

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

API 47-051-01706 County Marshall District Clay
Quad Glen Easton Pad Name Berger Field/Pool Name _____
Farm name Berger Well Number 6H
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 44313866.68 Easting 520984.62
Landing Point of Curve Northing 4414064.54 Easting 520722.54
Bottom Hole Northing 4415186.02 Easting 519813.42

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 loss control, emulsifier, and shale stabilizer additives.

Date permit issued 2/26/2014 Date drilling commenced 6/19/2014 Date drilling ceased 1/16/2015
Date completion activities began 8/4/2015 Date completion activities ceased 12/23/2015
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

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

Freshwater depth(s) ft 169' Open mine(s) (Y/N) depths _____
Salt water depth(s) ft _____ Void(s) encountered (Y/N) depths No
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

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Reviewed by:
EB 2-22-16

02/26/2016

API 47-051 - 01706 Farm name Berger Well number 6H

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	301	New	J-55; 54.50		
Coal							
Intermediate 1							
Intermediate 2	12 1/4	9 5/8	2666	New	N-80; 40		
Intermediate 3							
Production	8 1/2	5 1/2	11765	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	Bulk	382	15.60	1.21			
Coal							
Intermediate 1							
Intermediate 2	A	874	15.60	1.24			
Intermediate 3							
Production	A	2405	15.20	1.31			
Tubing							

Drillers TD (ft) 11777 Loggers TD (ft) 11777
 Deepest formation penetrated _____ Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 5708

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 A bow spring centralizer every two joints on the Water and Intermediate strings. The production string has two centralizers every joint in the lateral and curec, then one every two joints from KOP to surface.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS please see attached perforation and stimulation reports

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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API: 47-5101706-01	Well Name: Berger	Well Number: 6H
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PERFORATION RECORD					
Stage No.	Perforation Date	Perforated From TMD Ft.	Perforated To TMD Ft.	Number of Perforations	Formation(s)
1	11/3/15	11722	11562	60	Marcellus
2	11/4/15	11413	11272	50	Marcellus
3	11/5/15	11222	11025	50	Marcellus
4	11/5/15	10974	10778	50	Marcellus
5	11/6/15	10724	10517	50	Marcellus
6	11/7/15	10474	10268	50	Marcellus
7	11/8/15	10224	10020	50	Marcellus
8	11/9/15	9974	9772	50	Marcellus
9	11/10/15	9724	9522	50	Marcellus
10	11/11/15	9474	9272	50	Marcellus
11	11/11/15	9224	9022	50	Marcellus
12	11/12/15	8972	8774	50	Marcellus
13	11/13/15	8724	8522	50	Marcellus
14	11/13/15	8474	8272	50	Marcellus
15	11/14/15	8224	8022	50	Marcellus
16	11/14/15	7974	7772	50	Marcellus
17	11/15/15	7725	7522	50	Marcellus
18	11/15/15	7477	7272	50	Marcellus
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Please insert additional copies of this page if additional rows/stages are needed.

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API: 47-5101706-01	Well Name: Berger	Well Number: 6H
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STIMULATION INFORMATION / STAGE								
Complete a separate record for each stimulation stage. (Please insert additional lines for additional stages or additional pages as applicable).								
Stg 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)	Amount of Nitrogen/ other (units)
1	11/3/15	94	8898	--	4314	397721	10553	n/a
2	11/4/15	97	8326	5954	5353	500919	13430	n/a
3	11/5/15	98	7873	5597	4700	500161	12519	n/a
4	11/5/15	98	7960	6737	4722	501746	13281	n/a
5	11/6/15	99	8057	6660	4411	467431	12048	n/a
6	11/7/15	98	7588	6317	4497	498631	12430	n/a
7	11/8/15	97	8453	6560	4242	501323	12371	n/a
8	11/9/15	99	8009	6078	4180	508837	12573	n/a
9	11/10/15	89	7417	6151	4884	450700	12679	n/a
10	11/11/15	99	7452	5862	4019	502119	12313	n/a
11	11/11/15	99	7564	6835	4638	502669	12160	n/a
12	11/12/15	98	7319	6528	4728	499676	12274	n/a
13	11/13/15	90	7932	6320	4511	424040	15416	n/a
14	11/13/15	99	7377	5874	4748	500750	12247	n/a
15	11/14/15	98	7518	5972	5041	500271	12249	n/a
16	11/14/15	98	7311	6144	4773	499840	12327	n/a
17	11/15/15	99	7221	6595	4715	505040	12295	n/a
18	11/15/15	99	6740	6024	4773	500340	12236	n/a
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API 47- 051 - 01706 Farm name Berger Well number 6H

