



west virginia department of environmental protection

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

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Tuesday, November 16, 2021
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

EQT PRODUCTION COMPANY
625 LIBERTY AVE., SUITE 1700

PITTSBURGH, PA 15222

Re: Permit Modification Approval for 4H
47-103-03412-00-00

Lateral Extension

EQT PRODUCTION COMPANY

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

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

A blue ink signature of James A. Martin, Chief, is written over a white background.

James A. Martin
Chief

Operator's Well Number: 4H
Farm Name: MICHAEL KUHN
U.S. WELL NUMBER: 47-103-03412-00-00
Horizontal 6A New Drill
Date Modification Issued: 11/16/2021

Promoting a healthy environment.

11/19/2021

103-03412 Exp Mod



EQT PRODUCTION COMPANY
400 Woodcliff Drive | Canonsburg, PA 15317

Exp. MODIFICATION

November 4, 2021

Via FedEx Overnight

West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304

RE: Well Work Permit Modification
Michael Kuhn 4H Well
Permit Number 47-103-03412
Center District, Wetzel County, WV

RECEIVED
Office of Oil and Gas

NOV 05 2021

WV Department of
Environmental Protection

WVDEP Recipient,

Attached please find following information to modify the existing Well Work Permit for this well:

- Check in the amount of \$5,000 for the expedited permit fee
- Completed Form WW-6B and supporting documents, approved by the Oil and Gas Inspector
- Revised Well Bore Diagram
- Well Location Plat
- Completed Form WW-6A1 and supporting documentation
- Hydraulic Fracturing Monitoring Plan
- DVD with the updated Water Management Plan

EQT is proposing to extend the lateral from the previously permitted length and add an additional source to the previously approved Water Management Plan. The modification to the Water Management Plan will apply to all wells on the pad. *-ON AIGQ Draw*

EQT Production trusts that if any portion of the submitted documentation is found to be inadequate for processing the permit, notification will be made to our Permitting department at your earliest convenience. It is EQT Production's intent to cooperate fully to provide any additional requested documentation and clarification in a timely manner such that permitting proceeds in a predictable and logical manner.

Best Regards,

John Zavatchan
Project Specialist – Permitting
jzavatchan@eqt.com
724-746-9073

11/19/2021

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

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

2) Operator's Well Number: 4H Well Pad Name: Michael Kuhn

3) Farm Name/Surface Owner: Rachel Elizabeth Wyatt & Sheldon R Norris Public Road Access: CR 19/3

RECEIVED
Office of Oil and Gas
NOV 05 2021
WV Department of
Environmental Protection

4) Elevation, current ground: 1509' (built) Elevation, proposed post-construction: 1509' (built)

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):
Marcellus, 7,736', 51', 2,620 PSI

8) Proposed Total Vertical Depth: 7736'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 29,162'

11) Proposed Horizontal Leg Length: 20,636'

12) Approximate Fresh Water Strata Depths: 75', 361'

13) Method to Determine Fresh Water Depths: Offset Wells - 47-103-01884 & 43-103-01813

14) Approximate Saltwater Depths: 2027', 2100', 2295', 2369'

15) Approximate Coal Seam Depths: 1163'-1166', 1260'-1266'

16) Approximate Depth to Possible Void (coal mine, karst, other): N/A

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: _____

*CK# 590357
Amt \$ 5000
Date 10/21/21*

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 | 40 | 40 | 50 ft ³ / CTS |
| Fresh Water | 13 3/8 | New | J-55 | 54.5 | 1316 | 1316 ✓ | 1210 ft ³ / CTS |
| Coal | | | | | | | |
| Intermediate | 9 5/8 | New | J-55 | 36 | 2823 | 2823 | 1100 ft ³ / CTS |
| Production | 5 1/2 | New | P-110 | 20 | 29162 | 29162 ✓ | 500' above intermediate casing |
| Tubing | | | | | | | |
| Liners | | | | | | | |

Bryan Harris 10/21/21

| 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 | 0.312 | 1050 | 18 | Class A | 1.18 |
| Fresh Water | 13 3/8 | 17 1/2 | 0.380 | 2730 | 2184 | Class A / Type 1 | 1.13 - 1.19 |
| Coal | | | | | | | |
| Intermediate | 9 5/8 | 12 3/8 | 0.352 | 3520 | 2816 | Class A / Type 1 | 1.13 - 1.19 |
| Production | 5 1/2 | 8 1/2 | 0.361 | 14360 | ✓ 11488 | Class A/H | 1.04 - 2.10 |
| Tubing | | | | | | | |
| Liners | | | | | | | |

PACKERS

| | | | | |
|-------------|--|--|--|--|
| Kind: | | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

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

Drill and complete the horizontal portion of this well in the Marcellus Formation. 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 0.1%) of chemicals (including 15% Hydrochloric acid, friction reducer, biocide, and scale inhibitor), referred to in the industry as a "slickwater" completion. Maximum anticipated internal casing pressure is expected to be approximately 10,000 psi, maximum anticipated treating rates are expected to average approximately 100 bpm. Stage lengths vary from 150 to 300 feet. Average approximately 350,000 gallons of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Average approximately 200,000-600,000 pounds of proppant per stage.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 12.25 acres (2.87 acres previously disturbed)

22) Area to be disturbed for well pad only, less access road (acres): 5.17 acres (2.72 acres existing)

23) Describe centralizer placement for each casing string:

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

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

Conductor: Class A no additives
Surface: Calcium Chloride. Used to speed the setting of cement slurries
Intermediate: Calcium Chloride. Used to speed the setting of cement slurries.
Production: Calcium Carbonate, Fluid Loss, Extender, Dispersent, Viscosifier, Defoamer, POZ, Bonding Agent, Retarder, Anti-Settling/Suspension Agent

25) Proposed borehole conditioning procedures:

Surface: Circulate hole clean while rotating & reciprocating the drill string until cuttings diminish at surface.
Intermediate: Circulate hole clean while rotating & reciprocating the drill string until cuttings diminish at surface.
Production: Perform a cleanup cycle by pumping 3-8 bottoms up or until the shakers are clean. Check volume of cuttings coming across the shakers every 15 minutes.

