



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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Wednesday, October 24, 2018
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for LEEROY UNIT 2H
47-085-10363-00-00

Modified Lateral Length 7976'

ANTERO RESOURCES CORPORATION

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.

James A. Martin
Chief

Operator's Well Number: LEEROY UNIT 2H
Farm Name: DANIEL M. HAYMOND IV, ET AL
U.S. WELL NUMBER: 47-085-10363-00-00
Horizontal 6A New Drill
Date Modification Issued: October 24, 2018

Promoting a healthy environment.

WW-6B
(04/15)

Permit Modification - API# 47-085-10363 MOD
API NO. 47- 085 - 10363
OPERATOR WELL NO. Leeroy Unit 2H
Well Pad Name: Lettie Pad

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

1) Well Operator: Antero Resources Corporation 494507062 085 - Ritchie Clay Pennsboro 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Leeroy Unit 2H Well Pad Name: Lettie Pad

3) Farm Name/Surface Owner: Daniel M. Haymond IV, et al Public Road Access: Stull Hill Rd.

4) Elevation, current ground: 970' Elevation, proposed post-construction: _____

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

Other _____

(b) If Gas Shallow Deep _____

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 6800' TVD, Anticipated Thickness- 75 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 6800' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 15900' MD

11) Proposed Horizontal Leg Length: 7976'

12) Approximate Fresh Water Strata Depths: 408'

13) Method to Determine Fresh Water Depths: Offset well records. Depths have been adjusted according to surface elevations.

14) Approximate Saltwater Depths: 1760'

15) Approximate Coal Seam Depths: 622'

16) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated

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: _____

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MOD

18)

CASING AND TUBING PROGRAM

TYPE	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	20"	New	H-40	94#	80'	80'	CTS, 77 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	460' *see #19	460' *see #19	CTS, 639 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2500'	2500'	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	23#	15900'	15900'	3965 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

TYPE	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20"	24"	0.438"	1530	50	Class A	~1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730	1000	Class A	~1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	1500	Class A	~1.18
Intermediate							
Production	5-1/2"	8-3/4" & 8-1/2"	0.451"	14,530	2500	Lead-H/POZ & Tail - H	H/POZ~1.44 & H~1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

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

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WW-6B
(10/14)

API NO. 47-085 - 10363

OPERATOR WELL NO. Leeroy Unit 2H

Well Pad Name: Lettie Pad

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

Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale.
*Antero will be air drilling the fresh water string which makes it difficult to determine when fresh water is encountered. Therefore, we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

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

Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

Anticipated Max Pressure - 9300 lbs
Anticipated Max Rate - 80 bpm

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 14.68 Acres

22) Area to be disturbed for well pad only, less access road (acres): 6.68 Acres

23) Describe centralizer placement for each casing string:

Conductor: no centralizers
Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.
Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.
Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

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

Conductor: no additives, Class A cement.
Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake
Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat
Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51
Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

25) Proposed borehole conditioning procedures:

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.
Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.
Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.

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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:

Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Irene Nutter Haymond Trust Lease</u>			
Irene Nutter Haymond Trust	DC Petroleum, Inc.	1/8+	0257/0085
DC Petroleum, Inc.	Antero Resources Appalachian Corporation	Assignment	0257/0763
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Gary R. Davis et ux Lease (4-14)</u>			
Gary R. Davis et ux	Antero Resources Appalachian Corporation	1/8	0263/0651
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Kyser Haymond Jr. et al Lease</u>			
Kysor Haymond Jr. et al	Alton Skinner	1/8	0132/0667
Alton Skinner	Crystal G. Skinner and Desari S. Garrett	Assignment	0216/0391
Crystal G. Skinner and Desari S. Garrett	DC Petroleum, Inc.	Assignment	0247/0245
DC Petroleum, Inc.	Antero Resources Corporation	Partial Assignment	0290/0926
<u>Myron Perkins et ux Lease</u>			
Myron Perkins et ux	Antero Resources Appalachian Corporation	1/8+	0262/0549
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Helen N. McCullough Lease</u>			
Helen N. McCullough	Alton Skinner	1/8	0135/0328
Alton Skinner	Crystal G. Skinner & Desari S. Garrett	Assignment	0245/0010
Crystal G. Skinner & Desari S. Garrett	DC Petroleum, Inc.	Assignment	0247/0245
DC Petroleum, Inc.	Antero Resources Appalachian Corporation	Partial Assignment	0254/0133
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Norman Fleming Lease</u>			
Norman Fleming	DC Petroleum, Inc.	1/8	0254/1053
DC Petroleum, Inc.	Antero Resources Appalachian Corporation	Partial Assignment	0259/0862
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Ricky McCullough Lease</u>			
Ricky McCullough	Antero Resources Corporation	1/8+	0280/0117
<u>Emerson McCullough et al Lease</u>			
Emerson McCullough et al	Alton Skinner	1/8	0176/0360
Alton Skinner	Crystal G. Skinner and Desari S. Garrett	Assignment	0216/0391
Crystal D. Skinner & Desari S. Garrett	DC Petroleum, Inc.	Assignment	0247/0245
DC Petroleum, Inc.	Antero Resources Appalachian Corporation	Partial Assignment	0254/0133
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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JUL 23 2018
WV Department of Environmental Protection

*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>L.S. Taggart et al Lease</u>			
L.S. Taggart et al	Alton Skinner	1/8	0131/0508
Alton Skinner	Chase Petroleum Inc	Assignment	0142/0171
Chase Petroleum, Inc	Antero Resources Appalachian Corporation	Partial Assignment	0254/0133
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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WV Department of
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WW-6A1
(5/13)

Operator's Well No. Leeroy Unit 2H

**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)**

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- (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
<u>Gene P. Bond Lease</u>	Gene P. Bond	Drilling Appalachia Corporation	1/8	0213/0368
	Drilling Appalachia Corporation	Dominion Appalachian Development Properties LLC	Assignment	0225/0391
	Dominion Appalachian Development Properties LLC	Consol Gas Appalachian Development Properties, Inc	Name Change	0006/0523
	Consol Gas Appalachian Development Properties, Inc	Console Gas Reserves, Inc	Merger	0006/0543
	Console Gas Reserves, Inc	Consol Gas Company	Merger	0005/0555
	Consol Gas Company	CNX Gas Company	Name Change	0006/634
	CNX Gas Company	Antero Resources Corporation	Partial Assignment	0281/0631

*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

**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: Antero Resources Corporation
 By: Kevin Kilstrom
 Its: Senior VP of Production

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WV Department of
Environmental Protection

FORM WW-6A1
EXHIBIT 1

4708910363

MoA

FILED

JUN 10 2013

Natalie E. Tennant,
Secretary of State
1900 Kanawha Blvd E
Bldg 1, Suite 157-K
Charleston, WV 25305



Penney Barker, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvros.com
E-mail: business@wvros.com

APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY

Office Hours: Monday - Friday
8:30 a.m. - 5:00 p.m. ET

FILE ONE ORIGINAL
(Two if you want a filed
stamped copy returned to you)
FEE: \$25.00

**** In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby ****
applies for an Amended Certificate of Authority and submits the following statement:

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
- Date Certificate of Authority was issued in West Virginia: 6/26/2008
- Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)
- Other amendments: _____
(attach additional pages if necessary)

6. Name and phone number of contact person. (This is optional; however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)

