WR-35
Rev. 8/23/13

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

API 47 - 069 - 00110 County Ohio District Triadelphia
Quad Valley Grove Pad Name Chad Glauser OHI Field/Pool Name Sand Hill
Farm name Chad Glauser OHI 6H Well Number 834478
Operator (as registered with the OOG) Chesapeake Appalachia, L.L.C.
Address P.O. Box 18496 City Oklahoma City State OK Zip 73154-0496

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4431151.2 Easting 534355.1
Landing Point of Curve Northing Easting
Bottom Hole Northing 4429378.5 Easting 535196.6

Elevation (ft) 1,240 GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated ■ Horizontal □ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework □ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine ■Gas □ NGL □ Oil □ Other
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud ■Fresh Water Intermediate hole ■ Air □ Mud ■ Fresh Water □ Brine
Production hole □ Air ■ Mud ■ Fresh Water □ Brine
Mud Type(s) and Additive(s)
Synthetic Oil Based Mud

Date permit issued 5-25-2012 Date drilling commenced 7-4-2013 Date drilling ceased 7-17-2013
Date completion activities began 10-4-2013 Date completion activities ceased 11-7-2013
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 30', 300' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1,135 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 678' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

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CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor		20"	118'	New	J-55/94#		Y to surface
Surface		13 3/8"	762'	New	J-55/54.50#		Y to surface
Coal							
Intermediate 1		9 5/8"	2,115'	New	J-55/40#		Y to surface
Intermediate 2							
Intermediate 3							
Production		5 1/2"	12,943'	New	P-110/20#		Y 500' intermediate csg
Tubing							
Packer type and depth set							

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	A						
Surface	A	680		1.20	814 Cu. Ft.	24'	
Coal							
Intermediate 1	A	715		1.24	898 Cu. Ft.	20.2'	
Intermediate 2							
Intermediate 3							
Production	A	2,534		2.56	3,104 Cu. Ft.	1,207'	
Tubing							

Drillers TD (ft) 12,943' Loggers TD (ft) 12,943'
Deepest formation penetrated Marcellus Plug back to (ft)
Plug back procedure

Kick off depth (ft) 5,590.7'

Check all wireline logs run ☐ caliper ☐ density ■ deviated/directional ☐ induction
☐ neutron ☐ resistivity ■ gamma ray ☐ temperature ☐ sonic

Well cored ☐ Yes ■ No ☐ Conventional ☐ Sidewall Were cuttings collected ■ Yes ☐ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING Surface and Intermediate - run centralizers in the middle and top of the first joint, top of the third joint and every fourth joint. Production - Run first centralizer 3' from Shoe, second at top of the first joint and then one every third joint to top of curve.

WAS WELL COMPLETED AS SHOT HOLE ■ Yes ☐ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED

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WR-35
Rev. 8/23/13

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	Attached				

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
	Attached							

Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS			
Marcellus Shale	6,433	TVD	6,820-12,776	MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ■ Flow ☐ Pump

SHUT-IN PRESSURE Surface 1,117 psi Bottom Hole 4,181 psi DURATION OF TEST 72 hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	1,598 mcfpd	77 bpd	NA bpd	228 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		
Attached					

Please insert additional pages as applicable.

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Drilling Contractor Nomac Drilling
Address 3400 South Radio Road City El Reno State OK Zip 73036

Logging Company Nomac Drilling
Address 5701 S.W. 5th Street City Oklahoma City State OK Zip 73128

Cementing Company Schlumberger
Address 1080 U.S. 33 City Weston State WV Zip 26452

Stimulating Company Schlumberger
Address 1080 U.S. 33 City Weston State WV Zip 26452

Please insert additional pages as applicable.

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Completed by Marlene Williams Telephone (405)935-4158
Signature Marlene Williams Title Regulatory Analyst Date 1-7-2014

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Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