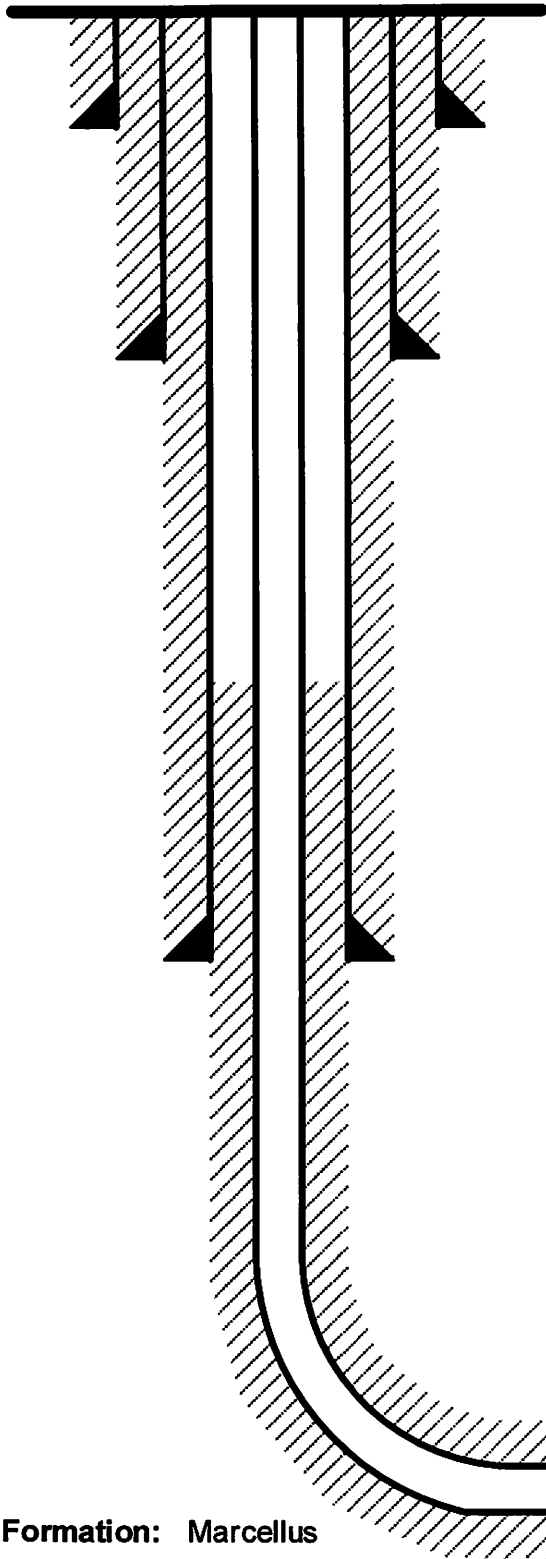
*Note: Attach additional sheets as needed.

EQT Production

Wellbore Diagram

Well: Michael Kuhn 4H
Pad: Michael Kuhn
Elevation: 1523' GL 1536' KB

County: Wetzel
State: West Virginia



Conductor @ 40'

26", 85.6#, A-500, cement to surface w/ Class A

Surface @ 1,316'

13-3/8", 54.5#, J-55, cement to surface w/ Class A/Type I

Intermediate @ 2,823'

9-5/8", 36#, J-55, cement to surface w/ Class A/Type I

Production @ 29,162' MD / 7,736' TVD

5-1/2", 20#, P-110, cement to 500' inside 9-5/8" w/ Class A/H

Formation: Marcellus

WEST VIRGINIA GEOLOGICAL PROGNOSIS

BIG467

Horizontal Well
 Pad Name: MICHAEL KUHN
 BIG-467

Drilling Objectives:
 Quad:
 County:
 Elevation:
 Recommended Azimuth:

Marcellus
 Limestone
 Wetzel
 1536 KB
 Degrees

Big Run

1523 GL

Recommended total wellbore length:

Proposed Logging Suite:

-No Pilot Hole Needed

Coal requirements:

Run a directional survey from the surface through the deepest coal seam

ESTIMATED FORMATION TOPS

Derived from well 4710302775

| Formation | Top (TVD) | Base (TVD) | Lithology | Comments |
|------------------|-----------|------------|------------------------|--|
| Fresh Water Zone | 1 | 361 | | FW from offsets @ 75,361,... |
| Sewickley Coal | 1163 | 1166 | Coal | |
| Pittsburgh Coal | 1260 | 1266 | Coal | SW @ 2027,2100,2295,2369 |
| Big Injun | 2623 | 2773 | Sandstone | Hydrocarbon prod/show in offset @2395,2679,3320,3432,3569, ... |
| Int. csg pt | 2823 | | | 50 ft below Big Injun |
| Berea | 2891 | 3151 | Sandstone | RED ROCK SHOWS NOT LISTED IN OFFSETS |
| Gantz | 3256 | 3324 | Silty sand | |
| Fifty foot | 3324 | 3412 | Silty sand | |
| Thirty foot | 3412 | 3609 | Silty sand | Outside of Storage Boundary |
| Bayard | 3609 | 3683 | Sandstone | |
| Upper Speechley | 4014 | 4067 | Silty sand | |
| Speechley | 4067 | 4150 | Silty sand | |
| Balltown | 4150 | 4514 | Silty sand | |
| Bradford | 4514 | 5629 | Silty sand | |
| Benson | 5629 | 6037 | Silty sand | |
| Alexander | 6037 | 6468 | Silty sand | |
| Elk | 6468 | 7272 | Silty sand | |
| Sonyea | 7272 | 7441 | Gray shale | |
| Middlesex | 7441 | 7485 | Black Shale | |
| Genesee | 7485 | 7572 | Gray shale interbedded | |
| Genesee | 7572 | 7599 | Black Shale | |
| Tully | 7599 | 7622 | Limestone | |
| Hamilton | 7622 | 7725 | Gray shale with some | |
| Marcellus | 7725 | 7776 | Black Shale | |
| -Purcell | 7742 | 7744 | Limestone | |
| -Cherry Valley | 7754 | 7756 | Limestone | |
| -Lateral Zone | 7751 | | | |
| Onondaga | 7776 | | Limestone | |

Top RR Base RR

Comments:

Note that this is a TVD prog for a horizontal well (azimuth of degrees; target formation = Marcellus). All measurements taken from estimated KB elevation. Water and coal information estimated from surrounding well data.

RECOMMENDED CASING POINTS

| | CSG OD | | CSG DEPTH | Planned Depth |
|--------------------|---------|--|-----------|---------------------------|
| Conductor: | 24" | | | 40 |
| Freshwater / Coal: | 13 3/8" | | | 1316 50' below Pittsburgh |
| Intermediate 1: | 9 5/8" | | | 2823 50' below big injun |
| Production: | 5 1/2" | | | @ TD |

**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 Attachment

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

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

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

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

Well Operator: EQT Production Company
 By: John Zavatchan *John F. Zavatchan Jr.*
 Its: Project Specialist - Permitting