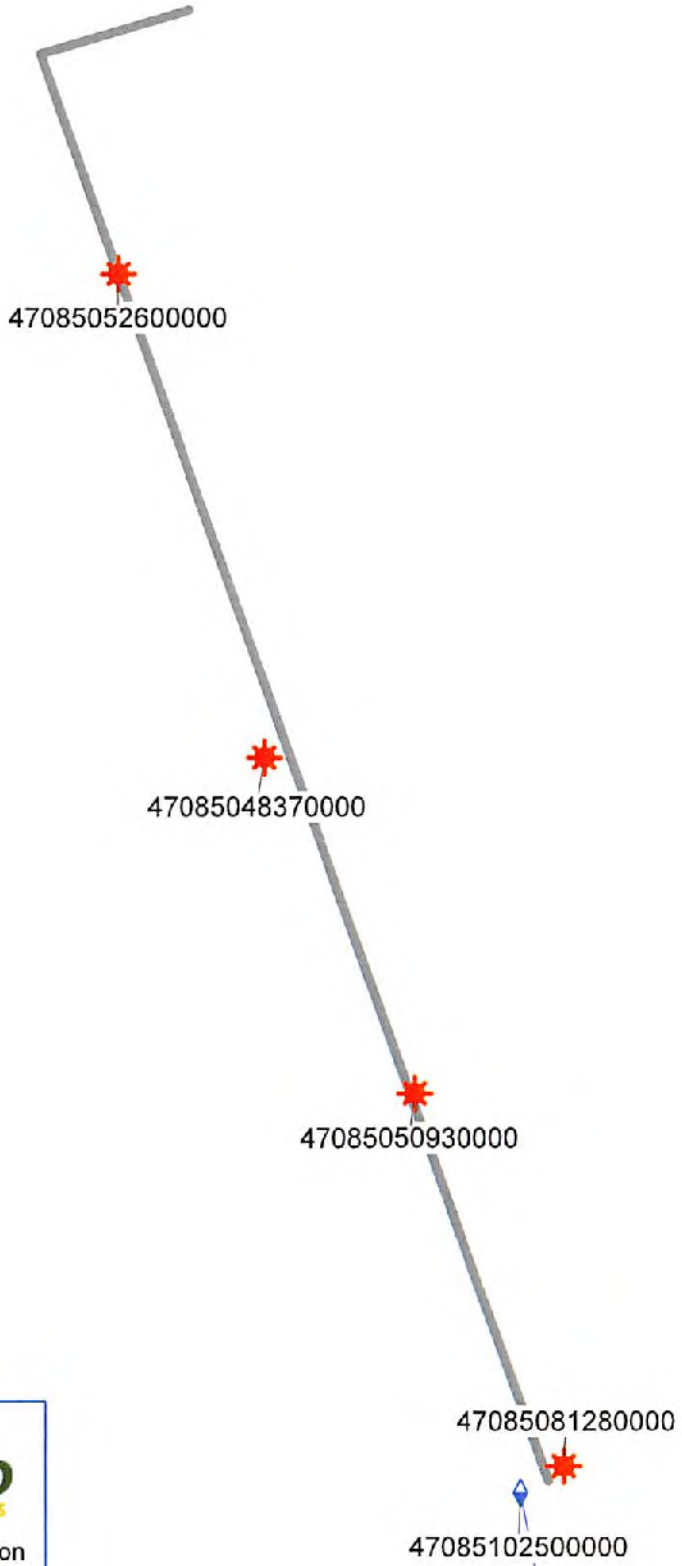
Alvyn A. Schopp (303) 367-7310
Contact Name Phone Number

7. Signature Information (See below **Important Legal Notice Regarding Signature**):

Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person

Signature: *Alvyn A. Schopp* Date: June 10, 2013

Important Legal Notice Regarding Signature For West Virginia Code 33D-1-129. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.



Antero Resources Corporation

Leeroy Unit 2H - AOR



WELL SYMBOLS
Gas Well
Waiting on Completion

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WV Department of
Environmental Protection

UWI (APINum)	Well Name	Well Number	Operator	Hist Oper	TD	Perforated Interval MD (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
47085052600000	HAYMOND W M JR ETAL	1	ABARTA O&G CO INC	CHASE PETROLEUM CO	5,206	4,038 - 4,391	Riley, Benson, Alexander	Warren, Gordon, Baltown
47085081280000	BOND GENE PAUL ETAL	BOND2	CONSOL GAS COMPANY	DAC CORP	5,372	4,526 - 5,203	Riley, Benson, Alexander	Warren, Gordon, Baltown
47085048370000	MCCULLOUGH BEN ETAL	4	ABARTA O&G CO INC	CHASE PETROLEUM CO	5,410	4,494 - 5,168	Riley, Benson, Alexander	Warren, Gordon, Baltown
47085050930000	GRIFFIN HEIRS ET AL	4	ABARTA O&G CO INC	CHASE PETROLEUM CO	5,990	4,472 - 5,290	Riley, Benson, Alexander	Warren, Gordon, Baltown
47085102500000	NILEY UNIT	1H	ANTERO RESOURCES CORPORATION	ANTERO RESOURCES CORPORATION	14297	N/A	Marcellus Fm	N/A

WV Department of
Environmental Protection

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10,075' TO TOP HOLE

LATITUDE 39°22'30"

8,125'

LATITUDE 39°22'30"

LONGITUDE 80°52'30"

LONGITUDE 80°52'30"

11,463' TO BOTTOM HOLE

Antero Resources Corporation Well No. Leeroy Unit 2H

NOTES:
WELL 2H TOP HOLE INFORMATION:
 N: 318,127ft E: 1,601,181ft
 LAT: 39°21'53.46" LON: 80°54'38.29"
BOTTOM HOLE INFORMATION:
 N: 310,332ft E: 1,603,011ft
 LAT: 39°20'36.71" LON: 80°54'13.43"
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER. 2H TOP MAPPING GRADE GPS UNIT. HOLE PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 2H TOP HOLE INFORMATION:
 N: 4,357,278m E: 507,713m
BOTTOM HOLE INFORMATION:
 N: 4,354,913m E: 508,310m



TM-Per	Surface Owner	Book/Pg	Acres
04-09	Christin Hayward	346/484	111.48 AC
04-10	Perkins Oil & Gas Inc.	316/683	73.168 AC
04-10.1	Perkins Oil & Gas Inc.	316/760	0.996 AC
04-10.2	Perkins Oil & Gas Inc.	316/760	19.772 AC
04-11.1	Marcy Richards	297/256	1.695 AC
04-11.2	Tommy Richmond	305/257	1.65 AC
04-13	Antero Resources Corp.	341/928	1.25 AC
04-13.1	Trustees North Fork Blg	124/569	1 AC
04-14	Jacob Cox	340/525	9.747 AC
04-14.3	Reilly McClain	286/361	1 AC
04-15	Christopher Haymond	214/99	1.33 AC
04-16	Charles Stull	193/778	1 AC
04-22	Donald Fraso	262/167	42.22 AC
04-22.1	Jacob Cox	340/525	5.91 AC
04-23	Mary Lou Dawson	285/268	0.781 AC
04-25	Dina Roland	297/27	1.12 AC
04-26	Gregory Bar	302/552	0.709 AC
04-27	Perkins Oil & Gas Inc.	303/653	29.589 AC
04-27.1	Perkins Oil & Gas Inc.	303/653	0.79 AC
04-31	Myron Perkins	186/821	1.39 AC
04-31.1	Bern Mesweld Sr.	316/1040	90.656 AC
04-32	Gary Bishop	339/45	4.7 AC
04-35	Gary Bishop	339/43	24.256 AC
04-35.1	Leola Jans	309/603	23.424 AC
04-36	William Shriver	185/415	21.4 AC
04-39	Scott Leggett	346/291	0.79 AC
04-43	Walter Fleming	280/373	4.66 AC
04-43.1	Scott Leggett	346/291	0.829 AC
04-44	Donald Morrison	154/251	1.25 AC
04-47	Shella Taylor	316/853	6.07 AC
04-47.1	William Shriver	185/415	8.5 AC
04-50	Jenna Mahoney	287/216	5 AC
04-51	Jacob Cox	340/525	2.2 AC
09-01	Jenna Mahoney	277/655	147.83 AC
09-03	Matthew Washington	306/138	39.66 AC
09-17	Rosette Holmes	253/451	
09-19	Reyer Scott	290/625	66 AC
09-20	Walter Smartycha	317/89	70.5 AC
09-21	Ray Robinson	176/817	36 AC
09-24	Ray Robinson Jr.	227/652	67.25 AC
09-27	Jeremy Lemp	255/929	0.789 AC

LINE	BEARING	DIST.
L1	N 44°29' W	1030.7'
L2	N 58°42' W	1467.2'
L3	S 33°14' W	908.2'
L4	S 14°39' W	747.3'
L5	S 04°35' W	1820.0'
L6	S 04°09' W	1253.8'
L7	N 74°14' E	1942.9'

Royalty Owner

A	The Irene Nutter Haymond Trust
B	Blair Ellis
C	Gary R. Davis Et Ux
D	Gary R. Davis Et Ux
E	Icyar Haymond Jr. Et Al
F	Mary Lou Dawson
G	Charles E. Stull Et Ux
H	Condice Winsler Nigallan
I	Condice Winsler Nigallan
J	Myron Perkins Et Ux
K	Helen N. McCullough
L	Norman Fleming
M	Ricky McCullough
N	Emerson McCullough Et Al
O	L. S. Taggart Et Al
P	Union Bank of Morrisville
Q	Gene P. Bond
R	H. K. Haymond Et Al

WV NORTH ZONE
GRID NORTH



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 RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

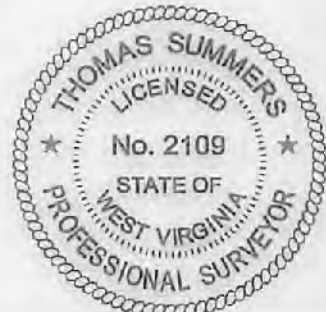


STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

(NAD) 27 (UTM) ZONE 17 COORDS:
WELL 2H TOP HOLE INFORMATION:
 N: 14,294,790ft E: 1,665,674ft
POINT OF ENTRY INFORMATION:
 N: 14,294,533ft E: 1,664,938ft
BOTTOM HOLE INFORMATION:
 N: 14,287,090ft E: 1,667,634ft

NOTE:
NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.



