

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

API 47-017-6383 County Doddridge District West Union
Quad West Union 7.5' Pad Name WEU51 Field/Pool Name _____
Farm name Jane Hardin Trustee/Mary Well Number 514665
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 4,345,193 Easting 520,431
Landing Point of Curve Northing 4,345,366 Easting 521,064
Bottom Hole Northing 4,344,163 Easting 521,649

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 9/19/2014
Date completion activities began 4/11/2015 Date completion activities ceased 4/17/2015
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 _____
Salt water depth(s) ft _____ Void(s) encountered (Y/N) depths _____
Coal depth(s) ft 101,170,294,314,486,555 Cavern(s) encountered (Y/N) depths JUL 06 2015
Is coal being mined in area (Y/N) N

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JUL 06 2015

Reviewed by:
JK 7/24/15
07/24/2015

API 47-017 - 6383 Farm name Jane Hardin Trustee/Mary Well number 514665

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"	1178.72'	New	54.5#/ft	98.87', 506.41'	Y
Coal							
Intermediate 1	12-3/8"	9-5/8"	5303.02'	New	40#/ft	568', 3955'	Y
Intermediate 2							
Intermediate 3							
Production	8-1/2"	5-1/2"	12,669	New	20lb/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	920	15.6	1.19	1094	0	8
Coal							
Intermediate 1	Class A	375/340/1165	14.2/15.6/15.6	1.26/1.18/1.18	2248.4	0	8
Intermediate 2							
Intermediate 3							
Production	Class A/Class H	505/600	14.2/15.2	1.26/1.97	1818	5,500	72
Tubing							

Drillers TD (ft) 12,670' Loggers TD (ft) _____
 Deepest formation penetrated Marcellus Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 5,522'

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 1131', 674', 219'
 Intermediate-bow spring centralizers set at 5258', 4806', 4294', 3782', 3295', 2801', 2275', 1815', 1277'
 Production- Composite bodied centralizers on every joint from Shoe track up to 1,000' above KOP

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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JUL 06 2015

API 47- 017 - 6383

Farm name Jane Hardin Trustee/Mary

Well number 514665

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

Please insert additional pages as applicable.

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JUL 06 2015

07/24/2015

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>
<u>Marcellus</u>	<u>6,687'</u> TVD <u>8,178'</u> MD
_____	_____
_____	_____
_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 1,932 psi Bottom Hole N/A psi DURATION OF TEST 69.50 hrs

OPEN FLOW Gas 7,945 mcfpd Oil 0 bpd NGL 12.2 bpd Water 1,039 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)
	<u>0</u>		<u>0</u>		

Please insert additional pages as applicable.

Drilling Contractor Alpha Hunter 4
Address 28407 State Route 7 City Marietta State OH Zip 45750

Logging Company Hoss Co. Services LLC
Address 614 Trotters Lane City Charleston State WV Zip 25312

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 75643

Please insert additional pages as applicable.

Completed by Jim Helmick Telephone 412-395-5518
Signature [Signature] Title VP Completions Date 7/1/2015

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



Drilling Contractor: Savanna Drilling

Address: 2204 Timberloch Place Suite 230

City: Woodlands

State: TX

Zip: 77380

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JUL 06 2015

07/24/2015

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
Fifty foot	2,489	2,489	2,579	2,579
Thirty foot	2,579	2,579	2,723	2,723
Forth Sand	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	6,980	6,319
Sonyea	6,980	6,319	7,403	6,463
Middlesex	7,403	6,463	7,586	6,521
Genesee	7,586	6,521	7,817	6,591
Geneseo	7,817	6,591	7,940	6,630
Tully	7,940	6,630	8,066	6,660
Hamilton	8,066	6,660	8,178	6,687
Marcellus	8,178	6,687	12,670	6,744

