

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

September 25, 2012

WELL WORK PERMIT Horizontal 6A Well

This permit, API Well Number: 47-8509978, issued to ANTERO RESOURCES APPALACHIAN CORPORATION, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, well operators report of well work, is to be submitted to this office within 90 days of completion of drilling, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact the at (304) 926-0499 ext. 1654.

James Martin Chief

Operator's Well No: PULLMAN UNIT 2H

Farm Name: CAMPBELL, JOHN A. & LINDA J.

API Well Number: 47-8509978

Permit Type: Horizontal 6A Well

Date Issued: 09/25/2012

Promoting a healthy environment.

85-9978

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

- 1. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
- 2. No clearing debris shall be buried.
- 3. Final Site Design, Construction Plan along with Erosion and Sediment Control Measures shall at minimum, use the Best Management Practices found in The West Virginia Erosion and Sediment Control Field Manual dated May 2012.
- 4. The contractor shall do in place density tests **every lift** on all fill material, with a minimum of two tests per lift per acre of fill. Every lift must pass a 95% compaction based on the standard proctor density test of the actual soils used in specific engineered sites
- 5. The contractor may <u>not</u> proof-roll the soil in lieu of standard proctor testing.
- 6. Permanent stabilization shall be applied to areas that are to be left dormant for more than <u>six</u> (6) months.

WW - 6B (1/12) API#85-09978

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

1) Well Operator: Antero Resources Appalachian Corporation	494488557	085- Ritchie	Union	Pullman 7.5'
	Operator ID	County	District	Quadrangle
2) Operator's Well Number: Pullman Unit 2H		Well Pad Nam	le: John Campbell	North Pad
3 Elevation, current ground:	Elevation, proposed	post-construc	tion:	1014
4) Well Type: (a) Gas Other (b) If Gas: Shallow Horizontal	Deep			
5) Existing Pad? Yes or No: No				
6) Proposed Target Formation(s), Depth(s), Anticipated Thickness- 50' feet, Associated Marcellus Shale: 6,800' TVD, Anticipated Thickness- 50' feet, Associated Marcellus Shale: 6,800' TVD 7) Proposed Total Vertical Depth: 8) Formation at Total Vertical Depth: 9) Proposed Total Measured Depth: 10) Approximate Fresh Water Strata Depths: 11) Method to Determine Fresh Water Depth: 12) Approximate Saltwater Depths: 13) Approximate Coal Seam Depths: 14) Approximate Depth to Possible Void (coal minute) Describe proposed well work: 15) Does land contain coal seams tributary or adjated Describe proposed well work: 17) Describe fracturing/stimulating methods in detanter plans to pump Slickwater into the Marcellus Shale formation in ord water and sand, with less than 1 percent special-purpose additives as should be special purpose additives as should be special pur	Pressure- 3,000# Shale 192', 230', 338' Offset well records lable ne, karst, other): cent to, active mine? fracture a new horizontal shallo tail: er to ready the well for production	None anticipate No w well and complete	ad Marcellus Shale	
19) Total area to be disturbed including mode ato	almila anan mita ata	(
18) Total area to be disturbed, including roads, sto		` ,	9.98 acres	
19) Area to be disturbed for well pad only, less acc	cess road (acres):	2.65 acres Office	AUG 22 20 Onmental	as n2 ient of protection

85-9978

20)

CASING AND TUBING PROGRAM

ТҮРЕ	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	New	H-40	94#	40'	40'	CTS
Fresh Water	13-3/8"	New	J-55	54.5#	405'	405'	CTS, 563 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2510'	2510'	CTS,1022 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	13500'	13500'	3311 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7300'	
Liners						=======================================	

TYPE	Size	Wellbore Diameter	<u>Wall</u> <u>Thickness</u>	Burst Pressure	Cement Type	Cement Yield
Conductor	20"	24"	0.438"	1530	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	Class A	1.18
Intermediate						
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12630	Lead-H/POZ & Tal! - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11200		
Liners						

PACKERS

Kind:	
Sizes:	THE GAS
Depths Set:	of Oil and

05/31/2024

21) 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.

