

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



API 47-051-01708 County Marshall District Clay
Quad Glen Easton Pad Name Berger Field/Pool Name _____
Farm name Berger Well Number 9H
Operator (as registered with the OOG) Chevron Appalachia, LLC
Address 800 Mountain View Drive City Smithfield State PA Zip 15478

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4413854.26 Easting 520988.08
Landing Point of Curve Northing 4413530.72 Easting 520981.28
Bottom Hole Northing 4412186.01 Easting 521913.12

Elevation (ft) 1292 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)
Surface sections were drilled on air. The Intermediate and Production sections were drilled on SBM Fluid loss control, emulsifier, and shale stabilizer additives.

Date permit issued 2/26/2014 Date drilling commenced 7/1/2014 Date drilling ceased 3/2/2015
Date completion activities began 8/18/2015 Date completion activities ceased 12/16/2015
Verbal plugging (Y/N) N Date permission granted _____ Granted by **RECEIVED**
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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug **DEC 22 2015**

Freshwater depth(s) ft 169' Open mine(s) (Y/N) depths WV Department of
Salt water depth(s) ft _____ Void(s) encountered (Y/N) depths Environmental Protection
Coal depth(s) ft 768'-769', 784'-785', 830'-837', 1411'-1413', 1415'-1418' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No but not sealed

Reviewed by:
EB 2-2216
AX 02/24/16
02/24/16

API 47-051 - 01708 Farm name Berger Well number 9H

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	36	30	40	New	X-42; 118.76		
Surface	17 1/2	13 3/8	297	New	J-55; 54.50		
Coal							
Intermediate 1	12	9 5/8	2673	New	J-55; 40		
Intermediate 2							
Intermediate 3							
Production	8 1/2	5 1/2	12431	New	P-110; 20		
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	Bulk	60				Surface	8
Surface	Bulk	382	15.60	1.21	462	Surface	8
Coal							
Intermediate 1	EasyBlok	912	15.6	1.23	1121	Surface	8
Intermediate 2							
Intermediate 3							
Production	EasyBLOK	2380	15.2	1.31	3118	Surface	8
Tubing							

Drillers TD (ft) 12480' Loggers TD (ft) 12480'
 Deepest formation penetrated Marcel Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 5238'

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 Bow spring centralizer every two joints on the Water
and Intermediate strings. Production string has two centralizer every joint in the lateral and curve, then one every two joints from KOP to surface.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS See attached perforation/stimulation report.
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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS DEC 22 2015

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED WV Department of Environmental Protection

API 47- 051 - 01708 Farm name Berger Well number 9H

PRODUCING FORMATION(S)	DEPTHS	
	TVD	MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs
 OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY
 Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
Dunkard Group Sand	160	169	169	169	Fresh Water 169'MD 1" stream
Pittsburgh Coal	830	837	830	837	Coal
Salt Sand	1538	1568	1540	1570	Gas Show @ 1550' 6101 units
Big Lime	1848	1928	1850	1930	Limestone: crm-wh, hd, crpxln
Burgoon (Big Injun)	1927	2117	1930	2120	SS:offwh, wh, cons, clr, trans, lcemt, fg-mg
Weir Sand	2277	2297	2280	2300	SLTST: ltgy-mgy, occ mgy, hrd, vf-fg, tcmt, bio, arg, sl calc
Berea Sand	2507	2530	2510	2533	SS: wh, clr, trans, ltgy-gy, cns, lcemt, mg-fg, sbang-ang, arg, msph, non calc, tr flwr, exl fast cut, fnt odr, lse pyr
Burket Shale	6297	6312	6514	6544	SH: drkgy, v. drkgy, frm, slty, grty, sbbkly-sbfiss, modcalc, embd calc, lse calct
Tully Limestone	6312	6352	6544	6636	LS: ltgy, gy, mgy, frm-hrd, dns, cln, mic-fxln, v. arg
Hamilton Shale	6352	6400	6636	6799	SH: drkgy, v. drkgy, frm, slty, grty, sbbkly-sbfiss, carb, modv. calc, lse calct, w/LS
Marcellus Shale	6400		6799		SH: drkgy, v. drkgy, frm, slty, grty, sbbkly-sbfiss, non calc, lse calct, lse pyr, w/LS, gy, ltgy, hrd, mott, mic, fxln, v. arg

Please insert additional pages as applicable.

