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**west virginia** department of environmental protection

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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

July 24, 2013

**WELL WORK PERMIT**

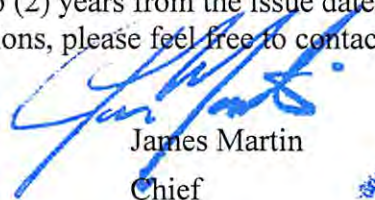
**Horizontal 6A Well**

This permit, API Well Number: 47-10302902, 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: 513726  
Farm Name: EQT PRODUCTION COMPANY  
**API Well Number: 47-10302902**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 07/24/2013

**Promoting a healthy environment.**

# 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

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1. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
2. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the fill material shall be within plus or minus 2% (unless soil test results show a greater range of moisture content is appropriate and 95% compaction can still be achieved) of the optimum moisture content as determined by the standard proctor density test, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Each lift must meet 95 % compaction of the optimum density based on results from the standard proctor density test of the actual soils used in specific engineered fill sites. 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.
3. 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.
4. 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.
5. 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.
6. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
7. 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.



**CASING AND TUBING PROGRAM**

20)

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: for Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu.Ft.)
Conductor	26	New	varies	varies	80	80	98
Fresh Water	13 3/8	New	MC-50	54	735	735	647 <i>CTS</i>
Coal	-	New	-	-	-	-	-
Intermediate	9 5/8	New	MC-50	40	2,945	2,945	1,159 <i>CTS</i>
Production	5 1/2	New	P-110	20	12,262	12,262	See Note 1
Tubing	2 3/8		J-55	4.6			may not be run, if run will be set 100' less than TD
Liners							

*LKC*

*DmH 425-13*

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	26	30	0.5	-	Construction	1.18
Fresh Water	13 3/8	17 1/2	0.38	2,480	1	1.21
Coal	-	-	-	-	-	-
Intermediate	9 5/8	12 3/8	0.395	3,590	1	1.21
Production	5 1/2	8 1/2	0.361	12,640	-	1.27/1.86
Tubing						
Liners						

**Packers**

Kind:	N/A		
Sizes:	N/A		
Depths Set:	N/A		

Note 1: EQT plans to bring the TOC on the production casing cement job 1,000' above kick off point, which is at least 500' above the shallowest production zone, to avoid communication.

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21) Describe centralizer placement for each casing string.

- Surface: Bow spring centralizers – One at the shoe and one spaced every 500'.
- Intermediate: Bow spring centralizers– One cent at the shoe and one spaced every 500'.
- Production: One spaced every 1000' from KOP to Int csg shoe

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

Surface (Type 1 Cement): 0-3% Calcium Chloride

Used to speed the setting of cement slurries.

0.4% flake. Loss Circulation Material (LCM) is used to combat the loss of the cement slurry to a thief zone.

✓ Intermediate (Type 1 Cement): 0-3% Calcium Chloride. Salt is used in shallow, low temperature formations to speed the setting of cement slurries. 0.4% flake. Loss Circulation Material (LCM) is used to combat the loss of whole drilling fluid or cement slurry (not filtrate) to a thief zone.

Production:

Lead (Type 1 Cement): 0.2-0.7% Lignosulfonate (Retarder). Lengthens thickening time.

0.3% CFR (dispersant). Makes cement easier to mix.

Tail (Type H Cement): 0.25-0.40% Lignosulfonate (Retarder). Lengthens thickening time.

0.2-0.3% CFR (dispersant). This is to make the cement easier to mix.

60 % Calcuim Carbonate. Acid solubility.

0.4-0.6% Halad (fluid loss). Reduces amount of water lost to formation.

23) Proposed borehole conditioning procedures. Surface: Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating one full joint until cuttings diminish at surface. When cuttings returning to surface diminish, continue to circulate an additional 5 minutes. To ensure that there is no fill, short trip two stands with no circulation. If there is fill, bring compressors back on and circulate hole clean. A constant rate of higher than expected cuttings volume likely indicates washouts that will not clean up.

Intermediate: Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating one full joint until cuttings diminish at surface. When cuttings returning to surface diminish, continue to circulate an additional 5 minutes. If foam drilling, to enhance hole cleaning use a soap sweep or increase injection rate & foam concentration.

Production: Pump marker sweep with nut plug to determine actual hole washout. Calculate a gauge holes bottoms up volume.

Perform a cleanup cycle by pumping 3-5 bottoms up or until the shakers are clean. Check volume of cuttings coming across the shakers every 15 minutes.

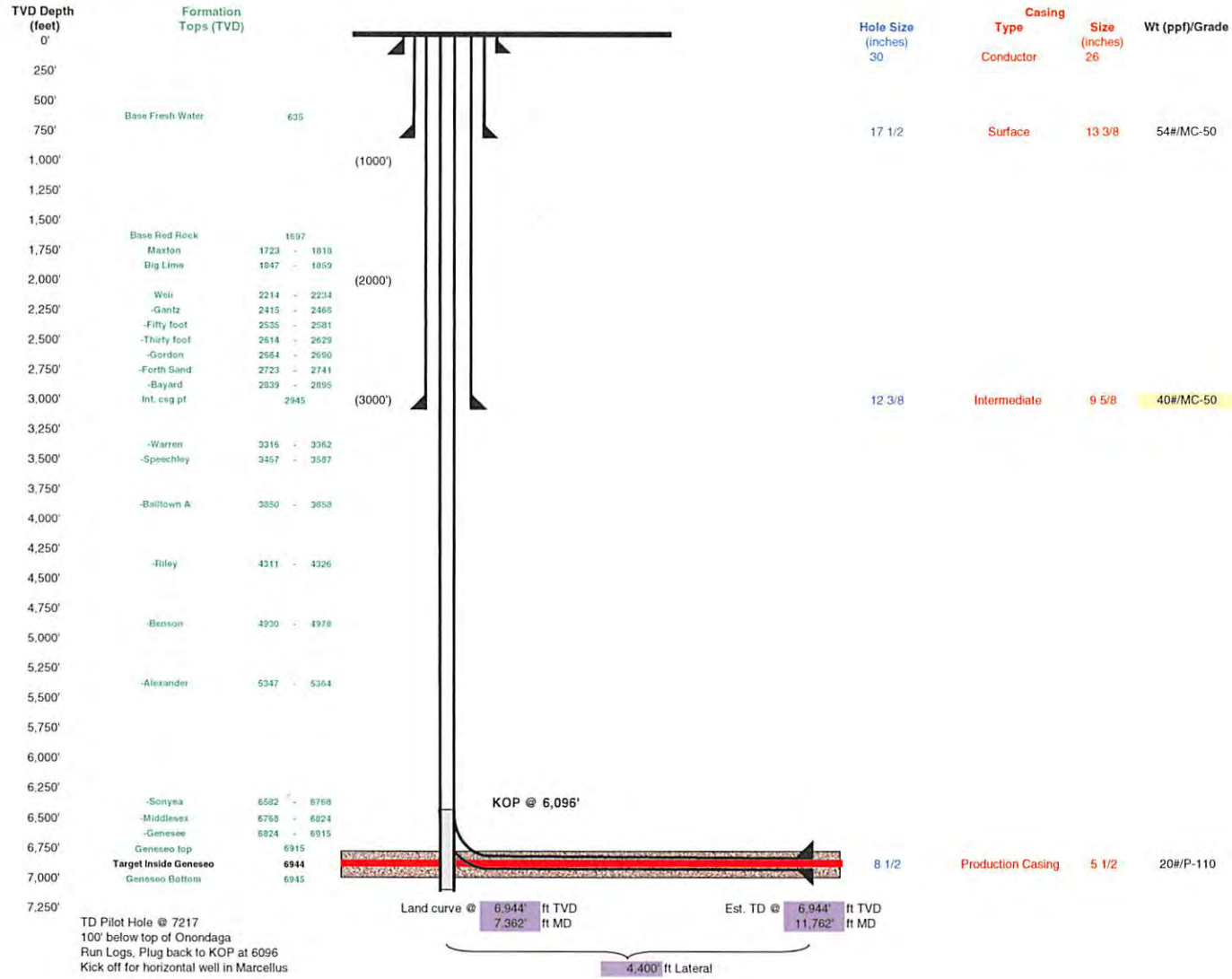
\*Note: Attach additional sheets as needed.

