



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

August 21, 2013

WELL WORK PERMIT

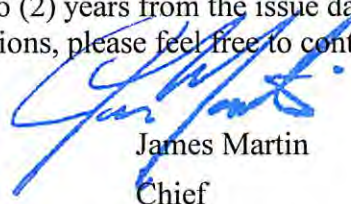
Horizontal 6A Well

This permit, API Well Number: 47-10302906, 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: 513982
Farm Name: SCYOC, SHARON ANN
API Well Number: 47-10302906
Permit Type: Horizontal 6A Well
Date Issued: 08/21/2013

Promoting a healthy environment.

08/23/2013

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. 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.

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: EQT Production Company

Operator ID	103	County	4	District	548	Quadrangle
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2) Operator's Well Number: 513982 Well Pad Name PNG103

3 Elevation, current ground: 1,458.0 Elevation, proposed post-construction: 1,458.0

4) Well Type: (a) Gas Oil Underground Storage
Other _____

(b) If Gas: Shallow Deep
 Horizontal

5) Existing Pad? Yes or No: yes

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Target formation is Marcellus at a depth of 7470 with the anticipated thickness to be 50 feet and anticipated target pressure of 4724 PSI

7) Proposed Total Vertical Depth: 7,599

8) Formation at Total Vertical Depth: Onondaga ✓

9) Proposed Total Measured Depth: 14,562

10) Approximate Fresh Water Strata Depths: 66, 141, 777

11) Method to Determine Fresh Water Depth: By offset wells

12) Approximate Saltwater Depths: 2187, 2487

13) Approximate Coal Seam Depths: 1054, 1161

14) Approximate Depth to Possible Void (coal mine, karst, other): none reported ✓

15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of Mine: n/a

6) Describe proposed well work: Drill and complete a new horizontal well. The vertical drill to go down to approximately depth of 7599' Tagging the Onondaga not more than 100' then plug back to approximately 4170' and kick off the horizontal leg into the marcellus using a slick water frac.

7) Describe fracturing/stimulating methods in detail: 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). Stage lengths vary from 150 to 450 feet. Average approximately 400,000 gallons of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Average approximately 400,000 pounds of sand per stage.

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

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

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WV Department of Environmental Protection 08/23/2013

CASING AND TUBING PROGRAM

20)

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft.</u>	<u>FOOTAGE: for Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu.Ft.)</u>
Conductor	20	New	MC-50	81	40	40	38
Fresh Water	13 3/8	New	MC-50	54	877	877	766 (TS)
Coal	-	-	-	-	-	-	-
Intermediate	9 5/8	New	MC-50	40	3,552	3,552	1,394 (TS)
Production	5 1/2	New	P-110	20	14,562	14,562	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							

DML 6-3-13

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield</u>
Conductor	20	24	0.375	-	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 east 500' above the shallowest production zone, to avoid communication.

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WV Department of
Environmental Protection

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 % Calcium 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.