JOB # 17-014WA	LEGEND	REFERENCES
DRAWING # LEEROY2HR	--- Surface Owner Boundary Lines +/-	STAKE/NAIL, SET
SCALE 1" = 2000'	- - - Interior Surface Tracts +/-	
MINIMUM DEGREE OF ACCURACY SUBMETER	X Existing Fence	
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS	⊕ Found monument, as noted	STAKE/NAIL, SET
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS	<i>Thomas Summers</i>	1" = 400'
	THOMAS SUMMERS P.S. 2109	1" = 400'
	DATE 07/18/18	
	OPERATOR'S WELL# LEEROY UNIT #2H	

WELL TYPE: OIL ___ GAS LIQUID INJECTION ___ WASTE DISPOSAL ___ 47 - 085 - 10363

(IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW STATE COUNTY PERMIT

LOCATION: ELEVATION 970' - AS BUILT WATERSHED NORTH FORK HUGHES RIVER

QUADRANGLE PENNSBORO 7.6 DISTRICT CLAY COUNTY RITCHIE

SURFACE OWNER DANIEL M. HAYMOND IV ET AL ACREAGE 111.48 ACRES +/-

OIL & GAS ROYALTY OWNER THE IRENE NUTTER HAYMOND TRUST; GARY R. DAVIS ET UX; LEASE ACREAGE 375 AC±; 10.25 AC±; KYSOR HAYMOND JR. ET AL; MYRON PERKINS ET UX; HELEN N. McCULLOUGH; NORMAN FLEMING; 8.5 AC±; 1.42 AC±; 103 AC±; 49.5 AC±; RICKY McCULLOUGH; EMERSON McCULLOUGH ET AL; L. S. TAGGART ET AL; GENE P. BOND 9.92 AC±; 154 AC±; 151 AC±; 70.5 AC±

PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER REDRILL ___ FRACTURE OR STIMULATE PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD-BHL PLUG & ABANDON CLEAN OUT & REPLUG

TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,800' TVD 15,900' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM

ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD

FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT

10,075' TO TOP HOLE

LATITUDE 39°22'30"

Antero Resources Corporation Well No. Leeroy Unit 2H

NOTES: WELL 2H TOP HOLE INFORMATION: N: 318,127ft E: 1,601,181ft... BOTTOM HOLE INFORMATION: N: 310,332ft E: 1,603,011ft...

(NAD) 83 (UTM) ZONE 17 COORDS: WELL 2H TOP HOLE INFORMATION: N: 4,357,278m E: 507,713m...



Table with 4 columns: Well No., Surface Owner, Book/Pg, Acreage. Lists various land parcels and owners such as Christina Hayward, Parkline Oil & Gas Inc., etc.

Table with 3 columns: LINE, BEARING, DIST. Lists boundary lines L1 through L7 with bearings and distances.

Table with 2 columns: Royalty Owner, Name. Lists royalty owners like The Irene Nutter Hayward Trust, Glen Ellis, etc.



WE CERTIFY THAT THIS PLAT IS CORRECT AND TRUE TO THE BEST OF OUR KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW...



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

WILLOW LAND SURVEYING PLLC 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

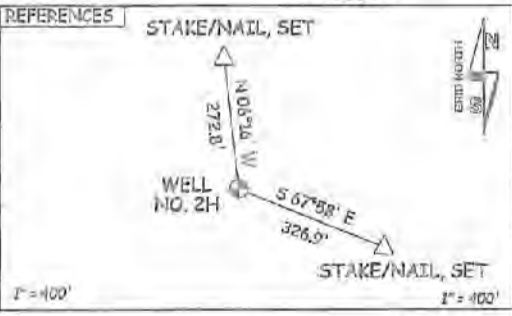
(NAD) 27 (UTM) ZONE 17 COORDS: WELL 2H TOP HOLE INFORMATION: N: 14,294,790ft E: 1,665,674ft...

NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY...



JOB # 17-014WA DRAWING # LEROY2HR SCALE 1" = 2000' MINIMUM DEGREE OF ACCURACY SUBMETER...

LEGEND: Surface Owner Boundary Lines +/- Interior Surface Tracts +/- Existing Fence Found monument, as noted. Signature of Thomas Summers.



WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL 47 - 085 - 10383 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X STATE COUNTY PERMIT LOCATION: ELEVATION 970' - AS BUILT WATERSHED NORTH FORK HUGHES RIVER QUADRANGLE PENNSBORO 7.7 DISTRICT CLAY COUNTY RITCHIE SURFACE OWNER DANIEL M. HAYMOND IV ET AL ACREAGE 111.48 ACRES +/- OIL & GAS ROYALTY OWNER THE IRENE NUTTER HAYMOND TRUST; GARY R. DAVIS ET UX; LEASE ACREAGE 375 AC +/-; 10.25 AC +/-; KYSOR HAYMOND JR. ET AL; MYRON PERKINS ET UX; HELEN N. McCULLOUGH; NORMAN FLEMING; 8.5 AC +/-; 1.42 AC +/-; 103 AC +/-; 49.5 AC +/-; RICKY McCULLOUGH; EMERSON McCULLOUGH ET AL; L. S. TAGGART ET AL; GENE P. BOND 9.92 AC +/-; 154 AC +/-; 151 AC +/-; 70.5 AC +/- PROPOSED WORK: DRILL CONVERT DRILL DEEPER X REDRILL FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD-BHL PLUG & ABANDON CLEAN OUT & REPLUG TARGET FORMATION MARCELLUS ESTIMATED DEPTH 8,800' TVD 15,900' MD WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD DENVER, CO 80202 CHARLESTON, WV 25313

LETTIE WELL PAD & WATER CONTAINMENT PAD AS-BUILT EROSION CONTROL IMPROVEMENTS

LOCATION COORDINATES:

ACCESS ROAD ENTRANCE
LATITUDE: 39.385306 LONGITUDE: -80.912305 (NAD 83)
N 4357319.87 E 507554.43 (UTM ZONE 17 METERS)

CENTER OF TANK
LATITUDE: 39.385734 LONGITUDE: -80.912124 (NAD 83)
N 4357367.42 E 507559.98 (UTM ZONE 17 METERS)

CENTROID OF PAD
LATITUDE: 39.384936 LONGITUDE: -80.910350 (NAD 83)
N 4357378.99 E 507732.90 (UTM ZONE 17 METERS)

GENERAL DESCRIPTION:

THE ACCESS ROAD(S), WATER CONTAINMENT PAD, AND WELL PAD HAVE BEEN CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

FLOODPLAIN NOTES:

THE SITE IS LOCATED WITHIN FEMA FLOOD ZONE "X" PER FEMA FLOOD MAP #54085C0125C.

MISS UTILITY STATEMENT:

ANTERO RESOURCES CORPORATION HAS NOTIFIED MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN; TICKET #1419246536. IN ADDITION, MISS UTILITY WAS CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

ENTRANCE PERMIT:

ANTERO RESOURCES CORPORATION HAS OBTAINED AN ENCROACHMENT PERMIT (FORM MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

ENVIRONMENTAL NOTES:

STREAM AND WETLAND DELINEATIONS WERE PERFORMED IN MAY 2014, JULY 2014, & OCTOBER 2016 BY K.C. HARVEY ENVIRONMENTAL, LLC TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE OCTOBER 31, 2016 DESIGN OVERVIEW MAP WAS PREPARED BY K.C. HARVEY ENVIRONMENTAL, LLC AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE MAP DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP.

GEOTECHNICAL NOTES:

A SUBSURFACE INVESTIGATION OF THE SITE WAS PERFORMED BY PENNSYLVANIA SOIL & ROCK, INC. BETWEEN FEBRUARY 11, 2015 & FEBRUARY 25, 2015. THE REPORT PREPARED BY PENNSYLVANIA SOIL & ROCK, INC. DATED MARCH 27, 2015 REVISED JANUARY 31, 2017, REFLECTS THE RESULTS OF THE SUBSURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WERE USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SUBSURFACE INVESTIGATION REPORT BY PENNSYLVANIA SOIL & ROCK, INC. FOR ADDITIONAL INFORMATION, AS NEEDED.