PERFORATION RECORD ATTACHMENT

Well Number and Name: 834478 Chad Glauser OHI 6H

PERFORATION RECORD					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	10/4/2013	12,564	12,776	7	Marcellus Shale
2	10/4/2013	12,303	12,515	7	Marcellus Shale
3	10/5/2013	12,042	12,254	7	Marcellus Shale
4	10/5/2013	11,781	11,993	7	Marcellus Shale
5	10/5/2013	11,520	11,732	7	Marcellus Shale
6	10/5/2013	11,258	11,471	7	Marcellus Shale
7	10/5/2013	10,997	11,210	7	Marcellus Shale
8	10/6/2013	10,736	10,949	7	Marcellus Shale
9	10/6/2013	10,481	10,688	7	Marcellus Shale
10	10/6/2013	10,218	10,427	7	Marcellus Shale
11	10/6/2013	9,953	10,164	7	Marcellus Shale
12	10/6/2013	9,692	9,897	7	Marcellus Shale
13	10/6/2013	9,431	9,638	7	Marcellus Shale
14	10/7/2013	9,170	9,382	7	Marcellus Shale
15	10/7/2013	8,909	9,121	7	Marcellus Shale
16	10/7/2013	8,648	8,860	7	Marcellus Shale
17	10/7/2013	8,387	8,599	7	Marcellus Shale
18	10/7/2013	8,125	8,338	7	Marcellus Shale
19	10/7/2013	7,864	8,077	7	Marcellus Shale
20	10/8/2013	7,603	7,816	7	Marcellus Shale
21	10/8/2013	7,342	7,555	7	Marcellus Shale
22	10/8/2013	7,081	7,294	7	Marcellus Shale
23	10/8/2013	6,820	7,032	7	Marcellus Shale

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STIMULATION INFORMATION PER STAGE

Well Number and Name: 834478 Chad Glauser OHI 6H

STIMULATION RECORD							
Stage No.	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)
1	10/4/2013	75	7,542	6,238	3,893	388,940	8,829
2	10/4/2013	77	7,294	6,664	3,806	390,780	7,333
3	10/5/2013	79	7,035	6,479	4,144	392,160	7,287
4	10/5/2013	70	7,138	6,514	4,229	391,260	7,269
5	10/5/2013	80	7,204	5,922	4,818	390,780	7,166
6	10/5/2013	79	7,140	5,881	4,327	390,760	7,219
7	10/5/2013	79	7,244	6,405	4,639	390,660	7,070
8	10/6/2013	80	6,979	6,951	4,354	390,900	7,315
9	10/6/2013	79	6,999	6,098	4,101	390,680	8,196
10	10/6/2013	77	7,254	6,030	4,113	390,400	7,722
11	10/6/2013	79	6,923	5,310	4,403	389,720	7,134
12	10/6/2013	79	6,766	6,652	4,484	390,780	6,998
13	10/7/2013	80	6,683	6,325	4,101	390,680	7,206
14	10/7/2013	80	6,639	6,203	4,144	390,720	7,243
15	10/7/2013	79	6,720	6,105	4,145	390,300	6,932
16	10/7/2013	79	6,871	7,738	4,329	389,020	7,015
17	10/7/2013	80	6,629	5,753	4,170	388,700	7,038
18	10/7/2013	80	6,479	6,161	4,185	389,900	6,959
19	10/8/2013	80	6,519	6,525	4,185	390,800	7,030
20	10/8/2013	79	6,612	7,010	4,270	390,220	6,969
21	10/8/2013	80	6,362	6,213	4,270	390,980	6,999
22	10/8/2013	79	6,948	7,566	4,223	389,320	6,926
23	10/8/2013	79	6,550	5,287	4,079	393,400	7,162

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

Maximum TVD of wellbore: 6488 ft TVD @ 12567 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	6393	6233
GENESEO (SH)	6393	6233	6423	6252
TULLY (LS)	6423	6252	6476	6284
HAMILTON (SH)	6476	6284	6727	6393
MARCELLUS (SH)	6727	6393		
TD OF LATERAL			12943	6473

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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

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
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	Last Gyro Survey @ 730' MD
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

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
1,020.0	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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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

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
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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Environmental Protection

Cathedral Energy Services

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 6H	**North Reference:**	Grid
Wellbore:	HZ	**Survey Calculation Method:**	Minimum Curvature
Design:	FINAL	**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 (°/100usf	Build Rate (°/100u	Formations / Comments
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 - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Chad Glauser 6H PBHL	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
- actual wellpath misses target center by 15.0usft at 12943.0usft MD (6473.8 TVD, -5863.9 N, 2664.2 E)									
- Point									
Chad Glauser 6H PBHL	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
- actual wellpath misses target center by 35.8usft at 12943.0usft MD (6473.8 TVD, -5863.9 N, 2664.2 E)									
- Point									
Chad Glauser 6H LP	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
- actual wellpath misses target center by 16.7usft at 6854.2usft MD (6419.5 TVD, -572.6 N, -335.5 E)									
- Point									
Chad Glauser 6H PBHL	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
- actual wellpath misses target center by 8.8usft at 12943.0usft MD (6473.8 TVD, -5863.9 N, 2664.2 E)									
- Point									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
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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Hydraulic Fracturing Fluid Product Component Information Disclosure

