



Cathedral Energy Services

Survey Report

Company:	Chesapeake Energy Corp	Local Co-ordinate Reference:	Well Chad Glauser OHI 6H
Project:	Ohio County, WV	TVD Reference:	WELL @ 1258.0usft (Original Well Elev)
Site:	Chad Glauser OHI Pad	MD Reference:	WELL @ 1258.0usft (Original Well Elev)
Well:	Chad Glauser OHI 6H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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

Site	Chad Glauser OHI Pad				
Site Position:		Northing:	559,068.36 usft	Latitude:	40° 1' 47.21 N
From:	Lat/Long	Easting:	1,692,664.31 usft	Longitude:	80° 35' 51.01 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-0.70 °

Well	Chad Glauser OHI 6H					
Well Position	+N/-S	0.0 usft	Northing:	559,077.47 usft	Latitude:	40° 1' 47.30 N
	+E/-W	0.0 usft	Easting:	1,692,649.42 usft	Longitude:	80° 35' 51.20 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,240.0 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/31/2013	-8.73	67.46	52,773

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	150.66	

Survey Program	Date 7/17/2013				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	730.0	Gyro (HZ)	Gyro	Gyro	
832.0	12,943.0	Survey #2 (HZ)	MWD	Geolink MWD	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.26	108.45	100.0	-0.1	0.2	0.2	0.26	0.26	
200.0	0.15	141.13	200.0	-0.2	0.5	0.5	0.16	-0.11	
300.0	0.05	250.81	300.0	-0.4	0.6	0.6	0.17	-0.10	
400.0	0.08	317.49	400.0	-0.3	0.5	0.5	0.08	0.03	
500.0	0.19	333.48	500.0	-0.1	0.3	0.3	0.12	0.11	
600.0	0.21	352.00	600.0	0.2	0.2	-0.1	0.07	0.02	
700.0	0.34	28.26	700.0	0.6	0.4	-0.4	0.21	0.13	
730.0	0.13	22.84	730.0	0.8	0.4	-0.5	0.70	-0.70	
832.0	0.20	288.30	832.0	0.9	0.3	-0.7	0.24	0.07	
895.0	1.10	23.00	895.0	1.5	0.4	-1.1	1.80	1.43	
958.0	1.60	4.80	958.0	2.9	0.7	-2.2	1.04	0.79	

