west virginia department of environmental protection

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

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

November 17, 2014

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-10302984, issued to EQT PRODUCTION COMPANY, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: 511407
Farm Name: COASTAL TIMBERLANDS CO.
API Well Number: 47-10302984
Permit Type: Horizontal 6A Well
Date Issued: 11/17/2014

11/21/2014

API Number: 103- 02984

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. Operator shall install noise barrier walls on the eastern and western sides of the pad during drilling and completion activities.

2. Operator shall relocate all overhead utilities before pad construction begins.

3. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.

4. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.

5. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.

6. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.

7. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations,* 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.

8. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.

9. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.

11/21/2014

API Number: 103-02984

PERMIT CONDITIONS

10. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

11. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

11/21/2014

47 103 02984

WW-6B
(9/13)

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

1) Well Operator:	EQT Production Company		103	4	254
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: 511407 Well Pad Name: BIG177

3) Farm Name/Surface Owner: Coastal Public Road Access: RT19

4) Elevation, current ground: 809 Elevation, proposed post-construction: 811

5) Well Type (a) Gas ■ Oil _____ Underground Storage _____
Other _____
(b)If Gas Shallow ■ Deep _____
Horizontal _____

DMH 9-4-14

6) Existing Pad: Yes or No no

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Target formation is Marcellus at a depth of 6910' with the anticipated thickness to be 53 feet and anticipated target pressure of 4373 PSI

8) Proposed Total Vertical Depth: 6910

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 13299

11) Proposed Horizontal Leg Length: 5560

12) Approximate Fresh Water Strata Depths: 162

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

14) Approximate Saltwater Depths: 1325,1400

15) Approximate Coal Seam Depths: 93,153,431,541,

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 ☑

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

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11/21/2014

47 10302984

August 6, 2014

Mr. Gene Smith
West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304

Re: Casing on Well 51 1407 (BIG177)

Dear Mr. Smith,

EQT is requesting the 9-5/8" intermediate casing be set 50' below the Gordon formation at 2759' KB. There is a significant red rock shows in the intermediate section as deep as 2546' that have given EQT drilling issues in the past. Shortening the intermediate casing length will reduce our drilling and casing running times which will reduce red rock exposure time and in turn reduce the risk of drilling issues.

In setting casing at 2759'KB, EQT will be covering the Big Lime, Big Injun, Weir and the gas storage zone in this area meaning the formations historically known to cause issue will be covered. From previous drilling experience, in the intermediate interval on offset pads, we know setting casing 50' below the Gordon will not cause issue while drilling the curves and laterals of these wells.

If you have any questions, please do not hesitate to contact me at (412) 395-3205

Sincerely,

Dan Doebereiner
Drilling Superintendent

Enc.

EQT Production 115 Professional Place I P.O. Box 280 I Bridgeport, WV 26330
T 304.848.0000 I F 304.848.0040 I www.eqt.com

WW-6B
(9/13)

18) **CASING AND TUBING PROGRAM**

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	26	new	varies	varies	80	80	98 CTS
Fresh Water	13 3/8	new	mc-50	54	765	765	672 CTS
Coal							
Intermediate	9 5/8	new	MC-50	40	2759	2759	1084 CTS
Production	5 1/2	new	P-110	20	13299	13299	see note 1
Tubing	2 3/8		J-55	4.6			
Liners							

DMH 9-4-14

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	26	30	.50	-	construction	1.18
Fresh Water	13 3/8	17 1/2	.38	2480	see note 2	1.21
Coal						
Intermediate	9 5/8	12 3/8	.395	3590	see note 2	1.21
Production	5 1/2	8 1/2	.361	12640	-	1.27/1.86
Tubing						
Liners						

PACKERS

Kind:	n/a			
Sizes:	n/a			
Depths Set:	n/a			

47 10302984

WW-6B
(9/13)

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. The vertical drill to go down to an approximate depth of 7042,tag the Onondaga not more than 100', run logs, then plug back, using a solid cement plug, to approximately 6130'. Then kick off the horizontal leg into the marcellus formation using a slick water frac .