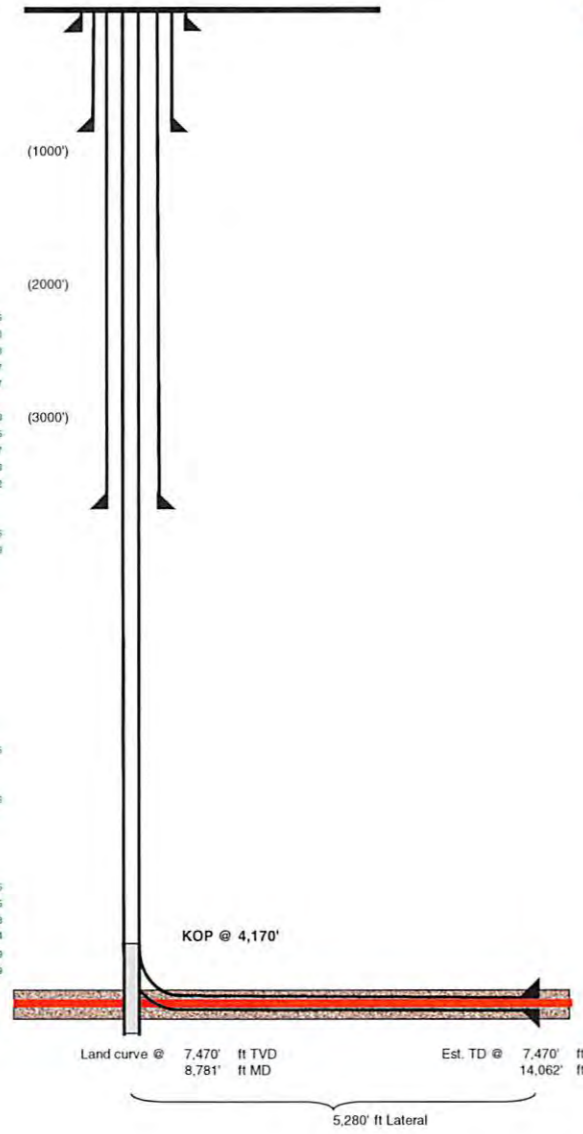
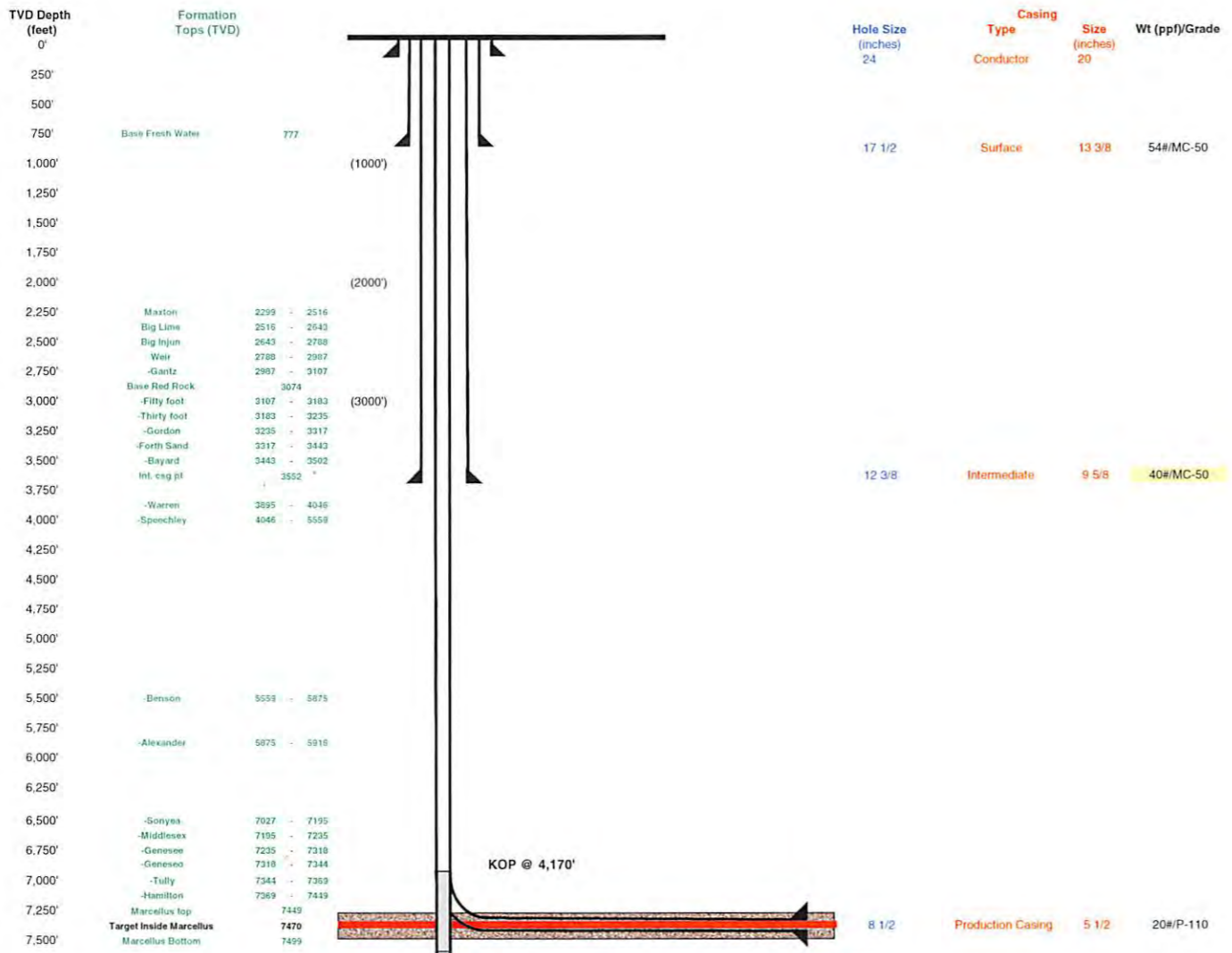
DMH
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103-02906

Well 513982 (PNG103)

EQT Production
Pine Grove
Wetzel West Virginia

Azimuth 166.5
Vertical Section 6533



TD Pilot Hole @ 7599
100' below top of Onondaga
Run Logs, Plug back to KOP at 4170
Kick off for horizontal well in Marcellus