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Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
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1,020.0	2.00	10.50	1,019.9	4.9	1.0	-3.8	0.71	0.65	
1,083.0	3.00	24.20	1,082.9	7.5	1.9	-5.6	1.84	1.59	
1,146.0	3.60	16.70	1,145.8	10.9	3.1	-7.9	1.17	0.95	
1,208.0	5.00	9.50	1,207.6	15.4	4.1	-11.4	2.42	2.26	
1,272.0	6.00	8.90	1,271.3	21.4	5.1	-16.2	1.57	1.56	
1,333.0	6.70	14.20	1,331.9	28.0	6.5	-21.3	1.50	1.15	
1,397.0	7.30	10.10	1,395.5	35.7	8.1	-27.1	1.22	0.94	
1,461.0	7.90	4.50	1,458.9	44.0	9.2	-33.9	1.49	0.94	
1,522.0	7.70	2.00	1,519.3	52.3	9.6	-40.9	0.65	-0.33	
1,584.0	8.30	354.40	1,580.7	60.9	9.3	-48.5	1.96	0.97	
1,647.0	9.20	353.20	1,643.0	70.4	8.3	-57.3	1.46	1.43	
1,710.0	9.40	351.00	1,705.2	80.5	6.9	-66.8	0.65	0.32	
1,773.0	7.90	344.10	1,767.4	89.8	4.9	-75.9	2.89	-2.38	
1,836.0	6.20	340.10	1,830.0	97.1	2.6	-83.4	2.81	-2.70	
1,899.0	5.30	338.40	1,892.7	103.0	0.3	-89.7	1.45	-1.43	
1,961.0	4.20	328.30	1,954.4	107.6	-1.9	-94.8	2.22	-1.77	
2,024.0	2.40	317.50	2,017.3	110.6	-4.0	-98.4	3.01	-2.86	
2,065.0	2.50	311.20	2,058.3	111.8	-5.3	-100.0	0.70	0.24	
2,143.0	2.10	299.70	2,136.2	113.6	-7.8	-102.9	0.78	-0.51	
2,269.0	1.40	284.20	2,262.2	115.1	-11.3	-105.9	0.67	-0.56	
2,397.0	1.00	274.80	2,390.1	115.6	-13.9	-107.6	0.35	-0.31	
2,522.0	0.80	276.80	2,515.1	115.8	-15.9	-108.7	0.16	-0.16	
2,648.0	0.90	291.80	2,641.1	116.3	-17.7	-110.0	0.19	0.08	
2,773.0	0.80	275.10	2,766.1	116.7	-19.4	-111.3	0.21	-0.08	
2,898.0	0.80	280.10	2,891.1	117.0	-21.2	-112.3	0.06	0.00	
3,023.0	0.80	262.00	3,016.1	117.0	-22.9	-113.2	0.20	0.00	
3,150.0	0.80	264.70	3,143.1	116.8	-24.7	-113.9	0.03	0.00	
3,337.0	0.60	250.50	3,330.1	116.3	-26.9	-114.6	0.14	-0.11	
3,462.0	0.50	281.10	3,455.0	116.2	-28.0	-115.1	0.24	-0.08	
3,588.0	0.40	270.10	3,581.0	116.3	-29.0	-115.6	0.10	-0.08	
3,714.0	0.60	246.10	3,707.0	116.1	-30.1	-115.9	0.23	0.16	
3,839.0	0.60	243.50	3,832.0	115.5	-31.2	-116.0	0.02	0.00	
3,966.0	0.50	229.80	3,959.0	114.9	-32.3	-115.9	0.13	-0.08	
4,094.0	0.50	237.40	4,087.0	114.2	-33.2	-115.8	0.05	0.00	
4,220.0	1.20	205.70	4,213.0	112.7	-34.2	-115.0	0.65	0.56	
4,345.0	0.70	216.50	4,338.0	110.9	-35.2	-113.9	0.42	-0.40	
4,472.0	0.90	219.50	4,465.0	109.5	-36.3	-113.3	0.16	0.16	
4,598.0	1.20	199.10	4,591.0	107.5	-37.4	-112.0	0.38	0.24	
4,725.0	1.20	210.00	4,717.9	105.1	-38.5	-110.5	0.18	0.00	
4,848.0	1.10	199.90	4,840.9	102.9	-39.5	-109.0	0.18	-0.08	
4,974.0	1.00	208.10	4,966.9	100.8	-40.4	-107.7	0.14	-0.08	
5,099.0	0.60	222.20	5,091.9	99.3	-41.4	-106.9	0.35	-0.32	
5,225.0	0.80	215.40	5,217.9	98.1	-42.4	-106.3	0.17	0.16	
5,351.0	0.90	243.90	5,343.9	97.0	-43.7	-106.0	0.34	0.08	
5,456.0	0.60	256.60	5,448.8	96.5	-45.0	-106.2	0.32	-0.29	
5,487.0	0.60	245.50	5,479.8	96.4	-45.3	-106.2	0.37	0.00	
5,518.0	0.70	276.60	5,510.8	96.3	-45.7	-106.3	1.17	0.32	
5,550.0	2.20	248.50	5,542.8	96.1	-46.4	-106.5	5.05	4.69	
5,582.0	5.10	244.60	5,574.7	95.3	-48.3	-106.7	9.09	9.06	
5,613.0	8.70	251.90	5,605.5	94.0	-51.8	-107.3	11.93	11.61	
5,645.0	11.90	252.10	5,637.0	92.2	-57.2	-108.4	10.00	10.00	
5,677.0	14.30	253.20	5,668.2	90.0	-64.1	-109.9	7.54	7.50	
5,709.0	16.70	251.40	5,699.0	87.4	-72.3	-111.6	7.65	7.50	