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

Hydraulic fracturing is completed in accordance with state regs using water recycled from previously fractured wells and obtained from fresh water sources. This water is mixed with sand and a small percentage (less than 0.3%) of chemicals (including 15% Hydrochloric acid, gelling agent, gel breaker, friction reducer, biocide, and scale inhibitor). Stage lengths vary from 150 to 450 feet. Avg approx 400,000 gl of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Avg approx 400,000 lb of sand per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Avg approx 400,000 lbs/stage.

DMH 9-4-14

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 69

22) Area to be disturbed for well pad only, less access road (acres): 6.5

23) Describe centralizer placement for each casing string:

- 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 spaced every 1000' from KOP to Int csg shoe

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

see attached

25) Proposed borehole conditioning procedures:

see attached

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*Note: Attach additional sheets as needed.

11/21/2014

WW2B

FROM CASING PLAN

Note 1: EQT plans to bring the TOC on the production casing cement job 1,000' above kick off point, which is at least 500' above the shallowest production zone, to avoid communication.
Note 2: Reference Variance 2014-17. (Attached)

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

Surface (Type 1 Cement): 0-3% Calcium Chloride used to spped the setting of cement slurries.
0.4% flake. Loss Circulation Material (LCM) is used to combat the loss of the cement slurry to a thief zone.
Intermediate (Type 1 Cement): 0-3% Calcium Chloride Salt is used in shallow, low temperature formations to speed the setting of cement slurries. 0.4% flake. Loss Circulation Material (LCM) is used to combat the loss of whole drilling fluid or cement slurry (not filtrate) to a theif zone.
Production:
Lead (Type 1 Cement): 0.2-0.7% Lignosulfonate (Retarder). Lengthens thickening time.
0.3% CFR (dispersant). Makes cement easier to mix.
Tail (Type H Cement): 0.25-0.40% Lignosulfonate (Retarder). Lengthens thickening time
0.2-0.3% CFR (dispersant). This is to make the cement easier to mix.
60 % Calcuim Carbonate. Acid solubility.
0.4-0.6% Halad (fluid loss). Reduces amount of water lost to formation.

25) Proposed borehole conditioning procedures.