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 DEPTH IN FT NAME 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 ₂ S, ETC)
	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, lcmt, mg-fg, sbang-ang, arg, msph, non calc, tr flor, exl fast cut, frt odr, lse pyr
Burket Shale	6285	6303	6386	6427	SH:drkgy,v.drkgy,frm,slty,grty, sbblky-sbfiss,modcalc,embd calc,lse calct
Tully Limestone	6303	6338	6427	6536	LS: ltgy, gy, mgy, frm-hrd, dns, cln, mic-fxln, v. arg
Hamilton Shale	6338	6377	6536	6771	SH:drkgy,v.drkgy,frm,slty, grty,sbblky-sbfiss,carb,modv. calc,lse calct,w/LS
Marcellus Shale	6377		6771		SH:drkgy,v.drkgy,frm,slty, grty,sbblky-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 PA 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 1/12/2016
 Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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API: 47-5101706	Well Name: Berger	Well Number: 6H
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DRILLING CONTRACTORS		
Driller	Driller	Driller
Name Rocky Mountain Drilling	Name Highlands Drilling LLC	Name Nabors Drilling USA
Address 185 North Vernal Avenue, Suite 2	Address 900 Virginia Street East	Address 10100 NW 10th Street
City - State - Zip Vernal, UT 84078	City - State - Zip Charlestown, WV 25301	City - State - Zip Oklahoma City, OK 73127

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API: 47-5101706	Well Name: Berger	Well Number: 6H
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CEMENTING CONTRACTORS		
Name Schlumberger Technology Corp	Name Baker Hughes	Name
Address Two Robinson Plaza, Suite 200	Address 5373 West Alabama, Suite 300	Address
City - State - Zip Pittsburgh, PA 15205	City - State - Zip Houston, TX 77056	City - State - Zip

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Well is located on topo map 142' feet south of Latitude: 39° 52' 30"

Well is located on topo map 1285' feet west of Longitude: 80° 45' 00"

AS DRILLED PLAT



NOTES:

1. There are no water wells or developed springs within 250' of proposed well.
2. There are no existing buildings within 625' of proposed well.
3. Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
4. There are no native trout streams within 300' of proposed well.
5. Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
6. 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 APPROX. LANDING POINT
 UTM 17-NAD83
 N:4414064.54
 E:520722.54
 NAD83, WV NORTH
 N:503792.32
 E:1615542.09

PERMITTED APPROX. LANDING POINT
 UTM 17-NAD83
 N:4413986.51
 E:520751.67
 NAD83, WV NORTH
 N:503634.66
 E:1615633.95

AS DRILLED BOTTOM HOLE LOCATION (BHL)
 UTM 17-NAD83
 N:4415186.02
 E:519813.42
 NAD83, WV NORTH
 N:507522.31
 E:1612620.29

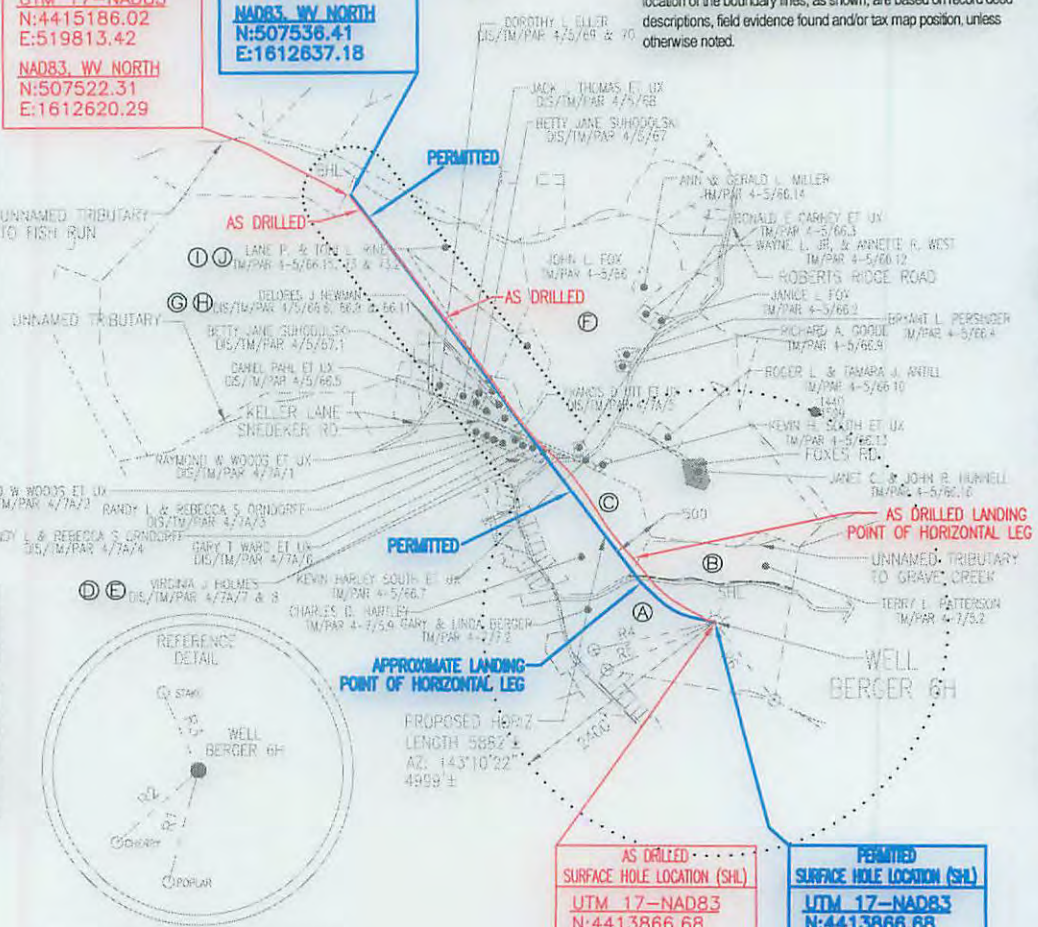
PERMITTED BOTTOM HOLE LOCATION (BHL)
 UTM 17-NAD83
 N:4415180.39
 E:519818.34
 NAD83, WV NORTH
 N:507538.41
 E:1612637.18