| Lease No. | Grantor, Lessor, etc. | Acres | Grantee, Lessee, etc. | Royalty | Book/Page |
|----------------------|---|----------|--|-------------------------------------|--|
| <u>870238</u> | <u>Michael G. Kuhn</u> Michael G. Kuhn, a single man Drilling Appalachian Corporation Grenadier Energy Partners, LLC Drilling Appalachian Corporation Statoil USA Onshore Properties Inc. | 202 ac | Drilling Appalachian Corporation Grenadier Energy Partners, LLC Statoil USA Onshore Properties Inc. Statoil USA Onshore Properties Inc. EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 77A/56 OG 118A/108 & 136A/538 OG 138A/1 OG 138A/54 OG 175A/707 |
| <u>870153</u> | <u>Three Rivers Royalty II, LLC</u> James E. Newman, Executor Drilling Appalachian Corporation Grenadier Energy Partners, LLC Drilling Appalachian Corporation Statoil USA Onshore Properties Inc. | 54.00 ac | Drilling Appalachian Corporation Grenadier Energy Partners, LLC Statoil USA Onshore Properties Inc. Statoil USA Onshore Properties Inc. EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 79A/120 OG 118A/108 & 136A/538 OG 138A/1 OG 138A/54 OG 175A/707 |
| <u>870125</u> | <u>Miriam Knowles, et al.</u> Miriam Knowles and Philip G. Knowles, wife and husband Drilling Appalachian Corporation Grenadier Energy Partners, LLC Drilling Appalachian Corporation Statoil USA Onshore Properties Inc. | 68.00 ac | Drilling Appalachian Corporation Grenadier Energy Partners, LLC Statoil USA Onshore Properties Inc. Statoil USA Onshore Properties Inc. EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 79A/138 & 79A/472 OG 118A/108 & 136A/538 OG 138A/1 OG 138A/54 OG 175A/707 |
| <u>870498</u> | <u>William B. Francik and Pamela S. Francik, Trustees of the William B. and Pamela S. Francik Joint Revocable Living Trust</u> William B. Francik, Sr. and Pamela S. Francik, husband and wife Drilling Appalachian Corporation Grenadier Energy Partners, LLC Drilling Appalachian Corporation Statoil USA Onshore Properties Inc. | 67 ac | Drilling Appalachian Corporation Grenadier Energy Partners, LLC Statoil USA Onshore Properties Inc. Statoil USA Onshore Properties Inc. EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 77A/281 OG 126A/970 & 136A/538 OG 138A/1 OG 138A/54 OG 175A/707 |
| <u>870164</u> | <u>William B. Francik and Pamela S. Francik, Trustees of the William B. and Pamela S. Francik Joint Revocable Living Trust, et al.</u> Pamela Francik Drilling Appalachian Corporation Grenadier Energy Partners, LLC Drilling Appalachian Corporation Statoil USA Onshore Properties Inc. | 76.78 ac | Drilling Appalachian Corporation Grenadier Energy Partners, LLC Statoil USA Onshore Properties Inc. Statoil USA Onshore Properties Inc. EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 81A/475 OG 118A/108 & 136A/538 OG 138A/1 OG 138A/54 OG 175A/707 |
| <u>870460</u> | <u>Mary L. Wood, et al.</u> | | | "at least 1/8th per WV Code 22-6-8" | |

| | | | | | |
|----------------|--|-----------|---|-------------------------------------|--|
| | Mary L. Wood, married dealing in her sole and separate property | 50 ac | EQT Production Company | | OG 184A/929 |
| 870098 | <u>David L. Hostutler, et al.</u> Pershing R. Taylor, widower, James L. Taylor, widower Dolly Hostutler, widow, Leonard C. Taylor, widower, Norma L. Ott and Harlin R. Ott, wife and husband | 93.875 ac | Drilling Appalachian Corporation Grenadier Energy Partners, LLC Statoil USA Onshore Properties Inc. Drilling Appalachian Corporation Statoil USA Onshore Properties Inc. | "at least 1/8th per WV Code 22-6-8" | OG 77A/86 OG 118A/108 & 136A/538 OG 138A/1 OG 138A/54 OG 175A/707 |
| 870442 | <u>Emma Joyce Dahlin Anderson, et al.</u> Emma D. Anderson, widow Statoil USA Onshore Properties Inc. | 62.25 ac | Statoil USA Onshore Properties, Inc. EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 161A/872 OG 175A/707 |
| 04-9-4 | <u>Bounty Minerals, LLC</u> Florence Dulaney and Jimmy A. Dulaney, husband and wife Royal Resources Corporation Sheldon and Associates, Inc. Diversified Resources, Inc. Tri-County Oil & Gas, Inc. Leatherwood, Inc. CNX Gas Company LLC Noble Energy, Inc. CNX Gas Company LLC | 122 ac | Royal Resources Corporation Sheldon and Associates, Inc. Diversified Resources, Inc. Tri-County Oil & Gas, Inc. Leatherwood, Inc. CNX Gas Company LLC Noble Energy, Inc. CNX Gas Company LLC EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 74A/174 Unrecorded WV SOS OG 81A/595 WV SOS OG 125A/435 OG 126A/486 OG 180A/285 OG 267A/653 |
| 870665 | <u>Wilda A. Dodd, et al.</u> Spencer P. Dodd and Wilda Dodd, husband and wife Drilling Appalachian Corporation Grenadier Energy Partners, LLC Drilling Appalachian Corporation Statoil USA Onshore Properties Inc. | 60.75 ac | Drilling Appalachian Corporation Grenadier Energy Partners, LLC Statoil USA Onshore Properties Inc. Statoil USA Onshore Properties Inc. EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 77A/706 OG 126A/970 & 136A/538 OG 138A/1 OG 138A/54 OG 175A/707 |
| 1043253 | <u>BRC Minerals LP & BRC Appalachian Minerals I LLC, et al.</u> BRC Appalachian Minerals I LLC & BRC Minerals LP BRC Appalachian Minerals I LLC & BRC Minerals LP BRC Working Interest Company LLC Chesapeake Appalachia, L.L.C. BRC Working Interest Company LLC | 158.00 ac | BRC Working Interest Company LLC BRC Working Interest Company LLC Chesapeake Appalachia, L.L.C. BRC Working Interest Company LLC EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 102A/505 OG 103A/320 OG 103A/470 OG 119A/495 Pending recording |
| 870450 | <u>Donald F. Kennedy, a/k/a/ Donald Franklin Kennedy, et al.</u> Carol Sue Kennedy Drilling Appalachian Corporation | 139 ac | Drilling Appalachian Corporation Grenadier Energy Partners, LLC | "at least 1/8th per WV Code 22-6-8" | OG 110A/940 OG 116A/878 & 135A/358 |

