

Well Operator's Report of Well Work



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WV Department of  
Environmental Protection

Well Number: 514478

API: 47 - 085 - 10228

Submission:  Initial  Amended

Notes:

Appears  
FINAL

**APPROVED**

NAME: Michael Hoff

DATE: 7-13-17

09/15/2017

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

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JUN 29 2017

WV Department of  
Environmental Protection

API 47-085-10228 County RITCHIE District CLAY  
Quad PENNSBORO 7.5' Pad Name PEN54 Field/Pool Name \_\_\_\_\_  
Farm name Jerry Morton et al Well Number 514478  
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 4,345,379.86 Easting 506,272.12  
Landing Point of Curve Northing 4,345,264.17 Easting 506,000.87  
Bottom Hole Northing 4,346,143.10 Easting 505,691.75

Elevation (ft) 1016 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 based mud 11.9 ppg, barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, sodium hydroxide, chrome lignosulfonate, calcium hydroxide, sodium acid pyrophosphate, bentonite, Methyl ester of sulfonated tannin, treated silica, partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, glutaraldehyde, ground walnut shells, calcium carbonate, fibrous cellulose.

Date permit issued 08/17/2015 Date drilling commenced 04/07/2016 Date drilling ceased 06/11/2016  
Date completion activities began 3/25/2017 Date completion activities ceased 3/30/2017  
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 109',115',312',637',739',755',780' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1360' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 336',799',877',1088',1192' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by: \_\_\_\_\_

09/15/2017

API 47- 085 - 10228 Farm name Jerry Morton et al Well number 514478

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"	40'	NEW	A-500 40LB/FT	NONE	Y
Surface	17.5"	13.375"	916'	NEW	J-55 54.5LB/FT	329'	Y
Coal							
Intermediate 1	12.375" / 12.25"	9.625"	5331'	NEW	A-500& P-110 40lb/ft	531',1502'	Y
Intermediate 2							
Intermediate 3							
Production	8.75" & 8.5"	5.5"	10,072'	NEW	P-110 20LB/FT	NONE	N
Tubing							
Packer type and depth set		Davis Lynch casing packer and diverter tool placed at 3365'. Two stage cement job performed.					

Comment Details \_\_\_\_\_

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	CLASS A	59	15.6	1.18	70	0	8
Surface	CLASS A	739	15.6	1.2	887	0	8
Coal							
Intermediate 1	CLASS A / CLASS A / CLASS A	159/310 & 1230	14.2/15.6 & 15.65	1.24/1.18 & 1.18	2014	0	8
Intermediate 2							
Intermediate 3							
Production	CLASS H / CLASS H	872 / 470	15.2 / 15.6	1.10 / 1.84	1824	2510'	72+
Tubing							

Drillers TD (ft) 10,099'      Loggers TD (ft) N/A  
 Deepest formation penetrated MARCELLUS      Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 3,692'

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- NONE  
SURFACE- JOINTS: 1,11,21  
INTERMEDIATE- RAN AT LEAST EVERY 500' FEET  
PRODUCTION- COMPOSITE BODY CENTRALIZERS RAN EVERY JOINT FROM SHOE TO KOP

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WAS WELL COMPLETED AS SHOT HOLE     Yes     No    DETAILS \_\_\_\_\_ JUN 29 2017

WAS WELL COMPLETED OPEN HOLE?     Yes     No    DETAILS \_\_\_\_\_ WV Department of Environmental Protection

WERE TRACERS USED     Yes     No    TYPE OF TRACER(S) USED \_\_\_\_\_

API 47- 085 - 10228 Farm name Jerry Morton et al Well number 514478

**PERFORATION RECORD**

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
					<b>Please See Attached</b>
					RECEIVED Office of Oil and Gas

Please insert additional pages as applicable.

**JUN 29 2017**

**STIMULATION INFORMATION PER STAGE**

WV Department of  
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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)
						<b>Please</b>	<b>See</b>	<b>Attached</b>

Please insert additional pages as applicable.

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API 47- 085 - 10228 Farm name Jerry Morton et al Well number 514478

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>MARCELLUS</u>	<u>6285</u> TVD	<u>6805</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST    Build up    Drawdown    Open Flow                  OIL TEST    Flow    Pump

SHUT-IN PRESSURE   Surface 1,743 psi   Bottom Hole N/A psi   DURATION OF TEST 38.5 hrs

OPEN FLOW        Gas                      Oil                      NGL                      Water                      GAS MEASURED BY

6,489 mcfpd   N/A bpd   147 bpd   1,006 bpd    Estimated    Orifice    Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H<sub>2</sub>S, ETC)</u>
	<u>DEPTH IN FT</u>	<u>DEPTH IN FT</u>	<u>DEPTH IN FT</u>	<u>DEPTH IN FT</u>	
	<u>NAME</u>	<u>TVD</u>	<u>MD</u>	<u>MD</u>	
	<u>0</u>		<u>0</u>		

Please insert additional pages as applicable.

