

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

API 47-017-06574 County Doddridge District West Union
Quad West Union 7.5' Pad Name WEU51 Field/Pool Name _____
Farm name Mary H. Holland Estate/Jane M. Hardin Well Number 515642
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 4,345,197 Easting 520,428
Landing Point of Curve Northing 4,345,460 Easting 521,316
Bottom Hole Northing 4,344,501 Easting 521,783

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)

Water base Mud 12.5 ppg barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, modified starch, sodium hydroxide, phosphonates and alkyl phosphates, glutaraldehyde solution, calcium hydroxide, partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid, ferrochrome lignosulfonate, calcium carbonate, fibrous cellulose

Date permit issued 10/20/2014 Date drilling commenced 10/22/2014 Date drilling ceased 12/22/2014
Date completion activities began 4/18/2015 Date completion activities ceased 4/23/2015
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

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:
JLH 7/24/15
08/14/2015

API 47-017 - 06574 Farm name Mary H. Holland Estate/Jane M. Hardin Well number 515642

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	30"	26"	40'	New	82.6#/ft	None	Y
Surface	17-1/2"	13-3/8"	1,186'	New	54.5#/ft	902' & 419'	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	5,316'	New	40#/ft	None	Y
Intermediate 2							
Intermediate 3							
Production	8-1/2"	5-1/2"	12,240'	New	20#/ft	None	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	58	0	8
Surface	Class A	925	15.6	1.19	1100	0	8
Coal							
Intermediate 1	Class A	375/340/1140	14.2/15.6/15.6	1.28/1.18/1.18	2226	0	8
Intermediate 2							
Intermediate 3							
Production	Class A/Class H	625/485	14.2/15.2	1.26/1.97	1743	5,400'	72
Tubing							

Drillers TD (ft) 12,250' MD Loggers TD (ft) N/A
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5,492' MD

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- Ran 10 centralizers, one every other jnt. up 211'
 Intermediate- RAN AT LEAST EVERY 500' FEET JOINTS: .2, 13, 24, 35, 46, 56, 67, 78, 89, 100, 111, 122, 133
 Production- Composite bodied centralizers on every joint from TD up to 4,971'

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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 _____

API 47- 017 - 06574

Farm name Mary H. Holland Estate/Jane M. Hardin

Well number 515642

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
					Please See Attached

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)
						Please	See	Attached

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Please insert additional pages as applicable.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6,685</u>	<u>TVD</u>	<u>8,706</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 1,703 psi Bottom Hole N/A psi DURATION OF TEST 89.5 hrs

OPEN FLOW Gas 7,690 mcfpd Oil 0 bpd NGL 13.4 bpd Water 816 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		

Please insert additional pages as applicable.

Drilling Contractor Savanna Drilling
 Address 2204 Timberloch Place Suite 230 City Woodlands State TX Zip 77380

Logging Company GyroData
 Address 601 Mayer St City Bridgeville State PA Zip 15017

Cementing Company Nabors
 Address 380 Southpointe Boulevard Suite 210 City Canonsburg State PA Zip 15317

Stimulating Company FTSI
 Address 301 E 18th Street City Cisco State TX Zip 76437

Please insert additional pages as applicable.

Completed by Jim Helmick Telephone 412-395-5518
 Signature _____ Title VP Completions Date 7/6/2015

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

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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	1,484	1,484
MAXTON	1,484	1,484	1,880	1,880
Big Lime	1,880	1,880	1,949	1,949
KEENER	1,949	1,949	2,179	2,179
Weir	2,179	2,179	2,375	2,375
BEREA	2,375	2,375	2,381	2,381
Gantz	2,381	2,381	2,495	2,495
Fifty foot	2,495	2,495	2,585	2,584
Thirty foot	2,585	2,584	2,729	2,728
Forth Sand	2,729	2,728	2,922	2,921
Bayard	2,922	2,921	3,239	3,238
Warren	3,239	3,238	3,300	3,299
Speechley	3,300	3,299	3,971	3,970
Balltown A	3,971	3,970	4,247	4,246
BRADFORD	4,247	4,246	4,453	4,452
Riley	4,453	4,452	4,890	4,889
Benson	4,890	4,889	5,137	5,132
Alexander	5,137	5,132	7,453	6,309
Sonyea	7,453	6,309	7,881	6,456
Middlesex	7,881	6,456	8,035	6,510
Genesee	8,035	6,510	8,349	6,601
Geneseo	8,349	6,601	8,441	6,627
Tully	8,441	6,627	8,555	6,655
Hamilton	8,555	6,655	8,706	6,685
Marcellus	8,706	6,685	12,250	6,750

