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

PERMIT MODIFICATION APPROVAL

March 24, 2016

EQT PRODUCTION COMPANY
120 PROFESSIONAL PLACE
BRIDGEPORT, WV 26330

Re: Permit Modification Approval for API Number 9502257, Well #: 514460

Extend Lateral, Sub-surface Easement

Oil and Gas Operator:
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.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely, Taylor Green
For

Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

EQT

January 12, 2016

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

MOD

Re: Modification of 47-095-02257, 02264, 02255, 02220, 02256

Dear Mr. Smith,

Enclosed is an updated WW-6B, schematics, WW-6A1, rec plan, Site Safety plan and mylar plat. EQT would like to revise the length of the lateral. The top hole has not changed. The Safety plan is being updated to include changes to the cement. All has been signed by the inspector.

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

Sincerely,

Vicki Roark
Permitting Supervisor-WV

Enc.

Received
Office of Oil & Gas
JAN 14 2016

west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
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Earl Ray Tomblin, Governor
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PERMIT MODIFICATION APPROVAL

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BRIDGEPORT, WV 26330

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Assistant Chief of Permitting
Office of Oil and Gas

January 12, 2016

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Office of Oil and Gas
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Permitting Supervisor-WV

Enc.

Received
Office of Oil & Gas
JAN 14 2016

WW - 6B
(4/15)

4709502257 MOP

API NO. 47 - 095 - 02257
OPERATOR WELL NO. 514460
Well Pad Name: SHR60

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

1) Well Operator: EQT Production Company

Operator ID	County	District	Quadrangle
306686	095	5	607

2) Operator's Well Number: 514460 Well Pad Name SHR60

3) Farm Name/Surface Owner : Vivian J Wells et al Public Road Access: 60/2

4) Elevation, current ground: 1,018.0 Elevation, proposed post-construction: 1,011.0

5) Well Type: (a) Gas ▪ Oil _____ Underground Storage _____

Other _____

(b) If Gas: Shallow ▪ Deep _____

Horizontal ▪

DMH
1-11-16

6) Existing Pad? Yes or No: yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):

Target formation is Marcellus at a depth of 6596 with the anticipated thickness to be 52 feet and anticipated target pressure of 2747 PSI

Top of Marcellus: 6571

8) Proposed Total Vertical Depth: 6723
9) Formation at Total Vertical Depth: Onondaga
10) Proposed Total Measured Depth: 12859
11) Proposed Horizontal Leg Length: 5822
12) Approximate Fresh Water Strata Depths: 83,133,570,906
13) Method to Determine Fresh Water Depth: By offset wells
14) Approximate Saltwater Depths: 1198, 1865
15) Approximate Coal Seam Depths: 19, 420, 686, 875, 1315
16) Approximate Depth to Possible Void (coal mine, karst, other): None reported
17) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes _____ No _____
(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

Received
Office of Oil & Gas
JAN 14 2016

WW - 6B
(4/15)

4709502257 MOD

API NO. 47 - 095 - 02257
OPERATOR WELL NO. 514460
Well Pad Name: SHR60

CASING AND TUBING PROGRAM

18)

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: for Drilling	INTERVALS: Left in Well	CEMENT: Fill- up (Cu.Ft.)
Conductor	20	New	A-500	78.6	60	60	90 C.T.S.
Fresh Water	13 3/8	New	J-55	54.5	997	997	929 C.T.S.
Coal	–	–	–	–	–	–	
Intermediate	9 5/8	New	A-500	40	2,778	2,778	1,084 C.T.S.
Production	5 1/2	New	P-110	20	12,859	12,859	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							

DmH 1/1/16

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20	26	0.375	-	18	Construction	1.18
Fresh Water	13 3/8	17 1/2	0.38	2,730	2,184	* See Note 2	1.19
Coal							
Intermediate	9 5/8	12 3/8	0.395	3,950	3,160	* See Note 2	1.19
Production	5 1/2	8 1/2	0.361	12,640	10,112	-	1.07/1.86
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 500' above the top producing zone.

Note 2: Reference Variance 2014-17. (Attached)

Received
Office of Oil & Gas
JAN 14 2016

WW - 6B
(10/14)

4709502257 MOD

API NO. 47 - 095 - 02257
OPERATOR WELL NO. 514460
Well Pad Name: SHR60

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

Drill and complete a new horizontal well in the Marcellus formation. Drill the vertical to an approximate depth of 6723'.

Tag the Onondaga not more than 100', run logs, then plug back with a solid cement plug to approximately 5135'.

Kick off and drill curve. Drill lateral in the Marcellus. Cement casing.

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

Hydraulic fracturing is completed in accordance with state regulations using water recycled from previously fractured wells and obtained from freshwater sources. This water is mixed with sand and a small percentage (less than 0.3%) of chemicals (including 15% Hydrochloric acid, gelling agent, gel breaker, friction reducer, biocide, and scale inhibitor), referred to in the industry as a "slickwater" completion. Maximum anticipated internal casing pressure is expected to average approximately 8500 psi, maximum anticipated treating rates are expected to average approximately 100 bpm. Stage lengths vary from 150 to 300 feet. Average approximately 200,000 barrels of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Average approximately 200,000 pounds of sand per stage.

21) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): no additional

22) Area to be disturbed for well pad only, less access road (acres): no additional

23) Describe centralizer placement for each casing string.