WV Department of Environmental Protection
Office of Oil and Gas
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Fracture Date:	10/4/2013
State:	WEST VIRGINIA
County:	OHIO
API Number:	4706900110
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	CHAD GLAUSER OHI 6H
Longitude:	-80.597554
Latitude:	40.029806
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	6,488
Total Water Volume (gal)*:	7,213,752

Hydraulic Fracturing Fluid Composition:

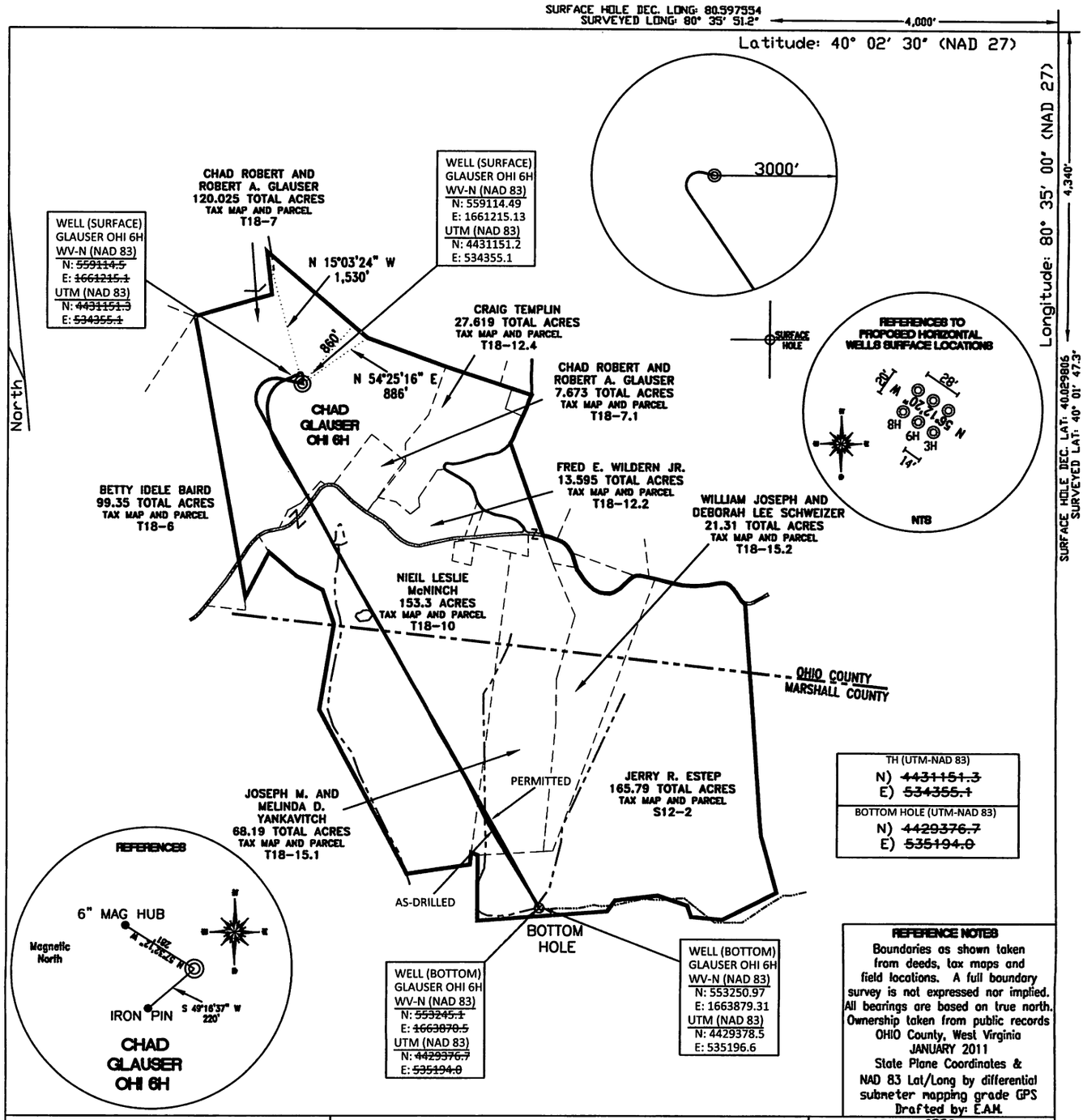
Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by Mass)**	Maximum Ingredient Concentration in HF Fluid (% by Mass)**	Comments
Fresh Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	81.39723%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	6.28461%	
EC6110A	NALCO	Anti-Bacterial Agent	Ethanol	000064-17-5	5.00%	0.00111%	
			Glutaraldehyde (Pentanediol)	000111-30-8	60.00%	0.01326%	
			Quaternary Ammonium Compounds	NA	10.00%	0.00221%	
EC6629A	NALCO	Scale Inhibitor	No Hazardous Components	NONE		0.00000%	
A264, J218, J580, J609, L058, U028, 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	14808-60-7	98.02921%	12.07540%	
			Hydrogen chloride	7647-01-0	1.44112%	0.17752%	
			Guar gum	9000-30-0	0.13152%	0.01620%	
			Acrylamide, 2-acrylamido-2-	38193-60-1	0.10750%	0.01324%	
			Ammonium sulfate	7783-20-2	0.10160%	0.01252%	
			Sodium erythorbate	6381-77-7	0.08217%	0.01012%	