Drilling Contractor Savanna Drilling Rig 803  
Address 125 Industry Road City Waynesburg State PA Zip 15370

Logging Company GYRODATA INC.  
Address 601 MAYER ST. City BRIDGEVILLE State PA Zip 15017

Cementing Company C&J (aka Nabors)  
Address 2504 SMITH CREEK ROAD City WAYNESBURG State PA Zip 15370

Stimulating Company C&J Energy Services  
Address 3990 Rogerdale Road City Houston State TX Zip 77042

Please insert additional pages as applicable.

Completed by Michael Rehl Telephone (412) 553-5815  
Signature  Title Mgr Completions Date 6/27/2017

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

09/15/2017

API 47- 085 - 10228 Farm name Jerry Morton et al Well number 514478

Drilling Contractor \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Logging Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Logging Company Professional Directional  
Address 103 Suds Run Road City Mt. Clare State WV Zip 26408

Cementing Company ALLIED SERVICES  
Address 116 KIMMEL SCHOOL ROAD City SHELOCTA State PA Zip 15773

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API 47-085-10228	514478			PEN54
Final Formations				
Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
SAND/SHALE	1	1	336	336
COAL	336	336	344	344
SAND/SHALE	344	344	799	799
COAL	799	799	802	802
SAND/SHALE	802	802	877	877
COAL	877	877	882	882
SAND/SHALE	882	882	1088	1088
COAL	1088	1088	1092	1092
SAND/SHALE	1092	1092	1192	1192
COAL	1192	1192	1197	1197
SAND/SHALE	1197	1197	1426	1426
MAXTON	1426	1426	1621	1621
BIG LIME	1621	1621	2003	2003
WEIR	2003	2003	2221	2221
GANTZ	2221	2221	2366	2366
50F	2366	2366	2461	2461
GORDON	2461	2461	2619	2619
5TH	2619	2619	2633	2633
BAYARD	2633	2633	3088	3088
WARREN	3088	3088	3166	3166
SPEECHLEY	3166	3166	3556	3556
BALLTOWN A	3556	3556	3911	3910
BALLTOWN B	3911	3910	3962	3960
BRADFORD	3962	3960	4212	4204
RILEY	4212	4204	4595	4567
BENSON	4595	4567	4842	4791
ALEXANDER	4842	4791	5381	5223
RHINESTREET	5381	5223	5643	5419
RHINESTREET UPPER	5643	5419	6270	5956
SONYEA	6270	5956	6499	6131
MIDDLESEX	6499	6131	6580	6182
GENESSEE	6580	6182	6672	6232
GENESE0	6672	6232	6756	6268
TULLY	6756	6268	6782	6277
HAMILTON	6782	6277	6805	6285
MARCELLUS	6805	6285	10099	6318