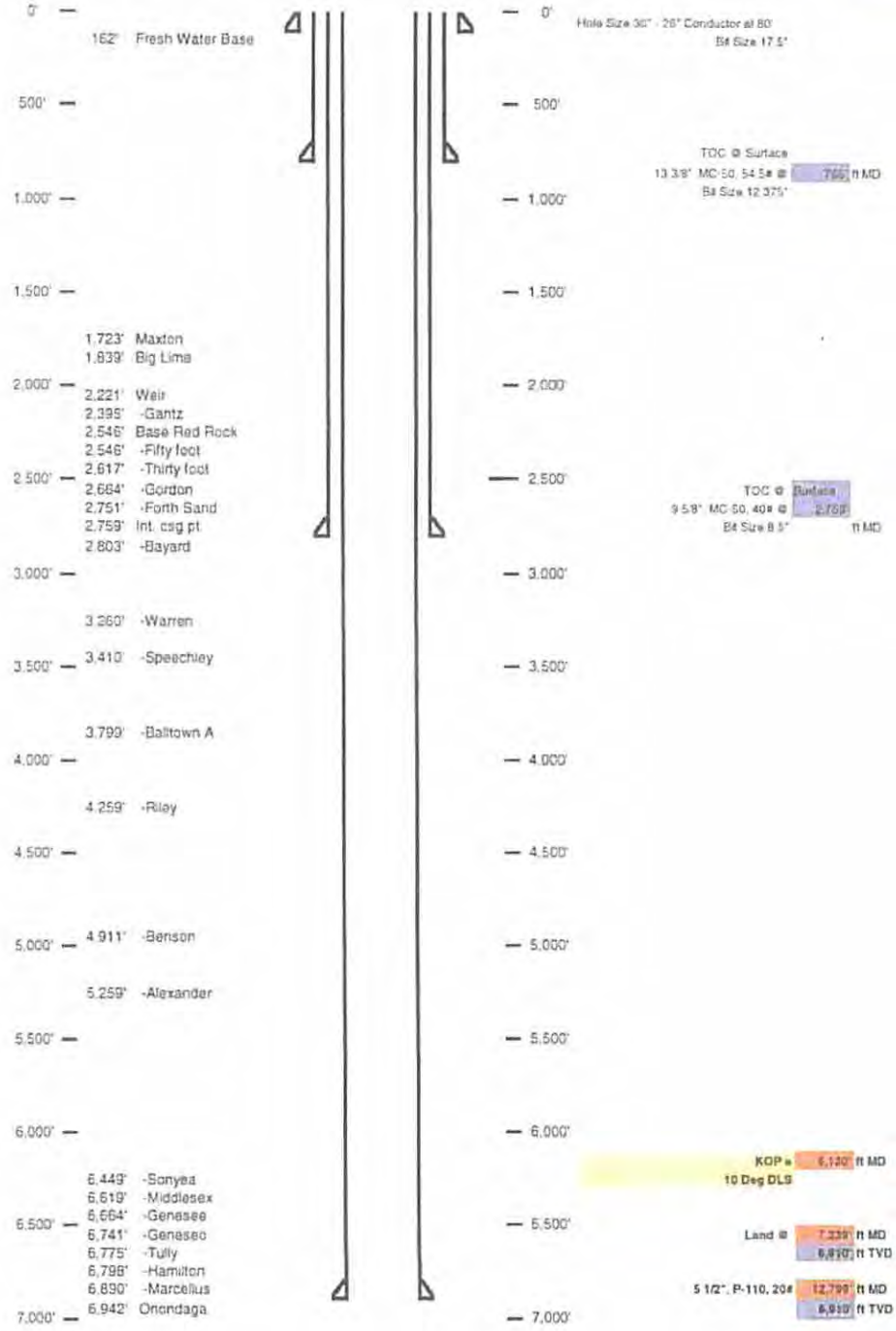
Surface: Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating one full joint until cuttings diminish at surface. When cuttings returning to surface diminish, continue to circulate an additional 5 minutes. To ensure that there is no fill, short trip two stands with no circulation. If there is fill, bring compressors back on and circulate hole clean. A constant rate of higher than expected cuttings volume likely indicates washouts that will not clean up.
Intermediate: Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating one full joint until cutting deminish at surface.
When cuttings returning to surface diminish, continue to circulate an additional 5 minutes. If foam drilling, to enhance hole cleaning use a soap sweep or increase injection rate & foam concentration.
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

DMH 9-4-14

47103029 84

Well Schematic
EQT Production

Well Name	[redacted]
County	Wetzel
State	West Virginia
Elevation KB:	[redacted]
Target	Marcellus
Prospect	
Azimuth	[redacted]
Vertical Section	[redacted]



11/21/2014

47 10302984

Well Number: 511407 (BIG177H1)

Casing and Cementing			Deepest Fresh Water: 162'	
Type	**Conductor**	**Surface**	**Intermediate**	**Production**
Hole Size, In.	30	17 1/2	12 3/8	8 1/2
Casing Size, OD In.	26	13 3/8	9 5/8	5 1/2
Casing Wall Thickness, In.	0.500	0.380	0.395	0.361
Depth, MD	**80'**	**765'**	**2,759'**	**12,799'**
Depth, TVD	**80'**	**765'**	**2,759'**	**6,910'**
Centralizers Used	Yes	Yes	Yes	Yes
Weight/Grade	Varies	54#/MC-50	40#/MC-50	20#/P-110
New or Used	New	New	New	New
Pressure Testing	-	20% Greater than exp. Pressure	20% Greater than exp. Pressure	20% greater than exp. fracture pressure
After Fracture Pressure Testing	-	-	-	20% greater than exp. shut pressure
ID, in	25.375	12.615	8.835	4.778
Burst (psi)	-	2,480	3,590	12,640
Collapse (psi)	-	1,110	2,470	11,100
Tension (mlbs)	-	455	456	587
Cement Class	-	-	-	H
Cement Type	Construction	1	1	-
Cement Yield	1.18	1.21	1.21	1.27/1.86
Meets API Standards	-	Yes	Yes	Yes
WOC Time	-	Min. 8 hrs	Min. 8 hrs	Min. 8 hrs
Top of Cement (Planned)	Surface	Surface	Surface	5,130'
Fill (ft.)	80'	765'	2,759'	7,669'
Percent Excess	-	20	20	10
Est. Volume (cu ft)	98	672	1,084	1,958
Est. Volume (BBLS)	17	120	193	349

