



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Jim Justice, Governor
Austin Caperton, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL
Horizontal 6A / Horizontal 6A Well - 1

EQT PRODUCTION COMPANY
120 PROFESSIONAL PLACE
BUILDING II
BRIDGEPORT, WV 26330

Re: Permit Modification Approval for 512916
47-103-03058-00-00

Changing formation to Marcellus and lengthening the wellbore.

EQT PRODUCTION COMPANY

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.



James A. Martin
Chief

Operator's Well Number: 512916
Farm Name: COASTAL FOREST RESOURCES COMPANY
U.S. WELL NUMBER: 47-103-03058-00-00
Horizontal 6A / Horizontal 6A Well - 1
Date Issued: 5/4/2017

Promoting a healthy environment.

05/05/2017

WW-6B
(04/15)

API NO. 47-103 - 03058
OPERATOR WELL NO. 512916
Well Pad Name: BIG177

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: EQT Production Company 306686 Wetzel Grant Big Run
Operator ID County District Quadrangle

2) Operator's Well Number: 512916 Well Pad Name: BIG177

3) Farm Name/Surface Owner: Coastal Forest Resources Co dba Coastal Timberlands Co Public Road Access: Rt 19

4) Elevation, current ground: 811 Elevation, proposed post-construction: 811

5) Well Type (a) Gas Oil _____ Underground Storage _____

Other _____

(b) If Gas Shallow Deep _____

Horizontal _____

6) Existing Pad: Yes or No Yes *DMH 5/2/17*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus, 6881', 53', 2620 PSI

8) Proposed Total Vertical Depth: 6881

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 17229

11) Proposed Horizontal Leg Length: 9745

12) Approximate Fresh Water Strata Depths: 173,283,483,633

13) Method to Determine Fresh Water Depths: By offset wells

14) Approximate Saltwater Depths: 1138, 1453

15) Approximate Coal Seam Depths: 103,156,434,544

16) Approximate Depth to Possible Void (coal mine, karst, other): None reported

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes _____ No **RECEIVED**
Office of Oil and Gas

(a) If Yes, provide Mine Info: Name: _____

Depth: _____

Seam: _____

Owner: _____

MAY 03 2017

WV Department of Environmental Protection

WW-6B
(04/15)

API NO. 47- 103 - 03058
OPERATOR WELL NO. 512916
Well Pad Name: BIG177

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	26	New	A-500	85.6	80	80	98 ft ³ / CTS
Fresh Water	18 5/8	New	J-55	87.5	320	320	519 ft ³ / CTS
Coal	13 3/8	New	J-55	54.5	765	765	644 ft ³ / CTS
Intermediate	9 5/8	New	A-500	40	2728	2728	1072 ft ³ / CTS
Production	5 1/2	New	P-110	20	17229	17229	500' above top producing zone
Tubing	2 3/8		J-55	4.7		May not be run, if run set 40' above top perf or 80' inclination	
Liners							

DMAH 5/2/17

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	26	30	.312	884	35	Class A	1.18
Fresh Water	24	18 5/8	.435	2250	1800	See Variance 2016-17	1.19
Coal	13 3/8	17 1/2	.38	2700	2160	See Variance 2016-17	1.19
Intermediate	9 5/8	12 3/8	.395	3950	3160	Class H	1.07
Production	5 1/2	8 1/2	.361	12640	10112	Class H	1.123/2.098
Tubing	2 3/8	NA	.19	7700			
Liners							

PACKERS

Kind:				RECEIVED Office of Oil and Gas MAY 03 2017
Sizes:				
Depths Set:				

WV Department of Environmental Protection

WW-6B
(10/14)

API NO. 47- 103 - 03058
OPERATOR WELL NO. 512916
Well Pad Name: BIG177

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill and complete a new horizontal well in the Marcellus Formation. Drill the vertical to an approximate depth of 5642'. Kick off and drill curve. Drill the lateral in the Marcellus. Cement casing.

DMAH 5/2/17

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Hydraulic fracturing is completed in accordance with state regulations using water recycled from previously fractured wells and obtained from freshwater sources. This water is mixed with sand and a small percentage (less than 0.3%) of chemicals (including 15% Hydrochloric acid, friction reducer, biocide, and scale inhibitor), referred to in the industry as a "slickwater" completion. Maximum anticipated internal casing pressure is expected to be approximately 10000 psi, maximum anticipated treating rates are expected to average approximately 100 bpm. Stage lengths vary from 150 to 300 feet. Average approximately 350,000 gallons of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Average approximately 400,000 pounds of proppant per stage.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc.. (acres): No additional disturbance

22) Area to be disturbed for well pad only, less access road (acres): No additional disturbance

23) Describe centralizer placement for each casing string:

Freshwater: Bow spring centralizers – One at the shoe and one spaced every 500'.
Surface: Bow spring centralizers – One at the shoe and one spaced every 500'.
Intermediate: Bow spring centralizers – One cent at the shoe and one spaced every 500'.
Production: One solid body cent spaced every joint from production casing shoe to KOP

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24) Describe all cement additives associated with each cement type:

Conductor: Class A no additives
Freshwater (Type 1 Cement): 0-3% Calcium Chloride. Used to speed the setting of cement slurries. .25% Floko Loss Circulation Material (LCM)
Surface (Type 1 Cement): 0-3% Calcium Chloride. Used to speed the setting of cement slurries. .25% Floko Loss Circulation Material (LCM)
Intermediate (Class H Cement): 0-3% Calcium Chloride. Used to speed the setting of cement slurries. 0.25% Floko Loss Circulation Material (LCM) .6% Super FL-300 (fluid loss/lengthens thickening time)
Production:
Lead (Class H Cement): 0.2% CD-20 (dispersant makes cement easier to mix). .15% SuperFL-300 (fluid loss/lengthens thickening time) 15% SEC-10 (fluid loss) 50 50 POZ (extender)
Tail (Class H Cement): 0.2% Super CR-1 (Retarder). Lengthens thickening time. .3% Super FL-200 (fluid loss) .2% SEC-10 (Fluid loss) .2% SuperFL-350 (fluid loss) Reduces amount of water lost to formation. 60 % Calcium Carbonate. Acid solubility.

25) Proposed borehole conditioning procedures:

Freshwater: Circulate hole clean while rotating & reciprocating the drill string until cuttings diminish at surface.
Surface: Circulate hole clean while rotating & reciprocating the drill string until cuttings diminish at surface.
Intermediate: Circulate hole clean while rotating & reciprocating the drill string until cuttings diminish at surface.
Production: Pump marker sweep with nut plug to determine actual hole washout. Calculate a gauge holes bottoms up volume. Perform a cleanup cycle by pumping 3-5 bottoms up or until the shakers are clean. Check volume of cuttings coming across the shakers every 15 minutes.

*Note: Attach additional sheets as needed.

WEST VIRGINIA GEOLOGICAL PROGNOSIS

Horizontal Well
512916(BIG17714)

Drilline Objectives:	Marcellus			
County:	Wetzel			
Quad:	Big Run			
Elevation:	824 KB		811 GL	
Surface location	Northing: 396140.10	Easting: 1694435.93		
Landing Point	Northing: 396618.92	Easting: 1693381.03		
Toe location	Northing: 405497.34	Easting: 1689453.20		
Recommended Azimuth	342 Degrees			

TVD: 6881
Recommended LP to TD: 9,745'

Proposed Logging Suite: No pilot hole logs on BIG177 pad, formation tops based on logs run in BIG7 and BIG176 pilot holes. Please have mudloggers rigged up on location by 6362.5' TVD.

Recommended Gas Tests: 1800, 2050, 2600, Intm Csg. Pt., 3400, 4900, 5250, KOP, (Gas test at any more void). Gas test during any trip or significant downtime while drilling the lateral section.

DMH 5/2/17

ESTIMATED FORMATION TOPS

Formation	Top (TVD)	Base (TVD)	Lithology	Comments	Top RR	Base RR
Fresh Water Zone	1	633		FW @ 173,283,483,633, .	14	22
Coal	103	106	Coal		195	208
Waynesburg	156	160	Coal		266	279
Mapletown	434	438	Coal		396	401
Pittsburgh	544	551	Coal	Planned future mining in Pittsburgh seam elev 280' thickness 60" to 72"	585	598
Maxton	1695	1739	Sandstone	SW @ 1138,1453, .	677	748
Possible Storage Zone	1757	1813		Possible Storage Zone	718	738
Big Lime	1811	1864	Limestone		792	877
Weir	2193	2221	Sandstone		1616	1654 Base of Red
Top Devonian	2367					
Gantz	2367	2405	Silty Sand			
Fifty foot	2518	2563	Silty Sand			
Thirty foot	2589	2623	Silty Sand			
Gordan	2636	2681	Silty Sand			
Int csg pt	2728					
Forth Sand	2723	2734	Silty Sand			
Bayard	2775	2848	Silty Sand			
Warren	3232	3278	Silty Sand	Base of Offset Well Perforations at 2877' TVD		
Speechley	3382	3396	Silty Sand			
Halltown A	3771	3788	Silty Sand			
Riley	4231	4244	Silty Sand			
Benson	4883	4922	Silty Sand			
Alexander	5231	5257	Silty Sand			
Ells	5257	6421	Gray Shales and Silts			
Sonyea	6421	6591	Gray shale			
Middlesex	6591	6636	Shale			
Genesee	6636	6713	with black shale			
Genesee	6713	6747	Black Shale			
Tully	6747	6770	Limestone			
Hamilton	6770	6862	calcareous shales			
Marcellus	6862	6914	Black Shale			
Purcell	6871	6873	Limestone	Start Lateral at 6880.5'		
-Lateral Zone	6881					
Cherry Valley	6891	6892	Limestone			
Onondaga	6914		Limestone			

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Target Thickness	53 feet
Max Anticipated Rock Pressure	2620 PSI

Comments:
Note that this is a TVD prog for a horizontal well (azimuth of 342.169 degrees, target formation = Marcellus). All measurements taken from estimated KB elevation. Water and coal information estimated from surrounding well data.
Intermediate casing point is recommended 50' beneath the Gordan to shut off any water production from the Upper Devonian sands. Intermediate casing should be cemented into the surface string, per WV regulations.
The estimated landing point TVD is 6880.5', rig geologist may adjust landing point. After the well is landed, drill to reported bed dips/ geologists' recommendation. The geologic structure is unknown at this time.
**AH6 (KB 13) hit redrock at 810' KB when drilling first well on BIG177 pad (511407). Do not drill deeper than 790' to avoid hitting RR prior to running casing (this will give us 30' rat-hole).