Land curve @ 7,470' ft TVD
8,781' ft MD

Est. TD @ 7,470' ft TVD
14,062' ft MD

5,280' ft Lateral

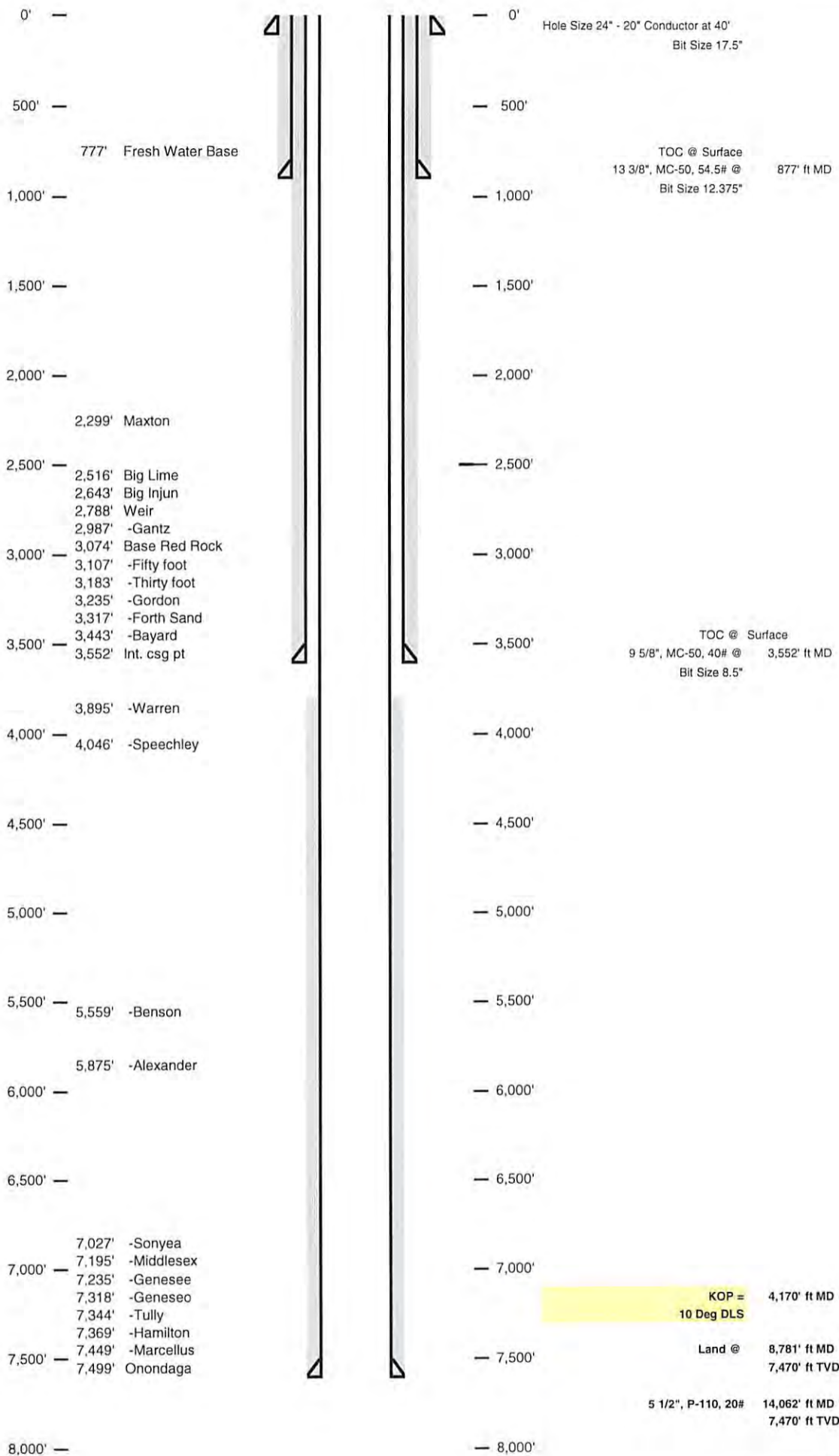
Received
Office of Oil & Gas
MAY 3 2012

Well Schematic
EQT Production

Well Name 513982 (PNG103)
County Wetzel
State West Virginia

Elevation KB:
Target
Prospect
Azimuth
Vertical Section

1468
Marcellus
166.5
6533



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Office of Oil & Gas

08/23/2013

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WW-9

API No. 47 - 103 - 0
Operator's Well No. 513982

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: 6-3-12

Field Reviewed? () Yes () No

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EQT Production Water plan Offsite disposals for Marcellus wells
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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

DAH
 6-3-13

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WV Department of
 Environmental Protection



Water Management Plan: Primary Water Sources



WMP-01323

API/ID Number: 047-103-02906

Operator:

EQT Production Company

513982 (PNG103H13)

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.

APPROVED AUG 21 2013

08/23/2013

Source Summary

WMP- 01323

API Number: 047-103-02906
513982 (PNG103H13)

Operator: EQT Production Company

Stream/River

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

Start Date End Date Total Volume (gal) Max. daily purchase (gal) Intake Latitude: Intake Longitude:
6/1/2013 6/1/2014 9,000,000 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** Wetzel Owner: **Dominion Transmission**

Start Date End Date Total Volume (gal) Max. daily purchase (gal) Intake Latitude: Intake Longitude:
6/1/2013 6/1/2014 9,000,000 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** Wetzel Owner: **Ronald Anderson**

Start Date End Date Total Volume (gal) Max. daily purchase (gal) Intake Latitude: Intake Longitude:
6/1/2013 6/1/2014 9,000,000 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:

08/23/2013

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

Start Date End Date Total Volume (gal) Max. daily purchase (gal) Intake Latitude: Intake Longitude:
6/1/2013 6/1/2014 9,000,000 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** Wetzzel Owner: **Cathy Edgell**

Start Date End Date Total Volume (gal) Max. daily purchase (gal) Intake Latitude: Intake Longitude:
6/1/2013 6/1/2014 9,000,000 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** Wetzzel Owner: **Les Lydick**

Start Date End Date Total Volume (gal) Max. daily purchase (gal) Intake Latitude: Intake Longitude:
6/1/2013 6/1/2014 9,000,000 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:

08/23/2013

● Source **N. Fork of Fishing Creek @ BIG176 Pad** Wetzel Owner: **John W. Kilcoyne**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
6/1/2013	6/1/2014	9,000,000		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** Wetzel Owner: **EQT Corporation**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
6/1/2013	6/1/2014	9,000,000		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:

08/23/2013

Source Detail

WMP- 01323

API/ID Number: 047-103-02906

Operator: EQT Production Company

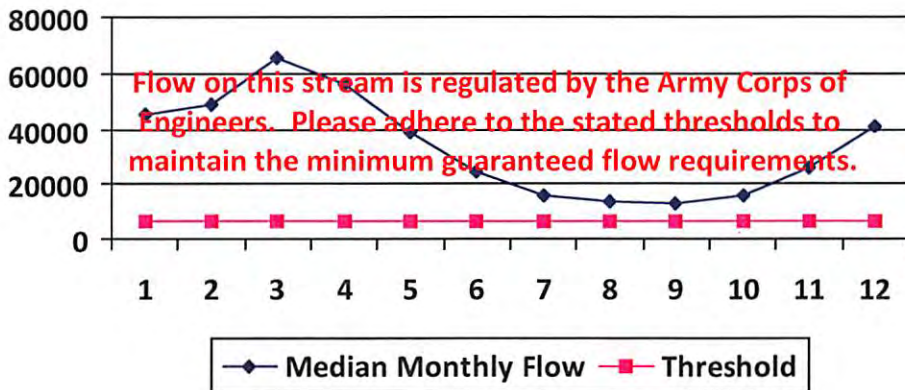
513982 (PNG103H13)

Source ID: 20349	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: 6/1/2013
<input type="checkbox"/> Endangered Species?	<input type="checkbox"/> Mussel Stream?		Anticipated withdrawal end date: 6/1/2014
<input type="checkbox"/> Trout Stream?	<input type="checkbox"/> Tier 3?		Total Volume from Source (gal): 9,000,000
<input checked="" type="checkbox"/> Regulated Stream?	Ohio River Min. Flow		Max. Pump rate (gpm): 1,500
<input checked="" type="checkbox"/> Proximate PSD?	New Martinsville		Max. Simultaneous Trucks: 0
<input checked="" type="checkbox"/> Gauged Stream?			Max. Truck pump rate (gpm): 0

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

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.

08/23/2013

Source Detail

WMP- 01323

API/ID Number: 047-103-02906

Operator: EQT Production Company

513982 (PNG103H13)

Source ID: 20350 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: 6/1/2013

Anticipated withdrawal end date: 6/1/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 9,000,000

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?

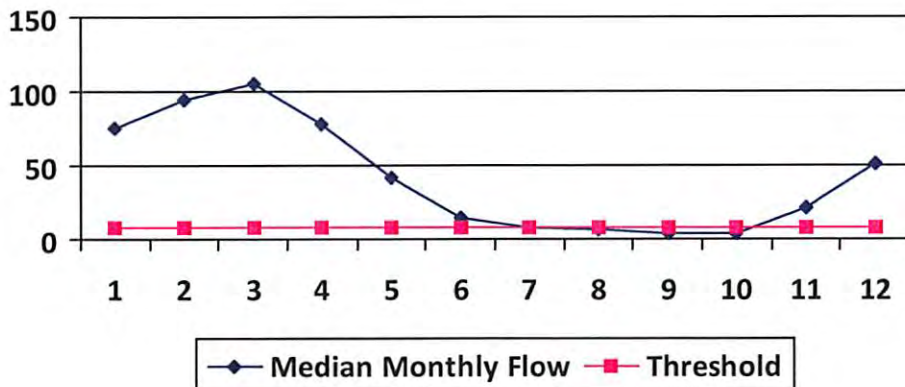
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	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

Min. Gauge Reading (cfs): 78.05
 Passby at Location (cfs): 10.32

"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.

08/23/2013

Source Detail

WMP-01323

API/ID Number: 047-103-02906

Operator: EQT Production Company

513982 (PNG103H13)

Source ID: 20351 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: 6/1/2013

Anticipated withdrawal end date: 6/1/2014

Total Volume from Source (gal): 9,000,000

Max. Pump rate (gpm): 1,260

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm): 0

Endangered Species? Mussel Stream?

Trout Stream? Tier 3?

Regulated Stream?

Proximate PSD?

Gauged Stream?

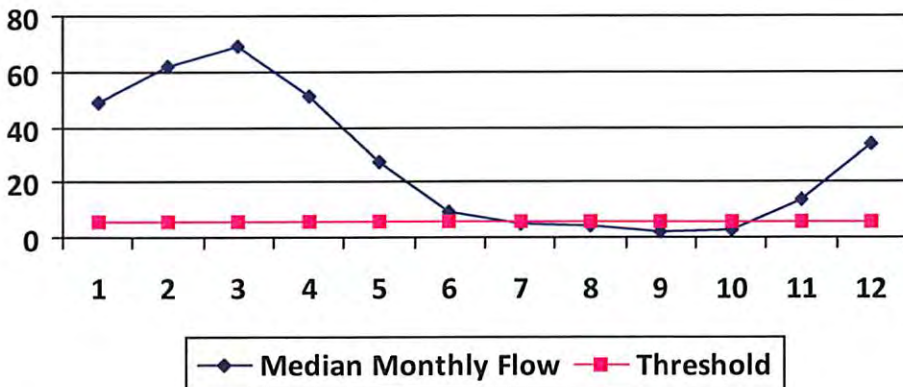
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	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
Min. Gauge Reading (cfs):	73.12
Passby at Location (cfs):	8.86

"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.

