

JK

WR-35
Rev (9-11)

Preliminary Report
State of West Virginia
Department of Environmental Protection
Office of Oil and Gas
Well Operator's Report of Well Work

DATE: 1-7-2014
API #: 47-069-00160
Office of Oil and Gas

JAN 08 2014

Farm name: Chad Glauser OHI 3H Operator Well No.: 834945

LOCATION: Elevation: 1,240' Quadrangle: Valley Grove

WV Department of Environmental Protection

District: Triadelphia County: Ohio
Latitude: 3,960' Feet South of 40 Deg. 02 Min. 30 Sec.
Longitude 4,330' Feet West of 80 Deg. 35 Min. 00 Sec.

Company: Chesapeake Appalachia, L.L.C.

Address:	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
P.O. Box 18496 Oklahoma City, OK 73154-0496	20"	118'	118'	342 Cu. Ft.
Agent: Eric Gillespie	13 3/8"	746'	746'	814 Cu. Ft.
Inspector: Gayne J. Knitowski/Bill Hendershot	9 5/8"	2,141'	2,141'	830 Cu. Ft.
Date Permit Issued: 3-13-2013	5 1/2"	15,109'	15,109'	3,671 Cu. Ft.
Date Well Work Commenced: 6-15-2013				
Date Well Work Completed: 10-28-2013				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 6,431'				
Total Measured Depth (ft): 15,111'				
Fresh Water Depth (ft.): 576'				
Salt Water Depth (ft.): 1,135'				
Is coal being mined in area (N/Y)? Y				
Coal Depths (ft.): 650'				
Void(s) encountered (N/Y) Depth(s) N				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation Marcellus Pay zone depth (ft) 6,720-14,952
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow 2,292* MCF/d Final open flow 128 Bbl/d
Time of open flow between initial and final tests 120 Hours
Static rock Pressure 4,128* psig (surface pressure) after 120 Hours *Calculated

Second producing formation _____ Pay zone depth (ft) _____
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow _____ MCF/d Final open flow _____ Bbl/d
Time of open flow between initial and final tests _____ Hours
Static rock Pressure _____ psig (surface pressure) after _____ Hours

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

Malcolm Williams
Signature

1-7-2014
Date

03/07/2014

PERFORATION RECORD ATTACHMENT

Well Number and Name: 834945 Chad Glauser OHI 3H

PERFORATION RECORD			STIMULATION RECORD							
Date	Interval Perforated		Date	Interval Treated		Fluid		Propping Agent		Average Injection
	From	To		Type	Amount	Type	Amount			
9/21/2013	14,743	14,952	9/22/2013	14,743	14,952	Sik wtr	7,672	Sand	374,960	77