LATERAL DRILLING TOLERANCES
Manview - Lateral: Deviate as little as possible to the left or right of the planned wellbore
Manview - TD: **DO NOT EXTEND** beyond recommended wellbore to avoid lease line

RECOMMENDED CASING POINTS			
Fresh Water	CSG OD	18 5/8	CSG DEPTH 320
Coal	CSG OD	13 3/8	CSG DEPTH 765
Intermediate 1:	CSG OD	9 5/8	CSG DEPTH 2728
Production:	CSG OD	5 1/2	CSG DEPTH @ TD

Beneath water show at 633'
Beneath the Gordan formation

4710303058 MD

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Environmental Protection

DWAH 5/24/17

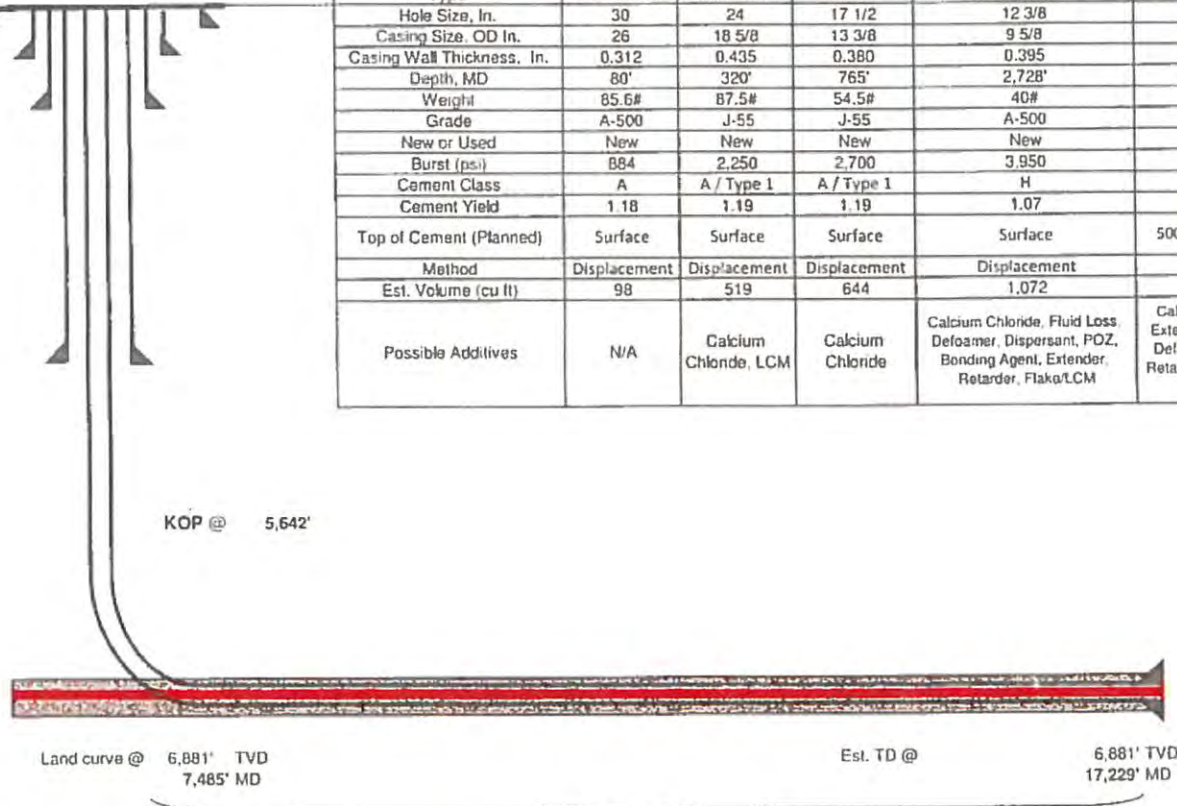
Well 512916(BIG177H4)
EQT Production
Big Run Quad
Wetzel County, WV

Azimuth 312
Vertical Section 10601

Note: Diagram is not to scale

Formations	Top TVD	Base TVD
Conductor	40	
Fresh Water Casing	329'	
Base Fresh Water	633	
Surface Casing	765	
Base Red Rock	1654	
Maxton	1695 - 1739	
Big Lime	1811 - 1864	
Wellr	2193 - 2221	
Gantz	2367 - 2405	
Fifty foot	2518 - 2563	
Thirty foot	2589 - 2623	
Gordon	2636 - 2681	
Forth Sand	2723 - 2734	
Intermediate Casing	2728	
Bayard	2775 - 2848	
Warren	3232 - 3278	
Speechley	3382 - 3396	
Balltown A	3771 - 3788	
Riley	4231 - 4244	
Benson	4883 - 4922	
Alexander	5231 - 5257	
Sonyea	6421 - 6591	
Middlesex	6591 - 6636	
Genesee	6636 - 6713	
Genesee	6713 - 6747	
Tully	6747 - 6770	
Hamilton	6770 - 6862	
Marcellus	6862 - 6914	
Production Casing	17229 MD	
Onondaga	6914	