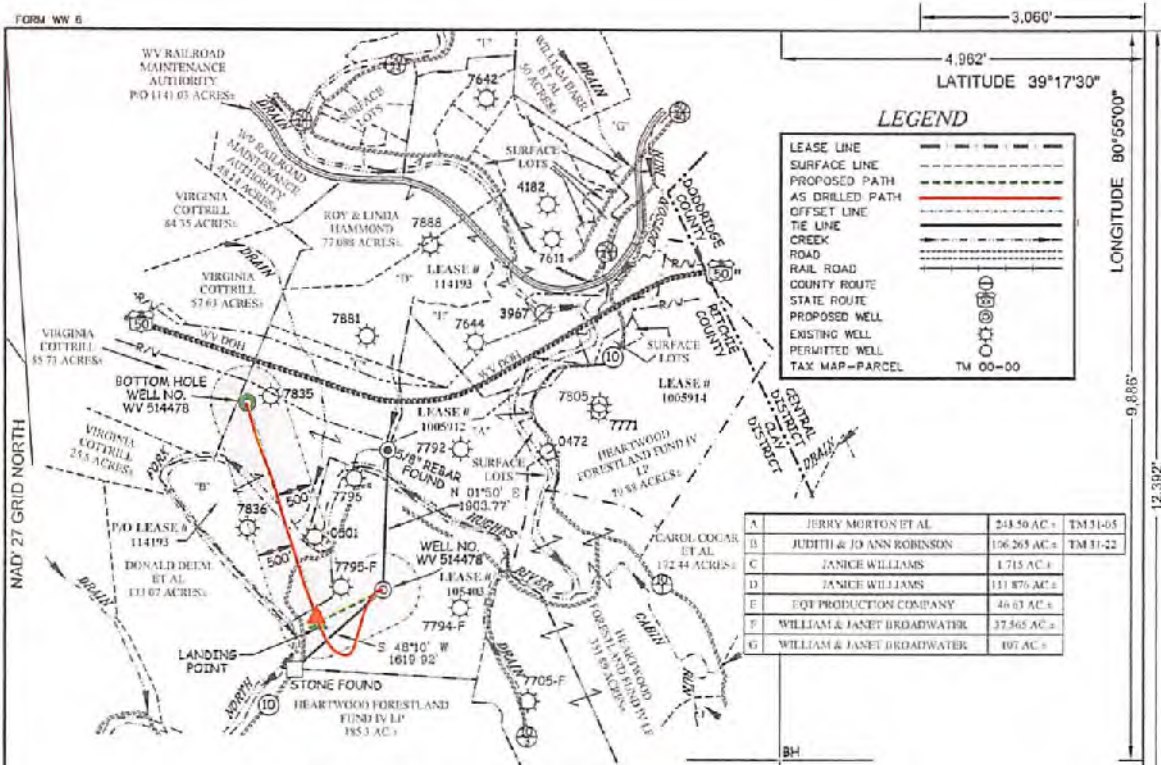
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A	JERRY MORTON ET AL	243.50 AC ±	TM 31-03
B	JUDITH & JO ANN ROBINSON	106.263 AC ±	TM 31-22
C	JANICE WILLIAMS	1.715 AC ±	
D	JANICE WILLIAMS	131.876 AC ±	
E	EQT PRODUCTION COMPANY	46.63 AC ±	
F	WILLIAM & JANET BROADWATER	37.565 AC ±	
G	WILLIAM & JANET BROADWATER	107 AC ±	

**EQT PRODUCTION COMPANY  
FLANAGAN LEASE  
268 ACRES±  
WELL NO. WV 514478  
(PEN54 H5)  
AS DRILLED COORDINATES  
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)**

NAD27 S.P.C.(FT) N. 279,160.90 E. 1,595,800.41  
 NAD27 GEO. LAT-(N) 39.257645 LONG-(W) 80.927472  
 NAD83 UTM (M) N. 4,345,379.66 E. 506,272.12

**LANDING POINT**

NAD27 S.P.C.(FT) N. 278,786.18 E. 1,594,303.95  
 NAD27 GEO. LAT-(N) 39.258604 LONG-(W) 80.930517  
 NAD83 UTM (M) N. 4,345,254.17 E. 506,000.87

**BOTTOM HOLE**

NAD27 S.P.C.(FT) N. 281,897.37 E. 1,593,937.70  
 NAD27 GEO. LAT-(N) 39.264527 LONG-(W) 80.934192  
 NAD83 UTM (M) N. 4,346,143.10 E. 505,691.75

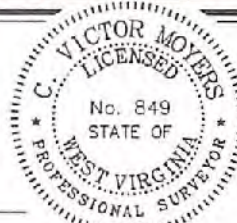
ROYALTY OWNERS		
MARY LEE AZELVANDRE ET AL	500 AC ±	LEASE NO. 114193

**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 EDT.



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 JUNE 25 20 15

REVISED AUGUST 03 20 15

OPERATORS WELL NO. WV 514478


API WELL NO. 47 - 085 - 10228H

STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 8033AD514478

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: PAD ELEVATION 1,016' WATERSHED NORTH FORK HUGHES RIVER

DISTRICT CLAY COUNTY RITCHIE QUADRANGLE PENNSBORO 7.5

SURFACE OWNER JERRY MORTON ET AL ACREAGE 243.50±

ROYALTY OWNER ELLEN S. FRANCAVIGLIA ET AL ACREAGE 268±

PROPOSED WORK: LEASE NO. 105403

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 6,275'

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

3,060'  
4,982'  
LATITUDE 39°17'30"  
LONGITUDE 80°55'00"  
9,885'  
12,392'  
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**514478- 47-085-10228-0000 - Perforations**