11/21/2014

WEST VIRGINIA GEOLOGICAL PROGNOSIS
Horizontal Well

511407 (BIG177H1)

4710302984

Drilling Objectives: Marcellus
County: Wetzel
Quad: Big Run
Elevation: 821 KB 811 GL
Surface location Northing: 396138.1 Easting: 1694445.7
Landing Point Northing: 396620.9 Easting: 1694172.8 TVD: 6910
Toe location Northing: 401530 Easting: 1691562.5 TVD: 6910
Recommended Azimuth 332 Degrees **Recommended LP to TD:** 5560

Proposed Logging Suite:
@ **Intermediate Casing Point:** The open hole logs need to consist of Gamma Ray, Neutron, Density, Induction and Dipole Sonic. **CONTACT LUKE SCHANKEN PRIOR TO LOGGING (412.580.8016)**
@ **At Pilothole TD - Run OH logs for evaluation of uphole zones.**
An elog should be run for the first well on every horizontal well pad.
GR/LDT/DIL/CNL/Temp/Audio (Allegheny's Air Suite) pull GR to surface
Mudloggers to be on location at kickoff point to run samples and measure gas thru both the curve and lateral sections

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

Top red rock possible at [illegible] 11 192 263 303 582 674 715 789 1613 2425 2534

ESTIMATED FORMATION TOPS

Formation	Top (TVD)	Base (TVD)	Lithology	Comments	Top RR	Base RR
Fresh Water Zone	1	162		FW @ 162...	11	19
Coal	93	96	Coal		192	203
Waynesburg	153	157	Coal		263	276
Mapletown	431	435	Coal		303	308
Pittsburgh	541	548	Coal	[illegible] Pittsburgh [illegible]	582	595
Maxton	1723	1767	Sandstone	SW @ 1325,1400	674	745
Possible Storage Zone	**1754**	**1810**	**Sandstone**	**Possible Storage Zone**	715	735 Set casing 30' below th
Big Lime	1839	1892	Limestone		789	874
Weir	2221	2249	Sandstone	Top Red Rock Possible @ 11 192 263 303 582 674 715 789 1613 2425 2534...	1613	1651
Top Devonian	2395				2425	2435
-Gantz	2395	2433	Silty Sand		2534	2546 Base of Red Rock
-Fifty foot	2548	2591	Silty Sand			
-Thirty foot	2617	2651	Silty Sand			
-Gordon	2664	2709	Silty Sand			
Int csg pt	2750					
-Forth Sand	2751	2762	Silty Sand			
-Bayard	2803	2876	Silty Sand			
-Warren	3260	3306	Silty Sand			
-Speechley	3410	3424	Silty Sand			
-Balltown A	3799	3816	Silty Sand			
-Riley	4259	4272	Silty Sand			
-Benson	4911	4950	Silty Sand			
-Alexander	5259	5285	Silty Sand			
-Elks	5285	6449	Gray Shales and Silts			
-Sonyea	6449	6619	Gray shale			
-Middlesex	6619	6664	Shale			
-Genesee	6664	6741	Gray shale interbedded			
-Geneseo	6741	6775	Black Shale			
-Tully	6775	6798	Limestone			
-Hamilton	6798	6890	Gray shale with some			
-Marcellus	6890	6942	Black Shale			
Purcell	6899	3389	Limestone			
-Lateral Zone	**6910**	**6910**		**Start Lateral at 6910 ft, drill to 6910 ft**		
-Cherry Valley	6919	3400	Limestone			
Onondaga	6942		Limestone			
Pilot Hole TD	**7042**					

Target Thickness	53 feet
Anticipated Target Pressure	4373 PSI

Comments: Note that this is a TVD prog for a horizontal well. **All measurements taken from estimated KB elevation.** Water and coal information estimated from surrounding well data. Intermediate casing point is recommended 50' beneath the Gordon 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 TD is the TVD landing point for the horizontal section of well, with the plan to then drill to a final TVD of 6910' at the toe of the lateral. The geologic structure is unknown at this time.