08/23/2013

Source Detail

WMP- 01323

API/ID Number: 047-103-02906

Operator: EQT Production Company

513982 (PNG103H13)

Source ID: 20352 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: 6/1/2013

Anticipated withdrawal end date: 6/1/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 9,000,000

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

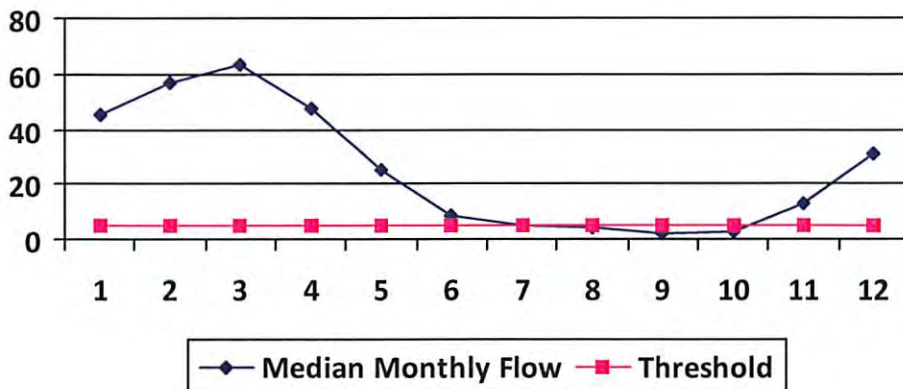
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

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
Min. Gauge Reading (cfs):	85.35
Passby at Location (cfs):	6.22

"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-01323

API/ID Number: 047-103-02906

Operator: EQT Production Company

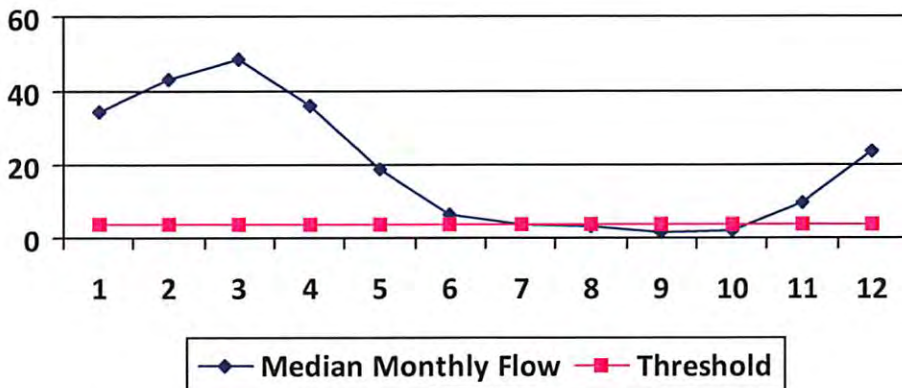
513982 (PNG103H13)

Source ID: 20353	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
<input type="checkbox"/> Endangered Species? <input type="checkbox"/> Trout Stream? <input type="checkbox"/> Regulated Stream? <input type="checkbox"/> Proximate PSD? <input type="checkbox"/> Gauged Stream?	<input checked="" type="checkbox"/> Mussel Stream? <input type="checkbox"/> Tier 3?	Anticipated withdrawal start date: 6/1/2013 Anticipated withdrawal end date: 6/1/2014 Total Volume from Source (gal): 9,000,000 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	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
<hr/>	
Min. Gauge Reading (cfs):	78.74
Passby at Location (cfs):	5.75

"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.

08/23/2013

Source Detail

WMP- 01323

API/ID Number: 047-103-02906

Operator: EQT Production Company

513982 (PNG103H13)

Source ID: 20354 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

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

Anticipated withdrawal start date: 6/1/2013

Anticipated withdrawal end date: 6/1/2014

Total Volume from Source (gal): 9,000,000

Max. Pump rate (gpm): 1,260

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

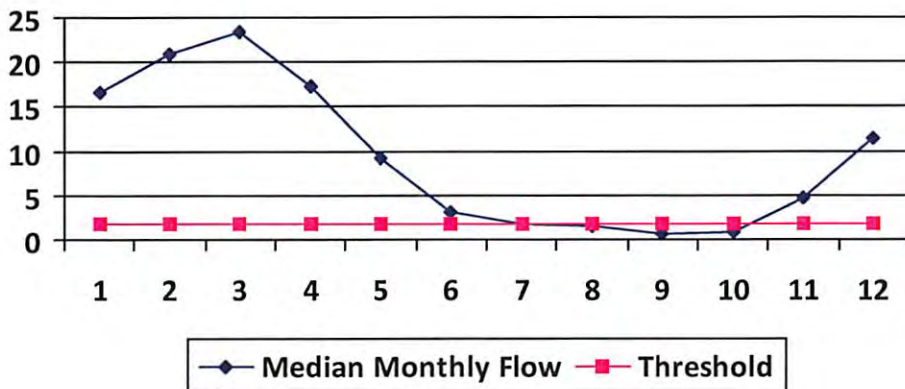
Reference Gaug 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

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
Min. Gauge Reading (cfs):	75.93
Passby at Location (cfs):	3.28

"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.