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

24) 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. 0.25% 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. 0.25% 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:

DMH 1-11-16

Lead (Type H Cement): 0.2% CD-20 (dispersant makes cement easier to mix). .15% SuperFL-300 (fluid loss/lengthens thickening time) .15% SEC-10 (fluid loss) 50:50 POZ (extender)

Tail (Type H Cement): 0.2% Super CR-1 (Retarder). Lengthens thickening time. .3% Super FL-200 (fluid loss) .2% SEC-10 (Fluid loss). .2% SuperFL-350 (fluid loss) Reduces amount of water lost to formation. 60 % Calcuim Carbonate. Acid solubility.

25) Proposed borehole conditioning procedures. **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. 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.

Received
Office of Oil & Gas
JAN 14 2016

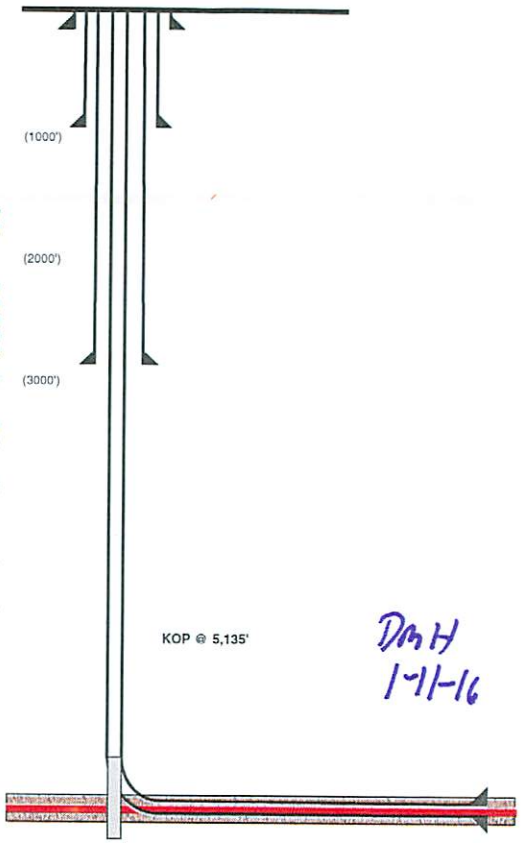
*Note: Attach additional sheets as needed.

Well 514460 (SHR60H1)
EQT Production
Shirley
Tyler West Virgina

Pad Name

Azimuth 157
Vertical Section 6030

TVD Depth (feet)	Formation Tops (TVD)	
0'		
250'		
500'		
750'		
1,000'	Base Fresh Water	906
1,250'		
1,500'		
1,750'	Maxton	1534 - 1587
	Big Lime	1829 - 2111
2,000'	Base Red Rock	1878
2,250'	Weir	2251 - 2317
	Gantz	2368 - 2415
2,500'	Fifty foot	2481 - 1496
	Thirty foot	2595 - 2636
2,750'	Gordon	2686 - 2700
	Int. csg pt	2778
3,000'	Bayard	3007 - 3067
3,250'		
3,500'	Warren	3339 - 3413
	Speechley	3433 - 3551
3,750'		
4,000'	Balltown A	3855 - 3925
4,250'		
4,500'	Riley	4548 - 4585
4,750'		
5,000'	Benson	4965 - 5002
5,250'	Alexander	5222 - 5294
5,500'		
5,750'	Sonyea	6212 - 6381
	Middlesex	6381 - 6425
6,000'	Genesee	6425 - 6501
	Geneseo	6501 - 6530
6,250'	Tully	6530 - 6554
	Hamilton	6554 - 6571
6,500'	Marcellus top	6571
	Target Inside Marcellus	**6596**
6,750'	Marcellus Bottom	6623
7,000'		
7,250'		
7,500'		
7,750'		



DMH
1-11-16

Land curve @ 6,596' ft TVD
7,037' ft MD

Est. TD @ 6,596' ft TVD
12,859' ft MD

5,822' ft Lateral

Hole Size (inches)	Type	Size (inches)	Wt (ppf)	Grade	Casing Wall Thickness	Depth (feet)	Top of Cement	Method
26	Conductor	20	78.6	A-500	0.312	60	Surface	Displacement
17 1/2	Surface	13 3/8	54.5	J-55	0.38	997	Surface	Displacement
12 3/8	Intermediate	9 5/8	40	A-500	0.395	2778	Surface	Displacement
8 1/2	Production Casing	5 1/2	20	P-110	0.361	12859	500' above top Producing Zone	Displacement

Proposed Well Work:
Drill and complete a new horizontal well in the Marcellus formation.
Drill the vertical to an approximate depth of 6723'.
Tag the Onondaga not more than 100', run logs, then plug back with a solid cement plug to approximately 5135'.
Kick off and drill curve. Drill lateral in the Marcellus. Cement casing.

Received
Office of Oil & Gas
JAN 14 2016

4709502257 MOD

4709502257 NOV

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
dep.wv.gov

March 18, 2014

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

Re: Cement Variance Request

Dear Sir or Madam,

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

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

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

Sincerely,

James Peterson by GCS

James Peterson
Environmental Resources Specialist / Permitting

Promoting a healthy environment.