LATERAL DRILLING TOLERANCES
Mapview - Left of borehole: Deviate as little as possible left to avoid planned lateral 512916
Mapview - Right of borehole: Deviate as little as possible right to avoid planned lateral 512915
Mapview - TD: DO NOT EXTEND beyond recommended wellbore to avoid leaseline
X-sectional View - Heel: 21 ft below MRC top
X-sectional View - Toe: 32 ft above MRC base

RECOMMENDED CASING POINTS

Fresh Water/Coal	CSG OD	13 3/8	CSG DEPTH	765	30 below a red rock
Intermediate 1:	CSG OD	9 5/8	CSG DEPTH	2750	50 below the Gordon
Production:	CSG OD	5 1/2	CSG DEPTH	@ TD	

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SSP

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25 attachment

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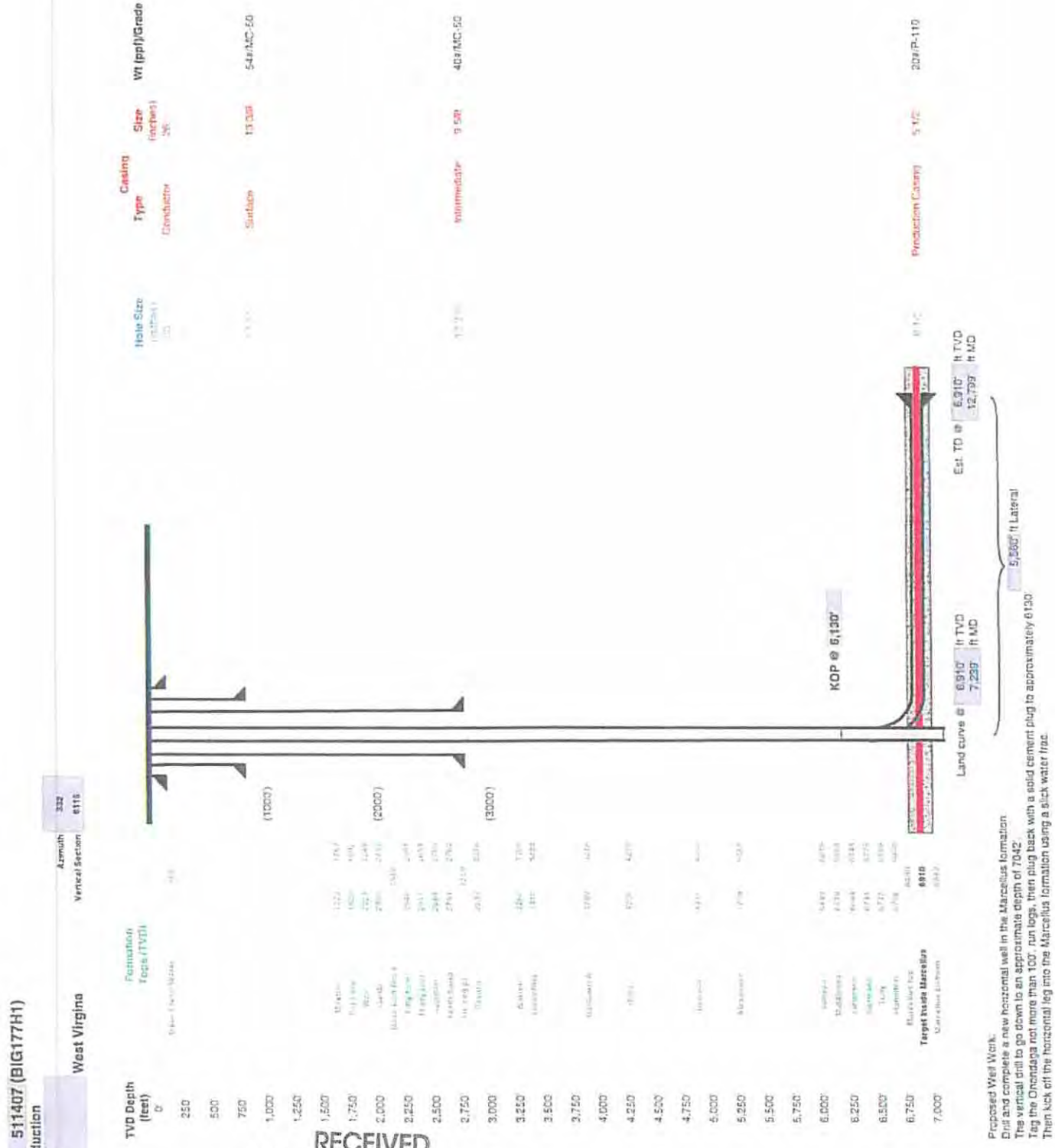

