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

May 03, 2016

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-10303058, 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: 512916
Farm Name: COASTAL FOREST RESOURCES
API Well Number: 47-10303058
Permit Type: Horizontal 6A Well
Date Issued: 05/03/2016

Promoting a healthy environment.

API Number: 103-03058

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. 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.

2. 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 one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.

3. 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.

4. 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.

5. 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.

6. 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.

7. In the event of an explosion, fire or other accident on or near a well or well work location, the well operator or its contractor shall give notice, stating the particulars of the event to the oil and gas inspector and the Chief, within 24 hours of said accident.

8. 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.

9. 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.

4710303058

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

Operator ID	County	District	Quadrangle
306686	103-Wetzel	4-Grant	254-Big Run

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

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

4) Elevation, current ground: 809.0 Elevation, proposed post-construction: 811.0

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

DMH
2-19-16

6) Existing Pad: Yes or No yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Middlesex, 6626, 45, 2620

8) Proposed Total Vertical Depth: 6626

9) Formation at Total Vertical Depth: Middlesex

10) Proposed Total Measured Depth: 12660

11) Proposed Horizontal Leg Length: 5430

12) Approximate Fresh Water Strata Depths: 170,280,480,630

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

14) Approximate Saltwater Depths: 1135, 1450

15) Approximate Coal Seam Depths: 100,153,431,541

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 X

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

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FEB 25 2016

4710303058

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	12660	12660	500' above top producing zone
Tubing	2 3/8		J-55	4.7			May not be run, if run set 100' from TD.
Liners							

DmH
2-19-16

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	-	18	Class A	1.18
Fresh Water	18 5/8	24	.435	2250	1800	See Variance	1.19
Coal	13 3/8	17 1/2	.38	2700	2160	See Variance	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	1.07/1.86
Tubing	2 3/8	NA	.19	7700			
Liners							

PACKERS

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

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FEB 25 2016

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 Middlesex Formation. Drill the vertical to an approximate depth of 5387'. Kick off and drill curve. Drill the lateral in the Middlesex. Cement casing.

DMH
2-19-16

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, gelling agent, gel breaker, 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 200,000 barrels of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Average approximately 200,000 pounds of sand per stage.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 6.9

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

23) Describe centralizer placement for each casing string:

- Freshwater: Bow spring centralizers – One at the shoe and one spaced every 500'.
- Coal: 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

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% Flake Loss Circulation Material (LCM)
Coal (Type 1 Cement): 0-3% Calcium Chloride. Used to speed the setting of cement slurries, .25% Flake Loss Circulation Material (LCM)
Intermediate (Class H Cement): 0-3% Calcium Chloride. Used to speed the setting of cement slurries. 0.25% flake. Loss Circulation Material (LCM) .6% Super FL-300 (fluid loss/lengthens thickening time)
Production:
Lead (Type 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 (Type 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 % Calcuim Carbonate. Acid solubility.

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25) Proposed borehole conditioning procedures:

Freshwater: Circulate hole clean while rotating & reciprocating the drill string until cuttings diminish at surface.
Coal: 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.

Well 512916(BIG177H4)

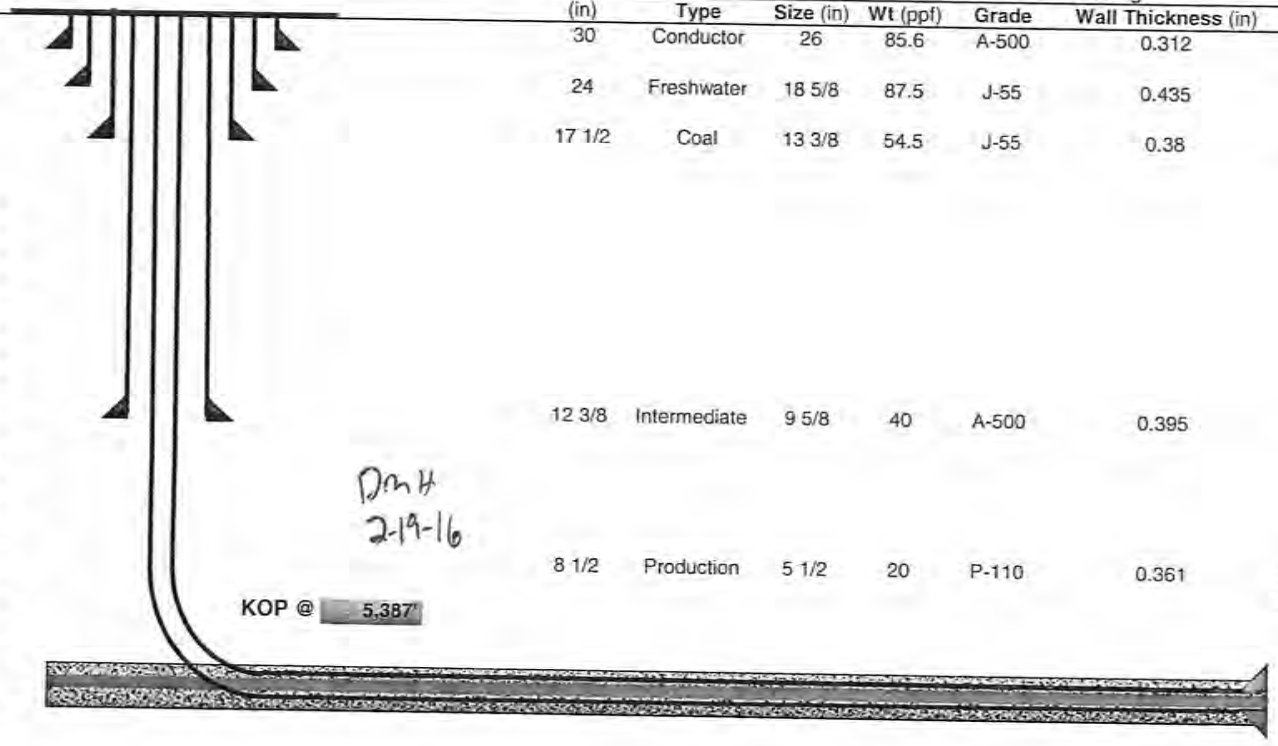
EQT Production

Big Run Quad
Wetzel County, WV

Note: Diagram is not to scale

Azimuth 332
Vertical Section 5273

Formations	Top TVD	Base TVD
Conductor	80	
Freshwater Casing	320	
Base Fresh Water	630	
Coal Casing	765	
Maxton	1692	1736
Big Lime	1808	1861
Weir	2190	2218
Gantz	2364	2402
Base Red Rock	2546	
Fifty foot	2515	2560
Thirty foot	2586	2620
Gordon	2633	2678
Intermediate Casing	2728	
Forth Sand	2720	2731
Bayard	2772	2845
Warren	3229	3275
Speechley	3379	3393
Balltown A	3768	3785
Riley	4228	4241
Benson	4880	4919
Alexander	5228	5254
Sonyea	6418	6588
Middlesex	6588	6633
Production Casing	12660 MD	
Genesee	6633	6710
Geneseo	6710	6744
Tully	6744	6767
Hamilton	6767	6859
Marcellus	6859	6911
Onondaga	6911	



Hole Size (in)	Casing Type	Size (in)	Wt (ppf)	Grade	Wall Thickness (in)	Top of Cement	Method
30	Conductor	26	85.6	A-500	0.312	Surface	Displacement
24	Freshwater	18 5/8	87.5	J-55	0.435	Surface	Displacement
17 1/2	Coal	13 3/8	54.5	J-55	0.38	Surface	Displacement
12 3/8	Intermediate	9 5/8	40	A-500	0.395	Surface	Displacement
8 1/2	Production	5 1/2	20	P-110	0.361	500' above top Producing Zone	Displacement

DMH
2-19-16

KOP @ 5,387'

Land curve @ 6,626' ft TVD
7,230' ft MD

Est. TD @ 6,626' ft TVD
12,660' ft MD

5,430' ft Lateral

Proposed Well Work:
Drill and complete a new horizontal well in the Middlesex formation.
Drill the vertical to an approximate depth of 5387'.
Kick off and drill curve. Drill lateral in the Middlesex. Cement casing.

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Office of Oil & Gas
FEB 25 2016

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601 57th Street, SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

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

March 18, 2014

Nabors Completion & Production Services Company
1380 Route 286 Hwy E #121
Indiana PA 15701

Re: Cement Variance Request

Dear Sir or Madam,

This agency is approving a variance request for the cement blend listed below to be used on surface and coal protection strings for the drilling of oil and gas wells in the state of West Virginia. The variance cannot be used without requesting its use on a permit application and approval by this agency:

- Type 1 (2% Calcium Chloride-Accelerator, 0.25% Super Flake-Lost Circulation, 5.2% Water, 94% Type "1" Cement)

If you have any questions regarding this matter feel free to contact me at 304-926-0499, ext. 1653.

Sincerely,

James Peterson by GCS

James Peterson
Environmental Resources Specialist / Permitting

Promoting a healthy environment.

Received
Office of Oil & Gas
FEB 25 2016

west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, SE
Charleston, WV 25304
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Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
dep.wv.gov

BEFORE THE OFFICE OF OIL AND GAS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE OF WEST VIRGINIA

IN THE MATTER OF A VARIANCE FROM	)	**ORDER NO. 2014 - 17**
REGULATION 35 CSR § 4-11.4/11.5/14.1	)	
AND 35 CSR § 8-9.2.h. 4/5/6/8 OF THE	)	
THE OPERATIONAL	)	
REGULATIONS OF CEMENTING OIL	)	
AND GAS WELLS	)	

REPORT OF THE OFFICE

Nabors Completion & Production Services Co. requests approval of a different cement blend for use in cementing surface and coal protection casing of oil and gas wells.

FINDINGS OF FACT

1.) Nabors Completion & Production Services Co. proposes the following cement blend:

- 2% Calcium Chloride (Accelerator)
- 0.25 % Super Flake (Lost Circulation)
- 94% Type "1" Cement
- 5.20 % Water

2.) Laboratory testing results indicate that the blend listed in Fact No.1 will achieve a 500 psi compressive strength within 6 hours and a 2,435 psi compressive strength within 24 hours.

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Office of Oil & Gas
FEB 25 2016

CONCLUSIONS OF LAW

Pursuant to Articles 6 and 6A, Chapter 22 of the Code of West Virginia, the Office of Oil and Gas has jurisdiction over the subject matter embraced in said notice, and the persons interested therein, and jurisdiction to promulgate the hereinafter prescribed Order.

Pursuant to 35 CSR § 4-11.5 and 35 CSR § 8-9.2.h.8 the Chief of the Office of Oil and Gas may approve different cement blends upon the well operator providing satisfactory proof that different cement types are adequate.

ORDER

It is ordered that Nabors Completion & Production Services Co. may use the cement blend listed in Findings of Fact No.1 for the cementing of surface and coal protection casing of oil and gas wells in the State as may be requested by oil and gas operators. The waiting time on the cement blend shall be **8** hours. The cement blend shall be mixed in strict accordance with the specifications for each blend and weight measurements made on-site to assure the cement slurries meet the minimum weight specifications. A sample shall be collected and, if after **8** hours the cement is not set up, additional time will be required. Nabors Completion & Production Services Co. shall keep a record of cement blend jobs in which the cement blend approved under this order is to be used and made available to the Office of Oil and Gas upon request.

Dated this, the 18th day of March, 2014.

IN THE NAME OF THE STATE OF WEST VIRGINIA

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

James Martin, Chief
Office of Oil and Gas

Received
Office of Oil & Gas
FEB 25 2016

4710303058

WW-9
(2/15)

API Number 47 - 103 - 03058
Operator's Well No. 512916

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name EQT Production Company OP Code 306686

Watershed (HUC 10) Willey Fork of North Fork Fishing Creek Quadrangle Big Run

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

Will a pit be used? Yes ☐ No ☑

If so, please describe anticipated pit waste: n/a

Will a synthetic liner be used in the pit? Yes ☐ No ☑ If so, what ml.? n/a

Proposed Disposal Method For Treated Pit Wastes:

- ____ Land Application
- ■ Underground Injection (UIC Permit Number 0014, 8462, 4037) DMH
- ■ Reuse (at API Number Various) 2-19-16
- ■ Off Site Disposal (Supply form WW-9 for disposal location)
- ____ Other (Explain ____

Will closed loop system be used? If so, describe: 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 (vertical and horizontal)? Air, freshwater, oil based, etc. See Attached

-If oil based, what type? Synthetic, petroleum, etc. Synthetic Mud

Additives to be used in drilling medium? See Attached

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, lime, sawdust) N/A

-Landfill or offsite name/permit number? See Attached List

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

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.

Received
Office of Oil & Gas
FEB 25 2016

Company Official Signature [signature]

Company Official (Typed Name) Victoria J. Roark

Company Official Title Permitting Supervisor

Subscribed and sworn before me this 10 day of February, 20 16

Rebecca L. Wanstreet Notary Public

My commission expires 4-7-20

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
REBECCA L. WANSTREET
EQT PRODUCTION COMPANY
PO BOX 280
BRIDGEPORT, WV 26330
My commission expires April 07, 2020

WW-9

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc.

- Air is used to drill the top-hole sections of the wellbore (surface, intermediate, and pilot). Water based mud may be necessary depending on hole conditions to stabilize and drill the intermediate section. The pilot hole, curve, and lateral sections will be drilled with either air, water based mud, or oil based mud.

Additives to be used in drilling medium?

- Air - biodegradable oil lubricant, detergent, defoaming, water. Water based mud – Barite, viscosifer, alkalinity control, lime, filtration control, deflocculates, biodegradable oil lubricant, defoaming, walnut shell, salt, x-cide, carbonates. Oil based mud – synthetic base oil, emulsifier, salt, lime, viscosifer, alkalinity control, filtration control, deflocculates, biodegradable oil lubricant, defoaming, carbonates.

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FEB 25 2016

4710303058

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

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FEB 25 2016

4710303058

Form WW-9

Operator's Well No. 512916

Proposed Revegetation Treatment: Acres Disturbed 6.9 Prevegetation pH 5.2

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type Granular 10-20-20

Fertilizer amount 1/3 lbs/acre

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 (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: ✓

Comments:

Received
Office of Oil & Gas
FEB 25 2016

Title: Oil + Gas Inspector Date: 2-19-16

Field Reviewed? (✓) Yes ( ) No

4710303058

EQT

Where energy meets innovation.™

Site Specific Safety Plan

EQT BIG177 Pad

Jacksonburg

Wetzel County, WV

For Wells:

512915 512916

Date Prepared: **February 9, 2016**

EQT Production

Permitting Supervisor
Title

2-10-16
Date

WV Oil and Gas Inspector

Oil + Gas Inspector
Title

2-19-16
Date

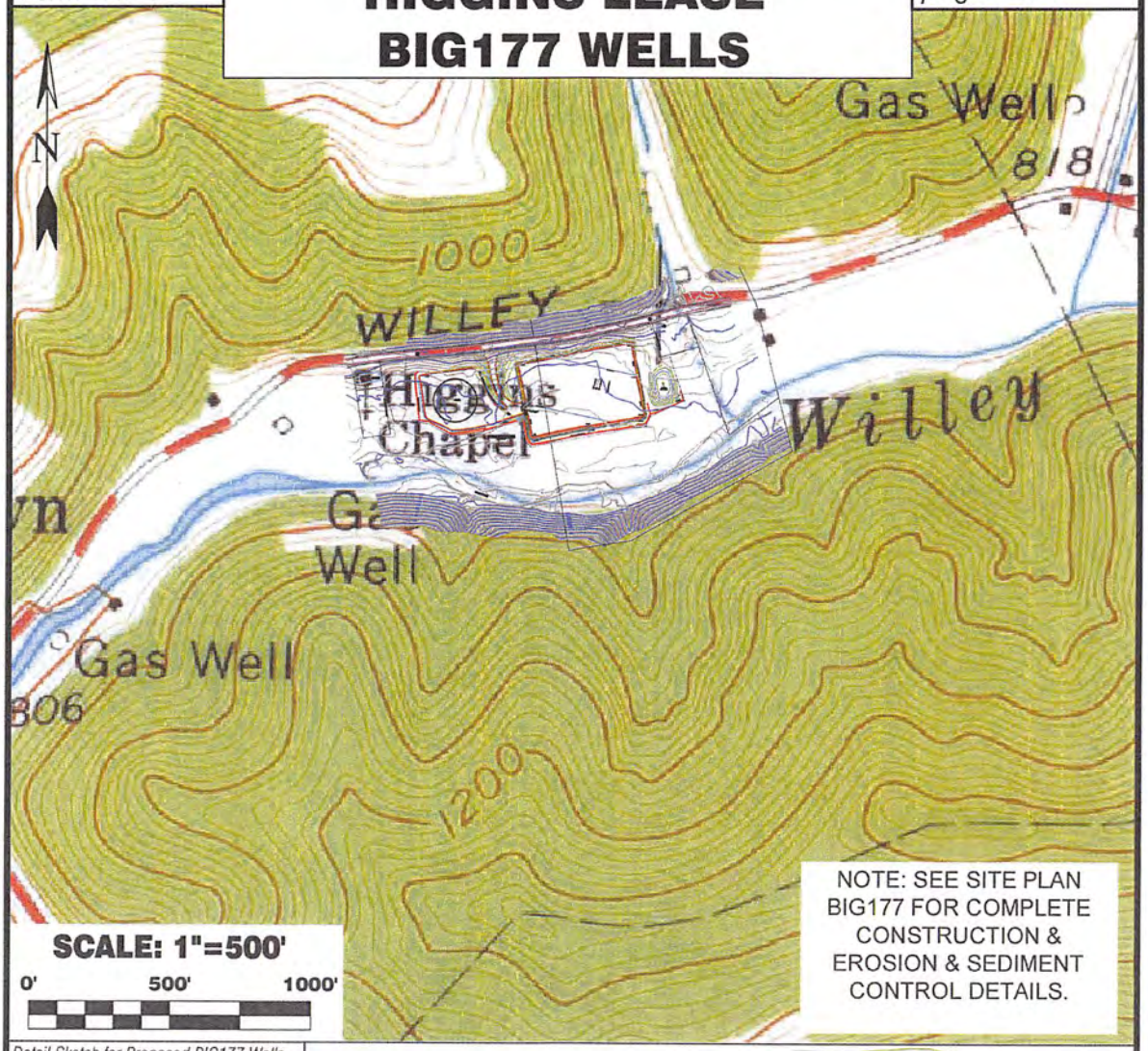
Received
Office of Oil & Gas
FEB 25 2016