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JUL 06 2015

07/24/2015

514665 - 47-017-06383-0000 -- 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	4/11/2015	8.1	5,735	6,971	5,443	0	1,373	0
1	4/12/2015	101.9	8,165	8,477	5,114	301,246	8,096	0
2	4/12/2015	98.6	8,151	8,621	5,136	307,932	8,091	0
3	4/12/2015	95.1	8,206	8,743	4,950	302,401	7,315	0
4	4/12/2015	95.5	8,046	8,916	5,122	300,396	7,344	0
5	4/12/2015	91.9	8,224	9,048	5,519	300,507	7,969	0
6	4/13/2015	98.4	7,979	8,235	4,550	301,795	7,919	0
7	4/13/2015	96.5	8,183	8,426	5,041	300,710	7,071	0
8	4/13/2015	103.5	8,248	8,478	5,154	298,788	7,034	0
9	4/13/2015	100.4	8,340	8,838	4,731	298,767	6,906	0
10	4/13/2015	100.0	8,137	8,438	4,913	302,990	7,811	0
11	4/14/2015	100.3	8,205	8,826	4,645	301,681	7,934	0
12	4/14/2015	100.6	7,598	8,466	4,841	304,501	7,703	0
13	4/14/2015	104.1	7,914	8,614	5,679	302,138	7,153	0
14	4/14/2015	101.2	7,831	8,952	4,674	301,077	7,146	0
15	4/14/2015	98.0	8,004	8,480	4,843	304,303	7,280	0
16	4/15/2015	98.8	7,443	8,021	5,161	301,803	10,930	0
17	4/15/2015	98.5	7,924	8,910	4,440	304,545	7,197	0
18	4/16/2015	100.3	7,872	8,391	4,936	302,386	7,204	0
19	4/16/2015	100.5	8,195	8,644	4,859	304,722	7,597	0
20	4/16/2015	99.3	7,724	8,176	5,092	299,733	6,842	0
21	4/16/2015	101.0	7,247	7,907	4,874	301,875	6,625	0
22	4/16/2015	100.3	7,311	7,729	4,998	303,146	7,049	0
23	4/16/2015	99.0	7,855	8,595	4,944	302,497	7,202	0
24	4/17/2015	100.5	7,355	8,170	4,954	300,931	6,664	0

514665 - 47-017-06383-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	2/2/2015	12,667.00	12,669.00	10	MARCELLUS
1	4/11/2015	12,523.00	12,585.00	42	MARCELLUS
2	4/12/2015	12,343.00	12,462.00	42	MARCELLUS
3	4/12/2015	12,163.00	12,283.00	42	MARCELLUS
4	4/12/2015	11,986.00	12,105.00	42	MARCELLUS
5	4/12/2015	11,803.00	11,925.00	42	MARCELLUS
6	4/12/2015	11,623.00	11,745.00	42	MARCELLUS
7	4/13/2015	11,443.00	11,565.00	42	MARCELLUS
8	4/13/2015	11,263.00	11,384.00	42	MARCELLUS
9	4/13/2015	11,083.00	11,205.00	42	MARCELLUS
10	4/13/2015	10,903.00	11,025.00	42	MARCELLUS
11	4/13/2015	10,723.00	10,845.00	42	MARCELLUS
12	4/14/2015	10,543.00	10,665.00	42	MARCELLUS
13	4/14/2015	10,363.00	10,485.00	42	MARCELLUS
14	4/14/2015	10,183.00	10,307.00	42	MARCELLUS
15	4/14/2015	10,003.00	10,123.00	42	MARCELLUS
16	4/14/2015	9,824.00	9,945.00	42	MARCELLUS
17	4/15/2015	9,642.00	9,765.00	42	MARCELLUS
18	4/15/2015	9,463.00	9,585.00	42	MARCELLUS
19	4/16/2015	9,283.00	9,405.00	42	MARCELLUS
20	4/16/2015	9,103.00	9,225.00	42	MARCELLUS
21	4/16/2015	8,923.00	9,045.00	42	MARCELLUS
22	4/16/2015	8,743.00	8,865.00	42	MARCELLUS
23	4/16/2015	8,563.00	8,688.00	42	MARCELLUS
24	4/17/2015	8,383.00	8,505.00	42	MARCELLUS