Received
Office of Oil & Gas
JAN 14 2016

4709502257 MOD

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
dep.wv.gov

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

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

REPORT OF THE OFFICE

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

FINDINGS OF FACT

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

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

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

Received
Office of Oil & Gas
JAN 14 2016

CONCLUSIONS OF LAW

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

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

ORDER

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

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

IN THE NAME OF THE STATE OF WEST VIRGINIA

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

James Martin, Chief
Office of Oil and Gas

Received
Office of Oil & Gas
JAN 14 2016

4709502257 MOD

WW-9
(2/15)

API No. 47 - 095 - 0
Operator's Well No. 514460

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
Fluids/Cuttings Disposal & Reclamation Plan

Operator Name EQT Production Company OP Code 306686

Watershed (HUC10) Morrison Run of McElroy Creek Quadrangle Shirley

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

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

If so please describe anticipated pit waste: flowback water & residual solids

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

DMH
1-11-16

- If oil based, what type? Synthetic, petroleum, etc Synthetic mud

Additives to be used in drilling medium? Air - biodegradable oil lubricant , detergent, defoaming, water. Water based mud – Barite, viscosifer, alkalinity control, lime, filtration control, deflocculates, biodegradable oil lubricant , defoaming, walnut shell, salt, x-cide, carbonates. Oil based mud – synthetic base oil, emulsifier, salt, lime, viscosifer, alkalinity control, filtration control, deflocculates, biodegradable oil lubricant , defoaming, carbonates.

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

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

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

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

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

Received
Office of Oil & Gas
JAN 14 2016

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

Subscribed and sworn before me this 17th day of December, 20 15

Rebecca L. Wanstreet Notary Public

My commission expires 4-7-20

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

4709502257 Moo

Form WW-9

Operator's Well No. 514460

Proposed Revegetation Treatment: Acres Disturbed no additional Prevegetation pH 6.3

Lime 3 Tons/acre or to correct to pH 6.5

Fertilize type Granular 10-20-20

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

Mulch 2 Tons/acre

Seed Mixtures

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

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [illegible]

Comments:

Title: Oil + Gas Inspector Date: 1-11-16

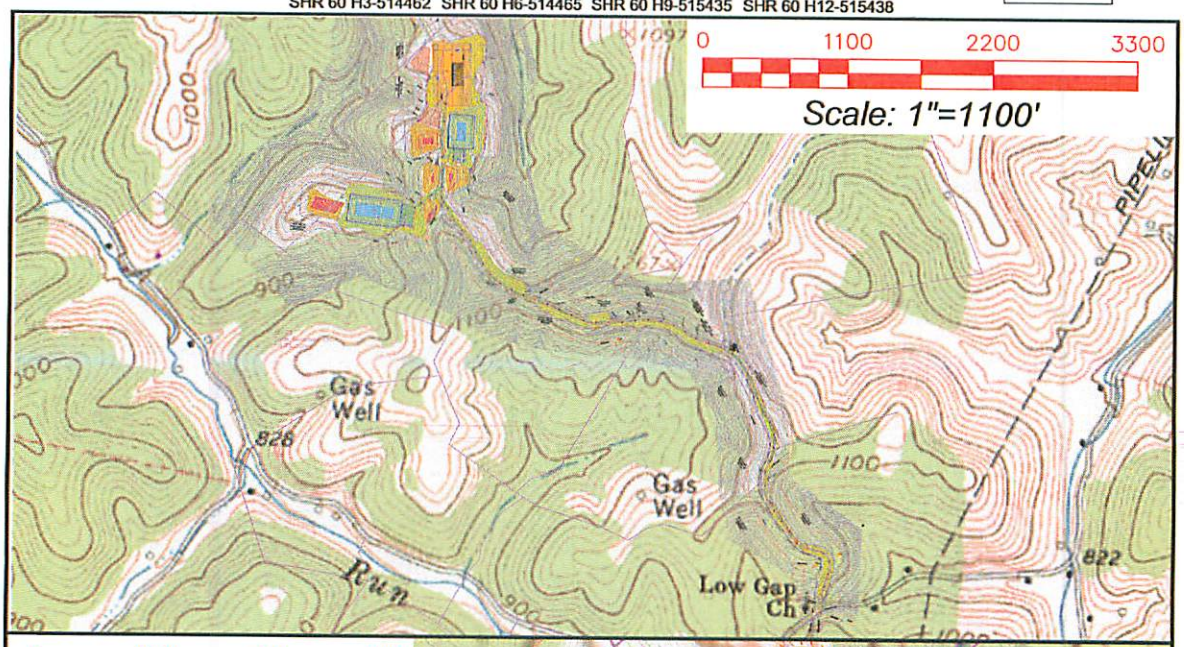
Field Reviewed? (✓) Yes ( ) No

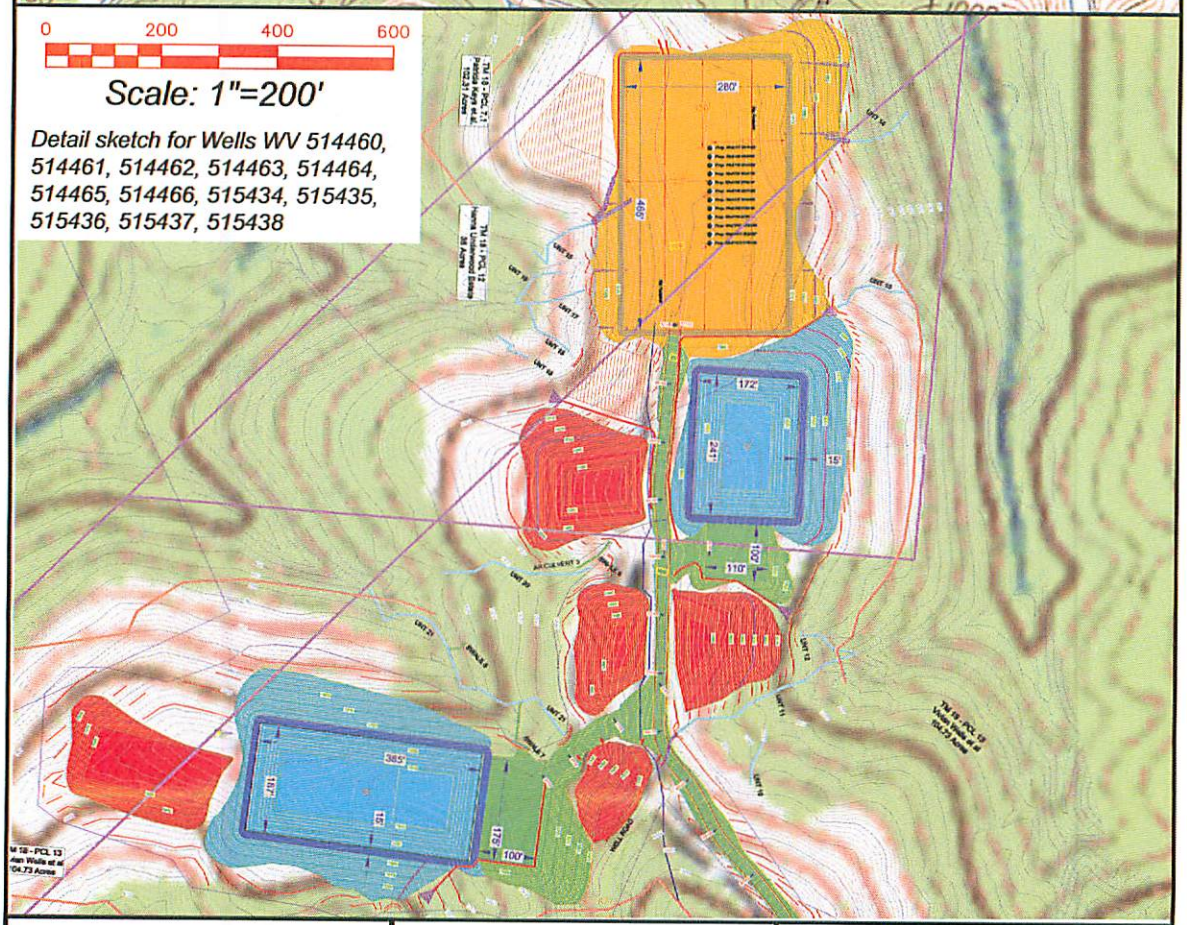
Received
Office of Oil & Gas
JAN 14 2016

4709502257 400

WW-9

SHR 60 H1-514460 SHR 60 H4-514463 SHR 60 H7-514466 SHR 60 H10-515436
SHR 60 H2-514461 SHR 60 H5-514464 SHR 60 H8-515434 SHR 60 H11-515437
SHR 60 H3-514462 SHR 60 H6-514465 SHR 60 H9-515435 SHR 60 H12-515438





Shirley 7.5' USGS QUADRANGLE		Proposed Disturbance Area	
Projected culvert inventory. (for bid purposes only)		Well Site Location	See Site Plan
15" minimum diameter culverts	See Site Plan	Proposed Access Road	See Site Plan
24" minimum diameter culverts	See Site Plan	Approximate Total Disturbance	See Site Plan
DRAWN BY: Dale Tomlin PS	DATE: October 24, 2014	FILE NO. 208-13	DRAWING FILE NO. ACAD-208-13-Rec Plan

Note: SEE SITE PLAN OF SHR 60 FOR COMPLETE GRADING & DRAINAGE CONSTRUCTION INCLUDING EROSION & SEDIMENT CONTROL DETAILS, ETC.

DMH 1-11-16

Received
Office of Oil & Gas
JAN 14 2016

SURVEYING AND MAPPING SERVICES PERFORMED BY:

ALLEGHENY SURVEYS, INC.

1-800-482-8606

Birch River Office
Phone: (304) 649-8606
Fax: (304) 649-8608

237 Birch River Road
P.O. Box 438
Birch River, WV 26610

4709502257 MOP

EQT

Where energy meets innovation.℠

Site Specific Safety Plan

EQT SHR 60 Pad

Shirley
Tyler County, WV

For Wells:

514460 514461 514462 514463 514464 514465 514466

Date Prepared: October 24, 2014

Date Reviewed: December 7, 2015

EQT Production

Permitting Supervisor
Title

1/7/16
Date

Received
Office of Oil & Gas
JAN 14 2016

WV Oil and Gas Inspector

Oil + Gas Inspector
Title

1-11-16
Date

SHR 60
WV 514460
EQT Production Company

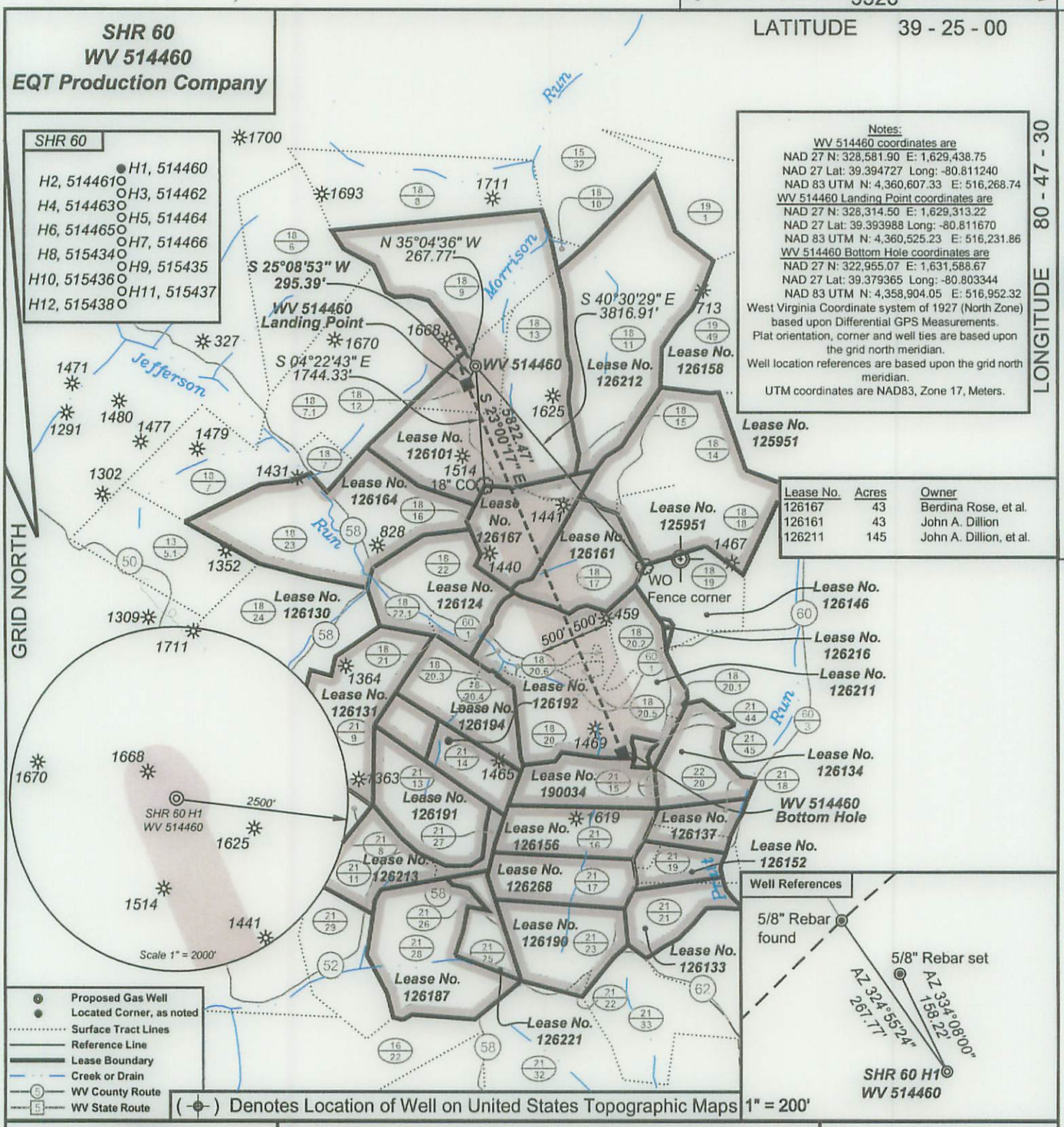
LATITUDE 39 - 25 - 00

LONGITUDE 80 - 47 - 30

5526'

7978'

GRID NORTH



Notes:
WV 514460 coordinates are
NAD 27 N: 328,581.90 E: 1,629,438.75
NAD 27 Lat: 39.394727 Long: -80.811240
NAD 83 UTM N: 4,360,607.33 E: 516,268.74
WV 514460 Landing Point coordinates are
NAD 27 N: 328,314.50 E: 1,629,313.22
NAD 27 Lat: 39.393988 Long: -80.811670
NAD 83 UTM N: 4,360,525.23 E: 516,231.86
WV 514460 Bottom Hole coordinates are
NAD 27 N: 322,955.07 E: 1,631,588.67
NAD 27 Lat: 39.379365 Long: -80.803344
NAD 83 UTM N: 4,358,904.05 E: 516,952.32
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.	Acres	Owner
126167	43	Berdina Rose, et al.
126161	43	John A. Dillion
126211	145	John A. Dillion, et al.

Well References
5/8" Rebar found
5/8" Rebar set
AZ 324°55'24" 267.77'
AZ 334°08'00" 158.22'
SHR 60 H1 WV 514460

ALLEGHENY SURVEYS, INC.

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

Ben R. Singleton LICENSED NO. 2092 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR
SEAL

FILE NO: 208-13
DRAWING NO: 208-13 SHR 60 H1
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: January 5 20 16
OPERATOR'S WELL NO.: 514460
API WELL NO
47 - 95 - 02257
STATE COUNTY PERMIT

WELL TYPE: ☐ OIL ☒ GAS ☐ LIQUID INJECTION ☐ WASTE DISPOSAL
(IF GAS) PRODUCTION: ☐ STORAGE ☐ DEEP ☒ SHALLOW
LOCATION: ELEVATION: Ground 1,018' Proposed 1,011' WATERSHED Morrison Run of McElroy Creek QUADRANGLE: Shirley
DISTRICT: McElroy COUNTY: Tyler
SURFACE OWNER: Vivian J. Wells, et al. ACREAGE: 35.38
ROYALTY OWNER: George Birklein, et al. LEASE NO: 126101 ACREAGE: 240
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 6,596'

WELL OPERATOR: EQT Production Company
ADDRESS: 115 Professional Place PO Box 280
Bridgeport, WV 26330

DESIGNATED AGENT: Rex C. Ray
ADDRESS: 115 Professional Place PO Box 280
Bridgeport, WV 26330

WW-6A1
(5/13)