DMH  
4-29-13

103-2962

Well 513726 (BIG57H5)  
 EQT Production  
 Big Run  
 Wetzel West Virginia

Azimuth 152  
 Vertical Section 5211



RECEIVED  
 Dept of Energy

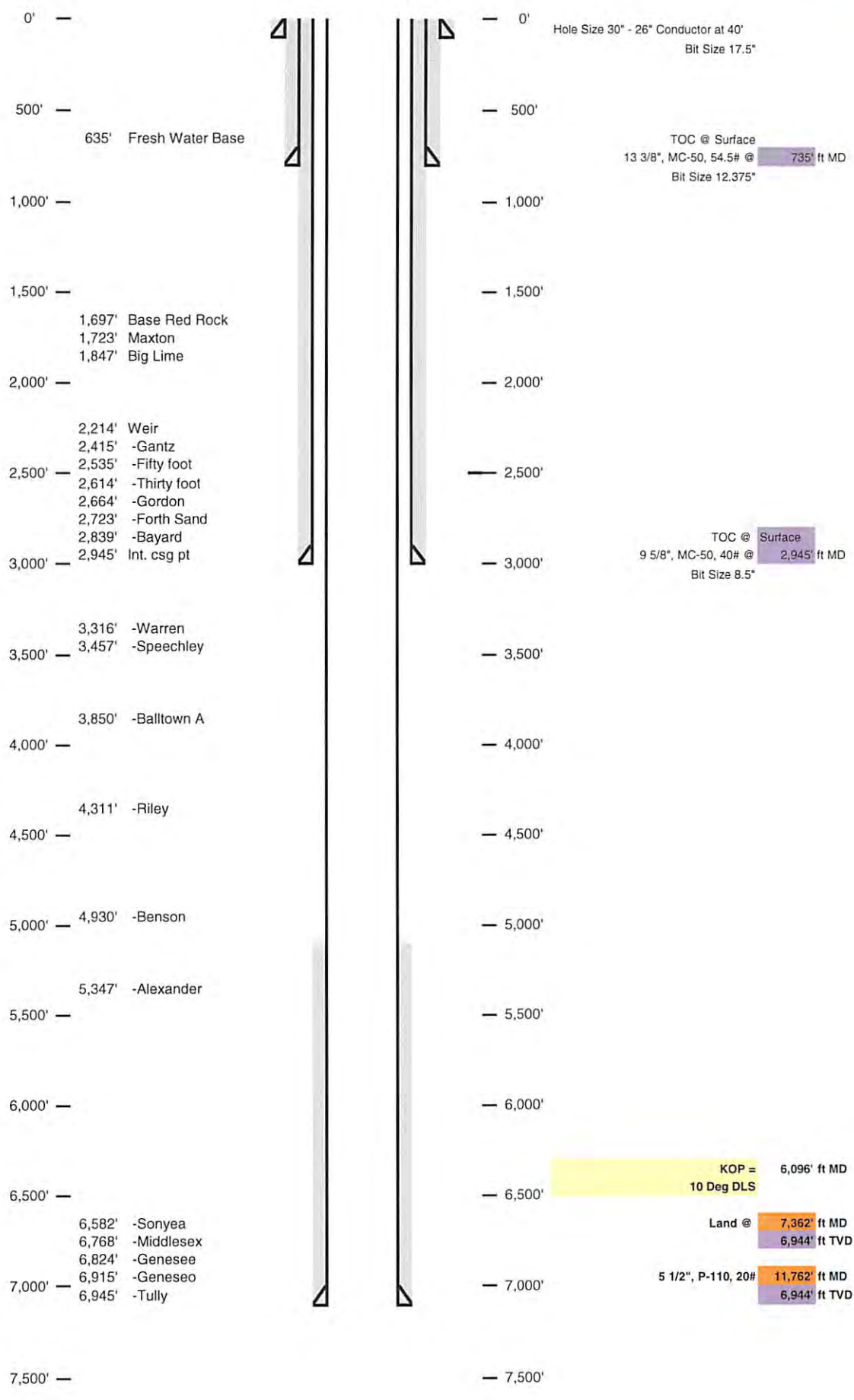
APP 30 2013

Wetzel County  
 Big Run

Well Schematic  
EQT Production

Well Name: 513726 (BIG57H5)  
County: Wetzel  
State: West Virginia

Elevation KB: 929  
Target: Genesee  
Prospect: Genesee  
Azimuth: 152  
Vertical Section: 5211



RECEIVED  
APR 30 2013

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

CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM  
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE

Operator Name BIG57 OP Code \_\_\_\_\_  
Watershed (HUC10) North Fork Fishing Creek Quadrangle Big Run 7.5'  
Elevation 919' County Wetzel District Grant

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

Will a pit be used for drill cuttings: Yes: \_\_\_\_\_ No: X

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 )
- \_\_\_\_\_ Reuse (at API Number \_\_\_\_\_ )
- \_\_\_\_\_ Off Site Disposal (Supply form WW-9 for disposal location)
- \_\_\_\_\_ Other (Explain \_\_\_\_\_ )

Will closed loop system be used? YES

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Air and water based mud

If oil based, what type? Synthetic, petroleum, etc \_\_\_\_\_ n/a

Additives to be used in drilling medium? MILBAR, Viscosifer, Alkalinity Control, Lime, Chloride Salts, Rate Filtration Control, Defloculant, Lubricant, Detergent, Defoaming, Walnut Shell, X-Cide, SOLTEX Terra