<b>Stage Number</b>	<b>Perforation Date</b>	<b>Top Perf Depth (ftKB)</b>	<b>Bottom Perf Depth (ftKB)</b>	<b>Number of Shots</b>	<b>Formation</b>
<b>Initiation Sleeve</b>	9/11/2016	10,047	10,072	10	MARCELLUS
<b>1</b>	3/25/2017	9,883	10,008	32	MARCELLUS
<b>2</b>	3/27/2017	9,686	9,848	40	MARCELLUS
<b>3</b>	3/27/2017	9,486	9,648	40	MARCELLUS
<b>4</b>	3/27/2017	9,286	9,448	40	MARCELLUS
<b>5</b>	3/27/2017	9,086	9,248	40	MARCELLUS
<b>6</b>	3/28/2017	8,886	9,048	40	MARCELLUS
<b>7</b>	3/28/2017	8,397	8,848	40	MARCELLUS
<b>8</b>	3/28/2017	8,197	8,359	40	MARCELLUS
<b>9</b>	3/28/2017	7,997	8,159	40	MARCELLUS
<b>10</b>	3/29/2017	7,797	7,959	40	MARCELLUS
<b>11</b>	3/29/2017	7,600	7,759	40	MARCELLUS
<b>12</b>	3/29/2017	7,397	7,559	40	MARCELLUS
<b>13</b>	3/29/2017	7,197	7,359	40	MARCELLUS
<b>14</b>	3/30/2017	6,997	7,159	40	MARCELLUS
<b>15</b>	3/30/2017	6,797	6,959	40	MARCELLUS

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**514478- 47-085-10228-0000 - 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	3/25/2017	11	4,704	6,074	4,018	0	901	0
1	3/25/2017	100	7,735	10,186	3,716	0	8,937	0
1	3/26/2017	7	4,579	6,738	4,390	449,960	5,110	0
2	3/27/2017	100	8,012	8,324	3,785	449,920	9,176	0
3	3/27/2017	100	7,552	7,948	3,619	451,120	9,068	0
4	3/27/2017	101	7,132	7,337	3,941	449,640	9,731	0
5	3/27/2017	100	7,785	8,769	4,736	441,460	11,355	0
6	3/28/2017	99	7,740	8,139	4,043	456,040	11,158	0
7	3/28/2017	100	6,994	7,278	3,770	431,680	8,852	0
8	3/28/2017	100	6,984	7,457	3,433	449,760	8,678	0
9	3/29/2017	100	7,327	8,122	3,968	465,240	9,021	0
10	3/29/2017	101	7,053	7,802	3,776	450,480	8,616	0
11	3/29/2017	101	7,044	7,451	3,814	450,920	8,601	0
12	3/29/2017	102	7,037	7,422	3,740	449,740	8,676	0
13	3/29/2017	101	7,486	8,509	4,095	451,560	8,894	0
14	3/30/2017	96	7,864	8,971	4,483	450,284	9,837	0
15	3/30/2017	100	7,244	8,930	4,045	449,860	8,645	0

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Xerox WC 7535 514478 Perf and Stim.xlsx Tue Jun 27 11:29:50 2017 Media Type: Default Color: Automatic Office: Display-sRGB Press: SWOP-Coated Print Quality: Standard Color Adjustments: Customized Automatic Setup

# Hydraulic Fracturing Fluid Product Component Information Disclosure

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Job Start Date:	3/25/2017
Job End Date:	3/30/2017
State:	West Virginia
County:	Ritchie
API Number:	47-085-10228-00-00
Operator Name:	EQT Production
Well Name and Number:	514478
Latitude:	39.25764500
Longitude:	-80.92747200
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,285
Total Base Water Volume (gal):	6,100,752
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	C and J Energy Services	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	87.98810	None
LD-2550	Multi-Chem Group	Additive					
				Listed Below			

LD-2250	Multi-Chem Group	Friction Reducer					
				Listed Below			
MC MX 5-3886	Multi-Chem Group	Specialty Brine					
				Listed Below			
BR-11	C and J Energy Services	Gel Breaker					
				Listed Below			
Other Chemical (s)	Listed Above	See Trade Name (s) List					
				Listed Below			
MC MX 8-2544	Multi-Chem Group	Live Culture - Nitrate Reducing Bacteria					
				Listed Below			
GA-7A	C and J Energy Services	Gelling Agent					
				Listed Below			
SI-6	C and J Energy Services	Scale Inhibitor					
				Listed Below		RECEIVED Office of Oil and Gas	
						JUN 29 2017	
Sand (Proppant)	C and J Energy Services	Proppant				WV Department of Environmental Protection	
				Listed Below			
Hydrochloric Acid (15%)	C and J Energy Services	Acidizing					