9/21/2013	14,484	14,693	9/22/2013	14,484	14,693	Sik wtr	7,230	Sand	378,780	75
9/22/2013	14,226	14,434	9/22/2013	14,226	14,434	Sik wtr	7,354	Sand	374,380	74
9/23/2013	13,967	14,175	9/23/2013	13,967	14,175	Sik wtr	7,279	Sand	374,660	80
9/23/2013	13,710	13,913	9/23/2013	13,710	13,913	Sik wtr	7,251	Sand	374,720	80
9/23/2013	13,455	13,658	9/23/2013	13,455	13,658	Sik wtr	7,073	Sand	374,240	80
9/23/2013	13,190	13,399	9/23/2013	13,190	13,399	Sik wtr	7,148	Sand	377,600	77
9/23/2013	12,932	13,140	9/24/2013	12,932	13,140	Sik wtr	7,310	Sand	374,680	79
9/24/2013	12,673	12,881	9/24/2013	12,673	12,881	Sik wtr	7,175	Sand	373,500	80
9/24/2013	12,414	12,622	9/24/2013	12,414	12,622	Sik wtr	7,106	Sand	374,880	77
9/24/2013	12,155	12,363	9/24/2013	12,155	12,363	Sik wtr	7,698	Sand	371,440	77
9/24/2013	11,896	12,105	9/25/2013	11,896	12,105	Sik wtr	8,401	Sand	376,300	80
9/25/2013	11,637	11,846	9/25/2013	11,637	11,846	Sik wtr	6,962	Sand	374,480	78
9/25/2013	11,430	11,587	9/25/2013	11,430	11,587	Sik wtr	7,567	Sand	375,920	73.6
9/25/2013	11,124	11,324	9/25/2013	11,124	11,324	Sik wtr	7,052	Sand	375,920	79.6
9/25/2013	10,861	11,069	9/25/2013	10,861	11,069	Sik wtr	7,109	Sand	374,420	77.6
9/26/2013	10,602	10,811	9/26/2013	10,602	10,811	Sik wtr	7,059	Sand	374,020	79
9/26/2013	10,343	10,552	9/26/2013	10,343	10,552	Sik wtr	6,944	Sand	374,940	79
9/26/2013	10,085	10,293	9/26/2013	10,085	10,293	Sik wtr	7,107	Sand	377,680	77
9/26/2013	9,826	10,034	9/26/2013	9,826	10,034	Sik wtr	7,089	Sand	374,280	76.9
9/27/2013	9,567	9,775	9/26/2013	9,567	9,775	Sik wtr	7,049	Sand	381,480	76.9
9/27/2013	9,308	9,517	9/26/2013	9,308	9,517	Sik wtr	6,958	Sand	378,440	76
9/27/2013	9,049	9,258	9/27/2013	9,049	9,258	Sik wtr	7,052	Sand	378,500	76
9/27/2013	8,791	8,995	9/27/2013	8,791	8,995	Sik wtr	7,500	Sand	374,760	76
9/27/2013	8,536	8,738	9/27/2013	8,536	8,738	Sik wtr	6,823	Sand	375,400	77.2
9/27/2013	8,270	8,481	9/27/2013	8,270	8,481	Sik wtr	7,072	Sand	373,920	78.6
9/28/2013	8,014	8,222	9/27/2013	8,014	8,222	Sik wtr	6,982	Sand	375,040	79.7
9/28/2013	7,755	7,964	9/28/2013	7,755	7,964	Sik wtr	6,940	Sand	376,160	80
9/28/2013	7,496	7,705	9/28/2013	7,496	7,705	Sik wtr	6,892	Sand	373,400	79
9/28/2013	7,238	7,446	9/28/2013	7,238	7,446	Sik wtr	6,603	Sand	346,120	77.8
9/29/2013	6,979	7,187	9/28/2013	6,979	7,187	Sik wtr	7,506	Sand	330,420	71.4
9/29/2013	6,720	6,928	9/28/2013	6,720	6,928	Sik wtr	6,887	Sand	378,660	80