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/11/2015
Job End Date:	4/17/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06383-00-00
Operator Name:	EQT Production
Well Name and Number:	514665
Longitude:	-80.76337800
Latitude:	39.25573600
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,744
Total Base Water Volume (gal):	7,621,110
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	89.43106	None
Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100.00000	10.19610	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05723	None
FRW-900	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.02237	None
			Alkyl Alcohol	Proprietary	10.00000	0.00746	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00373	None
Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.02543	None
CS-500-SI	FTS International	Scale inhibitor	Ethylene glycol	107-21-1	10.00000	0.00248	None
FRW-600	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.00149	None
			Ammonium acetate	631-61-8	6.00000	0.00030	None
B-10	FTS International	High pH buffer					

			Potassium carbonate	584-08-7	48.00000	0.00000	None
FE-100L			Potassium hydroxide	1310-58-3	20.00000	0.00020	None
	FTS International	Iron control					
FVG-1			Citric acid	77-92-9	55.00000	0.00050	None
	FTS International	Gelling agent					
			Petroleum distillate	64742-47-8	55.00000	0.00020	None
			Guar gum	9000-30-0	50.00000	0.00020	None
			Surfactant	68439-51-0	2.00000	0.00001	None
			Clay	14808-60-7	2.00000	0.00001	None
CI-150	FTS International	Acid Corrosion Inhibitor					
			Isopropanol	67-63-0	30.00000	0.00000	None
			Organic amine resin salt	Proprietary	30.00000	0.00000	None
			Ethylene glycol	107-21-1	30.00000	0.00000	None
			Aromatic aldehyde	Proprietary	10.00000	0.00000	None
			Quaternary ammonium compound	Proprietary	10.00000	0.00000	None
			Dimethylformamide	68-12-2	10.00000	0.00000	None
NE-100	FTS International	Non-emulsifier					
			2-Butoxyethanol	111-76-2	10.00000	0.00000	None
			2-Propanol	67-63-0	10.00000	0.00000	None
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00000	None
APB-1	FTS International	Breaker					
			Ammonium persulfate	7727-54-0	95.00000	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)