				Listed Below			
CI-3	C and J Energy Services	Corrosion Inhibitor					
				Listed Below			
Silver FR 420	Silverback Chemical	Emulsion of petroleum distillate and aqueous solution					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Silica Substrate	14808-60-7	100.00000	11.66186	None
			Calcium nitrate.4H2O	13477-34-4	100.00000	0.10800	None
			Calcium nitrate.4H2O	13477-34-4	100.00000	0.10800	
			Hydrochloric Acid	7647-01-0	15.00000	0.02083	None
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01078	
			Polyacrylate	Proprietary	30.00000	0.01078	
			Polyacrylate	Proprietary	30.00000	0.01078	None
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01078	None
			Sodium chloride	7647-14-5	100.00000	0.00941	None
			Sodium chloride	7647-14-5	100.00000	0.00941	
			copolymer of 2-propenamide	69418-26-4	30.00000	0.00740	None
	RECEIVED Office of Oil and Gas		copolymer of 2-propenamide	69418-26-4	30.00000	0.00740	
	JUN 29 2017		Petroleum Distillate	64742-47-8	20.00000	0.00493	
			Petroleum Distillate	64742-47-8	20.00000	0.00493	None
	WV Department of Environmental Protection		Inner salt of alkyl amines	Proprietary	60.00000	0.00469	
			Inner salt of alkyl amines	Proprietary	60.00000	0.00469	None
			Fatty nitrogen derived amides	Proprietary	5.00000	0.00180	None
			Sodium chloride	7647-14-5	5.00000	0.00180	None

			Ethoxylated alcohol	Proprietary	5.00000	0.00180	
			Sodium chloride	7647-14-5	5.00000	0.00180	
			Ethoxylated alcohol	Proprietary	5.00000	0.00180	None
			Fatty nitrogen derived amides	Proprietary	5.00000	0.00180	
			Trade Secret	Proprietary	7.00000	0.00172	None
			Sodium chloride	7647-14-5	10.00000	0.00078	
			Sodium chloride	7647-14-5	10.00000	0.00078	None
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00049	None
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00049	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00049	
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00049	None
			Ammonium Chloride	12125-02-9	2.00000	0.00049	None
			Monoethanolamine hydrochloride	2002-24-6	2.00000	0.00049	None
			Sodium nitrate	7631-99-4	5.00000	0.00047	None
			Sodium nitrate	7631-99-4	5.00000	0.00047	
			Guar Gum	9000-30-0	60.00000	0.00031	None
			Guar Gum	9000-30-0	60.00000	0.00031	
			Distillates (petroleum), Hydrotreated Light	64742-47-8	60.00000	0.00031	None
			Distillates (petroleum), Hydrotreated Light	64742-47-8	60.00000	0.00031	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00025	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00025	None
			Methanol	67-56-1	1.00000	0.00025	None
			Ethylene Glycol	107-21-1	40.00000	0.00011	None
			Dimethylformamide	68-12-2	20.00000	0.00006	None
			Surfactants	Proprietary	10.00000	0.00005	
			Surfactants	Proprietary	10.00000	0.00005	None

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			2-butoxyethanol	111-76-2	15.00000	0.00004	None
			Cinnamaldehyde	104-55-2	15.00000	0.00004	None
			Tar Bases, Quinoline Derivs., Benzyl Chloride-quaternized	72480-70-7	15.00000	0.00004	None
			4-nonylphenol, Branched, Ethoxylated	127087-87-0	5.00000	0.00001	
			1-decanol	112-30-1	5.00000	0.00001	None
			4-nonylphenol, Branched, Ethoxylated	127087-87-0	5.00000	0.00001	None
			1-decanol	112-30-1	5.00000	0.00001	
			Triethyl Phosphate	78-40-0	2.50000	0.00001	None
			1-octanol	111-87-5	2.50000	0.00001	None
			1-octanol	111-87-5	2.50000	0.00001	
			Isopropanol	67-63-0	2.50000	0.00001	None
			Isopropanol	67-63-0	2.50000	0.00001	
			Triethyl Phosphate	78-40-0	2.50000	0.00001	
			Ammonium Persulfate	7727-54-0	85.00000	0.00001	None
			Ammonium Persulfate	7727-54-0	85.00000	0.00001	
			Cured Resin	Proprietary	13.00000	0.00000	
			Cured Resin	Proprietary	13.00000	0.00000	None
			Silica - Crystalline, Quartz	14808-60-7	1.00000	0.00000	None
			Silica - Crystalline, Quartz	14808-60-7	1.00000	0.00000	

\* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

\*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

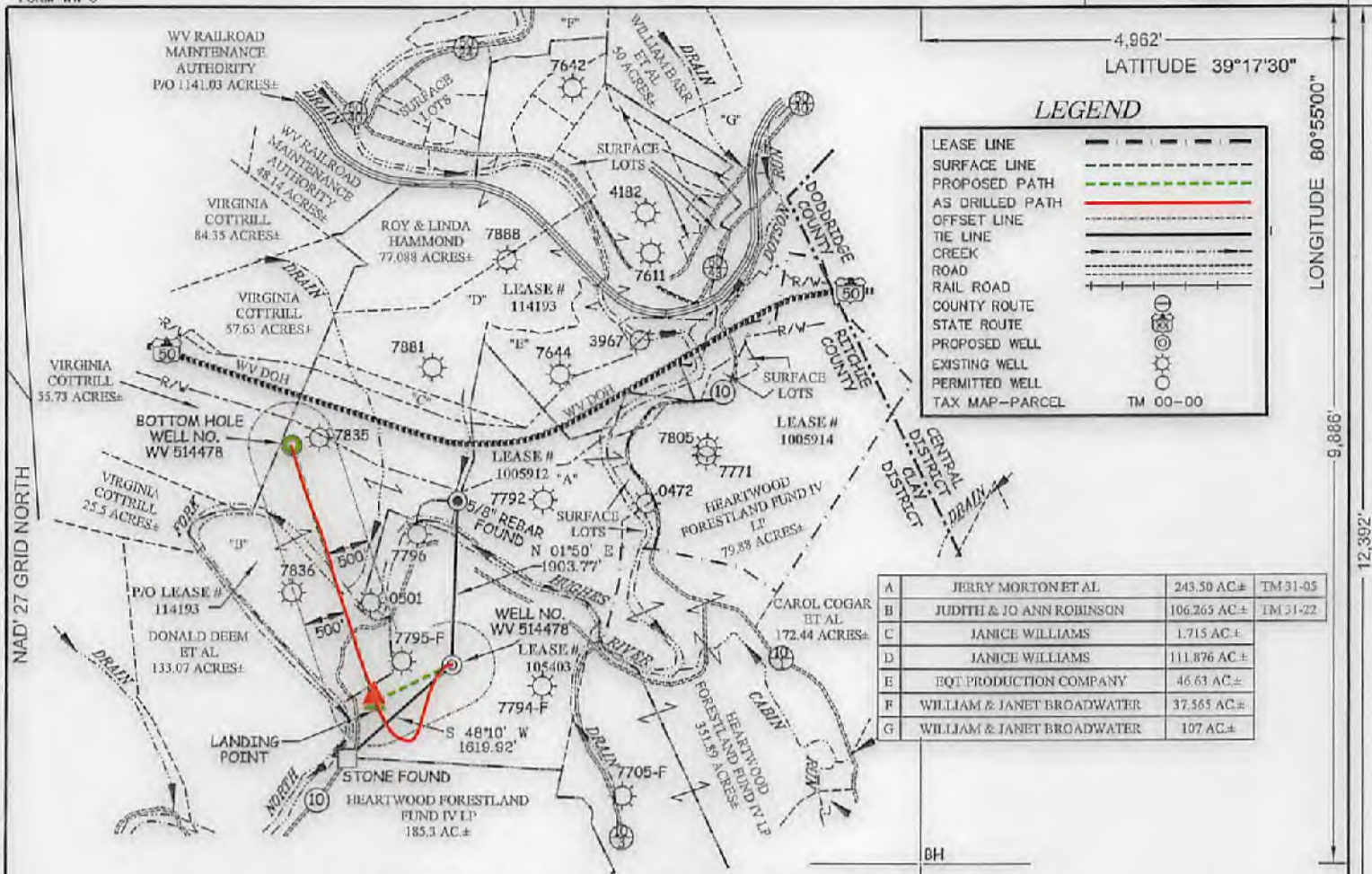
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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Environmental Protection





**EQT PRODUCTION COMPANY  
FLANAGAN LEASE  
268 ACRES±  
WELL NO. WV 514478  
(PEN54 H5)  
AS DRILLED COORDINATES  
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)**