LATERAL SIDETRACK WELLBORE (no vertical pilot hole associated with this well)

Maximum TVD of wellbore: 6431 ft TVD @ 6834 ft MD

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
SS	0	0	480	480
LS/SILT	480	480	648	648
PITTSBURG COAL	648	648	652	652
LS	652	652	710	710
SHALE/SS/SILT	710	710	1700	1700
BIG LIME (LS)	1700	1700	1796	1796
BIG INJUN (SS)	1796	1796	1974	1974
SHALE	1974	1974	6272	6229
GENESEO (SH)	6272	6229	6300	6250
TULLY (LS)	6300	6250	6347	6283
HAMILTON (SH)	6347	6283	6571	6389
MARCELLUS (SH)	6571	6389		
TD OF LATERAL			15111	6318



Cathedral Energy Services

Survey Report

Company:	Chesapeake Energy Corp	Local Co-ordinate Reference:	Well Chad Glauser OHI 3H
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 3H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	HZ	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 3H					
Well Position	+N/-S	0.0 usft	Northing:	559,068.34 usft	Latitude:	40° 1' 47.21 N
	+E/-W	0.0 usft	Easting:	1,692,664.31 usft	Longitude:	80° 35' 51.01 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	HZ				
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	322.90	

Survey Program	Date	7/1/2013			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	700.0	Gyro (HZ)	Gyro	Gyro	
836.0	15,111.0	Survey #2 (HZ)	MWD	Geolink MWD	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/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	144.95	100.0	-0.2	0.1	-0.2	0.26	0.26	
200.0	0.16	70.28	200.0	-0.3	0.4	-0.5	0.27	-0.10	
300.0	0.23	132.52	300.0	-0.4	0.7	-0.7	0.21	0.07	
400.0	0.09	351.81	400.0	-0.5	0.8	-0.9	0.31	-0.14	
500.0	0.04	243.92	500.0	-0.4	0.8	-0.8	0.11	-0.05	
600.0	0.14	270.80	600.0	-0.4	0.6	-0.7	0.11	0.10	
700.0	0.21	47.23	700.0	-0.3	0.6	-0.6	0.33	0.07	
836.0	0.30	232.30	836.0	-0.3	0.5	-0.6	0.37	0.07	
899.0	1.10	240.30	899.0	-0.7	-0.1	-0.5	1.28	1.27	
962.0	2.00	239.90	962.0	-1.6	-1.6	-0.3	1.43	1.43	
1,025.0	3.20	239.90	1,024.9	-3.0	-4.1	0.0	1.90	1.90	

