

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

API 47 - 103 - 02995 County Wetzel District Grant
Quad Pine Grove Pad Name WVDNR Pad 6 Field/Pool Name Jacksonburg
Farm name WV Conservation Commission Well Number WVDNR # 1410
Operator (as registered with the OOG) Triad Hunter, LLC
Address 777 Post Oak Blvd. Suite 910 City Houston State Texas Zip 77056

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4372892 Easting 529440
Landing Point of Curve Northing 4372690 Easting 529199
Bottom Hole Northing 4371560 Easting 530019

Elevation (ft) 1460' 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 Base Mud System

Date permit issued 6/9/14 Date drilling commenced 8/25/14 Date drilling ceased 9/19/14
Date completion activities began 11/21/14 Date completion activities ceased 12/19/14
Verbal plugging (Y/N) N Date permission granted N/A Granted by _____

N/A RECEIVED
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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug
Freshwater depth(s) ft Surface - 300' Open mine(s) (Y/N) depths _____
Salt water depth(s) ft 1400' - 2400' Void(s) encountered (Y/N) depths _____
Coal depth(s) ft Unknown Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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Reviewed by:
JK
WS 7/01/15

API 47- 103 - 02995 Farm name WV Conservation Commission Well number WVDNR # 1410

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	26"	20"	100'	new	A53B 90 lb.	none	yes
Surface	17 1/2"	13 3/8"	1300'	new	J-55 54.5 lb.	none	yes - 50 bbls. cement returns
Coal							
Intermediate 1	12 1/4"	9 5/8"	3478'	new	J-55 36 lb.	none	Returns not reported
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	12,510'	new	P-110 20lb.	none	yes - 30 bbls. cement returns
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	Class A	190	15.6	1.18	224	surface	12+
Surface	Class A	1140	15.5	1.21	1379	surface	8 - 12
Coal							
Intermediate 1	Class A	1175	15.6	1.21	1422		8 - 12
Intermediate 2							
Intermediate 3							
Production	Varicem / Fraccem	1070 / 1370	13.6 / 15.2	1.53 / 1.28	3391	3382'	12+
Tubing							

Drillers TD (ft) 12,533' TMD 7560' TVD Loggers TD (ft) No open hole logs run in well

Deepest formation penetrated Marcellus Shale Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) @ 6000' _____

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 _____

13 3/8" - 1300' 3 centralizers

9 5/8" - 3478' 9 centralizers

5 1/2" - 12,510' 57 turbo centralizers in lateral & curve, and 12 bow centralizers in vertical section

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS RECEIVED Office of Oil and Gas

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS JUN 18 2015

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

API 47- 103 - 02995 Farm name WV Conservation Commission Well number WVDNR # 1410

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
	See Enclosed	Spread Sheet			

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)
	See	Enclosed	Spread Sheet					

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Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS		
Marcellus Shale	7,580'	TVD	12,533' MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3,400 psi Bottom Hole 6,683 psi DURATION OF TEST 288 hrs

OPEN FLOW Gas 6,000 mcfpd Oil 36 bpd NGL bpd Water 240 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)
WVDNR # 1410 H	0		0		** The pilot hole for WVDNR # 1410 H is the Mills Wetzel # 31 H-1 permit number 47-103-02339. A copy of the stratigraphic record
Warren	3268'	3322'			for the pilot hole is enclosed with this filing. Formation identification was
Geneseo	7325'	7360'	7556'	7609'	based on a correlation between the bond log from the WVDNR # 1410 H well
Tully	7360'	7470'	7609'	7780'	and the open hole log from Mills Wetzel # 31H-1 well.
Marcellus	7470'	Not Drilled	7780'	Not Logged	
			Cased hole log	T.D. = 7837' MD	WVDNR # 1410 H
					KOP = 6000' VD
					LP = 7950' MD
					BHL = 12,533' TMD

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA, LP
Address 515 West Greens Road, Suite 1000 City Houston State Texas Zip 77067

Logging Company Blue Dot Energy Services (KLX)
Address P.O. Box 784 City Bridgeport State WV Zip 26330

Cementing Company Halliburton Energy Services
Address 4999 East Point Drive City Zanesville State Ohio Zip 43702

Stimulating Company Producer Services Corp.
Address 109 S. Graham Street City Zanesville State Ohio Zip 43701

Please insert additional pages as applicable.