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

Conductor: no additives, grout cement.

Surface: Class A cement with 2% calcium and 1/4 lb flake, 5 gallons of clay treat

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

23) 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 logal 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.

AND 22 2012

AND 22 2012

AND PRITTED TO THE PROPERTY OF THE P

WW-9 Rev. 1/12 API No. 47 - 085 - 9778
Operator's Well No. Pullman Unit 2H

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

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

Operator Name Antero Resource	es Appalachian Corporation	OP Cod	e 494488557
Watershed Left Fork		Quadrangle Pullman 7.5'	
Elevation 1014	County_Ritchle	Distri	ict Union
Description of anticipated Pit	Waste: Drilling and Flowback Fluids	and Cuttings	
Do you anticipate using more	than 5,000 bbls of water to compl	lete the proposed well work?	Yes X No
	in the pit? Yes]		
Proposed Disposal Method Fo	or Treated Pit Wastes: nd Application	:	
	derground Injection (UIC Permi		ADM will be presided as Few 1452.04
	f Site Disposal (Meadowfill Landfil		. API# will be provided on Form WR-34)
	ner (Explain	11 CHMR #5 W1 -1032-701	
	ici (Expiani		
Drilling medium anticipated f	or this well? Air, freshwater, oil	based, etc. Surface - Air/Freshwater, Init	ermediate - Dust/Stiff Foem, Production - Water Based Mud
_	pe? Synthetic, petroleum, etc. N/		
Additives to be used? Please	See Attachment		
Will closed loop system be us	ed ? Yes		
Drill cuttings disposal method	l? Leave in pit, landfill, removed	offsite, etc. Removed offsite a	nd taken to landfill
	n to solidify what medium will be		
-Landfill or offsite n	ame/permit number? Meadowfill La	ndfill (Permit #SWF-1032-98)	
or regulation can lead to enform a certify under penal application form and all attact the information, I believe the	recement action. Alty of law that I have personall himents thereto and that, based on at the information is true, accurating the possibility of fine of the company of the possibility of the possibili	y examined and am familia my inquiry of those individute, and complete. I am aw	general permit and/or other applicable law ar with the information submitted on this uals immediately responsible for obtaining are that there are significant penalties for
Company Official Title	оппольной пробото		CENED
Subscribed and sworn before	me this 29 th day of	June N	otary Public AUG 27 2012
My commission expires	07/20/2014	OTAQ	environmental Projection

Property Boundary		Diversion 44		
Road		Spring	○ →	
Existing Fence		- Wet Spot	Ö	
Planned Fence		_ Drain Pipe w/ size in inches ———		
Stream	~~~~~		(12)	
Open Ditch		_ Waterway —		
Rock	ට පිරිදුර			
North	↑	Artificial Filter Strip XX Pit: Cut Walls	en Tro	
Buildings		Pit: Compacted Fill Wal	В	
Water Wells	⊗ ⊕	Area for Land Application	Martinge	
Drill Sites New Pad (2 65) + New I	Frac Pit 1 (3.12)+ New Access Roads	of Pit Weste	ilea († 10) = 0.09. Acms	
	tment: Acres Disturbed 9.95			
		Prevege	tation pH by O would result all of flas When 2 You per	cent area
Lime 4	Tons/acre or to correct to p	H 6.5	less them 2 How per	a dell
Fertilizer (10-20-20	or equivalent) 500	os/acre (500 lbs minimum)		• 2
Mulch 2-3	Tons	/acre Hay or straw or Wood Fib	er (will be used where needed)	
		eed Mixtures		
		eed Mixtures		
As Seed Type	rea I <u>(Temporary)</u> lbs/acre	Seed Type	Area Il (Permanent) bs/acre	
Tall Fescue	45	Tall Fescue	45	
			45	
Perennial Rye Grass	20	Perennial Rye Grass		
	pit and proposed area for land ap	plication.		
Photocopied section of invol	lved 7.5' topographic sheet.			
	1			
Plan Approved by:	and who	u		
Comments:			THEN	
	•		Office of Oil & Gas	
Title: and ag	as inspuld	Date: 8-20	and the	f
Field Reviewed?	Yes () No	W Departmento	Chon
			Environmenta. Pole	