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 Last Gyro Survey @ 700 MD



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Survey Report

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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 3H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	HZ	Database:	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
1,088.0	4.00	240.50	1,087.8	-5.0	-7.5	0.5	1.27	1.27	
1,149.0	5.00	238.90	1,148.6	-7.4	-11.6	1.1	1.65	1.64	
1,211.0	6.20	238.30	1,210.3	-10.6	-16.8	1.7	1.94	1.94	
1,274.0	7.20	238.00	1,272.9	-14.4	-23.0	2.4	1.59	1.59	
1,336.0	7.80	233.60	1,334.3	-19.0	-29.7	2.8	1.34	0.97	
1,399.0	8.50	231.40	1,396.7	-24.4	-36.8	2.7	1.22	1.11	
1,463.0	8.20	231.70	1,460.0	-30.2	-44.1	2.5	0.47	-0.47	
1,526.0	8.20	226.80	1,522.4	-36.1	-50.9	1.9	1.11	0.00	
1,587.0	9.00	227.80	1,582.7	-42.3	-57.6	1.0	1.33	1.31	
1,649.0	9.50	223.60	1,643.9	-49.2	-64.7	-0.2	1.35	0.81	
1,712.0	9.60	225.80	1,706.0	-56.7	-72.1	-1.7	0.60	0.16	
1,775.0	8.40	224.10	1,768.2	-63.6	-79.0	-3.1	1.95	-1.90	
1,838.0	6.60	225.10	1,830.7	-69.5	-84.8	-4.3	2.86	-2.86	
1,900.0	5.10	222.40	1,892.4	-74.0	-89.2	-5.3	2.46	-2.42	
1,961.0	3.70	220.40	1,953.2	-77.5	-92.3	-6.2	2.31	-2.30	
2,025.0	2.50	217.10	2,017.1	-80.2	-94.5	-7.0	1.89	-1.88	
2,089.0	2.80	211.00	2,081.0	-82.7	-96.1	-8.0	0.64	0.47	
2,212.0	1.90	213.60	2,203.9	-87.0	-98.8	-9.8	0.74	-0.73	
2,339.0	1.30	228.40	2,330.9	-89.7	-101.0	-10.6	0.57	-0.47	
2,465.0	0.70	261.70	2,456.8	-90.7	-102.9	-10.3	0.64	-0.48	
2,592.0	0.70	269.50	2,583.8	-90.8	-104.4	-9.5	0.07	0.00	
2,715.0	0.70	277.90	2,706.8	-90.7	-105.9	-8.5	0.08	0.00	
2,838.0	0.70	267.10	2,829.8	-90.7	-107.4	-7.5	0.11	0.00	
2,963.0	0.60	270.50	2,954.8	-90.7	-108.8	-6.7	0.09	-0.08	
3,088.0	0.80	273.70	3,079.8	-90.6	-110.3	-5.7	0.16	0.16	
3,335.0	0.60	282.20	3,326.8	-90.3	-113.3	-3.6	0.09	-0.08	
3,465.0	0.80	275.70	3,456.8	-90.0	-114.9	-2.5	0.17	0.15	
3,590.0	0.70	281.60	3,581.8	-89.8	-116.5	-1.3	0.10	-0.08	
3,713.0	0.80	270.40	3,704.7	-89.6	-118.1	-0.2	0.14	0.08	
3,839.0	0.70	249.50	3,830.7	-89.9	-119.7	0.5	0.23	-0.08	
3,965.0	0.70	220.20	3,956.7	-90.8	-120.9	0.6	0.28	0.00	
4,091.0	0.60	229.20	4,082.7	-91.8	-121.9	0.3	0.11	-0.08	
4,216.0	0.80	232.40	4,207.7	-92.7	-123.1	0.3	0.16	0.16	
4,342.0	0.90	211.10	4,333.7	-94.1	-124.3	-0.1	0.26	0.08	
4,468.0	0.80	213.70	4,459.7	-95.7	-125.3	-0.7	0.09	-0.08	
4,594.0	1.00	193.10	4,585.7	-97.5	-126.0	-1.7	0.30	0.16	
4,719.0	0.80	207.60	4,710.6	-99.3	-126.7	-2.8	0.24	-0.16	
4,845.0	0.70	197.70	4,836.6	-100.8	-127.3	-3.6	0.13	-0.08	
4,970.0	0.70	192.40	4,961.6	-102.3	-127.7	-4.6	0.05	0.00	
5,097.0	0.50	204.70	5,088.6	-103.6	-128.1	-5.3	0.19	-0.16	
5,222.0	0.70	231.10	5,213.6	-104.6	-129.0	-5.6	0.27	0.16	
5,347.0	0.50	215.90	5,338.6	-105.5	-129.9	-5.8	0.20	-0.16	
5,473.0	0.80	212.80	5,464.6	-106.7	-130.7	-6.3	0.24	0.24	
5,598.0	0.80	189.50	5,589.6	-108.3	-131.3	-7.2	0.26	0.00	
5,724.0	0.80	220.60	5,715.6	-109.8	-132.0	-7.9	0.34	0.00	
5,830.0	0.80	252.70	5,821.6	-110.6	-133.2	-7.8	0.42	0.00	
5,893.0	3.30	302.90	5,884.5	-109.7	-135.1	-6.0	4.53	3.97	
5,924.0	6.30	313.50	5,915.4	-108.1	-137.1	-3.5	10.05	9.68	
5,955.0	9.40	318.60	5,946.1	-105.0	-140.0	0.7	10.24	10.00	
5,986.0	13.10	318.40	5,976.5	-100.5	-144.0	6.8	11.94	11.94	
6,018.0	15.70	321.80	6,007.5	-94.4	-149.1	14.7	8.54	8.13	
6,050.0	19.50	322.20	6,038.0	-86.7	-155.1	24.4	11.88	11.88	
6,081.0	22.40	321.80	6,067.0	-78.0	-161.9	35.5	9.37	9.35	