08/23/2013

Source Detail

WMP- 01323

API/ID Number: 047-103-02906

Operator: EQT Production Company

513982 (PNG103H13)

Source ID: 20355 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

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

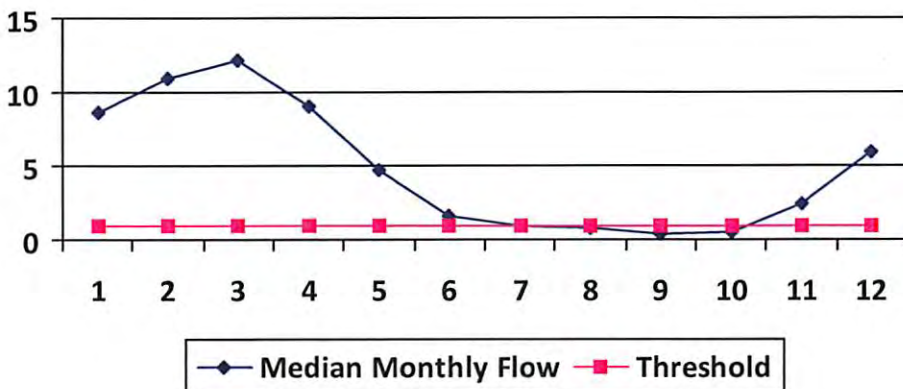
Anticipated withdrawal start date: 6/1/2013
Anticipated withdrawal end date: 6/1/2014
Total Volume from Source (gal): 9,000,000
Max. Pump rate (gpm): 1,260
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm): 0

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

Min. Gauge Reading (cfs): 73.12
Passby at Location (cfs): 2.19

"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.

08/23/2013

Source Detail

WMP- 01323

API/ID Number: 047-103-02906

Operator: EQT Production Company

513982 (PNG103H13)

Source ID: 20356 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: 6/1/2013

Anticipated withdrawal end date: 6/1/2014

Endangered Species? Mussel Stream?

Total Volume from Source (gal): 9,000,000

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?

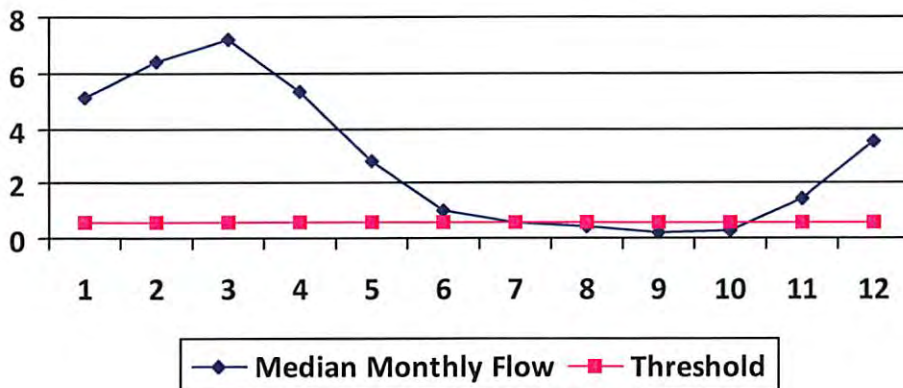
Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	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
Min. Gauge Reading (cfs):	70.31
Passby at Location (cfs):	1.70

"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.

08/23/2013



Water Management Plan: Secondary Water Sources



WMP-01323 API/ID Number: 047-103-02906 Operator: EQT Production Company
513982 (PNG103H13)

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:	20357	Source Name:	Groundwater Well TW#1		Source start date:	6/1/2013
					Source end date:	6/1/2014
	Source Lat:	39.56059	Source Long:	-80.56027	County:	Wetzel
	Max. Daily Purchase (gal):		Total Volume from Source (gal):			9,000,000
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:	20358	Source Name	Groundwater Well TW#5		Source start date:	6/1/2013	
					Source end date:	6/1/2014	
		Source Lat:	39.553434	Source Long:	-80.528871	County	Wetzel
		Max. Daily Purchase (gal)		Total Volume from Source (gal):		9,000,000	
DEP Comments:							

Recycled Frac Water

Source ID:	20359	Source Name	Various		Source start date:	6/1/2013
					Source end date:	6/1/2014
		Source Lat:		Source Long:		County
		Max. Daily Purchase (gal)		Total Volume from Source (gal):		9,000,000
DEP Comments:						

Topo Quad: Pine Grove 7.5'

Scale: 1" = 500'