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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
5,740.0	19.00	247.80	5,728.5	84.1	-81.2	-113.1	8.23	7.42	
5,771.0	21.30	246.10	5,757.6	79.9	-91.0	-114.2	7.66	7.42	
5,803.0	23.50	243.60	5,787.2	74.7	-102.0	-115.1	7.49	6.88	
5,834.0	25.80	243.20	5,815.4	68.9	-113.6	-115.7	7.44	7.42	
5,865.0	28.40	244.70	5,843.0	62.7	-126.3	-116.6	8.67	8.39	
5,896.0	31.20	246.80	5,869.9	56.4	-140.3	-117.9	9.64	9.03	
5,928.0	33.80	248.30	5,896.8	49.9	-156.2	-120.0	8.51	8.13	
5,960.0	36.40	249.00	5,923.0	43.2	-173.3	-122.6	8.22	8.13	
5,991.0	39.40	248.40	5,947.5	36.3	-191.1	-125.2	9.75	9.68	
6,021.0	42.40	246.20	5,970.2	28.7	-209.2	-127.5	11.09	10.00	
6,052.0	43.90	241.70	5,992.8	19.3	-228.2	-128.7	11.04	4.84	
6,084.0	43.40	237.10	6,015.9	8.1	-247.2	-128.2	10.04	-1.56	
6,115.0	43.60	233.50	6,038.4	-4.0	-264.8	-126.2	8.02	0.65	
6,146.0	43.20	229.40	6,061.0	-17.3	-281.4	-122.8	9.18	-1.29	
6,177.0	43.30	225.20	6,083.5	-31.7	-297.0	-117.9	9.29	0.32	
6,209.0	44.40	220.70	6,106.6	-47.9	-312.1	-111.2	10.33	3.44	
6,241.0	45.60	215.70	6,129.3	-65.7	-326.1	-102.5	11.67	3.75	
6,272.0	46.40	211.90	6,150.8	-84.2	-338.5	-92.4	9.19	2.58	
6,304.0	46.80	207.70	6,172.8	-104.4	-350.0	-80.5	9.62	1.25	
6,336.0	47.50	203.30	6,194.6	-125.6	-360.1	-67.0	10.31	2.19	
6,368.0	47.70	199.00	6,216.1	-147.6	-368.6	-52.0	9.94	0.63	
6,399.0	49.60	194.90	6,236.6	-169.8	-375.4	-35.9	11.67	6.13	
6,431.0	51.20	190.90	6,257.0	-193.9	-380.9	-17.6	10.85	5.00	
6,463.0	52.40	186.60	6,276.8	-218.7	-384.7	2.2	11.20	3.75	
6,494.0	55.20	183.40	6,295.1	-243.6	-386.9	22.8	12.29	9.03	
6,525.0	58.30	180.80	6,312.1	-269.5	-387.8	44.9	12.21	10.00	
6,556.0	61.20	178.30	6,327.7	-296.3	-387.6	68.4	11.66	9.35	
6,588.0	63.60	175.40	6,342.6	-324.6	-386.0	93.8	10.99	7.50	
6,620.0	65.50	172.30	6,356.3	-353.3	-382.9	120.4	10.57	5.94	
6,651.0	67.50	169.60	6,368.7	-381.4	-378.5	147.0	10.27	6.45	
6,683.0	70.10	169.40	6,380.3	-410.7	-373.0	175.3	8.15	8.13	
6,714.0	73.10	170.20	6,390.0	-439.7	-367.8	203.1	9.98	9.68	
6,746.0	75.60	169.10	6,398.7	-470.0	-362.3	232.2	8.48	7.81	
6,778.0	77.30	167.40	6,406.2	-500.4	-355.9	261.8	7.41	5.31	
6,810.0	79.70	164.80	6,412.5	-530.9	-348.4	292.1	10.94	7.50	
6,842.0	81.40	161.90	6,417.8	-561.1	-339.4	322.9	10.40	5.31	
6,873.0	83.60	159.90	6,421.8	-590.2	-329.3	353.1	9.55	7.10	
6,905.0	85.70	157.60	6,424.8	-619.8	-317.8	384.6	9.71	6.56	
6,937.0	87.20	154.50	6,426.8	-649.0	-304.8	416.4	10.75	4.69	
6,968.0	87.80	153.80	6,428.2	-676.9	-291.3	447.3	2.97	1.94	
6,999.0	88.50	151.30	6,429.2	-704.4	-277.0	478.3	8.37	2.26	
7,030.0	90.40	151.00	6,429.5	-731.5	-262.1	509.3	6.20	6.13	
7,093.0	91.10	148.30	6,428.6	-785.9	-230.2	572.3	4.43	1.11	
7,156.0	88.90	148.10	6,428.6	-839.4	-197.0	635.2	3.51	-3.49	
7,283.0	88.50	147.40	6,431.5	-946.8	-129.3	762.0	0.63	-0.31	
7,409.0	89.30	147.10	6,433.9	-1,052.8	-61.1	887.8	0.68	0.63	
7,533.0	88.00	148.70	6,436.9	-1,157.8	4.7	1,011.6	1.66	-1.05	
7,660.0	88.80	148.80	6,440.4	-1,266.3	70.6	1,138.5	0.63	0.63	
7,786.0	89.30	150.30	6,442.5	-1,374.9	134.4	1,264.4	1.25	0.40	
7,911.0	89.70	151.50	6,443.6	-1,484.1	195.2	1,389.4	1.01	0.32	
8,036.0	90.30	152.00	6,443.6	-1,594.2	254.4	1,514.4	0.62	0.48	
8,163.0	90.90	152.20	6,442.3	-1,706.5	313.8	1,641.4	0.50	0.47	
8,288.0	89.50	151.00	6,441.8	-1,816.4	373.3	1,766.3	1.48	-1.12	