103-03058

Form WW-9

HIGGINS LEASE
BIG177 WELLS

page of

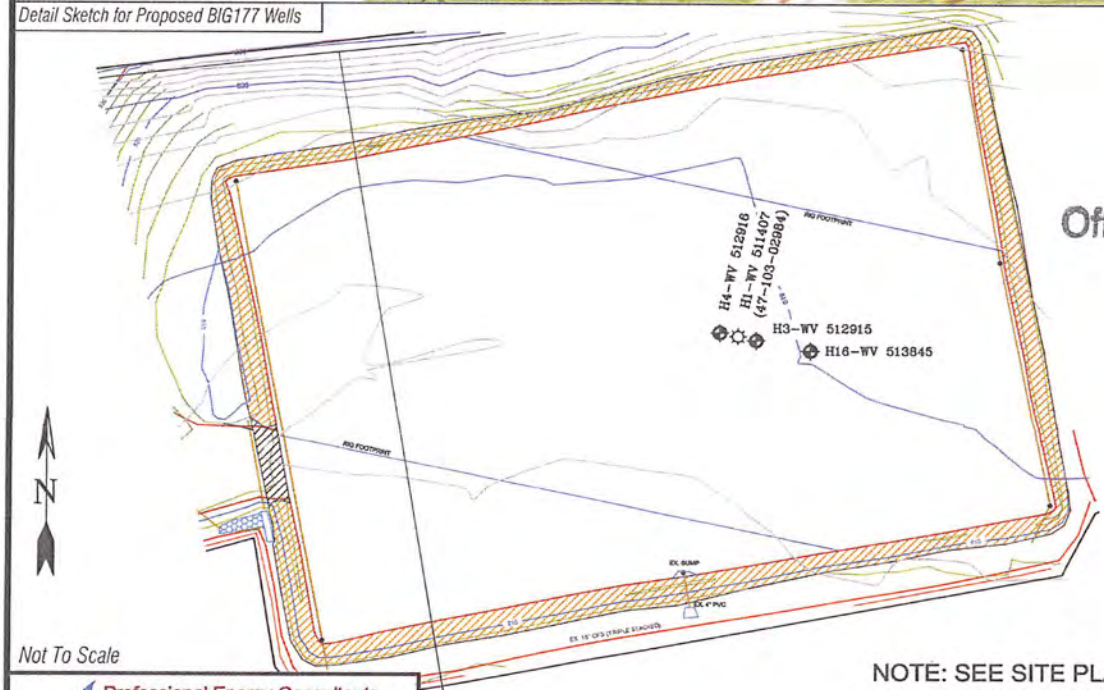


NOTE: SEE SITE PLAN BIG177 FOR COMPLETE CONSTRUCTION & EROSION & SEDIMENT CONTROL DETAILS.

SCALE: 1"=500'

0' 500' 1000'

Detail Sketch for Proposed BIG177 Wells



Not To Scale

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Office of Oil & Gas
FEB 25 2016

NOTE: SEE SITE PLAN BIG177 FOR COMPLETE CONSTRUCTION & EROSION & SEDIMENT CONTROL DETAILS.

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

DRAWN BY	FILE NO.	DATE	CADD FILE:
K.D.W.	6806	09-09-15	6806BIG177REC.dwg

WW-6A1
(5/13)

Operator's Well No. 512916

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

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

Received
Office of Oil & Gas
FEB 25 2016

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

103-03058

EQT

February 24, 2016

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

Re: BIG177, well 512916 (47-103-003058)
Grant District, Wetzel County

Dear Mr. Martin,

EQT Production Company is submitting an application for a new well work permit for the above well number. Upon information and belief, Operator's lease and/ or other real property rights permit it to conduct drilling operations for the subject well in the location shown on the plat, including under any public roads that the well lateral crosses.

Sincerely,

Vicki Roark
Permitting Supervisor-WV

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Office of Oil & Gas
FEB 25 2016

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

Well Designation: - 512916

Lease No.	Leasehold - Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
103021	**Coastal Forest Resources Co DBA Coastal Timberlands Co. (current royalty owner)**		min pd 1/8th	
	James V. Higgins (original lessor)	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
993308	Coastal Forest Resources Co.; d/b/a Coastal Timberlands Co., etal(originial lessor and currrent royalty owner)	EQT Production Company	min pd 1/8th	OG147A/664
1009272	Kevin S. Goff (original lessor and current royalty owner)	EQT Production Company	min pd 1/8th	OG 163A/843
102894	**EQT Production Company (current royalty owner)**		in fee	
	J. B. Hicks (original lessor)	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		DB 105/908
	Equitrans, L.P.	EQT Production Company		DB 131A/81

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Office of Oil & Gas
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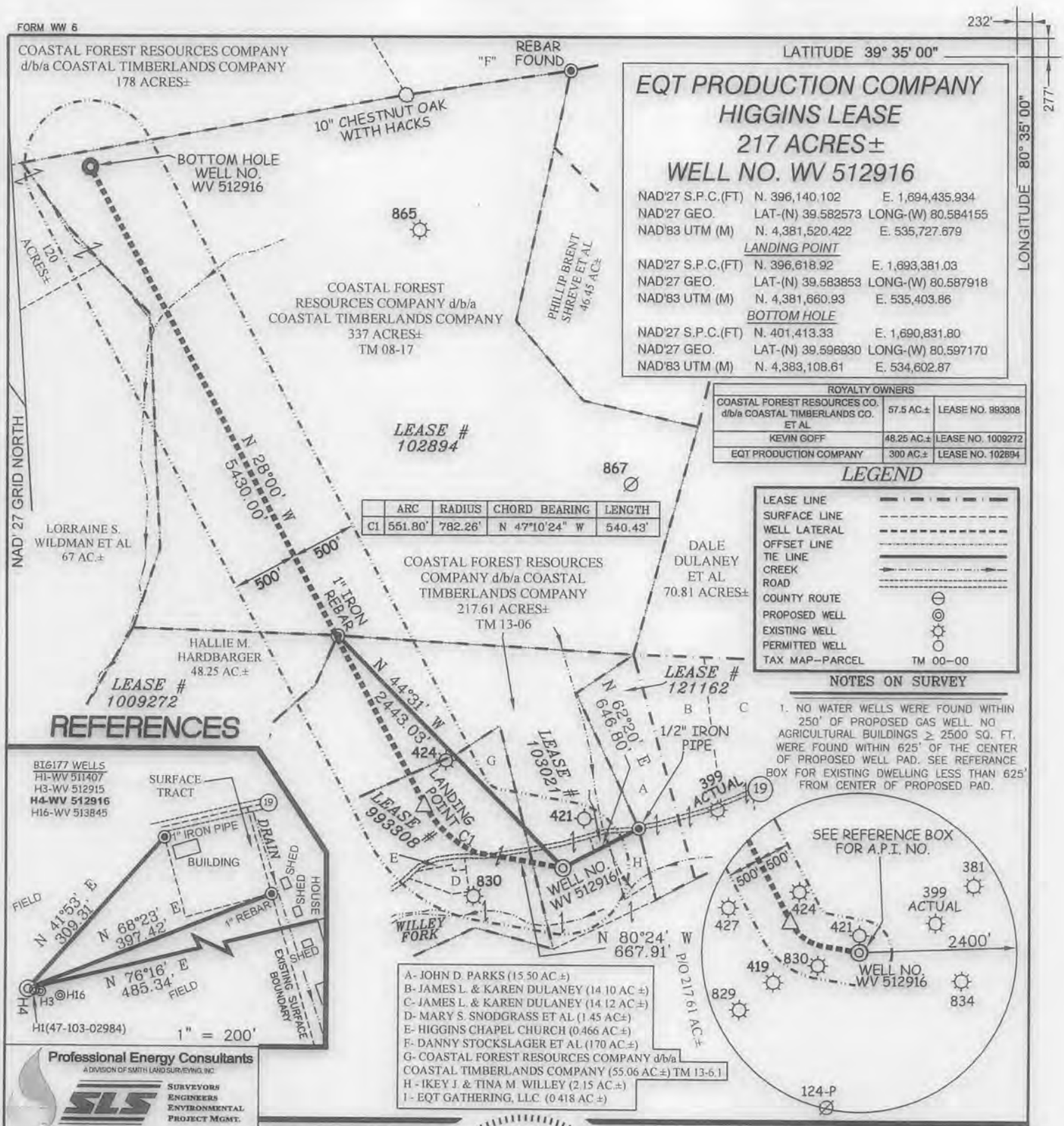
FORM WW 6



EQT PRODUCTION COMPANY
HIGGINS LEASE
217 ACRES±
WELL NO. WV 512916

NAD'27 S.P.C.(FT)	N. 396,140.102	E. 1,694,435.934
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. 401,413.33	E. 1,690,831.80
NAD'27 GEO.	LAT-(N) 39.596930	LONG-(W) 80.597170
NAD'83 UTM (M)	N. 4,383,108.61	E. 534,602.87

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

	ARC	RADIUS	CHORD BEARING	LENGTH
C1	551.80'	782.26'	N 47°10'24" W	540.43'

LEGEND

LEASE LINE	
SURFACE LINE	
WELL LATERAL	
OFFSET LINE	
TIE LINE	
CREEK	
ROAD	
COUNTY ROUTE	⊖
PROPOSED WELL	◎
EXISTING WELL	☼
PERMITTED WELL	○
TAX MAP--PARCEL	TM 00-00

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 REFERANCE BOX FOR EXISTING DWELLING LESS THAN 625' FROM CENTER OF PROPOSED PAD.

REFERENCES

A- JOHN D. PARKS (15.50 AC.±)
B- JAMES L. & KAREN DULANEY (14.10 AC.±)
C- JAMES L. & KAREN DULANEY (14.12 AC.±)
D- MARY S. SNODGRASS ET AL (1.45 AC±)
E- HIGGINS CHAPEL CHURCH (0.466 AC.±)
F- DANNY STOCKSLAGER ET AL (170 AC.±)
G- COASTAL FOREST RESOURCES COMPANY d/b/a COASTAL TIMBERLANDS COMPANY (55.06 AC.±) TM 13-6.1
H - IKEY J. & TINA M. WILLEY (2.15 AC.±)
I - EQT GATHERING, LLC (0.418 AC.±)

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. 849 C. Victor Moyers

C. VICTOR MOYERS LICENSED No. 849 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

(+) 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

OPERATORS WELL NO. WV 512916

API WELL NO. 47 — 103 — 03058 H6A
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 6806P512916R8

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 ACREAGE 242.5

PROPOSED WORK : LEASE NO. 103021

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 MIDDLESEX

ESTIMATED DEPTH 6619'

COUNTY NAME

PERMIT

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

WW6-A

47-103-03058

Coal Owners

Coastal Forest Resources Co
fka Coastal Lumber Company
C/O Edward G. Kraynok
P.O. Box 709
Buckhannon, WV 26201

CNX Land LLC
Attn: Analyst
Engineering & Ops Support Dept. Coal
CNX Center, 1000 Consol Energy Drive
Canonsburg, PA 15317

Irrevocable Intervivos Trust of Billy Higgins
Frances J & William P. Higgins, co-trustees
531 Franklin Terrace
Washington, PA 15301

WPP, LLC
C/O George Angus
5260 Irwin Road
Huntington, WV 25705

Deanna Merle Weber
633 Carothers Road
Weirton, WV 26062

Doris E. Hamilton
55 Parker Street
Wheeling, WV 26003-7404

Robin Barr
4060 S.W. County Road 232
Bell, FL 32619

Murray American Energy, Inc
1 Bridge Street
Monongah WV 26554

Murray American Energy, Inc
C/O Murray Energy Corporation
46226 National Road
St Clairsville, OH 43950

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Additional Coal Owners: CBM

CNX Gas Company, LLC
Attn Analyst Engineering & Operations Support Dept. Coal
Casey Saunders
1000 Consol Energy Drive
Cannonsburg, PA 15317

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

Operator ID	County	District	Quadrangle
306686	103-Wetzel	4-Grant	254-Big Run

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

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

4) Elevation, current ground: 809.0 Elevation, proposed post-construction: 811.0

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

6) Existing Pad: Yes or No yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Middlesex, 6626, 45, 2620

8) Proposed Total Vertical Depth: 6626

9) Formation at Total Vertical Depth: Middlesex

10) Proposed Total Measured Depth: 12660

11) Proposed Horizontal Leg Length: 5430

12) Approximate Fresh Water Strata Depths: 170,280,480,630

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

14) Approximate Saltwater Depths: 1135, 1450

15) Approximate Coal Seam Depths: 100,153,431,541

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 x

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

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Office of Oil & Gas
FEB 25 2016

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	12660	12660	500' above top producing zone
Tubing	2 3/8		J-55	4.7			May not be run, if run set 100' from TD.
Liners							

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	-	18	Class A	1.18
Fresh Water	18 5/8	24	.435	2250	1800	See Variance	1.19
Coal	13 3/8	17 1/2	.38	2700	2160	See Variance	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	1.07/1.86
Tubing	2 3/8	NA	.19	7700			
Liners							

PACKERS

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

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FEB 25 2016

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 Middlesex Formation. Drill the vertical to an approximate depth of 5387'. Kick off and drill curve. Drill the lateral in the Middlesex. Cement casing.

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, gelling agent, gel breaker, 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 200,000 barrels of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Average approximately 200,000 pounds of sand per stage.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 6.9

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

23) Describe centralizer placement for each casing string:

- Freshwater: Bow spring centralizers – One at the shoe and one spaced every 500'.
- Coal: 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

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% Flake Loss Circulation Material (LCM)
Coal (Type 1 Cement): 0-3% Calcium Chloride. Used to speed the setting of cement slurries, .25% Flake Loss Circulation Material (LCM)
Intermediate (Class H Cement): 0-3% Calcium Chloride. Used to speed the setting of cement slurries. 0.25% flake. Loss Circulation Material (LCM) .6% Super FL-300 (fluid loss/lengthens thickening time)
Production:
Lead (Type 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 (Type 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 % Calcuim Carbonate. Acid solubility.

25) Proposed borehole conditioning procedures:

Freshwater: Circulate hole clean while rotating & reciprocating the drill string until cuttings diminish at surface.
Coal: 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 hole 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.

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Office of Oil & Gas
FEB 25 2016

*Note: Attach additional sheets as needed.

103-03058

EQT

February 12, 2016

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

Re: Revision of BIG177(47-103-03058, 03057)

Dear Mr. Smith,

Enclosed is an updated WW-6B, schematics, WW-6A1, Site Safety plan, mylar plat and W-9). EQT is moving these wells per Docket No. 250, issued by the Shallow Gas Well Review Board, a signed agreement with WPP, to move to their preferred azimuth.

If you have any questions, please do not hesitate to contact me at (304) 848-0076.

Sincerely,

Vicki Roark
Permitting Supervisor-WV

Enc.

Received
Office of Oil & Gas
FEB 25 2016

WW-6AC
(1/12)

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

Date of Notice Certification: NOV 17 2014

API No. 47 - 103 - 03058
Operator's Well No. 512916
Well Pad Name: BIG177

Notice has been given:
Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

State:	WV	UTM NAD 83 Easting:	4,381,517.00
County:	Wetzel	UTM NAD 83 Northing:	535,717.30
District:	Grant	Public Road Access:	Rt. 19
Quadrangle:	Big Run 7.5	Generally used farm name:	Coastal Forest Resources Co dba Coastal Timberlands Co
Watershed:	Willey Fork of North Fork Fishing Creek		

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:		OOG OFFICE USE ONLY
*PLEASE CHECK ALL THAT APPLY		
☐ NOTICE OF SEISMIC ACTIVITY or	☑ NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED	☐ RECEIVED/NOT REQUIRED
☐ NOTICE OF ENTRY FOR PLAT SURVEY or	☑ NO PLAT SURVEY WAS CONDUCTED	☐ RECEIVED
☑ NOTICE OF INTENT TO DRILL or	☐ NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED OR	☐ RECEIVED/NOT REQUIRED
	☑ WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)	
☑ NOTICE OF PLANNED OPERATION		☐ RECEIVED
☑ PUBLIC NOTICE		☐ RECEIVED
☑ NOTICE OF APPLICATION		☐ RECEIVED

Received
Office of Oil & Gas
NOV 18 2014

Required Attachments:
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

WW-6AC
(1/12)

103-03058

Certification of Notice is hereby given:

THEREFORE, I _____, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, 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 and imprisonment.

