

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

API 47-103-02764 County Wetzel District Green  
Quad Pine Grove Pad Name Mills-Wetzel Field/Pool Name Heather  
Farm name WV Conservation Commission Well Number #23H  
Operator (as registered with the OOG) Stone Energy Corporation  
Address 1300 Fort Pierpont Dr. - Suite 201 City Morgantown State WV Zip 26508

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,373,421 Easting 528,107  
Landing Point of Curve Northing 4,373,529 Easting 527,628  
Bottom Hole Northing 4,375,085 Easting 526,536

Elevation (ft) 1,293 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)  
Saturated salt mud which includes Caustic Soda, Barite, Lime, New-Drill, Perma-Lose HT, Xan-Plex D, X-Cide 102, Soda Ash, and Sodium Chloride

Date permit issued 6/13/2012 Date drilling commenced 1/2/2013 Date drilling ceased 8/11/2013  
Date completion activities began 9/12/2013 Date completion activities ceased 7/14/2014  
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 60 Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1,291 Void(s) encountered (Y/N) depths Received N  
Coal depth(s) ft 910 Cavern(s) encountered (Y/N) depths Office of Oil & Gas  
Is coal being mined in area (Y/N) N

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Reviewed by:  
A.L. 5/6/15  
W.S. 6/10/15  
**06/12/2015**

API 47-103 - 02764 Farm name WV Conservation Commission Well number #23H

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	24"	20"	55'	New	LS		Y - GTS
Surface	17.5"	13.375"	1,290'	New	J55	123' & 207'	Y - CTS
Coal	17.5"	13.375"	1,290'	New	J55	123' & 207'	Y - CTS
Intermediate 1	12.25"	9.625"	2,757'	New	J55		Y - CTS
Intermediate 2							
Intermediate 3							
Production	8.75"	5.5"	14,279'	New	P110		Y
Tubing	N/A	2.375"	7,850'	New	N80		N/A
Packer type and depth set							

Comment Details 13.375" casing string circulated 34 bbls cement to surface, 9.625" casing string circulated 48 bbls cement to surface. 5.5" casing string TOC @ 1,140'.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Type 1	34	15.6	1.18	40	Surface	24.0
Surface	Class "A"	980	15.6	1.19	1,166	Surface	8.0
Coal	Class "A"	996	15.6	1.19	1,166	Surface	8.0
Intermediate 1	Lead-FlexSeal Tail-Class "A"	Lead-540 Tail-420	Lead-15.0 Tail-15.5	Lead-1.26 Tail-1.19	Lead-680 Tail-500	Surface	12.0
Intermediate 2							
Intermediate 3							
Production	Lead-GasStop Tail-HalCem	Lead-921 Tail-1,930	Lead-15.0 Tail-15.6	Lead-1.26 Tail-1.20	Lead-1,160 Tail-2,316	1,140'	7.0
Tubing							

Drillers TD (ft) 14,299 MD / 7,217 TVD Loggers TD (ft) N/A  
 Deepest formation penetrated Marcellus Shale Plug back to (ft) \_\_\_\_\_  
 Plug back procedure \_\_\_\_\_

Kick off depth (ft) 6,474 MD / 6,434 TVD

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/Coal casing had bow spring centralizers placed on joints #s 2,4,6,8,12,14,16,18,20,22,24 and 26. Intermediate casing had bow spring centralizers placed on joints #s 3,6,9,12,15,18,21,24,27,30,33,36,39,42,45,48,51,54,57,60,63 and 66. The production casing has rigid spiral alternating left/right centralizers placed beginning on joint #1 and then every fourth joint up to the top of curve at joint #145. From there bow spring centralizers were placed beginning on joint #148 and then every seventh joint to joint #247. A total of 37 rigid left/right centralizers were used and 34 bow spring centralizers were used. The joint numbers begin at TD of each individual casing string and increase as you climb towards the surface.