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8,414.0	87.80	150.10	6,444.8	-1,926.1	435.2	1,892.3	1.53	-1.35	
8,538.0	88.50	149.60	6,448.8	-2,033.3	497.5	2,016.2	0.69	0.56	
8,665.0	88.60	149.20	6,452.0	-2,142.6	562.1	2,143.1	0.32	0.08	
8,791.0	89.70	150.40	6,453.9	-2,251.4	625.5	2,269.1	1.29	0.87	
8,917.0	90.90	149.70	6,453.2	-2,360.6	688.4	2,395.1	1.10	0.95	
9,042.0	88.90	151.20	6,453.4	-2,469.3	750.0	2,520.1	2.00	-1.60	
9,166.0	89.50	150.70	6,455.2	-2,577.7	810.2	2,644.1	0.63	0.48	
9,293.0	89.90	150.00	6,455.8	-2,688.1	873.0	2,771.1	0.63	0.31	
9,420.0	88.20	150.80	6,457.9	-2,798.5	935.7	2,898.0	1.48	-1.34	
9,545.0	89.40	150.60	6,460.6	-2,907.5	996.9	3,023.0	0.97	0.96	
9,671.0	89.70	151.00	6,461.5	-3,017.5	1,058.4	3,149.0	0.40	0.24	
9,796.0	89.10	151.10	6,462.9	-3,126.8	1,118.9	3,274.0	0.49	-0.48	
9,919.0	87.30	151.10	6,466.7	-3,234.5	1,178.3	3,396.9	1.46	-1.46	
10,046.0	88.60	150.10	6,471.3	-3,345.0	1,240.6	3,523.8	1.29	1.02	
10,172.0	90.10	149.60	6,472.7	-3,454.0	1,303.9	3,649.8	1.25	1.19	
10,298.0	91.50	151.80	6,470.9	-3,563.8	1,365.5	3,775.8	2.07	1.11	
10,423.0	90.10	154.30	6,469.2	-3,675.2	1,422.2	3,900.6	2.29	-1.12	
10,550.0	88.00	153.50	6,471.3	-3,789.3	1,478.0	4,027.4	1.77	-1.65	
10,677.0	88.00	151.00	6,475.7	-3,901.6	1,537.1	4,154.3	1.97	0.00	
10,802.0	87.10	149.50	6,481.1	-4,010.0	1,599.1	4,279.2	1.40	-0.72	
10,927.0	90.40	149.50	6,483.8	-4,117.7	1,662.5	4,404.1	2.64	2.64	
11,053.0	92.60	150.20	6,480.5	-4,226.6	1,725.7	4,530.0	1.83	1.75	
11,179.0	89.90	151.00	6,477.7	-4,336.3	1,787.6	4,656.0	2.23	-2.14	
11,304.0	88.90	151.80	6,479.1	-4,446.0	1,847.4	4,780.9	1.02	-0.80	
11,431.0	90.90	155.70	6,479.3	-4,559.9	1,903.6	4,907.7	3.45	1.57	
11,557.0	88.60	154.00	6,479.8	-4,674.0	1,957.1	5,033.4	2.27	-1.83	
11,684.0	90.00	154.20	6,481.4	-4,788.2	2,012.6	5,160.1	1.11	1.10	
11,811.0	91.10	151.70	6,480.2	-4,901.3	2,070.3	5,287.0	2.15	0.87	
11,937.0	92.00	149.10	6,476.8	-5,010.8	2,132.5	5,413.0	2.18	0.71	
12,063.0	91.10	148.80	6,473.3	-5,118.7	2,197.5	5,538.9	0.75	-0.71	
12,188.0	87.60	148.20	6,474.8	-5,225.2	2,262.8	5,663.7	2.84	-2.80	
12,314.0	86.80	148.20	6,480.9	-5,332.2	2,329.1	5,789.5	0.63	-0.63	
12,441.0	87.70	148.00	6,487.0	-5,439.9	2,396.1	5,916.2	0.73	0.71	
12,567.0	91.20	148.50	6,488.2	-5,547.0	2,462.4	6,042.1	2.81	2.78	
12,692.0	92.20	147.10	6,484.5	-5,652.7	2,529.0	6,166.8	1.38	0.80	
12,819.0	92.20	147.80	6,479.6	-5,759.7	2,597.3	6,293.6	0.55	0.00	
12,891.0	92.90	147.10	6,476.4	-5,820.4	2,636.0	6,365.4	1.37	0.97	Last Cathedral Survey @ 12,891' MD
12,943.0	92.90	147.10	6,473.8	-5,863.9	2,664.2	6,417.2	0.00	0.00	Projection to Bit @ 12,943' MD