Completed by Ben Smeltzer Telephone (&40) 760-0570
Signature Ben Smeltzer Title Geologist Date June 12, 2015

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

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MILLS WETZEL # 31 H-1 (Pilot Hole for WVDNR # 1410, # 1411, # 1412, & # 1413)

Permit # 47-103-02339

Lithology / Formation	Depth	Shows / Comments
Gordon Sandstone	2952' - N/A	No open hole logs above 3062'
9 5/8" Casing Point	3062'	
shale & siltstone	3062' - 3586'	
First Warren Sand	3586' -3628'	
shale	3628' - 3643'	
Second Warren Sand	3643' - 3654'	
shale & siltstone	3654' - 4799'	
Riley	4799' - 4818'	
shale & siltstone	4818' - 5207'	
Benson Sandstone	5207' - 5240'	
shale	5240' - 5574'	Base Huron Shale @ 5293'
Alexander Siltstone	5574' - 5616'	
shale	5616' - 6275'	
Rhinestreet Shale	6275' - 6790'	Slight Show Gas
Mahantango Formation	6790' - 7048'	
Geneseo Formation	7048' - 7086'	
Tully Limestone	7086' - 7152'	
Marcellus Shale	7152' - 7208'	Show Gas
Onondaga Limestone	7208' -7238'	

Driller's T.D = N/A

Logger's T.D. = 7238'

**Note: Revised from original WR-35
filing.**

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WVDNR 1410H

API	Total Depth (ft) (POTD)	Landing Point MD (ft)	Landing Point Angle (Degrees)	Effective Lateral Length (ft)	TVD (ft)	Tubing Depth (ft)	Tubing Size (OD)	Tubing Angle (Degrees)	Casing Depth (ft)	Casing Size (OD)
47-103-02995	12,533	8,030	90	4,503	7,580				12,510	5 1/2

Stages	Perforation Intervals	Footage	Stage Intervals	Footage	Total Volume (bbl)	Average Rate (bpm)	Formation Break (')	Average Pressure (')	80/100 Mesh Pumped (lb)	30/50 Mesh Pumped (lb)	20/40 Mesh /CRC Pumped (lb)	Total Sand Pumped (lb)	ISIP (')	Completed per design	Notes on Frac
	Actual Length		Actual Length												
STAGE #1	12,242'-12,393'	151	12,415'-12,211'	204	8,009	72	6,188	6,834	49,000	174,500	0	223,500	3,625		
STAGE #2	12,044'-12,202'	158	12,211'-12,030'	181	7,647	72	N/A	7,099	49,100	80,400	0	129,500	4,513		
STAGE #3	11,846'-12,005'	159	12,030'-11,832'	198	9,613	72		6,829	49,000	320,000	94,200	463,200	4,513		
STAGE #4	11,649'-11,807'	158	11,832'-11,634'	198	8,677	71	6,026	7,250	49,000	172,000	27,400	248,400	4,519		
STAGE #5	11,451'-11,609'	158	11,634'-11,432'	202	7,136	74	5,996	6,738	49,000	174,000	0	223,000	4,623		
STAGE #6	11,251'-11,410'	159	11,432'-11,239'	193	9,278	70	5,812	6,738	49,000	320,400	0 / 66,300 CRC	435,700	7,750		
STAGE #7	11,054'-11,212'	158	11,239'-11,038'	201	9,779	74	6,987	7,064	49,000	320,100	72,800	441,900	5,610		
STAGE #8	10,856'-11,014'	158	11,038'-10,843'	195	10,090	76	7,439	7,049	49,000	320,400	90,900	460,300	4,923		
STAGE #9	10,660'-10,818'	158	10,843'-10,642'	201	10,014	85	6,900	7,384	49,000	320,400	90,900	460,300	4,898		
STAGE #10	10,463'-10,621'	158	10,642'-10,448'	194	10,097	76	7,193	6,909	49,200	320,600	90,700	460,500	5,597		
STAGE #11	10,265'-10,423'	158	10,448'-10,250'	198	10,788	83	6,631	7,138	49,000	320,400	90,900	460,300	5,385		
STAGE #12	10,065'-10,223'	158	10,250'-10,053'	197	10,146	83	6,360	6,756	49,000	320,400	90,900	460,300	5,267		
STAGE #13	9,867'-10,025'	159	10,053'-9,851'	202	10,279	79	6,062	7,135	49,200	320,200	29,800	399,200	5,690		
STAGE #14	9,672'-9,830'	158	9,851'-9,657'	194	9,822	84	6,254	6,823	49,000	320,400	90,900	460,300	5,332		
STAGE #15	9,472'-9,630'	158	9,657'-9,457'	200	9,850	82	6,353	6,963	49,000	320,000	79,400	448,400	5,401		
STAGE #16	9,274'-9,432'	158	9,457'-9,262'	195	11,537	75	5,988	6,955	49,000	320,400	90,900	460,300	5,460		
STAGE #17	9,079'-9,237'	158	9,262'-9,064'	198	10,711	77	6,153	6,769	49,000	321,100	90,900	461,000	5,941		
STAGE #18	8,879'-9,037'	158	9,064'-8,866'	198	9,712	85	5,899	6,664	49,000	320,400	90,900	460,300	5,111		
STAGE #19	8,681'-8,839'	158	8,866'-8,667'	199	9,466	83	5,450	6,644	49,000	321,100	90,900	461,000	5,200		
STAGE #20	8,484'-8,642'	158	8,667'-8,471'	196	10,156	82	5,990	6,846	49,000	320,400	90,300	459,700	5,953		
STAGE #21	8,288'-8,446'	158	8,471'-8,271'	200	10,005	81	5,945	6,816	49,200	320,600	90,700	460,500	4,071		
STAGE #22	8,090'-8,248'	158	8,271'-8,076'	195	9,904	83	6,559	6,678	49,000	320,500	90,300	459,800	4,984		
STAGE #23	7,890'-8,049'	159	8,076'-		9,823	83	6,974	6,610	49,000	320,400	83,800	453,200	5,019		