Well Operator:	EQT Production Company	Address:	P.O. Box 280
By:	Victoria J. Roark		Bridgeport, WV 26330
Its:	Permitting Supervisor	Facsimile:	304-848-0040
Telephone:	304-848-0076	Email:	vroark@eqt.com

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

NOTARY SEAL

Subscribed and sworn before me this 13 day of Oct. ,2014

Notary Public

My Commission Expires 8-24-22

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

Received
Office of Oil & Gas
NOV 18 2014

WW-6A
(9-13)

API NO. 47 - 103 - 0 3658
OPERATOR WELL NO. 512916
Well Pad Name: BIG177

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

Notice Time Requirement: notice shall be provided no later than the filing date of permit application.

Date of Notice: NOV 17 2014 Date Permit Application Filed: NOV 17 2014

Notice of:

☑ PERMIT FOR ANY WELL WORK ☐ CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

Delivery method pursuant to West Virginia Code § 22-6A-10(b)

☐ PERSONAL SERVICE ☐ REGISTERED MAIL ☑ METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

☑ Application Notice ☑ WSSP Notice ☑ E&S Plan Notice ☑ Well Plat Notice is hereby provided to:

☑ SURFACE OWNER(s)
Name: Coastal Forest Resources Co
Address: dba Coastal Timberlands Co
P.O. Box 709
Buckhannon, WV 26201

Name: 0
Address: 0
0
0

☑ SURFACE OWNERS(s) (Road and/or Other Disturbance)
Name: Coastal Forest Resources Co
Address: dba Coastal Timberlands Co
P.O. Box 709
Buckhannon, WV 26201
Name: 0
Address: 0
0
0

☑ SURFACE OWNER(s) (Impoundments/Pits)
Name: Coastal Forest Resources Co
Address: dba Coastal Timberlands Co
P.O. Box 709
Buckhannon, WV 26201

☑ COAL OWNER OR LESSEE
Name: CNX Land Resources, Inc
Address: Ryan Arp
1000 Consol Energy Dr
Canonsburg, PA 15317
See attached for additional coal owners.

☐ COAL OPERATOR
Name: 0
Address: 0
0
0

☑ SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: Ike Willey
Address: HC 62 Box 92
Pine Grove, WV 26419
See Attached

☐ OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name:
Address:

*Please attach additional forms if necessary

Received
Office of Oil & Gas
NOV 18 2014

WW6-A

103-03058

Additional Coal Owners

WPP, LLC
C/O George Angus
5260 Irwin Road
Huntington, WV 25705

Billy James Higgins
531 Franklin Terrace
Washington, PA 15301

Deanna Merle Weber
633 Carothers Road
Weirton, WV 26062

Coastal Forest Resources Co
fka Coastal Lumber Company
C/O Edward G. Kraynok
P.O. Box 709
Buckhannon, WV 26201

Robin Barr
4060 S.W. County Road 232
Bell, FL 32619

Murray American Energy, Inc
1 Bridge Street
Monongah WV 26554

Murray American Energy, Inc
C/O Murray Energy Corporation
46226 National Road
St Clairsville, OH 43950

Additional Coal Owners: CBM

CNX Gas Company, LLC
Attn Analyst Engineering & Operations Support Dept. Coal
Ryan Arp
1000 Consol Energy Drive
Cannonsburg, PA 15317

Additional Water Purveyors

Sarah Bates
HC 62 Box 93
Pine Grove, WV 26419

Mary Eastham
HC 62 Box 90
Pine Grove, WV 26419

Higgins Chapel, Church of Christ
12597 Willey Fork Rd.
Pine Grove, WV 26419

WW-6A
(8-13)

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

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

This Notice Shall Include:
Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Location Restrictions

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items

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examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

Water Well Testing:

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

Water Testing Laboratories:

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

Written Comment:

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

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Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0450

Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.
NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.

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(8-13)

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

Time Limits and Methods for Filing Comments.

The law requires these materials to be served on or before the date the operator files its Application. You have THIRTY (30) DAYS after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article

Comment Requirements

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

Permit Denial or Condition

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

(1) The proposed well work will constitute a hazard to the safety of persons;
(2) The plan for soil erosion and sediment control is not adequate or effective;
(3) Damage would occur to publicly owned lands or resources; or
(4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

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103-03058

Notice is hereby given by:

Well Operator:	EQT Production Company	Address:	115 Professional Place P.O. Box 280
Telephone:	304-848-0082		Bridgeport, WV 26330
Email:	Vroark@eqt.com	Facsimile:	304-848-0041

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

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, 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.

By: Victoria Roark

Its: Permitting Supervisor

Subscribed and sworn before n 13 day of Oct, 2014

Notary Public

My Commission Expir 8-24-22

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

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SLS SMITH LAND SURVEYING, INC. P.O. BOX 150, GLENVILLE, WV 26351
(304) 462-5634 • FAX 462-5650

WELL INFORMATION AND FINAL WATER WELL SAMPLE DATA SHEET

OPERATOR: *EQT Production Company*
LEASE NAME AND NUMBER: *HIGGINBOTHAM LEASE* B16177

COMMENTS

The initial field and/or mapping review of the area surrounding the proposed well site revealed the below listed surface owner(s) that were potentially utilizing groundwater (potable) for Human Consumption or other purposes within 2500' of the proposed well site. (For location of each site see attached area map.)

INDIVIDUAL CONTACTED OR NOTIFIED

Site: *1* Spacing *2050* Owner/Occupant: *Elias Leasure*
Address: *PO Box 156 Big Run, WV 26561* Ph: *(304)889-2609*
Field Contact Date: *9-24-13* Sampled: *No* Date Sampled: *N/A* Source: *Water well*
If No, declined by who _____ Letter/Notice Date: 1st _____ 2nd _____ Certified (3rd) _____
Comments: *Tax Map 8 Par. 46*
Northing: 39.584318
Easting: 80.577311

Site: *2* Spacing *1800* Owner/Occupant: *Judy Utt*
Address: *HC 62 box 125 Pine Grove, WV 26419* Ph: _____
Field Contact Date: *9-24-13* Sampled: *No* Date Sampled: *N/A* Source: _____
If No, declined by who Judy Utt Letter/Notice Date: 1st _____ 2nd _____ Certified (3rd) _____
Comments: *Tax Map 8 Par. 43*
Northing:
Easting:

Site: *3* Spacing *1800* Owner/Occupant: *Judy Utt*
Address: *HC 62 box 125 Pine Grove, WV 26419* Ph: _____
Field Contact Date: *9-24-13* Sampled: *No* Date Sampled: *N/A* Source: _____
If No, declined by who Judy Utt Letter/Notice Date: 1st _____ 2nd _____ Certified (3rd) _____
Comments: *Tax Map 8 Par. 43*
Northing:
Easting:

Site: *4* Spacing *2100* Owner/Occupant: *Sherry Dulaney*
Address: *HC 62 box 117 Pine Grove, WV 26561* Ph: *(304)-889-3478*
Field Contact Date: *9-24-13* Sampled: *No* Date Sampled: *N/A* Source: *Water well*
If No, declined by who _____ Letter/Notice Date: 1st _____ 2nd _____ Certified (3rd) _____
Comments: *Tax Map 8 Par. 38*
Northing: 39.585187
Easting: 80.577809

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Site: 5 Spacing 2500 Owner/Occupant: Karen Dulaney
Address: HC 62 box 118 Pine Grove, WV 26561 Ph: (304)-889-2701
Field Contact Date: 9-24-13 Sampled: No Date Sampled: N/A Source: Water Well
If No, declined by who _____ Letter/Notice Date: 1st _____ 2nd _____ Certified (3rd) _____
Comments: Tax Map 8 Par. 23.1
Northing:39.587092
Easting:803577227

Site: 6 Spacing 625 Owner/Occupant: Ike Willey
Address: HC 62 box 92 Pine Grove, WV 26419 Ph: (304)-889-2760
Field Contact Date: 9-24-13 Sampled: No Date Sampled: N/A Source: Water well
If No, declined by who _____ Letter/Notice Date: 1st _____ 2nd _____ Certified (3rd) _____
Comments: Tax Map 8 Par. 65
Northing:39.585086
Easting:80.581987

Site: 7 Spacing 700 Owner/Occupant: Sarah Bates
Address: HC 62 box 93 Pine Grove, WV 26419 Ph: (304)-889-3484
Field Contact Date: 10-3-13 Sampled: No Date Sampled: N/A Source: Water Well
If No, declined by who _____ Letter/Notice Date: 1st 9-24-13 2nd _____ Certified (3rd) _____
Comments: Tax Map 8 Par. 35
Northing:39.
Easting:80.

Site: 8 Spacing 750 Owner/Occupant: Mary Eastham
Address: HC 62 box 90 Pine Grove, WV 26419 Ph:
Field Contact Date: 9-24-2013 Sampled: No Date Sampled: N/A Source: Water Well
If No, declined by who _____ Letter/Notice Date: 1st _____ 2nd _____ Certified (3rd) _____
Comments: Northing:39.582803
Easting:80.586893
Shares well with chapel (neighboring parcel).

Site: 9 Spacing 2200 Owner/Occupant: Susan Lydick
Address: HC 62 box 71 Pine Grove, WV 26419 Ph:
Field Contact Date: 10-3-2013 Sampled: No Date Sampled: N/A Source: Water Well
If No, declined by who _____ Letter/Notice Date: 1st _____ 2nd _____ Certified (3rd) _____
Comments: Northing:39.579350
Easting:80.591143

Site: 10 Spacing 2450 Owner/Occupant: EQT Production Company
Address: Ph:
Field Contact Date: _____ Sampled: _____ Date Sampled: _____ Source: Creek
If No, declined by who _____ Letter/Notice Date: 1st _____ 2nd _____ Certified (3rd) _____
Comments: Northing:39.579793
Easting:80.591567
Information taken, request of EQT.

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Site: 11 Spacing 2200 Owner/Occupant: EQT Production Company
Address: Ph:
Field Contact Date: 10-3-13 Sampled: No Date Sampled: N/A Source: Creek
If No, declined by who Letter/Notice Date: 1st 2nd Certified (3rd)
Comments: Northing: 39.583619
Easting: 80.576493
Information taken, request of EQT

Site: 12 Spacing 500 Owner/Occupant: EQT Production Company
Address: Ph:
Field Contact Date: 10-3-13 Sampled: Date Sampled: Source: Creek
If No, declined by who Letter/Notice Date: 1st 2nd Certified (3rd)
Comments: Northing: 39.582172
Easting: 80.581666
Information taken, request of EQT

Site: 13 Spacing 750 Owner/Occupant: Higgins Chapel, Church of Christ
Address: 12597 Willey Fork Rd. Pine Grove WV 26419 Ph:
Field Contact Date: 9-24-13 Sampled: Date Sampled: Source: Waterwell
If No, declined by who Letter/Notice Date: 1st 2nd Certified (3rd)
Comments: Shares well with Mary Eastham
Northing 39.582803
Easting 80.586893

Site: 14 Spacing Owner/Occupant:
Address: Ph:
Field Contact Date: Sampled: Date Sampled: Source:
If No, declined by who Letter/Notice Date: 1st 2nd Certified (3rd)
Comments:

Site: 15 Spacing Owner/Occupant:
Address: Ph:
Field Contact Date: Sampled: Date Sampled: Source:
If No, declined by who Letter/Notice Date: 1st 2nd Certified (3rd)
Comments:

Site: 16 Spacing Owner/Occupant:
Address: Ph:
Field Contact Date: Sampled: Date Sampled: Source:
If No, declined by who Letter/Notice Date: 1st 2nd Certified (3rd)
Comments:

6806 final water eqt WV#511467.pdf

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SMITH LAND SURVEYING, INC. P.O. BOX 150, GLENVILLE, WV 26351
(304) 462-5634 • FAX 462-5656

To Whom It May Concern:

Smith Land Surveying, Inc. of Glenville, WV has been contracted by:

EQT

To do some preliminary work for a proposed oil and gas well permit application.

Due to 1994 regulations set by the Sate of West Virginia Division of Environmental Protection, Department of Oil and Gas, operators are required to offer water testing for water wells or other non-public water sources that fall within 1500 feet of the proposed well, if they are requested to do so by the resident or owner. This test will only help ensure the water quality control, which in turn benefits you as the resident or landowner.

Since your residence falls within the 2500 foot radius, you are entitled to have your potable water source(s) sampled and analyzed at an independent lab. Your lab analysis results would then be mailed to your home. This is done at no expense to you.

Please notify Smith Land Surveying immediately if you are interested in having your potable water tested. Please have this letter with you at the time of contact so that the client and well number may be referenced.

Thank you for your cooperation in this matter. I look forward to hearing from you at your earliest convenience. If you have any questions, please feel free to contact me at:

Smith Land Surveying, Inc.
PO Box 150
Glenville, WV 26351

(304) 462-5634 (voice)
(304) 463-5656 (fax)
E-Mail mmurphy@slsserveys.com

Date: 9-24-13

Left/sent by: Nathan Spencer

Well Number: 51407 (Big 177)

Site Number: Site # 223

*If you do not have a water well or other non-public water source, please make note of it and include your name and address when you return this sheet.

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If you do not feel the need to have your Water well/spring/or other non-public water source sampled, please sign on the line below and return to the above address. This will signify that a sample has been offered to the surface owner and has been declined.

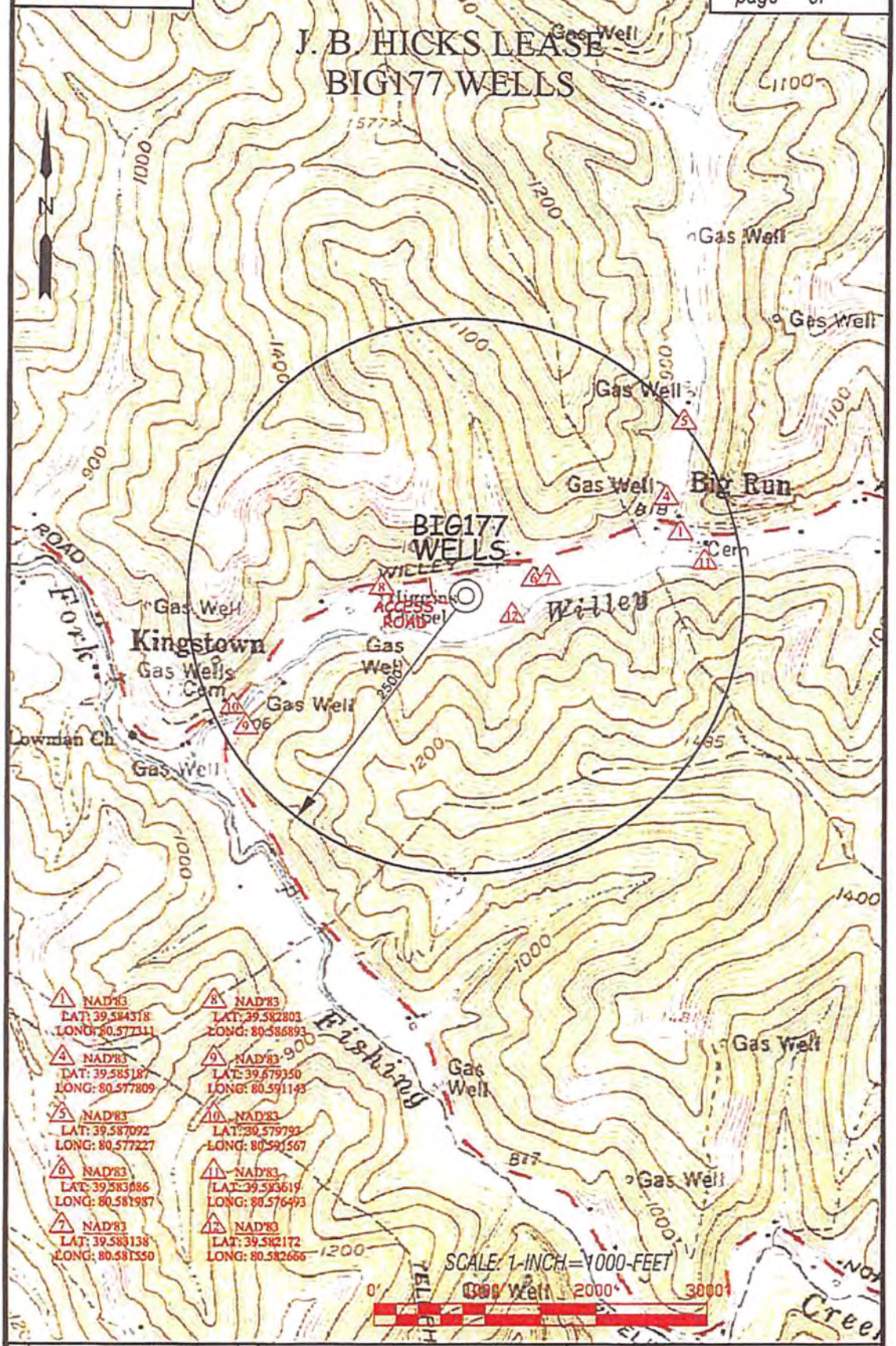
Signature: Judy Utt Date: 9/24/13

103-03058

WATER SAMPLES

page of

J. B. HICKS LEASE
BIG177 WELLS



Professional Energy Consultants

SLS

DRAWN BY	FILE NO.	DATE	CADD FILE
K.E.S.	6806	10/11/13	6806W2BC177

TOPO SECTION OF:
BIG RUN, WV 7.5' QUAD.