Cathedral Energy Services Survey Report

Company: Chesapeake Energy Corp	Local Co-ordinate Reference: Well Chad Glauser OHI 6H	
Project: Ohio County, WV	TVD Reference: WELL @ 1258.0usft (Original Well Elev)	
Site: Chad Glauser OHI Pad	MD Reference: WELL @ 1258.0usft (Original Well Elev)	
Well: Chad Glauser OHI 6H	North Reference: Grid	
Wellbore: HZ	Survey Calculation Method: Minimum Curvature	
Design: FINAL	Database: USA EDM 5000 Multi Users DB	

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Chad Glauser 6H PBHL - actual wellpath misses target center by 15.0usft at 12943.0usft MD (6473.8 TVD, -5863.9 N, 2664.2 E) - Point	0.00	0.00	6,486.0	-5,871.4	2,659.6	553,206.30	1,695,308.91	40° 0' 49.60 N	80° 35' 16.10 W
Chad Glauser 6H PBHL - actual wellpath misses target center by 35.8usft at 12943.0usft MD (6473.8 TVD, -5863.9 N, 2664.2 E) - Point	0.00	0.00	6,508.5	-5,871.4	2,659.6	553,206.30	1,695,308.91	40° 0' 49.60 N	80° 35' 16.10 W
Chad Glauser 6H LP - actual wellpath misses target center by 16.7usft at 6854.2usft MD (6419.5 TVD, -572.6 N, -335.5 E) - Point	0.00	0.00	6,432.9	-567.7	-326.8	558,509.80	1,692,322.64	40° 1' 41.65 N	80° 35' 55.31 W
Chad Glauser 6H PBHL - actual wellpath misses target center by 8.8usft at 12943.0usft MD (6473.8 TVD, -5863.9 N, 2664.2 E) - Point	0.00	0.00	6,474.4	-5,871.4	2,659.6	553,206.30	1,695,308.91	40° 0' 49.60 N	80° 35' 16.10 W

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
730.0	730.0	0.8	0.4	Last Gyro Survey @ 730' MD	
12,891.0	6,476.4	-5,820.4	2,636.0	Last Cathedral Survey @ 12,891' MD	
12,943.0	6,473.8	-5,863.9	2,664.2	Projection to Bit @ 12,943' MD	

Checked By: _____ Approved By: _____ Date: _____

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JUN 13 2014
WV Department of
Environmental Protection