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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API 47- 103 - 02764 Farm name WV Conservation Commission Well number #23H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	1/18/14	13,986	14,174	72	Marcellus Shale
2	4/1/14	13,712	13,907	72	Marcellus Shale
3	4/3/14	13,441	13,633	72	Marcellus Shale
4	4/4/14	13,188	13,373	72	Marcellus Shale
5	4/5/14	12,928	13,118	72	Marcellus Shale
6	4/6/14	12,665	12,857	72	Marcellus Shale
7	4/7/14	12,401	12,592	72	Marcellus Shale
8	4/8/14	12,134	12,320	72	Marcellus Shale
9	4/9/14	11,871	12,063	72	Marcellus Shale
10	4/10/14	11,615	11,803	72	Marcellus Shale
11	4/11/14	11,356	11,548	72	Marcellus Shale
12	4/12/14	11,091	11,288	72	Marcellus Shale
13	4/14/14	10,831	11,023	72	Marcellus Shale
14	4/16/14	10,572	10,763	72	Marcellus Shale
15	4/18/14	10,313	10,503	72	Marcellus Shale
16	4/20/14	10,0048	10,243	72	Marcellus Shale

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)
1	4/1/14	78.9	8,404	6,349	4,380	368,660	10,055	
2	4/3/14	81.4	8,403	6,315	4,830	411,040	9,044	
3	4/4/14	81.7	8,129	6,118	4,614	409,780	8,315	
4	4/5/14	84.5	8,186	6,592	4,659	406,360	8,628	
5	4/6/14	80.1	8,634	7,363	4,477	381,880	8,868	
6	4/7/14	83.1	8,165	6,900	4,416	405,820	8,434	
7	4/8/14	80.2	8,057	7,047	4,659	407,060	8,728	
8	4/9/14	84.7	8,294	6,646	4,659	408,504	8,472	
9	4/10/14	77.0	8,031	6,578	5,025	411,562	8,565	
10	4/11/14	74.4	7,968	6,996	4,293	414,280	10,041	
11	4/12/14	80.0	7,625	6,442	5,146	412,375	8,629	
12	4/14/14	77.5	7,634	7,332	4,354	418,950	8,590	
13	4/16/14	77.0	8,031	6,578	5,025	411,562	8,565	
14	4/17/14	80.0	7,540	6,419	4,659	407,820	8,553	
15	4/20/14	85.1	7,903	6,712	4,782	406,889	8,438	
16	4/22/14	81.9	7,627	6,707	4,902	412,784	8,546	

Please insert additional pages as applicable.

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FEB 26 2015  
06/12/2015

API 47- 103 - 02764 Farm name WV Conservation Commission Well number #23H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
17	4/22/14	9,784	9,975	72	Marcellus Shale
18	4/23/14	9,517	9,710	72	Marcellus Shale
19	4/25/14	9,252	9,448	72	Marcellus Shale
20	4/27/14	8,995	9,183	72	Marcellus Shale
21	4/29/14	8,733	8,923	72	Marcellus Shale
22	4/30/14	8,474	8,663	72	Marcellus Shale
23	5/2/14	8,206	8,403	72	Marcellus Shale
24	5/4/14	7,946	8,138	72	Marcellus Shale

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)
17	4/23/14	84.9	7,405	7,081	3,421	416,727	6,454	
18	4/25/14	85.0	7,409	6,878	4,902	408,440	8,452	
19	4/27/14	81.3	7,969	7,301	4,964	409,720	8,369	
20	4/29/14	81.9	7,552	6,541	4,782	414,500	8,703	
21	4/30/14	84.9	7,431	7,567	4,293	408,640	8,227	
22	5/2/14	83.5	7,492	6,786	4,830	410,180	8,363	
23	5/4/14	83.4	7,423	7,096	4,091	410,640	8,372	
24	5/5/14	80.7	7,307	6,542	4,964	411,080	8,323	

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Office of Oil & Gas  
FEB 26 2015

