

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

API 47 - 017 - 06385 County Doddridge District West Union
Quad West Union 7.5' Pad Name WEU51 Field/Pool Name _____
Farm name Jane Hardin Trustee/Mary Holland Well Number 514663
Operator (as registered with the OOG) EQT Production Company
Address 625 Liberty Ave. EQT Plaza, Suite 1700 City Pittsburgh State PA Zip 15222

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,345,185 Easting 520,435
Landing Point of Curve Northing 4,345,102 Easting 520,596
Bottom Hole Northing 4,343,025 Easting 521,606

Elevation (ft) 1208 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)
SBM 12.5ppg - powdered hydrocarbon resin, calcium carbonate, ground almond hulls, barium sulfate, calcium chloride, lecithin liquid, organophilic clay, polyaminated fatty acid, calcium hydroxide, polyimide surfactant, modified fatty acid, dimer.trimer fatty acid, ground walnut hulls, refined base oil.

Date permit issued 1/31/2014 Date drilling commenced 5/29/2014 Date drilling ceased 10/9/2014
Date completion activities began 3/15/2015 Date completion activities ceased 3/28/2015
Verbal plugging (Y/N) N Date permission granted N/A Granted by Office of Oil & Gas

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

Freshwater depth(s) ft 334 Open mine(s) (Y/N) depths N
Salt water depth(s) ft _____ Void(s) encountered (Y/N) depths N
Coal depth(s) ft 101,170,294,314,486,555 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:
JR 8/26/15
10/23/2015

API 47-017 - 06385

Farm name Jane Hardin Trustee/Mary Holland Well number 514663

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	28"	26"	40'	New	82.6#/ft		Y
Surface	17-1/2"	13-3/8"	1187.75'	New	54.5#/ft	234', 561'	Y
Coal							
Intermediate 1	12-3/8"	9-5/8"	5343.3'	New	40#/ft	3151'	Y
Intermediate 2							
Intermediate 3							
Production	8-1/2"	5-1/2"	14,869'	New	20#/ft	N/A	N
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	49	15.6	1.18	57.82	0	8
Surface	Class A	985	15.7	1.19	1172.15	0	8
Coal							
Intermediate 1	Class A	385/340/985	14.2/15.6/15.6	1.26/1.18/1.18	2048.6	0	8
Intermediate 2							
Intermediate 3							
Production	Class A/Class H	305/1020	14.2/15.2	1.26/1.97	2394	5375'	72
Tubing							

Drillers TD (ft) 14,885'

Loggers TD (ft) 6813'

Deepest formation penetrated Onondaga

Plug back to (ft) 5382'

Plug back procedure Orbited 80 into the Onondaga. Trip out hole to @ 6175' pumped 1 bbl H2O. 37 6 bbls on 1.2 bbls H2O. Trip out hole @ 5651' pumped 2 bbls H2O. 37 6 bbls on 2 bbls H2O. Trip out of hole to @ 4560' 2 bbls H2O. 40 9 bbls on 20 bbls H2O

Kick off depth (ft) 5387'

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 Conductor-N/A

Surface-bow spring centralizers set at 992', 500'

Intermediate-bow spring centralizers set at 5294', 4811', 4329', 3847', 3367', 2910', 2430', 1948', 1466', 984', 502'

Production- Composite bodied centralizers on every joint from Shoe track up to 5,000' MD

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

API 47- 017 - 06385

Drilling Contractor: Savanna Drilling

Address: 2204 Timberloch Place Suite 230

City: Woodlands

State: TX

Zip: 77380

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Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
FRESH WATER ZONE	0	0	334	334
SAND / SHALE	0	0	101	101
WASHINGTON COAL	101	101	104	104
SAND / SHALE	104	104	170	170
WAYNESBURG A COAL	170	170	172	172
SAND / SHALE	172	172	294	294
COAL	294	294	298	298
SAND / SHALE	298	298	314	314
UNIONTOWN COAL	314	314	317	317
SAND / SHALE	317	317	486	486
REDSTONE COAL	486	486	487	487
SAND / SHALE	487	487	555	555
PITTSBURGH COAL	555	555	558	558
SAND / SHALE	558	558	1,478	1,478
MAXTON	1,478	1,478	1,874	1,874
BIG LIME	1,874	1,874	1,943	1,943
KEENER	1,943	1,943	2,173	2,173
WEIR	2,173	2,173	2,369	2,369
BEREA	2,369	2,369	2,375	2,375
GANTZ	2,375	2,375	2,489	2,489
50F	2,489	2,489	2,579	2,579
30F	2,579	2,579	2,723	2,723
4TH	2,723	2,723	2,916	2,916
BAYARD	2,916	2,916	3,233	3,233
WARREN	3,233	3,233	3,294	3,294
SPEECHLEY	3,294	3,294	3,965	3,965
BALLTOWN A	3,965	3,965	4,241	4,241
BRADFORD	4,241	4,241	4,447	4,447
RILEY	4,447	4,447	4,884	4,884
BENSON	4,884	4,884	5,131	5,131
ALEXANDER	5,131	5,131	6,386	6,300
SONYEA	6,386	6,300	6,552	6,447
MIDDLESEX	6,552	6,447	6,620	6,502
GENESEE	6,620	6,502	6,754	6,594
GENESEO	6,754	6,594	6,804	6,623
TULLY	6,804	6,623	6,861	6,653
HAMILTON	6,861	6,653	6,912	6,675
MARCELLUS	6,912	6,675	14,885	6,755