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11/21/2014
26 attachment

4710302984

WW-9
(5/13)

Page _____ of _____
API No. 47 - 103 - 0
Operator's Well No. 511407

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

Fluids/Cuttings Disposal & Reclamation Plan

Operator Name BIG177 OP Code _____

Watershed (HUC10) Willey Fork of North Fork Fishing Creek Quadrangle Big Run 7.5

Elevation 811.0 County Wetzel District Grant

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes x No _____

Will a pit be used ? Yes: _____ No: X

If so please describe anticipated pit waste: _____

Will a synthetic liner be used in the pit? Yes _____ No X If so, what ml.? 60

Proposed Disposal Method For Treated Pit Wastes:

_____ Land Application
• Underground Injection (UIC Permit Number 0014, 8462, 4037)
_____ Reuse (at API Number _____)
• Off Site Disposal (Supply form WW-9 for disposal location)
_____ Other (Explain _____)

Will closed loop system be used ? Yes, The closed loop system will remove drill cuttings from the drilling fluid. The drill cuttings are then prepared for transportation to an off-site disposal facility.

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Air is used to drill the top-hole sections of the wellbore, Surface, Intermediate, and Pilot hole sections, water based mud is used to drill the curve and lateral.

DMH 3-26-14

If oil based, what type? Synthetic, petroleum, etc _____

Additives to be used in drilling medium? MILBAR, Viscosifer, Alkalinity Control, Lime, Chloride Salts,Rate Filtration Control, Deflocculant, Lubricant, Detergent, Defoaming, Walnut Shell, X-Cide, SOLTEX Terra. Of the listed chemicals the following are generally used when drilling on air: lubricant, detergent, defoaming. Water based fluids use the following chemicals: MILBAR, viscosifer, alkalinity control, lime, chloride salts, rate filtration control, deflocculant, lubricant, detergent, defoaming, walnut shell, x-cide, SOLTEX terra

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Landfill

- If left in pit and plan to solidify what medium will be used? (Cement, Line, sawdust) n/a
- Landfill or offsite name/permit number? See Attached List

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature _____
Company Official (Typed Name) Victoria J. Roark
Company Official Title Permitting Supervisor

Subscribed and sworn before me this 12 day of March, 20 14

_____ Notary Public

My commission expires 8-24-22

11/21/2014

OFFICIAL SEAL
STATE OF WEST VIRGINIA
NOTARY PUBLIC
Pamela Sykes
EQT Production
PO Box 280
Bridgeport, WV 26330
My Commission Expires Aug. 24, 2022

WW-9

4710302984

Operator's Well No. 511407

Proposed Revegetation Treatment: Acres Disturbed 6.9 Prevegetation pH 5.2

Lime 3 Tons/acre or to correct to pH 6.5

Fertilize type

Fertilizer Amount 1/3 lbs/acre (500 lbs minimum)

Mulch 2 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
KY-31	40	Orchard Grass	15
Alsike Clover	5	Alsike Clover	5
Annual Rye	15		

Attach:
Drawing(s) of road, location,pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: V. ✓

Comments:

Title: Oil & Gas Inspector Date: 3-26-14

Field Reviewed? (✓) Yes ( ) No

11/21/2014

47 10302984

EQT Production Water plan
Offsite disposals for Marcellus wells

CWS TRUCKING INC.
P.O. Box 391
Williamstown, WV 26187
740-516-3586
Noble County/Noble Township
Permit # 3390

LAD LIQUID ASSETS DISPOSAL INC.
226 Rankin Road
Washington, PA 15301
724-350-2760
724-222-6080
724-229-7034 fax
Ohio County/Wheeling
Permit # USEPA WV 0014

TRI COUNTY WASTE WATER MANAGEMENT, INC.
1487 Toms Run Road
Holbrook, PA 15341
724-627-7178 Plant
724-499-5647 Office
Greene County/Waynesburg
Permit # TC-1009

Waste Management - Meadowfill Landfill
Rt. 2, Box 68 Dawson Drive
Bridgeport, WV 26330
304-326-6027
Permit #SWF-1032-98
Approval #100785WV

Waste Management - Northwestern Landfill
512 E. Dry Road
Parkersburg, WV 26104
304-428-0602
Permit #SWF-1025 WV-0109400
Approval #100833WV

BROAD STREET ENERGY LLC
37 West Broad Street
Suite 1100
Columbus, Ohio 43215
740-516-5381
Washington County/Belpre Twp.
Permit # 8462

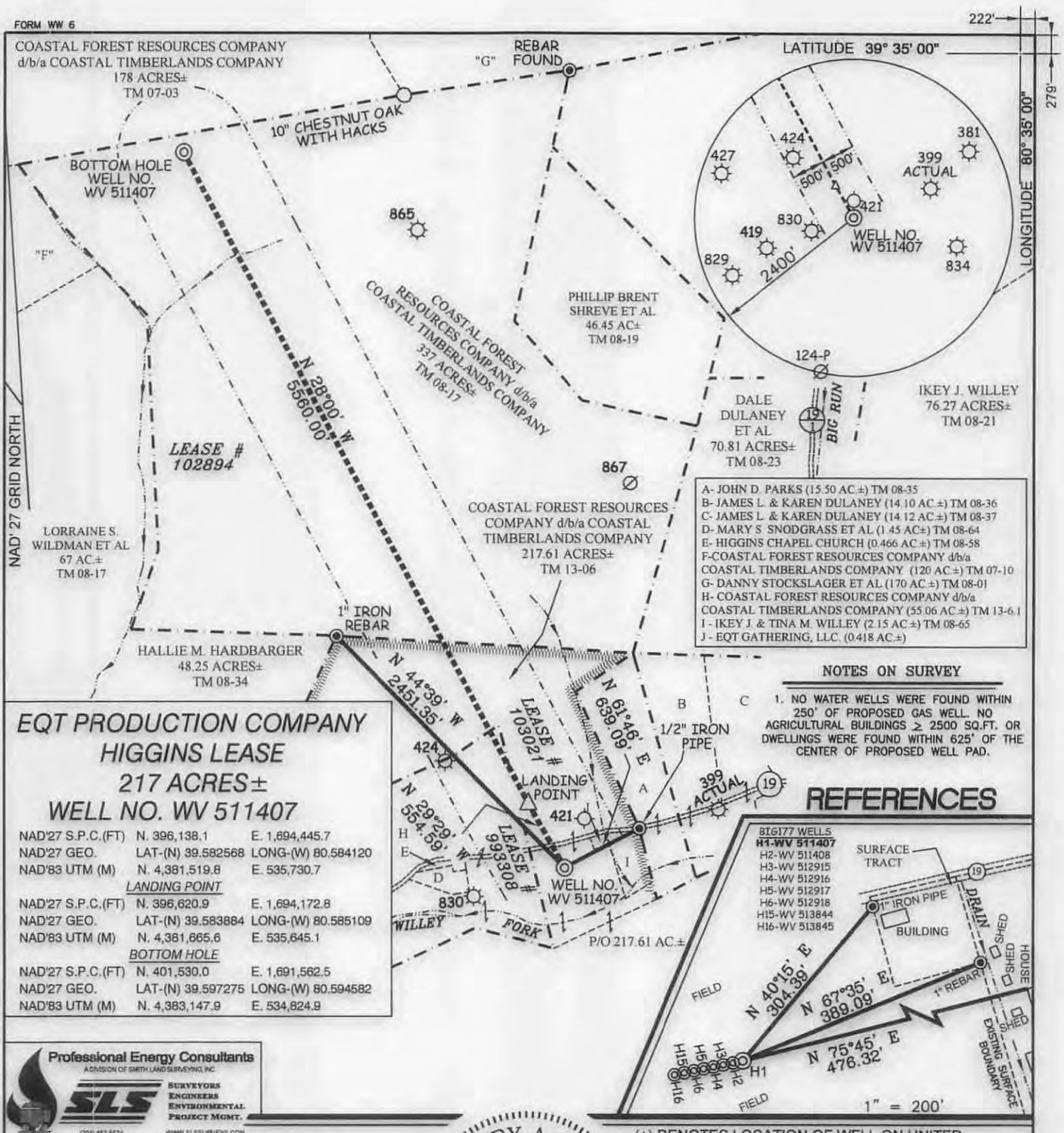
TRIAD ENERGY
P.O. Box 430
Reno, OH 45773
740-516-6021 Well
740-374-2940 Reno Office Jennifer
Nobel County/Jackson Township
Permit # 4037