DISTRICT	COUNTY	TAX MAP-PARCEL NO.
GRANT	WETZEL	8 - 18

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

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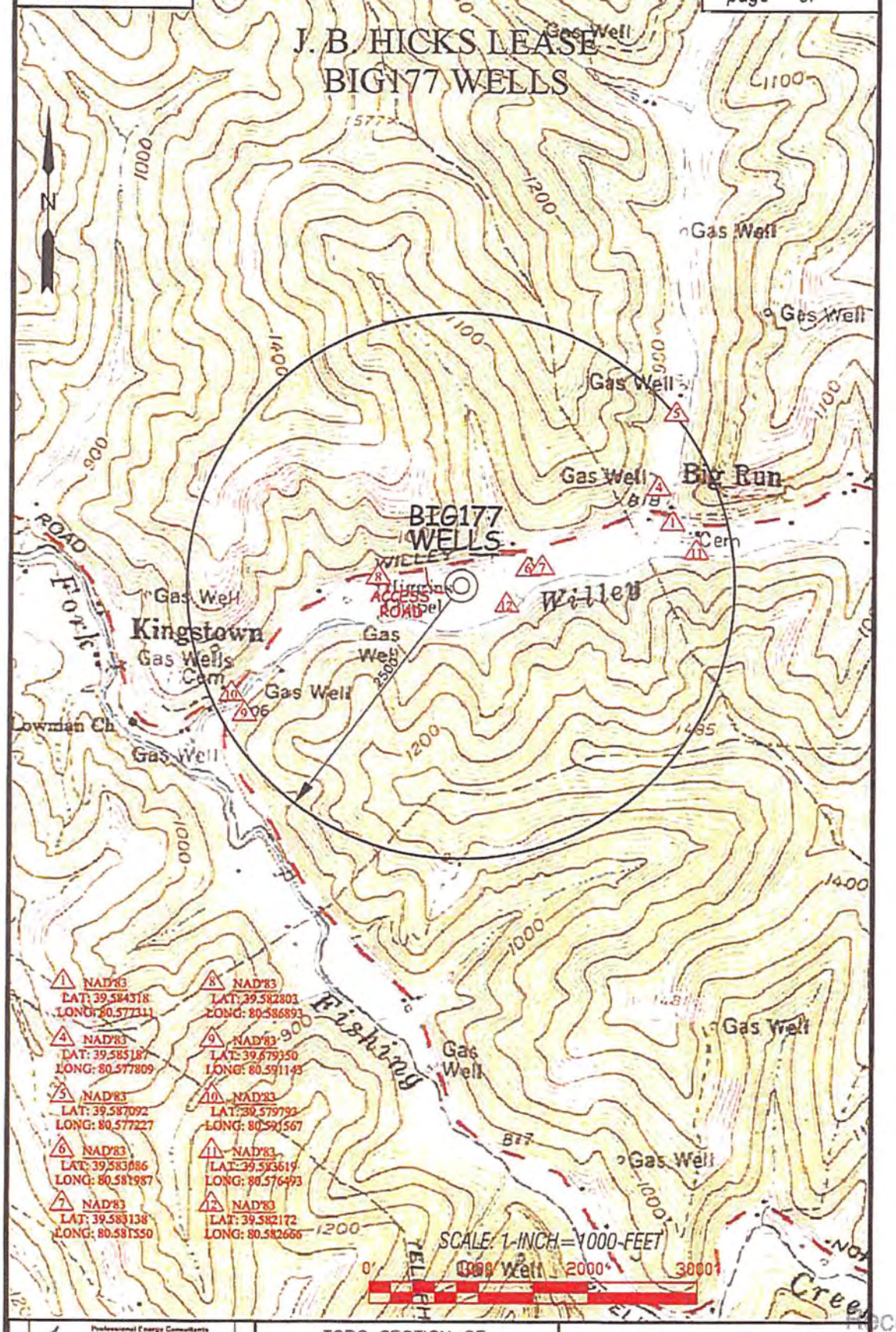
WATER SAMPLES

page of

J. B. HICKS LEASE
BIG177 WELLS



Professional Energy Consultants
SLS

DRAWN BY	FILE NO.	DATE	CADD FILE
K.E.S.	6806	10/11/13	6806W2BG177

TOPO SECTION OF:
BIG RUN, WV 7.5' QUAD.

DISTRICT	COUNTY	TAX MAP-PARCEL NO.
GRANT	WETZEL	8 - 18

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

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WW-6A4
(1/12)

Operator Well No. 512916

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF INTENT TO DRILL

Pursuant to W. Va. Code § 22-6A-16(b), the Notice of Intent to Drill is only required if the notice requirements of W. Va. Code § 22-6A-10(a) have NOT been met or if the Notice of Intent to Drill requirement has NOT been waived in writing by the surface owner.

Notice Time Requirement: Notice shall be provided at least TEN (10) days prior to filing a permit application.
Date of Notice: 9/16/2014 **Date Permit Application Filed:** 9/26/14

Delivery method pursuant to West Virginia Code § 22-6A-16(b)

☐ HAND DELIVERY ☑ CERTIFIED MAIL RETURN RECEIPT REQUESTED

Pursuant to W. Va. Code § 22-6A-16(b), at least ten days prior to filing a permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner notice of its intent to enter upon the surface owner's land for the purpose of drilling a horizontal well: Provided, That notice given pursuant to subsection (a), section ten of this article satisfies the requirements of this subsection as of the date the notice was provided to the surface owner: Provided, however, That the notice requirements of this subsection may be waived in writing by the surface owner. The notice, if required, shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative.

Notice is hereby provided to the SURFACE OWNER(s):

Name:	Coastal Forest Resources Co	Name:	0
Address:	dba Coastal Timberlands Co	Address:	0
	P.O. Box 709		0
	Buckhannon, WV 26201		

Notice is hereby given:
Pursuant to West Virginia Code § 22-6A-16(b), notice is hereby given that the undersigned well operator has an intent to enter upon the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State:	WV	UTM NAD 83	Easting	4,381,517.00
County:	Wetzel		Northing	535,717.30
District:	Grant		Public Road Access:	Rt. 19
Quadrangle:	Big Run 7.5		Generally used farm name:	Coastal Forest Resources Co dba Coastal Timberlands Co
Watershed:	Willey Fork of North Fork Fishing Creek			

This Notice Shall Include:
Pursuant to West Virginia Code § 22-6A-16(b), this notice shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx

Notice is hereby given by:

Well Operator:	EQT Production Company	Authorized Representative:	Victoria Roark
Address:	115 Professional Place, P.O Box 280	Address:	115 Professional Place, P.O Box 280
	Bridgeport, WV 26330		Bridgeport, WV 26330
Telephone:	304-848-0076	Telephone:	304-848-0076
Email:	vroark@eqt.com	Email:	vroark@eqt.com
Facsimile:	304-848-0041	Facsimile:	304-848-0041

Oil and Gas Privacy Notice:
The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

Received
Office of Oil & Gas
NOV 18 2014

103-03058

WW-6A4W
(1/12)

Operator Well No. 512916

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF INTENT TO DRILL
WAIVER

Pursuant to W. Va. Code § 22-6A-16(b), at least ten days prior to filing a permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner notice of its intent to enter upon the surface owner's land for the purpose of drilling a horizontal well: Provided, That notice given pursuant to subsection (a), section ten of this article satisfies the requirements of this subsection as of the date the notice was provided to the surface owner: Provided, however, That the notice requirements of this subsection may be waived in writing by the surface owner. The notice, if required, shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative.

Surface Owner Waiver:

I, _____, hereby state that I have read the notice provisions listed above and hereby waive the notice requirements under West Virginia Code § 22-6A-16(b) for the tract of land as follows:

State:	WV		Easting:	535,717.30
County:	Wetzel	UTM NAD 83	Northing:	4,381,517.00
District:	Grant	Public Road Access:		Rt. 19
Quadrangle:	Big Run 7.5	Generally used farm name:		Higgins
Watershed:	Willey Fork of North Fork Fishing Creek			

Name: Coastal Forest Resources Company
Address: d/b/a Coastal Timberlands Company
P.O. Box 709
Buckhannon, WV 26201

Signature: Edward L. Kraynak

Date: 12/11/13

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov

Received
Office of Oil & Gas
NOV 18 2014

103-03058

WW-6A5
(1/12)

Operator Well No. 512916

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

Notice Time Requirement: notice shall be provided no later than the filing date of permit application.
Date of Notice: NOV 17 2014 **Date Permit Application Filed:** _____

NOV 18 2014

Delivery method pursuant to West Virginia Code § 22-6A-16(c)

☑ CERTIFIED MAIL RETURN RECEIPT REQUESTED ☐ HAND DELIVERY

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

Notice is hereby provided to the SURFACE OWNER(s)
(at the address listed in the records of the sheriff at the time of notice):

Name: Coastal Forest Resources Co
Address: dba Coastal Timberlands Co
P.O. Box 709
Buckhannon, WV 26201

Name: 0
Address: 0
0

Notice is hereby given:
Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State:	WV	UTM NAD 83	Easting:	4,381,517.000000
County:	Wetzel		Northing:	535,717.300000
District:	Grant	Public Road Access:		Rt. 19
Quadrangle:	Big Run 7.5	Generally used farm name:		Coastal Forest Resources Co dba Coastal Timberlands Co
Watershed:	Willey Fork of North Fork Fishing Creek			

This Notice Shall Include:
Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1)A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Operator:	EQT Production Company	Address:	115 Professional Place, P.O. Box 280
Telephone:	304-848-0082		Bridgeport, WV 26330
Email:	vroark@eqt.com	Facsimile:	304-848-0040

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Received
Office of Oil & Gas
NOV 18 2014

WW-6RW
(1-12)

EQT PRODUCTION COMPANY
PO BOX 280
BRIDGEPORT, WV 26330-0280

API NO. 47- 103 - 03056
OPERATOR WELL NO. H4 - 512916
Well Pad Name: BIG 177

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL LOCATION RESTRICTION WAIVER

The well operator, EQT Production Company is applying for a permit from the State of West Virginia to conduct oil or gas well work. Please be advised that well work permits are valid for twenty-four (24) months.

Well Location Restrictions
Pursuant to West Virginia Code § 22-6A-12(a), Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements.

WAIVER

I, _____, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through _____, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State:	West Virginia	UTM NAD 83 Easting:	
County:	Wetzel	UTM NAD 83 Northing:	
District:	Grant	Public Road Access:	CR 19 / Willey Fork Road
Quadrangle:	Big Run 7.5"	Generally used farm name:	
Watershed:	Willey Fork		

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials and I therefore waive all well site restrictions listed under West Virginia Code § 22-6A-12(a).

WELL SITE RESTRICTIONS BEING WAIVED
*Please check all that apply

- ☐ EXISTING WATER WELLS
- ☐ DEVELOPED SPRINGS
- ☒ DWELLINGS
- ☐ AGRICULTURAL BUILDINGS

FOR EXECUTION BY A NATURAL PERSON
Signature: Willey
Print Name: Tina M. Willey
Date: 7-31-2013

FOR EXECUTION BY A CORPORATION, ETC.
Company:
By:
Its:
Signature:
Date:

Received
Office of Oil & Gas
NOV 18 2014

DOUGLAS HAUGHT
WETZEL County 02:26:17 PM
Instrument No 154549
Date Recorded 12/03/2013
Document Type MS
Pages Recorded 1
Book-Page 105-674
Recording Fee $5.00
Additional $5.00

Well Operator: EQT Production Company
By: John W. Damato
Its: Attorney-In-Fact
Signature:
Telephone:

OFFICIAL SEAL
NOTARY SEAL
COMMISSIONER FOR WEST VIRGINIA
Bryson J. Karp
Weston, WV
My Commission Expires January 1, 2021

Subscribed and sworn before me this 31 day of July 2013
Bryson J. Karp Notary Public
My Commission Expires Jan 1 2021

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WW-6RW
(1-12)

EQT PRODUCTION COMPANY
PO BOX 280
BRIDGEPORT, WV 26330-0280

API NO. 47- 103 - 03058
OPERATOR WELL NO. H4 - 512916
Well Pad Name: BIG 177

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
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*Please check all that apply

- ☐ EXISTING WATER WELLS
- ☐ DEVELOPED SPRINGS
- ☒ DWELLINGS
- ☐ AGRICULTURAL BUILDINGS

Received
Office of Oil & Gas
NOV 18 2014

FOR EXECUTION BY A NATURAL PERSON
Signature: Ikey Joe Willey
Print Name: Ikey Joe Willey
Date: 7-31-2013

FOR EXECUTION BY A CORPORATION, ETC.
Company: _____
By: _____
Its: _____
Signature: _____
Date: _____

Carol S Haught
WETZEL County 02:25:17 PM
Instrument No 154548
Date Recorded 12/03/2013
Document Type WS
Pages Recorded 1
Book-Page 105-673
Recording Fee $5.00
Additional $6.00

Well Operator: EQT Production Company
By: John W. Damato
Its: Attorney-In-Fact

Signature: _____
Telephone: _____

OFFICIAL SEAL
COMMISSIONER FOR WEST VIRGINIA
NOTARY SEAL
Bryson J. Karp
Weston, WV
My Commission Expires January 1, 2021

Subscribed and sworn before me this 31 day of July 2013

_____ Notary Public

My Commission Expires Jan 1 2021

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103-03058

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Earl Ray Tomblin
Governor

Paul A. Mattox, Jr., P. E.
Secretary of Transportation/
Commissioner of Highways

April 16, 2014

James A. Martin, Chief
Office of Oil and Gas
Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Subject: DOH Permit for the BIG177 Well Site, Wetzel County

511407 BIG177H1	511408 BIG177H2	512915 BIG177H3
512916 BIG177H4	512917 BIG177H5	512918 BIG177H6
513836 BIG177H7	513837 BIG177H8	513838 BIG177H9
513839 BIG177H10	513840 BIG177H11	513841 BIG177H12
513842 BIG177H13	513823 BIG177H14	513844 BIG177H15
513845 BIG177H16	513846 BIG177H17	513847 BIG177H18

Dear Mr. Martin,

This well site will be accessed from existing Permit # 06-2013-0292 issued to EQT Production Company for access to the State Road for a well site located off of Wetzel County Route 19 SLS.

The operator has signed a STATEWIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

Gary K. Clayton

Gary K. Clayton
Regional Maintenance Engineer
Central Office Oil & Gas Coordinator

Cc: Nick Bumgardner
EQT Production Company
CH, OM, D-6
File

Received
Office of Oil & Gas
NOV 18 2014

E.E.O./AFFIRMATIVE ACTION EMPLOYER

103-03058

Anticipated Frac Additives
Chemical Names and CAS numbers

Material	Ingredient	CAS Number
Water		
Sand	Hydrotreated light petroleum distillate	14808-60-7
Friction Reducer	Tributyl tetradecyl phosphonium chloride	64742-47-8
Biocide	Ammonium chloride	81741-28-8
Scale Inhibitor	Hydrochloric Acid	12125-02-9
15% Hydrochloric Acid	Propargyl Alcohol	7647-01-0
Corrosion Inhibitor	Methanol	107-19-7
Corrosion Inhibitor	Guar Gum	67-56-1
Gelling Agent	Sodium Persulfate	9000-30-0
Oxidizing Breaker	Potassium Carbonate	7775-27-1
Buffering Agent		584-08-7

DMH
11-18-14

RECEIVED
Office of Oil and Gas
NOV 25 2014
WV Department of
Environmental Protection

BIG 177 H1-H6, H15, H16 SITE PLAN
EQT PRODUCTION COMPANY

(PROPOSED WELL NO. WV 511407, WV 511408, WV 512915, WV 512916, WV 512917, WV 512918, WV 513844, WV 513845)

SITUATE ON THE WATERS OF WILLEY FORK OF NORTH FORK FISHING CREEK IN GRANT DISTRICT, WETZEL COUNTY, WEST VIRGINIA.

APPROVED
WVDEP OOG
11/12/2014

API# 10302984

PROJECT INFORMATION

PROJECT NAME: BIG 177 H1-H6, H15, H16

TAX PARCEL:
GRANT DISTRICT
MAP 13-6, 13-6.1

SURFACE OWNER:
COSTAL FOREST RESOURCES COMPANY D/B/A
COASTAL TIMBERLANDS COMPANY
GRANT DISTRICT
WETZEL COUNTY, WV
TOTAL PROPERTY AREA: 27 ± ACRES OF 217 ± ACRES AND 55 ± ACRES

OIL AND GAS ROYALTY OWNER:
HIGGINS FAMILY TRUST (LEASE No. 103021)
GRANT DISTRICT
WETZEL COUNTY, WV
TOTAL PROPERTY AREA: 242.5 ± ACRES

SITE LOCATION:
THE BIG 177 SITE IS LOCATED IN THE BOTTOM NORTH OF WILLEY FORK APPROXIMATELY 2,300 FT EAST OF THE CO. RT. 19 AND CO. RT. 15 INTERSECTION.

LOCATION COORDINATES

BIG 177 H1-H6, H15, H16 WELL PAD ENTRANCE
LATITUDE: 39.58303 LONGITUDE: -80.58527 (NAD 83)

BIG 177 H1-H6, H15, H16 WELL PAD
LATITUDE: 39.58263 LONGITUDE: -80.58412 (NAD 83)

BIG 177 H1-H6, H15, H16 TANK PAD
LATITUDE: 39.58252 LONGITUDE: -80.58570 (NAD 83)

SITE DISTURBANCE COMPUTATIONS

PAD AREA = 6.5 ± ACRES*
ACCESS ROAD = 0.4 ± ACRES
TOTAL SITE DISTURBANCE = 6.9 ± ACRES
*INCLUDES AREA OF THE WELL PAD, TANK PAD, & STOCKPILES

ENTRANCE PERMIT

EQT PRODUCTION COMPANY WILL OBTAIN AN ENCROACHMENT PERMIT (FORM MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

MISS UTILITY STATEMENT

MISS UTILITY OF WEST VIRGINIA WAS NOTIFIED FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN; TICKET #1312631014. IN ADDITION, MISS UTILITY WILL BE CONTACTED PRIOR TO START OF THE PROJECT.