| | | | | | |
|----------------|--|----------|--|-------------------------------------|--|
| | Grenadier Energy Partners, LLC Drilling Appalachian Corporation Statoil USA Onshore Properties Inc. | | Statoil USA Onshore Properties Inc. Statoil USA Onshore Properties Inc. EQT Production Company | | OG 138A/1 OG 138A/54 OG 175A/707 |
| 993341 | <u>Three Rivers Royalty II, LLC, et al.</u> Three Rivers Royalty II, LLC | 137 ac | EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 235A/151 |
| 300642 | <u>Waco Oil & Gas Co., Inc., et al.</u> F.F. Morgan & M.V. Morgan, his wife The Carter Oil Company Hope Natural Gas Company Consolidation Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Eastern States Oil & Gas, Inc. Blazer Energy Corp. Eastern States Oil & Gas, Inc., Blazer Energy Corp., et al. | 256 ac | The Carter Oil Co. The Hope Natural Gas Company Consolidation Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Eastern States Oil & Gas, Inc. Blazer Energy Corp. Eastern States Oil & Gas, Inc. EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 79/101 OG 1A/198 DB 233/387 OG 66A/69 Corp. Book 13/151 OG 76A/232 Corp. Book 12/253 Corp. Book 12/259 Corp. Book 13/14 |
| 870575 | <u>David E. Bowyer, et al.</u> David E. Bowyer | 147.5 ac | EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 226A/34 |
| 704100 | <u>Piney Holdings, Inc., et al.</u> B. C. Merrifield and J. M. V. Merrifield, her husband J. E. Camahan and H. L. Smith Carnegie Natural Gas Company Carnegie Production Company | 70.00 ac | J. E. Camahan and H. L. Smith Carnegie Natural Gas Company Carnegie Production Company EQT Production Company | "at least 1/8th per WV Code 22-6-8" | DB 96/349 Unrecorded OG 78A/513 WV SOS |
| 300681 | <u>Wayne Thorne, Jr., et al.</u> E. C. Snodgrass and Mary E. Snodgrass, his wife Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Eastern States Oil & Gas, Inc. Blazer Energy Corp. Eastern States Oil & Gas, Inc., Blazer Energy Corp., et al. | 40.00 ac | Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Eastern States Oil & Gas, Inc. Blazer Energy Corp. Eastern States Oil & Gas, Inc. EQT Production Company | "at least 1/8th per WV Code 22-6-8" | DB 101/566 DB 233/387 OG 66A/69 Corp. Book 13/151 OG 76A/232 Corp. Book 12/253 Corp. Book 12/259 Corp. Book 13/14 |
| 1043481 | <u>Stone Hill Minerals Holdings, LLC</u> Chesapeake Appalachia, LLC SWN Production Company, LLC Antero Exchange Properties LLC Antero Resources Corporation | 70.28 ac | SWN Production Company, LLC Antero Exchange Properties LLC Antero Resources Corporation EQT Production Company | "at least 1/8th per WV Code 22-6-8" | OG 157A/634 OG 177A/533 Corp. Book 13/311 OG 208A/593 |

EQT Production
Hydraulic Fracturing Monitoring Plan
Pad ID: Michael Kuhn
County: Wetzel

May 14, 2021

Purpose

The purpose of this pad-specific Hydraulic Fracturing Monitoring Plan is to identify and notify conventional well operators near EQT hydraulic fracturing in Wetzel County, WV prior to hydraulic fracturing at the following EQT wells on the Michael Kuhn well pad: 4H, 6H, 8H, 10H, 12H, 14H, 16H

Due to the requirements under 35CSR8 5.11, the permittee is required to review the area surrounding the proposed well pad so as to identify and evaluate potential conduits for unintended fracture propagation.

A report is required to be submitted along with a well work permit application.

The plan is being implemented as an additional safety measure to be utilized in conjunction with existing best management practices and emergency action plans for the site. These additional measures include coordination with well operators of the timing and location of the hydraulic fracturing, establishment of measures well operators should implement, and assurance that the OOG is notified of the timeline, as well as any issues that may arise during fracturing.

1. Communications with Well Operators

EQT, using available data (WV Geological Survey, WVDEP website, and IHS data service), has identified all known wells and well operators within 500 feet of this pad and the lateral sections that are known or could reasonably be expected to be within range of the fracture propagation. A map showing these wells along with a list of the wells and operators is included in **Attachment A**.

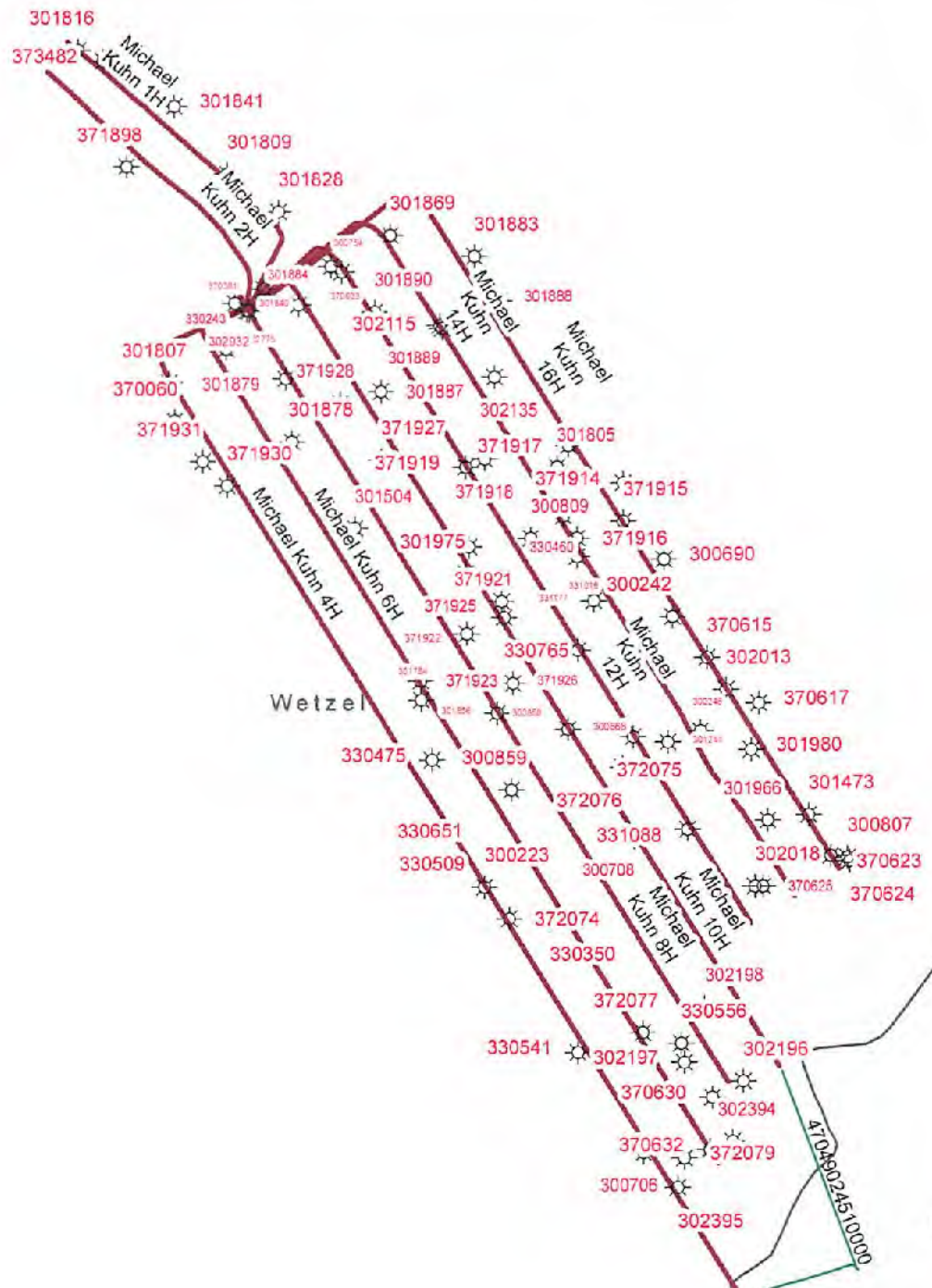
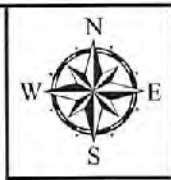
EQT will notify these operators of the hydraulic fracturing schedule for these wells, and coordinate with them throughout the fracturing process.