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

If left in pit and plan to solidify what medium will be used? (Cement, Lime, sawdust) \_\_\_\_\_ n/a

Landfill or offsite name/permit number? See Attached List

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

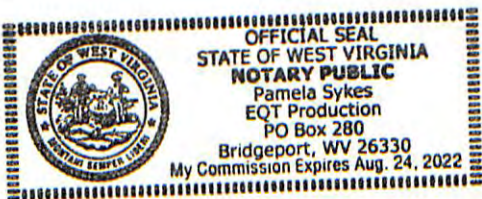
I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is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

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

Subscribed and sworn before me this 18 day of April, 20 13

\_\_\_\_\_  
Notary Public

My commission expires 8-24-22



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WW-9

4710302902

API No. 47 - 103 - 0  
Operator's Well No. 513726

Proposed Revegetation Treatment: Acres Disturbed no additional disturbance Prevegetation pH 6.5

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20 or equivalent) 13 lbs/acre (500 lbs minimum)

Mulch 2 Tons/acre

Seed Mixtures

Area I		Area II	
Seed Type	lbs/acre	Seed Type	lbs/acre
KY-31	40	Orchard Grass	15
Alsike Clover	5	Alsike Clover	5
Annual Rye	15		

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Title: Oil & Gas Inspector Date: 4-29-13

Field Reviewed? ( ✓ ) Yes ( ) No

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4710302902

**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

**BROAD STREET ENERGY LLC**

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

**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

**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

**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

**KING EXCAVATING CO.**

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

**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

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4-29-17

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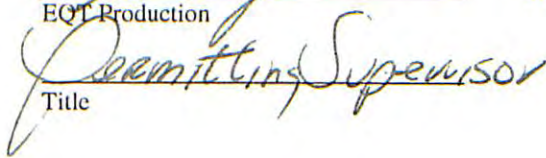



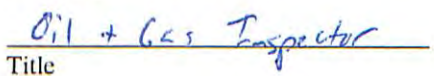
Where energy meets innovation.™

## Well Site Safety Plan

Marcellus Well  
513726 BIG57H5  
Wetzel County, WV

DATE:  
April 10, 2013

  
\_\_\_\_\_  
EQT Production  
Date 4-18-13  
  
\_\_\_\_\_  
Permitting Supervisor  
Title

  
\_\_\_\_\_  
WVOOG  
Date 4-29-13  
  
\_\_\_\_\_  
Oil + Gas Inspector  
Title

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## Water Management Plan: Primary Water Sources



WMP- 01242

API/ID Number: 047-103-02902

Operator: EQT Production Company

513726 (BIG57H5)

### Important:

For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP's assessment is based on the following considerations:

- Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
- Identification of sensitive aquatic life (endangered species, mussels, etc.);
- Quantification of known existing demands on the water supply (Large Quantity Users);
- Minimum flows required by the Army Corps of Engineers; and
- Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

**DEP is aware that some intake points will be used for multiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interpreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.**

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator's responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at [DEP.water.use@wv.gov](mailto:DEP.water.use@wv.gov).

**APPROVED JUN 12 2013**

## Source Summary

WMP-01242

API Number: 047-103-02902  
513726 (BIG57H5)

Operator: EQT Production Company

### Stream/River

● Source **Ohio River at Hannibal, OH** Owner: **Richard Potts/Rich Merryman**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/1/2014	1/1/2015	8,400,000		39.655883	-80.86678

Regulated Stream? Ohio River Min. Flow Ref. Gauge ID: 9999999 Ohio River Station: Willow Island Lock & Dam

Max. Pump rate (gpm): **1,500** Min. Gauge Reading (cfs): **6,468.00** Min. Passby (cfs)

DEP Comments: Refer to the specified station on the National Weather Service's Ohio River forecast website: <http://www.erh.noaa.gov/ohrfc//flows.shtml>

● Source **S. Fork of Fishing Creek @ Hastings Truck Pad** Owner: **Dominion Transmission**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/1/2014	1/1/2015	8,400,000		39.553	-80.669

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): **1,260** Min. Gauge Reading (cfs): **78.05** Min. Passby (cfs) **10.32**

DEP Comments:

● Source **S. Fork of Fishing Creek @ Jacksonburg Truck Pad** Owner: **Ronald Anderson**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/1/2014	1/1/2015	8,400,000		39.52609	-80.6338

Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): **1,260** Min. Gauge Reading (cfs): **73.12** Min. Passby (cfs) **8.86**

DEP Comments:

● Source **N. Fork of Fishing Creek @ Pine Grove Truck Pad** Owner: **Town of Pine Grove**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/1/2014	1/1/2015	8,400,000		39.571562	-80.677848

Regulated Stream? Ref. Gauge ID: **3114500** **MIDDLE ISLAND CREEK AT LITTLE, WV**

**Max. Pump rate (gpm): 2,520** **Min. Gauge Reading (cfs): 85.35** **Min. Passby (cfs) 6.22**

DEP Comments:

● Source **N. Fork of Fishing Creek @ Edgell Property** Owner: **Cathy Edgell**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/1/2014	1/1/2015	8,400,000		39.58191	-80.622839

Regulated Stream? Ref. Gauge ID: **3114500** **MIDDLE ISLAND CREEK AT LITTLE, WV**

**Max. Pump rate (gpm): 1,260** **Min. Gauge Reading (cfs): 78.74** **Min. Passby (cfs) 5.76**

DEP Comments:

● Source **N. Fork of Fishing Creek @ Lydick Property** Owner: **Les Lydick**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/1/2014	1/1/2015	8,400,000		39.57795	-80.59221

Regulated Stream? Ref. Gauge ID: **3114500** **MIDDLE ISLAND CREEK AT LITTLE, WV**

**Max. Pump rate (gpm): 1,260** **Min. Gauge Reading (cfs): 75.93** **Min. Passby (cfs) 3.28**

DEP Comments:

● Source **N. Fork of Fishing Creek @ BIG176 Pad**

Owner: **John W. Kilcoyne**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/1/2014	1/1/2015	8,400,000		39.560283	-80.560763

Regulated Stream? Ref. Gauge ID: **3114500** **MIDDLE ISLAND CREEK AT LITTLE, WV**

**Max. Pump rate (gpm): 1,260** **Min. Gauge Reading (cfs): 73.12** **Min. Passby (cfs) 2.19**

DEP Comments:

● Source **N. Fork of Fishing Creek @ Big 57 Pad**

Owner: **EQT Corporation**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
1/1/2014	1/1/2015	8,400,000		39.55316	-80.53064

Regulated Stream? Ref. Gauge ID: **3114500** **MIDDLE ISLAND CREEK AT LITTLE, WV**

**Max. Pump rate (gpm): 1,260** **Min. Gauge Reading (cfs): 70.31** **Min. Passby (cfs) 1.71**

DEP Comments:

## Source Detail

WMP-01242

API/ID Number: 047-103-02902

Operator: EQT Production Company

513726 (BIG57H5)

Source ID: 18095    Source Name: Ohio River at Hannibal, OH  
Richard Potts/Rich Merryman

Source Latitude: 39.655883

Source Longitude: -80.86678

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 25000    County: Wetzel

Anticipated withdrawal start date: 1/1/2014

Anticipated withdrawal end date: 1/1/2015

Endangered Species?     Mussel Stream?

