-9.6	-23.4	25.0	24.9	0.14	174.813			
195.8	195.8	195.7	195.7	0.2	0.2	5.46	-9.2	-23.7	24.6	24.3	0.31	79.372			
200.0	200.0	199.9	199.9	0.2	0.2	5.45	-9.2	-23.7	24.6	24.3	0.32	77.537			
300.0	300.0	299.9	299.9	0.2	0.2	4.14	-8.9	-24.2	24.5	24.0	0.49	49.725			
400.0	400.0	400.0	400.0	0.3	0.3	-16.68	-8.5	-24.5	24.2	23.5	0.87	36.205			
500.0	500.0	500.0	500.0	0.4	0.4	-38.87	-7.9	-24.8	23.9	23.0	0.84	26.376			
600.0	600.0	599.8	599.8	0.5	0.5	-3.89	-7.5	-25.4	23.7	22.7	1.02	23.284			
810.0	810.0	609.9	609.8	0.5	0.5	-17.52	-7.4	-25.4	23.7	22.6	1.04	22.690			
654.4	654.4	654.3	654.3	0.6	0.6	-25.77	-7.2	-25.7	23.6	22.4	1.20	19.890 CC, ES			
835.0	835.0	834.6	834.6	0.9	0.9	-169.41	-5.2	-27.8	25.6	23.8	1.83	13.993			
868.0	868.0	867.4	867.4	1.0	1.0	179.18	-4.7	-28.5	26.7	24.8	1.95	13.723 SF			
900.0	900.0	899.1	899.1	1.0	1.0	169.70	-4.0	-28.5	26.3	26.3	2.06	13.761			
931.0	931.0	929.8	929.7	1.1	1.1	160.44	-3.2	-30.7	30.6	28.4	2.17	14.097			
963.0	962.9	961.3	961.1	1.1	1.2	160.16	-2.1	-32.3	33.6	31.3	2.28	14.733			
994.0	993.8	991.7	991.5	1.2	1.2	162.70	-0.8	-34.1	37.3	34.9	2.39	15.802			
1,026.0	1,025.8	1,023.1	1,022.7	1.3	1.3	165.38	0.9	-36.1	41.8	39.3	2.50	16.722			
1,057.0	1,056.6	1,053.0	1,052.5	1.3	1.4	167.77	3.1	-38.3	47.0	44.4	2.61	18.035			
1,088.0	1,087.4	1,082.6	1,081.9	1.4	1.4	169.07	5.4	-40.8	53.3	50.5	2.71	19.622			
1,152.0	1,150.9	1,143.1	1,141.9	1.5	1.6	166.66	10.6	-47.1	68.8	65.9	2.93	23.486			
1,214.0	1,212.2	1,201.9	1,200.0	1.7	1.7	170.38	16.3	-53.7	86.1	82.9	3.14	27.420			
1,277.0	1,274.5	1,261.1	1,258.4	1.9	1.9	170.39	22.5	-60.7	105.0	101.7	3.35	31.359			
1,339.0	1,335.6	1,319.6	1,316.2	2.0	2.1	168.72	28.4	-68.0	124.1	120.6	3.56	34.891			
1,402.0	1,397.8	1,381.8	1,377.7	2.2	2.3	172.69	34.7	-75.1	143.4	139.6	3.77	38.037			
1,465.0	1,459.9	1,440.8	1,436.0	2.4	2.4	173.55	40.9	-81.4	162.9	159.0	3.98	40.944			
1,525.0	1,519.0	1,497.4	1,491.9	2.6	2.6	169.44	46.8	-87.8	181.4	177.2	4.19	43.315			
1,588.0	1,581.4	1,560.2	1,554.0	2.8	2.8	169.60	53.2	-94.5	199.2	194.8	4.41	45.157			
1,651.0	1,643.8	1,621.0	1,614.2	2.9	3.0	174.78	59.0	-100.6	215.7	211.1	4.62	46.640			
1,714.0	1,706.3	1,681.2	1,673.6	3.1	3.1	177.89	65.4	-106.6	232.4	227.8	4.84	48.009			
1,777.0	1,768.8	1,742.1	1,734.0	3.3	3.3	179.03	72.2	-112.2	249.1	244.0	5.05	49.283			
1,840.0	1,831.1	1,798.5	1,788.8	3.5	3.5	178.08	79.1	-117.7	267.2	262.0	5.26	50.824			
1,903.0	1,893.4	1,857.4	1,847.9	3.7	3.7	178.15	86.6	-123.8	285.6	281.2	5.47	52.425			
1,967.0	1,956.6	1,919.6	1,909.3	3.9	3.9	-179.29	93.9	-130.6	306.6	300.9	5.68	53.942			
2,030.0	2,018.8	1,976.4	1,965.3	4.1	4.1	-174.71	100.3	-137.1	326.1	320.3	5.90	55.300			
2,092.0	2,080.1	2,035.2	2,023.3	4.3	4.3	-172.84	107.2	-144.1	345.2	339.1	6.11	56.475			
2,140.0	2,127.8	2,081.3	2,068.7	4.4	4.4	-170.50	112.8	-149.6	359.7	353.5	6.28	57.303			
2,246.0	2,232.5	2,184.7	2,170.7	4.7	4.8	-165.79	124.9	-161.2	391.1	384.4	6.55	58.783			
2,309.0	2,295.0	2,246.6	2,231.8	4.9	5.0	-161.09	132.1	-168.0	408.6	401.7	6.89	59.338			
2,373.0	2,358.8	2,309.5	2,293.9	5.0	5.2	-146.45	138.8	-175.0	425.1	418.0	7.12	59.718			
2,436.0	2,421.0	2,370.2	2,354.0	5.2	5.3	-137.51	143.7	-182.8	440.9	433.5	7.34	60.077			
2,499.0	2,483.3	2,429.1	2,412.1	5.4	5.5	-132.68	147.1	-191.4	457.3	449.7	7.55	60.538			
2,562.0	2,545.3	2,490.7	2,472.9	5.6	5.7	-131.51	149.6	-201.2	474.7	466.9	7.78	61.049			
2,625.0	2,607.0	2,554.9	2,536.3	5.8	5.9	-134.65	150.4	-211.7	492.6	484.6	7.99	61.628			
2,688.0	2,668.5	2,615.0	2,595.5	6.0	6.1	-138.21	149.9	-221.7	511.3	503.1	8.20	62.358			
2,752.0	2,730.8	2,672.3	2,652.0	6.3	6.2	-139.68	149.1	-231.4	531.8	523.4	8.41	63.255			
2,815.0	2,791.8	2,725.3	2,704.2	6.5	6.4	-143.35	148.2	-240.7	553.6	545.0	8.60	64.369			
2,878.0	2,852.6	2,774.0	2,751.9	6.8	6.5	-147.01	147.3	-250.0	577.5	568.7	8.78	65.767			
2,941.0	2,913.1	2,821.1	2,798.0	7.1	6.7	-145.67	146.1	-259.9	603.4	594.5	8.98	67.234			
3,004.0	2,973.4	2,871.5	2,847.1	7.4	6.9	-143.98	144.4	-271.1	630.4	621.2	9.19	68.587			
3,067.0	3,033.5	2,919.7	2,893.9	7.7	7.1	-146.66	142.6	-282.2	658.6	649.2	9.37	70.294			
3,130.0	3,093.2	2,962.0	2,934.9	8.1	7.2	-150.66	140.6	-292.6	689.1	679.6	9.52	72.391			
3,192.0	3,151.6	3,006.9	2,978.2	8.5	7.4	-154.17	138.1	-304.3	721.3	711.8	9.67	74.575			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Reference Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at:</b>	2.00 sigma
<b>Reference Wellbore:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Survey Survey #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 206H - HZ - FINAL													Offset Site Error	0.0 usft
Survey Program 100-Gyro, 675-MWI													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
3,254.0	3,210.0	3,050.7	3,020.2	8.8	7.6	-153.07	135.1	-316.3	754.1	744.2	9.89	76.240		
3,316.0	3,266.9	3,088.0	3,055.8	9.1	7.7	-152.67	132.0	-326.9	786.4	776.3	10.09	77.946		
3,441.0	3,367.2	3,171.7	3,135.0	9.9	8.1	-155.01	123.5	-352.6	855.3	844.9	10.40	82.243		
3,503.0	3,445.6	3,214.0	3,174.7	10.2	8.3	-156.17	118.6	-366.5	891.4	880.8	10.58	84.240		
3,585.0	3,504.4	3,250.3	3,208.6	10.6	8.5	-153.97	114.1	-378.8	927.3	916.5	10.79	85.933		
3,629.0	3,585.1	3,293.2	3,248.4	11.0	8.8	-159.05	108.5	-393.6	965.0	954.1	10.91	88.433		
3,691.0	3,623.7	3,339.0	3,290.7	11.3	9.0	-161.50	101.8	-409.7	1,002.7	991.7	11.04	90.847		
3,754.0	3,683.2	3,374.2	3,323.0	11.7	9.2	-160.63	98.0	-422.4	1,041.7	1,030.4	11.24	92.714		
3,817.0	3,743.1	3,410.6	3,356.3	12.0	9.4	-159.29	89.5	-435.8	1,080.3	1,068.9	11.44	94.463		
3,881.0	3,804.0	3,446.7	3,389.1	12.4	9.7	-156.02	83.0	-449.5	1,119.9	1,108.2	11.64	96.194		
3,943.0	3,862.8	3,494.8	3,432.4	12.8	10.0	-159.55	74.7	-467.9	1,159.2	1,147.4	11.77	98.493		
4,005.0	3,921.9	3,551.6	3,484.3	13.1	10.3	-157.42	64.7	-489.3	1,197.5	1,185.5	12.01	99.686		
4,068.0	3,982.5	3,590.0	3,519.3	13.4	10.6	-154.72	57.9	-503.6	1,234.6	1,222.4	12.23	100.942		
4,130.0	4,042.3	3,630.1	3,555.7	13.7	10.8	-160.36	50.6	-518.7	1,271.2	1,258.9	12.35	102.954		
4,193.0	4,102.9	3,667.5	3,589.4	14.0	11.1	-163.38	43.8	-533.3	1,310.1	1,297.6	12.47	105.088		
4,256.0	4,163.2	3,722.6	3,639.3	14.4	11.5	-165.40	33.9	-554.8	1,350.1	1,337.5	12.61	107.039		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Reference Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	Gnd
<b>Reference Well:</b>	Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at:</b>	2.00 sigma
<b>Reference Wellbore:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Survey Survey #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 3H (Existing) - Existing - Existing													Offset Site Error	0.0 usft
Survey Program 100-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	12.0	12.0	0.0	0.0	-133.64	-30.0	-31.5	43.5					
100.0	100.0	112.1	112.1	0.1	0.2	-15.75	-29.6	-31.4	42.9	42.7	0.24	179.113		
177.7	177.7	189.6	189.6	0.1	0.3	-16.50	-29.5	-31.6	42.6	42.1	0.44	96.201		
200.0	200.0	211.8	211.8	0.2	0.3	-18.93	-29.6	-31.6	42.6	42.1	0.50	85.048		
300.0	300.0	312.1	312.1	0.2	0.5	-19.19	-29.4	-31.9	42.1	41.3	0.76	55.179		
372.7	372.7	384.5	384.5	0.3	0.6	-31.64	-29.3	-32.0	41.8	40.8	0.95	43.862		
400.0	400.0	411.8	411.8	0.3	0.7	-41.10	-29.4	-32.1	41.8	40.8	1.02	40.835		
500.0	500.0	511.9	511.9	0.4	0.9	-62.37	-29.4	-32.4	41.9	40.6	1.29	32.544		
600.0	600.0	611.9	611.9	0.5	1.0	-30.70	-29.2	-32.9	41.6	40.0	1.55	26.838		
610.0	610.0	622.0	622.0	0.5	1.1	-44.35	-29.2	-32.9	41.5	39.9	1.57	26.353		
755.9	755.9	768.1	768.1	0.8	1.3	175.15	-28.9	-32.7	41.0	38.9	2.08	19.660 CC		
835.0	835.0	847.2	847.2	0.9	1.5	157.84	-28.8	-32.3	41.2	38.8	2.36	17.442 ES		
888.0	888.0	880.3	880.3	1.0	1.5	145.18	-28.7	-32.1	41.4	38.9	2.48	16.710		
900.0	900.0	912.3	912.3	1.0	1.6	134.47	-28.6	-31.8	41.7	39.1	2.59	18.105		
931.0	931.0	943.4	943.3	1.1	1.6	123.96	-28.4	-31.6	42.1	39.4	2.70	15.810		
963.0	962.9	975.3	975.3	1.1	1.7	122.57	-28.2	-31.4	42.7	39.9	2.81	15.195		