NAD'27 S.P.C. (FT)	N. 279,160.90	E. 1,595,800.41
NAD'27 GEO.	LAT. (N) 39.257645	LONG. (W) 80.927472
NAD'83 UTM (M)	N. 4,345,379.86	E. 506,272.12

**LANDING POINT**

NAD'27 S.P.C. (FT)	N. 278,796.15	E. 1,594,903.95
NAD'27 GEO.	LAT. (N) 39.256604	LONG. (W) 80.930617
NAD'83 UTM (M)	N. 4,345,264.17	E. 505,000.87

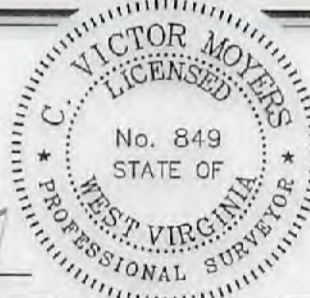
**BOTTOM HOLE**

NAD'27 S.P.C. (FT)	N. 281,697.37	E. 1,593,937.70
NAD'27 GEO.	LAT. (N) 39.264527	LONG. (W) 80.934192
NAD'83 UTM (M)	N. 4,346,143.10	E. 505,691.75

ROYALTY OWNERS		
MARY LEE AZELVANDRE ET AL	500 AC±	LEASE NO. 114193

**NOTES ON SURVEY**

- 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.
- AS DRILLED INFORMATION PROVIDED BY EQT.



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 JUNE 25, 20 15  
 REVISED AUGUST 03, 20 16  
 OPERATORS WELL NO. WV 514478  
 API WELL NO. 47 - 085 - 10228H  
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 8083AD514478  
 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  INJECTION  WASTE DISPOSAL  IF "GAS" PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION: PAD ELEVATION 1,016' WATERSHED NORTH FORK HUGHES RIVER  
 DISTRICT CLAY COUNTY RITCHIE QUADRANGLE PENNSBORO 7.5'

SURFACE OWNER JERRY MORTON ET AL ACREAGE 243.50±  
 ROYALTY OWNER ELLEN S. FRANCAVIGLIA ET AL ACREAGE 268±

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 6,275'

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

09/15/2017

COUNTY NAME PERMIT



3,080'

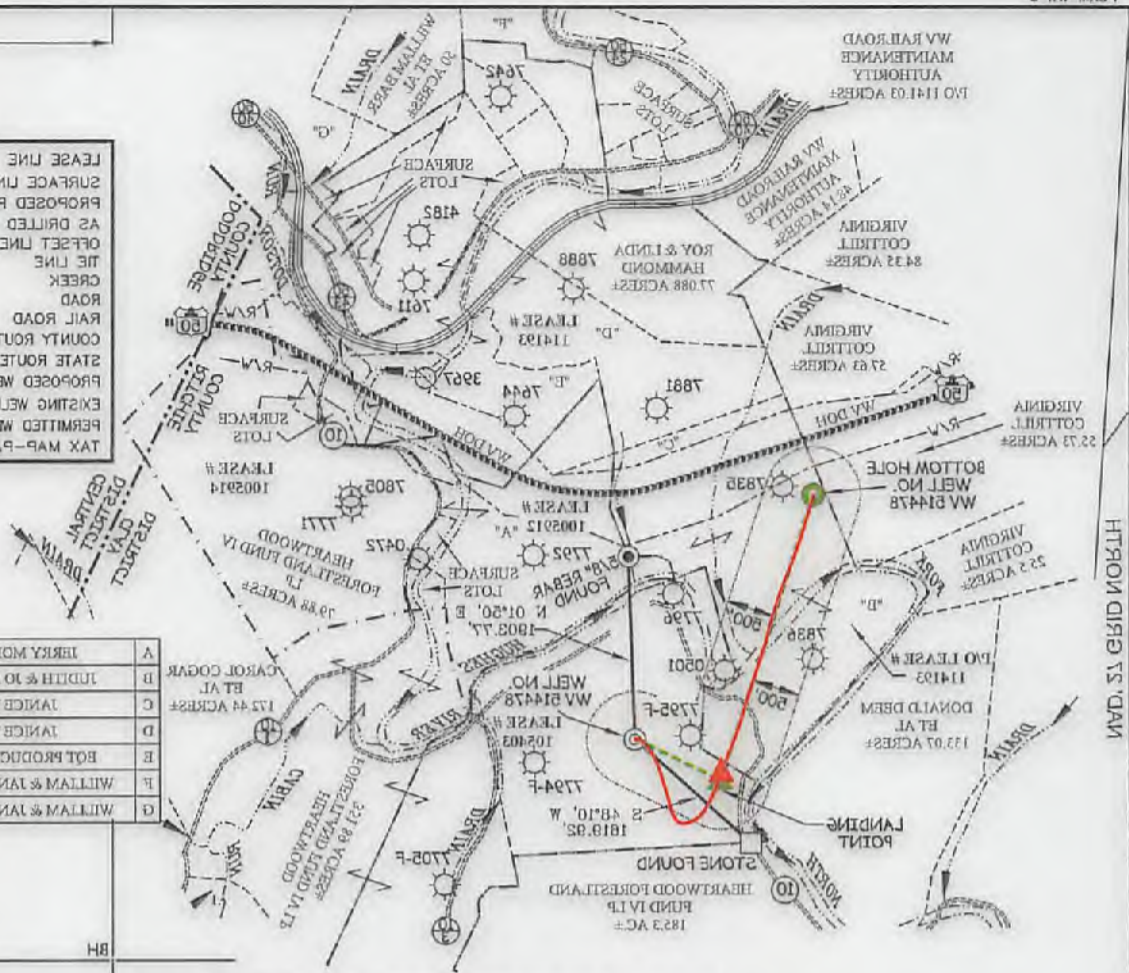
4,985'