EQT will recommend to these operators at a minimum to:

1. Inspect their surface equipment prior to fracturing to establish integrity and establish pre-frac well conditions
2. Observe wells closely during and after fracturing and monitor for abnormal increases in water, gas or pressure
3. Inspect or install master valves or other necessary equipment for wellhead integrity capable of a pressure recommended by EQT
4. Notify the OOG and EQT if any changes in water, gas production, pressure, or other anomalies are identified

2. Reporting

EQT will provide information relating to the hydraulic fracturing schedule, communication with other operators, and ongoing monitoring of the work upon request of OOG or immediately in the event of any noted abnormalities.



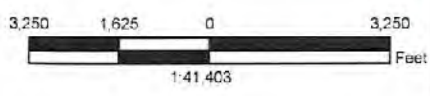
EQT
 EQT Corporation
 625 Liberty Avenue
 Pittsburgh, PA 15222

Michael Kuhn

Vertical Offsets and Foreign Laterals within 500'

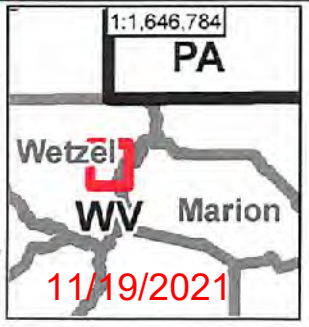
Coauthor: By: Kellen Waltman Printed By: McClayC on 10/19/2021

- Legend**
- Foreign Offset Wells
 - Foreign Horizontals
 - Well Lateral_FM
 - Formation**
 - Genesee
 - Marcellus
 - Utica



Disclaimer:

This map is confidential and is to be used only for the express informational purposes for which it was created. Unauthorized use, copying, or dissemination is strictly prohibited. EQT does not warrant the accuracy of the location of any items shown on this map, including, but not limited to, any structures, well or pipeline facilities, property boundaries, topography, roadways, or waterways. The items shown on the map may not have been placed on the map using survey lines or GPS coordinates. The specific location of any of the map items should be determined by a field survey performed by a licensed surveyor upon consultation with EQT.

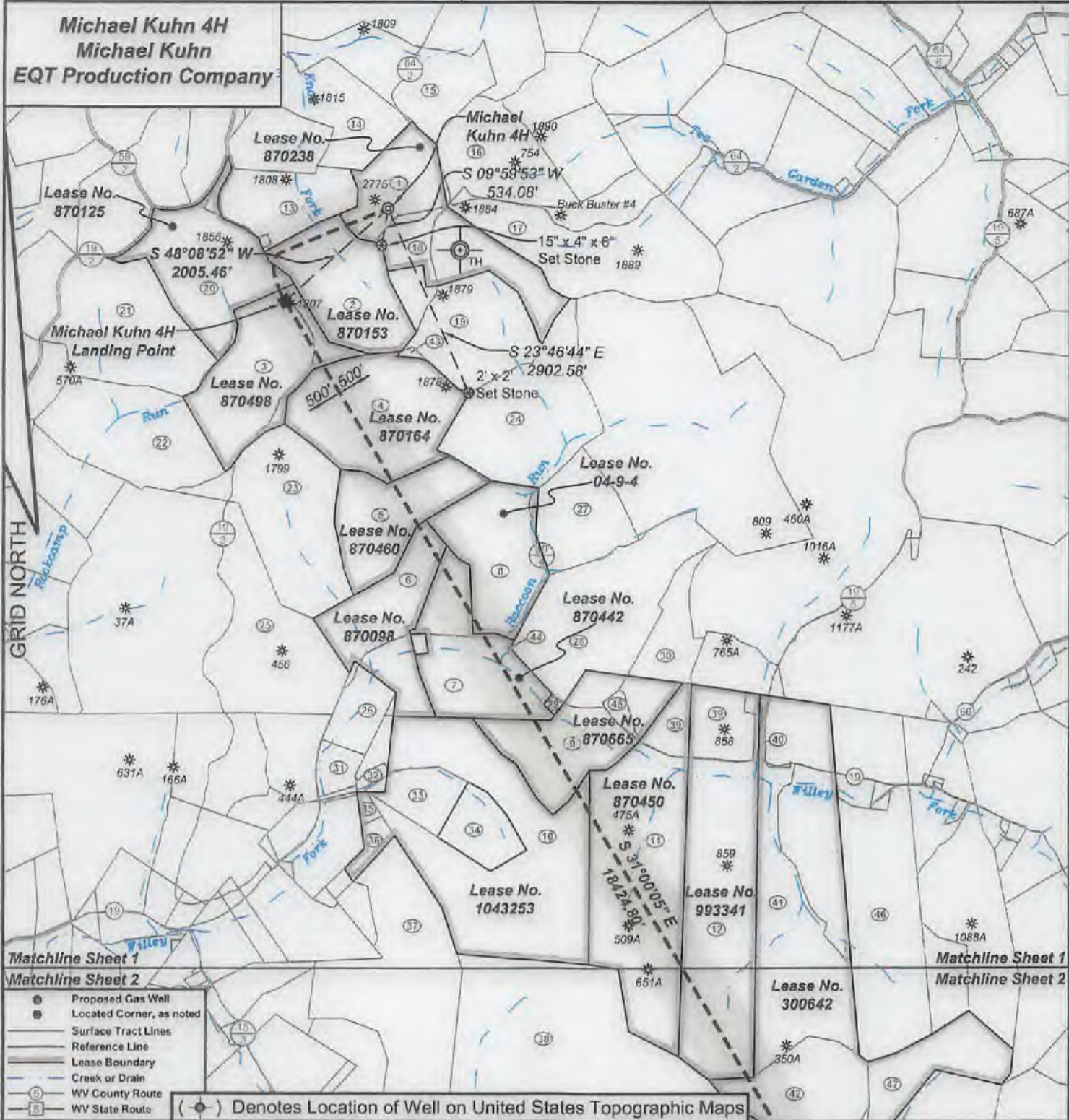


| | | | | | | | | | | | | |
|--------|-----------------|------------------|--------------|-------|--------------|-------------|--------------|------------------|-------|------|------|------|
| 371925 | Completed Wells | UNKNOWN | UNCLASSIFIED | UNKWN | UNCLASSIFIED | 39.59960100 | -80.51386300 | UNKNOVH | HAD27 | 0.00 | 0.00 | 0.00 |
| 371926 | Completed Wells | UNKNOWN | UNCLASSIFIED | UNKWN | UNCLASSIFIED | 39.59960800 | -80.50861800 | UNKNOVH | HAD27 | 0.00 | 0.00 | 0.00 |
| 371919 | Completed Wells | UNKNOWN | UNCLASSIFIED | UNKWN | UNCLASSIFIED | 39.60671300 | -80.51629810 | UNKNOVH | HAD27 | 0.00 | 0.00 | 0.00 |
| 370615 | Completed Wells | UNKNOWN | UNCLASSIFIED | UNKWN | UNCLASSIFIED | 39.59665300 | -80.49973500 | UNKNOVH | HAD27 | 0.00 | 0.00 | 0.00 |
| 370617 | Completed Wells | HOPE NATURAL GAS | UNCLASSIFIED | UNKWN | UNCLASSIFIED | 39.59408500 | -80.49617600 | HOPE NATURAL GAS | HAD27 | 0.00 | 0.00 | 0.00 |