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API 47- 103 - 02764 Farm name WV Conservation Commission Well number #23H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>
<u>Marcellus Shale</u>	<u>7,278' to 7,225'</u> TVD <u>7,946' to 14,174'</u> MD
_____	_____
_____	_____
_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 2,183 psi Bottom Hole 4,294 calculated psi DURATION OF TEST 58 hrs

OPEN FLOW Gas 4,679 mcfpd Oil \_\_\_\_\_ bpd NGL 79.1 bpd Water 520.0 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 <sub>2</sub> S, ETC)
	<u>0</u>		<u>0</u>		
See Attached Sheet	Page 6 of 14				

Please insert additional pages as applicable.

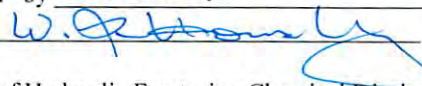
Drilling Contractor Nomac Drilling (top-hole) & Saxon Drilling (horizontal)  
Address 171 Locust Ave. Ext. / 9303 New Trails Drive City Mount Morris / The Woodlands State PA / TX Zip 15349 / 77381

Logging Company Scientific Drilling and Schlumberger  
Address 116 Vista Dr. / 1178 US HWY 33 East City Charleroi / Weston State PA / WV Zip 15022 / 26452

Cementing Company Schlumberger / Halliburton  
Address 1178 US HWY 33 East City Weston / Jane Lew State WV Zip 26452 / 26378

Stimulating Company Schlumberger  
Address 1178 US HWY 33 East City Weston State WV Zip 26452

Please insert additional pages as applicable.

Completed by W. Lee Hornsby Telephone 304-225-1600  
Signature  Title Drilling Engineer Date 2/24/2015

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MILL-WETZEL #23H  
 API 47-103-02764  
 Stone Energy Corporation

	Horizontal		Bottom (ft TVD)	Bottom (ft MD)	
	Top (ft TVD)	Top (ft MD)			
Sandstone & Shale	Surface	*	910		FW @ 60'
Coal	910	*	913		
Sandstone & Shale	913	*	2,190		SW @ 1,291'
Little Lime	2,190	*	2,220		
Big Lime	2,220	*	2,365		
Big Injun	2,365	*	2,422		
Sandstone & Shale	2,422	*	2,851		
Berea Sandstone	2,851	*	2,881		
Shale	2,881	*	3,055		
Gordon	3,055	*	3,105		
Undiff Devonian Shale	3,105	*	5,358		
Riley Shale	5,358	*	5,465		
Benson Siltstone	5,465	*	5,713		
Pipe Creek Shale	5,713	*	5,722		
Undiff Devonian Shale	5,722	~	5,995	6,029	
Rhinestreet	5,995	6,029	~	6,899	6,996
Cashaqua	6,899	6,996	~	7,019	7,171
Middlesex	7,019	7,171	~	7,089	7,297
West River	7,089	7,297	~	7,148	7,458
Geneseo	7,148	7,458	~	7,182	7,532
Tully Limestone	7,182	7,532	~	7,205	7,607
Hamilton Shale	7,205	7,607	~	7,263	7,847
Marcellus	7,263	7,847	~	7,217	14,299
TD			7,217		14,299

\* From Pilot Hole Log and Driller's Log

~ From MWD Gamma Log

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FEB 26 2015

06/12/2015

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	5/4/2014
State:	West Virginia
County/Parish:	Wetzel County
API Number:	47-103-02764
Operator Name:	Stone Energy
Well Name and Number:	Mills Wetzel #23H
Longitude:	528,107
Latitude:	4,373,421
Long/Lat Projection:	
Production Type:	
True Vertical Depth (TVD):	0
Total Water Volume (gal)*:	8640858