PROJECT CONTACTS:

OPERATOR:

ANTERO RESOURCES CORPORATION
535 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE: (304) 842-4100
FAX: (304) 842-4102

ELI WAGONER - ENVIRONMENTAL ENGINEER
OFFICE: (304) 842-4058 CELL: (304) 475-9770

JON MCEVERS - OPERATIONS SUPERINTENDENT
OFFICE: (303) 367-6799 CELL: (303) 808-2423

AARON KUNZLER - CONSTRUCTION SUPERVISOR
CELL: (405) 227-8344

ROBERT B. WIRKS - FIELD ENGINEER
OFFICE: (304) 842-4100 CELL: (304) 627-7405

CHARLES E. COMPTON, III - SURVEYING COORDINATOR
CELL: (304) 719-6449

RICHARD LYLES - LAND AGENT
CELL: (770) 378-8833

ENGINEER/SURVEYOR:

NAVITUS ENGINEERING, INC.
CYRUS S. KUMP, PE - PROJECT MANAGER/ENGINEER
OFFICE: (866) 662-4185 CELL: (540) 886-6747

ENVIRONMENTAL:

KC HARVEY ENVIRONMENTAL, LLC
SHANNON THOMPSON - STAFF SCIENTIST
OFFICE: (740) 373-1970 CELL: (970) 398-8250

GEOTECHNICAL:

PENNSYLVANIA SOIL & ROCK, INC.
CHRISTOPHER W. SAMIOS - PROJECT ENGINEER
OFFICE: (412) 372-4000 CELL: (412) 589-0662

RESTRICTIONS NOTES:

1. THERE ARE NO LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE WELL PAD AND LOD. THERE ARE WETLANDS & PERENNIAL STREAMS ADJACENT TO THE STAGING AREA & WATER CONTAINMENT PAD THAT HAS REMAINED UNDISTURBED.
2. THERE ARE NO NATURALLY PRODUCING TROUT STREAMS WITHIN 300 FEET OF THE WELL PAD AND LOD.
3. THERE ARE NO GROUNDWATER INTAKE OR PUBLIC WATER SUPPLY FACILITIES WITHIN 1000 FEET OF THE WELL PAD AND LOD.
4. THERE ARE NO APPARENT EXISTING WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE WELL(S) BEING DRILLED.
5. THERE ARE NO OCCUPIED DWELLING STRUCTURES WITHIN 625 FEET OF THE CENTER OF THE WELL PAD.
6. THERE ARE NO AGRICULTURAL BUILDINGS LARGER THAN 2,500 SQUARE FEET WITHIN 625 FEET OF THE CENTER OF THE WELL PAD.

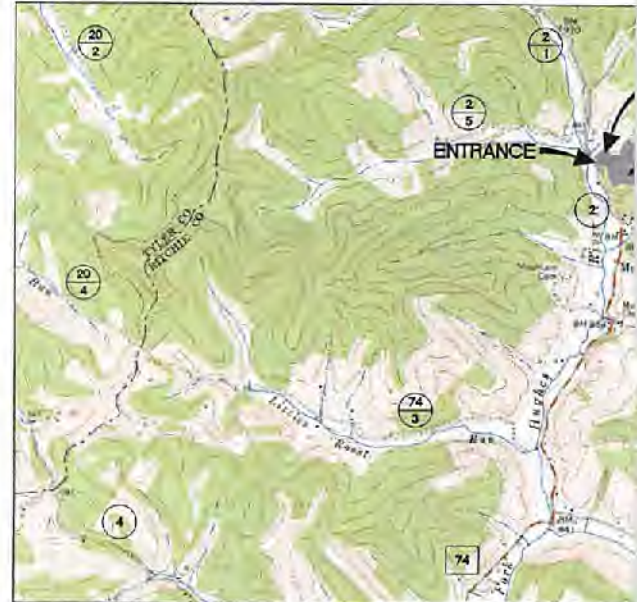
REPRODUCTION NOTE

THESE PLANS WERE CREATED TO BE PLOTTED ON 22"x34" (ANSI B) PAPER. HALF SCALE DRAWINGS ARE ON 11"x17" (ANSI B) PAPER.

THESE PLANS WERE CREATED FOR COLOR PLOTTING AND ANY REPRODUCTIONS IN GRAY SCALE OR COLOR MAY RESULT IN A LOSS OF INFORMATION AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

CLAY DISTRICT, RITCHIE COUNTY
CABIN RUN-NORTH FORK HUGHES

USGS 7.5 PENNSBORO



WEST VIRGINIA COUNTY MAP



(NOT TO SCALE)

AS-BUILT CERTIFICATIONS:

THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS CRS 36-8.

WATER CONTAINMENT PAD & SEDIMENT CONTROL PLAN

JUL 23 2018

WV Department of
Environmental Protection

SHEET INDEX:

- 1 - COVER SHEET
- 2 - LEGEND
- 3 - OVERALL PLAN SHEET INDEX
- 4 - ACCESS ROAD, WELL PAD, & WATER CONTAINMENT PAD AS-BUILT PLAN
- 5 - ACCESS ROAD AS-BUILT PROFILE, WELL PAD, WATER CONTAINMENT PAD, & STOCKPILE AS-BUILT SECTIONS

CLAY COUNTY, WEST VIRGINIA
RIVER WATERSHED
ROAD MAP



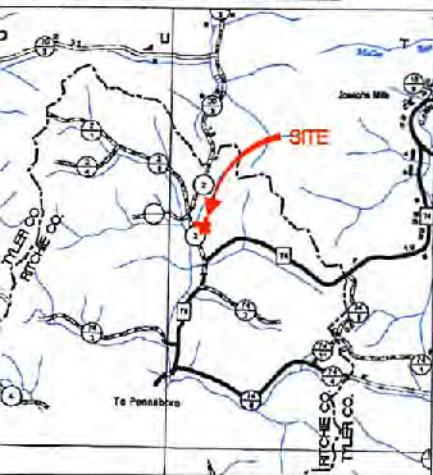
WEST VIRGINIA STATE PLANE COORDINATE SYSTEM
NORTH ZONE, NAD83
ELEVATION BASED ON NAVD83
ESTABLISHED BY SURVEY GRADE GPS & OPUS
POST-PROCESSING

LETTIE LIMITS OF DISTURBANCE AREA (AC)	
Total Site	
Access Road "A" (554')	1.94
Access Road "B" (37')	0.05
Staging Area	1.14
Well Pad	6.86
Water Containment Pad	1.47
Excess/Topsoil Material Stockpiles	3.22
Total Affected Area	14.68
Total Wooded Acres Disturbed	
	12.34
Impacts to Christopher K. Haymond TM 4-09	
Access Road "A" (487')	1.70
Access Road "B" (24')	0.02
Staging Area	1.14
Well Pad	6.86
Water Containment Pad	0.76
Excess/Topsoil Material Stockpiles	3.22
Total Affected Area	13.70
Total Wooded Acres Disturbed	
	12.25
Impacts to Michael D. Hammett TM 4-13	
Access Road "A" (67')	0.24
Access Road "B" (13')	0.03
Water Containment Pad	0.71
Total Affected Area	0.98
Total Wooded Acres Disturbed	
	0.09

NAVITUS
ENERGY ENGINEERING

Telephone: (888) 662-4185 | www.NavitusEng.com

WVDOH COUNTY ROAD MAP



Proposed Well Name	WV North NAD 27	WV North NAD 83	UTM (METERS) Zone 17	NAD 83 Lat & Long
Leeroy Unit 1H	N 318123.36 E 1601170.59	N 318162.77 E 1569729.51	N 4357278.66 E 507709.97	LAT 39-21-53.796 LONG -80-54-37.6009
Leeroy Unit 2H	N 318127.48 E 1601180.55	N 318161.85 E 1569739.47	N 4357278.44 E 507713.01	LAT 39-21-53.7510 LONG -80-54-37.6740
Leeroy Unit 3H	N 318126.58 E 1601190.51	N 318160.98 E 1569749.43	N 4357278.22 E 507715.05	LAT 39-21-53.7437 LONG -80-54-37.5470
Master Unit 1H	N 318125.67 E 1601200.47	N 318160.08 E 1569759.39	N 4357278.00 E 507719.09	LAT 39-21-53.7354 LONG -80-54-37.4200
Master Unit 2H	N 318124.77 E 1601210.43	N 318159.19 E 1569769.35	N 4357277.78 E 507722.13	LAT 39-21-53.7291 LONG -80-54-37.2930
Master Unit 3H	N 318123.88 E 1601220.39	N 318158.29 E 1569779.31	N 4357277.55 E 507725.17	LAT 39-21-53.7218 LONG -80-54-37.1660
Hayes Unit 1H	N 318122.98 E 1601230.35	N 318157.40 E 1569789.27	N 4357277.33 E 507728.21	LAT 39-21-53.7145 LONG -80-54-37.0390
Hayes Unit 2H	N 318122.09 E 1601240.31	N 318156.50 E 1569799.23	N 4357277.11 E 507731.24	LAT 39-21-53.7072 LONG -80-54-36.9121
Christopher Unit 1H	N 318121.19 E 1601250.27	N 318155.61 E 1569809.19	N 4357276.89 E 507734.28	LAT 39-21-53.6999 LONG -80-54-36.7851
Christopher Unit 2H	N 318120.29 E 1601260.23	N 318154.71 E 1569819.15	N 4357276.67 E 507737.32	LAT 39-21-53.6926 LONG -80-54-36.6581
Christopher Unit 3H	N 318119.40 E 1601270.19	N 318153.82 E 1569829.11	N 4357276.44 E 507740.36	LAT 39-21-53.6852 LONG -80-54-36.5311
Well Pad Elevation	970.0			