FLOODPLAIN NOTE

THE PROPOSED LIMITS OF DISTURBANCE FOR THIS PROJECT IS LOCATED IN FEMA FLOOD ZONE "A", PER THE FLOOD INSURANCE RATE MAP (FIRM) NUMBER 54103C0225C, DATED SEPT. 25, 2009. A FLOODPLAIN ANALYSIS FOR THE PROPOSED DISTURBANCE HAS BEEN PROVIDED BY NAVITUS ENGINEERING, DATED AUGUST 1, 2013 SHOWING THE IMPACTS OF THE PROPOSED IMPROVEMENTS. PLEASE REFER TO THE ANALYSIS FOR ADDITIONAL INFORMATION.

ENVIRONMENTAL NOTES

A WETLAND DELINEATION WAS PERFORMED ON SEPTEMBER 22, 2011; AND DECEMBER 14, 2012 AND DECEMBER 17, 2012 BY POTESTA & ASSOCIATES, INC. TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE FEBRUARY 4, 2013 REPORT PROJECT # 0101-11-147-17701 WAS PREPARED BY POTESTA & ASSOCIATES, INC. SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE REPORT DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP. IT IS STRONGLY RECOMMENDED THAT THE AFOREMENTIONED AGENCIES BE CONSULTED IN AN EFFORT TO GAIN WRITTEN CONFIRMATION OF THE DELINEATION DESCRIBED BY THIS REPORT PRIOR TO ENGAGING CONSTRUCTION ON THE PROPERTY DESCRIBED HEREIN. THE DEVELOPER SHALL OBTAIN THE APPROPRIATE PERMITS FROM THE FEDERAL AND/OR STATE REGULATORY AGENCIES PRIOR TO ANY PROPOSED IMPACTS TO WATERS OF THE U.S., INCLUDING WETLAND FILLS AND STREAM CROSSINGS.

GENERAL DESCRIPTION

THE WELL PAD AND TANK PAD ARE BEING CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

MISS Utility of West Virginia
1-800-245-4848
West Virginia State Law
(Section XIV: Chapter 24-C)
Requires that you call two business days before you dig in the state of West Virginia.
IT'S THE LAW!!

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS

BIG RUN QUAD
2000 0 2000
SCALE: 1" = 2000'

Electronic plans maybe viewed at: Q:\OIL GAS\SAY FILES\REVIEWS\EQT

OPERATOR

EQT PRODUCTION COMPANY
OPERATOR ID: 306686
115 PROFESSIONAL PLACE
P.O. BOX 280
BRIDGEPORT, WV 26330
PHONE: (304) 348-3870

SURVEYOR/ENGINEER

SMITH LAND SURVEYING, INC.
12 VANHORN DRIVE
P.O. BOX 150
GLENVILLE, WV 26351
PHONE: (304) 462-5634

LIST OF DRAWINGS

1 - COVER SHEET
2 - NOTES AND DETAIL SKETCH
3 - WELL PAD AND ACCESS ROAD DETAILS AND VOLUMES
4 - WELL PAD SECTION AND ROAD PROFILE AND SECTIONS
5 - WELL PAD RECLAMATION PLAN
6 - CONSTRUCTION DETAILS
7 - CONSTRUCTION DETAILS
8 - CONSTRUCTION DETAILS

LEGEND

EX. INDEX CONTOUR	PROP. INDEX CONTOUR
EX. INTERMEDIATE CONTOUR	PROP. INTERMEDIATE CONTOUR
EX. BOUNDARY LINE	PROP. GRADING LIMITS
EX. RIGHT-OF-WAY LINE	PROP. LIMITS OF DISTURBANCE
EX. ROAD EDGE OF GRAVEL/DIRT	PROP. WELL PAD
EX. ROAD EDGE OF PAVEMENT	PROP. WELL HEAD
EX. ROAD CENTERLINE	PROP. 4" PVC DRAIN PIPE
EX. DITCHLINE	PROP. SUMP DRAIN
EX. CULVERT	PROP. CONTAINMENT BERM
EX. GUARDRAIL	PROP. PIT/IMPOUNDMENT CL
EX. FENCELINE	PROP. PERIMETER SAFETY FENCE
EX. GATE	PROP. ACCESS GATE WITH EMERGENCY LIFELINE
EX. OVERHEAD UTILITY	
EX. OVERHEAD UTILITY R/W	
EX. POWER POLE	
EX. GUY WIRE	
EX. TELEPHONE LINE	
EX. GASLINE	PROP. ROCK CONSTRUCTION ENTRANCE
EX. GASLINE R/W	
EX. WATERLINE	
EX. WATER WELL	
EX. GAS WELL	
EX. TREELINE	PROP. ROAD EDGE OF GRAVEL
EX. REFERENCE TREE	PROP. ROAD CENTERLINE
EX. DELINEATED STREAM	PROP. V-DITCH W/ CHECK DAMS
EX. DELINEATED WETLAND/POND	PROP. DITCH RELIEF CULVERT (DRC)
EX. BUILDING	PROP. RIP-RAP OUTLET PROTECTION
EX. BRIDGE	PROP. GUARDRAIL
EX. TOP OF BANK	PROP. ROCK LEVEL SPREADER
EX. 100 YEAR FEMA FLOODPLAIN	PROP. EARTHEN DIVERSION BERM
EX. 100 YEAR FLOODPLAIN	PROP. ORANGE SAFETY FENCE
100' WETLAND/STREAM BUFFER	PROP. SUPER SILT FENCE
FLOOD PROTECTION SETBACK	PROP. REINFORCED SILT FENCE
PROP. 100 YEAR FLOODPLAIN	PROP. COMPOST SOCK DIVERSION
	PROP. GROUNDWATER DEWATERING TRENCH
	PROP. GROUNDWATER DEWATERING PIPE
	SECTION LINE
	MATCHLINE
	X-SECTION GRID INDEX
	X-SECTION GRID INTERMEDIATE
	X-SECTION PROPOSED GRADE
	X-SECTION EXISTING GRADE
	X-SECTION WATER SURFACE
	SPOT ELEVATION
	CENTER OF PAD

EQT Where energy meets innovation.

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

KIP R. HALL REGISTERED 15176 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

THIS DOCUMENT WAS REVISED BY: SMITH LAND SURVEYING, INC.
FOR: EQT PRODUCTION COMPANY

COVER SHEET
BIG 177
GRANT DISTRICT
WETZEL COUNTY, WV

DATE: 05/09/2013
SCALE: 1" = 2000'
DESIGNED BY: CSK
FILE NO. 6605
SHEET 1 OF 8
REV.: 11/10/14

CONSTRUCTION NOTES:

1. THE CONTRACTOR IS TO VERIFY FIELD CONDITIONS PRIOR TO AND DURING CONSTRUCTION AND WILL NOTIFY SMITH LAND SURVEYING AT (304) 462-5634 IMMEDIATELY OF ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THE APPROVED PLAN. ANY WORK PERFORMED BY THE CONTRACTOR AFTER THE FINDING OF SUCH DISCREPANCIES, SHALL BE DONE AT THE CONTRACTOR'S RISK.

2. METHODS AND MATERIALS USED IN THE CONSTRUCTION OF THE IMPROVEMENTS HEREIN SHALL CONFORM TO THE CURRENT COUNTY CONSTRUCTION STANDARDS AND SPECIFICATIONS AND/OR CURRENT WVDEP EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL STANDARDS AND SPECIFICATIONS. SHOULD A CONFLICT BETWEEN THE DESIGN, SPECIFICATIONS, AND PLANS OCCUR, THE MOST STRINGENT REQUIREMENT WILL APPLY. THE APPROVAL OF THESE PLANS IN NO WAY RELIEVES THE DEVELOPER OR HIS AGENT OF THE RESPONSIBILITIES CONTAINED IN THE WVDEP EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL.

3. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE. ALSO, A REPRESENTATIVE OF THE DEVELOPER MUST BE AVAILABLE AT ALL TIMES.

4. THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS OF CLEANING MUD FROM TRUCKS AND/OR OTHER EQUIPMENT PRIOR TO ENTERING PUBLIC STREETS, AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO CLEAN STREETS, ALLAY DUST, AND TO TAKE WHATEVER MEASURES ARE NECESSARY TO INSURE THAT THE STREETS ARE MAINTAINED IN A CLEAN, MUD AND DUST FREE CONDITION AT ALL TIMES.

5. THE LOCATION OF EXISTING UTILITIES SHOWN IN THESE PLANS ARE FROM FIELD LOCATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES AS NEEDED PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE ENGINEER OF ANY CONFLICTS ARISING FROM HIS EXISTING UTILITY VERIFICATION AND THE PROPOSED CONSTRUCTION.

6. THE CONTRACTOR SHALL PROVIDE NOTIFICATION TO THE APPROPRIATE UTILITY COMPANY PRIOR TO CONSTRUCTION OF WATER AND/OR GAS PIPE LINES. INFORMATION SHOULD ALSO BE OBTAINED FROM THE APPROPRIATE AUTHORITY CONCERNING PERMITS, CUT SHEETS, AND CONNECTIONS TO EXISTING LINES.

7. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGES TO THE EXISTING STREETS AND UTILITIES WHICH OCCURS AS A RESULT OF HIS CONSTRUCTION PROJECT WITHIN OR CONTIGUOUS TO THE EXISTING RIGHT-OF-WAY.

8. WHEN GRADING IS PROPOSED WITHIN EASEMENTS OF UTILITIES, LETTERS OF PERMISSION FROM ALL INVOLVED COMPANIES MUST BE OBTAINED PRIOR TO GRADING AND/OR SITE DEVELOPMENT.

9. THE DEVELOPER WILL BE RESPONSIBLE FOR THE RELOCATION OF ANY UTILITIES WHICH IS REQUIRED AS A RESULT OF HIS PROJECT. THE RELOCATION SHOULD BE DONE PRIOR TO CONSTRUCTION.

10. THESE PLANS IDENTIFY THE LOCATION OF ALL KNOWN GRAVESITES. GRAVESITES SHOWN ON THIS PLAN WILL BE PROTECTED IN ACCORDANCE WITH STATE LAW. IN THE EVENT GRAVESITES ARE DISCOVERED DURING CONSTRUCTION, THE OWNER AND ENGINEER MUST BE NOTIFIED IMMEDIATELY.

11. THE CONTRACTOR(S) SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATING OR BLASTING AT LEAST TWO (2) WORKING DAYS, BUT NOT MORE THAN TEN (10) WORKING DAYS, PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION.

12. CONTRACTOR TO CONTACT OPERATOR AND ENGINEER IF GROUNDWATER IS ENCOUNTERED DURING CONSTRUCTION.

13. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR 2 DAYS PRIOR TO THE START OF CONSTRUCTION.

14. THE CONTRACTOR IS RESPONSIBLE FOR ALL FILL MATERIAL TESTING REQUIRED DURING THE CONSTRUCTION OF THIS PROJECT. ALL MATERIAL TEST SHALL BE CONDUCTED BY A CERTIFIED MATERIALS TESTING LABORATORY AND A CERTIFICATION OF THE MATERIALS TESTED SHALL BE PROVIDED BY A LICENSED PROFESSIONAL ENGINEER REPRESENTING THE LABORATORY. ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER CERTIFYING THE CONSTRUCTED FACILITY. FAILURE TO CONDUCT THE DENSITY TEST SHALL BE CAUSE FOR NON-ACCEPTANCE OF THE CONSTRUCTED FACILITY.

15. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTING THE SITE IN ACCORDANCE WITH THE DESIGN PLANS AND CONSTRUCTION DOCUMENTS AND THE SCOPE OF WORK SHALL CONFORM WITH THE GRADES, BERMS, DEPTHS, DIMENSIONS, ETC. SHOWN HEREON.

16. THE CONTRACTOR WILL BE RESPONSIBLE FOR MAINTENANCE OF TRAFFIC WHILE WORKING WITHIN EXISTING ROW AS PER ANY FEDERAL, STATE, OR LOCAL REGULATIONS.

CONSTRUCTION SEQUENCE

THE DEVELOPMENT OF THIS SITE SHALL BE CONSISTENT WITH THE FOLLOWING GENERAL SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHALL IMPLEMENT, MAINTAIN, AND OPERATE ALL PROPOSED EROSION AND SEDIMENT CONTROL MEASURES TO EFFECTIVELY MITIGATE THE HAZARD OF ACCELERATED EROSION AND SEDIMENTATION TO ACCEPTABLE LEVELS. MINOR DEVIATIONS FROM THIS SEQUENCE SHALL BE EXECUTED BY THE PROJECT'S SUPERINTENDENT AS NEEDED TO ELIMINATE ANY POTENTIAL EROSIVE CONDITION THAT MAY ARISE FOR THE DURATION OF THE PROJECT. THE WVDEP OFFICE OF OIL AND GAS SHALL BE NOTIFIED OF ANY AND ALL SUCH DEVIATIONS FROM THE APPROVED PLANS.

1) A PRE-CONSTRUCTION CONFERENCE WITH THE CONTRACTOR AND THE APPROPRIATE EROSION AND SEDIMENT CONTROL INSPECTOR 48 HOURS PRIOR TO BEGINNING WORK TO REVIEW THE CONSTRUCTION DRAWINGS AND PROVIDE ANY REQUESTED GUIDANCE.

2) STAKE THE LIMITS OF CONSTRUCTION.

3) INSTALL THE ROCK CONSTRUCTION ENTRANCE AS SHOWN ON THE PLANS.

4) INSTALL ALL ORANGE SAFETY FENCE AS SHOWN AROUND ANY DELINEATED STREAMS AND WETLANDS TO CLEARLY IDENTIFY THOSE AREAS THAT ARE NOT TO BE DISTURBED.

5) INSTALL ALL BMP'S (COMPOST FILTER SOCKS, SEDIMENT TRAPS, ETC) AS SHOWN ON THE PLANS AND DETAILS. THE SEDIMENT TRAPS SHOWN ON THIS PLAN WILL FUNCTION AS A PLUNGE POOL TO REDUCE THE VELOCITIES ON THE PROPOSED DITCHES DRAINING INTO THEM. THE RUNOFF DRAINING TO THESE FACILITIES WILL BE SEDIMENT FREE.

6) CLEAR AND GRUB THE ACCESS ROAD AND PAD AREA. ALL WOODY MATERIAL, BRUSH, TREES, STUMPS, LARGE ROOTS, BOULDERS, AND DEBRIS SHALL BE CLEARED FROM THE SITE AREA AND KEPT TO THE MINIMUM NECESSARY FOR PROPER CONSTRUCTION, INCLUDING FOR INSTALLATION OF NECESSARY SEDIMENT CONTROLS. TREES SIX INCHES IN DIAMETER AND LARGER SHALL BE CUT AND LOGS STACKED. SMALLER TREES, BRUSH, & STUMPS SHALL BE CUT AND OR CHIPPED AND WINDROWED IN APPROPRIATE AREAS FOR USE AS SEDIMENT BARRIERS AT WATER DRAINAGE OUTLETS; WINDROWED BELOW THE WELL SITE, USED FOR WILDLIFE HABITAT, BURNED (AS PER WV FOREST FIRE LAWS), REMOVED FROM SITE, OR DISPOSED OF BY OTHER METHODS APPROVED BY DEP.

7) CONSTRUCT THE ACCESS ROAD. DITCH RELIEF CULVERTS SHALL BE INSTALLED AT A GRADE OF 10% TO MINIMIZE OUTLET VELOCITIES TO THE EXTENT POSSIBLE. INSTALL OUTLET PROTECTION AS SHOWN ON PLANS. STABILIZE THE ROAD WITH GEOTEXTILE FABRIC & STONE AND SIDE SLOPES AS SPECIFIED WITH PERMANENT SEEDING. STOCKPILE AND STABILIZE EXCESS MATERIAL ALONG THE ACCESS ROAD, AS NEEDED.

8) STRIP THE TOPSOIL FROM THE PAD AREA. ALL STRIPPED TOPSOIL SHALL BE STOCKPILED IN AREAS SHOWN IN THE PLANS AND IMMEDIATELY STABILIZED. ADDITIONAL BMP MEASURES SHALL BE CONSTRUCTED AROUND TOPSOIL STOCKPILES, IF NECESSARY.

9) ALL DITCH LINES SHALL BE CLEANED PRIOR TO INSTALLATION OF LINED PROTECTION. ALL DITCHES SHALL HAVE ROCK AND GEOTEXTILE FABRIC LINING. INSTALL OUTLET PROTECTION ONCE DITCH RELIEF CULVERTS ARE INSTALLED, AS SHOWN ON THIS PLAN.

10) GRADE THE PAD AREA AS SHOWN ON THE PLANS. IMMEDIATELY STABILIZE THE OUTER AREAS OF THE WELL PAD. THE WELL PAD AND TURNAROUND AREA(S) SHALL BE STABILIZED WITH GEOTEXTILE FABRIC & STONE AND THE SIDE SLOPES WITH EROSION CONTROL BLANKETS ON ALL SLOPES GREATER THAN 3:1. APPLY SEED AND MULCH TO ALL DISTURBED AREAS. THIS SHALL INCLUDE ALL AREAS THAT WILL NOT BE SUBJECT TO REGULAR TRAFFIC ACTIVITY (TO BE STABILIZED WITH STONE), OR ANY DISTURBED AREA THAT WILL NOT BE RE-DISTURBED BEFORE SITE RECLAMATION BEGINS.