Total	23	3,631	4,339	222,484					1,127,700	6,689,100	1,633,800	9,450,600			
Average		158	197	9,673	78	6,341	6,900	49,030	290,830	78,309	410,896	5,230			

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WVDNR Well Number Permit Number District / County
 1410 H 47-103-02995 Grant / Wetzel

CHEMICAL SUMMARY

STAGE #	SURFACTANT (gals.)	BIOCIDE (gals.)	SCALE INHIBITOR (gals.)	FRICTION REDUCER (gal.)	LINEAR GEL (gal.)	SP BREAKER (gal.)	7.5% HCL ACID (gals.)	15% HCL ACID (gals.)
1	290	77	55	290	305	1	0	3000
2	300	110	55	305	88	1	0	6,000
3	380	110	62	420	382	2	0	3000
4	385	120	60	400	442	1.4	0	3000
5	290	115	23	280	127	1	0	3,000
6	360	110	7	375	636	2.6	0	3000
7	0	114	62	528	630	2.4	0	1,500
8	202	156	58	435	540	2	3000	0
9	200	150	50	401	575	2.1	3000	0
10	250	160	60	460	594	2.4	3000	0
11	227	175	60	440	578	2.5	3000	0
12	317	135	60	433	456	1.3	3000	0
13	380	125	75	412	714	2.5	3000	0
14	200	80	60	460	498	2.2	3000	0
15	207	140	60	450	534	2	3000	0
16	275	150	62	440	563	2.2	3000	0
17	215	156	100	460	548	2.1	3000	0
18	210	105	53	406	533	1.9	3000	0
19	200	104	58	384	526	2	3000	0
20	312	115	62	443	525	2.2	3000	0
21	225	105	50	470	628	2.3	3000	0
22	200	106	62	380	542	2.3	3000	0
23	200	140	50	390	525	2	3000	0
TOTALS:								
23	5,825	2,858	1,304	9,462	11,489	45	48,000	22,500
<i>Stages</i>	<i>Gals</i>	<i>Gals</i>	<i>Gals</i>	<i>Gals</i>	<i>Gals</i>	<i>Gals</i>	<i>Gals</i>	<i>Gals</i>