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515642 - 47-017-06574-0000- Perforations

<i>Stage Number</i>	<i>Perforation Date</i>	<i>Top Perf Depth (ftKB)</i>	<i>Bottom Perf Depth (ftKB)</i>	<i>Number of Shots</i>	<i>Formation</i>
Initiation Sleeve	1/30/2015	12,238.00	12,240.00	10	MARCELLUS
1	4/18/2015	12,093.00	12,155.00	28	MARCELLUS
2	4/18/2015	11,913.00	12,035.00	42	MARCELLUS
3	4/18/2015	11,733.00	11,855.00	42	MARCELLUS
4	4/19/2015	11,553.00	11,675.00	42	MARCELLUS
5	4/19/2015	11,373.00	11,493.00	42	MARCELLUS
6	4/19/2015	11,373.00	11,493.00	42	MARCELLUS
7	4/19/2015	11,015.00	11,135.00	42	MARCELLUS
8	4/19/2015	10,833.00	10,955.00	42	MARCELLUS
9	4/20/2015	10,653.00	10,775.00	42	MARCELLUS
10	4/20/2015	10,473.00	10,595.00	42	MARCELLUS
11	4/20/2015	10,293.00	10,415.00	42	MARCELLUS
12	4/20/2015	10,113.00	10,235.00	42	MARCELLUS
13	4/21/2015	9,933.00	10,055.00	42	MARCELLUS
14	4/22/2015	9,753.00	9,871.00	42	MARCELLUS
15	4/22/2015	9,573.00	9,693.00	42	MARCELLUS
16	4/22/2015	9,394.00	9,515.00	42	MARCELLUS
17	4/22/2015	9,217.00	9,335.00	42	MARCELLUS
18	4/22/2015	9,033.00	9,155.00	42	MARCELLUS
19	4/23/2015	8,853.00	8,975.00	42	MARCELLUS

515642 - 47-017-06574-0000 -- Stimulated Stages

Stage Number	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)
Initiation Sleeve	4/18/2015	8.8	5,827	7,991	4,331	0	623	0
1	4/18/2015	99.2	8,352	8,848	5,168	302,768	8,086	0
2	4/18/2015	84.5	8,010	9,046	5,136	299,471	10,802	0
3	4/18/2015	100.3	7,698	8,192	5,328	309,511	8,022	0
4	4/19/2015	99.2	7,783	8,297	5,332	302,559	6,418	0
5	4/19/2015	100.1	7,640	8,504	5,218	299,250	6,259	0
6	4/19/2015	99.2	7,633	8,288	5,019	300,647	5,980	0
7	4/19/2015	100.7	7,980	8,907	5,247	300,616	7,101	0
8	4/20/2015	96.8	7,973	9,207	5,004	302,355	6,381	0
9	4/20/2015	100.0	7,609	8,379	5,057	302,184	6,099	0
10	4/20/2015	97.4	7,723	8,634	5,092	301,051	5,818	0
11	4/20/2015	95.7	7,788	8,497	5,119	300,950	7,026	0
12	4/20/2015	98.8	7,452	8,803	4,864	304,830	6,046	0
13	4/21/2015	97.5	8,088	8,568	5,080	302,439	7,035	0
14	4/22/2015	99.0	7,124	7,361	4,974	301,062	5,791	0
15	4/22/2015	101.9	7,231	7,824	4,883	299,734	5,723	0
16	4/22/2015	100.2	7,089	7,532	4,849	301,269	5,736	0
17	4/22/2015	100.8	7,063	7,866	5,077	305,308	6,204	0
18	4/23/2015	100.2	7,240	7,659	4,856	304,026	6,253	0
19	4/23/2015	99.1	7,295	8,210	4,732	309,372	6,076	0

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/18/2015
Job End Date:	4/23/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06574-00-00
Operator Name:	EQT Production
Well Name and Number:	515642
Longitude:	-80.76340200
Latitude:	39.25577200
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,750
Total Base Water Volume (gal):	5,354,118
Total Base Non Water Volume:	0