| Horizontals | | | | | | | | | | | | |
|----------------|-----------------|-------------------|----------------------|------------------|----------|-------------|--------------|-------------------|-----------|-----------|----------|--------------------------------|
| LNH | ACT_STATUS | CURR_OPER | FNL_CLASS | INIT_CLASS | LATITUDE | LONGITUDE | OPER_NAME | ELEV_RF_CD | ELEVATION | TOT_DEPTH | TVD | WELL_NAME |
| 47049023460000 | Completed Wells | EQT PRODUCTION CO | DEVELOPMENT WELL-GAS | DEVELOPMENT WELL | | 39.56398000 | -80.48358100 | EQT PRODUCTION CO | KB | 1447.00 | 13610.00 | 7770.00 VV 514744 BROWER ET AL |
| 47049024510000 | Completed Wells | EQT PRODUCTION CO | DEVELOPMENT WELL-GAS | DEVELOPMENT WELL | | 39.56399560 | -80.48368610 | EQT PRODUCTION CO | KB | 1440.00 | 12027.00 | 7835.00 HS GLO76 |

TH: 8851' LAT: 39-37-30

Michael Kuhn 4H
Michael Kuhn
EQT Production Company



TH: 3564' LON: 80-30-00

Matchline Sheet 1
Matchline Sheet 2

Matchline Sheet 1
Matchline Sheet 2

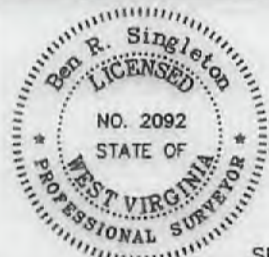
- ⊙ Proposed Gas Well
- ⊙ Located Corner, as noted
- Surface Tract Lines
- Reference Line
- Lease Boundary
- Creek or Drain
- Ⓢ WV County Route
- Ⓟ WV State Route

(*) 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 R. Singleton
P.S. 2092



SEAL

FILE NO: 49-20
DRAWING NO: Michael Kuhn 4H
SCALE: 1" = 2000'
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: October 28 20 21
OPERATOR'S WELL NO.: Michael Kuhn 4H
API WELL NO MOD
47 103 03412
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
LOCATION: ELEVATION: 1509' WATERSHED: Knob Fork of West Virginia Fork Fishing Creek QUADRANGLE: Big Run
DISTRICT: Center COUNTY: Wetzel
SURFACE OWNER: Rachel Elizabeth Wyatt & Sheldon R. Norris ACREAGE: 36.40
ROYALTY OWNER: Michael G. Kuhn LEASE NO: 870238 ACREAGE: 202
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: 7736'

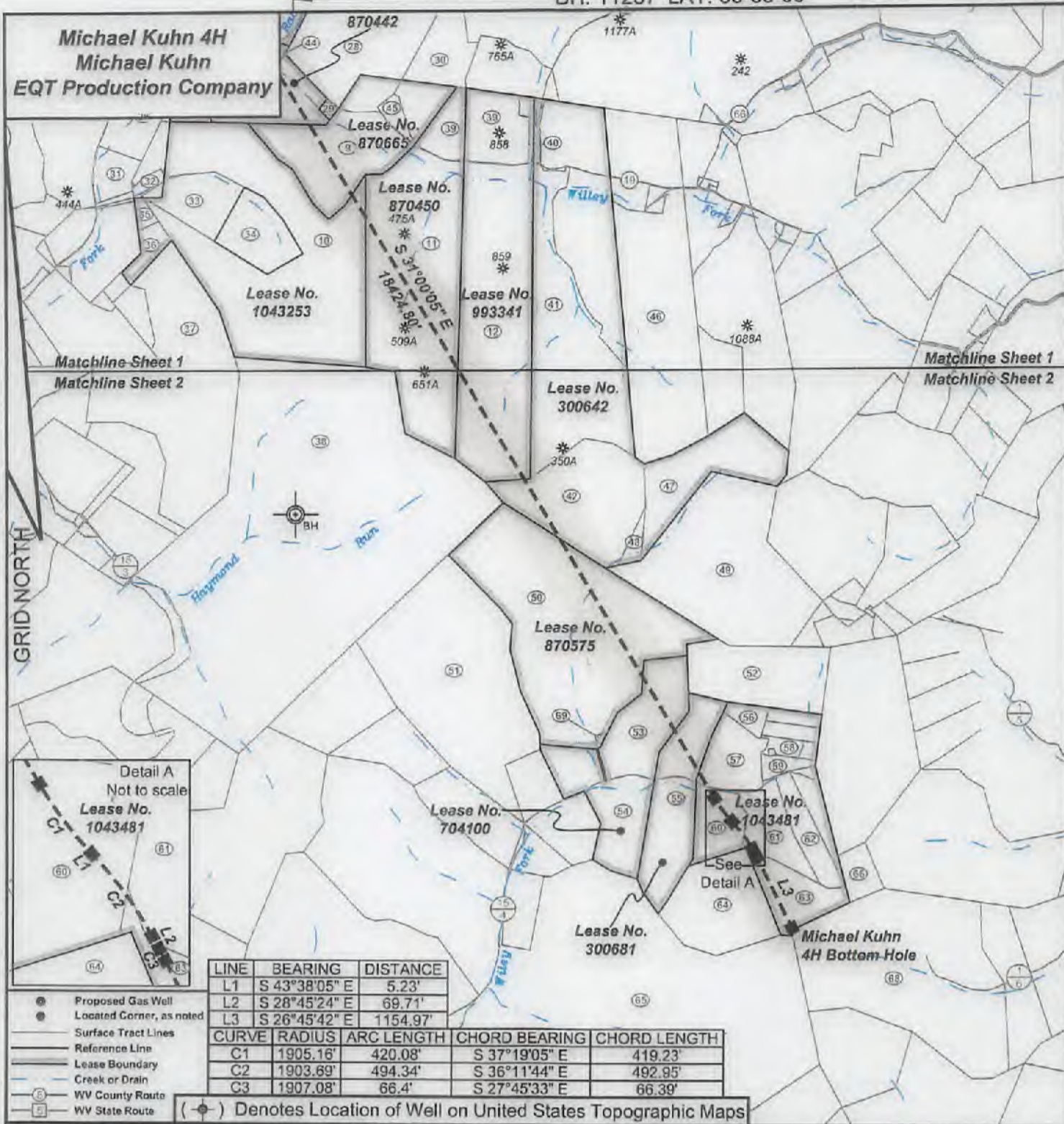
11/19/2021

WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Joseph C. Mallow
ADDRESS: 400 Woodcliff Drive ADDRESS: 115 Professional Place PO Box 280
Canonsburg, PA 15317 Bridgeport, WV 26330