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6,113.0	26.20	319.90	6,096.1	-67.8	-170.2	48.6	12.12	11.88	
6,144.0	29.50	319.90	6,123.5	-56.7	-179.6	63.1	10.65	10.65	
6,175.0	32.60	322.50	6,150.1	-44.3	-189.6	79.0	10.89	10.00	
6,206.0	32.50	325.70	6,176.2	-30.7	-199.3	95.7	5.56	-0.32	
6,237.0	35.50	328.40	6,201.9	-16.2	-208.7	113.0	10.83	9.68	
6,269.0	39.30	330.40	6,227.3	0.5	-218.6	132.3	12.47	11.88	
6,301.0	43.20	333.10	6,251.4	19.1	-228.6	153.1	13.39	12.19	
6,332.0	46.60	334.70	6,273.3	38.8	-238.2	174.6	11.56	10.97	
6,364.0	51.20	334.10	6,294.4	60.5	-248.6	198.2	14.44	14.38	
6,395.0	54.90	332.10	6,313.0	82.6	-259.8	222.6	13.00	11.94	
6,426.0	59.20	330.80	6,329.9	105.4	-272.3	248.3	14.31	13.87	
6,458.0	62.10	329.20	6,345.5	129.6	-286.2	276.0	10.06	9.06	
6,489.0	65.10	328.30	6,359.3	153.3	-300.6	303.6	10.02	9.68	
6,520.0	67.60	327.20	6,371.8	177.3	-315.8	331.9	8.69	8.06	
6,551.0	70.90	326.60	6,382.7	201.6	-331.6	360.8	10.80	10.65	
6,583.0	73.40	326.30	6,392.5	227.0	-348.4	391.2	7.86	7.81	
6,614.0	75.60	326.70	6,400.8	251.9	-364.9	421.0	7.20	7.10	
6,645.0	76.60	326.40	6,408.3	277.0	-381.5	451.1	3.36	3.23	
6,676.0	77.00	325.70	6,415.4	302.0	-398.4	481.2	2.55	1.29	
6,707.0	79.20	326.30	6,421.7	327.2	-415.3	511.5	7.35	7.10	
6,739.0	83.00	326.50	6,426.7	353.5	-432.8	543.0	11.89	11.88	
6,771.0	85.90	324.00	6,429.8	379.7	-451.0	574.9	11.94	9.06	
6,802.0	88.70	323.90	6,431.3	404.7	-469.2	605.8	9.04	9.03	
6,834.0	91.00	322.20	6,431.3	430.3	-488.4	637.8	8.94	7.19	
6,897.0	93.40	322.00	6,428.9	480.0	-527.1	700.8	3.82	3.81	
6,959.0	93.50	323.50	6,425.2	529.2	-564.6	762.6	2.42	0.16	
7,020.0	92.20	323.70	6,422.2	578.3	-600.7	823.6	2.16	-2.13	
7,084.0	90.70	325.60	6,420.5	630.4	-637.7	887.5	3.78	-2.34	
7,146.0	91.40	324.30	6,419.4	681.2	-673.3	949.5	2.38	1.13	
7,209.0	90.10	323.80	6,418.6	732.2	-710.3	1,012.4	2.21	-2.06	
7,272.0	90.80	323.20	6,418.1	782.8	-747.8	1,075.4	1.46	1.11	
7,334.0	91.70	322.50	6,416.7	832.2	-785.2	1,137.4	1.84	1.45	
7,398.0	90.80	323.10	6,415.3	883.2	-823.9	1,201.4	1.69	-1.41	
7,459.0	91.00	322.70	6,414.4	931.8	-860.7	1,262.4	0.73	0.33	
7,522.0	90.10	324.70	6,413.8	982.6	-898.0	1,325.4	3.48	-1.43	
7,585.0	90.10	324.50	6,413.7	1,034.0	-934.5	1,388.4	0.32	0.00	
7,648.0	91.50	324.20	6,412.8	1,085.1	-971.2	1,451.3	2.27	2.22	
7,711.0	88.70	323.70	6,412.7	1,136.1	-1,008.3	1,514.3	4.51	-4.44	
7,773.0	88.60	323.20	6,414.1	1,185.9	-1,045.2	1,576.3	0.82	-0.16	
7,836.0	89.30	323.70	6,415.3	1,236.5	-1,082.7	1,639.3	1.37	1.11	
7,899.0	90.20	323.90	6,415.6	1,287.3	-1,119.9	1,702.3	1.46	1.43	
7,963.0	91.20	324.70	6,414.8	1,339.3	-1,157.2	1,766.2	2.00	1.56	
8,026.0	90.20	321.50	6,414.0	1,389.6	-1,195.1	1,829.2	5.32	-1.59	
8,089.0	91.00	320.10	6,413.3	1,438.5	-1,234.9	1,892.2	2.56	1.27	
8,152.0	91.90	320.00	6,411.8	1,486.7	-1,275.3	1,955.1	1.44	1.43	
8,215.0	91.20	321.60	6,410.0	1,535.5	-1,315.1	2,018.0	2.77	-1.11	
8,278.0	90.20	322.80	6,409.3	1,585.3	-1,353.7	2,081.0	2.48	-1.59	
8,342.0	90.70	322.50	6,408.8	1,636.2	-1,392.5	2,145.0	0.91	0.78	
8,405.0	91.80	321.40	6,407.4	1,685.8	-1,431.4	2,208.0	2.47	1.75	
8,468.0	90.40	322.80	6,406.2	1,735.5	-1,470.1	2,270.9	3.14	-2.22	
8,532.0	88.60	322.70	6,406.7	1,786.4	-1,508.8	2,334.9	2.82	-2.81	
8,594.0	89.00	322.60	6,408.0	1,835.7	-1,546.4	2,396.9	0.67	0.65	
8,657.0	90.00	322.80	6,408.6	1,885.8	-1,584.6	2,459.9	1.62	1.59	