Drilling Contractor SEE ATTACHED
 Address _____ City _____ State _____ Zip _____

Logging Company ALS Group USA Corp
 Address 3352 128th Avenue City Holland State MI Zip 49424

Cementing Company SEE ATTACHED
 Address _____ City _____ State _____ Zip _____

Stimulating Company Schlumberger Technology Corp
 Address 4600 J Barry Court, Suite 200 City Canonsburg State _____ Zip 15307

Please insert additional pages as applicable.

Completed by Jackie M. Scholar Telephone 724-564-3721
 Signature [Signature] Title Regulatory Compliance Team Lead Date 12/17/2015

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DEC 22 2015
 WV Department of Environmental Protection

Well is located on topo map 183' feet south of Latitude: 39° 52' 30"

Well is located on topo map 1274' feet west of Longitude: 80° 45' 00"

LEGEND

- TOPO MAP POINT
- WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED
- LEASE LETTER
- MINERAL TRACT BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE
- AS DRILLED
- EXISTING WELLS
 - EXISTING WELLS
 - PLUGGED WELLS

PERMITTED SURFACE HOLE LOCATION (SHL)
 UTM 17-NAD83
 N:4413854.26
 E:520988.08
NAD83, WV NORTH
 N:503087.72
 E:1616402.48

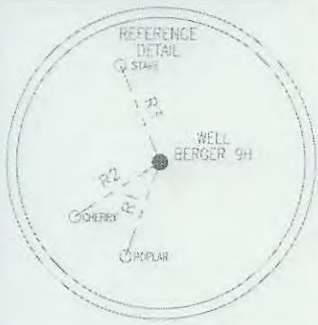
PERMITTED APPROX. LANDING POINT
 UTM 17-NAD83
 N:4413756.33
 E:520833.82
NAD83, WV NORTH
 N:502774.83
 E:1615890.90

AS DRILLED APPROX. LANDING POINT
 UTM 17-NAD83
 N:4413530.72
 E:520981.28
NAD83, WV NORTH
 N:502026.41
 E:1616361.86

- NOTES:
- There are no water wells or developed springs within 250' of proposed well.
 - There are no existing buildings within 625' of proposed well.
 - Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
 - There are no native trout streams within 300' of proposed well.
 - Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
 - It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

AS DRILLED PLAT

PARCEL	LESSOR
A	GARY & LINDA BERGER
B	GEORGE E. & REBECCA VUCELICK
C	GEORGE E. & REBECCA VUCELICK
D	STEVEN L. & KAREN HIGGINBOTHAM
E	JEFFERSON HEIRS
F	HEATH & CHRISTY TAYLOR
G	FRANCIS J. & LORETTA A. NIEMEC
H	SUSAN K. FLOWERS
I	LINDA S. WELLS
J	WILLIAM S. & DEBRA S. JONES
K	MICHAEL A. & LEE ANN DAVOLIO
L	JMK IRREVOCABLE TRUST
M	MATTHEW S. & BRENDA ANDERSON



LINE	BEARING	DISTANCE
R1	S 20°24'11" W	204.40'
R2	S 57°59'02" W	208.93'
R3	N 22°34'37" W	217.68'
R4	S 79°04'52" W	1277.13'
R5	S 68°14'45" W	1208.26'
R6	S 38°38'43" E	962.43'

AS DRILLED BOTTOM HOLE LOCATION (BHL)
 UTM 17-NAD83
 N:4412186.01
 E:521913.12
NAD83, WV NORTH
 N:497562.62
 E:1619345.95