Casing and Cementing				Deepest Fresh Water: 633'	
Type	Conductor	Freshwater	Surface	Intermediate	Production
Hole Size, In.	30	24	17 1/2	12 3/8	8 1/2
Casing Size, OD In.	26	18 5/8	13 3/8	9 5/8	5 1/2
Casing Wall Thickness, In.	0.312	0.435	0.380	0.395	0.361
Depth, MD	80'	320'	765'	2,728'	17,229'
Weight	85.6#	87.5#	54.5#	40#	20#
Grade	A-500	J-55	J-55	A-500	P-110
New or Used	New	New	New	New	New
Burst (psi)	884	2,250	2,700	3,950	12,640
Cement Class	A	A / Type 1	A / Type 1	H	A / H
Cement Yield	1.18	1.19	1.19	1.07	1.123 / 2.098
Top of Cement (Planned)	Surface	Surface	Surface	Surface	500' above top Producing Zone
Method	Displacement	Displacement	Displacement	Displacement	Displacement
Est. Volume (cu ft)	98	519	644	1,072	3,747
Possible Additives	N/A	Calcium Chloride, LCM	Calcium Chloride	Calcium Chloride, Fluid Loss Defoamer, Dispersant, POZ, Bonding Agent, Extender, Retarder, Fluka/LCM	Calcium Carbonate, Fluid Loss Extender, Dispersant, Viscosifier, Defoamer, POZ, Bonding Agent, Retarder, Anti-Settling/Suspension Agent



Proposed Well Work:
Drill and complete a new horizontal well in the Marcellus formation.
Drill the vertical to an approximate depth of 5642'
Kick off and drill curve. Drill lateral in the Marcellus. Cement casing.