## 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
Proppant Transport	Schlumberger	Corrosion Inhibitor, Bactericide (Myacide GA25), Scale Inhibitor, Surfactant, Acid, Breaker, Gelling Agent, Friction Reducer, Iron Control Agent, Clay Control Agent, Propping Agent, Fluid Loss	Water (Including Mix Water Supplied by Client)*	NA		87.75576%	
			Crystalline silica	14808-60-7	98.58668%	12.07119%	
			Hydrochloric acid	7647-01-0	0.79624%	0.09749%	
			Carbohydrate polymer	Proprietary	0.55084%	0.06745%	
			Ammonium sulfate	7783-20-2	0.21571%	0.02641%	
			Polyethylene glycol monohexyl ether	31726-34-8	0.06732%	0.00824%	
			Glutaraldehyde	111-30-8	0.04651%	0.00569%	
			Urea	57-13-6	0.03595%	0.00440%	
			Diammonium peroxodisulfate	7727-54-0	0.01251%	0.00153%	
			Calcium chloride	10043-52-4	0.01065%	0.00130%	
			Dicoco dimethyl quaternary ammonium chloride	61789-77-3	0.00518%	0.00063%	
			Trisodium ortho phosphate	7601-54-9	0.00434%	0.00053%	
			Ethane-1,2-diol	107-21-1	0.00434%	0.00053%	
			Sodium erythorbate	6381-77-7	0.00347%	0.00042%	
			Methanol	67-56-1	0.00305%	0.00037%	
			Aliphatic alcohols, ethoxylated #2	Proprietary	0.00229%	0.00028%	
			Aliphatic acids	Proprietary	0.00229%	0.00028%	
			Prop-2-yn-1-ol	107-19-7	0.00076%	0.00009%	

\* 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%

Report ID: RPT-27150 (Generated on 5/14/2014 5:04 PM)

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.

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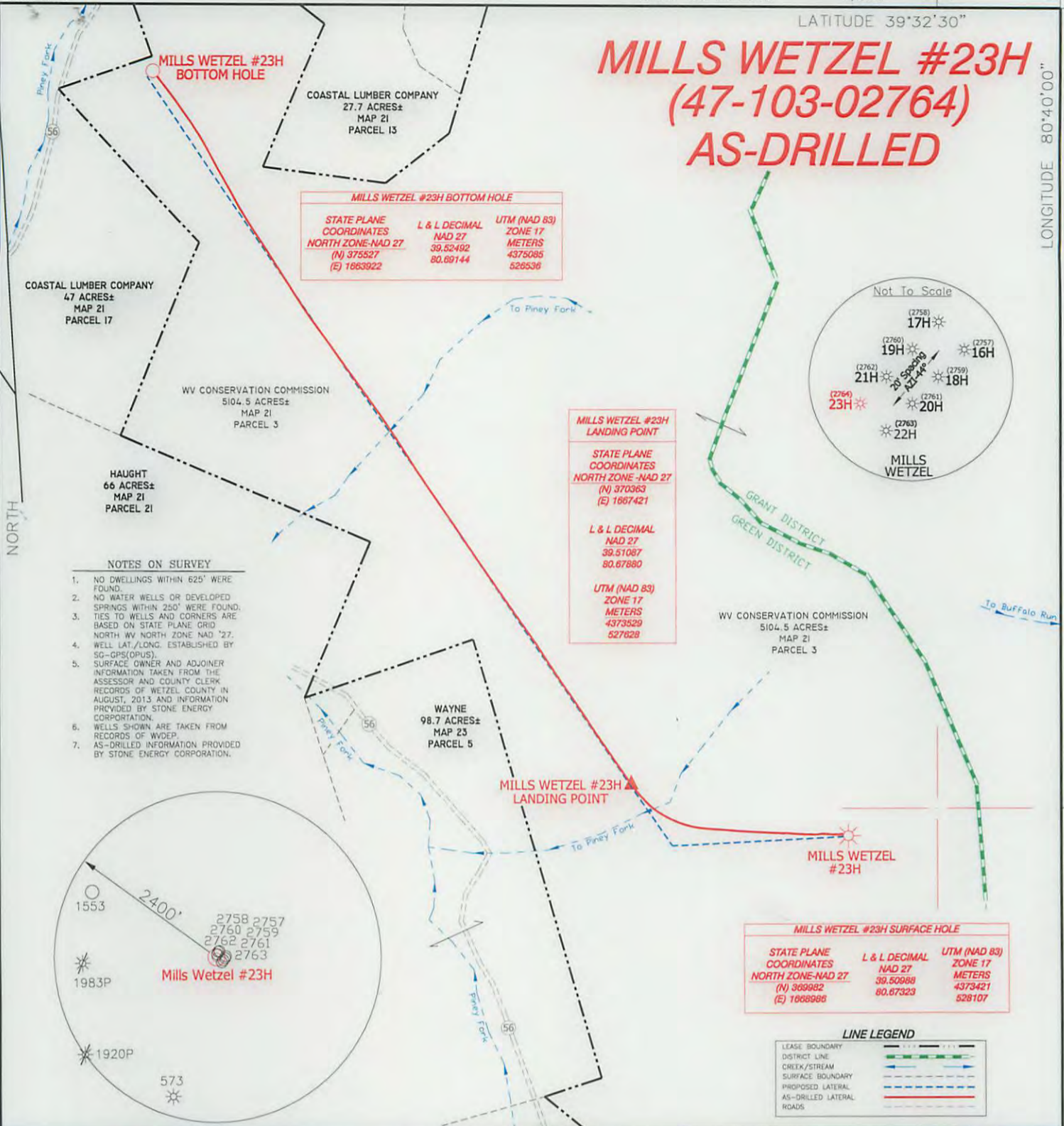
06/12/2015