11) PRIOR TO THE INSTALLATION OF THE TANK, THE CONTRACTOR SHALL CONTACT THE ENGINEER/SURVEYOR TO COMPLETE AN AS-BUILT SURVEY OF THE CONSTRUCTED TANK PAD TO ENSURE CONFORMANCE WITH THE DESIGN DRAWINGS. THE AS-BUILT WILL BE REVIEWED BY THE ENGINEER AND THE CONTRACTOR IS RESPONSIBLE FOR ANY CORRECTIVE ACTION DEEMED NECESSARY BY THE ENGINEER FOR ANY DEVIATION(S) FROM THE DESIGN DRAWINGS.

12) PREVIOUSLY DISTURBED AREAS AND IMMEDIATE DOWN SLOPE AREAS SHALL BE INSPECTED AFTER EACH RAINFALL STORM EVENT AND MONITORED WEEKLY FOR SIGNS OF ACCELERATED EROSION. IMPLEMENT ADDITIONAL BMP'S AS DEEMED NECESSARY. THESE INSPECTIONS SHALL CONTINUE DURING THE DURATION OF THE PROJECT AND SUBSEQUENT SITE RECLAMATION.

13) COMMENCE THE DRILLING ACTIVITY.

14) ONCE DISTURBED AREAS HAVE BEEN RE-VEGETATED AND STABILIZED FOLLOWING RECLAMATION, THE TEMPORARY BMP'S IN THOSE AREAS MAY BE REMOVED. CONTINUE TO MONITOR THESE AREAS TO ENSURE A UNIFORM RATE OF 70% VEGETATIVE COVERAGE IS MAINTAINED. ANY AREAS FOUND TO BE DEFICIENT SHALL BE RE-SEEDED AND MULCHED.

SITE CLEANUP & RECYCLE PROGRAM

1. GARBAGE, FUELS OR ANY SUBSTANCE HARMFUL TO HUMAN, AQUATIC OR FISH LIFE, WILL BE PREVENTED FROM ENTERING SPRINGS, STREAMS, PONDS, LAKES, WETLANDS OR ANY WATER COURSE OR WATER BODY.

2. OILS, FUELS, LUBRICANTS AND COOLANTS WILL BE PLACED IN SUITABLE CONTAINERS AND DISPOSED PROPERLY.

3. ALL TRASH AND GARBAGE WILL BE COLLECTED AND DISPOSED PROPERLY.

4. ALL SEDIMENT REMOVED FROM SEDIMENT CAPTURING DEVICES SHALL BE PLACED ON THE TOPSOIL STOCKPILE, THEN SEEDED AND MULCHED, AS NECESSARY. ALTERNATIVELY, THE REMOVED SEDIMENT CAN BE TRANSPORTED TO A SITE WITH AN APPROVED PERMIT.

MAINTENANCE PROGRAM

1. BMP'S WILL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH MEASURABLE RAINFALL EVENT DURING THE ACTIVE CONSTRUCTION PHASE OF THE PROJECT.

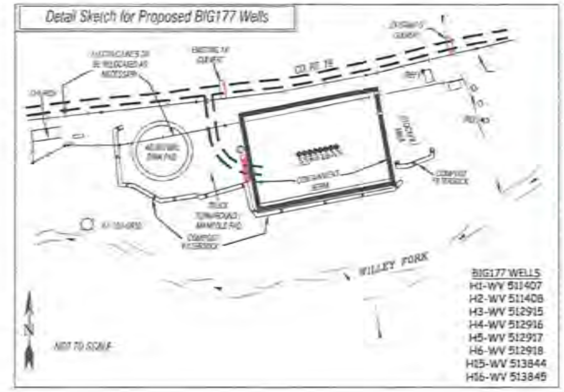
2. ALL REVEGETATED ACCESS ROADS AND FACILITIES ARE TO BE MAINTAINED THROUGHOUT THE LIFE OF EACH STRUCTURE.

3. CULVERTS, ROAD DITCHES, BROAD-BASED DIPS, DIVERSION DITCHES, AND ROCK CHECK DAMS MUST BE MAINTAINED IN PROPER WORKING ORDER AND WILL BE CLEANED OUT, REPAIRED, OR REPLACED AS NECESSARY.

4. FILTER STRIPS AND/OR SILT FENCE WILL BE MAINTAINED.

5. ALL AREAS OF EARTH DISTURBANCE WILL BE REPAIRED WHERE SIGNS OF ACCELERATED EROSION ARE DETECTED.

6. SEEDING AND MULCHING WILL BE REPEATED IN THOSE AREAS THAT APPEAR TO BE FAILING OR HAVE FAILED.



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FOR: EQT PRODUCTION COMPANY

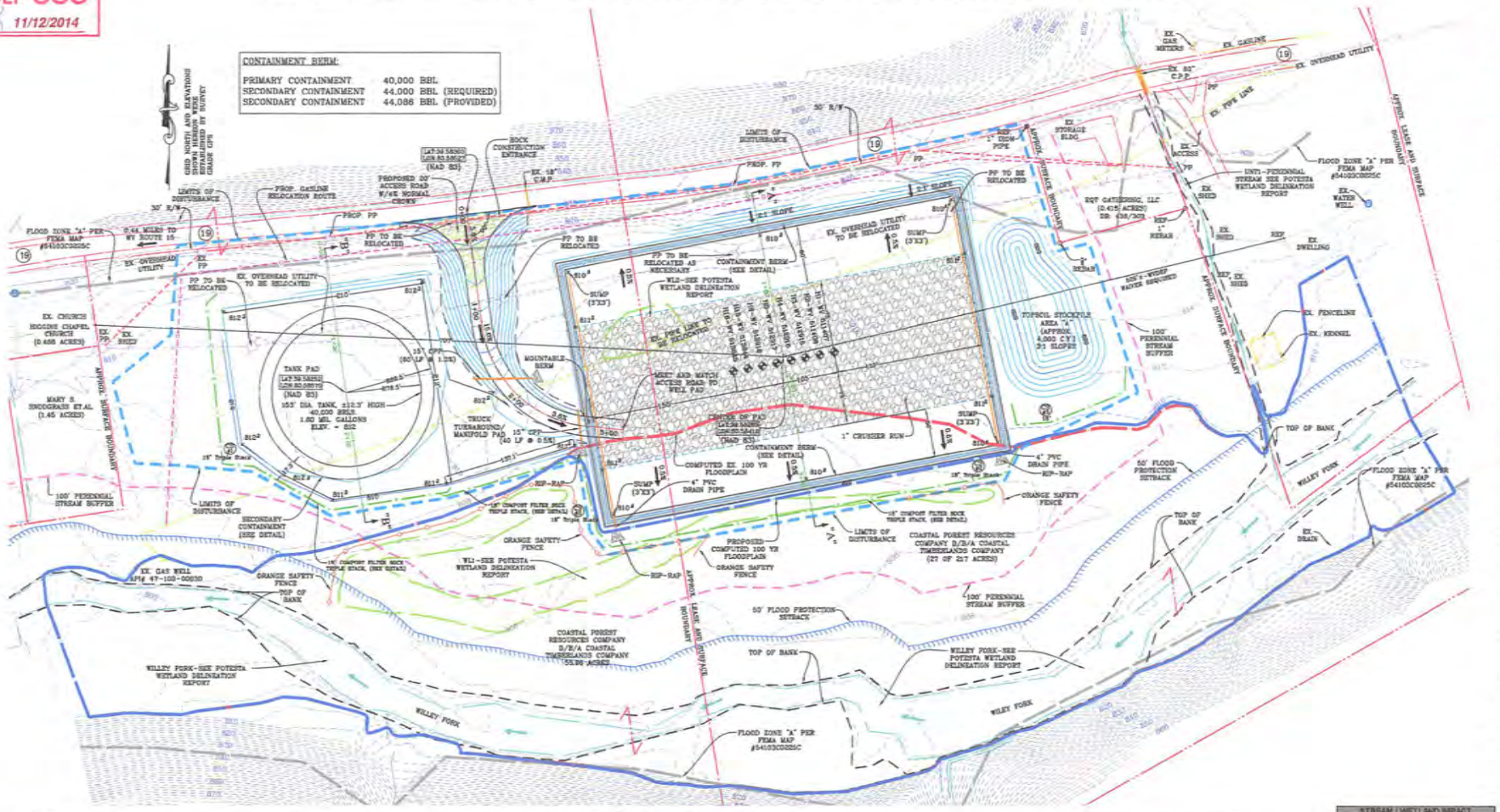
NOTES AND DETAIL SKETCH
BIG 177
GRANT DISTRICT
WETZEL COUNTY, WV

DATE: 05/09/2013
SCALE: N/A
DESIGNED BY: CSK
FILE NO. 8508
SHEET 2 OF 8
REV: 11/10/14

APPROVED
WVDEP OOG
11/12/2014

WELL PAD & ACCESS ROAD DETAILS

PROPOSED WELL NO. WV 511407, WV 511408, WV 512915, WV 512916, WV 512917, WV 512918, WV 513844, WV 513845



NOTE:

1. ALL PROPOSED DRAINAGE CULVERTS AND DRAIN PIPES SHALL HAVE ADEQUATE OUTLET PROTECTION (RIP-RAP) AS SHOWN ON THESE PLANS.

2. ALL FILL AREAS SHALL BE "KEYED IN" AND COMPACTED IN 12" LIFTS (9" RECOMMENDED) WITH A VIBRATING SHEEPSFOOT ROLLER TO 95% COMPACTION PER STANDARD PROCTER.

3. TOPSOIL SHALL BE STRIPPED FROM ALL STOCKPILE AREAS PRIOR TO CONSTRUCTING STOCKPILES. AFTER STOCKPILES ARE CONSTRUCTED TOPSOIL IS TO BE REAPPLIED AT A DEPTH OF 6". SLOPES SHALL BE TRACKED BY RUNNING TRACKED MACHINERY UP AND DOWN THE SLOPE, LEAVING TREAD MARKS PARALLEL TO THE CONTOUR.

4. ALL EARTHWORK VOLUMES WERE CALCULATED USING A CUT SWELL FACTOR OF 1.0 AND A FILL SHRINK FACTOR OF 1.0.

5. THERE WILL BE NO DISCHARGE FROM THE SUMPS DURING DRILLING OR COMPLETION.

50 25 0 50 100

SCALE: 1" = 50'

GENERAL NOTES AND ADDITIONAL DESIGN CONCERNS:

1. THE TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON FIELD LOCATED MAPPING PROVIDED BY SLS, INC.
2. THE WETLAND AND STREAM DELINEATION SHOWN HEREON WAS PROVIDED BY SLS, INC. AND POTESTA.
3. THERE IS ONE OCCUPIED DWELLINGS WITHIN 625 FEET OF THE CENTER OF THE PROPOSED PAD. WVDEP WAIVER IS REQUIRED.
4. THERE ARE NO APPARENT WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE CENTER OF THE PROPOSED PAD.
5. THE PROPOSED SITE IS LOCATED WITHIN FEMA FLOOD ZONE "X" AND "A" PER FEMA FLOOD MAP #54103C0025C. THE PROPOSED WELL PAD IS LOCATED IN FEMA ZONE "A". A FLOODPLAIN STUDY SHALL BE COMPLETED AND A FLOODPLAIN PERMIT SHALL BE OBTAINED FROM THE COUNTY FLOODPLAIN MANAGER.
6. ALL WETLAND AND STREAM IMPACTS SHALL BE PERMITTED THROUGH THE ARMY CORPS OF ENGINEERS.
7. THE ACCESS ROAD HAS BEEN DESIGNED TO ACCOMMODATE A WB-67 TRUCK.
8. THE CONTRACTOR AND OPERATOR SHALL MAINTAIN A MINIMUM OF 300' OF SIGHT DISTANCE. TREES AND BRUSH SHALL BE TRIMMED AND REMOVED AS NECESSARY FOR THE DURATION OF THIS SITE.

Topsoil Stockpiles	
Name	CY
A	4000.0
Totals	4000.0

STREAM / WETLAND IMPACT	
PEM Wetland Impact (Square Feet)	
WL1 (Well Pad)	3,222
WL2 (Well Pad)	3,232
Total Area (Sq. Ft.)	6,454
Total Area (Acres)	0.14

BIG 177 PAD QUANTITIES						
Description	Cut (CY)	Fill (CY)	Spoil (CY)	Borrow (CY)	Max. Slope (%)	Length of Slope (FT)
Access Road-A	1.3	4040.3	0.0	4039.0	15.0	75.0
Well Pad	1680.0	7357.5	0.0	5677.5	n/a	n/a
Well Pad Containent Berm	0.0	378.0	0.0	378.0	n/a	n/a
Tank Pad-A	289.0	3125.9	0.0	2836.9	n/a	n/a
Truck Turnaround Pad-A	0.0	917.1	0.0	917.1	n/a	n/a
Stripped Topsoil (6")	3638.0	0.0	3638.0	0.0	n/a	n/a
Material Stockpiles	0.0	4000.0	0.0	4000.0	n/a	n/a
Totals	5608.3	19818.8	3638.0	17848.5	n/a	n/a
	Total Spoil (CY) =		-14210.5			

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FOR: EQT PRODUCTION COMPANY

WELL PAD AND ACCESS ROAD DETAILS AND VOLUMES

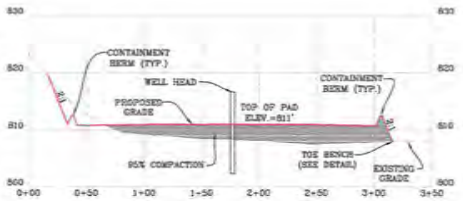
BIG 177

GRANT DISTRICT
WETZEL COUNTY, WV

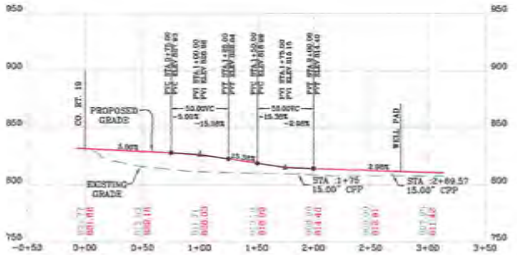
DATE: 05/09/2013
SCALE: 1" = 50'
DESIGNED BY: CSK
FILE NO. 6606
SHEET 3 OF 8
REV.: 11/10/14

APPROVED
WVDEP OOG
11/12/2014

WELL PAD SECTION AND ROAD PROFILE AND SECTIONS



WELL CROSS SECTION "A-A"
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



WELL PAD ACCESS ROAD PROFILE
SCALE: HORIZ. 1" = 50' VERT. 1" = 50'

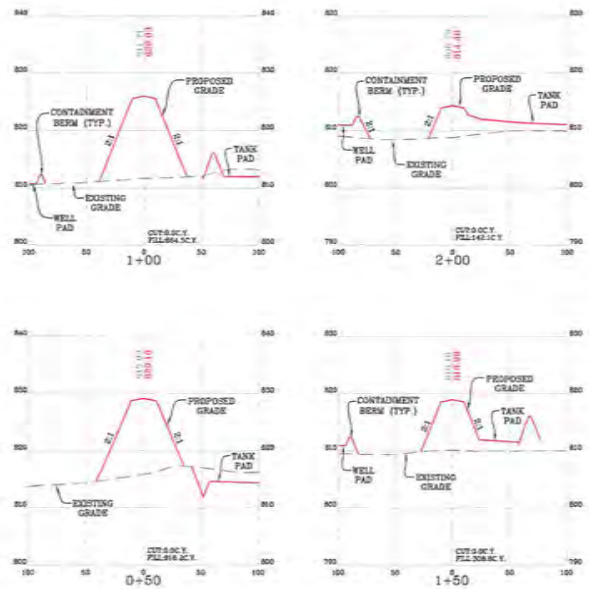
NOTE:
1. ALL PROPOSED DRAINAGE CULVERTS AND DRAIN PIPES SHALL HAVE ADEQUATE OUTLET PROTECTION (RIP-RAP) AS SHOWN ON THESE PLANS.

2. ALL FILL AREAS SHALL BE "KEYED IN" AND COMPACTED IN 12" LIFTS (9" RECOMMENDED) WITH A VIBRATING SHEEPSFOOT ROLLER TO 95% COMPACTION PER STANDARD PROCTER.

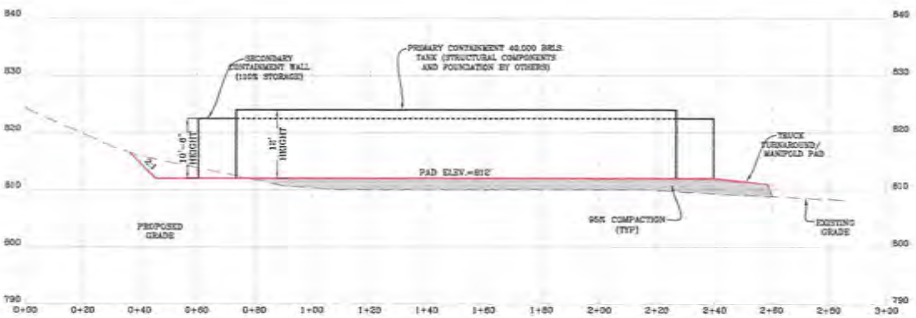
3. TOPSOIL SHALL BE STRIPPED FROM ALL STOCKPILE AREAS PRIOR TO CONSTRUCTING STOCKPILES. AFTER STOCKPILES ARE CONSTRUCTED TOPSOIL IS TO BE REAPPLIED AT A DEPTH OF 6". SLOPES SHALL BE TRACKED BY RUNNING TRACKED MACHINERY UP AND DOWN THE SLOPE, LEAVING TREAD MARKS PARALLEL TO THE CONTOUR.