994.0	993.8	1,006.3	1,006.3	1.2	1.7	124.26	-27.9	-31.2	43.4	40.5	2.92	14.891		
1,026.0	1,025.8	1,038.0	1,038.0	1.3	1.8	126.25	-27.7	-31.1	44.6	41.6	3.03	14.718		
1,057.0	1,056.6	1,068.8	1,068.8	1.3	1.8	128.26	-27.6	-31.0	46.2	43.1	3.14	14.707 SF		
1,088.0	1,087.4	1,099.5	1,099.4	1.4	1.9	129.79	-27.5	-31.0	48.3	45.0	3.25	14.839		
1,152.0	1,150.9	1,163.0	1,163.0	1.5	2.0	129.49	-27.4	-31.0	53.4	49.9	3.49	15.309		
1,214.0	1,212.2	1,224.4	1,224.4	1.7	2.1	136.23	-27.1	-30.9	59.5	55.8	3.71	16.034		
1,277.0	1,274.5	1,286.7	1,286.7	1.9	2.2	139.69	-26.7	-30.8	66.8	62.8	3.94	16.948		
1,339.0	1,335.6	1,348.0	1,348.0	2.0	2.3	141.32	-26.3	-30.6	74.3	70.1	4.16	17.840		
1,402.0	1,397.8	1,410.3	1,410.2	2.2	2.4	147.68	-26.3	-30.3	82.4	78.0	4.38	18.812		
1,465.0	1,459.9	1,472.4	1,472.4	2.4	2.5	150.72	-26.3	-29.9	91.4	86.8	4.60	19.870		
1,525.0	1,519.0	1,531.5	1,531.5	2.6	2.6	148.69	-26.1	-29.6	99.7	94.9	4.82	20.705		
1,588.0	1,581.4	1,593.8	1,593.7	2.8	2.8	150.19	-26.1	-29.3	107.2	102.2	5.04	21.290		
1,651.0	1,643.8	1,656.8	1,656.8	2.9	2.9	156.17	-26.5	-29.0	114.2	109.0	5.25	21.742		
1,714.0	1,706.3	1,719.8	1,719.8	3.1	3.0	159.71	-27.2	-28.5	121.0	115.5	5.47	22.101		
1,777.0	1,768.6	1,782.5	1,782.5	3.3	3.1	161.05	-28.0	-27.9	127.9	122.2	5.69	22.473		
1,840.0	1,831.1	1,844.9	1,844.9	3.5	3.2	160.36	-29.0	-27.3	135.6	129.7	5.91	22.956		
1,903.0	1,893.4	1,907.2	1,907.1	3.7	3.3	160.66	-30.1	-26.8	144.0	137.9	6.13	23.514		
1,967.0	1,956.6	1,970.5	1,970.5	3.9	3.4	163.51	-31.3	-26.4	153.0	146.6	6.35	24.111		
2,030.0	2,016.8	2,033.0	2,032.9	4.1	3.5	168.37	-32.3	-25.8	161.7	155.1	6.57	24.629		
2,092.0	2,080.1	2,094.6	2,094.5	4.3	3.6	170.46	-33.1	-25.2	169.8	163.1	6.78	25.043		
2,140.0	2,127.6	2,141.4	2,141.3	4.4	3.7	172.89	-33.6	-24.8	176.1	169.2	6.95	25.357		
2,246.0	2,232.5	2,245.6	2,245.5	4.7	3.9	177.69	-34.2	-24.3	190.4	183.1	7.31	26.056		
2,309.0	2,295.0	2,308.1	2,308.0	4.9	4.0	-177.61	-34.4	-24.1	198.3	190.7	7.53	26.327		
2,373.0	2,358.6	2,370.5	2,370.4	5.0	4.1	-183.31	-34.6	-23.9	205.5	197.8	7.75	26.531		
2,436.0	2,421.0	2,434.4	2,434.3	5.2	4.2	-154.76	-34.7	-24.1	213.2	205.2	7.96	26.790		
2,499.0	2,483.3	2,490.0	2,489.9	5.4	4.3	-150.10	-34.4	-24.4	222.1	214.0	8.15	27.268		
2,562.0	2,545.3	2,545.9	2,545.8	5.6	4.4	-149.00	-34.1	-26.5	234.3	226.0	8.34	28.107		
2,625.0	2,607.0	2,602.9	2,602.8	5.8	4.5	-151.94	-33.5	-29.9	249.0	240.5	8.53	29.200		
2,688.0	2,668.5	2,663.3	2,662.9	6.0	4.6	-155.25	-32.7	-33.8	265.3	256.6	8.72	30.421		
2,752.0	2,730.8	2,725.4	2,724.9	6.3	4.7	-156.49	-31.8	-37.8	283.1	274.2	8.92	31.744		
2,815.0	2,791.8	2,791.7	2,791.1	6.5	4.8	-160.07	-31.3	-41.4	301.1	291.9	9.12	33.007		
2,878.0	2,852.6	2,850.0	2,849.3	6.8	5.0	-163.53	-31.5	-44.0	319.5	310.2	9.31	34.319		
2,941.0	2,913.1	2,908.0	2,907.3	7.1	5.1	-162.07	-31.5	-47.1	339.5	330.0	9.49	35.768		
3,004.0	2,973.4	2,967.5	2,966.6	7.4	5.2	-160.05	-31.5	-50.2	359.9	350.2	9.70	37.103		
3,067.0	3,033.5	3,028.8	3,027.9	7.7	5.3	-162.51	-31.4	-53.2	380.9	371.0	9.88	38.540		
3,130.0	3,093.2	3,088.4	3,087.4	8.1	5.4	-166.27	-31.2	-55.9	403.0	393.0	10.05	40.108		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 3H (Existing) - Existing - Existing													Offset Site Error	0.0 usft
Survey Program 100-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre →N-S (usft)	Offset Wellbore Centre →E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
3,192.0	3,151.6	3,147.3	3,146.3	8.5	5.5	-169.20	-31.0	-58.4	425.9	415.7	10.23	41.638		
3,254.0	3,210.0	3,211.3	3,210.2	8.8	5.8	-167.41	-30.7	-60.5	448.1	437.6	10.49	42.737		
3,316.0	3,268.9	3,275.3	3,274.2	9.1	5.7	-166.48	-30.3	-61.8	468.3	457.5	10.74	43.815		
3,441.0	3,387.2	3,397.2	3,396.1	9.9	5.9	-168.07	-29.9	-62.7	508.7	487.6	11.09	45.885		
3,503.0	3,445.6	3,455.6	3,454.5	10.2	6.0	-168.37	-29.6	-63.1	529.3	518.0	11.33	46.736		
3,565.0	3,504.4	3,514.6	3,513.5	10.6	6.1	-165.83	-29.4	-63.4	549.0	537.4	11.56	47.472		
3,629.0	3,565.1	3,575.6	3,574.5	11.0	6.2	-170.00	-29.3	-63.7	569.1	557.3	11.76	48.387		
3,691.0	3,623.7	3,634.4	3,633.3	11.3	6.3	-171.72	-29.0	-63.9	589.4	577.5	11.93	49.391		
3,754.0	3,683.2	3,694.1	3,693.0	11.7	6.4	-170.35	-28.7	-64.2	610.1	597.9	12.18	50.098		
3,817.0	3,743.1	3,753.8	3,752.7	12.0	6.5	-168.50	-28.2	-64.4	629.6	617.2	12.43	50.862		
3,881.0	3,804.0	3,814.5	3,813.4	12.4	6.7	-165.34	-27.7	-64.6	649.1	636.5	12.63	51.406		
3,943.0	3,862.8	3,874.1	3,873.0	12.8	6.8	-167.97	-27.2	-64.8	668.5	655.7	12.82	52.153		
4,005.0	3,921.9	3,934.7	3,933.6	13.1	6.9	-164.96	-26.1	-64.9	686.9	673.8	13.10	52.427		
4,068.0	3,982.5	3,997.5	3,996.4	13.4	7.0	-161.86	-24.6	-64.9	703.4	690.0	13.37	52.810		
4,130.0	4,042.3	4,060.1	4,059.0	13.7	7.1	-166.65	-23.6	-64.6	718.7	705.1	13.57	52.967		
4,193.0	4,102.9	4,121.8	4,120.6	14.0	7.2	-169.22	-23.1	-64.2	735.1	721.3	13.75	53.462		
4,256.0	4,163.2	4,180.8	4,179.6	14.4	7.3	-170.62	-22.8	-63.8	752.8	738.9	13.92	54.082		
4,318.0	4,222.2	4,238.8	4,237.7	14.7	7.4	-169.67	-22.6	-63.5	771.3	757.2	14.11	54.652		
4,380.0	4,281.1	4,298.2	4,297.0	15.1	7.5	-170.33	-22.5	-63.2	790.0	775.6	14.33	55.145		
4,443.0	4,341.0	4,358.5	4,357.3	15.4	7.6	-173.55	-22.5	-62.9	809.2	794.7	14.52	55.748		
4,503.0	4,397.7	4,417.7	4,416.5	15.8	7.7	-174.19	-22.4	-62.5	828.2	813.5	14.69	56.397		
4,566.0	4,457.1	4,479.7	4,478.6	16.2	7.8	-177.35	-22.2	-61.9	848.6	833.7	14.89	56.986		
4,629.0	4,516.4	4,541.2	4,540.0	16.6	7.9	178.21	-22.1	-61.1	869.2	854.1	15.09	57.590		
4,693.0	4,576.5	4,603.5	4,602.3	17.0	8.0	178.03	-22.4	-60.2	890.2	874.9	15.32	58.121		
4,756.0	4,636.2	4,663.5	4,662.3	17.4	8.1	178.80	-23.1	-59.3	909.5	893.8	15.63	58.204		
4,817.0	4,694.7	4,721.7	4,720.5	17.7	8.2	-178.14	-24.0	-58.3	925.9	910.0	15.90	58.250		
4,879.0	4,754.4	4,781.8	4,780.5	18.0	8.3	-174.06	-25.2	-57.4	941.6	925.5	16.11	58.430		
4,941.0	4,814.1	4,842.4	4,841.2	18.3	8.4	-173.49	-26.2	-56.4	957.3	941.0	16.31	58.703		
5,005.0	4,875.5	4,900.4	4,899.2	18.7	8.5	-174.36	-27.0	-55.5	974.2	957.7	16.50	59.036		
5,068.0	4,935.8	4,951.9	4,950.6	19.0	8.6	-169.18	-27.4	-55.1	991.8	975.2	16.68	59.457		
5,130.0	4,994.9	5,007.0	5,005.7	19.4	8.7	-168.10	-27.5	-55.2	1,010.3	993.5	16.86	59.927		
5,193.0	5,054.8	5,066.5	5,059.3	19.7	8.8	-169.96	-27.5	-55.6	1,030.0	1,013.0	17.04	60.440		
5,257.0	5,115.7	5,121.0	5,119.7	20.1	8.9	-174.85	-27.3	-56.0	1,050.0	1,032.8	17.28	60.771		
5,319.0	5,174.8	5,179.9	5,178.7	20.4	9.0	-175.05	-27.0	-56.5	1,068.9	1,051.4	17.51	61.054		
5,382.0	5,235.0	5,240.0	5,238.7	20.8	9.1	-174.08	-26.6	-57.0	1,088.0	1,070.3	17.71	61.436		
5,445.0	5,295.0	5,305.7	5,304.5	21.2	9.2	-176.52	-25.9	-57.4	1,107.3	1,089.4	17.91	61.816		
5,508.0	5,355.0	5,376.5	5,375.2	21.5	9.4	-179.99	-25.4	-57.3	1,126.5	1,108.3	18.14	62.095		
5,570.0	5,414.0	5,448.4	5,447.1	21.9	9.5	-179.98	-25.2	-56.4	1,144.9	1,126.5	18.36	62.346		
5,632.0	5,472.8	5,521.4	5,520.1	22.3	9.6	179.30	-25.0	-54.6	1,162.9	1,144.3	18.58	62.592		
5,696.0	5,533.4	5,577.0	5,575.7	22.6	9.7	-179.87	-25.1	-53.0	1,181.7	1,163.0	18.76	62.986		
5,759.0	5,593.0	5,629.5	5,628.2	23.0	9.8	-178.65	-25.5	-51.8	1,200.9	1,181.9	18.96	63.333		
5,820.0	5,650.7	5,679.1	5,677.8	23.4	9.9	-176.42	-26.3	-51.0	1,219.7	1,200.5	19.17	63.630		
5,883.0	5,710.3	5,728.7	5,727.3	23.8	10.0	-176.39	-27.0	-50.5	1,239.5	1,220.2	19.34	64.080		
5,946.0	5,769.9	5,788.0	5,786.6	24.2	10.1	-176.48	-27.6	-50.5	1,260.1	1,240.5	19.57	64.404		
6,007.0	5,827.7	5,833.1	5,831.8	24.6	10.2	-176.11	-27.8	-50.8	1,280.0	1,260.2	19.76	64.781		
6,070.0	5,887.3	5,892.1	5,890.7	24.9	10.3	-179.83	-28.1	-51.1	1,300.8	1,280.8	19.95	65.198		
6,119.0	5,933.7	5,932.8	5,931.4	25.2	10.3	-177.10	-28.1	-51.4	1,316.9	1,296.8	20.13	65.406		
6,201.0	6,011.4	6,003.0	6,001.6	25.7	10.5	-171.82	-26.5	-52.7	1,344.0	1,323.6	20.40	65.867		
6,233.0	6,041.9	6,024.7	6,023.3	25.9	10.5	-166.92	-26.6	-53.1	1,354.1	1,333.5	20.61	65.897		