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Cathedral Energy Services

Survey Report

Company:	Chesapeake Energy Corp	Local Co-ordinate Reference:	Well Chad Glauser OHI 3H
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 3H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	HZ	Database:	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
8,719.0	90.60	323.30	6,408.3	1,935.4	-1,621.8	2,521.9	1.26	0.97	
8,783.0	91.80	323.00	6,406.9	1,986.6	-1,660.2	2,585.9	1.93	1.88	
8,845.0	90.40	324.20	6,405.7	2,036.5	-1,697.0	2,647.9	2.97	-2.26	
8,906.0	88.70	324.20	6,406.2	2,085.9	-1,732.7	2,708.9	2.79	-2.79	
8,969.0	89.10	324.00	6,407.4	2,137.0	-1,769.6	2,771.8	0.71	0.63	
9,032.0	90.30	324.30	6,407.8	2,188.0	-1,806.5	2,834.8	1.96	1.90	
9,096.0	91.60	324.40	6,406.7	2,240.0	-1,843.8	2,898.8	2.04	2.03	
9,159.0	90.60	324.20	6,405.5	2,291.2	-1,880.6	2,961.8	1.62	-1.59	
9,224.0	89.10	322.30	6,405.7	2,343.2	-1,919.4	3,026.8	3.72	-2.31	
9,285.0	90.20	323.20	6,406.0	2,391.8	-1,956.4	3,087.8	2.33	1.80	
9,346.0	91.50	324.70	6,405.1	2,441.1	-1,992.3	3,148.7	3.25	2.13	
9,408.0	90.20	322.90	6,404.2	2,491.1	-2,028.9	3,210.7	3.58	-2.10	
9,470.0	90.70	322.60	6,403.7	2,540.5	-2,066.4	3,272.7	0.94	0.81	
9,533.0	89.60	320.90	6,403.6	2,590.0	-2,105.4	3,335.7	3.21	-1.75	
9,594.0	90.90	321.50	6,403.3	2,637.5	-2,143.6	3,396.7	2.35	2.13	
9,657.0	91.80	321.70	6,401.8	2,686.8	-2,182.7	3,459.6	1.46	1.43	
9,719.0	92.60	322.10	6,399.4	2,735.6	-2,221.0	3,521.6	1.44	1.29	
9,848.0	89.60	322.80	6,396.9	2,837.8	-2,299.6	3,650.5	2.39	-2.33	
9,911.0	90.20	322.40	6,397.1	2,887.9	-2,337.8	3,713.5	1.14	0.95	
9,974.0	91.10	321.80	6,396.3	2,937.6	-2,376.5	3,776.5	1.72	1.43	
10,036.0	89.90	322.50	6,395.8	2,986.6	-2,414.6	3,838.5	2.24	-1.94	
10,102.0	89.90	322.20	6,395.9	3,038.8	-2,454.9	3,904.5	0.45	0.00	
10,165.0	90.80	322.50	6,395.5	3,088.7	-2,493.4	3,967.5	1.51	1.43	
10,228.0	89.80	322.70	6,395.2	3,138.7	-2,531.6	4,030.5	1.62	-1.59	
10,291.0	90.40	322.70	6,395.1	3,188.8	-2,569.8	4,093.5	0.95	0.95	
10,354.0	91.70	323.60	6,393.9	3,239.3	-2,607.6	4,156.5	2.51	2.06	
10,417.0	91.10	324.50	6,392.4	3,290.2	-2,644.5	4,219.5	1.72	-0.95	
10,481.0	89.30	324.40	6,392.2	3,342.3	-2,681.8	4,283.4	2.82	-2.81	
10,542.0	90.20	324.50	6,392.4	3,391.9	-2,717.2	4,344.4	1.48	1.48	
10,604.0	91.00	324.20	6,391.8	3,442.3	-2,753.4	4,406.4	1.38	1.29	
10,667.0	92.40	324.50	6,389.9	3,493.5	-2,790.1	4,469.3	2.27	2.22	
10,730.0	90.70	323.90	6,388.2	3,544.6	-2,826.9	4,532.3	2.86	-2.70	
10,794.0	89.10	321.90	6,388.3	3,595.6	-2,865.5	4,596.3	4.00	-2.50	
10,856.0	89.80	321.70	6,388.9	3,644.3	-2,903.8	4,658.3	1.17	1.13	
10,920.0	91.20	323.00	6,388.4	3,695.0	-2,942.9	4,722.3	2.99	2.19	
10,983.0	90.00	323.00	6,387.7	3,745.3	-2,980.8	4,785.3	1.90	-1.90	
11,045.0	91.40	323.00	6,387.0	3,794.8	-3,018.1	4,847.2	2.26	2.26	
11,109.0	91.20	323.10	6,385.5	3,845.9	-3,056.6	4,911.2	0.35	-0.31	
11,172.0	89.10	322.70	6,385.3	3,896.2	-3,094.6	4,974.2	3.39	-3.33	
11,235.0	89.30	321.40	6,386.2	3,945.9	-3,133.3	5,037.2	2.09	0.32	
11,299.0	90.40	322.30	6,386.4	3,996.2	-3,172.9	5,101.2	2.22	1.72	
11,362.0	91.50	323.40	6,385.3	4,046.4	-3,210.9	5,164.2	2.47	1.75	
11,425.0	89.90	322.20	6,384.6	4,096.6	-3,249.0	5,227.2	3.17	-2.54	
11,486.0	90.30	322.30	6,384.5	4,144.8	-3,286.3	5,288.2	0.68	0.66	
11,549.0	91.60	322.40	6,383.4	4,194.7	-3,324.8	5,351.2	2.07	2.06	
11,613.0	90.40	322.40	6,382.3	4,245.4	-3,363.9	5,415.1	1.88	-1.88	
11,676.0	90.80	321.80	6,381.6	4,295.1	-3,402.6	5,478.1	1.14	0.63	
11,739.0	91.20	321.60	6,380.5	4,344.5	-3,441.6	5,541.1	0.71	0.63	
11,801.0	89.50	321.60	6,380.2	4,393.1	-3,480.1	5,603.1	2.74	-2.74	
11,863.0	87.80	321.60	6,381.6	4,441.7	-3,518.6	5,665.1	2.74	-2.74	
11,926.0	88.70	321.60	6,383.5	4,491.0	-3,557.7	5,728.0	1.43	1.43	
11,988.0	89.20	321.40	6,384.7	4,539.5	-3,596.3	5,790.0	0.87	0.81	
12,052.0	89.80	321.00	6,385.2	4,589.4	-3,636.4	5,854.0	1.13	0.94	