BH: 11257' LAT: 39-35-00

BH: 7301' LON: 80-27-30

**Michael Kuhn 4H
Michael Kuhn
EQT Production Company**



- Proposed Gas Well
- Located Corner, as noted
- Surface Tract Lines
- Reference Line
- Lease Boundary
- Creek or Drain
- Ⓢ WV County Route
- Ⓡ WV State Route

(●) 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 R. Singleton
P.S. 2092



SEAL

FILE NO: 49-20
DRAWING NO: Michael Kuhn 4H
SCALE: 1" = 2000'
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: October 28 20 21
OPERATOR'S WELL NO.: Michael Kuhn 4H
API WELL NO M&D
47 - 103 - 03412
STATE COUNTY PERMIT

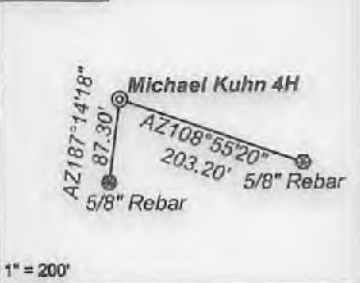
WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
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WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Joseph C. Mallow
ADDRESS: 400 Woodcliff Drive ADDRESS: 115 Professional Place PO Box 280
Canonsburg, PA 15317 Bridgeport, WV 26330

Michael Kuhn 4H
Michael Kuhn
EQT Production Company

| Tract I.D. | Tax Map No. | Parcel No. | County | District | Surface Tract Owner | Acres |
|------------|-------------|------------|--------|------------|---|--------|
| 1 | 26 | 32 | Wetzel | Center | Rachel Elizabeth Wyatt & Sheldon R. Norris | 36.40 |
| 2 | 26 | 36 | Wetzel | Center | Rachel Elizabeth Wyatt & Sheldon R. Norris | 64.00 |
| 3 | 26 | 38 | Wetzel | Center | William B. Franck Sr. & Pamela Sprow | 66.58 |
| 4 | 4 | 10 | Wetzel | Grant | William B. & Pamela S. Franck | 76.76 |
| 5 | 9 | 3 | Wetzel | Grant | William B. & Pamela S. Franck | 50.80 |
| 6 | 9 | 11 | Wetzel | Grant | Elizabeth Anderson, et al | 50.32 |
| 7 | 9 | 21 | Wetzel | Grant | Gregory & Michael Dikow | 59.90 |
| 8 | 9 | 4 | Wetzel | Grant | Gregory & Michael Dikow | 50.80 |
| 9 | 9 | 27 | Wetzel | Grant | Bud Barr | 47.17 |
| 10 | 9 | 34 | Wetzel | Grant | Terry L. & Carolyn M. Fry | 155.08 |
| 11 | 9 | 39 | Wetzel | Grant | Coastal Forest Resources Company | 128.00 |
| 12 | 19 | 28 | Wetzel | Grant | Coastal Forest Resources Company | 107.00 |
| 13 | 26 | 31 | Wetzel | Center | Rachel Elizabeth Wyatt & Sheldon R. Norris | 40.00 |
| 14 | 26 | 27 | Wetzel | Center | Robert E. & Linda E. Rex | 46.75 |
| 15 | 26 | 18 | Wetzel | Center | Robert E. & Linda E. Rex | 60.10 |
| 16 | 13 | 8 | Wetzel | Church | William B. Franck Jr. | 48.44 |
| 17 | 17 | 1 | Wetzel | Church | Back Buster Hunt Club of WV Inc. | 100.00 |
| 18 | 26 | 36 | Wetzel | Center | Rachel Elizabeth Wyatt & Sheldon R. Norris | 65.80 |
| 19 | 26 | 27 | Wetzel | Center | William B. & Pamela S. Franck | 67.50 |
| 20 | 26 | 23 | Wetzel | Center | Myra L. Phelps Trust | 68.00 |
| 21 | 4 | 5 | Wetzel | Grant | Ermy J. Stomberg, et al | 180.00 |
| 22 | 4 | 9 | Wetzel | Grant | Jessie A. Yoho | 53.60 |
| 23 | 9 | 2 | Wetzel | Grant | Liberty Holding Company | 74.30 |
| 24 | 4 | 11 | Wetzel | Grant | Liberty Holding Company | 89.06 |
| 25 | 9 | 19 | Wetzel | Grant | William B. & Pamela S. Franck | 232.97 |
| 26 | 9 | 22 | Wetzel | Grant | William B. & Pamela S. Franck | 59.50 |
| 27 | 9 | 5 | Wetzel | Grant | John E. Seiwel | 36.60 |
| 28 | 9 | 12 | Wetzel | Grant | Bud Barr | 89.26 |
| 29 | 9 | 21.2 | Wetzel | Grant | David W. & Barbara L. Anderson | 1.00 |
| 30 | 9 | 24 | Wetzel | Grant | Calvin N. Barr, et al | 52.60 |
| 31 | 9 | 26 | Wetzel | Grant | Elizabeth L. Taylor, et al | 10.60 |
| 32 | 9 | 33.1 | Wetzel | Grant | Terry L. & Carolyn M. Fry | 3.80 |
| 33 | 9 | 36 | Wetzel | Grant | Terry L. & Carolyn M. Fry | 15.90 |
| 34 | 9 | 27 | Wetzel | Grant | Terry L. & Carolyn M. Fry | 25.60 |
| 35 | 9 | 34 | Wetzel | Grant | Terry L. & Carolyn M. Fry | 3.26 |
| 36 | 9 | 35 | Wetzel | Grant | Terry L. & Carolyn M. Fry | 6.25 |
| 37 | 9 | 61 | Wetzel | Grant | Jimble's Quiet Mountain Ranch | 114.10 |
| 38 | 14 | 0 | Wetzel | Grant | Coastal Forest Resources Company | 332.90 |
| 39 | 16 | 16 | Wetzel | Grant | Michael J. & Patricia L. Barber | 36.60 |
| 40 | 10 | 29.1 | Wetzel | Grant | Robert Blos | 2.21 |
| 41 | 16 | 29 | Wetzel | Grant | Billy J. & Frances J. Higgins Irrevocable Trust | 99.31 |
| 42 | 15 | 5 | Wetzel | Grant | Donald J. D'Lukey, et al | 43.20 |
| 43 | 26 | 37.1 | Wetzel | Center | William Franck | 0.71 |
| 44 | 9 | 12.1 | Wetzel | Grant | Michael Oulany | 0.00 |
| 45 | 9 | 27.1 | Wetzel | Grant | David Barr | 3.70 |
| 46 | 10 | 38 | Wetzel | Grant | Tammy D. Chambers | 69.67 |
| 47 | 15 | 1 | Wetzel | Grant | Timothy E. Tise | 43.20 |
| 48 | 15 | 9 | Wetzel | Grant | Donald J. D'Lukey, et al | 2.76 |
| 49 | 15 | 7 | Wetzel | Grant | Timothy E. Tise | 115.00 |
| 50 | 15 | 12 | Wetzel | Grant | Donald J. D'Lukey, et al | 147.56 |
| 51 | 14 | 26 | Wetzel | Grant | EQT Production Company | 129.50 |
| 52 | 15 | 13 | Wetzel | Grant | Donald W. & Donna White | 40.80 |
| 53 | 15 | 15.1 | Wetzel | Grant | Donald J. & Jane A. D'Lukey | 59.80 |
| 54 | 15 | 16 | Wetzel | Grant | Donald J. D'Lukey | 39.50 |
| 55 | 15 | 29 | Wetzel | Grant | Terry & Carolyn Phillips | 40.00 |
| 56 | 15 | 21 | Wetzel | Grant | William Jack & Beverly L. Barr | 4.70 |
| 57 | 15 | 20 | Wetzel | Grant | Donald J. D'Lukey | 18.68 |
| 58 | 15 | 24 | Wetzel | Grant | William Jack & Beverly L. Barr | 4.75 |
| 59 | 15 | 25 | Wetzel | Grant | William Jack & Beverly L. Barr | 4.20 |
| 60 | 15 | 30 | Wetzel | Grant | Terry & Carolyn Phillips | 10.00 |
| 61 | 15 | 21 | Wetzel | Grant | Donald W. & Donna White | 18.60 |
| 62 | 15 | 32 | Wetzel | Grant | William Jack & Beverly L. Barr | 10.75 |
| 63 | 15 | 35 | Wetzel | Grant | Donald J. D'Lukey, et al | 17.80 |
| 64 | 15 | 34 | Wetzel | Grant | Donald J. D'Lukey, et al | 42.00 |
| 65 | 20 | 1 | Wetzel | Grant | Coastal Forest Resources Company | 520.08 |
| 66 | 15 | 36 | Wetzel | Grant | EQM Gathering OPCOLLC | 7.86 |
| 68 | 43 | 11 | Marion | Mannington | Robert E. & Maxine P. Tonkay | 111.00 |
| 69 | 15 | 15 | Marion | Grant | John F. Joseph | 0.50 |