**RECEIVED**  
**Office of Oil and Gas**

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Reference Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at:</b>	2.00 sigma
<b>Reference Wellbore:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Survey: Survey #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 5H - HZ - FINAL													Offset Site Error	0.0 usft
Survey Program 10D-Cyro, 8U1-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	38.20	10.0	7.9	12.8					
100.0	100.0	100.0	100.0	0.1	0.1	158.58	9.7	8.3	13.1	12.9	0.14	91.082		
200.0	200.0	200.0	200.0	0.2	0.2	161.15	9.3	8.9	13.6	13.3	0.32	42.813		
300.0	300.0	300.0	300.0	0.2	0.2	160.57	9.2	9.1	14.2	13.7	0.49	28.739		
400.0	400.0	400.0	400.0	0.3	0.3	139.96	9.1	9.2	14.7	14.0	0.87	21.986		
500.0	500.0	500.0	500.0	0.4	0.4	120.01	9.1	9.1	14.9	14.0	0.84	17.656		
600.0	600.0	600.0	600.0	0.5	0.5	152.72	9.2	9.0	15.3	14.3	1.02	15.081		
610.0	610.0	610.0	610.0	0.5	0.5	139.20	9.2	9.0	15.4	14.4	1.04	14.787		
835.0	835.0	834.9	834.9	0.9	0.9	-18.02	9.7	9.1	15.4	13.6	1.83	8.422		
854.9	854.9	854.7	854.7	0.9	1.0	-27.44	9.7	9.3	15.4	13.5	1.90	8.094		
868.0	868.0	867.7	867.7	1.0	1.0	-30.72	9.7	9.6	15.4	13.4	1.94	7.913		
900.0	900.0	899.5	899.5	1.0	1.0	-41.89	9.8	10.5	15.8	13.5	2.05	7.573		
931.0	931.0	930.3	930.3	1.1	1.1	-54.42	10.1	11.8	15.9	13.8	2.16	7.365		
963.0	962.9	962.1	962.0	1.1	1.1	-59.75	10.5	13.4	16.6	14.3	2.28	7.289		
994.0	993.8	992.9	992.7	1.2	1.2	-62.54	11.0	15.5	17.5	15.1	2.39	7.331		
1,026.0	1,025.8	1,024.8	1,024.5	1.3	1.3	-65.02	11.4	18.1	18.5	16.0	2.51	7.391		
1,057.0	1,056.6	1,055.5	1,055.1	1.3	1.3	-67.31	11.5	21.2	19.6	17.0	2.62	7.470		
1,088.0	1,087.4	1,085.4	1,085.7	1.4	1.4	-70.05	11.6	24.8	20.9	18.1	2.75	7.589		
1,152.0	1,150.9	1,150.1	1,148.8	1.5	1.5	-78.58	11.0	33.9	24.1	21.1	3.04	7.951		
1,214.0	1,212.2	1,212.0	1,209.9	1.7	1.7	-80.13	9.8	43.7	27.8	24.4	3.34	8.317		
1,277.0	1,274.5	1,274.8	1,271.8	1.9	1.9	-84.65	8.5	54.0	31.8	28.1	3.68	8.639		
1,339.0	1,335.6	1,336.5	1,332.6	2.0	2.1	-89.20	7.1	64.6	38.5	32.4	4.02	9.066		
1,402.0	1,397.8	1,399.1	1,394.2	2.2	2.3	-88.07	5.8	75.8	41.8	37.2	4.39	9.479		
1,465.0	1,459.9	1,461.9	1,456.0	2.4	2.5	-89.91	4.7	86.7	46.8	42.0	4.78	9.790		
1,525.0	1,519.0	1,522.2	1,515.3	2.6	2.7	-95.43	3.2	97.4	51.9	46.8	5.14	10.100		
1,588.0	1,581.4	1,585.8	1,578.0	2.8	2.9	-95.34	0.9	108.2	57.0	51.5	5.50	10.357		
1,651.0	1,643.8	1,649.4	1,640.7	2.9	3.1	-89.60	-2.0	118.3	60.8	56.0	5.85	10.407		
1,714.0	1,706.3	1,714.1	1,704.9	3.1	3.2	-87.55	-4.8	126.2	63.0	56.8	6.18	10.198		
1,777.0	1,768.8	1,777.0	1,767.6	3.3	3.4	-90.31	-6.4	130.7	64.1	57.6	6.52	9.842		
1,840.0	1,831.1	1,839.2	1,829.7	3.5	3.5	-96.95	-6.9	134.1	66.0	59.1	6.87	9.613		
1,903.0	1,893.4	1,901.7	1,892.1	3.7	3.6	-103.03	-7.0	137.4	68.0	61.8	7.20	9.584		
1,967.0	1,956.6	1,965.6	1,955.9	3.9	3.7	-108.73	-7.2	140.4	72.6	65.0	7.51	9.557		
2,030.0	2,018.8	2,028.0	2,018.2	4.1	3.8	-107.84	-7.3	143.0	76.0	68.2	7.78	9.769		
2,092.0	2,080.1	2,089.8	2,080.0	4.3	3.9	-110.76	-7.4	145.4	79.4	71.3	8.02	9.897		
2,140.0	2,127.6	2,137.3	2,127.5	4.4	4.0	-111.95	-7.5	147.0	82.0	73.8	8.19	10.013		
2,246.0	2,232.5	2,242.6	2,232.7	4.7	4.2	-114.36	-7.5	150.6	87.9	79.4	8.52	10.320		
2,309.0	2,295.0	2,304.9	2,295.0	4.9	4.3	-113.55	-7.5	152.0	91.2	82.5	8.68	10.506		
2,373.0	2,358.6	2,367.9	2,358.0	5.0	4.4	-102.78	-7.1	153.0	93.8	85.0	8.83	10.621		
2,436.0	2,421.0	2,430.4	2,420.5	5.2	4.5	-97.96	-6.6	153.4	95.6	86.6	8.96	10.671		
2,499.0	2,483.3	2,492.8	2,482.9	5.4	4.6	-97.91	-6.2	153.6	97.2	88.1	9.06	10.733		
2,562.0	2,545.3	2,564.9	2,545.0	5.6	4.7	-101.88	-5.9	153.8	99.3	90.2	9.12	10.896		
2,625.0	2,607.0	2,616.2	2,606.3	5.8	4.8	-110.01	-5.6	153.7	103.2	94.0	9.16	11.288		
2,688.0	2,668.5	2,677.7	2,667.8	6.0	4.8	-118.44	-5.3	153.5	109.3	100.2	9.19	11.901		
2,752.0	2,730.8	2,739.9	2,730.0	6.3	4.9	-124.76	-5.1	153.1	117.7	108.5	9.22	12.785		
2,815.0	2,791.8	2,801.1	2,791.1	6.5	5.0	-132.56	-4.9	152.8	128.1	118.8	9.27	13.811		
2,878.0	2,852.8	2,861.8	2,851.8	6.8	5.1	-139.80	-4.6	152.6	140.5	131.2	9.35	15.025		
2,941.0	2,913.1	2,922.2	2,912.2	7.1	5.2	-141.39	-4.2	152.5	154.6	145.2	9.47	16.332		
3,004.0	2,973.4	2,982.2	2,972.2	7.4	5.3	-142.29	-3.9	152.2	168.6	160.0	9.60	17.667		
3,067.0	3,033.5	3,042.2	3,032.3	7.7	5.4	-147.09	-3.7	151.9	185.7	176.0	9.73	19.087		
3,130.0	3,093.2	3,102.0	3,092.1	8.1	5.5	-152.76	-3.4	151.6	203.7	193.9	9.86	20.666		
3,192.0	3,151.6	3,159.5	3,151.6	8.5	5.6	-157.19	-3.0	151.3	223.2	213.2	10.00	22.316		
3,254.0	3,210.0	3,218.1	3,208.1	8.9	5.7	-156.82	-2.5	150.9	242.9	232.7	10.21	23.789		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 5H - HZ - FINAL													Offset Site Error	0.0 usft
Survey Program 100-Gyro, R04-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance					Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
3,316.0	3,288.9	3,276.9	3,287.0	9.1	5.7	-157.03	-2.1	150.6	261.3	250.9	10.42	25.082		
3,441.0	3,387.2	3,393.9	3,383.9	9.9	5.9	-160.32	-1.3	149.6	300.3	289.6	10.76	27.906		
3,503.0	3,445.6	3,452.2	3,442.3	10.2	6.0	-161.43	-1.0	149.0	320.6	309.7	10.98	29.213		
3,565.0	3,504.4	3,510.7	3,500.8	10.6	6.1	-159.58	-0.7	148.4	340.0	328.8	11.20	30.357		
3,629.0	3,565.1	3,572.5	3,562.5	11.0	6.2	-164.29	-0.4	147.9	359.9	348.5	11.38	31.610		
3,691.0	3,623.7	3,631.7	3,621.7	11.3	6.3	-166.44	0.0	147.6	379.9	368.4	11.56	32.865		
3,754.0	3,683.2	3,690.2	3,680.2	11.7	6.4	-165.51	0.3	147.2	400.4	388.6	11.79	33.955		
3,817.0	3,743.1	3,750.9	3,740.9	12.0	6.5	-164.07	0.7	146.9	419.8	407.8	12.03	34.885		
3,881.0	3,804.0	3,812.0	3,802.1	12.4	6.6	-161.27	1.2	146.6	439.0	426.7	12.25	35.845		
3,943.0	3,862.8	3,870.1	3,860.1	12.8	6.7	-164.21	1.7	146.4	458.2	445.7	12.43	36.855		
4,005.0	3,921.9	3,927.7	3,917.7	13.1	6.8	-161.53	2.4	146.0	476.6	463.9	12.69	37.557		
4,068.0	3,982.5	3,992.1	3,982.2	13.4	6.9	-158.79	3.3	145.7	493.2	480.2	12.94	38.098		
4,130.0	4,042.3	4,051.8	4,041.8	13.7	7.0	-163.77	4.2	145.7	508.6	495.5	13.14	38.715		
4,193.0	4,102.9	4,111.1	4,101.1	14.0	7.1	-166.45	5.1	145.6	525.4	512.1	13.32	39.442		
4,256.0	4,163.2	4,171.1	4,161.1	14.4	7.1	-167.95	6.1	145.4	543.6	530.1	13.50	40.262		
4,318.0	4,222.2	4,230.9	4,220.9	14.7	7.2	-167.11	6.8	145.2	562.4	548.7	13.70	41.041		
4,380.0	4,281.1	4,291.1	4,281.1	15.1	7.3	-167.90	7.4	145.1	581.3	567.4	13.91	41.775		
4,443.0	4,341.0	4,352.5	4,342.4	15.4	7.4	-171.21	8.0	145.2	600.7	586.5	14.10	42.586		
4,503.0	4,397.7	4,409.0	4,399.0	15.8	7.5	-171.91	8.5	145.3	619.8	605.5	14.28	43.413		
4,566.0	4,457.1	4,469.0	4,459.0	16.2	7.6	-175.15	8.9	145.5	640.6	626.1	14.47	44.281		