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****CELLS WITH BLUE BACKGROUND ARE THE ONLY CELLS TO BE EDITED****

Fracture Start Date/Time:	11/21/2014 14:41:00 PM
Fracture End Date/Time:	12/19/14 9:40
State:	WV
County:	Wetzel
API Number:	47-103-02995-0000
Operator Number:	494494833
Well Name:	WV DNR 1410
Federal Well:	No
Longitude:	-80.65774
Latitude:	39.50507
Long/Lat Projection:	NAD27
True Vertical Depth (TVD):	7,580'
Total Clean Fluid Volume* (gal):	9,344,328



(e.g. XX-XXX-XXXX-0000)



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Additive	Specific Gravity	Additive Quantity	Mass (lbs)
Water	1.00	9,344,328	77,978,417
Sand (Proppant)	2.65	9,449,700	9,449,700
Hydrochloric Acid (7.5%)	1.04	69,000	598,837
PROHIB II	0.97	93	753
PRO FR 2000	1.00	9,462	78,960
PRO GEL 4.0L	1.04	11,507	99,867
PRO BREAKER 4	1.26	11	116
MB 7530	1.24	2,843	29,419
PRO SCALE STOP 2000	1.06	1,304	11,535
STIMOIL EN	1.26	6,133	64,487

gal
lb
gal
gal
gal
gal
gal
gal
gal
gal
gal
gal
gal
gal
gal

Total Slurry Mass (Lbs)
88,312,090

Ingredients Section:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Mass per Component (LBS)	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Company 1	Carrier/Base Fluid	Water	7732-18-5	100.00%	77,978,417	88.29869%	
Sand (Proppant)	PSC	Proppant	Silica Substrate		100.00%	9,449,700	10.70035%	
Hydrochloric Acid (7.5%)	Producers Service Corp	Acidizing	Hydrochloric Acid	7647-01-0	7.50%	44,913	0.05086%	
PROHIB II	Producers Service Corp	Inhibitor	Ethoxylated Nonylphenol	68412-54-4	10.00%	75	0.00009%	
			Dimethylecoamine, bis(chloroethyl)ether, diquatena	68607-28-3	60.00%	452	0.00051%	
			Ethylene Glycol	107-21-1	40.00%	301	0.00034%	
			Glycol Ethers	111-76-2	40.00%	301	0.00034%	
			Methanol	67-56-1	30.00%	226	0.00026%	
			Propargyl Alcohol	107-19-7	30.00%	226	0.00026%	
PRO FR 2000	Producers Service Corp	Friction Reducer	Petroleum Distillate	064742-47-8	24.00%	18,950	0.02146%	
PRO GEL 4.0L	Producers Service Corp	Gelling Agent	Distillates (Petroleum), hydrotreated light	64742-47-8	65.00%	64,914	0.07350%	
			Nonylphenol, Ethoxylate	9016-45-9	5.00%	4,993	0.00565%	
			Guar Gum	9000-30-0	50.00%	49,933	0.05654%	
			Nonionic Surfactant	60828-78-6	5.00%	4,993	0.00565%	
			Nomonic Surfactant	60828-78-6	5.00%	4,993	0.00565%	
PRO BREAKER 4	Producers Service Corp	Breaker	Ethylene Glycol	107-21-1	40.00%	46	0.00005%	
			Sucrose	57-50-1	40.00%	46	0.00005%	
			Polyether Polyol	9003-11-6	1.00%	1	0.00000%	
			Sodium Bicarbonate	144-55-8	1.00%	1	0.00000%	
			Hexamethylenetetramine	100-97-0	1.00%	1	0.00000%	
			Proprietary Ingredient	Proprietary	1.00%	1	0.00000%	
			Proprietary Ingredient	Proprietary	1.00%	1	0.00000%	
			Proprietary Ingredient	Proprietary	1.00%	1	0.00000%	
			Water	7732-18-5	Proprietary	0	0.00000%	
MB 7530	Producers Service Corp	Biocide	Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thion	533-74-4	24.00%	7,061	0.00799%	
			Sodium Hydroxide	1310-73-2	4.00%	1,177	0.00133%	
PRO SCALE STOP 2000	Producers Service Corp	Scale Inhibitor	Organic Phosphate	71050-62-9	25.00%	2,884	0.00327%	
STIMOIL EN	Producers Service Corp	Surfactant	Isopropyl Alcohol	67-63-0	30.00%	19,346	0.02191%	
			Citrus Terpenes	68647-72-3	5.00%	3,224	0.00365%	