9,745' Lateral

Est. TD @ 6,881' TVD
17,229' MD

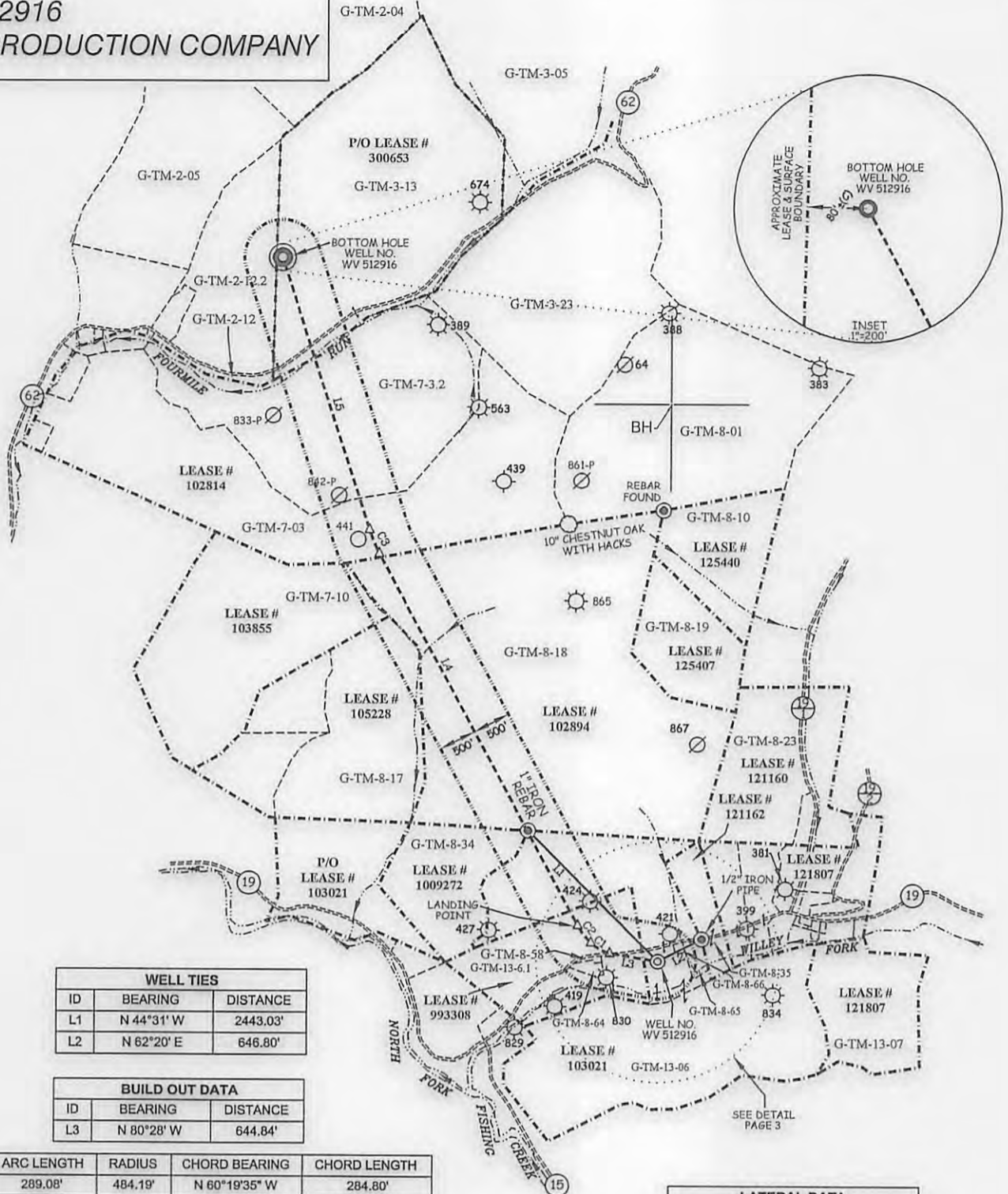
BIG177
WV 512916
EQT PRODUCTION COMPANY

BOTTOM HOLE LATITUDE 39°37'30"

5,327'

TH

NAD'27 GRID NORTH



80°35'00"

BOTTOM HOLE LONGITUDE 80°35'00"

6,158'

WELL TIES		
ID	BEARING	DISTANCE
L1	N 44°31' W	2443.03'
L2	N 62°20' E	646.80'

BUILD OUT DATA		
ID	BEARING	DISTANCE
L3	N 80°28' W	644.84'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	289.08'	484.19'	N 60°19'35" W	284.80'
C2	288.93'	935.67'	N 36°24'52" W	287.78'

LATERAL DATA		
ID	BEARING	DISTANCE
L4	N 28°00' W	5610.22'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C3	338.90'	1910.04'	N 22°54'59" W	338.45'

ID	BEARING	DISTANCE
L5	N 17°50' W	3795.46'

TOTAL LATERAL LENGTH = 9744.58'

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 www.slsurvey.com

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD'27 S.P.C.(FT)	N. 396,140.10	E. 1,694,435.93	
NAD'27 GEO.	LAT-(N) 39.582573	LONG-(W) 80.584155	
NAD'83 UTM (M)	N. 4,381,520.422	E. 535,727.679	
LANDING POINT			
NAD'27 S.P.C.(FT)	N. 396,618.92	E. 1,693,381.03	
NAD'27 GEO.	LAT-(N) 39.583853	LONG-(W) 80.587918	
NAD'83 UTM (M)	N. 4,381,660.93	E. 535,403.86	
BOTTOM HOLE			
NAD'27 S.P.C.(FT)	N. 405,497.34	E. 1,689,453.20	
NAD'27 GEO.	LAT-(N) 39.608095	LONG-(W) 80.602240	
NAD'83 UTM (M)	N. 4,384,345.83	E. 534,162.14	



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

LEGEND	
LEASE LINE	-----
SURFACE LINE	-----
WELL LATERAL	-----
OFFSET LINE	-----
TIE LINE	-----
CREEK	-----
ROAD	-----
COUNTY ROUTE	-----
PROPOSED WELL	⊙
EXISTING WELL	⊙
PERMITTED WELL	⊙
GRANT DISTRICT TAX MAP-PARCEL	G-TM-00-00

SCALE 1" = 2000' FILE NO. 6806P512916R13
 DATE OCTOBER 02, 20 13
 03/26/14, 09/09/14, 08/25/15, 09/14/15, 10/06/16
 REVISED 03/31/17 & 04/21/17
 OPERATORS WELL NO. WV 512916
 API WELL NO. 47 - 103 - 03058
 STATE COUNTY PERMIT

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

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

COUNTY NAME PERMIT

05/05/2017

**BIG177
WV 512916
EQT PRODUCTION COMPANY**

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

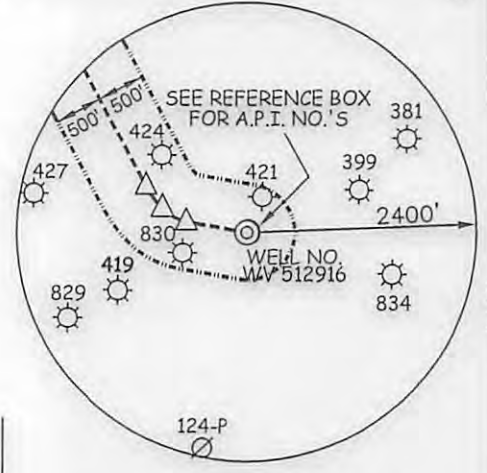
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BOTTOM HOLE

NAD'27 S.P.C.(FT) N. 405,497.34 E. 1,689,453.20
 NAD'27 GEO. LAT-(N) 39.608095 LONG-(W) 80.602240
 NAD'83 UTM (M) N. 4,384,345.83 E. 534,162.14



NOTES ON SURVEY

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD. SEE REFERENCE BOX FOR DWELLING WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'.