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	88.27584	None
Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100.00000	11.35927	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05723	None
Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03043	None
FRW-900	FTS International	Friction reducer	Hydrotreated light distillate	84742-47-8	30.00000	0.00843	None
			Alkyl Alcohol	Proprietary	10.00000	0.00281	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00140	None
LTB-1	FTS International	Breaker	Ammonium persulfate	7727-54-0	75.00000	0.00328	None
			Cured acrylic resin	Proprietary	16.00000	0.00070	None
			Silica, Crystalline-Quartz	14808-60-7	10.00000	0.00044	None
CS-500-SI	FTS International	Scale inhibitor	Ethylene glycol	107-21-1	10.00000	0.00247	None

APB-1	FTS International	Breaker	Ammonium persulfate	7727-54-0	95.00000	0.00244	None
FRW-600	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.00121	None
FE-100L	FTS International	Iron control	Ammonium acetate	631-61-8	6.00000	0.00024	None
CI-150	FTS International	Acid Corrosion Inhibitor	Citric acid	77-92-9	55.00000	0.00069	None
			Organic amine resin salt	Proprietary	30.00000	0.00010	None
			Isopropanol	67-63-0	30.00000	0.00010	None
			Ethylene glycol	107-21-1	30.00000	0.00010	None
			Quaternary ammonium compound	Proprietary	10.00000	0.00003	None
			Dimethylformamide	68-12-2	10.00000	0.00003	None
			Aromatic aldehyde	Proprietary	10.00000	0.00003	None
FRW-200	FTS International	Friction reducer	Petroleum distillate hydrotreated light	64742-47-8	26.00000	0.00020	None
HVG-1	FTS International	Gelling agent	Petroleum distillate	64742-47-8	55.00000	0.00005	None
			Guar gum	9000-30-0	50.00000	0.00004	None
			Clay	14808-60-7	2.00000	0.00000	None
			Surfactant	68439-51-0	2.00000	0.00000	None
NE-100	FTS International	Non-emulsifier	2-Propanol	67-63-0	10.00000	0.00004	None
			2-Butoxyethanol	111-76-2	10.00000	0.00004	None
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00002	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)

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 515642

API: 47 - 017 - 06574

Submission: Initial Amended

Notes:

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**AS DRILLED COORDINATES
FOR WELL NO. WV 515642**

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT) N. 277,783.2 E. 1,642,245.0
 NAD'27 GEO. LAT-(N) 39.255772 LONG-(W) 80.763403
 NAD'83 UTM (M) N. 4,345,196.6 E. 520,428.3

BOTTOM HOLE

NAD'27 S.P.C.(FT) N. 275,448.5 E. 1,646,662.4
 NAD'27 GEO. LAT-(N) 39.249532 LONG-(W) 80.747690
 NAD'83 UTM (M) N. 4,344,507.8 E. 521,786.0

**EQT PRODUCTION COMPANY
LEEMAN MAXWELL LEASE
1000 ACRES±
WELL NO. WV 515642**

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT) N. 277,783.2 E. 1,642,245.0
 NAD'27 GEO. LAT-(N) 39.255772 LONG-(W) 80.763403
 NAD'83 UTM (M) N. 4,345,196.6 E. 520,428.3

LANDING POINT

NAD'27 S.P.C.(FT) N. 278,598.2 E. 1,645,171.6
 NAD'27 GEO. LAT-(N) 39.258122 LONG-(W) 80.753109
 NAD'83 UTM (M) N. 4,345,459.8 E. 521,315.8