County: Wetzel

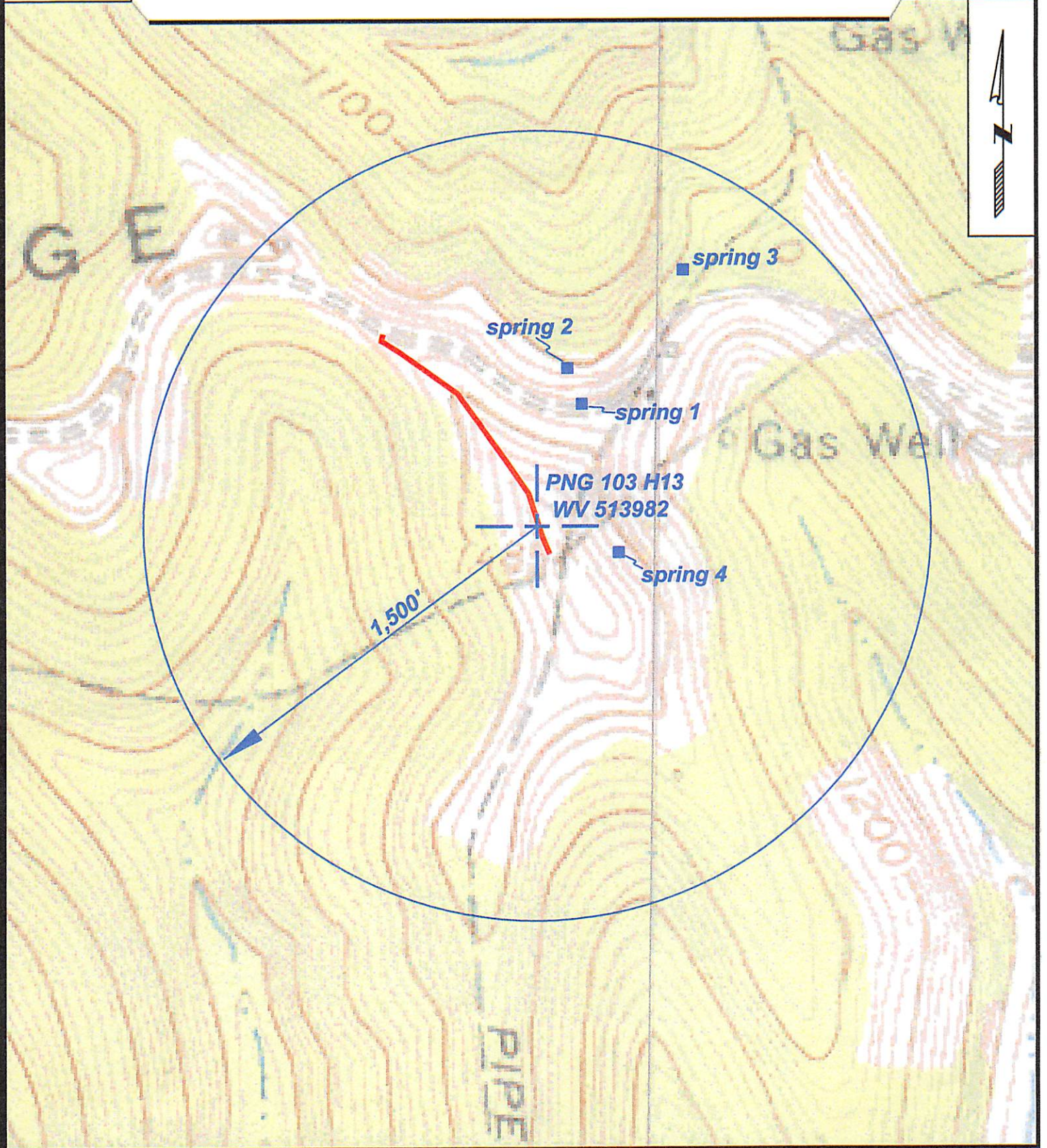
Date: April 17, 2013

District: Grant

Project No: 212-34-G-10

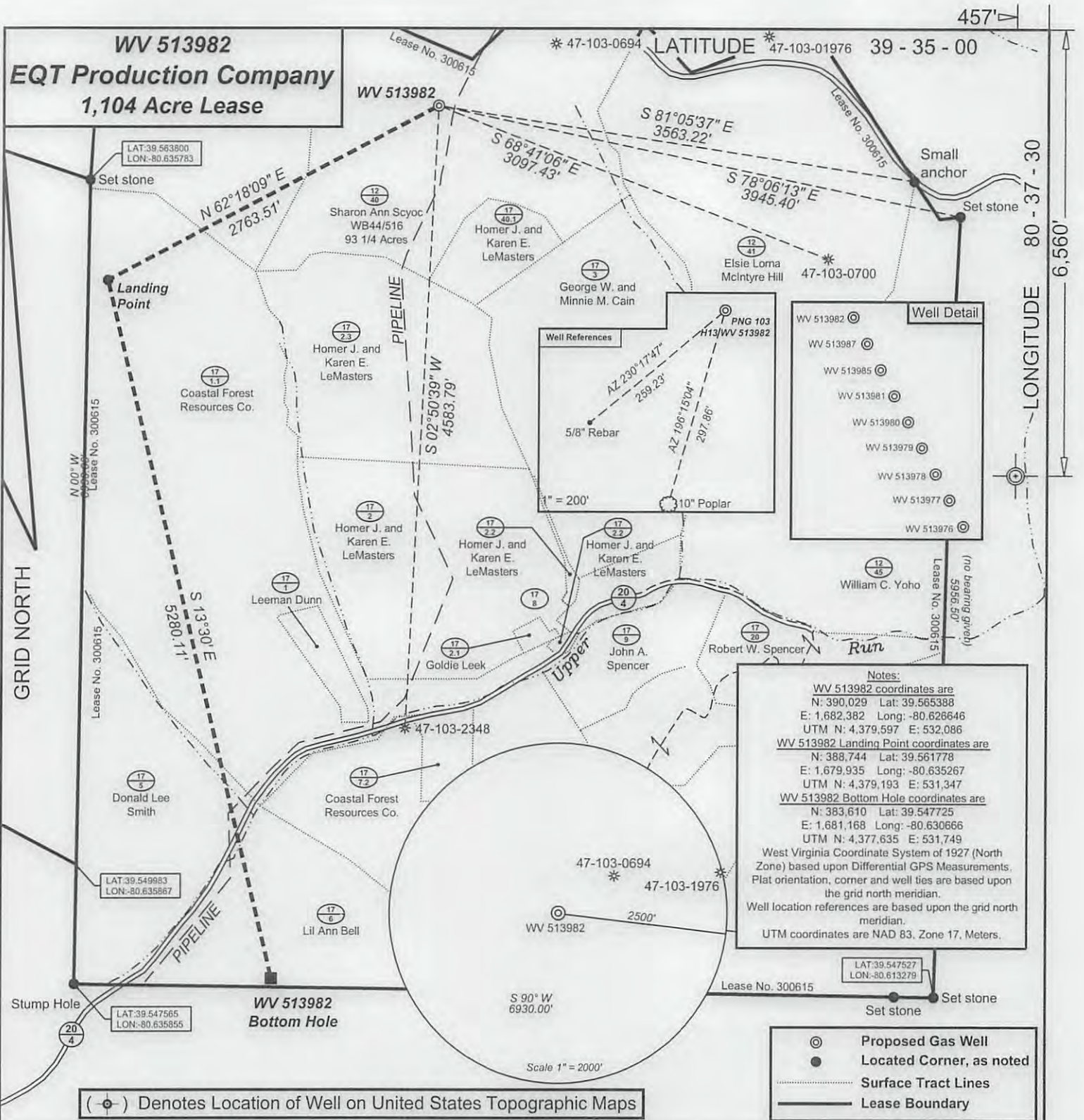
WV 513982 PNG 103 H13

Topo



Received
Office of Oil & Gas
08/23/2013

MAY 31 2013



Well Detail	
WV 513982	Well Location
WV 513987	Well Location
WV 513985	Well Location
WV 513981	Well Location
WV 513980	Well Location
WV 513979	Well Location
WV 513978	Well Location
WV 513977	Well Location
WV 513976	Well Location

Notes:
 WV 513982 coordinates are
 N: 390,029 Lat: 39.565388
 E: 1,682,382 Long: -80.626646
 UTM N: 4,379,597 E: 532,086
 WV 513982 Landing Point coordinates are
 N: 388,744 Lat: 39.561778
 E: 1,679,935 Long: -80.635267
 UTM N: 4,379,193 E: 531,347
 WV 513982 Bottom Hole coordinates are
 N: 383,610 Lat: 39.547725
 E: 1,681,168 Long: -80.630666
 UTM N: 4,377,635 E: 531,749
 West Virginia Coordinate System of 1927 (North Zone) based upon Differential GPS Measurements. Plat orientation, corner and well ties are based upon the grid north meridian. Well location references are based upon the grid north meridian. UTM coordinates are NAD 83, Zone 17, Meters.

- ⊙ Proposed Gas Well