			Sodium sulfate	7757-82-6	0.04391%	0.00541%	
			Sodium hydroxide	1310-73-2	0.02091%	0.00258%	
			Polymer of 2-acrylamido-2-	136793-29-8	0.01152%	0.00142%	
			Diammonium peroxidisulphate	7727-54-0	0.00814%	0.00100%	
			Urea	57-13-6	0.00708%	0.00087%	
			Methanol	67-56-1	0.00428%	0.00053%	
			Fatty acids, tall-oil	61790-12-3	0.00314%	0.00039%	
			Thiourea, polymer with	68527-49-1	0.00259%	0.00032%	
			Non-crystalline silica	7631-86-9	0.00138%	0.00017%	
			Alcohols, C14-15, ethoxylated	68951-67-7	0.00120%	0.00015%	
			Prop-2-yn-1-ol	107-19-7	0.00080%	0.00010%	
			Alkenes, C>10 a-	64743-02-8	0.00053%	0.00007%	
			Tetrasodium	64-02-8	0.00022%	0.00003%	
			Dimethyl siloxanes and silicones	63148-62-9	0.00010%	0.00001%	
			Siloxanes and Silicones, di-Me,	67762-90-7	0.00001%	< 0.00001%	
			Octamethylcyclotetrasiloxane	556-67-2	0.00001%	< 0.00001%	
			Decamethyl cyclopentasiloxane	541-02-6	0.00001%	< 0.00001%	
			Dodecamethylcyclohexasiloxane	540-97-6	< 0.00001%	< 0.00001%	

Additional Ingredients Not Listed on MSDS							
EC6110A, EC6629A	NALCO	Anti-Bacterial Agent, Scale Inhibitor	Methanol (Methyl Alcohol)	000067-56-1		0.00636%	
			Proprietary Acrylate Polymer	TRADE SECRET		0.00636%	
			Proprietary Quaternary Ammonium Salt	TRADE SECRET		0.00636%	
			Water	007732-18-5		0.02257%	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%

"Additional Ingredients Not Listed on MSDS" component information were obtained directly from the supplier. As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of this information should be directed to the supplier who provided it.



FILE #: CHE 047
DRAWING #: 1569
SCALE: 1" = 1600'
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: _____

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III
LICENSED
No. 2124
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

DATE: JUNE 04, 2014
OPERATOR'S WELL #: CHAD GLAUSER OHI 6H AS-DRILLED

API WELL #: 47 (STATE) 69 (COUNTY) 00110 (PERMIT)

Well Type: ☐ Oil ☐ Waste Diposal ☐ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: UPPER OHIO SOUTH
ELEVATION: 1,240'
COUNTY/DISTRICT: OHIO / TRIADELPHIA
QUADRANGLE: VALLEY GROVE WV.
SURFACE OWNER: CHAD ROBERT AND ROBERT A. GLAUSER
ACREAGE: 120.025 +/-
OIL & GAS ROYALTY OWNER: CHAD ROBERT AND ROBERT A. GLAUSER
ACREAGE: 528.615 +/-
LEASE NUMBERS:

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☒
PLUG OFF FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐
CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY):

TARGET FORMATION: MARCELLUS
ESTIMATED DEPTH: TVD: 6,385' TMD: 13,148'
WELL OPERATOR: CHESAPEAKE APPALACHIA, LLC.
DESIGNATED AGENT: ERIC GILLESPIE
ADDRESS: PO BOX 18496
ADDRESS: PO BOX 6070
CITY: OKLAHOMA CITY STATE: OK ZIP CODE: 73154-0496
CITY: CHARLESTON STATE: WV ZIP CODE: 25301