4,629.0	4,516.4	4,527.3	4,517.3	16.6	7.7	-179.84	9.4	145.6	661.7	647.0	14.68	45.137		
4,693.0	4,576.5	4,585.8	4,575.8	17.0	7.8	-178.19	9.8	145.6	683.6	668.8	14.87	45.973		
4,756.0	4,636.2	4,645.7	4,635.7	17.4	7.9	-179.22	10.2	145.6	703.9	688.7	15.17	46.402		
4,817.0	4,694.7	4,704.9	4,694.9	17.7	8.0	-175.93	10.6	145.5	721.3	705.9	15.44	46.730		
4,879.0	4,754.4	4,767.3	4,757.3	18.0	8.1	-171.81	10.9	145.7	737.6	722.0	15.68	47.092		
4,941.0	4,814.1	4,828.1	4,818.1	18.3	8.2	-171.22	11.2	145.9	754.0	738.1	15.86	47.530		
5,005.0	4,875.5	4,891.1	4,881.1	18.7	8.4	-172.12	11.3	146.4	771.3	755.2	16.07	48.002		
5,068.0	4,935.8	4,949.1	4,939.1	19.0	8.4	-167.02	11.3	146.7	788.9	772.7	16.27	48.477		
5,130.0	4,994.9	5,010.6	5,000.6	19.4	8.6	-164.07	11.2	147.0	806.8	790.4	16.48	48.969		
5,193.0	5,054.8	5,071.2	5,061.2	19.7	8.7	-168.08	11.0	147.5	825.5	808.9	16.68	49.540		
5,257.0	5,115.7	5,131.7	5,121.6	20.1	8.8	-172.84	10.7	148.0	844.5	827.6	16.88	50.020		
5,319.0	5,174.8	5,187.7	5,177.7	20.4	8.9	-173.33	10.5	148.2	862.6	845.5	17.10	50.437		
5,382.0	5,235.0	5,245.9	5,235.9	20.8	9.0	-172.41	10.7	148.4	881.0	863.7	17.31	50.909		
5,445.0	5,295.0	5,306.5	5,296.4	21.2	9.1	-174.91	11.2	148.4	899.9	882.4	17.50	51.423		
5,508.0	5,355.0	5,370.8	5,360.7	21.5	9.2	-178.40	11.8	148.6	918.9	901.2	17.71	51.888		
5,570.0	5,414.0	5,423.3	5,413.3	21.9	9.3	-178.39	12.4	148.8	937.9	920.0	17.90	52.393		
5,632.0	5,472.8	5,478.2	5,468.2	22.3	9.3	-179.09	13.3	148.6	957.5	939.5	18.09	52.939		
5,696.0	5,533.4	5,539.9	5,529.9	22.6	9.4	-178.21	14.3	148.2	978.4	960.1	18.29	53.504		
5,759.0	5,593.0	5,600.3	5,590.2	23.0	9.5	-178.93	15.2	148.0	999.1	980.6	18.50	53.994		
5,820.0	5,650.7	5,657.1	5,641.1	23.4	15.2	-166.55	171.4	525.3	986.4	964.5	21.94	44.960		
5,883.0	5,710.3	5,621.7	5,604.1	23.8	15.7	-164.75	196.6	545.0	955.4	932.7	22.70	42.095		
5,946.0	5,769.9	5,642.7	5,611.9	24.2	15.9	-163.61	212.2	556.7	926.6	903.3	23.30	39.789		
6,007.0	5,827.7	5,663.0	5,619.5	24.6	16.2	-163.66	227.6	567.5	901.3	877.3	23.98	37.590		
6,070.0	5,887.3	5,673.3	5,623.3	24.9	16.3	-164.46	235.6	572.7	878.5	854.1	24.40	35.998		
6,119.0	5,933.7	5,684.1	5,627.4	25.2	16.4	-161.59	244.1	578.1	863.0	838.2	24.78	34.824		
6,201.0	6,011.4	5,694.0	5,631.1	25.7	16.5	-156.69	252.0	582.7	841.2	816.1	25.17	33.424		
6,233.0	6,041.9	5,710.8	5,637.4	25.9	16.7	-142.96	265.6	590.3	833.4	807.8	25.51	32.665		
6,284.0	6,071.3	5,726.0	5,643.2	26.0	16.9	-130.52	278.0	596.8	825.5	799.8	25.69	32.139		
6,296.0	6,101.3	5,726.0	5,643.2	26.2	16.9	-127.40	283.0	596.8	818.0	792.4	25.61	31.934		
6,328.0	6,130.7	5,737.3	5,647.8	26.4	17.0	-120.90	287.5	601.4	811.3	785.5	25.78	31.477		
6,360.0	6,159.6	5,747.1	5,651.3	26.6	17.1	-120.12	295.6	605.1	805.6	779.5	26.13	30.833		
6,390.0	6,186.0	5,758.0	5,655.5	26.8	17.3	-119.91	304.9	609.2	801.8	775.2	26.60	30.144		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Reference Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	Grd
<b>Reference Well:</b>	Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at:</b>	2.00 sigma
<b>Reference Wellbore:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Survey, Survey #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 5H - HZ - FINAL													Offset Site Error	0.0 usft
Survey Program 100 Gyro, 804-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
6,422.0	6,213.4	6,758.0	6,455.5	27.0	17.3	-120.68	304.9	609.2	799.6	772.7	28.93	29.696		
6,442.2	6,230.2	6,772.4	6,461.1	27.2	17.4	-120.65	317.2	614.2	799.1	771.5	27.55	29.002		
6,453.0	6,239.0	6,775.7	6,462.4	27.2	17.4	-120.78	320.0	615.2	799.2	771.4	27.79	28.761		
6,484.0	6,263.9	6,788.0	6,467.2	27.5	17.6	-118.44	330.7	619.1	800.3	771.9	28.34	28.241		
6,516.0	6,289.0	6,788.0	6,467.2	27.7	17.6	-114.62	330.7	619.1	801.8	773.5	28.37	28.261		
6,547.0	6,312.8	6,808.3	6,475.2	28.0	17.8	-111.89	348.4	624.8	803.2	774.2	29.00	27.866		
6,578.0	6,335.9	6,820.0	6,479.9	28.2	17.9	-109.00	358.7	627.8	805.0	775.7	29.31	27.462		
6,609.0	6,358.5	6,831.1	6,484.4	28.4	18.0	-106.11	368.4	630.5	806.6	777.2	29.42	27.413		
6,640.0	6,381.2	6,851.0	6,492.6	28.6	18.2	-102.77	386.1	634.6	807.9	778.4	29.47	27.413		
6,671.0	6,403.8	6,851.0	6,492.6	28.8	18.2	-99.62	386.1	634.6	808.2	779.1	29.08	27.794		
6,703.0	6,426.4	6,868.0	6,499.6	29.0	18.3	-96.58	401.4	637.7	808.1	779.0	28.09	27.780		
6,734.0	6,447.5	6,882.0	6,505.4	29.1	18.5	-94.11	413.9	639.9	807.5	778.5	28.96	27.881		
6,765.0	6,468.4	6,897.1	6,511.6	29.3	18.6	-91.54	427.5	642.0	806.3	777.5	28.75	28.042		
6,797.0	6,489.9	6,912.0	6,517.6	29.4	18.7	-89.37	441.0	643.8	804.5	775.8	28.63	28.103		
6,828.0	6,510.1	6,926.5	6,523.5	29.5	18.9	-87.95	454.1	645.3	802.4	773.8	28.58	28.079		
6,859.0	6,529.2	6,944.0	6,530.6	29.6	19.0	-86.72	470.1	646.7	800.2	771.6	28.56	28.021		
6,890.0	6,547.0	6,956.0	6,535.6	29.7	19.1	-85.31	481.0	647.5	797.5	769.3	28.14	28.338		
6,922.0	6,563.9	6,974.0	6,543.0	29.9	19.3	-84.57	497.3	648.2	794.2	766.3	27.93	28.433		
6,954.0	6,579.0	6,989.9	6,549.7	30.0	19.4	-84.62	511.7	648.6	790.8	762.7	28.09	28.147		
6,986.0	6,592.7	7,008.0	6,556.6	30.1	19.5	-84.27	526.3	648.8	787.4	759.3	28.03	28.087		
7,017.0	6,604.9	7,025.7	6,565.0	30.2	19.7	-84.27	544.2	648.6	784.0	755.8	28.20	27.801		
7,049.0	6,616.2	7,046.0	6,573.7	30.4	19.9	-84.32	562.5	648.1	780.3	752.2	28.19	27.661		
7,080.0	6,625.6	7,069.0	6,583.2	30.5	20.1	-84.22	583.4	647.2	776.3	748.4	27.88	27.848		
7,111.0	6,633.9	7,086.5	6,590.0	30.6	20.2	-84.36	599.5	646.4	771.7	743.9	27.88	27.684		
7,142.0	6,640.9	7,105.3	6,598.8	30.7	20.4	-84.97	617.0	646.2	767.3	739.0	28.33	27.087		
7,174.0	6,646.6	7,132.0	6,606.6	30.9	20.6	-85.41	642.1	643.2	762.7	734.4	28.35	26.899		
7,205.0	6,650.9	7,152.0	6,611.5	31.0	20.8	-85.92	661.1	641.5	758.0	729.3	28.65	26.461		
7,236.0	6,654.2	7,176.6	6,617.9	31.1	21.1	-86.26	684.6	639.2	753.2	724.2	29.00	25.973		
7,267.0	6,656.6	7,202.3	6,624.0	31.3	21.3	-86.98	709.6	636.7	748.3	718.9	29.42	25.433		
7,330.0	6,657.3	7,248.6	6,633.7	31.8	21.8	-88.40	754.6	631.8	738.3	708.0	30.38	24.306		
7,393.0	6,656.3	7,290.0	6,640.3	32.0	22.2	-88.75	795.1	625.1	730.4	698.3	32.03	22.805		
7,456.0	6,656.5	7,322.0	6,643.8	32.4	22.6	-88.97	826.4	620.3	725.1	691.9	33.18	21.854		
7,520.0	6,656.7	7,353.0	6,645.5	32.8	22.9	-89.11	856.6	613.7	722.1	687.6	34.47	20.949		
7,582.0	6,656.9	7,415.5	6,645.2	33.3	23.6	-89.07	917.4	599.2	720.8	684.4	36.38	19.812		
7,644.0	6,656.8	7,474.3	6,642.9	33.8	24.3	-88.90	974.6	585.9	719.7	681.2	38.51	18.689		