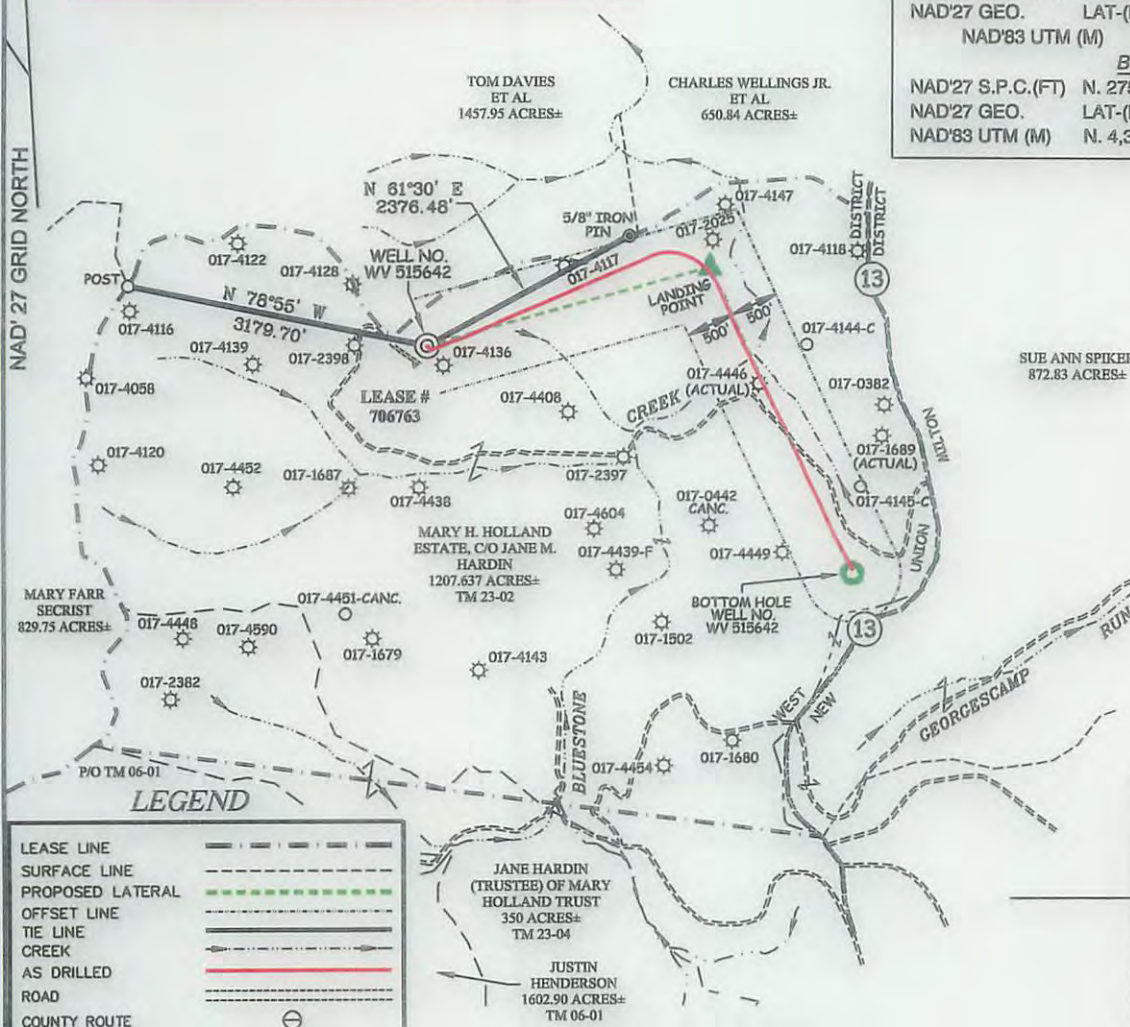
BOTTOM HOLE

NAD'27 S.P.C.(FT) N. 275,426.2 E. 1,646,650.8
 NAD'27 GEO. LAT-(N) 39.249470 LONG-(W) 80.747730
 NAD'83 UTM (M) N. 4,344,500.9 E. 521,782.5

NAD' 27 GRID NORTH

LONGITUDE 80°45'00"

13,074'



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 625' OF THE CENTER OF PROPOSED WELL PAD.
2. AS DRILLED INFORMATION PROVIDED BY EQT.

Professional Energy Consultants
 A DIVISION OF SMITH LAND SURVEYING, INC.

 SURVEYORS
 ENGINEERS
 ENVIRONMENTAL
 PROJECT MGMT.
 (304) 462-6834
 WWW.SLSURVEYS.COM

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 MAY 30, 20 14

REVISED 08/06/14 & 01/13/15

OPERATORS WELL NO. WV 515642

API WELL NO. 47-017-06574
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 8051ASDRILLED515642

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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 MARY H. HOLLAND ESTATE, C/O JANE M. HARDIN ACREAGE 1207.637±

ROYALTY OWNER LEEMAN MAXWELL HEIRS ACREAGE 1,000± LEASE NO. 706763

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 TVD 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

COUNTY NAME PERMIT

08/14/2015