Operator's Well No. 514460

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	
126101	**George Birklein, et al(current royalty owner)**		**Min 1/8 pd**		
	WM. Blaine Underwood Et ux et al (original lessor)	Equitable Gas Co.		DB186/86	
	Equitable Gas Co.	Equitrans, Inc.		DB274/471	
	Equitrans, Inc./Equitable Gas Company/Equitable Resrouces, Inc.	Equitrans, L.P.		DB433/777	
	Equitrans, L.P.	EQT Production Company		DB396/640	
	Equitrans, L.P.	EQT Production Company		OG420/10	Tyler Co.
5-18-7.1	Brenda J. Ashley, et al	EQT Production Company	N/A	508/181	Subsurface Easement Attached
5-18-7.1	Patricia A. Keys	EQT Production Company	N/A	514/375	Subsurface Easement Attached
5-18-9	Billy Joe Rayburn a/k/a William Joe Rayburn, et al	EQT Production Company	N/A	508/175	Subsurface Easement Attached
5-18-9	Lawrence Rayburn, et al	EQT Production Company	N/A	508/177	Subsurface Easement Attached
126167	**Berdina Rose, et al (current royalty owner)**		**Min 1/8 pd**		
	Savannah Pratt, et al(original lessor)	Equitable Gas Co.		DB192/425	
	Equitable Gas Co.	Equitrans, Inc.		DB274/471	
	Equitrans, Inc./Equitable Gas Company/Equitable Resrouces, Inc.	Equitrans, L.P.		DB433/777	
	Equitrans, L.P.	EQT Production Company		DB396/640	
126161	**John A. Dillion (current royalty owner)**		**Min 1/8 pd**		
	John M. Pierpoint, et al(original lessor)	Equitable Gas Co.		DB192/368	
	Equitable Gas Co.	Equitrans, Inc.		DB274/471	
	Equitrans, Inc./Equitable Gas Company/Equitable Resrouces, Inc.	Equitrans, L.P.		DB433/777	
	Equitrans, L.P.	EQT Production Company		DB396/640	

4709502207 MOV

Received
Office of Oil & Gas
JAN 14 2016

126211	John A. Dillion, et al (current royalty owner)	Min 1/8 pd		
	Mary E. Underwood, et vir (original lessor)	Hope Natural Gas Co.	DB70/477	
	Hope Natural Gas Co.	Consolidated Gas Supply Corp.	DB169/26	
	Consolidated Gas Supply Corp.	Consolidated Gas Transmission Corp.	DB249/287	
	Consolidated Gas Transmission Corp.	CNG Development Co.	DB253/57	
	CNG Development Co.	Dominion Appalachian Development, Inc.	DB337/340	
	Dominion Appalachian Development, Inc.	Consol Gas Appalachian Development, LLC	CB9/131	name change
	Consol Gas Appalachian Development, LLC	CNX Gas Co., LLC	CB9/206	name change
	CNX Gas Co., LLC	EQT Production Co.	DB479/55	
	CNX Gas Co., LLC/Noble Energy, Inc	EQT Production Co.	AB505/222	

Upon information and belief, Operator's lease and/or other real property rights permit it to conduct drilling operations for the subject well in the location shown on the plat, including under any public roads that the well lateral crosses.

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:
Its: Permitting Supervisor

4709502257 MOP

Received
Office of Oil & Gas
JAN 14 2016

4709502257 MGR

Teresea R Hamilton
TYLER County 01:21:34 PM
Instrument No 114424
Date Recorded 11/05/2015
Document Type AGR
Pages Recorded 2
Book-Page 509-181
Recording Fee $5.00
Additional $6.00

115 PROFESSIONAL PLACE PO BOX 280
BRIDGEPORT, WV 26330-0280

MEMORANDUM OF SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT

1. **NAME AND ADDRESS OF GRANTOR:**

   Brenda J. Ashley and Stephen D. Ashley
   1048 Middle Island Road
   Middlebourne, WV 26149

2. **NAME AND ADDRESS OF GRANTEE:**

   EQT Production Company
   625 Liberty Avenue
   Suite 1700
   Pittsburgh, PA 15222

3. **SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT REFERENCE:** A SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT dated the 5th day of October, 2015, was entered into for good and valuable consideration by and between Brenda J. Ashley and Stephen D. Ashley, her husband, ("Grantor", whether one or more) and EQT Production Company ("Grantee").

4. **DESCRIPTION OF PREMISES:** That certain tract or parcel of land containing 102.31 acres, more or less, located on the waters of Jefferson Run in Tyler County, West Virginia, being the same lands conveyed to Grantor by Deed dated the 15th day of October, 1998, of record in the Office of the Clerk of the County Commission of Tyler County, West Virginia in Deed Book 326, at Page 372. ("the Property").

5. **TERM:** The SUBSURFACE RIGHT-OF-WAY AND EASEMENT shall run with the land and shall remain in full force and effect until released and relinquished by the Grantee back to the Grantor, in writing.

(REMAINDER OF PAGE LEFT BLANK INTENTIONALLY)

Received
Office of Oil & Gas
JAN 14 2016

4709502257 MOD

IN WITNESS WHEREOF, the parties have signed their names hereto as of the date of the Agreement referenced in Section 3 above.

GRANTOR:

Brenda J. Ashley

Brenda J. Ashley

Stephen D. Ashley

Stephen D. Ashley

GRANTEE:
EQT Production Company

By: John W. Damato
Its: Attorney in fact

STATE OF WEST VIRGINIA:

COUNTY OF TYLER :

I, John Knopp, a Notary Public, in and for said State and County, do hereby certify that Brenda J. Ashley and Stephen D. Ashley, personally known to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be their free act and deeds for uses and purposes therein set forth.

Given under my hand this 5th day of October, 2015.

My Commission expires: July 25, 2021.

OFFICIAL SEAL
Notary Public, State of West Virginia
JOHN L KNOPP
Box 434 Station Camp Road
Leroy, WV 25252
My commission expires July 25, 2021

Notary Public

STATE OF WEST VIRGINIA ;

COUNTY OF HARRISON :

I, Tina Maxwell, a Notary Public, in and for said State and County, do hereby certify that John W. Damato, personally known to be the same person whose name is subscribed to the foregoing instrument and the Attorney in fact of EQT Production Company, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be his free act and deed for uses and purposes therein set forth on behalf of said company.