Daw Wan 8-20-12



85-9978

Well Site Safety Plan Antero Resources

Well Name: Campbell Unit 1H, Campbell Unit 2H, Pullman Unit 1H and Pullman Unit 2H

Pad Location: JOHN CAMPBELL NORTH PAD

Ritchie County/ Union District

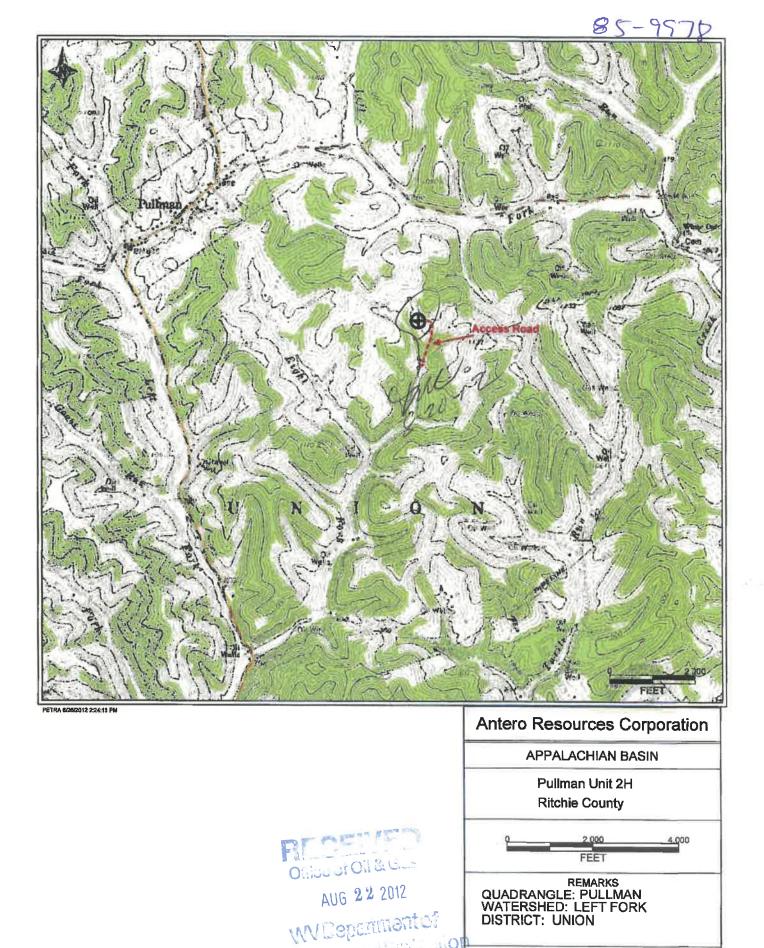
GPS Coordinates: Lat 39°10′51.46″/Long 80°55′47.81″

Driving Directions:

FROM EAST: From the intersection of I-79 and Hwy 50 near Bridgeport WV, head west on Hwy 50 for ~39.6 miles. Turn LEFT onto W Virginia 74 S, and follow for ~7.4 miles. Turn RIGHT onto Co Rd 9 (Main St) and continue for ~0.1 miles. Turn LEFT onto Co Rd 7/9 (Slab Creek Road) and continue for ~0.7 miles. Continue onto Co Rd 9/7/Left Fork Turtle Run for ~0.7 miles. Look for rig signs and location on the right. Drill site is right off the road.