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 514665

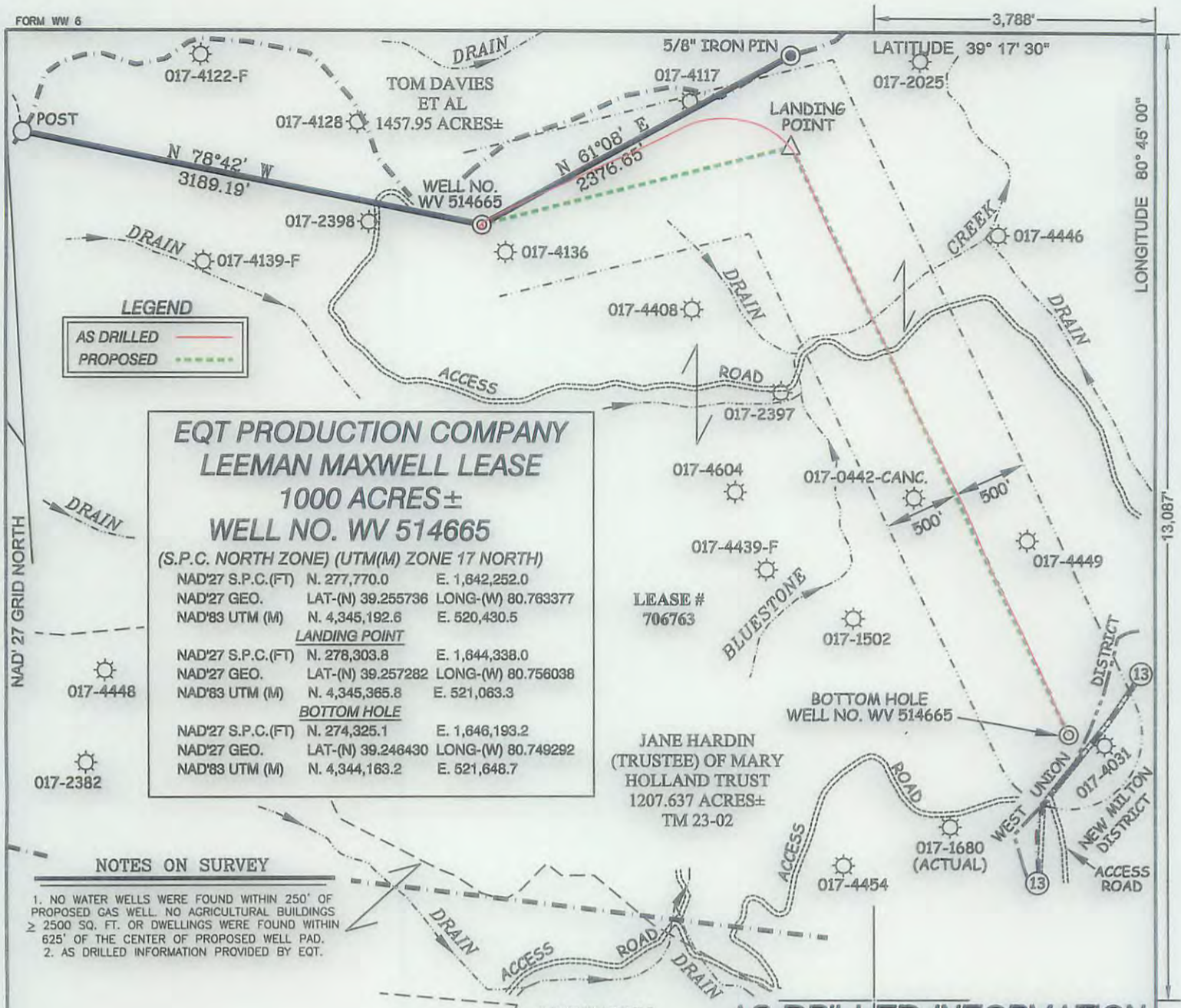
API: 47 - 017 - 06383

Submission: Initial Amended

Notes: Inj Test 1.01; 16.01

Received
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JUL 06 2015

07/24/2015



**EQT PRODUCTION COMPANY
LEEMAN MAXWELL LEASE
1000 ACRES±
WELL NO. WV 514665**

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

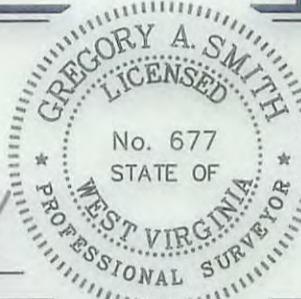
NAD'27 S.P.C.(FT)	N. 277,770.0	E. 1,642,252.0
NAD'27 GEO.	LAT-(N) 39.255736	LONG-(W) 80.763377
NAD'83 UTM (M)	N. 4,345,192.6	E. 520,430.5
LANDING POINT		
NAD'27 S.P.C.(FT)	N. 278,303.8	E. 1,644,338.0
NAD'27 GEO.	LAT-(N) 39.257282	LONG-(W) 80.756038
NAD'83 UTM (M)	N. 4,345,365.8	E. 521,063.3
BOTTOM HOLE		
NAD'27 S.P.C.(FT)	N. 274,325.1	E. 1,646,193.2
NAD'27 GEO.	LAT-(N) 39.246430	LONG-(W) 80.749292
NAD'83 UTM (M)	N. 4,344,163.2	E. 521,648.7

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.

AS DRILLED INFORMATION

BOTTOM HOLE WELL NO. WV 514665 STATE PLANE COORDINATES (NORTH ZONE) NAD 27		WELL NO. WV 514665 STATE PLANE COORDINATES (NORTH ZONE) NAD 27	
N. 274,324.3	E. 1,646,192.9	N. 277,770.0	E. 1,642,252.0
LAT=(N) 39.246428	LONG=(W) 80.749293	LAT=(N) 39.255736	LONG=(W) 80.763377
UTM (NAD83)(METERS)		UTM (NAD83)(METERS)	
N. 4,344,162.9	E. 521,648.6	N. 4,345,192.6	E. 520,430.5




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. 677 *Gregory A. Smith*

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE SEPTEMBER 4, 20 13
REVISED 03/05/14 & 09/30/14
OPERATORS WELL NO. WV 514665
API WELL NO. 47-017-06383
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 8051ASDRILLED514665
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 1,000'

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 1,225(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 LEASE ACREAGE 1000± 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 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

07/24/2015