Given under my hand this 12th day of October, 2015.

My Commission expires: August 29, 2019

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
TINA MAXWELL
EQT PRODUCTION COMPANY
115 PROFESSIONAL PLACE
BRIDGEPORT, WV 26330
My commission expires August 29, 2019

Notary Public

Received
Office of Oil & Gas
JAN 14 2016

This instrument was prepared by EQT Production Company, 1710 Pennsylvania Avenue, Charleston, WV 25302.

4709502257 MOP

MEMORANDUM OF
SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT

1. **NAME AND ADDRESS OF GRANTOR:**

   Patricia A. Keys
   536 Briarcliff CT
   New Martinsville, WV 26155

2. **NAME AND ADDRESS OF GRANTEE:**

   EQT Production Company
   625 Liberty Avenue
   Suite 1700
   Pittsburgh, PA 15222

3. **SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT REFERENCE:** A SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT dated the 29th day of September, 2015, was entered into for good and valuable consideration by and between Patricia A. Keys, a single woman ("Grantor", whether one or more) and EQT Production Company ("Grantee").

4. **DESCRIPTION OF PREMISES:** That certain tract or parcel of land containing 102.31 acres, more or less, located on the waters of Jefferson Run in Tyler County, West Virginia, being the same lands conveyed to Grantor by Deed dated the 15th day of October, 1998, of record in the Office of the Clerk of the County Commission of Tyler County, West Virginia in Deed Book 326, at Page 372. ("the Property").

5. **TERM:** The SUBSURFACE RIGHT-OF-WAY AND EASEMENT shall run with the land and shall remain in full force and effect until released and relinquished by the Grantee back to the Grantor, in writing.

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115 PROFESSIONAL PLACE PO BOX 280
BRIDGEPORT, WV 26330-0280

Received
Office of Oil & Gas
JAN 14 2016

Teresa R Hamilton
TYLER County 10:47:32 AM
Instrument No 11690
Date Recorded 12/28/2015
Document Type ROW
Pages Recorded 2
Book-Page 514-375
Recording Fee $6.00
Additional $6.00

IN WITNESS WHEREOF, the parties have signed their names hereto as of the date of the Agreement referenced in Section 3 above.

GRANTOR:

Patricia A. Keys

Patricia A. Keys

GRANTEE:
EQT Production Company

mw

By: John W. Damato
Its Attorney in fact

STATE OF WEST VIRGINIA;

COUNTY OF WETZEL:

I, John Knopp, a Notary Public, in and for said State and County, do hereby certify that Patricia A. Keys, a single woman, personally known to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be their free act and deeds for uses and purposes therein set forth.

Given under my hand this 29th day of September, 2015.

My Commission expires: July 25, 2021.

OFFICIAL SEAL
Notary Public, State of West Virginia
JOHN L KNOPP
Box 434 Station Camp Road
Leroy, WV 25252
My commission expires July 25, 2021

Notary Public

STATE OF WEST VIRGINIA ;

COUNTY OF HARRISON :

I, Tina Maxwell, a Notary Public, in and for said State and County, do hereby certify that John W. Damato, personally known to be the same person whose name is subscribed to the foregoing instrument and the Attorney in fact of EQT Production Company, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be his free act and deed for uses and purposes therein set forth on behalf of said company.

Given under my hand this 1st day of October, 2015.

My Commission expires: August 29, 2019

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
TINA MAXWELL
EQT PRODUCTION COMPANY
115 PROFESSIONAL PLACE
BRIDGEPORT, WV 26330
My commission expires August 29, 2019

Tina Maxwell
Notary Public

This instrument was prepared by EQT Production Company, 1710 Pennsylvania Avenue, Charleston, WV 25302.

Received
Office of Oil & Gas
JAN 14 2016

4709502257MOD

Teresea R Hamilton
TYLER County 01:11:26 PM
Instrument No 114420
Date Recorded 11/05/2015
Document Type AGR
Pages Recorded 2
Book-Page 508-175
Recording Fee $5.00
Additional $6.00

MEMORANDUM OF
SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT

115 PROFESSIONAL PLACE PO BOX 280
BRIDGEPORT, WV 26330-0280

1. **NAME AND ADDRESS OF GRANTOR:**

   Billy Joe Rayburn a/k/a William Joe Rayburn and Jackie Jo Rayburn
   3499 State Hwy 2078
   Olive Hill, KY 41164

2. **NAME AND ADDRESS OF GRANTEE:**

   EQT Production Company
   625 Liberty Avenue
   Suite 1700
   Pittsburgh, PA 15222

3. **SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT REFERENCE:** A SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT dated the 28th day of September, 2015, was entered into for good and valuable consideration by and between Billy Joe Rayburn a/k/a William Joe Rayburn and Jackie Jo Rayburn, his wife, ("Grantor", whether one or more) and EQT Production Company ("Grantee").

4. **DESCRIPTION OF PREMISES:** That certain tract or parcel of land containing 100 acres, more or less, located on the waters of Morrisons Run in Tyler County, West Virginia, being the same lands conveyed to Grantor by Deed dated the 21st day of December, 1979, of record in the Office of the Clerk of the County Commission of Tyler County, West Virginia in Deed Book 223, at Page 22. ("the Property").

5. **TERM:** The SUBSURFACE RIGHT-OF-WAY AND EASEMENT shall run with the land and shall remain in full force and effect until released and relinquished by the Grantee back to the Grantor, in writing.