7,657.2	6,656.7	7,484.7	6,642.6	33.9	24.4	-88.88	984.7	583.5	719.7	680.8	38.88	18.509		
7,706.0	6,656.1	7,525.2	6,642.1	34.3	24.9	-88.87	1,024.0	573.6	720.1	679.8	40.30	17.888		
7,768.0	6,655.1	7,582.4	6,642.6	34.9	25.6	-89.00	1,079.4	559.1	721.2	679.0	42.12	17.121		
7,830.0	6,654.0	7,635.0	6,643.5	35.5	26.2	-89.13	1,130.1	545.8	722.8	678.6	44.14	16.376		
7,894.0	6,653.2	7,698.0	6,644.9	36.1	27.0	-89.34	1,190.8	528.7	724.6	679.3	45.24	16.017		
7,956.0	6,652.8	7,745.8	6,646.1	36.7	27.6	-89.45	1,236.6	515.1	726.5	679.5	47.05	15.441		
8,018.0	6,652.2	7,811.8	6,646.8	37.4	28.5	-89.55	1,299.9	496.1	729.1	679.6	49.43	14.751		
8,081.0	6,651.3	7,879.7	6,646.5	38.1	29.4	-89.60	1,365.0	477.2	731.4	679.8	51.56	14.186		
8,143.0	6,650.3	7,950.8	6,645.7	38.8	30.4	-89.61	1,433.5	457.9	733.4	679.3	54.06	13.566		
8,205.0	6,649.2	8,006.3	6,644.3	39.5	31.2	-89.58	1,487.0	443.0	735.5	679.5	56.00	13.133		
8,268.0	6,648.2	8,043.8	6,643.7	40.3	31.8	-89.58	1,522.8	432.3	739.2	681.2	58.00	12.744		
8,331.0	6,647.2	8,078.0	6,644.1	41.1	32.3	-89.61	1,555.2	421.2	746.0	685.8	60.20	12.392		
8,394.0	6,646.8	8,139.0	6,646.0	41.9	33.1	-89.68	1,612.5	400.3	753.9	692.5	61.41	12.276		
8,455.0	6,646.9	8,185.1	6,647.6	42.6	33.8	-90.05	1,656.6	384.1	761.6	698.1	63.49	11.994		
8,519.0	6,647.1	8,226.9	6,649.1	43.5	34.4	-90.20	1,694.4	368.5	770.9	706.0	64.91	11.877		
8,582.0	6,647.4	8,266.0	6,650.8	44.3	35.0	-90.29	1,730.1	352.8	781.8	715.1	66.66	11.729		
8,645.0	6,647.5	8,316.0	6,652.9	45.2	35.7	-90.40	1,775.3	331.7	794.4	725.4	69.06	11.503		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 5H - HZ - FINAL													Offset Site Error	0.0 usft
Survey Program 100-Gyo, 904-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
8,707.0	6,647.6	8,400.6	6,654.0	46.0	37.0	-90.50	1,852.2	296.1	807.0	735.6	71.47	11.292		
8,770.0	6,647.2	8,524.6	6,652.7	46.9	38.9	-90.32	1,967.9	251.8	814.1	740.3	73.80	11.031		
8,833.0	6,646.2	8,578.0	6,653.5	47.7	39.8	-90.41	2,018.0	233.5	819.8	744.2	75.83	10.840		
8,897.0	6,645.6	8,613.7	6,654.5	48.6	40.3	-90.82	2,051.3	220.5	824.7	749.9	74.80	11.025		
8,959.0	6,646.0	8,664.5	6,655.7	49.4	41.1	-90.69	2,098.2	201.0	827.3	752.8	74.55	11.099		
9,023.0	6,646.0	8,729.3	6,655.6	50.3	42.2	-90.67	2,158.0	176.0	828.9	751.7	77.16	10.742		
9,086.0	6,645.2	8,788.2	6,654.8	51.1	43.1	-90.64	2,212.3	153.3	830.6	751.3	79.33	10.470		
9,150.0	6,644.1	8,844.6	6,653.3	52.0	44.1	-90.60	2,284.0	131.0	832.7	751.8	80.84	10.300		
9,212.0	6,642.6	8,912.3	6,651.8	52.9	45.2	-90.59	2,326.3	104.3	834.4	750.8	83.58	9.984		
9,273.0	6,641.5	8,976.5	6,652.1	53.8	46.2	-90.72	2,385.3	79.2	836.3	750.2	86.05	9.718		
9,335.0	6,641.1	9,041.9	6,652.3	54.7	47.3	-90.75	2,445.7	54.0	838.0	749.5	88.51	9.468		
9,398.0	6,640.8	9,106.2	6,651.6	55.6	48.4	-90.73	2,505.0	29.2	839.9	749.2	90.72	9.258		
9,461.0	6,640.8	9,180.4	6,650.0	56.5	49.7	-90.64	2,573.7	1.3	840.8	748.2	92.62	9.078		
9,524.0	6,640.3	9,248.9	6,649.8	57.4	50.8	-90.64	2,637.4	-23.8	840.5	745.6	94.90	8.857		
9,587.0	6,639.8	9,312.8	6,651.2	58.4	51.9	-90.79	2,697.0	-47.1	840.1	742.8	97.37	8.628		
9,650.0	6,638.8	9,379.1	6,652.3	59.3	53.0	-90.95	2,758.7	-71.0	839.6	740.1	99.55	8.434		
9,712.0	6,636.8	9,452.9	6,652.0	60.3	54.3	-91.07	2,827.6	-97.2	838.9	736.4	102.51	8.183		
9,776.0	6,634.9	9,515.6	6,651.2	61.2	55.4	-91.12	2,886.6	-118.9	838.3	732.9	105.44	7.951		
9,776.6	6,634.8	9,516.2	6,651.2	61.3	55.4	-91.12	2,887.2	-119.1	838.3	732.9	105.46	7.949		
9,839.0	6,633.2	9,560.0	6,651.3	62.2	56.2	-91.20	2,928.0	-134.8	838.9	731.5	107.39	7.812		
9,902.0	6,631.7	9,603.9	6,651.8	63.2	56.9	-91.33	2,988.6	-151.5	840.8	731.9	108.82	7.719		
9,965.0	6,631.5	9,652.9	6,651.9	64.2	57.8	-91.39	3,013.8	-171.0	842.3	733.4	108.90	7.734		
10,029.0	6,632.5	9,718.1	6,650.6	65.2	58.9	-91.27	3,071.4	-196.6	843.7	731.4	112.36	7.509		
10,092.0	6,633.5	9,789.6	6,649.1	66.2	60.2	-91.10	3,138.7	-226.2	846.9	730.1	116.73	7.255		
10,155.0	6,634.3	9,874.4	6,649.7	67.2	61.6	-91.05	3,217.2	-258.3	849.1	730.2	118.88	7.142		
10,218.0	6,634.7	9,937.5	6,649.9	68.2	62.8	-91.03	3,275.7	-281.6	850.6	729.4	121.27	7.014		
10,281.0	6,634.8	9,998.9	6,649.1	69.2	63.8	-90.96	3,332.8	-304.4	852.5	728.6	123.86	6.882		
10,344.0	6,634.3	10,062.0	6,649.0	70.3	65.0	-90.95	3,391.4	-327.9	854.8	728.4	126.41	6.762		
10,407.0	6,634.1	10,121.2	6,648.7	71.3	66.0	-90.98	3,446.2	-350.0	856.7	729.0	127.88	6.710		
10,471.0	6,634.5	10,186.0	6,647.0	72.3	67.2	-90.84	3,506.2	-374.5	858.6	728.1	130.52	6.578		
10,535.0	6,635.2	10,247.9	6,646.2	73.4	68.3	-90.75	3,563.6	-397.6	860.1	727.9	132.19	6.507		
10,598.0	6,635.5	10,302.8	6,647.2	74.4	69.2	-90.77	3,614.3	-418.6	862.1	727.2	134.93	6.390		
10,658.0	6,635.7	10,359.3	6,648.0	75.4	70.2	-90.83	3,666.4	-440.6	864.6	727.9	136.74	6.323		
10,721.0	6,635.8	10,425.7	6,647.6	76.5	71.4	-90.78	3,727.5	-466.4	866.8	727.9	138.89	6.241		
10,785.0	6,635.5	10,493.5	6,647.7	77.5	72.6	-90.79	3,790.1	-492.4	868.8	727.2	141.56	6.137		
10,847.0	6,635.2	10,548.1	6,647.8	78.6	73.6	-90.82	3,840.6	-513.3	870.4	727.2	143.21	6.078		
10,910.0	6,634.7	10,592.0	6,647.3	79.6	74.4	-90.81	3,880.8	-531.0	872.6	728.0	144.52	6.038		
10,973.0	6,634.5	10,669.5	6,645.8	80.7	75.8	-90.75	3,951.7	-562.3	875.2	727.0	148.20	5.906		
11,036.0	6,634.6	10,783.7	6,644.4	81.8	77.9	-90.64	4,057.6	-604.8	878.9	725.1	151.78	5.777		
11,099.0	6,634.4	10,858.6	6,644.3	82.8	79.2	-90.65	4,128.3	-629.5	875.7	721.2	154.54	5.667		
11,159.9	6,634.2	10,898.0	6,644.8	83.7	79.9	-90.69	4,185.4	-642.7	875.3	719.0	156.28	5.601		
11,181.0	6,634.1	10,906.0	6,644.9	83.9	80.0	-90.71	4,173.0	-645.4	875.3	718.6	156.62	5.588		
11,223.0	6,633.6	10,984.7	6,646.1	84.9	81.1	-90.83	4,228.1	-665.7	875.0	716.9	158.04	5.536		
11,283.3	6,633.0	11,003.4	6,646.5	85.6	81.8	-90.88	4,254.3	-679.1	874.7	714.8	159.96	5.468		
11,286.0	6,632.6	11,025.1	6,646.4	86.0	82.2	-90.90	4,284.7	-686.7	874.8	713.8	161.03	5.432		
11,349.0	6,631.7	11,088.1	6,645.1	87.1	83.3	-90.87	4,343.5	-708.8	875.9	711.6	164.24	5.333		
11,412.0	6,631.0	11,141.7	6,643.8	88.2	84.3	-90.80	4,393.8	-727.8	878.0	711.5	165.45	5.275		
11,475.0	6,630.1	11,194.7	6,643.9	89.3	85.3	-90.84	4,443.1	-747.1	881.3	712.1	169.14	5.210		
11,539.0	6,629.3	11,250.2	6,646.0	90.4	86.3	-91.06	4,494.6	-767.9	885.0	714.7	170.32	5.196		
11,602.0	6,628.8	11,309.0	6,648.3	91.4	87.3	-91.23	4,548.9	-790.3	888.7	715.7	172.92	5.139		
11,666.0	6,628.0	11,372.1	6,649.6	92.6	88.5	-91.32	4,607.2	-814.5	892.7	717.5	175.20	5.095		
11,728.0	6,626.7	11,432.1	6,649.6	93.8	89.6	-91.43	4,662.5	-837.6	895.6	719.7	176.81	5.084		