NOTES:

1. ALL BMP'S MUST REMAIN IN PLACE AND FUNCTIONAL UNTIL ALL AREAS WITHIN THE LIMIT OF DISTURBANCE ARE COMPLETE AND PERMANENTLY STABILIZED. MAINTENANCE MUST INCLUDE INSPECTION OF ALL EROSION AND SEDIMENT CONTROLS AFTER EACH RUNOFF EVENT IN EXCESS OF 0.5" AND ON A BIWEEKLY BASIS.
2. THE CONSTRUCTION SITE SHOULD BE STABILIZED AS SOON AS POSSIBLE AFTER COMPLETION. ESTABLISHMENT OF FINAL STABILIZATION MUST BE INITIATED NO LATER THAN 7 DAYS AFTER REACHING FINAL GRADE. FINAL STABILIZATION MEANS THAT ALL SOIL-DISTURBING ACTIVITIES ARE COMPLETED, AND THAT EITHER A PERMANENT VEGETATIVE COVER WITH A DENSITY OF 70% OR GREATER HAS BEEN ESTABLISHED OR THAT THE SURFACE HAS BEEN STABILIZED BY HARD COVER SUCH AS PAVEMENT OR BUILDINGS. IT SHOULD BE NOTED THAT THE 70% REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT JUST A PERCENT OF THE SITE.
3. ALL PERMANENT SEDIMENT CONTROL MEASURES CAN BE REMOVED AFTER THE SITE IS PERMANENTLY STABILIZED AND APPROVAL IS RECEIVED FROM THE WVDEP.
4. ANY AREAS DISTURBED BY REMOVAL OF CONTROLS SHALL BE REPAIRED, STABILIZED, AND PERMANENTLY SEEDED.
5. THE AS-BUILT INFORMATION SHOWN HEREON REFLECTS FIELD DATA COLLECTED RELATING TO THE FINAL GRADING OF THE DISTURBED AREA AS OF MARCH 15, 2018. NAVITUS ENGINEERING IS NOT RESPONSIBLE FOR ANY CHANGES MADE TO THE SITE AFTER THE ABOVE MENTIONED DATES.
6. THE EXISTING CONTAINMENT BERM AROUND THE WELL PAD SHALL BE REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS
7. THE EXISTING EGREGESSES TO THE WELL PAD SHALL HAVE THE MOUNTABLE BERMS REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS.

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

DATE	REVISION



THIS DOCUMENT
WAS PREPARED FOR:
ANTERO RESOURCES
CORPORATION

COVER SHEET
LETTIE
WELL PAD & WATER CONTAINMENT PAD
CLAY DISTRICT
RITCHIE COUNTY, WEST VIRGINIA



DATE: 03/28/2018
SCALE: AS SHOWN
SHEET 1 OF 5

LEGEND

LEGEND		
EX. INDEX CONTOUR & CONTOUR LABEL		PR. INDEX CONTOUR
EX. INTERMEDIATE CONTOUR		PR. INTERMEDIATE CONTOUR
EX. PROPERTY LINE		PR. INTERMEDIATE CONTOUR
EX. TOP OF BERM		PR. INDEX ROAD
EX. ROAD EDGE OF GRAVEL/DIRT		PR. INTERMEDIATE CONTOUR
EX. ROAD EDGE OF PAVEMENT		PR. PADS/STOCK PILES
EX. ROAD CENTERLINE		PERMITTED LIMIT
EX. GUARDRAIL		MODIFICATION LINE
EX. BRIDGE		PR. ROAD/IMPROVEMENT
EX. DITCHLINE/DRAINAGE FEATURE		PR. ROAD CENTERLINE
EX. RIP-RAP		PR. GUARDRAIL
EX. CULVERT		PR. ROCK CONSTRUCTION
EX. TREELINE		PR. AIR BRIDGE
EX. BUILDING		PR. CULVERT
EX. MISCELLANEOUS FEATURE		PR. DITCH
EX. 100 YR FEMA FLOODPLAIN		PR. RIP-RAP TRAIL
EX. DELINEATED STREAM		PR. OUTLET PROTECTION
EX. DELINEATED WETLAND/POND		PR. DIVERSION
100' WETLAND/STREAM BUFFER		PR. ROCK LEVEL
STREAM/WETLAND DELINEATION STUDY AREA		PR. COMPOST FENCE
EX. FENCELINE		PR. SUPER SILT FENCE
EX. GATE		PR. WELL HEAD
EX. PERIMETER SAFETY FENCE		PR. PAD DEWATERING
EX. ACCESS GATE WITH EMERGENCY LIFELINE		PR. TOP OF PAD
EX. WELL HEAD ON DESIGNED PAD		PR. 220' X 320'
EX. GAS WELL		PR. SPOT SHOT
EX. PIPELINE		PR. PERIMETER
EX. PIPELINE R/W		PR. ACCESS GATE
EX. PIPELINE METER		PR. PIPELINE
EX. PIPELINE VALVE		PR. PIPELINE R/W
EX. PIT		PR. OVERHEAD UTILITY
EX. OVERHEAD UTILITY		PR. POWER POLE
EX. POWER POLE/GUY WIRE		PR. OVERHEAD UTILITY
EX. UNDERGROUND ELECTRIC		PR. WATERLINE
EX. UNDERGROUND TELEPHONE		BORING LOCATION
EX. UNDERGROUND FIBER OPTIC		X-SECTION/PROTECTION
EX. UTILITY R/W		X-SECTION/PROTECTION
EX. WATERLINE		X-SECTION/PROTECTION
EX. WATER WELL/EX. SPRING		X-SECTION/PROTECTION
EX. COMPOST SOCK		X-SECTION/PROTECTION
EX. SUPER SILT FENCE		X-SECTION/PROTECTION
EX. SILT FENCE		MATCHLINE
APPROX. LOCATION OF SLIDE AREA		EX. METER
APPROX. LOCATION OF BORROW/ SPOIL AREA		EX. TANK
PR. TOE BENCH		EX. COMBUSTOR
EX. APPROX. SURFACE & SUB-SURFACE ELECTRIC LINE AREA		EX. GPU
EX. APPROX. SURFACE & SUB-SURFACE DUMP LINE AREA		EX. SEPARATOR
EX. APPROX. SURFACE & SUB-SURFACE WELL LINE AREA		EX. VRT
EX. APPROX. SURFACE & SUB-SURFACE SALES LINE AREA		EX. KNOCK-OUT

CONTOUR (10' INTERVAL) & CONTOUR LABEL		1000
CONTOUR (2' INTERVAL)		
CONTOUR (1' INTERVAL)		
CONTOUR (10' INTERVAL) & CONTOUR LABEL		1000
ROAD CONTOUR (2' INTERVAL)		
PILE TOPO LIMITS		
LIMITS OF DISTURBANCE		
LIMITS OF DISTURBANCE		
EXISTING EDGE OF GRAVEL		
LINE		
CONSTRUCTION ENTRANCE		
PEZONDAI DITCH		
SECTION		
SPREADER		
WATER SOCK		
FENCE		
IRIGATING SYSTEM		
CONTAINMENT BERM		
PAD FOOTPRINT		1000 x
SAFETY FENCE		
WITH EMERGENCY LIFELINE		
UTILITY		
UTILITY GUY WIRE		
UTILITY R/W		
GRID INDEX		
GRID INTERMEDIATE		
PROPOSED GRADE		
EXISTING GRADE		
WATER SURFACE		
CULVERT		
EX. STAIRS/CATWALK		
EX. DEWATERING SYSTEM		
EX. PIG LAUNCHER		
EX. SECONDARY CONTAINMENT		
EX. ABOVE-GND VAPOR LINE		
EX. ESD		
EX. MAILBOX		
EX. CONTROL PT.		
EX. MUSTER AREA		