Total Volume from Source (gal): 8,400,000

Trout Stream?     Tier 3?

Max. Pump rate (gpm): 1,500

Regulated Stream?    Ohio River Min. Flow

Max. Simultaneous Trucks: 0

Proximate PSD?    New Martinsville

Max. Truck pump rate (gpm): 0

Gauged Stream?

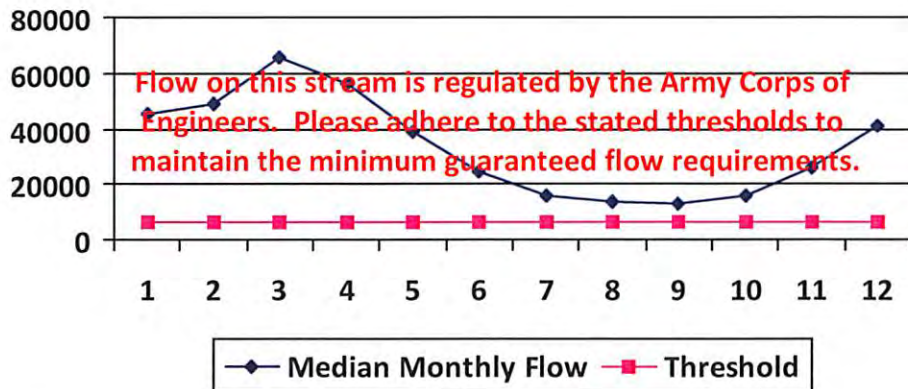
Reference Gaug: 9999999    Ohio River Station: Willow Island Lock & Dam

Drainage Area (sq. mi.): 25,000.00

Gauge Threshold (cfs): 6468

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	45,700.00	-	-
2	49,200.00	-	-
3	65,700.00	-	-
4	56,100.00	-	-
5	38,700.00	-	-
6	24,300.00	-	-
7	16,000.00	-	-
8	13,400.00	-	-
9	12,800.00	-	-
10	15,500.00	-	-
11	26,300.00	-	-
12	41,300.00	-	-

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	3.34
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
<hr/>	
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.



## Source Detail

WMP-01242

API/ID Number: 047-103-02902

Operator: EQT Production Company

513726 (BIG57H5)

Source ID: 18096    Source Name: S. Fork of Fishing Creek @ Hastings Truck Pad  
 Dominion Transmission

Source Latitude: 39.553  
 Source Longitude: -80.669

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 70.02    County: Wetzel

Anticipated withdrawal start date: 1/1/2014

Anticipated withdrawal end date: 1/1/2015

- Endangered Species?     Mussel Stream?
- Trout Stream?             Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Total Volume from Source (gal): 8,400,000

Max. Pump rate (gpm): 1,260

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

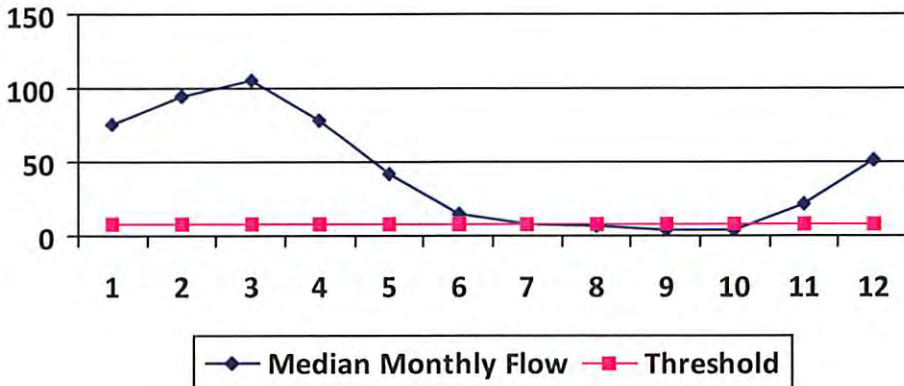
Reference Gaug: 3114500    MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	75.09	20.87	54.35
2	94.45	20.87	73.72
3	105.69	20.87	84.95
4	78.48	20.87	57.75
5	41.40	20.87	20.66
6	14.46	20.87	-6.28
7	8.18	20.87	-12.56
8	6.74	20.87	-14.00
9	3.45	20.87	-17.29
10	4.33	20.87	-16.40
11	21.17	20.87	0.43
12	51.72	20.87	30.99

### Water Availability Profile



#### Water Availability Assessment of Location

Base Threshold (cfs):	6.88
Upstream Demand (cfs):	7.74
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.81
Headwater Safety (cfs):	1.72
Ungauged Stream Safety (cfs):	1.72
<b>Min. Gauge Reading (cfs):</b>	<b>78.05</b>
<b>Passby at Location (cfs):</b>	<b>10.32</b>

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

## Source Detail

WMP-01242

API/ID Number: 047-103-02902

Operator: EQT Production Company

513726 (BIG57H5)

Source ID: 18097    Source Name: S. Fork of Fishing Creek @ Jacksonburg Truck Pad  
Ronald Anderson

Source Latitude: 39.52609  
Source Longitude: -80.6338

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 45.72    County: Wetzel

Anticipated withdrawal start date: 1/1/2014

Anticipated withdrawal end date: 1/1/2015

- Endangered Species?     Mussel Stream?
- Trout Stream?             Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Total Volume from Source (gal): 8,400,000

Max. Pump rate (gpm): 1,260

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

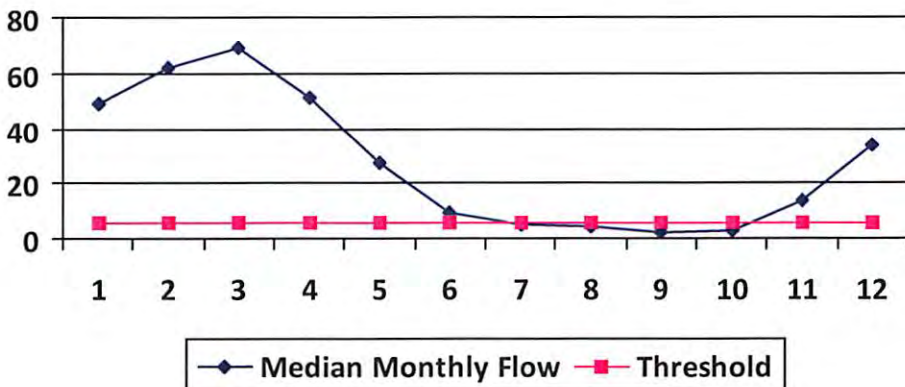
Reference Gaug: 3114500    MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	49.03	12.36	37.12
2	61.67	12.36	49.76
3	69.01	12.36	57.10
4	51.25	12.36	39.33
5	27.03	12.36	15.12
6	9.44	12.36	-2.47
7	5.34	12.36	-6.57
8	4.40	12.36	-7.51
9	2.25	12.36	-9.66
10	2.83	12.36	-9.08
11	13.82	12.36	1.91
12	33.77	12.36	21.86