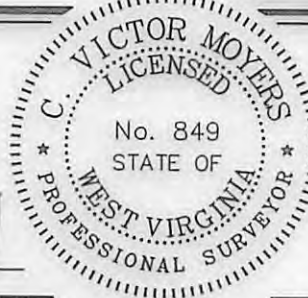
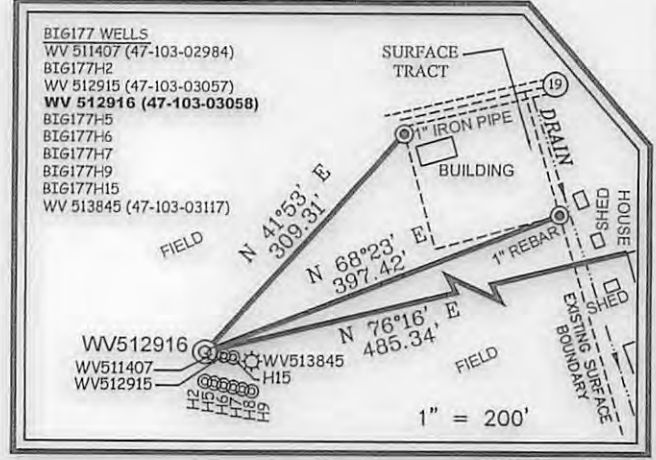
ROYALTY OWNERS		
COASTAL FOREST RESOURCES CO. d/b/a COASTAL TIMBERLANDS CO. ET AL	57.5 AC.±	LEASE NO. 993308
KEVIN GOFF	48.25 AC.±	LEASE NO. 1009272
EQT PRODUCTION COMPANY	300 AC.±	LEASE NO. 102894
JOSEPH SHIBEN & MINNIE SHIBEN ESTATE	1030 AC.±	LEASE NO. 102814
JAMES E. NEWMAN ET AL	P/O 332 AC.±	LEASE NO. 300853

SURFACE OWNERS - CONTINUED

G-TM-13-6.1	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	55.06 ACRES±
G-TM-13-07	MANSEL McDIFFITT ET AL	51.8 ACRES±

SURFACE OWNERS		
G-TM-2-04	JOHN C. COMER ET UX	104.00 ACRES±
G-TM-2-05	EDWIN L. DULANEY ET UX	104.00 ACRES±
G-TM-2-12	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	3.63 ACRES±
G-TM-2-12.2	TEORA & SANDRA DULANEY	66.64 ACRES±
G-TM-3-05	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	179.00 ACRES±
G-TM-3-13	EDWARD L. DULANEY II	164.75 ACRES±
G-TM-3-23	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	167.75 ACRES±
G-TM-7-03	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	178 ACRES±
G-TM-7-3.2	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	156.98 ACRES±
G-TM-7-10	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	120 ACRES±
G-TM-8-01	DANNY STOCKSLAGER ET AL	170 ACRES±
G-TM-8-10	GARLAND MINOR ET AL	48.1 ACRES±
G-TM-8-17	KENNETH & LORRAINE WILDMAN	67 ACRES±
G-TM-8-18	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	337 ACRES±
G-TM-8-19	PHILLIP & KIMBERLY SHREVE	46.45 ACRES±
G-TM-8-23	DALE DULANEY ET AL	70.81 ACRES±
G-TM-8-34	HALLIE HARDBARGER	54.01 ACRES±
G-TM-8-35	DEBORAH FRONCZEK ET AL	15.5 ACRES±
G-TM-8-58	HIGGINS CHAPEL CHURCH OF CHRIST	0.99 ACRES±
G-TM-8-64	MARY EASTHAM ET AL	1.45 ACRES±
G-TM-8-65	IKKEY & TINA WILLEY	2.15 ACRES±
G-TM-8-66	EQM GATHERING OPOC LLC	.42 ACRES±
G-TM-13-06	COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY	217.19 ACRES±

REFERENCES



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 02 20 13
 REVISED 03/26/14, 09/09/14, 08/25/15, 09/14/15, 10/06/16
03/31/17 & 04/21/17
 OPERATORS WELL NO. WV 512916
 API WELL NO. 47 - 103 - 03058 Mod
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 6806P512916R13.dwg
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE SEE NOTE 2

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 811' WATERSHED WILLEY FORK OF NORTH FORK FISHING CREEK
 DISTRICT GRANT COUNTY WETZEL QUADRANGLE BIG RUN 7.5'

SURFACE OWNER COASTAL FOREST RESOURCES CO. d/b/a COASTAL TIMBERLANDS CO. ACREAGE 27± OF 217±
 ROYALTY OWNER HIGGINS FAMILY TRUST ACREAGE 242.5