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



PARCEL	LESSOR
A	GARY & LINDA BERGER
B	TERRY L. PATTERSON
C	CHARLES HARTLEY
D	VIRGINIA HOLMES
E	VIRGINIA HOLMES
F	MARY PERSINGER
G	DELORES J. NEWMAN
H	DELORES J. NEWMAN
I	LANE P. & TONI L. RINE
J	LANE P. & TONI L. RINE

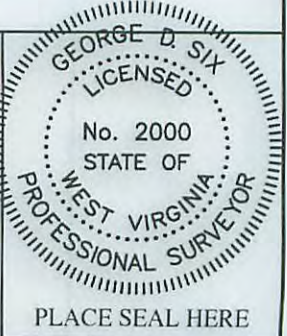
LINE	BEARING	DISTANCE
R1	S 14° 35' 59" W	240.30'
R2	S 47° 39' 04" W	225.24'
R3	N 24° 29' 11" W	125.35'
R4	S 77° 10' 57" W	225.09'
R5	S 65° 15' 48" W	1214.24'
R6	S 37° 39' 32" E	1001.25'

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

FILE #: BERGER 6H-AS DRILLED
 DRAWING #: BERGER 6H-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



(+) 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 6H-AS DRILLED
 API WELL #: 47 51 01706
 STATE COUNTY PERMIT

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

WATERSHED: MIDDLE GRAVE CREEK - GRAVE CREEK ELEVATION: 1287.50'

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: 450.826±

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: 11,955'±

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

02/26/2016

Office of Oil and Gas

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/3/2015
Job End Date:	11/15/2015
State:	West Virginia
County:	Marshall
API Number:	47-051-01706-01-00
Operator Name:	Chevron USA Inc.
Well Name and Number:	Berger 6H
Longitude:	-80.75461100
Latitude:	39.87458800
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,313
Total Base Water Volume (gal):	9,357,587
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	89.80346	
Proppant	Schlumberger	Proppant					
			Crystalline Silica	14808-60-7	100.00000	10.08270	
7.5% Acid	Schlumberger	Perf Cleanup					
			Hydrochloric Acid	7647-01-0	8.00000	0.00728	
J580	Schlumberger	Gelling Agent					
			Carbohydrate Polymer	Proprietary	100.00000	0.00235	
M300	BASF Corporation	Biocide					
			Water	7732-18-5	75.00000	0.00168	
			Glutaral	111-30-8	25.00000	0.00056	
U042	Schlumberger	Iron Chelating Agent					
			Tetrasodium ethylenediaminetetraacetate	64-02-8	60.00000	0.00165	
			Trisodium nitrilotriacetate (impurity)	5064-31-3	10.00000	0.00027	
			Sodium hydroxide	1310-73-2	5.00000	0.00014	
L058	Schlumberger	Iron Stabilizer					
			Sodium erythorbate	6381-77-7	100.00000	0.00033	
B317	Schlumberger	Scale Inhibitor					

			Trisodium ortho phosphate	7601-54-9	5.00000	0.00011	RECEIVED Office of Oil and Gas JAN 13 2016
			Ethane-1,2-diol	107-21-1	5.00000	0.00011	
A264	Schlumberger	Corrosion Inhibitor					
			Methanol	67-56-1	40.00000	0.00004	
			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	0.00004	
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)