REVISION	DATE



LEGEND

LETTIE

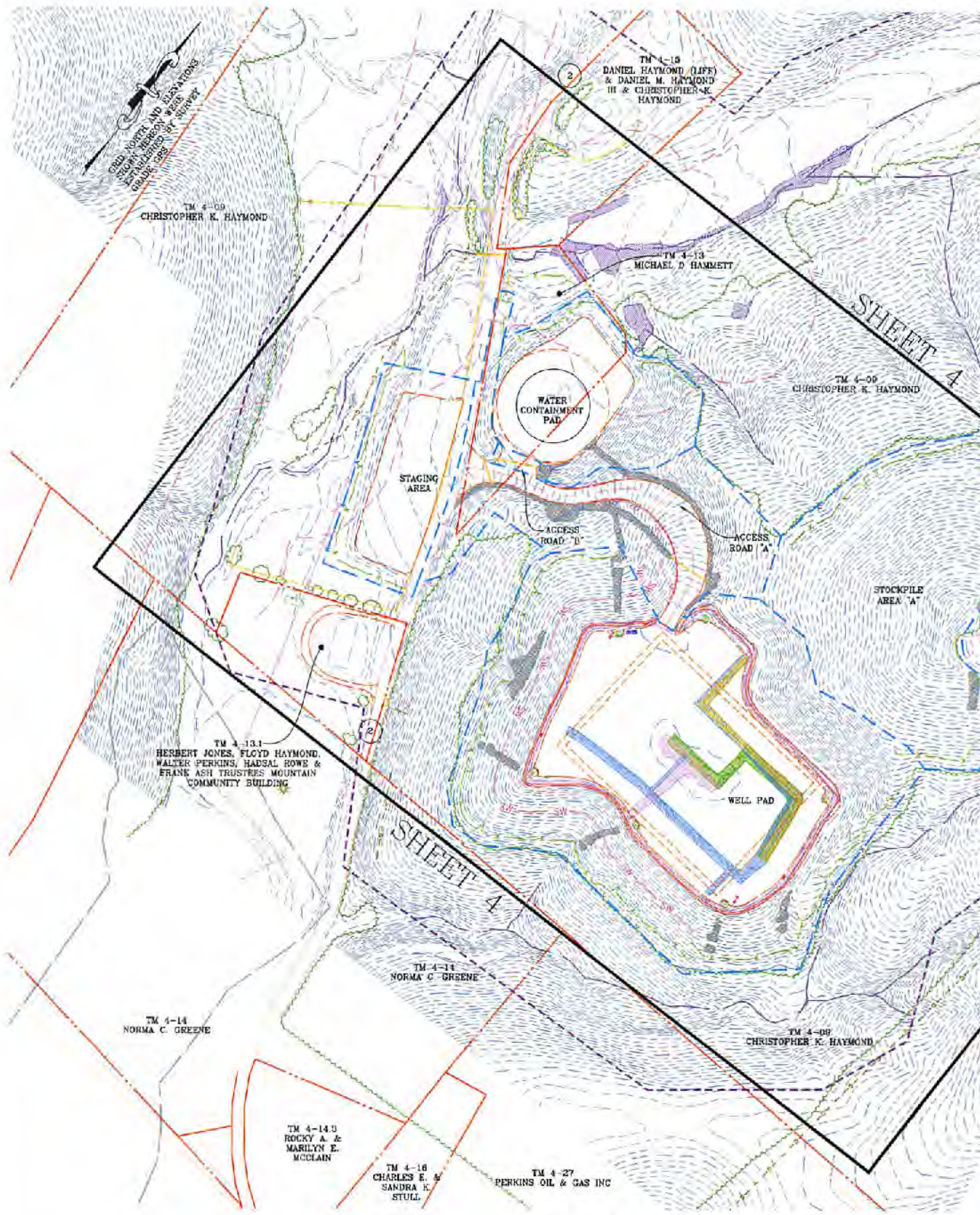
WELL PAD & WATER CONTAINMENT PAD
CLAY DISTRICT
RITCHIE COUNTY, WEST VIRGINIA



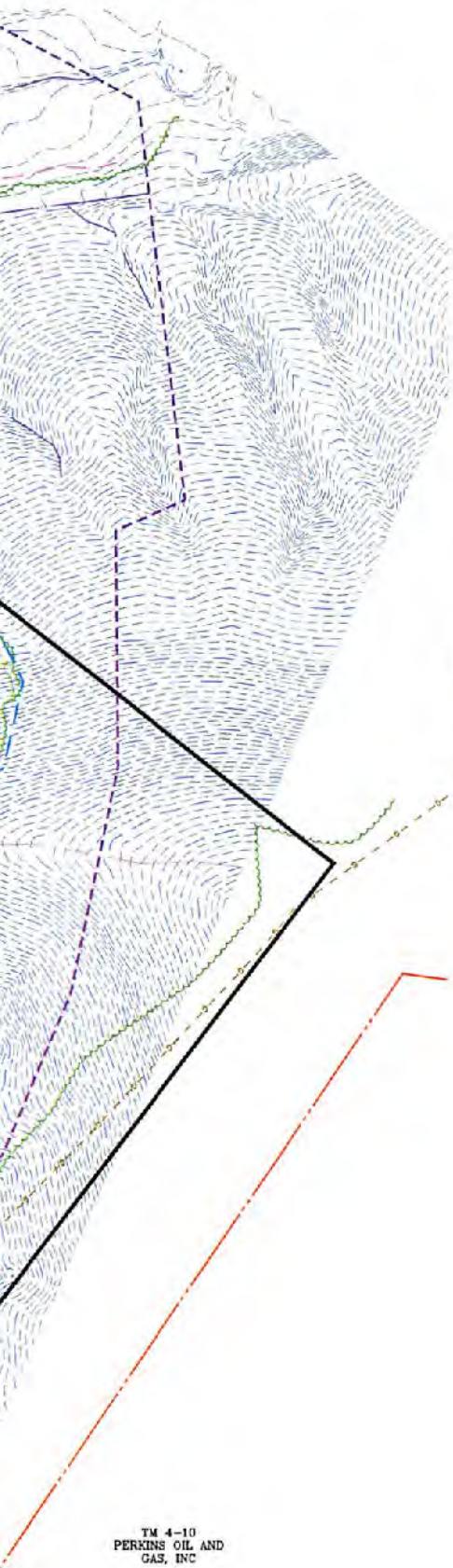
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Office of Oil and Gas
JUL 23 2018
WV Department of
Environmental Protection

DATE: 03/26/2018
SCALE: N/A
SHEET 2 OF 5

OVERALL PLAN S



SHEET INDEX



GENERAL NOTES:

1. THE TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON APRIL 6, 2014 AERIAL PHOTOGRAPHY COMPILED MAY, 2014 BY BLUE MOUNTAIN AERIAL MAPPING, BURTON, WEST VIRGINIA.
2. AS-BUILT INFORMATION SHOWN HEREON IS BASED ON FIELD SURVEY PERFORMED BY NAVITUS ENGINEERING, INC. IN BETWEEN SEPTEMBER 11, 2017 & MARCH 15, 2017.
3. THE PROPERTY LINES SHOWN HEREON DO NOT REPRESENT A BOUNDARY SURVEY ON ANY OF THE PARCELS SHOWN. PROPERTY CORNERS AND LINES PERTINENT TO WELL LOCATION ARE BASED ON A FIELD SURVEY. THE REMAINDER OF THE PROPERTY LINES ARE BASED ON COUNTY REAL ESTATE TAX MAPS, GIS INFORMATION AND DEEDS OF RECORD.
4. UTILITIES AND THEIR LOCATIONS AS SHOWN HEREON ARE BASED ON: A) OBSERVABLE EVIDENCE OF THOSE VISIBLE, ABOVE-GROUND FACILITIES, FEATURES, AND MARKERS WHICH WERE FOUND ON THE SUBJECT PROPERTY AT THE TIME OF SURVEY PERFORMED BY NAVITUS ENGINEERING AND B) FIELD MARKINGS PLACED BY UTILITY COMPANIES IN RESPONSE TO THE WV 811 TICKET SUBMITTED BY NAVITUS ENGINEERING. NAVITUS ENGINEERING CANNOT GUARANTEE THE ACCURACY OF THE UTILITY MARKINGS PERFORMED BY OTHERS OR THAT ALL UTILITIES EXISTING WITHIN THE LIMITS OF THIS PLAN ARE SHOWN. ANY UTILITIES ENCOUNTERED SUBSEQUENT TO PLAN APPROVAL OR DURING CONSTRUCTION THAT ARE NOT SHOWN ON THE PLAN SHOULD BE REPORTED TO NAVITUS ENGINEERING AND ANTERO RESOURCES CORPORATION.