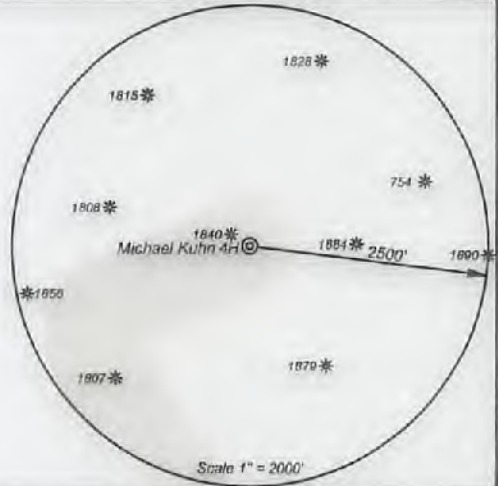
Well References



Notes:
 Michael Kuhn 4H coordinates are
 NAD 27 N: 407,853.86 E: 1,709,435.53
 NAD 27 Lat: 39.615216 Long: -80.531418
 NAD 83 UTM N: 4,385,165.58 E: 540,238.12
 Michael Kuhn 4H Landing Point coordinates are
 NAD 27 N: 406,515.82 E: 1,707,941.70
 NAD 27 Lat: 39.611495 Long: -80.536655
 NAD 83 UTM N: 4,384,750.32 E: 539,789.79
 Michael Kuhn 4H Bottom Hole coordinates are
 NAD 27 N: 388,836.31 E: 1,718,566.19
 NAD 27 Lat: 39.563290 Long: -80.498263
 NAD 83 UTM N: 4,379,418.12 E: 543,116.10
 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 NAD83, Zone 17, Meters.

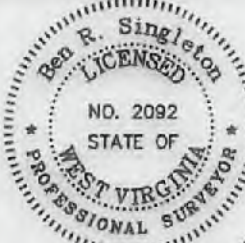


| Lease No. | Owner | Acres |
|-----------|---|--------|
| 870153 | Three Rivers Royalty II, LLC | 54.00 |
| 870128 | Miriam Knowles, et al | 68.00 |
| 870408 | William B. Franck and Pamela S. Franck, Trustees of the William B. and Pamela S. Franck Joint Revocable Living Trust | 67 |
| 870164 | William B. Franck and Pamela S. Franck, Trustees of the William B. and Pamela S. Franck Joint Revocable Living Trust, et al | 76.76 |
| 870460 | Mary L. Wood, et al | 50 |
| 870008 | David L. Hostetter, et al | 93.875 |
| 870442 | Emma Joyce Dahlin Anderson, et al | 62.25 |
| 04-9-4 | Bounty Minerals, LLC | 122 |
| 870665 | Kevin Gump, et al | 60.75 |
| 1043253 | BRC Minerals LP & BRC Appalachia Minerals I LLC, et al | 158.00 |
| 870450 | Donald F. Kennedy, aka Donald Franklin Kennedy, et al | 139 |
| 993341 | Three Rivers Royalty II, LLC, et al | 137 |
| 300842 | Waco Oil & Gas Co., Inc., et al | 256 |
| 870575 | David E. Bowyer, et al | 147.5 |
| 704100 | Piney Holdings, Inc., et al | 70.00 |
| 300681 | Wayne Thorne, Jr., et al | 40.00 |
| 1043481 | Stone Hill Minerals Holdings, LLC | 70.28 |



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 R. Singleton
 P.S. 2092



SEAL

FILE NO: 49-20
 DRAWING NO: Michael Kuhn 4H
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1:2500
 PROVEN SOURCE OF ELEVATION: NGS CORS Station



DATE: October 28 20 21
 OPERATOR'S WELL NO.: Michael Kuhn 4H
 API WELL NO MOD
 47 - 103 - 03412
 STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
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WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Joseph C. Mallow
 ADDRESS: 400 Woodcliff Drive ADDRESS: 115 Professional Place PO Box 280
 Canonsburg, PA 15317 Bridgeport, WV 26330



Stansberry, Wade A <wade.a.stansberry@wv.gov>

Expedited Modification Horizontal H6A Well Work Permit (API: 47-103-03412 & 47-103-03416)

1 message

Stansberry, Wade A <wade.a.stansberry@wv.gov>

Tue, Nov 16, 2021 at 11:14 AM

To: John <JZavatchan@eqt.com>, "Shrum, Becky" <bshrum@eqt.com>, Todd <tklaner@eqt.com>, Erin Spine <espine@eqt.com>, Olivia Pishioneri <opishioneri@eqt.com>, "Harris, Bryan O" <bryan.o.harris@wv.gov>, Scott Lemley <slemley@wvassessor.com>

have attached a copy of the newly issued well permit number "MICHAEL KUHN 4H & MICHAEL KUHN 14H" . This will serve as your copy.

If you have any questions, then please contact us here at the Office of Oil and Gas.

Thank you,

Thank you,

Wade A. Stansberry

Environmental Resource Specialist 3

West Virginia Department of Environmental Protection

Office of Oil & Gas

601 57th St. SE


Charleston, WV 25304


(304) 926-0499 ext. 41115

(304) 926-0452 fax

Wade.A.Stansberry@wv.gov

2 attachments

 **47-103-03412 - mod.pdf**
1463K

 **47-103-03416 - Copy.pdf**
1279K

11/19/2021