PERMITTED BOTTOM HOLE LOCATION (BHL)
 UTM 17-NAD83
 N:4412188.00
 E:521917.13
NAD83, WV NORTH
 N:497568.94
 E:1619359.88

Blue Mountain Inc.
 10125 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: BERGER 9H-AS DRILLED
 DRAWING #: BERGER 9H-AS DRILLED
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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: *George D. Six*
 R.P.E.: _____ L.L.S.: P.S. No. 2000

GEORGE D. SIX
 LICENSED
 No. 2000
 STATE OF WEST VIRGINIA
 PROFESSIONAL SURVEYOR
 PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304



DATE: SEPTEMBER 28, 2015
 OPERATOR'S WELL #: BERGER 9H-AS DRILLED
 API WELL #: 47 51 01708
 STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: MIDDLE GRAVE CREEK - GRAVE CREEK ELEVATION: 1287.47'

COUNTY/DISTRICT: MARSHALL / CLAY QUADRANGLE: POWHATAN, OH-WV 7.5'

SURFACE OWNER: GARY & LINDA BERGER ACREAGE: 51.753±

OIL & GAS ROYALTY OWNER: GARY & LINDA BERGER ACREAGE: 375.576±

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,538'± TMD: 13,484'±

WELL OPERATOR: CHEVRON APPALACHIA, LLC DESIGNATED AGENT: KENNETH E. TAWNEY
 Address: 800 MOUNTAIN VIEW DRIVE Address: 500 LEE STREET, EAST SUITE 1600
 City: SMITHFIELD State: PA Zip Code: 15478 City: CHARLESTON State: WV Zip Code: 25301-3202

04/08/2016

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/20/2015
Job End Date:	10/31/2015
State:	West Virginia
County:	Marshall
API Number:	47-051-01708-00-00
Operator Name:	Chevron USA Inc.
Well Name and Number:	Berger 9H
Longitude:	-80.75457100
Latitude:	39.87447600
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,481
Total Base Water Volume (gal):	11,822,692
Total Base Non Water Volume:	



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
Base Fluid	Chevron	Carrier/Base Fluid					
			Water (Including Mix Water Supplied by Client)	7732-18-5	100.00000	90.03484	
Proppant	Schlumberger	Proppant					
			Crystalline Silica	14808-60-7	100.00000	9.83915	
7.5% Acid	Schlumberger	Perf Cleanup					
			Hydrochloric Acid	7647-01-0	8.00000	0.00820	
M300	BASF Corporation	Biocide					
			Water	7732-18-5	75.00000	0.00163	
			Glutaral	111-30-8	25.00000	0.00054	
U042	Schlumberger	Iron Chelating Agent					
			Tetrasodium ethylenediaminetetraacetate	64-02-8	60.00000	0.00160	
			Trisodium nitrilotriacetate (im purity)	5064-31-3	10.00000	0.00027	
			Sodium hydroxide	1310-73-2	5.00000	0.00013	
J580	Schlumberger	Gelling Agent					
			Carbohydrate Polymer	Proprietary	100.00000	0.00095	
L058	Schlumberger	Iron Stabilizer					
			Sodium erythorbate	6381-77-7	100.00000	0.00037	
B317	Schlumberger	Scale Inhibitor					

			Ethane-1,2-diol	107-21-1	5.00000	0.00010
			Trisodium ortho phosphate	7601-54-9	5.00000	0.00010
A264	Schlumberger	Corrosion Inhibitor				
			Methanol	67-56-1	40.00000	0.00005
			Aliphatic acids	Proprietary	30.00000	0.00003
			Aliphatic alcohols, ethoxylated #1	Proprietary	30.00000	0.00003
			Prop-2-yn-1-ol	107-19-7	10.00000	0.00001
J134	Schlumberger	Gel Breaker				
			Hemicellulase enzyme	9012-54-8	100.00000	0.00002
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.						

* 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%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)