4. ALL EARTHWORK VOLUMES WERE CALCULATED USING A CUT SWELL FACTOR OF 1.0 AND A FILL SHRINK FACTOR OF 1.0.

CONTAINMENT BERM:	
PRIMARY CONTAINMENT	40,000 BBL
SECONDARY CONTAINMENT	44,000 BBL (REQUIRED)
SECONDARY CONTAINMENT	44,000 BBL (PROVIDED)



WELL PAD ACCESS ROAD CROSS-SECTIONS
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'



TANK PAD CROSS SECTION "B-B"
SCALE: HORIZ. 1" = 20' VERT. 1" = 10'

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WELL PAD SECTION AND ROAD PROFILE AND SECTIONS
BIG 177
GRANT DISTRICT
WETZEL COUNTY, WV

DATE: 05/09/2013
SCALE: AS SHOWN
DESIGNED BY: CSK
FILE NO. 6826
SHEET 4 OF 8
REV.: 11/10/14

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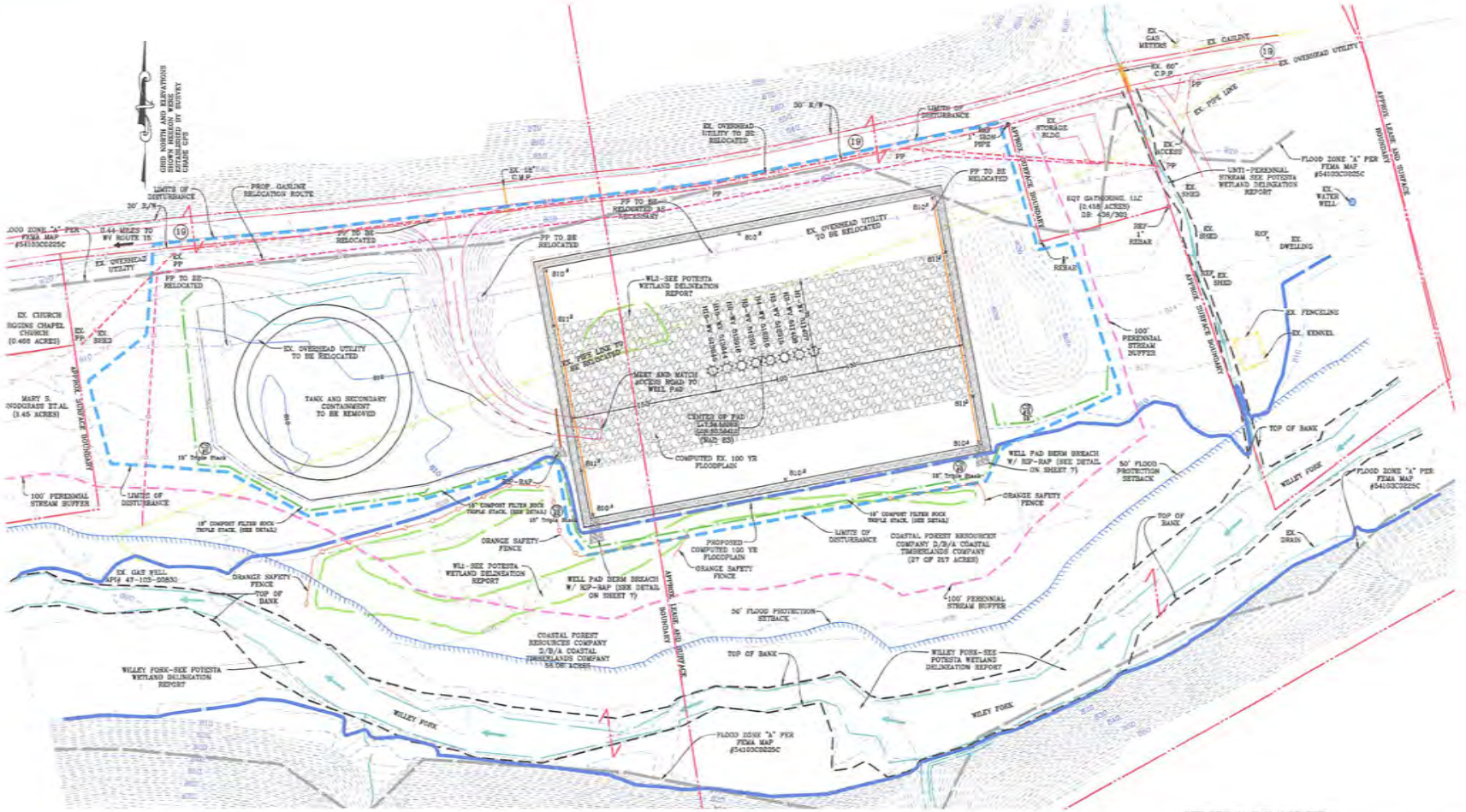
11/12/2014

WELL PAD AND TANK PAD RECLAMATION PLAN



50 25 0 50 100
SCALE: 1" = 50'

NOTE:

1. DURING SITE RECLAMATION ALL FILL AREAS SHALL BE COMPACTED IN 24" MAXIMUM LIFT THICKNESS (12" RECOMMENDED) WITH A VIBRATING SHEEPSFOOT ROLLER TO 90% COMPACTION PER STANDARD PROCTOR DENSITY, ASTM D-698.

SITE RECLAMATION NARRATIVE

WITHIN 6 MONTHS OF THE EXPIRATION OF APPROVAL OF THE WELL PAD, & TANK PAD FACILITY, THIS SITE SHALL BE CLOSED AND RESTORED TO A PRE-CONSTRUCTION CONDITION. THE LINER SYSTEM SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED RECYCLING OR WASTE DISPOSAL FACILITY. ALL PIPING FOR THE GROUNDWATER DEWATERING SYSTEM, WATER LINES, AND ASSOCIATED STRUCTURES SHALL BE REMOVED. ALL EX. BMP'S SHOWN SHALL BE INSPECTED FOR DAMAGE AND REPLACED AS NECESSARY BEFORE RECLAMATION CAN BEGIN. THE SITE SHALL BE REGRADED AS INDICATED ON PLANS TO PRE-CONSTRUCTION GRADES. UPON COMPLETION OF GRADING, THE SITE SHALL BE SEEDED AND MULCHED PER THE REVEGETATION DETAILS ON SHEET 8.

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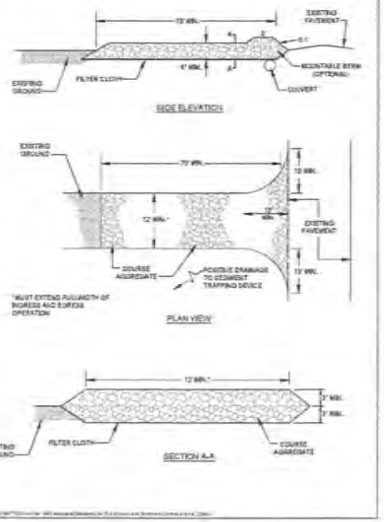
WELL PAD AND TANK PAD RECLAMATION PLAN
BIG 177
GRANT DISTRICT
WETZEL COUNTY, WV

DATE: 05/09/2013
SCALE: 1" = 50'
DESIGNED BY: CSK
FILE NO: 6806
SHEET 5 OF 8
REV.: 11/10/14

FIGURE 3.03.1

STONE CONSTRUCTION ENTRANCE



TYPICAL DITCH RELIEF CULVERT OUTLET TREATMENT

NOTE:
ALL DITCH LINE PROTECTION SHALL BE INSTALLED AS RECOMMENDED IN THE WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE (BMP) MANUAL. DITCH LINE PROTECTION SHALL BE BASED ON THE FOLLOWING GRADES:

1. LESS THAN 3% – GRASSED
2. 3–8% – GRASS WITH ROLLED EROSION CONTROL PRODUCTS (RECP)
3. GREATER THAN 8% – RIPRAP OR EQUIVALENT GEOTEXTILE

IF HIGH ERODIVE SOILS ARE ENCOUNTERED DURING CONSTRUCTION, THE ENGINEER SHOULD BE CONTACTED FOR FURTHER EVALUATION.

Modified Figure 3.1 – Typical Roadside Ditch Section Sump at Ditch Relief Culvert

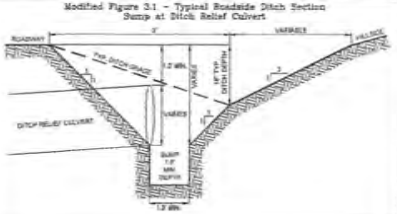


FIGURE B-4

DITCH RELIEF CULVERT

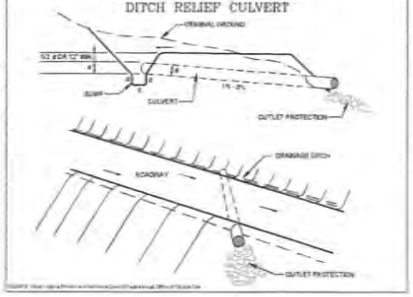


Table B-5

Pipe Sizes for Culverts Across Roads		
Drainage Area (Ac)	Pipe Diameter (in)	Pipe Capacity (Cfs)
15	12	8
20	15	9
30	21	12
35	24	15
50	27	24
100	33	39
200	39	60
300	42	80

Table B-6

Spacing of Culverts	
Road Grade %	Distance (Ft)
3-5	300-250
6-10	200-225
11-15	200-125
16-20	100

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11/12/2014

FIGURE 3.05.1

ROCK CHECK DAM

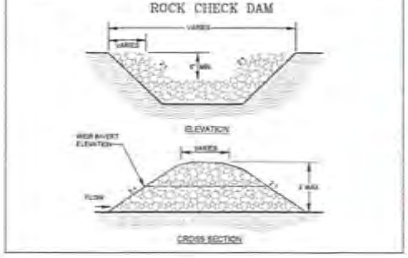
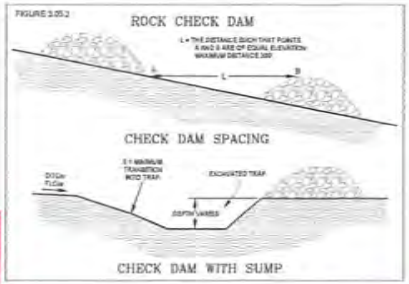


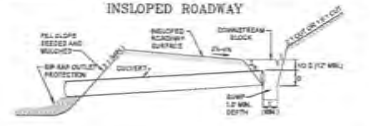
FIGURE 3.05.2

ROCK CHECK DAM



CROWNED ROADWAY

INSLOPED ROADWAY



Cut and fill slopes shall be stabilized immediately upon completion of roadway grading. These areas shall be stabilized whenever they are located within 50 feet of a surface water or within 100 feet of a surface water where a suitable vegetative filter strip does not exist.

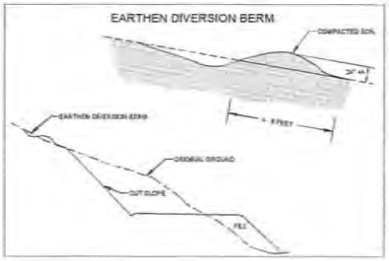
A stable tire cleaning shall be provided for solid hauling low strength.

Roadside ditches shall be provided with adequate protective lining.

Adequately sized culverts or other suitable cross drains shall be provided at all areas, springs, and drainageways.

Roadway shall be inspected weekly and after each runoff event. Damaged roadways, ditches, or cross drains shall be repaired immediately.

EARTHEN DIVERSION BERM



TOE BENCH DETAIL

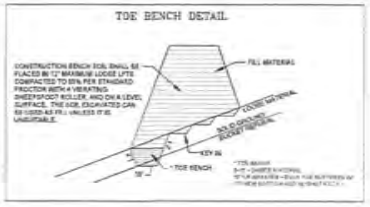


FIGURE 3.13.1

TYPICAL RECP CHANNEL INSTALLATION

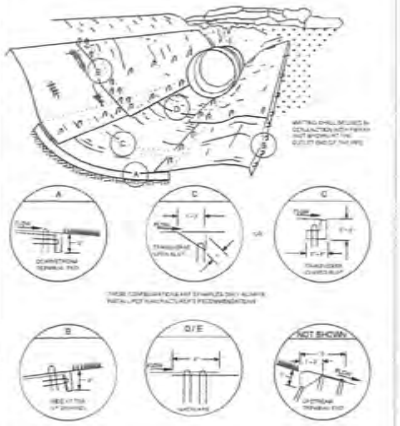
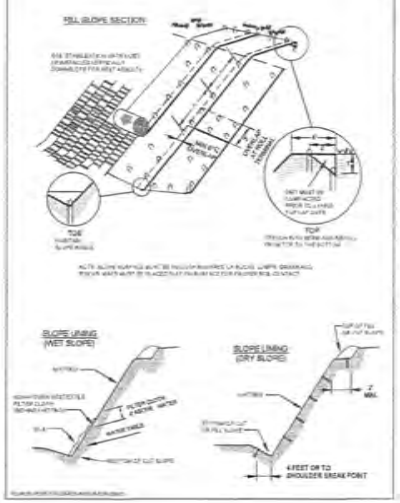
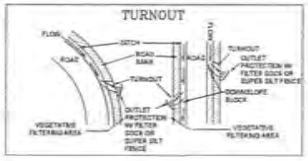


FIGURE 3.13.2

ROLLED EROSION CONTROL PRODUCTS



TURNOUT



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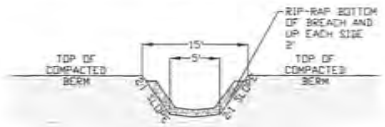
THIS DOCUMENT WAS REVISED BY: SMITH LAND SURVEYING, INC.
FOR: EQT PRODUCTION COMPANY

CONSTRUCTION DETAILS
BIG 177
GRANT DISTRICT
WETZEL COUNTY, WV

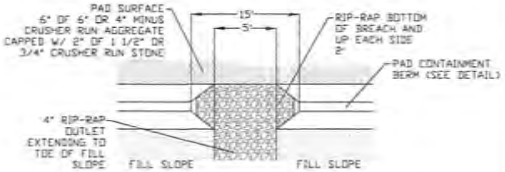
DATE:	05/09/2013
SCALE:	N/A
DESIGNED BY:	CSX
FILE NO:	5808
SHEET:	6 OF 8
REV.:	11/10/14

PAD BERM BREACH DETAIL

NTS



PROFILE VIEW



PLAN VIEW

APPROVED
WVDEP OOG
11/12/2014

MOUNTABLE BERM TYPICAL

NOT TO SCALE

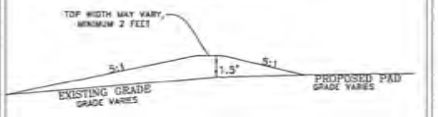


FIGURE 11-10

BRUSH PILE SEDIMENT BARRIER

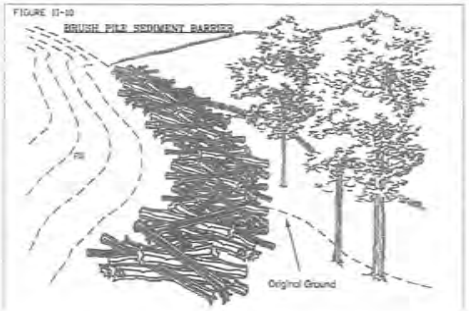
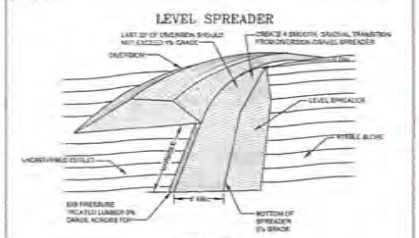
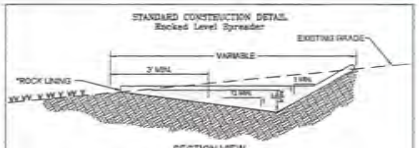


FIGURE 3.52.1

LEVEL SPREADER

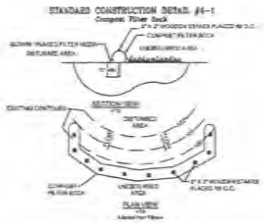


STANDARD CONSTRUCTION DETAIL
Rocked Level Spreader



*All Level Spreader rock shall be a minimum of #4.

STANDARD CONSTRUCTION DETAIL #4-1
Compost Filter Sock



Sock fabric shall meet standards of Table 4.1. Compost shall meet the following standards:

Organic Matter Content	80% - 100% (dry weight basis)
Organic Portion	Fibrous and elongated
pH	5.5-8.0
Moisture Content	30%-50%
Particle Size	98% pass through 1" screen
Soluble Salt Concentration	5.0 dS Maximum

Compost Filter Sock shall be placed at existing level grade. Both ends of the sock shall be extended at least 8 feet up the slope at 45 degrees to the main sock alignment. Maximum slope length above any sock shall not exceed manufacturer's maximum permissible slope length.

Traffic shall not be permitted to cross filter socks.

Accumulated Sediment shall be removed when it reaches 1/2 the above ground height of the sock and disposed in the manner described elsewhere in the plan.