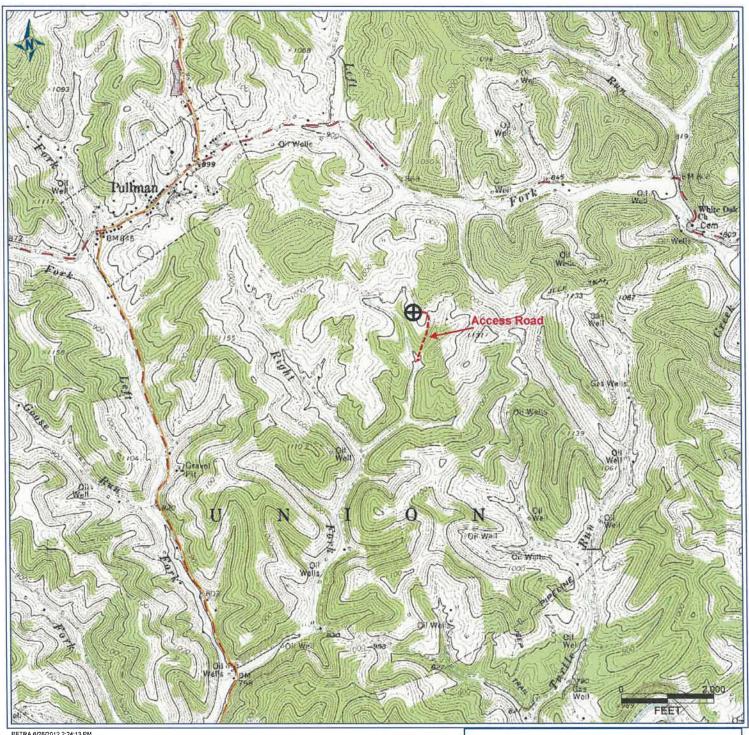
FROM WEST: From the intersection of I-77 and Hwy 50 near Parkersburg WV, head east on Hwy 50 for ~ 32.3 miles. Turn RiGHT onto W Virginia 74 S, and follow for ~7.4 miles. Turn LEFT onto Co Rd 7/9 (Slab Creek Road) and continue for ~0.7 miles. Continue onto Co Rd 9/7/Left Fork Turtle Run for ~0.7 miles. Look for rig signs and location on the right. Drill site is right off the road.





Environmentan 10100110

Date: 6/26/2012



85-9978 CHISCOLO CONS. CO. S. CO. S.

Antero Resources Corporation

APPALACHIAN BASIN

Pullman Unit 2H
Ritchie County

2000 4000
FEET

REMARKS
QUADRANGLE: PULLMAN
WATERSHED: LEFT FORK
DISTRICT: UNION

Date: 6/26/2012

ADDRESS

1625 17TH STREET

DENVER, CO 80202

ADDRESS

FORM WW-6

5400 D BIG TYLER ROAD

CHARLESTON, WV 25313



Operator's Well Number Pullman 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)

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	. Roya	alty	Book/Page
Freeman Campbell Lease				
Freeman Campbell, et ux	Key Oil Company		1/8	LB 0227/0243
Key Oil Company	Antero Resources Appalachian C		al Assignment Oil and gas Leases	LB 0253/0747
John A. Campbell Lease				
John A. Campbell & Linda J. Campbell, his wife	Antero Resources Appalachian C	Corp.	15.00%	0254/0379
		X.		
O'Neill Family Trust et al Lease		Ore		
Robert E. O'Neil	Key Oil Company	.101 1 0 7012	1/8	LB 0224/0433
Anna L. Lockhart, Individually & as	Key Oil Company	JOE 10 5015	1/8	LB 0224/0437
Trustee of O. Glenn Lockhart Estate		Walls a little of	4.	
Betty J. O'Neill	Key Oil Company		1/8	LB 0233/0239
Nancy Antill & Mary Francis Harms	Key Oil Company	Wironnoman	1/8	LB 0233/0244
Nancy Antill & Mary Francis Harms	Key Oil Company		1/8	LB 0241/0967
Mary Francis Harms	Key Oil Company		1/8	LB 0243/0810
Daniel J. O'Neill, Trustee for the O'Neill	Key Oil Company		1/8	LB 0252/1053
Family Trust et al Sharon S. O'Neill	Key Oil Company		1/8	LB 0252/1056
Kathleen R. Hooven	Key Oil Company		1/8	LB 0252/1059
Mary F. Harms	Key Oil Company		1/8	LB 0252/1062
Nancy L. Antill	Key Oil Company Key Oil Company		1/8	LB 0252/1065
Romarlo, LLC & Robert E. O'Neill	Key Oil Company		1/8	LB 0252/1068
Sharon S. O'Neill	Key Oil Company		1/8	LB 0252/1072
Kathleen R. Hooven	Key Oil Company		1/8	LB 0252/1075
Mary F. Harms	Key Oil Company		1/8	LB 0252/1078
Romarlo, LLC, et al	Key Oil Company		1/8	LB 0252/1076
Nancy I. Antill	Key Oil Company		1/8	LB 0252/1081
Daniel J. O'Neill, Trustee, et al	Key Oil Company		1/8 * =~1/8	LB 0252/1086
Clifton G. Valentine & Erma Valentine	Key Oil Company		-1/8	LB 0232/1086 LB 0224/0663
***************************************		Office of Ol Ma	ial Assignment	LB 0253/0747
Key Oil Company	Antero Resources Appalachian (Oil and gas Leases	LD 0233/0/4/