TM 4-10
PERKINS OIL AND
GAS, INC

RECEIVED
Office of Oil and Gas

JUL 23 2018

WV Department of
Environmental Protection



REVISION

DATE



THIS DOCUMENT
WAS PREPARED FOR:
ANTERO RESOURCES
CORPORATION

OVERALL PLAN SHEET INDEX

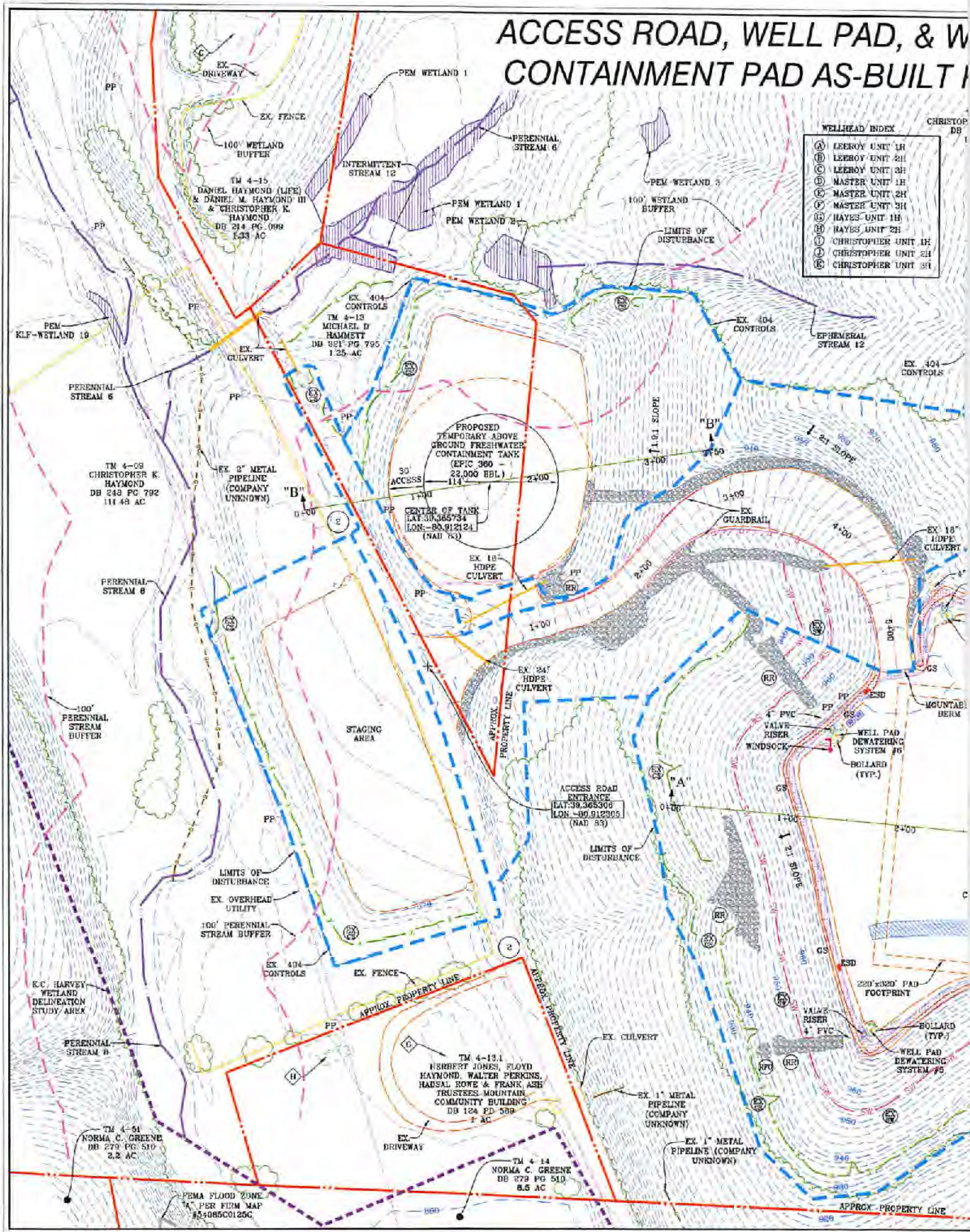
LETTIE

WELL PAD & WATER CONTAINMENT PAD
CLAY DISTRICT
RITCHIE COUNTY, WEST VIRGINIA



DATE: 03/26/2018
SCALE: 1" = 100'
SHEET 3 OF 5

ACCESS ROAD, WELL PAD, & W CONTAINMENT PAD AS-BUILT I



WELLHEAD INDEX

(A)	LEEROY UNIT 1H
(B)	LEEROY UNIT 2H
(C)	LEEROY UNIT 3H
(D)	MASTER UNIT 1H
(E)	MASTER UNIT 2H
(F)	MASTER UNIT 3H
(G)	HAYES UNIT 1H
(H)	HAYES UNIT 2H
(I)	CHRISTOPHER UNIT 1H
(J)	CHRISTOPHER UNIT 2H
(K)	CHRISTOPHER UNIT 3H

CHRISTOPHER UNIT 1H

CHRISTOPHER UNIT 2H

CHRISTOPHER UNIT 3H

MASTER UNIT 1H

MASTER UNIT 2H

MASTER UNIT 3H

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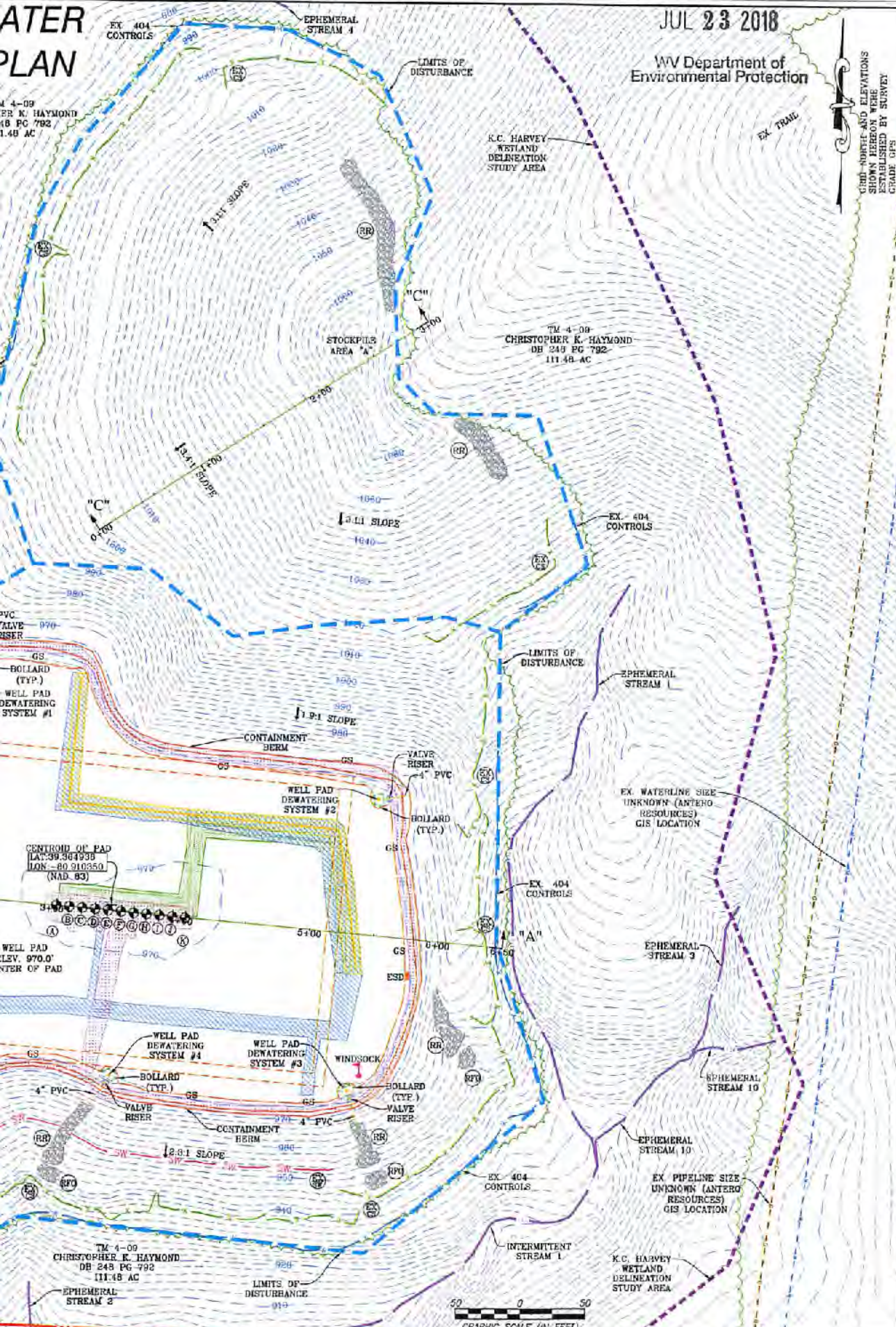
CHRISTOPHER UNIT 3H