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs):	4.49
Upstream Demand (cfs):	2.81
Downstream Demand (cfs):	2.12
Pump rate (cfs):	2.81
Headwater Safety (cfs):	1.12
Ungauged Stream Safety (cfs):	1.12
<b>Min. Gauge Reading (cfs):</b>	<b>73.12</b>
<b>Passby at Location (cfs):</b>	<b>8.86</b>

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

## Source Detail

WMP-01242

API/ID Number: 047-103-02902

Operator: EQT Production Company

513726 (BIG57H5)

Source ID: 18099    Source Name: N. Fork of Fishing Creek @ Pine Grove Truck Pad  
Town of Pine Grove

Source Latitude: 39.571562  
Source Longitude: -80.677848

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 42.17    County: Wetzel

Anticipated withdrawal start date: 1/1/2014

Anticipated withdrawal end date: 1/1/2015

Endangered Species?     Mussel Stream?

Total Volume from Source (gal): 8,400,000

Trout Stream?     Tier 3?

Max. Pump rate (gpm): 2,520

Regulated Stream?  
 Proximate PSD?    Pine Grove

Max. Simultaneous Trucks: 0

Gauged Stream?

Max. Truck pump rate (gpm): 0

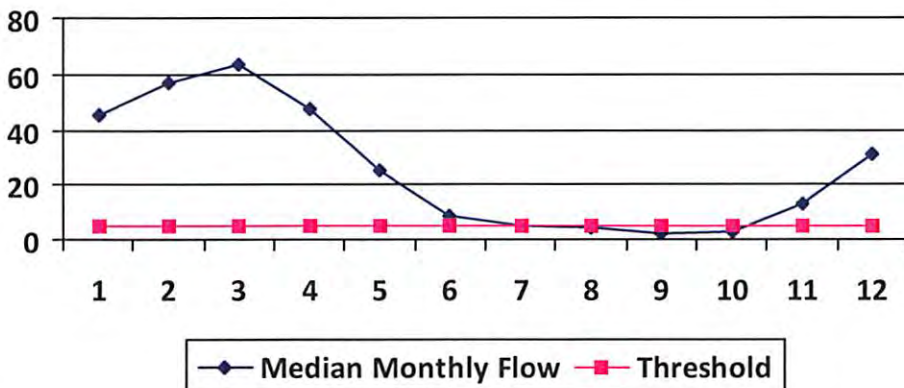
Reference Gaug: 3114500    MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	45.22	24.07	21.25
2	56.89	24.07	32.91
3	63.65	24.07	39.68
4	47.27	24.07	23.29
5	24.93	24.07	0.96
6	8.71	24.07	-15.27
7	4.93	24.07	-19.05
8	4.06	24.07	-19.92
9	2.08	24.07	-21.90
10	2.61	24.07	-21.37
11	12.75	24.07	-11.23
12	31.15	24.07	7.17

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs):	4.14
Upstream Demand (cfs):	12.24
Downstream Demand (cfs):	0.00
Pump rate (cfs):	5.61
Headwater Safety (cfs):	1.04
Ungauged Stream Safety (cfs):	1.04
<b>Min. Gauge Reading (cfs):</b>	<b>85.35</b>
<b>Passby at Location (cfs):</b>	<b>6.22</b>

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

## Source Detail

WMP- 01242

API/ID Number: 047-103-02902

Operator: EQT Production Company

513726 (BIG57H5)

Source ID: 18100    Source Name: N. Fork of Fishing Creek @ Edgell Property  
Cathy Edgell

Source Latitude: 39.58191  
Source Longitude: -80.622839

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 32.23    County: Wetzel

Anticipated withdrawal start date: 1/1/2014

Anticipated withdrawal end date: 1/1/2015

Endangered Species?     Mussel Stream?

Total Volume from Source (gal): 8,400,000

Trout Stream?     Tier 3?

Max. Pump rate (gpm): 1,260

Regulated Stream?

Max. Simultaneous Trucks: 0

Proximate PSD?

Max. Truck pump rate (gpm): 0

Gauged Stream?

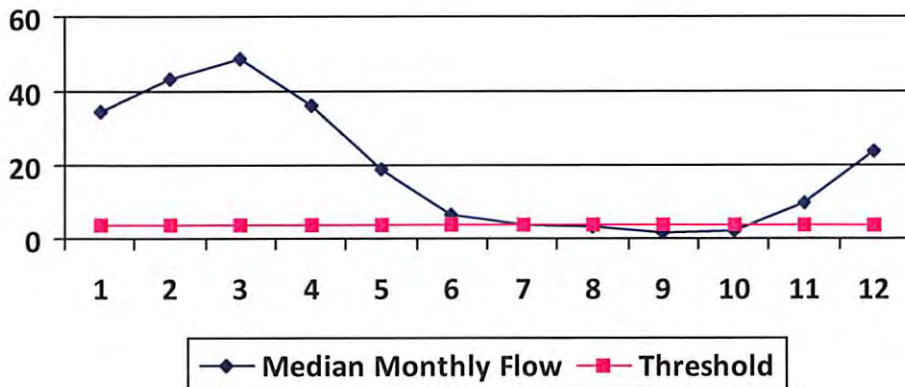
Reference Gaug: 3114500    MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	34.56	15.99	18.59
2	43.48	15.99	27.51
3	48.65	15.99	32.68
4	36.13	15.99	20.16
5	19.06	15.99	3.09
6	6.65	15.99	-9.32
7	3.77	15.99	-12.20
8	3.10	15.99	-12.87
9	1.59	15.99	-14.38
10	2.00	15.99	-13.98
11	9.74	15.99	-6.23
12	23.81	15.99	7.84

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs):	3.17
Upstream Demand (cfs):	8.43
Downstream Demand (cfs):	1.00
Pump rate (cfs):	2.81
Headwater Safety (cfs):	0.79
Ungauged Stream Safety (cfs):	0.79
<b>Min. Gauge Reading (cfs):</b>	<b>78.74</b>
<b>Passby at Location (cfs):</b>	<b>5.75</b>

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

## Source Detail

WMP- 01242

API/ID Number: 047-103-02902

Operator: EQT Production Company

513726 (BIG57H5)