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/15/2015
Job End Date:	3/28/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06385-00-00
Operator Name:	EQT Production
Well Name and Number:	514663
Longitude:	-80.76332600
Latitude:	39.25566400
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,755
Total Base Water Volume (gal):	14,086,548
Total Base Non Water Volume:	0



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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
Water	FTS International	Carrier/Base Fluid	Water	7732-18-5	100.00000	90.02860	None
Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100.00000	9.58571	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05734	None
Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.02770	None
FRW-600	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.02003	None
			Ammonium acetate	631-61-8	6.00000	0.00401	None
CI-150	FTS International	Acid Corrosion Inhibitor	Isopropanol	67-63-0	30.00000	0.00729	None
			Dimethylformamide	68-12-2	10.00000	0.00243	None
			Organic amine resin salt	Proprietary	30.00000	0.00010	None
			Ethylene glycol	107-21-1	30.00000	0.00010	None
			Aromatic aldehyde	Proprietary	10.00000	0.00003	None

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			Quaternary ammonium compound	Proprietary	10.00000	0.00003	None
B-10	FTS International	High pH buffer					
			Potassium carbonate	584-08-7	48.00000	0.00570	None
			Potassium hydroxide	1310-58-3	20.00000	0.00238	None
CS-500-SI	FTS International	Scale inhibitor					
			Ethylene glycol	107-21-1	10.00000	0.00243	None
HVG-1	FTS International	Gelling agent					
			Petroleum distillate	64742-47-8	55.00000	0.00041	None
			Guar gum	9000-30-0	50.00000	0.00037	None
			Clay	14808-60-7	2.00000	0.00001	None
			Surfactant	68439-51-0	2.00000	0.00001	None
APB-1	FTS International	Breaker					
			Ammonium persulfate	7727-54-0	95.00000	0.00033	None
FE-100L	FTS International	Iron control					
			Citric acid	77-92-9	55.00000	0.00019	None
NE-100	FTS International	Non-emulsifier					
			2-Butoxyethanol	111-76-2	10.00000	0.00011	None
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00001	None
			2-Propanol	67-63-0	10.00000	0.00000	None

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)

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**EQT PRODUCTION COMPANY
LEEMAN MAXWELL LEASE**

**1000 ACRES±
WELL NO. WV 514663**

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'27 S.P.C.(FT) N. 277,743.5 E. 1,842,266.1
 NAD'27 GEO. LAT-(N) 39.255664 LONG-(W) 80.763326
 NAD'83 UTM (M) N. 4,345,184.6 E. 520,435.0

LANDING POINT

NAD'27 S.P.C.(FT) N. 277,462.1 E. 1,842,788.5
 NAD'27 GEO. LAT-(N) 39.254912 LONG-(W) 80.761468
 NAD'83 UTM (M) N. 4,345,101.5 E. 520,595.5

BOTTOM HOLE

NAD'27 S.P.C.(FT) N. 270,592.3 E. 1,645,991.9
 NAD'27 GEO. LAT-(N) 39.236175 LONG-(W) 80.749819
 NAD'83 UTM (M) N. 4,343,025.0 E. 521,606.4



NOTES ON SURVEY

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 825' OF THE CENTER OF PROPOSED WELL PAD.
2. AS DRILLED INFO PROVIDED BY EQT.

LEGEND

AS DRILLED ———
 PROPOSED - - - - -

AS DRILLED INFORMATION

BOTTOM HOLE		WELL NO. WV 514663	
WELL NO. WV 514663		WELL NO. WV 514663	
STATE PLANE COORDINATES (NORTH ZONE) NAD 27		STATE PLANE COORDINATES (NORTH ZONE) NAD 27	
N. 270,626.8	E. 1,648,056.7	N. 277,743.5	E. 1,842,266.1
LAT=(N) 39.236272	LONG=(W) 80.749592	LAT=(N) 39.255664	LONG=(W) 80.763326
UTM (NAD83)(METERS)		UTM (NAD83)(METERS)	
N. 4,343,035.8	E. 521,625.9	N. 4,345,184.6	E. 520,435.0

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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.

P.S. 849 *C. Victor Moyers*

(*) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE OCTOBER 1, 20 13
 REVISED 03/13/14 & 10/17/14
 OPERATORS WELL NO. WV 514663
 API WELL NO. 47-017-06385
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 200 FILE NO. 8051ASDRILLED514663
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2,000'

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 1,224'(GROUND) 1,208'(PROPOSED) WATERSHED BLUESTONE CREEK
 DISTRICT WEST UNION COUNTY DODDRIDGE QUADRANGLE WEST UNION 7.5'
 SURFACE OWNER JANE HARDIN (TRUSTEE) OF MARY HOLLAND TRUST ACREAGE 1207.637±
 ROYALTY OWNER LEEMAN MAXWELL HEIRS (1000 AC.±) (2164 AC.±)

PROPOSED WORK:
 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 6661'

WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY
 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330

10/23/2015