- Located Corner, as noted
- Surface Tract Lines
- Lease Boundary

(⊙) Denotes Location of Well on United States Topographic Maps



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 Department of Environmental Protection.

Ben Singleton
 P.S. 2092



FILE NO: 212-34-G-10
 DRAWING NO: 212-10 PNG 103 H13.dwg
 SCALE: 1" = 1000'
 MINIMUM DEGREE OF ACCURACY: 1:2500
 PROVEN SOURCE OF ELEVATION: NGS CORS Station

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

DATE: April 24 20 13
 OPERATOR'S WELL NO. WV 513982
 API WELL NO. 47 - 103 - 02906 H6A
 STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
 LOCATION: ELEVATION: 1458' WATERSHED Upper Run QUADRANGLE: Pine Grove
 DISTRICT: Grant COUNTY: Wetzel
 SURFACE OWNER: Sharon Ann Scyoc ACREAGE: 93 1/4
 ROYALTY OWNER: Shiben Estates, Inc. LEASE NO: 300615 ACREAGE: 1,104
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY)
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus ESTIMATED DEPTH: TVD=7,800 MD=16,900

WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Rex C. Ray
 ADDRESS: PO Box 280 / 115 Professional Place ADDRESS: PO Box 280 / 115 Professional Place
 Charleston, WV 26330 Charleston, WV 26330