JUL 23 2018

WV Department of
Environmental Protection

WATER PLAN

TM 4-09
CHRISTOPHER K. HAYMOND
DB 243 PG 792
111.48 AC



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

NAVITUS
ENERGY ENGINEERING

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DATE	REVISION

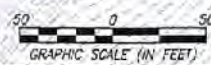
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CORPORATION

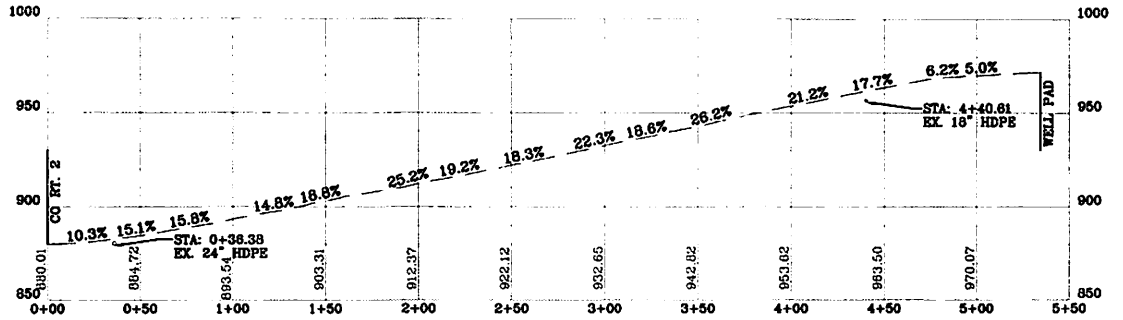
ACCESS ROAD, WELL PAD, & WATER
CONTAINMENT PAD AS-BUILT PLAN
LETTIE
WELL PAD & WATER CONTAINMENT PAD
CLAY DISTRICT
RITCHIE COUNTY, WEST VIRGINIA

Professional Engineer Seal: Chris B. King, Registered Professional Engineer, State of West Virginia, No. 8278, expires 02/25/2018.

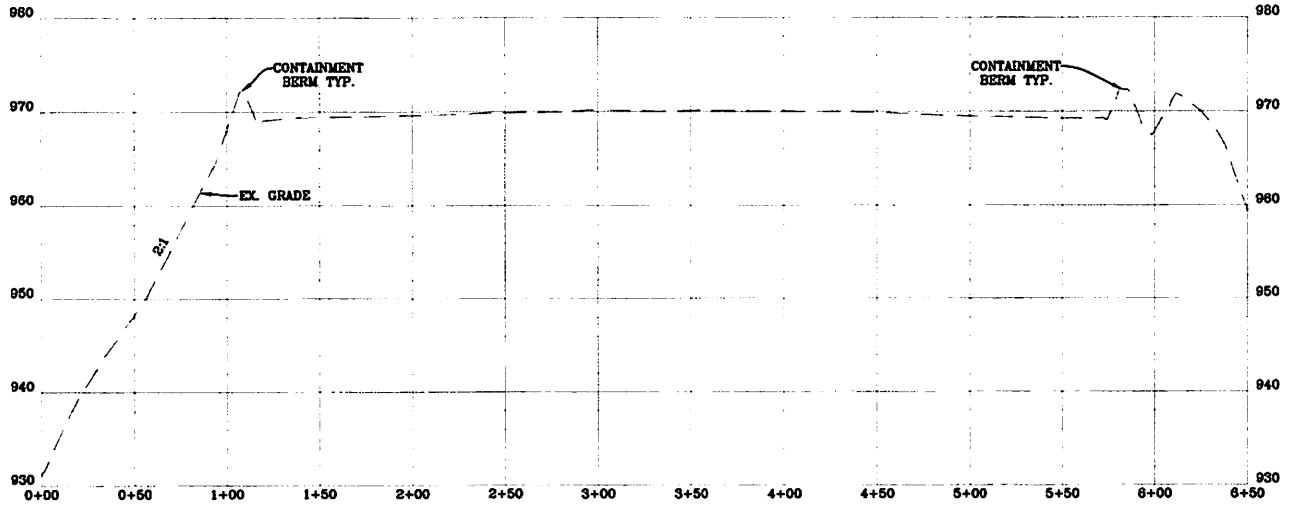
DATE: 03/25/2018
SCALE: 1" = 50'
SHEET 4 OF 5



ACCESS ROAD AS-BUILT PROFILE CONTAINMENT PAD, & STOCKPI

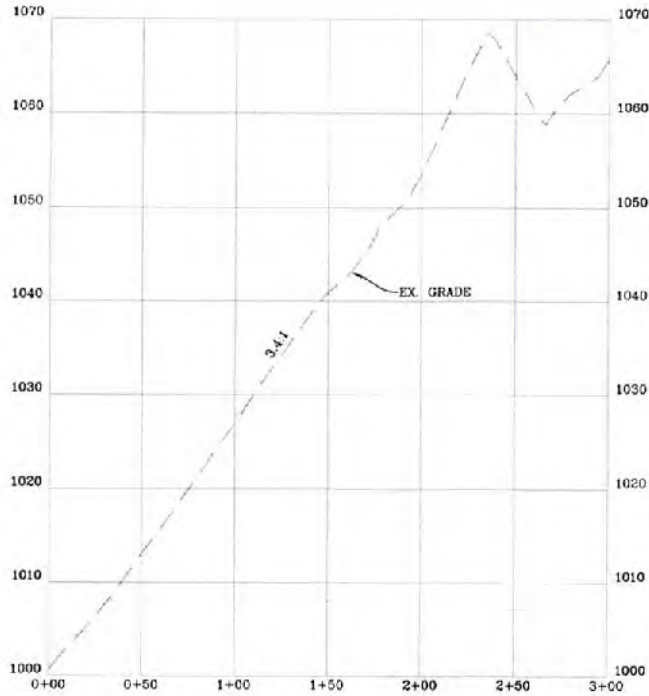


ACCESS ROAD "A" AS-BUILT PROFILE
SCALE: HORIZ. 1" = 50' VERT. 1" = 50'



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

PROFILE, WELL PAD, WATER CONTAINMENT PAD AS-BUILT SECTIONS



STOCKPILE AREA "A" AS-BUILT CROSS-SECTION "C-C"

SCALE: HORIZ. 1" = 50' VERT. 1" = 10'

RECEIVED
Office of Oil and Gas

JUL 23 2018

WV Department of
Environmental Protection

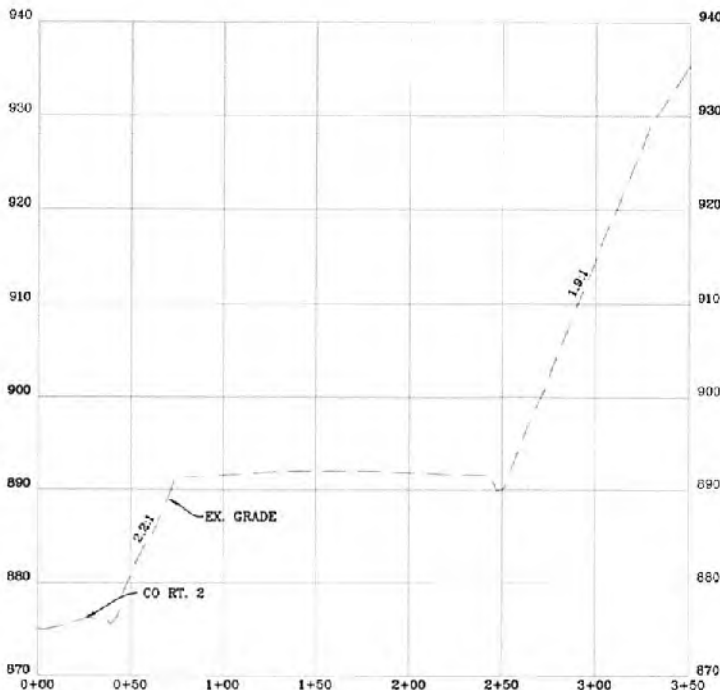


REVISION

DATE



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CORPORATION



WATER CONTAINMENT PAD AS-BUILT CROSS-SECTION "B-B"

SCALE: HORIZ. 1" = 50' VERT. 1" = 10'

ACCESS ROAD AS-BUILT PROFILES, WELL PAD,
WCP, & STOCKPILE AS-BUILT SECTIONS
LETTIE
WELL PAD & WATER CONTAINMENT PAD
CLAY DISTRICT
RITCHIE COUNTY, WEST VIRGINIA



DATE: 03/26/2018

SCALE: AS SHOWN

SHEET 5 OF 5