LONGITUDE 80°22'00"

LATITUDE 38°17'30"

LEGEND

- LEASE LINE
- SURFACE LINE
- PROPOSED PATH
- AS DRILLED PATH
- OFFSET LINE
- THE LINE
- CREEK
- ROAD
- RAIL ROAD
- COUNTY ROUTE
- STATE ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL



A	JERRY MORTON ET AL	243.30 AC ±	TM 21-02
B	LUDITH & ANN ROBINSON	100.202 AC ±	TM 21-22
C	JANICE WILLIAMS	1.715 AC ±	
D	JANICE WILLIAMS	111.826 AC ±	
E	EQT PRODUCTION COMPANY	46.63 AC ±	
F	WILLIAM & JANET BROADWATER	37.262 AC ±	
G	WILLIAM & JANET BROADWATER	107.20 ±	

**EQT PRODUCTION COMPANY  
FLANAGAN LEASE  
288 ACRES ±  
WELL NO. WV 514478  
(PEN54 H5)  
AS DRILLED COORDINATES**

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
 NAD27 S.P.C.(FT) N. 270,160.90 E. 1,282,800.41  
 NAD27 GEO. LAT(N) 38.287845 LONG(W) 80.827475  
 NAD83 UTM (M) N. 4,342,378.88 E. 508,225.12  
**LANDING POINT**  
 NAD27 S.P.C.(FT) N. 278,788.12 E. 1,284,603.88  
 NAD27 GEO. LAT(N) 38.286804 LONG(W) 80.826817  
 NAD83 UTM (M) N. 4,342,264.17 E. 508,000.87  
**BOTTOM HOLE**  
 NAD27 S.P.C.(FT) N. 281,697.37 E. 1,283,897.70  
 NAD27 GEO. LAT(N) 38.286257 LONG(W) 80.824185  
 NAD83 UTM (M) N. 4,348,143.10 E. 507,891.75

ROYALTY OWNERS  
 MARY LEE AZELVANDRE ET AL 500 AC ± LEASE NO. 144189

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 INFORMATION PROVIDED BY EQT.



BY THE DIVISION OF ENVIRONMENTAL PROTECTION THE REGULATIONS ISSUED AND PRESCRIBED BY THE INFORMATION REQUIRED BY LAW AND THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE UNDERIGNED, HEREBY CERTIFY THAT



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

APR 18 2018  
 REVISED AUGUST 03 2018  
 DATE JUNE 25 2018  
 OPERATORS WELL NO. WV 514478

NO. 47 - 085 - 10228H  
 COUNTY STATE PERMIT

MINIMUM DEGREE OF ACCURACY 1:200  
 SCALE 1" = 2000'  
 FILE NO. 8083AD514478

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

LOCATION: PAD ELEVATION 1,018' WATERSHED NORTH FORK HUGHES RIVER DISTRICT CLAY COUNTY RITCHIE PENNSBORO 2'S SURFACE OWNER JERRY MORTON ET AL ACREAGE 243.30± ROYALTY OWNER ELLEN S. FRANCAVIGLIA ET AL ACREAGE 288± 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

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COUNTY NAME

PERMIT