Source ID: 18101 Source Name N. Fork of Fishing Creek @ Lydick Property  
Les Lydick

Source Latitude: 39.57795  
Source Longitude: -80.59221

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 15.46 County: Wetzel

Anticipated withdrawal start date: 1/1/2014

Anticipated withdrawal end date: 1/1/2015

- Endangered Species?  Mussel Stream?
- Trout Stream?  Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Total Volume from Source (gal): 8,400,000

Max. Pump rate (gpm): 1,260

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

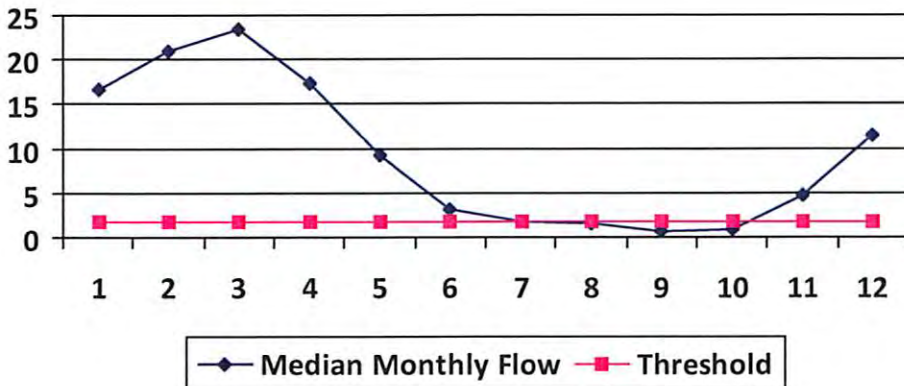
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	16.58	10.71	6.04
2	20.86	10.71	10.32
3	23.34	10.71	12.80
4	17.33	10.71	6.79
5	9.14	10.71	-1.40
6	3.19	10.71	-7.34
7	1.81	10.71	-8.73
8	1.49	10.71	-9.05
9	0.76	10.71	-9.78
10	0.96	10.71	-9.58
11	4.67	10.71	-5.86
12	11.42	10.71	0.88

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs):	1.52
Upstream Demand (cfs):	5.62
Downstream Demand (cfs):	1.00
Pump rate (cfs):	2.81
Headwater Safety (cfs):	0.38
Ungauged Stream Safety (cfs):	0.38
<b>Min. Gauge Reading (cfs):</b>	<b>75.93</b>
<b>Passby at Location (cfs):</b>	<b>3.28</b>

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

## Source Detail

WMP- 01242

API/ID Number: 047-103-02902

Operator: EQT Production Company

513726 (BIG57H5)

Source ID: 18102    Source Name: N. Fork of Fishing Creek @ BIG176 Pad  
John W. Kilcoyne

Source Latitude: 39.560283  
Source Longitude: -80.560763

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 8.09    County: Wetzel

Anticipated withdrawal start date: 1/1/2014

Anticipated withdrawal end date: 1/1/2015

- Endangered Species?     Mussel Stream?
- Trout Stream?     Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Total Volume from Source (gal): 8,400,000

Max. Pump rate (gpm): 1,260

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

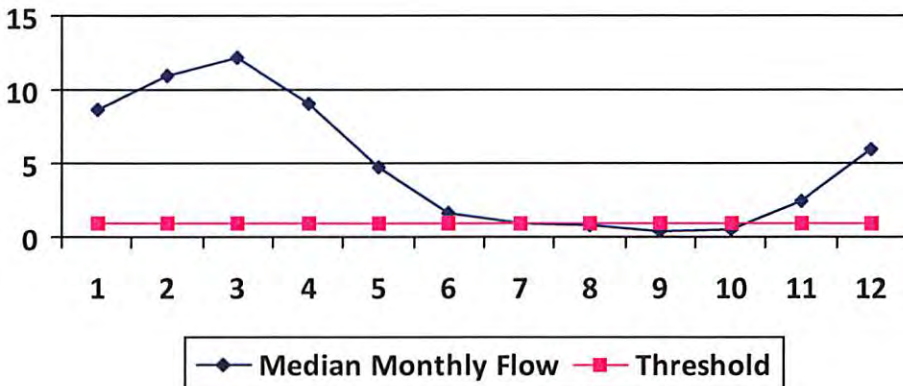
Reference Gaug: 3114500    MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	8.68	6.81	2.21
2	10.91	6.81	4.45
3	12.21	6.81	5.75
4	9.07	6.81	2.60
5	4.78	6.81	-1.68
6	1.67	6.81	-4.79
7	0.95	6.81	-5.52
8	0.78	6.81	-5.69
9	0.40	6.81	-6.07
10	0.50	6.81	-5.96
11	2.45	6.81	-4.02
12	5.98	6.81	-0.49

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs):	0.79
Upstream Demand (cfs):	2.81
Downstream Demand (cfs):	1.00
Pump rate (cfs):	2.81
Headwater Safety (cfs):	0.20
Ungauged Stream Safety (cfs):	0.20
<b>Min. Gauge Reading (cfs):</b>	<b>73.12</b>
<b>Passby at Location (cfs):</b>	<b>2.19</b>

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

## Source Detail

WMP- 01242

API/ID Number: 047-103-02902

Operator: EQT Production Company

513726 (BIG57H5)

Source ID: 18103    Source Name: N. Fork of Fishing Creek @ Big 57 Pad  
EQT Corporation

Source Latitude: 39.55316  
Source Longitude: -80.53064

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 4.77    County: Wetzel

Anticipated withdrawal start date: 1/1/2014

Anticipated withdrawal end date: 1/1/2015

- Endangered Species?     Mussel Stream?
- Trout Stream?             Tier 3?
- Regulated Stream?
- Proximate PSD?
- Gauged Stream?

Total Volume from Source (gal): 8,400,000

Max. Pump rate (gpm): 1,260

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

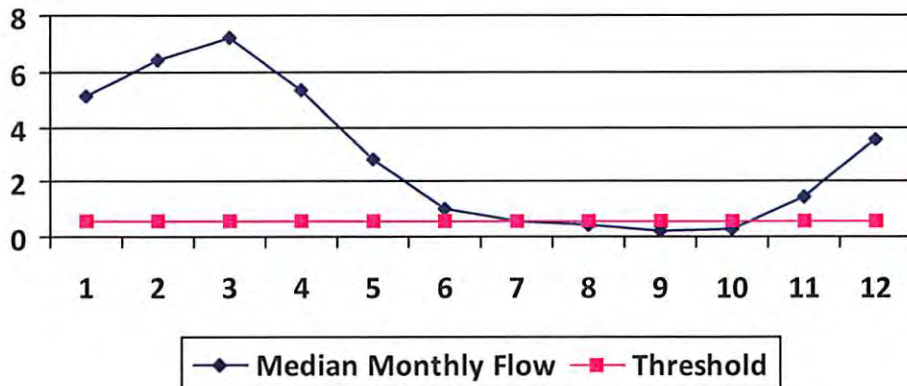
Reference Gaug: 3114500    MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	5.12	3.51	1.62
2	6.43	3.51	2.94
3	7.20	3.51	3.71
4	5.35	3.51	1.85
5	2.82	3.51	-0.67
6	0.98	3.51	-2.51
7	0.56	3.51	-2.93
8	0.46	3.51	-3.03
9	0.24	3.51	-3.26
10	0.30	3.51	-3.20
11	1.44	3.51	-2.05
12	3.52	3.51	0.03

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs):	0.47
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	1.00
Pump rate (cfs):	2.81
Headwater Safety (cfs):	0.12
Ungauged Stream Safety (cfs):	0.12
<b>Min. Gauge Reading (cfs):</b>	<b>70.31</b>
<b>Passby at Location (cfs):</b>	<b>1.70</b>

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.