KING EXCAVATING CO.
Advanced Waste Services
101 River Park Drive
New Castle, Pa. 16101
Facility Permit# PAR000029132

Dmit
3-26-14

11/21/2014

FORM WW 6



EQT PRODUCTION COMPANY
HIGGINS LEASE
217 ACRES±
WELL NO. WV 511407

NAD'27 S.P.C.(FT)	N. 396,138.1	E. 1,694,445.7
NAD'27 GEO.	LAT-(N) 39.582568	LONG-(W) 80.584120
NAD'83 UTM (M)	N. 4,381,519.8	E. 535,730.7
LANDING POINT		
NAD'27 S.P.C.(FT)	N. 396,620.9	E. 1,694,172.8
NAD'27 GEO.	LAT-(N) 39.583884	LONG-(W) 80.585109
NAD'83 UTM (M)	N. 4,381,665.6	E. 535,645.1
BOTTOM HOLE		
NAD'27 S.P.C.(FT)	N. 401,530.0	E. 1,691,562.5
NAD'27 GEO.	LAT-(N) 39.597275	LONG-(W) 80.594582
NAD'83 UTM (M)	N. 4,383,147.9	E. 534,824.9

Professional Energy Consultants
A DIVISION OF SMITH LAND SURVEYING INC
SLS SURVEYORS ENGINEERS ENVIRONMENTAL PROJECT MGMT.
(304) 462-5634 WWW.SLSSURVEYS.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. 677 Gregory A. Smith

GREGORY A. SMITH LICENSED No. 677 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

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

DATE MAY 20 , 20 13

REVISED 07/29/13, 09/18/13, 01/23/14 & 01/29/14

OPERATORS WELL NO. WV 511407

API WELL NO. 47 — 103 — 02984 HLA
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500

FILE NO. 6806P511407R8

SCALE 1" = 1000'

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK)

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

WELL TYPE: OIL ____ GAS X LIQUID INJECTION ____ WASTE DISPOSAL ____ IF "GAS" PRODUCTION X STORAGE ____ DEEP ____ SHALLOW X

LOCATION :

ELEVATION 809' (GROUND) 811' (PROPOSED) 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 (242.5 AC.±) / COASTAL FOREST RESOURCES CO. d/b/a COASTAL TIMBERLANDS CO. ET AL (67.5 AC.±)

PROPOSED WORK : EQT PRODUCTION COMPANY (300 AC.±) LEASE NO. 103021 / 993308 / 102894

DRILL X CONVERT ____ DRILL DEEPER ____ REDRILL ____ FRACTURE OR STIMULATE X 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 6890'

11/21/2014

COUNTY NAME PERMIT

WELL OPERATOR EQT PRODUCTION COMPANY
ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280
BRIDGEPORT, WV 26330

DESIGNATED AGENT REX C. RAY
ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280
BRIDGEPORT, WV 26330

SLS
134868