RECEIVED

Office of Oil and Gas

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

JUN 21 2016

10/28/2016

# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey. Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 5H - HZ - FINAL													Offset Site Error	0.0 usft
Survey Program 100-Gyro, 804-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipse (usft)	Total Uncertainty Axis	Separation Factor		
11,792.0	6,825.4	11,494.5	6,648.1	94.7	90.7	-91.44	4,720.0	-861.8	896.8	719.6	177.21	5.061		
11,855.0	6,624.6	11,561.5	6,845.1	95.8	91.9	-91.30	4,781.7	-887.8	897.4	718.0	179.34	5.004		
11,919.0	6,624.1	11,649.7	6,842.9	96.9	93.5	-91.22	4,863.5	-920.7	897.0	714.3	182.82	4.912		
11,981.0	6,623.3	11,721.3	6,643.4	98.0	94.8	-91.31	4,930.5	-945.9	895.2	710.6	184.63	4.849		
12,045.0	6,622.4	11,785.2	6,643.7	99.1	96.0	-91.39	4,990.3	-988.1	893.3	705.7	187.62	4.761		
12,108.0	6,621.2	11,848.5	6,644.0	100.2	97.2	-91.49	5,049.7	-990.2	891.8	701.9	189.95	4.695		
12,171.0	6,619.6	11,915.8	6,643.7	101.3	98.4	-91.61	5,112.8	-1,013.5	890.0	697.9	192.10	4.633		
12,234.0	6,618.4	11,973.0	6,642.8	102.4	99.4	-91.60	5,188.5	-1,033.3	887.7	693.8	193.93	4.578		
12,298.0	6,618.6	12,036.0	6,641.6	103.5	100.6	-91.46	5,225.4	-1,055.4	885.6	689.3	196.26	4.512		
12,360.0	6,619.2	12,088.2	6,641.0	104.6	101.5	-91.41	5,274.2	-1,074.1	884.3	685.1	199.20	4.439		
12,422.0	6,619.7	12,154.6	6,639.4	105.7	102.7	-91.28	5,336.1	-1,098.0	883.6	682.3	201.31	4.389		
12,486.0	6,620.6	12,215.2	6,637.0	106.8	103.8	-91.05	5,392.7	-1,119.7	882.5	678.9	203.63	4.334		
12,548.0	6,621.3	12,275.0	6,635.4	107.9	104.9	-90.92	5,448.4	-1,141.4	881.9	675.8	206.08	4.279		
12,577.4	6,621.4	12,301.9	6,635.0	108.5	105.4	-90.89	5,473.5	-1,151.2	881.8	674.4	207.37	4.252		
12,611.0	6,621.4	12,331.1	6,634.8	109.0	106.0	-90.87	5,500.6	-1,161.9	881.9	673.1	208.81	4.224		
12,674.0	6,621.3	12,376.5	6,634.9	110.2	106.8	-90.87	5,542.7	-1,179.0	883.5	672.1	211.39	4.179		
12,737.0	6,620.9	12,417.5	6,636.2	111.3	107.5	-90.94	5,580.2	-1,195.4	887.7	673.4	214.29	4.143		
12,800.0	6,619.9	12,474.9	6,639.1	112.4	108.6	-91.05	5,632.4	-1,219.1	893.8	677.0	216.73	4.124		
12,864.0	6,619.1	12,535.7	6,639.2	113.5	109.7	-91.26	5,687.6	-1,244.5	900.5	681.3	219.22	4.108		
12,925.0	6,619.1	12,583.5	6,639.4	114.6	110.6	-91.31	5,730.9	-1,264.8	907.2	686.5	220.74	4.110		
12,989.0	6,619.9	12,649.4	6,638.5	115.7	111.8	-91.26	5,790.3	-1,293.4	913.3	691.9	221.44	4.124		
13,052.0	6,620.9	12,708.2	6,637.2	116.9	112.9	-91.06	5,841.5	-1,317.9	917.8	694.2	223.36	4.108		
13,115.0	6,621.3	12,801.8	6,636.0	118.0	114.6	-90.91	5,928.0	-1,358.6	921.8	695.0	226.78	4.065		
13,177.0	6,620.9	12,855.0	6,635.0	119.1	115.6	-90.83	5,976.8	-1,379.7	924.5	695.0	229.50	4.028		
13,240.0	6,620.0	12,917.0	6,634.7	120.2	116.8	-90.83	6,033.3	-1,405.3	928.8	696.8	232.07	4.002		
13,302.0	6,619.1	12,985.2	6,633.5	121.3	118.0	-90.86	6,095.1	-1,434.0	933.7	699.5	234.18	3.987		
13,363.0	6,618.6	13,037.8	6,631.6	122.4	119.0	-90.75	6,143.0	-1,455.7	937.7	701.1	236.61	3.963		
13,425.0	6,617.7	13,157.0	6,629.4	123.5	121.2	-90.69	6,252.4	-1,502.9	941.8	701.5	240.36	3.918		
13,488.0	6,617.0	13,265.2	6,628.0	124.6	123.2	-90.67	6,354.6	-1,538.0	940.4	697.4	243.04	3.869		
13,551.0	6,616.5	13,329.1	6,626.0	125.8	124.3	-90.61	6,415.3	-1,558.5	938.3	692.7	245.61	3.820		
13,612.0	6,616.2	13,397.0	6,624.9	126.9	125.6	-90.52	6,479.7	-1,579.5	935.6	688.4	247.17	3.785		
13,676.0	6,616.0	13,466.5	6,625.5	128.0	126.8	-90.67	6,546.0	-1,600.5	931.9	681.9	249.95	3.728		
13,739.0	6,615.8	13,529.1	6,627.3	129.1	128.0	-90.71	6,605.8	-1,619.3	927.3	676.7	250.80	3.700		
13,802.0	6,615.8	13,584.1	6,626.2	130.3	129.0	-90.84	6,658.1	-1,636.0	921.3	669.5	251.80	3.659		
13,865.0	6,615.3	13,629.9	6,625.3	131.4	129.8	-90.89	6,698.7	-1,649.5	916.2	661.5	254.75	3.596		
13,927.0	6,615.0	13,686.0	6,624.9	132.5	130.5	-90.81	6,737.3	-1,663.6	913.1	657.1	255.98	3.567		
13,975.8	6,614.8	13,694.6	6,624.7	133.4	131.0	-90.62	6,762.1	-1,673.4	912.0	653.3	258.72	3.525		
13,990.0	6,614.6	13,704.2	6,624.6	133.6	131.2	-90.62	6,770.9	-1,677.0	912.1	652.6	259.52	3.515		
14,053.0	6,613.4	13,753.9	6,624.1	134.8	132.1	-90.64	6,816.7	-1,696.2	913.4	651.9	261.54	3.493		
14,115.0	6,612.5	13,813.9	6,622.1	135.9	133.2	-90.60	6,871.9	-1,719.8	915.0	651.2	263.81	3.469		
14,178.0	6,612.1	13,879.0	6,619.9	137.0	134.4	-90.46	6,931.7	-1,745.4	917.2	650.4	266.79	3.438		
14,241.0	6,610.8	13,948.0	6,618.5	138.2	135.7	-90.39	6,995.4	-1,772.1	919.9	649.6	270.24	3.404		
14,303.0	6,610.0	14,013.3	6,616.5	139.3	136.9	-90.41	7,056.6	-1,797.2	923.0	650.6	272.37	3.389		
14,367.0	6,610.3	14,081.1	6,614.7	140.4	138.2	-90.28	7,118.4	-1,822.9	924.9	651.0	273.89	3.377		
14,428.0	6,610.5	14,143.0	6,612.7	141.5	139.3	-90.14	7,175.6	-1,846.2	926.4	649.7	276.66	3.349		
14,490.0	6,610.3	14,213.5	6,611.6	142.7	140.6	-90.07	7,241.0	-1,872.5	928.0	648.8	279.20	3.324		
14,553.0	6,609.7	14,285.5	6,609.9	143.8	141.9	-90.01	7,308.0	-1,898.7	928.9	647.4	281.54	3.299		
14,616.0	6,608.7	14,357.3	6,608.9	144.9	143.3	-89.86	7,375.1	-1,924.2	929.9	644.9	285.05	3.262		
14,679.0	6,607.1	14,426.7	6,605.1	146.1	144.5	-89.86	7,439.2	-1,947.9	930.9	643.7	287.20	3.241		
14,742.0	6,605.9	14,491.5	6,604.5	147.2	145.7	-89.91	7,501.0	-1,970.5	931.4	641.9	289.44	3.218		
14,805.0	6,605.0	14,555.3	6,602.5	148.3	146.9	-89.85	7,560.9	-1,992.4	931.6	639.9	291.70	3.194		
14,868.0	6,603.4	14,641.0	6,599.3	149.5	148.5	-89.76	7,641.8	-2,020.6	931.3	636.2	295.05	3.156		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Reference Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Survey Survey #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 5H - HZ - FINAL													Offset Site Error	0.0 usft
Survey Program 100-Gyro, 804-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
14,930.0	6,602.1	14,697.6	6,599.3	150.6	149.5	-89.83	7,695.4	-2,038.4	930.1	633.6	296.46	3.137		
14,990.3	6,601.7	14,737.0	6,600.4	151.7	150.2	-89.92	7,732.6	-2,051.6	929.4	631.2	298.24	3.116		
14,992.0	6,601.7	14,737.0	6,600.4	151.7	150.2	-89.92	7,732.6	-2,051.6	929.4	631.2	298.27	3.116		
15,053.0	6,601.1	14,790.1	6,602.4	152.8	151.2	-90.08	7,782.3	-2,070.1	929.2	629.6	299.67	3.101		
15,115.0	6,600.3	14,857.8	6,603.7	154.0	152.5	-90.22	7,846.7	-2,094.1	928.8	626.7	302.07	3.075		
15,178.0	6,599.3	14,918.6	6,603.0	155.1	153.6	-90.23	7,902.6	-2,115.3	928.4	623.6	304.77	3.048		
15,185.4	6,599.2	14,926.0	6,602.8	155.2	153.7	-90.22	7,909.5	-2,117.9	928.4	623.4	305.04	3.044		
15,241.0	6,598.0	14,964.2	6,601.8	156.2	154.4	-90.21	7,945.2	-2,131.7	928.9	622.1	306.71	3.028		
15,303.0	6,596.1	15,017.9	6,600.9	157.4	155.4	-90.24	7,994.9	-2,151.9	930.5	621.4	309.10	3.010		
15,381.0	6,592.2	15,102.4	6,600.4	158.8	157.0	-90.49	8,073.3	-2,183.5	931.9	620.7	311.23	2.994		
15,443.0	6,588.0	15,168.2	6,598.2	159.9	158.2	-90.54	8,134.4	-2,207.8	932.4	618.3	314.18	2.968		
15,506.0	6,587.8	15,221.5	6,598.0	161.1	159.2	-90.51	8,183.8	-2,227.5	932.9	617.5	315.48	2.957		
15,569.0	6,588.3	15,278.8	6,594.7	162.2	160.3	-90.41	8,236.8	-2,249.3	933.7	615.7	317.98	2.936		
15,632.0	6,589.3	15,338.5	6,594.4	163.3	161.4	-90.33	8,291.9	-2,272.2	934.8	614.6	320.19	2.919		
15,696.0	6,589.6	15,404.0	6,593.2	164.5	162.6	-90.21	8,352.4	-2,297.5	936.4	613.2	323.13	2.898		
15,760.0	6,589.9	15,472.9	6,590.5	165.7	163.9	-90.05	8,416.0	-2,323.7	937.9	612.3	325.52	2.881		
15,823.0	6,590.1	15,534.9	6,587.5	166.8	165.0	-89.84	8,473.3	-2,347.1	939.6	611.1	328.48	2.860		
15,887.0	6,590.6	15,596.5	6,584.1	168.0	166.1	-89.62	8,530.2	-2,370.6	941.4	611.4	330.01	2.853		
15,950.0	6,591.4	15,656.6	6,580.0	169.1	167.3	-89.33	8,585.6	-2,393.5	943.0	610.4	332.62	2.835		
16,013.0	6,591.5	15,716.7	6,574.5	170.3	168.4	-88.95	8,640.8	-2,416.6	945.3	610.1	335.25	2.820		
16,076.0	6,590.4	15,773.7	6,568.1	171.4	169.4	-88.54	8,693.0	-2,438.6	948.8	610.6	338.24	2.805		
16,139.0	6,589.3	15,832.1	6,560.4	172.6	170.5	-88.23	8,746.1	-2,461.5	953.6	613.0	340.64	2.799 SF		
16,203.0	6,589.1	15,847.0	6,558.5	173.7	170.8	-88.17	8,759.7	-2,467.3	960.5	617.9	342.54	2.804		
16,265.0	6,589.6	15,847.0	6,558.5	174.9	170.8	-88.29	8,759.7	-2,467.3	971.0	627.7	343.28	2.829		
16,329.0	6,591.6	15,847.0	6,558.5	176.0	170.8	-88.71	8,759.7	-2,467.3	984.8	641.1	343.66	2.866		
16,392.0	6,594.6	15,847.0	6,558.5	177.2	170.8	-88.59	8,759.7	-2,467.3	1,001.7	656.6	345.16	2.902		
16,454.0	6,597.6	15,847.0	6,558.5	178.3	170.8	-88.80	8,759.7	-2,467.3	1,021.1	676.5	344.59	2.983		
16,518.0	6,600.2	15,847.0	6,558.5	179.5	170.8	-88.05	8,759.7	-2,467.3	1,043.1	698.1	344.97	3.024		
16,581.0	6,600.8	15,847.0	6,558.5	180.6	170.8	-87.41	8,759.7	-2,467.3	1,067.6	721.6	345.94	3.086		
16,643.0	6,599.5	15,847.0	6,558.5	181.8	170.8	-88.54	8,759.7	-2,467.3	1,094.0	748.8	345.20	3.189		
16,705.0	6,596.7	15,847.0	6,558.5	182.9	170.8	-86.08	8,759.7	-2,467.3	1,122.4	776.4	345.98	3.244		
16,767.0	6,592.9	15,847.0	6,558.5	184.0	170.8	-85.62	8,759.7	-2,467.3	1,153.3	806.5	346.84	3.325		
16,843.0	6,586.9	15,847.0	6,558.5	185.4	170.8	-84.75	8,759.7	-2,467.3	1,194.9	846.4	348.44	3.429		
16,892.0	6,582.5	15,847.0	6,558.5	186.3	170.8	-84.75	8,759.7	-2,467.3	1,223.6	874.2	349.35	3.502		



# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey: Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 6H - HZ - FINAL													Offset Site Error	0.0 usft
Survey Program: 100 Gyro, 700-MWD, 1337-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-130.28	-20.0	-23.6	30.9					
100.0	100.0	100.1	100.1	0.1	0.1	-12.35	-19.7	-23.6	30.5	30.3	0.14	212.744		
200.0	200.0	200.0	200.0	0.2	0.2	-12.91	-19.3	-23.8	29.9	29.6	0.32	94.001		
300.0	300.0	300.0	300.0	0.2	0.2	-14.81	-19.0	-24.1	29.4	28.9	0.49	59.644		
400.0	400.0	400.0	400.0	0.3	0.3	-36.27	-18.7	-24.3	28.9	28.2	0.67	43.279		
500.0	500.0	500.0	500.0	0.4	0.4	-57.40	-18.4	-24.4	28.5	27.6	0.84	33.848		
600.0	600.0	600.0	600.0	0.5	0.5	-26.24	-18.3	-24.4	28.0	28.9	1.02	27.509		
610.0	610.0	609.9	609.9	0.5	0.5	-39.95	-18.3	-24.4	27.9	26.9	1.03	26.990		
658.2	658.2	658.1	658.1	0.6	0.6	-50.17	-18.3	-24.7	27.8	26.6	1.19	23.416 CC		
835.0	835.0	835.2	835.2	0.9	0.9	163.86	-17.7	-25.1	28.4	26.6	1.81	15.725		
868.0	868.0	868.4	868.4	1.0	1.0	152.03	-17.2	-25.0	28.5	26.6	1.92	14.812		
900.0	900.0	900.6	900.6	1.0	1.0	142.45	-16.5	-24.8	28.5	26.5	2.03	14.019		
931.0	931.0	931.8	931.8	1.1	1.1	133.56	-15.6	-24.4	28.6	26.4	2.15	13.309		
963.0	962.9	964.0	964.0	1.1	1.1	134.50	-14.2	-24.0	28.6	26.4	2.26	12.861 ES		
994.0	993.8	995.2	995.1	1.2	1.2	139.06	-12.6	-23.4	28.8	26.5	2.37	12.151		
1,026.0	1,025.8	1,027.0	1,026.8	1.3	1.2	144.52	-10.6	-22.7	29.5	27.0	2.49	11.835 SF		
1,057.0	1,056.6	1,057.7	1,057.5	1.3	1.3	150.06	-8.6	-22.2	30.9	28.3	2.60	11.658		
1,088.0	1,087.4	1,088.3	1,088.0	1.4	1.4	154.97	-6.4	-21.8	33.2	30.5	2.72	12.204		
1,152.0	1,150.9	1,150.7	1,150.2	1.5	1.5	159.75	-1.6	-21.6	40.7	37.7	2.95	13.777		
1,214.0	1,212.2	1,210.4	1,209.7	1.7	1.6	168.08	3.1	-22.6	51.5	48.4	3.17	16.246		
1,277.0	1,274.5	1,270.3	1,269.3	1.9	1.8	171.07	8.3	-24.8	65.3	61.9	3.40	19.223		
1,339.0	1,335.6	1,328.6	1,327.3	2.0	1.9	171.48	14.1	-27.9	80.8	77.2	3.61	22.358		
1,402.0	1,397.8	1,388.2	1,386.4	2.2	2.0	176.54	20.4	-32.1	97.9	94.0	3.84	25.501		
1,465.0	1,459.9	1,447.5	1,445.1	2.4	2.2	178.17	27.1	-36.4	116.2	112.1	4.06	28.614		
1,525.0	1,519.0	1,503.6	1,500.6	2.6	2.4	174.75	34.1	-40.6	133.8	129.6	4.27	31.316		
1,588.0	1,581.4	1,562.3	1,558.6	2.8	2.5	175.51	42.0	-45.4	151.7	147.2	4.50	33.730		
1,651.0	1,643.8	1,621.6	1,617.1	2.9	2.7	-178.72	50.5	-50.6	169.6	164.8	4.72	35.947		
1,714.0	1,706.3	1,684.0	1,678.6	3.1	2.9	-175.26	59.3	-56.0	187.1	182.2	4.94	37.848		
1,777.0	1,768.8	1,748.1	1,742.0	3.3	3.1	-174.11	67.3	-60.9	203.8	198.6	5.17	39.435		
1,840.0	1,831.1	1,810.0	1,803.3	3.5	3.2	-175.18	74.5	-65.2	220.7	215.3	5.39	40.977		
1,903.0	1,893.4	1,870.7	1,863.5	3.7	3.4	-175.32	81.3	-69.4	238.2	232.6	5.60	42.501		
1,967.0	1,956.6	1,931.7	1,923.9	3.9	3.6	-172.87	88.3	-73.6	256.2	250.4	5.83	43.969		
2,030.0	2,018.8	1,991.0	1,982.7	4.1	3.8	-168.28	95.4	-77.8	273.9	267.6	6.06	45.216		
2,092.0	2,080.1	2,050.7	2,041.8	4.3	3.9	-166.33	102.8	-81.6	290.8	284.6	6.28	46.279		
2,140.0	2,127.6	2,098.7	2,089.4	4.4	4.1	-163.97	106.6	-84.8	303.6	297.1	6.46	46.983		
2,246.0	2,232.5	2,205.1	2,194.9	4.7	4.3	-159.47	120.1	-91.4	330.2	323.3	6.66	48.146		
2,309.0	2,295.0	2,268.3	2,257.7	4.9	4.5	-154.98	126.2	-95.4	344.7	337.6	7.10	48.558		
2,373.0	2,358.6	2,329.5	2,318.5	5.0	4.7	-140.70	131.1	-100.0	358.0	350.7	7.33	48.834		
2,436.0	2,421.0	2,391.6	2,380.2	5.2	4.8	-132.20	134.7	-106.0	370.9	363.3	7.55	49.092		
2,499.0	2,483.3	2,454.6	2,442.8	5.4	4.9	-127.98	136.6	-113.3	383.8	376.1	7.77	49.373		
2,562.0	2,545.3	2,514.1	2,501.8	5.6	5.1	-127.36	136.8	-120.9	397.5	389.5	7.99	49.756		
2,625.0	2,607.0	2,571.1	2,558.2	5.8	5.2	-130.76	136.6	-128.9	412.6	404.4	8.19	50.359		
2,688.0	2,668.5	2,625.4	2,611.9	6.0	5.3	-134.53	136.0	-137.3	429.7	421.3	8.39	51.212		
2,752.0	2,730.8	2,677.7	2,663.3	6.3	5.5	-136.25	135.3	-146.2	449.4	440.6	8.59	52.321		
2,815.0	2,791.8	2,726.0	2,710.8	6.5	5.6	-140.15	134.7	-155.3	471.1	462.3	8.77	53.703		
2,878.0	2,852.6	2,776.1	2,759.9	6.8	5.7	-144.15	134.3	-165.4	495.2	486.2	8.95	55.320		
2,941.0	2,913.1	2,825.3	2,807.9	7.1	5.9	-143.11	133.9	-176.2	521.4	512.2	9.15	57.011		
3,004.0	2,973.4	2,874.8	2,856.0	7.4	6.0	-141.66	133.2	-187.7	548.7	539.3	9.35	58.656		
3,067.0	3,033.5	2,925.5	2,905.2	7.7	6.2	-144.88	131.6	-200.2	577.3	567.8	9.52	60.608		
3,130.0	3,093.2	2,980.7	2,958.3	8.1	6.4	-149.40	128.3	-214.3	607.7	598.0	9.67	62.851		
3,192.0	3,151.6	3,035.2	3,010.8	8.5	6.6	-153.59	123.2	-228.5	639.0	629.2	9.81	65.169		
3,254.0	3,210.0	3,090.8	3,064.0	8.8	6.7	-153.25	118.4	-243.0	670.3	660.3	10.01	68.973		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference:</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Reference Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at:</b>	2.00 sigma
<b>Reference Wellbore:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Survey: Survey #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 6H - HZ - FINAL													Offset Site Error	0 0 usft
Survey Program 100-Gyro, 700-MWD, 1337-MWD													Offset Well Error	0 0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
3,316.0	3,268.9	3,153.5	3,124.0	9.1	6.9	-153.84	108.0	-258.8	700.2	690.0	10.21	68.613		
3,441.0	3,387.2	3,290.2	3,258.2	9.9	7.3	-157.84	90.2	-289.0	759.6	749.1	10.52	72.186		
3,503.0	3,445.6	3,367.7	3,332.0	10.2	7.5	-159.49	81.7	-302.4	787.8	777.0	10.75	73.268		
3,585.0	3,504.4	3,416.0	3,379.5	10.6	7.7	-157.34	77.7	-310.7	815.2	804.3	10.97	74.300		
3,629.0	3,565.1	3,449.0	3,411.8	11.0	7.8	-161.77	75.2	-316.8	844.5	833.4	11.11	76.021		
3,691.0	3,623.7	3,487.9	3,449.8	11.3	7.9	-163.76	72.4	-324.6	874.9	863.8	11.24	77.816		
3,754.0	3,683.2	3,528.0	3,488.8	11.7	8.1	-162.71	69.2	-333.3	906.7	895.3	11.45	79.189		
3,817.0	3,743.1	3,570.2	3,529.7	12.0	8.3	-161.20	65.3	-343.1	938.4	926.7	11.66	80.449		
3,881.0	3,804.0	3,616.2	3,574.0	12.4	8.4	-156.13	60.3	-354.3	970.8	958.9	11.86	81.886		
3,943.0	3,862.8	3,667.7	3,623.4	12.8	8.6	-161.43	53.9	-367.1	1,003.0	991.0	12.00	83.566		
4,005.0	3,921.9	3,724.2	3,677.7	13.1	8.9	-159.07	46.6	-380.9	1,034.4	1,022.2	12.26	84.398		
4,068.0	3,982.5	3,809.4	3,760.1	13.4	9.2	-156.92	38.1	-400.3	1,063.6	1,051.0	12.53	84.885		
4,130.0	4,042.3	3,868.0	3,816.9	13.7	9.4	-162.41	29.1	-412.5	1,090.9	1,078.2	12.69	85.942		
4,193.0	4,102.9	3,915.0	3,862.5	14.0	9.6	-165.35	23.3	-422.7	1,120.1	1,107.2	12.83	87.273		
4,256.0	4,163.2	3,954.0	3,900.2	14.4	9.8	-166.98	18.5	-431.6	1,151.1	1,138.2	12.96	88.794		
4,318.0	4,222.2	4,005.7	3,950.1	14.7	10.0	-166.24	12.4	-443.5	1,182.8	1,169.7	13.14	90.008		
4,380.0	4,281.1	4,071.9	4,014.1	15.1	10.2	-167.40	4.8	-458.4	1,214.5	1,201.2	13.35	90.992		
4,443.0	4,341.0	4,128.1	4,068.7	15.4	10.5	-171.15	-1.5	-470.5	1,246.4	1,232.9	13.51	92.268		
4,503.0	4,397.7	4,167.0	4,108.3	15.8	10.6	-171.98	-6.1	-479.1	1,277.9	1,264.3	13.64	93.710		
4,566.0	4,457.1	4,201.8	4,139.9	16.2	10.8	-175.60	-10.2	-487.1	1,312.3	1,298.5	13.78	95.218		
4,629.0	4,516.4	4,230.0	4,167.1	16.6	10.9	179.31	-13.5	-494.0	1,347.6	1,333.7	13.92	96.845		

# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 8H (Existing) - Existing - Existing													Offset Site Error	0.0 usft
Survey Program 100 MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	11.0	11.0	0.0	0.0	-158.32	-40.3	-16.0	43.4					
100.0	100.0	111.0	111.0	0.1	0.2	-41.14	-40.3	-15.9	43.1	42.9	0.24	180.223		
163.8	163.8	174.6	174.6	0.1	0.3	-42.11	-40.4	-15.9	43.0	42.6	0.41	105.846		
200.0	200.0	210.8	210.8	0.2	0.3	-42.78	-40.6	-15.9	43.0	42.5	0.50	85.901		
300.0	300.0	310.9	310.9	0.2	0.5	-45.21	-40.7	-18.4	43.0	42.2	0.76	56.323		
400.0	400.0	411.1	411.1	0.3	0.7	-66.82	-40.5	-16.9	42.6	41.8	1.03	41.559		
500.0	500.0	511.1	511.1	0.4	0.9	-87.88	-40.1	-17.2	42.3	41.0	1.29	32.825		
600.0	600.0	611.0	611.0	0.5	1.0	-86.92	-39.9	-17.2	41.9	40.3	1.56	27.039		
610.0	610.0	621.0	621.0	0.5	1.1	-70.65	-39.9	-17.2	41.8	40.3	1.58	26.567		
645.8	645.8	656.7	656.7	0.6	1.1	-77.16	-40.0	-17.3	41.8	40.1	1.70	24.589 CC, ES		
835.0	835.0	845.9	845.9	0.9	1.5	132.00	-40.2	-17.3	42.6	40.3	2.36	18.059		
868.0	868.0	878.9	878.9	1.0	1.5	119.52	-40.3	-17.3	42.9	40.4	2.47	17.343		
900.0	900.0	910.9	910.9	1.0	1.6	108.03	-40.4	-17.2	43.3	40.7	2.59	16.724		
931.0	931.0	941.9	941.9	1.1	1.6	96.74	-40.4	-17.2	43.5	40.8	2.70	16.151		
953.0	952.9	973.9	973.9	1.1	1.7	97.81	-40.4	-17.2	43.8	41.0	2.81	15.581		
994.0	993.8	1,004.8	1,004.8	1.2	1.7	99.66	-40.4	-17.3	44.1	41.2	2.92	15.108		
1,026.0	1,025.8	1,036.8	1,036.8	1.3	1.8	102.19	-40.4	-17.4	44.6	41.6	3.04	14.684		
1,057.0	1,056.6	1,067.7	1,067.7	1.3	1.8	104.95	-40.3	-17.5	45.2	42.1	3.15	14.352		
1,088.0	1,087.4	1,098.6	1,098.6	1.4	1.9	107.49	-40.2	-17.5	46.1	42.8	3.27	14.105		
1,152.0	1,150.9	1,162.1	1,162.1	1.5	2.0	109.59	-39.9	-17.5	48.4	44.9	3.51	13.782 SF		
1,214.0	1,212.2	1,223.4	1,223.4	1.7	2.1	118.85	-39.7	-17.4	52.0	48.2	3.75	13.652		
1,277.0	1,274.5	1,285.4	1,285.4	1.9	2.2	124.73	-39.8	-17.3	57.2	53.2	3.99	14.339		
1,339.0	1,335.6	1,346.6	1,346.6	2.0	2.3	128.38	-39.8	-17.3	63.3	59.1	4.22	15.000		
1,402.0	1,397.8	1,408.7	1,408.7	2.2	2.4	138.86	-40.0	-17.3	70.4	66.0	4.44	15.854		
1,485.0	1,459.9	1,470.8	1,470.8	2.4	2.5	141.43	-40.0	-17.4	78.7	74.0	4.66	16.886		
1,525.0	1,519.0	1,530.1	1,530.1	2.6	2.6	140.73	-39.8	-17.4	86.5	81.6	4.87	17.760		
1,588.0	1,581.4	1,592.7	1,592.7	2.8	2.8	143.31	-39.6	-17.3	93.6	88.5	5.09	18.388		
1,651.0	1,643.8	1,655.3	1,655.2	2.9	2.9	150.14	-39.9	-17.1	100.2	94.9	5.30	18.907		
1,714.0	1,706.3	1,717.7	1,717.7	3.1	3.0	154.43	-40.1	-16.8	107.0	101.5	5.52	19.407		
1,777.0	1,768.8	1,779.8	1,779.8	3.3	3.1	156.43	-40.3	-16.8	114.4	108.6	5.73	19.966		
1,840.0	1,831.1	1,842.5	1,842.5	3.5	3.2	156.42	-40.5	-16.8	122.6	118.7	5.94	20.638		
1,903.0	1,893.4	1,905.6	1,905.6	3.7	3.3	157.37	-41.0	-16.4	131.2	125.0	6.16	21.308		
1,967.0	1,956.6	1,968.2	1,968.2	3.9	3.4	160.73	-41.5	-16.1	140.3	134.0	6.37	22.021		
2,030.0	2,018.8	2,030.2	2,030.2	4.1	3.5	165.94	-41.9	-16.0	149.5	142.9	6.59	22.694		
2,092.0	2,080.1	2,091.5	2,091.5	4.3	3.6	168.27	-42.4	-16.0	158.3	151.4	6.80	23.264		
2,140.0	2,127.6	2,138.9	2,138.9	4.4	3.7	170.82	-42.7	-16.0	165.0	158.0	6.97	23.681		
2,246.0	2,232.5	2,243.0	2,242.9	4.7	3.9	175.71	-43.4	-16.2	179.9	172.5	7.33	24.544		
2,309.0	2,295.0	2,304.4	2,304.4	4.9	4.0	-179.54	-43.6	-16.6	188.4	180.8	7.55	24.958		
2,373.0	2,358.6	2,368.2	2,368.2	5.0	4.1	-165.18	-43.6	-17.1	196.4	188.6	7.77	25.291		
2,438.0	2,421.0	2,430.5	2,430.5	5.2	4.2	-156.56	-43.8	-17.6	204.4	196.4	7.97	25.640		
2,499.0	2,483.3	2,492.0	2,491.9	5.4	4.3	-152.01	-43.4	-18.1	213.6	205.5	8.17	26.157		
2,562.0	2,545.3	2,554.7	2,554.7	5.6	4.4	-150.94	-43.0	-18.6	224.2	215.9	8.37	26.793		
2,625.0	2,607.0	2,616.8	2,616.7	5.8	4.5	-153.87	-42.7	-18.9	235.7	227.2	8.57	27.514		
2,688.0	2,668.5	2,676.5	2,676.5	6.0	4.8	-157.06	-42.3	-19.3	248.7	239.9	8.76	28.384		
2,752.0	2,730.8	2,738.9	2,738.9	6.3	4.8	-158.27	-41.9	-20.1	259.3	254.4	8.96	29.397		
2,815.0	2,791.8	2,801.4	2,801.4	6.5	4.9	-161.73	-41.9	-20.6	278.6	269.4	9.15	30.431		
2,878.0	2,852.6	2,862.0	2,862.0	6.8	5.0	-165.10	-41.9	-20.9	294.8	285.4	9.35	31.537		
2,941.0	2,913.1	2,922.3	2,922.3	7.1	5.1	-163.62	-41.9	-21.3	312.1	302.5	9.53	32.745		
3,004.0	2,973.4	2,982.5	2,982.5	7.4	5.2	-161.52	-41.6	-21.6	329.9	320.2	9.74	33.867		
3,067.0	3,033.5	3,044.5	3,044.5	7.7	5.3	-163.87	-41.1	-21.8	348.3	338.3	9.92	35.094		
3,130.0	3,099.9	3,106.5	3,106.5	8.1	5.4	-167.59	-40.9	-21.5	367.6	357.5	10.10	36.412		
3,192.0	3,151.6	3,162.2	3,162.2	8.5	5.5	-170.43	-40.8	-21.4	387.9	377.7	10.27	37.763		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Chesapeake Energy Corp	<b>Local Co-ordinate Reference</b>	Well Roy Ferrell OHI 205H
<b>Project:</b>	Ohio County, WV	<b>TVD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Reference Site:</b>	Roy Ferrell OHI Pad	<b>MD Reference:</b>	WELL @ 1214.0usft (Original Well Elev)
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Roy Ferrell OHI 205H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore:</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Survey Survey #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Roy Ferrell OHI Pad - Roy Ferrell OHI 8H (Existing) - Existing - Existing													Offset Site Error	0.0 usft
Survey Program: 100-MWD													Offset Well Error	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
3,254.0	3,210.0	3,237.2	3,237.2	8.8	5.6	-168.78	-41.0	-20.8	408.0	397.5	10.55	38.877		
3,316.0	3,288.9	3,318.5	3,319.1	9.1	5.8	-168.17	-42.3	-14.0	421.7	410.9	10.84	38.914		
3,441.0	3,387.2	3,400.0	3,399.5	9.9	5.9	-169.51	-42.8	-10.3	455.8	444.7	11.12	41.002		
3,503.0	3,445.8	3,455.2	3,454.7	10.2	6.0	-169.74	-42.4	-10.3	475.3	464.9	11.35	41.957		
3,585.0	3,504.4	3,512.2	3,511.7	10.6	6.1	-167.12	-41.8	-10.7	498.1	484.5	11.58	42.825		
3,629.0	3,565.1	3,573.9	3,573.4	11.0	6.2	-171.26	-41.3	-11.1	516.3	504.5	11.78	43.815		
3,891.0	3,623.7	3,632.3	3,631.8	11.3	6.3	-172.98	-41.2	-11.4	536.7	524.8	11.96	44.888		
3,754.0	3,683.2	3,690.5	3,690.0	11.7	6.4	-171.81	-41.2	-11.7	557.8	545.4	12.20	45.716		
3,817.0	3,743.1	3,755.4	3,754.9	12.0	6.5	-169.79	-41.0	-12.0	577.2	564.8	12.45	46.348		
3,881.0	3,804.0	3,818.8	3,818.3	12.4	6.6	-168.88	-40.8	-11.6	598.2	583.6	12.65	47.116		
3,943.0	3,862.8	3,872.1	3,871.6	12.8	6.7	-169.25	-40.1	-11.6	615.4	602.8	12.84	47.946		
4,005.0	3,921.9	3,928.5	3,928.0	13.1	6.8	-166.21	-39.4	-12.0	634.3	621.1	13.11	48.376		
4,068.0	3,982.5	3,990.1	3,989.5	13.4	6.9	-163.16	-38.9	-12.5	651.3	637.9	13.37	48.699		
4,130.0	4,042.3	4,053.6	4,053.0	13.7	7.0	-168.01	-38.4	-12.7	667.2	653.5	13.58	49.140		
4,193.0	4,102.9	4,116.8	4,116.3	14.0	7.2	-170.59	-38.0	-12.6	684.0	670.2	13.76	49.701		
4,256.0	4,163.2	4,175.3	4,174.8	14.4	7.3	-171.95	-37.3	-12.5	702.1	688.1	13.93	50.394		
4,318.0	4,222.2	4,234.6	4,234.1	14.7	7.4	-170.84	-36.5	-12.5	720.8	708.7	14.12	51.039		
4,380.0	4,281.1	4,295.3	4,294.8	15.1	7.5	-171.58	-36.1	-12.3	739.7	725.4	14.34	51.590		
4,443.0	4,341.0	4,353.8	4,353.3	15.4	7.6	-174.76	-36.0	-12.2	759.1	744.6	14.53	52.251		
4,503.0	4,397.7	4,409.5	4,408.9	15.8	7.7	-175.38	-35.7	-12.2	778.5	763.8	14.89	52.987		
4,566.0	4,457.1	4,470.7	4,470.1	16.2	7.8	-178.49	-35.5	-12.1	799.4	784.5	14.90	53.649		
4,629.0	4,516.4	4,529.1	4,528.6	16.6	7.9	177.08	-35.3	-11.9	820.6	805.5	15.10	54.328		
4,693.0	4,576.5	4,585.7	4,585.1	17.0	8.0	174.97	-35.0	-12.0	842.5	827.2	15.32	54.989		
4,756.0	4,636.2	4,644.9	4,644.3	17.4	8.1	177.87	-34.6	-12.2	862.9	847.3	15.62	55.240		
4,817.0	4,694.7	4,704.1	4,703.6	17.7	8.2	-178.95	-34.4	-12.4	880.4	864.5	15.89	55.417		
4,879.0	4,754.4	4,768.9	4,768.3	18.0	8.3	-174.76	-34.4	-12.5	897.0	880.9	16.11	55.692		
4,941.0	4,814.1	4,829.2	4,828.7	18.3	8.4	-174.14	-34.7	-12.3	913.5	897.3	16.30	56.039		
5,005.0	4,875.5	4,892.9	4,892.4	18.7	8.5	-174.98	-34.9	-11.9	931.1	914.6	16.51	56.408		
5,068.0	4,935.8	4,952.8	4,952.3	19.0	8.6	-169.79	-34.9	-11.6	948.8	932.1	16.70	56.827		
5,130.0	4,994.9	5,007.0	5,006.4	19.4	8.7	-168.70	-34.8	-11.3	967.0	950.1	16.87	57.322		
5,193.0	5,054.8	5,044.4	5,043.8	19.7	8.8	-170.52	-34.9	-11.7	986.9	969.9	17.03	57.981		
5,257.0	5,115.7	5,084.5	5,083.9	20.1	8.8	-175.23	-35.4	-13.1	1,008.5	991.3	17.23	58.524		
5,319.0	5,174.8	5,134.0	5,133.3	20.4	8.9	-175.71	-36.9	-15.3	1,029.7	1,012.3	17.45	59.025		
5,382.0	5,235.0	5,194.2	5,193.4	20.8	9.0	-174.87	-39.4	-18.2	1,051.4	1,033.8	17.65	59.581		
5,445.0	5,295.0	5,265.2	5,264.3	21.2	9.2	-177.55	-42.6	-21.1	1,073.1	1,055.2	17.87	60.063		
5,508.0	5,355.0	5,323.9	5,322.9	21.5	9.3	178.79	-45.3	-23.2	1,094.7	1,078.6	18.08	60.538		
5,570.0	5,414.0	5,387.4	5,386.3	21.9	9.4	178.66	-48.2	-25.3	1,116.0	1,097.7	18.29	61.003		
5,632.0	5,472.8	5,449.0	5,447.8	22.3	9.5	177.79	-51.1	-27.0	1,137.3	1,118.8	18.50	61.486		
5,696.0	5,533.4	5,497.1	5,495.8	22.6	9.6	178.54	-53.6	-28.5	1,160.0	1,141.4	18.67	62.136		
5,759.0	5,593.0	5,527.4	5,526.1	23.0	9.6	179.76	-55.3	-29.8	1,183.6	1,164.8	18.83	62.881		
5,820.0	5,650.7	5,544.0	5,542.5	23.4	9.7	-177.90	-56.3	-31.0	1,207.9	1,188.9	18.97	63.671		
5,883.0	5,710.3	5,576.0	5,574.3	23.8	9.7	-177.89	-58.3	-34.3	1,234.8	1,215.5	19.12	64.581		
5,946.0	5,769.9	5,596.9	5,595.0	24.2	9.8	-177.96	-59.7	-37.0	1,263.0	1,243.7	19.27	65.525		
6,007.0	5,827.7	5,618.6	5,616.4	24.6	9.8	-179.72	-61.3	-40.3	1,291.6	1,272.1	19.44	66.448		
6,070.0	5,887.3	5,639.0	5,636.4	24.9	9.8	178.41	-62.9	-44.0	1,322.7	1,303.1	19.58	67.562		
6,119.0	5,933.7	5,651.8	5,648.9	25.2	9.9	-178.67	-64.1	-46.6	1,347.8	1,328.1	19.70	68.426		

RECEIVED  
Office of Oil and Gas

JUN 21 2016

CO - Min center to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# Cathedral Energy Services

## Anticollision Report

**Company:** Chesapeake Energy Corp  
**Project:** Ohio County, WV  
**Reference Site:** Roy Ferrell OHI Pad  
**Site Error:** 0.0usft  
**Reference Well:** Roy Ferrell OHI 205H  
**Well Error:** 0.0usft  
**Reference Wellbore:** HZ  
**Reference Design:** Survey: Survey #1

**Local Co-ordinate Reference:** Well Roy Ferrell OHI 205H  
**TVD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**MD Reference:** WELL @ 1214.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** USA EDM 5000 Multi Users DB  
**Offset TVD Reference:** Offset Datum

Reference Depths are relative to WELL @ 1214.0usft (Original Well Ele)  
 Offset Depths are relative to Offset Datum  
 Central Meridian is 79° 30' 0.00 W °

Coordinates are relative to: Roy Ferrell OHI 205H  
 Coordinate System is US State Plane 1927 (Exact solution), West Virginia North 4  
 Grid Convergence at Surface is: -0.66°