Cathedral Energy Services

Survey Report

Company:	Chesapeake Energy Corp	Local Co-ordinate Reference:	Well Chad Glauser OHI 3H
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 3H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	HZ	Database:	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
12,114.0	89.70	320.40	6,385.5	4,637.4	-3,675.7	5,915.9	0.98	-0.16	
12,176.0	89.40	319.70	6,386.0	4,684.9	-3,715.5	5,977.8	1.23	-0.48	
12,239.0	90.00	321.50	6,386.3	4,733.6	-3,755.5	6,040.8	3.01	0.95	
12,303.0	90.80	321.90	6,385.9	4,783.8	-3,795.1	6,104.8	1.40	1.25	
12,365.0	92.00	322.50	6,384.4	4,832.8	-3,833.1	6,166.7	2.16	1.94	
12,428.0	91.30	322.30	6,382.6	4,882.7	-3,871.6	6,229.7	1.16	-1.11	
12,492.0	90.90	321.90	6,381.3	4,933.2	-3,910.9	6,293.7	0.88	-0.63	
12,554.0	90.50	320.60	6,380.6	4,981.5	-3,949.7	6,355.7	2.19	-0.65	
12,616.0	89.90	322.90	6,380.4	5,030.2	-3,988.0	6,417.6	3.83	-0.97	
12,679.0	91.50	323.70	6,379.6	5,080.7	-4,025.7	6,480.6	2.84	2.54	
12,742.0	92.10	323.40	6,377.6	5,131.4	-4,063.1	6,543.6	1.06	0.95	
12,803.0	92.90	323.20	6,374.9	5,180.2	-4,099.5	6,604.5	1.35	1.31	
12,866.0	92.60	325.70	6,371.9	5,231.4	-4,136.1	6,667.4	3.99	-0.48	
12,929.0	90.90	325.00	6,370.0	5,283.2	-4,171.9	6,730.3	2.92	-2.70	
12,992.0	91.40	324.60	6,368.7	5,334.7	-4,208.2	6,793.3	1.02	0.79	
13,054.0	90.40	324.10	6,367.8	5,385.1	-4,244.3	6,855.3	1.80	-1.61	
13,117.0	90.50	324.00	6,367.3	5,436.1	-4,281.3	6,918.2	0.22	0.16	
13,180.0	90.90	324.10	6,366.5	5,487.1	-4,318.3	6,981.2	0.65	0.63	
13,243.0	91.80	324.00	6,365.0	5,538.0	-4,355.3	7,044.2	1.44	1.43	
13,306.0	91.50	323.00	6,363.2	5,588.7	-4,392.7	7,107.2	1.66	-0.48	
13,369.0	91.10	323.50	6,361.8	5,639.1	-4,430.4	7,170.2	1.02	-0.63	
13,495.0	91.20	323.30	6,359.2	5,740.3	-4,505.5	7,296.1	0.18	0.08	
13,559.0	90.60	323.00	6,358.2	5,791.5	-4,543.9	7,360.1	1.05	-0.94	
13,620.0	90.10	321.70	6,357.9	5,839.8	-4,581.2	7,421.1	2.28	-0.82	
13,682.0	90.50	322.00	6,357.5	5,888.5	-4,619.5	7,483.1	0.81	0.65	
13,746.0	91.40	322.50	6,356.5	5,939.1	-4,658.7	7,547.1	1.61	1.41	
13,809.0	91.80	322.20	6,354.7	5,989.0	-4,697.1	7,610.1	0.79	0.63	
13,872.0	90.10	320.10	6,353.7	6,038.0	-4,736.6	7,673.0	4.29	-2.70	
13,935.0	89.10	321.00	6,354.1	6,086.7	-4,776.7	7,736.0	2.14	-1.59	
13,997.0	91.10	322.30	6,354.0	6,135.3	-4,815.1	7,797.9	3.85	3.23	
14,059.0	90.70	322.30	6,353.0	6,184.3	-4,853.0	7,859.9	0.65	-0.65	
14,121.0	91.50	321.60	6,351.8	6,233.2	-4,891.2	7,921.9	1.71	1.29	
14,184.0	91.00	322.30	6,350.5	6,282.8	-4,930.1	7,984.9	1.37	-0.79	
14,247.0	90.90	321.90	6,349.4	6,332.5	-4,968.8	8,047.9	0.65	-0.16	
14,309.0	91.40	322.10	6,348.2	6,381.3	-5,006.9	8,109.9	0.87	0.81	
14,371.0	92.30	321.60	6,346.2	6,430.1	-5,045.2	8,171.8	1.66	1.45	
14,435.0	92.80	321.90	6,343.3	6,480.3	-5,084.8	8,235.7	0.91	0.78	
14,498.0	91.60	322.10	6,340.9	6,529.9	-5,123.6	8,298.7	1.93	-1.90	
14,560.0	90.40	322.70	6,339.8	6,579.0	-5,161.4	8,360.7	2.16	-1.94	
14,623.0	89.70	322.20	6,339.8	6,628.9	-5,199.8	8,423.7	1.37	-1.11	
14,686.0	91.10	322.60	6,339.3	6,678.8	-5,238.2	8,486.7	2.31	2.22	
14,750.0	91.50	321.60	6,337.9	6,729.3	-5,277.5	8,550.6	1.68	0.62	
14,813.0	91.70	320.70	6,336.1	6,778.4	-5,317.0	8,613.6	1.46	0.32	
14,876.0	92.40	320.40	6,333.9	6,827.0	-5,357.0	8,676.5	1.21	1.11	
14,939.0	93.10	319.40	6,330.8	6,875.1	-5,397.6	8,739.3	1.94	1.11	
15,002.0	94.00	319.40	6,326.9	6,922.9	-5,438.5	8,802.1	1.43	1.43	
15,065.0	94.70	318.90	6,322.2	6,970.4	-5,479.6	8,864.8	1.36	1.11	
15,111.0	95.21	318.53	6,318.2	7,004.8	-5,509.8	8,910.5	1.37	1.11	