Socks shall be inspected weekly and after each rainfall event. Damaged socks shall be repaired according to manufacturer's specifications or replaced within 24 hours of inspection.

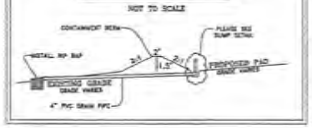
Biodegradable filter socks shall be replaced after 8 months; photodegradable socks after 1 year. Polypropylene socks shall be replaced according to manufacturer's recommendations.

Upon stabilization of the area tributary to the sock, stakes shall be removed. The sock may be left in place and vegetated or removed. In the latter case, the sock shall be cut open and the mulch spread as a soil supplement.

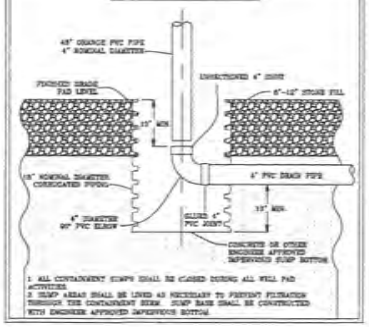
In the event the ground is frozen, #5 rebar with safety caps shall be used instead of wooden stakes to anchor the filter sock. Once the ground thaws the rebar anchors shall be removed and replaced with 2" x 2" wooden stakes and installed as shown in the detail above.

BERM TYPICAL

NOT TO SCALE



SUMP TYPICAL



1. ALL CONTAINMENT SUMPS SHALL BE CLEANED DURING ALL WELL PAD ACTIVITIES.
2. SUMP AREAS SHALL BE LINED AS NECESSARY TO PREVENT FILTRATION THROUGH THE CONTAINMENT BERM. SUMP BASE SHALL BE CONSTRUCTED WITH ENGINEER APPROVED IMPERVIOUS BOTTOM.

FIGURE 8-11

SILT FENCE SEDIMENT BARRIER

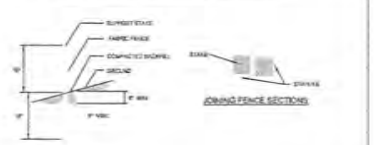
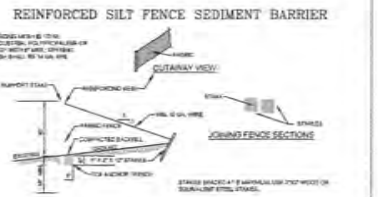
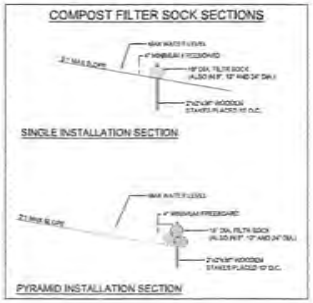


FIGURE 8-12

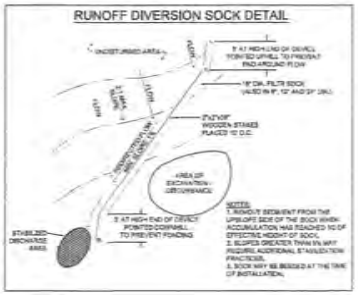
REINFORCED SILT FENCE SEDIMENT BARRIER



COMPOST FILTER SOCK SECTIONS



RUNOFF DIVERSION SOCK DETAIL



NOTES:
1. REMOVE SEDIMENT FROM THE UPHILL SIDE OF THE SOCK WHEN ACCUMULATION HAS REACHED 1/2 OF EFFECTIVE HEIGHT OF SOCK.
2. SLOPES GREATER THAN 5% MAY REQUIRE ADDITIONAL STABILIZATION PRACTICES.
3. SOCK MAY BE BIODEGRADABLE AT THE TIME OF INSTALLATION.

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FOR: EQT PRODUCTION COMPANY

CONSTRUCTION DETAILS
BIG 177
GRANT DISTRICT
WETZEL COUNTY, WV

DATE: 06/09/2013
SCALE: N/A
DESIGNED BY: CSK
FILE NO. 6808
SHEET 7 OF 8
REV.: 11/10/14

REVEGETATION

Taken from the
West Virginia Erosion and Sediment Control Field Manual
West Virginia Division of Environmental Protection Office of Oil and Gas
Charleston, W.Va.
Section IV

APPROVED
WVDEP OOG
11/12/2014

Temporary Seeding

a. General Conditions Where Practice Applies
Where exposed soil surfaces are not to be fine-graded or worked for periods longer than 21 days. Temporary vegetative cover with sediment controls must be established where runoff will go directly into a stream. Immediately upon construction of the site (site includes road and location), vegetation must be established on road bank and location slopes. A permanent vegetative cover shall be applied to areas that will be left un-worked for a period of more than six months.

b. Seed Mixtures and Planting Dates
Refer to Tables 2 through 4 for recommended dates to establish vegetative cover and the approved lists of temporary and permanent plant species, and planting rates. Table 3 gives recommended types of temporary vegetation, rates of application, and optimum seeding dates. In situations where another cover is desired, contact the local soil conservation district for seeding recommendations.

c. Seed Application
Apply seed by broadcasting, drilling, or by hydroseed according to the rates indicates in Table IV-3. Perform all planting operations at right angles to the slope. Necessary site preparation and roughening of the soil surface should be done just prior to seeding. Seedbed preparation may not be required on newly disturbed areas.

Permanent Seeding

a. General
Permanent vegetative cover will be established where no further soil disturbance is anticipated or needed. Soil fertility and pH level should be tested and adjusted according to seed species planted. Planting of permanent vegetative covers must be performed on all disturbed areas after completion of the drilling process. Any site that contains significant amounts of topsoil shall have the topsoil removed and stockpiled when feasible. Topsoil should not be added to slopes steeper than 2:1 unless a good bonding to the sub-layer can be achieved. After proper grading and seedbed preparation, the vegetation will reestablish ground cover for the control of surface water runoff erosion.
All required seedbed preparation and loosening of soil by disking or dozer tracking should be performed just prior to seeding. If seedbed preparation is not feasible, 50% more seed shall be added to the recommended rates shown in Tables IV-3 and IV-4.
When hydroseeding, seedbed preparation may not be necessary if adequate site preparation was performed. Incorporate the appropriate amount of lime and/or fertilizer in the slurry mix when hydroseeding.
When hydroseeding, first mix the lime, fertilizer, and hydro-mulch in the recommended amount of water. Mix the seed and inoculants together within one hour prior to planting, and add to the slurry just before seeding. Apply the slurry uniformly over the prepared site. Assure that agitation is continuous throughout the seeding operation and the mix is applied within one hour of initial mixing.

b. Lime and Fertilizer
1. Lime shall be applied to all permanent seedings. The pH of the soil is to be determined and lime applied accordingly. Once the pH is known, select the amount of lime to be applied from Table IV-5.
2. Fertilizer shall be applied in all permanent seedings. Apply the equivalent for 500 lbs. minimum 10-20-20 fertilizer per acre or use the amount of fertilizer and lime recommended by a certified soil test.
3. Application: For best results and maximum benefits, the lime and fertilizer are to be applied at the time of seedbed preparation.

c. Permanent Seed Mixtures
Planners should take into consideration the species makeup of the existing pasture and the landowner's future pasture management plans when recommending seed mixtures. Selection: From Tables IV 4a and b, Permanent Seeding Mixtures Suitable for Establishment in West Virginia.
Notes:
1. All legumes must be planted with the proper inoculants prior to seeding.
2. 'Lathco' Flatpea is potentially poisonous to some livestock.
3. Only endophyte free varieties of Tall Fescue should be used. Tall Fescue and Crownvetch are also very invasive species, non-native to WV.
4. For unprepared seedbeds or seeding outside the optimum timeframes, add 50% more seed to the specified rate. Mixtures in Table 4b are more wildlife and farm friendly; those listed in bold are suitable for use in shaded woodland settings. Mixtures in italic are suitable for use in filter strips.

d. Seeding for Wildlife Habitat
Consider the use of the native plants or locally adapted plants when selecting cover types and species for wildlife habitat. Wildlife friendly species or mixes that have multiple values should be considered. See wildlife friendly species/mixtures in Table IV-4b. Consider selecting no or low maintenance long-lived plants adaptable to sites which may be difficult to maintain with equipment.

Mulching

a. General Organic Mulches
The application of straw, hay or other suitable materials to the soil surface to prevent erosion. Straw made from wheat or oats is the preferred mulch, the use of hay is permissible, but not encouraged due to the risk of spreading invasive species. Mulch must be applied to all temporary and permanent seeding on all disturbed areas.
Depending on site conditions, in critical areas such as waterways or steep slopes, additional or substitute soil protective measures may be used if deemed necessary. Examples include jute mesh and soil stabilization blankets or erosion control matting.
Areas that have been temporarily or permanently seeded should be mulched immediately following seeding. Mulches conserve desirable soil properties, reduce soil moisture loss, prevent crusting and sealing of the soil surface and provide a suitable microclimate for seed germination.
Areas that cannot be seeded because of the season should be mulched to provide some protection to the soil surface. An organic mulch, straw or hay should be used and the area then seeded as soon as weather or seasonal conditions permit. Do not use fiber mulch (cellulose-hydroseed) alone for this practice; at normal application rates it will not give the soil protection of other types of mulch.
Wood cellulose fiber mulch is used in hydroseeding operations and applied as part of the slurry. It creates the best seed-soil contact when applied over the top of (as a separate operation) newly seeded areas. Fiber mulch does not alone provide sufficient protection on highly erodible soils, or during less than favorable growing conditions. Fiber mulch should not be used alone during the dry summer months or when used for late fall mulch cover. Use straw mulch during these periods and fiber mulch may be used to tack (anchor) the straw mulch. Fiber mulch is well suited for steep slopes, critical areas and areas susceptible to wind.

b. Chemical Mulches, Soil Binders and Tackifiers
A wide range of synthetic spray on materials are marketed to stabilize and protect the soil surface. These are mixed with water and sprayed over the mulch and to the soil. They may be used alone in some cases as temporary stabilizers, or in conjunction with fiber mulch, straw or hay.
When used alone most chemical mulches do not have the capability to insulate the soil or retain soil moisture that organic mulches have.

c. Specifications
From Table IV-6 select the type of mulch and rate of application that will best suit the conditions at the site.

d. Anchoring
Depending on the field situation, mulch may not stay in place because of wind action or rapid water runoff. In such cases, mulch is to be anchored mechanically or with mulch netting.
1. Mechanical Anchoring
Apply mulch and pull mulch anchoring tool over the mulch. When a disk is used set the disk straight and pull across slope. Mulch material should be tucked into the soil about three inches.
2. Mulch netting
Follow manufacturer's recommendation when positioning and stapling the mulch netting in the soil.

Table IV-1
Recommended Seeding Dates

Planting Dates	Suitability
March 1 - April 15 and August 1 - October 1	Best Seeding Periods
April 15 - August 1	HIGH RISK - moisture stress likely
October 1 - December 1	HIGH RISK - freeze damage to young seedlings
December 1 - March 1	Good seeding period. Dormant seeding

Table 2
Acceptable Fertilization Recommendation

Species	N (lbs/ac)	P2O5 (lbs/ac)	Example Rec. (per acre)
Cool Season Grass	40	80	400 lbs. 10-20-20
CS Grass & Legume	30	60	300 lbs. 10-20-20
Temporary Cover	40	40	200 lbs. 19-19-19

Table 3
Temporary Cover

Species	Seeding Rate (lbs/acre)	Optimum Seeding Dates	Drainage	pH Range
Annual Ryegrass	40	3/1 - 6/15 or 8/15 - 9/15	Well - Poorly	5.5 - 7.5
Field Bromegrass	40	3/1 - 6/15 or 8/15 - 9/15	Well - Mod. Well	6.0 - 7.0
Spring Oats	96	3/1 - 6/15	Well - Poorly	5.5 - 7.0
Sundangrass	40	5/15 - 8/15	Well - Poorly	5.5 - 7.5
Winter Rye	168	8/15 - 10/15	Well - Poorly	5.5 - 7.5
Winter Wheat	180	8/15 - 11/15	Well - Mod. Well	5.5 - 7.0
Japanese Millet	30	6/15 - 8/15	Well	4.5 - 7.0
Redtop	5	3/1 - 6/15	Well	4.0 - 7.5
Annual Ryegrass	26	3/1 - 6/15	Well - Poorly	5.5 - 7.5
Spring Oats	64	3/1 - 6/15	Well - Poorly	5.5 - 7.5

NOTE: These rates should be increased by 50% if planted April 15 - August 1 and October 1 - March 1.

Table 4a
Permanent Seeding Mixture

Species/Mixture	Seeding Rate (lbs/acre)	Soil Drainage preference	pH Range
Crownvetch /	10 - 15	Well - Mod. Well	5.0 - 7.5
Tall Fescue	30		
Crownvetch /	*10 - 15*	*Well - Mod. Well*	*5.0 - 7.5*
Perennial Ryegrass	*20*		
Flatpea or Perennial Pea /	**20**	**Well - Mod. Well**	**4.0 - 8.0**
Tall Fescue	**15**		
Ladino Clover /	30		
Sericia Lespedeza /	25	Well - Mod. Well	4.5 - 7.5
Tall Fescue	2		
Tall Fescue /	*40*		
Ladino Clover /	*3*	*Well - Mod. Well*	*5.0 - 7.5*
Redtop	*3*		
Crownvetch /	10		
Tall Fescue /	20	Well - Mod. Well	5.0 - 7.5
Redtop	3		
Tall Fescue /	40		
Birdsfoot Trefoil /	10	Well - Mod. Well	5.0 - 7.5
Redtop	3		
Sericia Lespedeza /	25		
Tall Fescue /	30	Well - Mod. Well	4.5 - 7.5
Redtop	3		
Redtop /	30		
Tall Fescue /	3	Well - Mod. Well	5.0 - 7.5
Creeping Red	50		
Tall Fescue	*50*	*Well - Poorly*	*4.5 - 7.5*
Perennial Ryegrass /	**10**		
Tall Fescue /	**15**	**Well - Poorly**	**5.8 - 8.0**
Lathco Flatpea *	**20**		

** 'Lathco' Flatpea is potentially poisonous to some livestock. All legumes should be planted with proper inoculants prior to seeding. For unprepared seedbeds or seeding outside the optimum timeframe, add 50% more seed to the specified rate.*

Mixtures listed in bold are suitable for use in shaded woodland settings; those in italics are suitable for use in filter strips.

Table 4b
Wildlife and Farm Friendly Seed Mixtures

Species/Mixture	Seeding Rate (lbs/acre)	Soil Drainage preference	pH Range
KY Bluegrass /	20		
Redtop /	3	Well - Mod. Well	5.5 - 7.5
Ladino Clover or Birdsfoot Trefoil	2 / 10		
Timothy /	5	Well - Mod. Well	5.5 - 8.0
Alfalfa	12		
Timothy /	5	Well - Poorly	5.5 - 7.5
Birdsfoot Trefoil	8		
Orchardgrass /	*10*		
Ladino Clover /	*2*	*Well - Mod. Well*	*5.5 - 7.5*
Redtop	*3*		
Orchardgrass /	*10*	*Well - Mod. Well*	*5.5 - 7.5*
Ladino Clover	*2*		
Orchardgrass /	*20*	*Well - Mod. Well*	*5.5 - 7.5*
Perennial Ryegrass	*10*		
Creeping Red Fescue /	**30**	*Well - Mod. Well*	**5.5 - 7.5**
Perennial Ryegrass	**10**		
Orchardgrass or KY Bluegrass	20	Well - Mod. Well	5.0 - 7.5
Birdsfoot Trefoil /	10		
Redtop /	5	Well - Mod. Well	5.5 - 7.5
Orchardgrass	20		
Lathco Flatpea */	**30**	**Well - Mod. Well**	**5.5 - 7.5**
Perennial Ryegrass	**20**		
Lathco Flatpea */	30	Well - Mod. Well	5.5 - 7.5
Orchardgrass	20		

** 'Lathco' Flatpea is potentially poisonous to some livestock. All legumes should be planted with proper inoculants prior to seeding. For unprepared seedbeds or seeding outside the optimum timeframe, add 50% more seed to the specified rate.*

Mixtures listed in bold are suitable for use in shaded woodland settings; those in italics are suitable for use in filter strips.

Table IV-5
Lime and Fertilizer Application Table

pH of Soil	Lime in Tons per Acre	Fertilizer, Lbs., per Acre (10-20-20 or Equivalent)
Above 6.0	2	500
5.0 to 6.0	3	500
Below 5.0	4	500

The pH can be determined with a portable pH testing kit or by sending the soil samples to a soil testing laboratory. When 4 tons of lime per acre are applied it must be incorporated into the soil by disking, backblading or tracking up and down the slope.

Table IV-6
Mulch Materials Rates and Uses

Material	Minimum Rates per acre	Coverage	Remarks
Hay or Straw	2 to 3 Tons 100 to 150 bales	Cover 75% to 90% of Surface	Subject to wind blowing or washing unless tied down
Wood Fiber Pulp Fiber Wood - Cellulose Recirculated Paper	1000 to 1500 lbs	Cover all Disturbed Areas	For hydroseeding

Tables IV 1-4 taken from Natural Resources Conservation Service Manual 'Critical Area Planting'

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FOR: EQT PRODUCTION COMPANY

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BIG 177
GRANT DISTRICT
WETZEL COUNTY, WV

DATE: 05/09/2013
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FILE NO. 6806
SHEET 8 OF 8
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