(REMAINDER OF PAGE LEFT BLANK INTENTIONALLY)

Received
Office of Oil & Gas
JAN 14 2016

4709502257 MOD

IN WITNESS WHEREOF, the parties have signed their names hereto as of the date of the Agreement referenced in Section 3 above.

GRANTOR:

Billy Joe Rayburn

Billy Joe Rayburn a/k/a
William Joe Rayburn

Jackie Jo Rayburn

Jackie Jo Rayburn

GRANTEE:
EQT Production Company

By: John W. Damato
Its: Attorney in fact

STATE OF WEST VIRGINIA ;

COUNTY OF CABELL :

I, John Knopp, a Notary Public, in and for said State and County, do hereby certify that Billy Joe Rayburn a/k/a William Joe Rayburn and Jackie Jo Rayburn, his wife, personally known to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be their free act and deeds for uses and purposes therein set forth.

Given under my hand this 28th day of September, 2015.

My Commission expires: July 25, 2021.

OFFICIAL SEAL
Notary Public, State of West Virginia
JOHN L KNOPP
Box 434 Station Camp Road
Leroy, WV 25252
My commission expires July 25, 2021

Notary Public

STATE OF WEST VIRGINIA ;

COUNTY OF HARRISON :

I, Tina Maxwell, a Notary Public, in and for said State and County, do hereby certify that John W. Damato, personally known to be the same person whose name is subscribed to the foregoing instrument and the Attorney in fact of EQT Production Company, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be his free act and deed for uses and purposes therein set forth on behalf of said company.

Given under my hand this 6th day of October, 2015.

My Commission expires: August 29, 2019.

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
TINA MAXWELL
EQT PRODUCTION COMPANY
115 PROFESSIONAL PLACE
BRIDGEPORT, WV 26330
My commission expires August 29, 2019

Tina Maxwell
Notary Public

This instrument was prepared by EQT Production Company, 1710 Pennsylvania Avenue, Charleston, WV 25302.

Received
Office of Oil & Gas
JAN 14 2016

4709502257 Mo

Teresa R Hamilton
TYLER County 01:16:15 PM
Instrument No 114421
Date Recorded 11/05/2015
Document Type AGR
Pages Recorded 2
Book-Page 508-177
Recording Fee $5.00
Additional $6.00

115 PROFESSIONAL PLACE PO BOX 280
BRIDGEPORT, WV 26330-0280

MEMORANDUM OF
SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT

1. **NAME AND ADDRESS OF GRANTOR:**

   Lawrence Rayburn and Shelia Kay Rayburn
   212 Fitch Lane
   Olive Hill, KY 41164

2. **NAME AND ADDRESS OF GRANTEE:**

   EQT Production Company
   625 Liberty Avenue
   Suite 1700
   Pittsburgh, PA 15222

3. **SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT REFERENCE:** A SUBSURFACE RIGHT-OF-WAY AND EASEMENT AGREEMENT dated the 28th day of September, 2015, was entered into for good and valuable consideration by and between Lawrence Rayburn and Shelia Kay Rayburn, his wife, ("Grantor", whether one or more) and EQT Production Company ("Grantee").

4. **DESCRIPTION OF PREMISES:** That certain tract or parcel of land containing 100 acres, more or less, located on the waters of Morrisons Run in Tyler County, West Virginia, being the same lands conveyed to Grantor by Deed dated the 21st day of December, 1979, of record in the Office of the Clerk of the County Commission of Tyler County, West Virginia in Deed Book 223, at Page 22. ("the Property").

5. **TERM:** The SUBSURFACE RIGHT-OF-WAY AND EASEMENT shall run with the land and shall remain in full force and effect until released and relinquished by the Grantee back to the Grantor, in writing.

(REMAINDER OF PAGE LEFT BLANK INTENTIONALLY)

Received
Office of Oil & Gas
JAN 14 2016

4709502257 MOP

IN WITNESS WHEREOF, the parties have signed their names hereto as of the date of the Agreement referenced in Section 3 above.

GRANTOR:

Lawrence Rayburn

Lawrence Rayburn

Shelia Kay Rayburn

Shelia Kay Rayburn

GRANTEE:
EQT Production Company

By: John W. Damato
Its: Attorney in fact

STATE OF WEST VIRGINIA:

COUNTY OF CABELL:

I, John Knopp, a Notary Public, in and for said State and County, do hereby certify that Lawrence Rayburn and Shelia Kay Rayburn, his wife, personally known to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be their free act and deeds for uses and purposes therein set forth.

Given under my hand this 28th day of September, 2015.

My Commission expires: July 25, 2021.

OFFICIAL SEAL
Notary Public, State of West Virginia
JOHN L KNOPP
Box 434 Station Camp Road
Leroy, WV 25252
My commission expires July 25, 2021

Notary Public

STATE OF WEST VIRGINIA ;

COUNTY OF HARRISON :

I, Tina Maxwell, a Notary Public, in and for said State and County, do hereby certify that John W. Damato, personally known to be the same person whose name is subscribed to the foregoing instrument and the Attorney in fact of EQT Production Company, appeared before me this day in person in the State and County aforesaid, and acknowledged and delivered the said instrument to be his free act and deed for uses and purposes therein set forth on behalf of said company.

Given under my hand this 6th day of October, 2015.

My Commission expires: August 29, 2019.

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
TINA MAXWELL
EQT PRODUCTION COMPANY
115 PROFESSIONAL PLACE
BRIDGEPORT, WV 26330
My commission expires August 29, 2019

Notary Public

Received
Office of Oil & Gas
JAN 14 2016

This instrument was prepared by EQT Production Company, 1710 Pennsylvania Avenue, Charleston, WV 25302.