(CONTINUED ON NEXT PAGE)

Coving and the second

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
O'Neill Family Trust et al Lease (CONTIL			
Kathleen R. Hooven	Key Oil Company	1/8	LB 0252/1075
Mary F. Harms	Key Oil Company	1/8	LB 0252/1078
Romarlo, LLC, et al	Key Oil Company	1/8	LB 0252/1081
Nancy I. Antill	Key Oil Company	1/8	LB 0252/1083
Daniel J. O'Neill, Trustee, et al	Key Oil Company	1/8	LB 0252/1086
Clifton G. & Erma Valentine	Key Oil Company	1/8	LB 0224/0663
Key Oil Company	Antero Resources Appalachian Corporation	Partial Assignment	LB 0253/0747
15 17 1825		of Oil & Gas Leases	
Patricia Goff et al Lease			
Clifton G. & Erma Valentine	Key Oil Company	1/8	LB 0254/0586
Dr. Byron King, AIF for Patricia Goff	Key Oil Company	1/8	LB 0230/0270
Key Oil Company	Antero Resources Appalachian Corporation	Partial Assignment of Oil & Gas Leases	LB 0253/0747

^{*}Partial Assignments to Antero Resources Appalachian 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 Appalachian Corporation

By: Kevin Kilstrom

Environmenta. To: Sion 10.1. Cos

JUL JAMES

Its: Vice President of Production



June 28, 2012

Antero Resources 1625 17th Street Denver, Colorado 80202 Office 303.357.7310 Fax 303.357.7315

West Virginia Department of Environmental Protection Chief, Office of Oil and Gas Attn: Mr. James Martin 601 57th Street SE Charleston, WV 25304

RE: Pullman Unit 2H

Quadrangle: Pullman 7.5'

Ritchie County/Union District, West Virginia

Mr. Martin:

Antero Resources Appalachian Corporation (Antero) is submitting the following application for a new well work permit for the Pullman Unit 2H horizontal shallow well. As an authorized representative, I certify that Antero has the right to extract, produce or market the oil or gas for all leases through which the Pullman Unit 2H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

Houston Eagleston Landman Date of Notice Certification: 06/29/2012

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS $\frac{\text{NOTICE CERTIFICATION}}{\text{NOTICE CERTIFICATION}}$