# Water Management Plan: Secondary Water Sources



WMP- 01242

API/ID Number 047-103-02902

Operator: EQT Production Company

513726 (BIG57H5)

**Important:**

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

## Ground Water

Source ID:	18104	Source Name	Groundwater Well TW#1	Source start date:	1/1/2014	
				Source end date:	1/1/2015	
	Source Lat:	39.56059	Source Long:	-80.56027	County	Wetzel
	Max. Daily Purchase (gal)		Total Volume from Source (gal):		8,400,000	

DEP Comments:



**Important:**

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

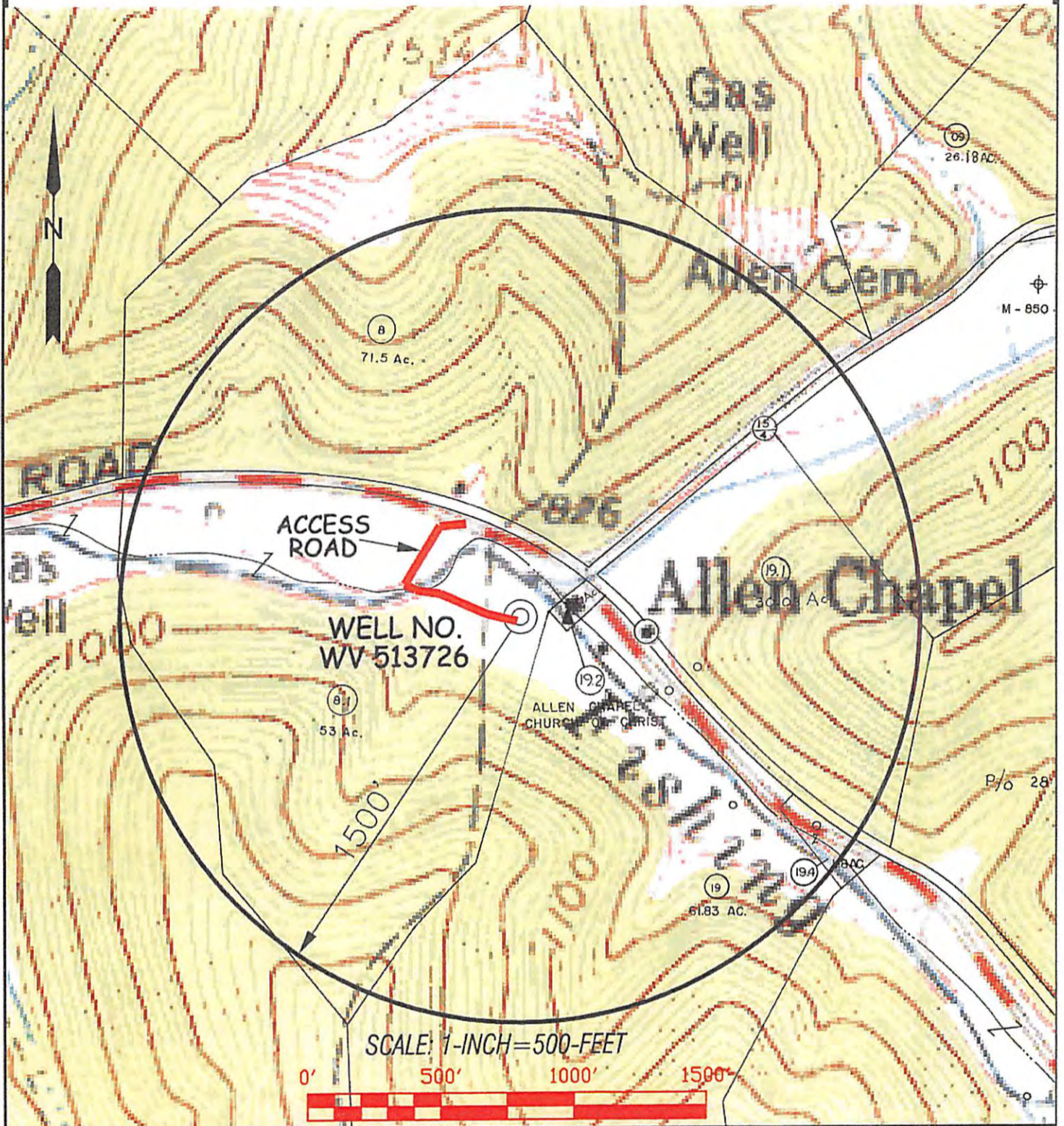
- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.


Source ID: 18105	Source Name	Groundwater Well TW#5	Source start date:	1/1/2014
			Source end date:	1/1/2015
	Source Lat:	39.553434	Source Long:	-80.528871
			County	Wetzel
	Max. Daily Purchase (gal)		Total Volume from Source (gal):	8,400,000
DEP Comments:				

**Recycled Frac Water**

Source ID: 18106	Source Name	Various	Source start date:	1/1/2014
			Source end date:	1/1/2015
	Source Lat:		Source Long:	
			County	
	Max. Daily Purchase (gal)		Total Volume from Source (gal):	8,400,000
DEP Comments:				

# J.M. ALLEN ET AL LEASE WELL NO. WV 513726



 <p><b>Professional Energy Consultants</b> A DIVISION OF STATE LAND SURVEYING</p> <p>Surveyors Product Mgmt 226 Wood Elm St P.O. Box 100 Shelburne, WV 26307 (304) 463-3634 HONESTY INTEGRITY QUALITY</p> <p>Engineers Environmental 3600 Unity Station Road Shelburne, WV 26307 (304) 471-9811</p>	TOPO SECTION OF: BIG RUN, WV 7.5' QUAD.			OPERATOR: <b>EQT PRODUCTION COMPANY</b> 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330						
	DRAWN BY K.D.W.	FILE NO. 6242	DATE 04/03/13	CADD FILE: 6242W5513726.DWG	<table border="1"> <thead> <tr> <th>DISTRICT</th> <th>COUNTY</th> <th>TAX MAP-PARCEL NO.</th> </tr> </thead> <tbody> <tr> <td>GRANT</td> <td>WETZEL</td> <td>19-8.1</td> </tr> </tbody> </table>	DISTRICT	COUNTY	TAX MAP-PARCEL NO.	GRANT	WETZEL
DISTRICT	COUNTY	TAX MAP-PARCEL NO.								
GRANT	WETZEL	19-8.1								