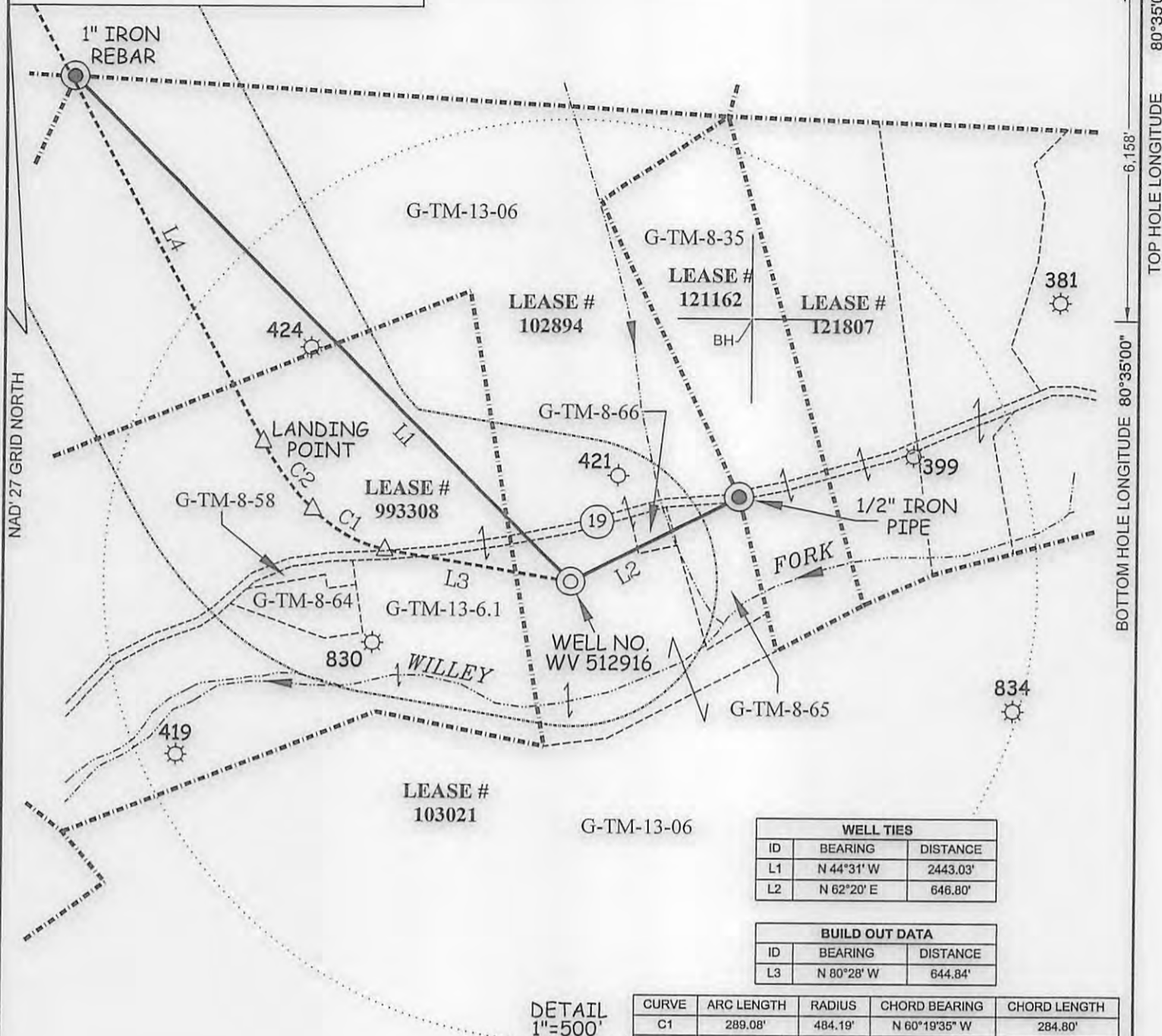
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,881'

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

BIG177
WV 512916
EQT PRODUCTION COMPANY



WELL TIES		
ID	BEARING	DISTANCE
L1	N 44°31' W	2443.03'
L2	N 62°20' E	646.80'

BUILD OUT DATA		
ID	BEARING	DISTANCE
L3	N 80°28' W	644.84'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	289.08'	484.19'	N 60°19'35" W	284.80'
C2	288.93'	935.67'	N 36°24'52" W	287.78'

LATERAL DATA		
ID	BEARING	DISTANCE
L4	N 28°00' W	5610.22'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C3	338.90'	1910.04'	N 22°54'59" W	338.45'

ID	BEARING	DISTANCE
L5	N 17°50' W	3795.46'

TOTAL LATERAL LENGTH = 9744.58'

DETAIL
1"=500'

SLS
Land & Energy Development
Solutions from the ground up.
 P.O. Box 150 • 12 Vanham Drive • Glenville, WV 26351 • (304) 462-9634
 www.slsurveys.com



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

LEGEND	
LEASE LINE	-----
SURFACE LINE	-----
WELL LATERAL	-----
OFFSET LINE	-----
TIE LINE	-----
CREEK	~~~~~
ROAD	-----
COUNTY ROUTE	-----
PROPOSED WELL	⊙
EXISTING WELL	⊙
PERMITTED WELL	⊙
GRANT DISTRICT TAX MAP-PARCEL	G-TM-00-00