# MILLS WETZEL #23H (47-103-02764) AS-DRILLED

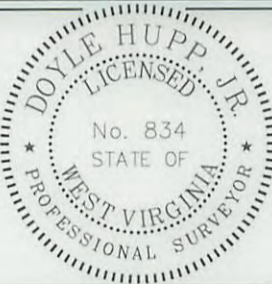
LONGITUDE 80°40'00"

11,650'

LAT. 39°30'35.6"



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 DIVISION OF ENVIRONMENTAL PROTECTION.



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

DATE DECEMBER 18, 2014

OPERATORS WELL NO. MILLS WETZEL #23H

API WELL NO. 47-103-02764

STATE COUNTY PERMIT

P.S. 834

*Doyle Hupp, Jr.*

**HUPP Surveying & Mapping**  
P.O. Box 647 Grantsville, WV 26147  
(304) 354-7035 EMAIL: hupp@frontiernet.net

MINIMUM DEGREE OF ACCURACY 1/2500 FILE NO. W1719 (BK75-3)

PROVEN SOURCE OF ELEVATION SG-GPS (OPUS) SCALE 1" = 1000'

STATE OF WEST VIRGINIA  
DIVISION OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS

WELL TYPE : OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  IF "GAS" PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION : ELEVATION 1293' WATERSHED TRIBUTARY OF PINEY FORK

DISTRICT GREEN COUNTY WETZEL QUADRANGLE PINE GROVE 7.5'

SURFACE OWNER WEST VIRGINIA CONSERVATION COMMISSION ACREAGE 5104.5 ±

ROYALTY OWNER MILLS WETZEL LAND Inc. LEASE ACREAGE 5104.5± **06/12/2015**

PROPOSED WORK : LEASE NO. \_\_\_\_\_

DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG AND ABANDON  CLEAN OUT AND REPLUG  OTHER \_\_\_\_\_

PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION MARCELLUS

ESTIMATED DEPTH 7,216' TVD 14,299' MD

WELL OPERATOR STONE ENERGY CORPORATION DESIGNATED AGENT TIM MCGREGOR

ADDRESS P.O. BOX 52807 LAFAYETTE, LA 70508 ADDRESS 1300 FORT PIERPONT DR., SUITE 201 MORGANTOWN, WV 26508

COUNTY NAME

PERMIT