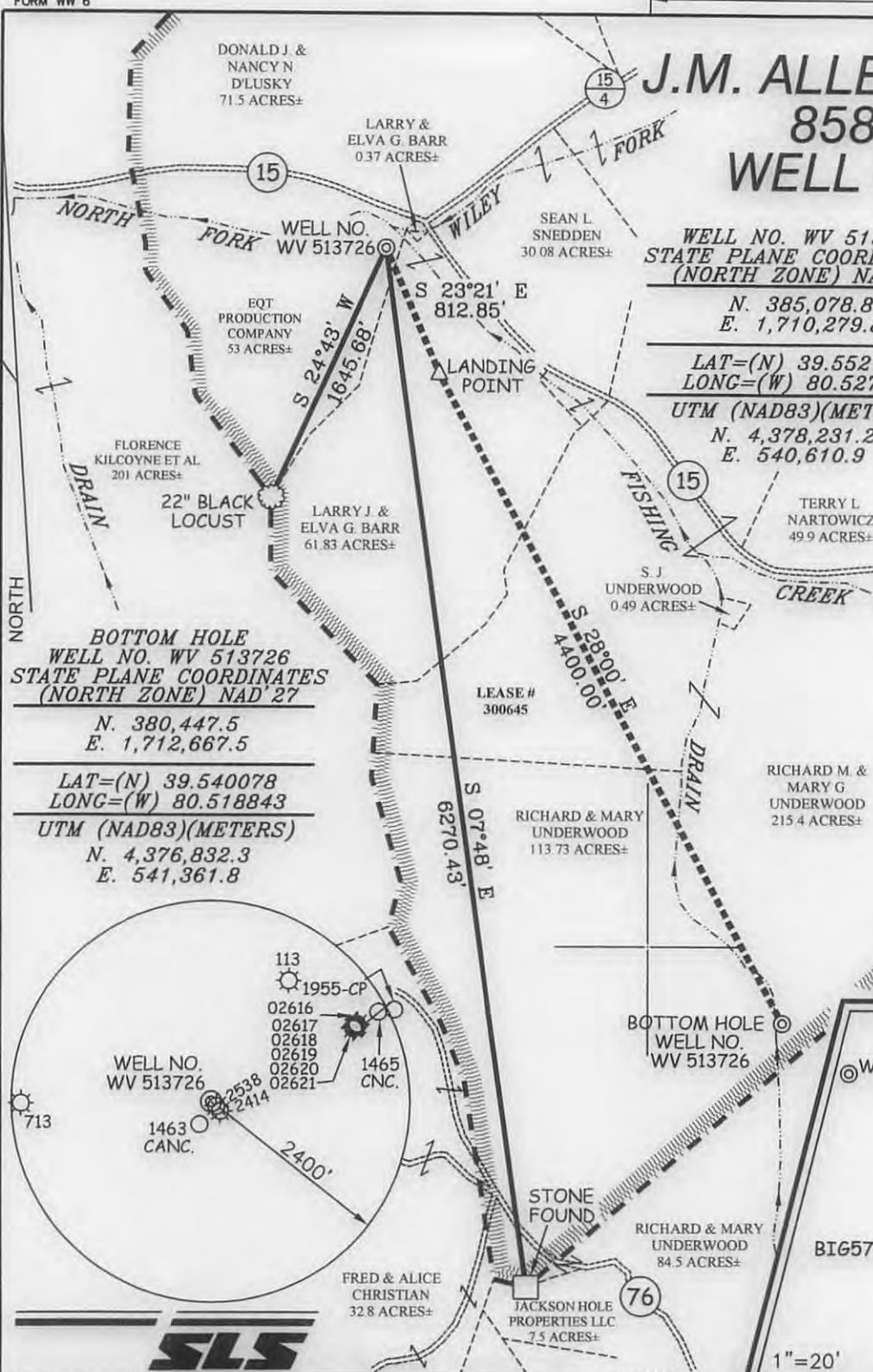
RECEIVED  
Dept of Oil and Gas

APR 30 2013

Department of  
Environmental Protection

# J.M. ALLEN ET AL LEASE 858 ACRES± WELL NO. 513726

LONGITUDE 80°30'00"



WELL NO. WV 513726  
STATE PLANE COORDINATES  
(NORTH ZONE) NAD '27

N. 385,078.8  
E. 1,710,279.8

LAT=(N) 39.552718  
LONG=(W) 80.527497  
UTM (NAD83)(METERS)  
N. 4,378,231.2  
E. 540,610.9

LANDING POINT  
WELL NO. WV 513726  
STATE PLANE COORDINATES  
(NORTH ZONE) NAD '27

N. 384,332.5  
E. 1,710,601.8

LAT=(N) 39.550679  
LONG=(W) 80.526324  
UTM (NAD83)(METERS)  
N. 4,378,005.4  
E. 540,712.8

### NOTES ON SURVEY

1. TIES TO WELLS, CORNERS AND REFERENCES ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD '27.
2. LEASE BOUNDARY SHOWN HEREON TAKEN FROM DEED BOOK 14 PAGE 302.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF WETZEL COUNTY IN JULY, 2012.
4. WELL LAT./LONG. (NAD'27) ESTABLISHED BY DGPS(SURVEY GRADE TIE TO CORS NETWORK).

### REFERENCES



BOTTOM HOLE  
WELL NO. WV 513726  
STATE PLANE COORDINATES  
(NORTH ZONE) NAD '27

N. 380,447.5  
E. 1,712,667.5

LAT=(N) 39.540078  
LONG=(W) 80.518843  
UTM (NAD83)(METERS)  
N. 4,376,832.3  
E. 541,361.8



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

P.S. 849 *C. Victor Moyers*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
DATE APRIL 3, 20 13  
OPERATORS WELL NO. WV 513726  
API WELL NO. 47 103 2902 H6A  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 6242P513726  
PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 1000'

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

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

LOCATION: ELEVATION 919' (PAD ELEVATION) WATERSHED NORTH FORK FISHING CREEK DISTRICT GRANT COUNTY WETZEL QUADRANGLE BIG RUN 7.5'

SURFACE OWNER EQT PRODUCTION COMPANY ACREAGE 53± ROYALTY OWNER J.M. ALLEN ESTATE ET AL LEASE ACREAGE 858± PROPOSED WORK: LEASE NO. 300645

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

PHYSICAL CHANGE IN WELL (SPECIFY) TARGET FORMATION GENESEO ESTIMATED DEPTH

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

COUNTY NAME PERMIT