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD'27 S.P.C.(FT)	N. 396,140.10	E. 1,694,435.93	
NAD'27 GEO.	LAT-(N) 39.582573	LONG-(W) 80.584155	
NAD'83 UTM (M)	N. 4,381,520.422	E. 535,727.679	
LANDING POINT			
NAD'27 S.P.C.(FT)	N. 396,618.92	E. 1,693,381.03	
NAD'27 GEO.	LAT-(N) 39.583853	LONG-(W) 80.587918	
NAD'83 UTM (M)	N. 4,381,660.93	E. 535,403.86	
BOTTOM HOLE			
NAD'27 S.P.C.(FT)	N. 405,497.34	E. 1,689,453.20	
NAD'27 GEO.	LAT-(N) 39.608095	LONG-(W) 80.602240	
NAD'83 UTM (M)	N. 4,384,345.83	E. 534,162.14	

SCALE	1" = 2000'	FILE NO.	6806P512916R13
DATE	OCTOBER 02		20 13
REVISED	03/26/14, 09/09/14, 08/25/15, 09/14/15, 10/06/16		03/31/17 & 04/21/17
OPERATORS WELL NO.	WV 512916		
API WELL NO.	47	103	03058
NO.	STATE	COUNTY	PERMIT

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



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

05/05/2017

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
See Attached				

**RECEIVED
Office of Oil and Gas**

MAY 03 2017

**WV Department of
Environmental Protection**

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: EQT Production Company
 By: Victoria J Roark
 Its: Permitting Supervisor

Lease No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Higgins Family Trust, et al. (currenty royalty owner)</u>				
<u>103021</u>	James V. Higgins	The Philadelphia Company of West Va.	**	DB 60/414
	The Philadelphia Company of West Va.	Pittsburgh & West Virginia Gas Company		DB 98/146
	Pittsburgh & West Virgina Gas Company	Equitable Gas Company		DB 187/321
	Equitable Gas Company	Equitrans, Inc.		OG 71A/453
	Equitrans, Inc.	Equitrans, LP		DB 105/908
	Equitrans, L.P.	EQT Production Company		DB 131A/81
<u>993308</u>	Coastal Lumber Company c/o Coastal Forest Resources Co., et al.	EQT Production Company		DB 147A/664
<u>1009272</u>	Kevin S. Goff	EQT Production Company		OG 163A/843
<u>EQT Production Company (currenty royalty owner)</u>				
<u>102894</u>	J. B. Hicks (Original Lease)	The Philadelphia Company of West Va.	**	OG 47/441
	The Philadelphia Company of West Va.	Pittsburgh & West Virginia Gas Company		OG 22A/352
	Pittsburgh & West Virgina Gas Company	Equitable Gas Company		DB 187/321
	Equitable Gas Company	Equitrans, Inc.		OG 71A/453
	Equitrans, Inc.	Equitrans, LP		AB 105/915
	Equitrans, LP	Equitable Production-Eastern States (EPES)		AB 23/899 Marion Co.
	Equitable Production-Eastern States (EPES)	Equitable Production Company		see attached
	Equitable Production Company	EQT Production Company		CB 13/14
<u>102814</u>	Joesph Shiben and Minnie Shiben Estate, et al.	EQT Production Company	**	DB 182A/84
<u>James E. Newman, et al. (Current Royalty Owner)</u>				
<u>300653</u>	John Ingram (Original Lease)	South Penn Oil Company	**	DB 46/228
	South Penn Oil Company	Hope Natural Gas Company		DB 91/468
	Hope Natural Gas Company	Consolidated Gas Supply Corporation		DB 233/387
	Consolidated Gas Supply Corporation	Consolidated Gas Transmission Corporation		LB 66A/59
	Consolidated Gas Transmission Corporation	CNG Transmission Corporation		CB 46/654 (Marion County)
	CNG Transmission Corporation	Eastern States Oil and Gas, Inc.		76A/232
	Eastern States Oil and Gas, Inc.	Blazer Energy Corp.		CB 12/253
	Blazer Energy Corp.	Eastern States Oil and Gas, Inc.		CB 12/259
	Eastern States Oil and Gas, Inc.	Equitable Production-Eastern States Oil & Gas		CB 13/14
	Equitable Production-Eastern States Oil & Gas	Equitable Production Company		CB 13/14
	Equitable Production Company	EQT Production Company		CB 13/14

** Per West Virginia Code 22-6-8

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WV Department of
Environmental Protection

05/05/2017



May 2, 2017

James Martin
WV Dept. of Environmental Protection
Division of Oil and Gas
601 57th St East
Charleston, WV 25304

RE: APIs: 47-103-03058

Dear Mr. Martin

Please find attached a revised WW-6B with inspector signoffs, Mylar and WW-6A1 for the above listed well on EQT's BIG177 wellpad changing the formation from Middlesex to Marcellus and lengthening the wellbore.

If you have any questions, please contact me at 304.848.0076

Sincerely,

A handwritten signature in blue ink, appearing to read 'Vicki Roark'.

Vicki Roark
Permitting Supervisor - WV

Enc.

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Office of Oil and Gas

MAY 03 2017

WV Department of
Environmental Protection