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Last Cathedral Survey @ 15,065' MD
Projection to Bit @ 15,111' MD



Cathedral Energy Services

Survey Report

Company:	Chesapeake Energy Corp	Local Co-ordinate Reference:	Well Chad Glauser OHI 3H
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 3H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	HZ	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 3H PBHL	0.00	0.00	6,343.2	7,029.2	-5,480.1	566,097.28	1,687,184.42	40° 2' 56.00 N	80° 37' 2.57 W
- actual wellpath misses target center by 45.7usft at 15107.5usft MD (6318.5 TVD, 7002.2 N, -5507.5 E)									
- Point									
Chad Glauser 3H PBHL	0.00	0.00	6,352.2	7,029.2	-5,480.1	566,097.28	1,687,184.42	40° 2' 56.00 N	80° 37' 2.57 W
- actual wellpath misses target center by 51.1usft at 15106.8usft MD (6318.6 TVD, 7001.7 N, -5507.0 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
700.0	700.0	-0.3	0.6	Last Gyro Survey @ 700' MD	
15,065.0	6,322.2	6,970.4	-5,479.6	Last Cathedral Survey @ 15,065' MD	
15,111.0	6,318.2	7,004.8	-5,509.8	Projection to Bit @ 15,111' MD	

Checked By: _____ Approved By: _____ Date: _____

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	9/22/2013
State:	WEST VIRGINIA
County:	OHIO
API Number:	4706900160
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	CHAD GLAUSER OHI 3H
Longitude:	-80.597511
Latitude:	40.029785
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	6,431
Total Water Volume (gal)*:	10,047,534

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by Mass)**	Maximum Ingredient Concentration in HF Fluid (% by Mass)**	Comments
Fresh Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	79.10688%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	8.19032%	
EC6110A	NALCO	Anti-Bacterial Agent	Ethanol Glutaraldehyde (Pentanediol) Quaternary Ammonium Compounds	000064-17-5 000111-30-8 NA	5.00% 60.00% 10.00%	0.00128% 0.01535% 0.00256%	
EC6629A	NALCO	Scale Inhibitor	No Hazardous Components	NONE		0.00000%	
A264, J218, J580, J609, L058, Acid, Hydrochloric 15pct, Northern White Sand, 100 Mesh Sand	SCHLUMBERGER	Breaker, Corrosion Inhibitor, Friction Reducer, Gelling Agent, Iron Control Agent, Acid, Proppant - Natural	Crystalline silica Hydrogen chloride Acrylamide, 2-acrylamido-2-Ammonium sulfate Guar gum Sodium erythorbate	14808-60-7 7647-01-0 38193-60-1 7783-20-2 9000-30-0 6381-77-7	98.17103% 1.35032% 0.11495% 0.10864% 0.08798% 0.08022%	12.48814% 0.17177% 0.01462% 0.01382% 0.01119% 0.01020%	

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