API No. 47- 085

			Operator's	Well No. Pullma	n Unit 2H
			Well Pad N	ame: John Car	npbell North Pad
Notice has b					
	e provisions in West Virginia Code §	22-6A, the Operator has prov	ided the req	uired parties w	ith the Notice Forms listed
	tract of land as follows:		T		
State:	West Virginia	UTM NAD 83	Easting:	506044m	
County:	Ritchie		Northing:	4336870m	
District:	Union Pullman 7.5'	Public Road Acce Generally used fa		CR 9/7 Campbell, John	
Quadrangle: Watershed:	Left Fork	Generally used la	irm name:	Campbell, John	
watersned.	Leiti oik	 -			
prescribed by it has provid information r of giving the requirements Virginia Cod	West Virginia Code § 22-6A-7(b), the secretary, shall be verified and s ed the owners of the surface describequired by subsections (b) and (c), se surface owner notice of entry to su of subsection (b), section sixteen of e § 22-6A-11(b), the applicant shall thave been completed by the applicant	hall contain the following info bed in subdivisions (1), (2) a ection sixteen of this article; (ii arvey pursuant to subsection (if this article were waived in ender proof of and certify to the	ormation: (14 nd (4), subs i) that the red (a), section t writing by	 A certification ection (b), secquirement was en of this artication the surface ow 	on from the operator that (i) tion ten of this article, the deemed satisfied as a result cle six-a; or (iii) the notice oner; and Pursuant to West
	West Virginia Code § 22-6A, the Operator has properly served the require		his Notice C	ertification	OOG OFFICE USE
*PLEASE CH	ECK ALL THAT APPLY				ONLY
☐ 1. NO	TICE OF SEISMIC ACTIVITY or	NOTICE NOT REQUIRED NOTICE NOT REQUIRED NOTICE NOT REQUIRED NOTICE NOTIC			RECEIVED/ NOT REQUIRED
2. NO	TICE OF ENTRY FOR PLAT SURV	VEY or NO PLAT SURV	EY WAS C	ONDUCTED	☐ RECEIVED
■ 3. NO	TICE OF INTENT TO DRILL or	NOTICE NOT REQUIINOTICE OF ENTRY FOR WAS CONDUCTED or			RECEIVED/ NOT REQUIRED
		☐ WRITTEN WAIVER (PLEASE ATTACH)		CE OWNER	
■ 4. NO	TICE OF PLANNED OPERATION				☐ RECEIVED
■ 5. PU	BLIC NOTICE				☐ RECEIVED
■ 6. NC	TICE OF APPLICATION				☐ RECEIVED
Doguired /	Attachments:				

Required Attachments:

The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made-by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

---- a....ome protection

Certification of Notice is hereby given:

THEREFORE, I Kevin Kilstrom , have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, 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 and imprisonment.

 Well Operator:
 Antero Resources Appalachian Corporation
 Address:
 1625 17th Street

 By:
 Kevin Kilstrom
 Denver, CO 80202

 Its:
 Vice President of Production
 Facsimile: (303) 357-7315

 Telephone:
 (303) 357-7310
 Email:

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at deprivacyofficer@wv.gov.

WW-6A (5-12) API NO. 47- 085 OPERATOR WELL NO. Pullman Unit 2H
Well Pad Name: John Campbell North Pad

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

	ce Time Requirement: notice shall be provided no later that of Notice: 06/29/2012 Date Permit Application Filed: 06/29	
Noti	ce of:	III OFFIED
	PERMIT FOR ANY WELL WORK CONSTRUCTION OF A	PROVAL FOR THE AN IMPOUNDMENT OR PIT JUL 1 0 2012
Deli	very method pursuant to West Virginia Code § 22-6A-10	O(b)
		OD OF DELIVERY THAT REQUIRES A IPT OR SIGNATURE CONFIRMATION
erosi own- tract road seve loca oil a enla Any with dom (c)(1) the l main cont	ion and sediment control plan required by section seven of the sor frecord of the surface of the tract on which the well is or tracts overlying the oil and gas leasehold being developes or other land disturbance as described in the erosion and on of this article; (3) The coal owner, operator or lessee, in the ted [sic] is known to be underlain by one or more coal seaming gas leasehold being developed by the proposed well working gement, alteration, repair, removal or abandonment of any surface owner or water purveyor who is known to the application one thousand five hundred feet of the center of the well prestic animals; and (6) The operator of any natural gas storaged.) If more than three tenants in common or other co-owners ands, the applicant may serve the documents required upon	a receipt or signature confirmation, copies of the application, the his article, and the well plat to each of the following persons: (1) The or is proposed to be located; (2) The owners of record of the surface ed by the proposed well work, if the surface tract is to be used for ediment control plan submitted pursuant to subsection (c), section ne event the tract of land on which the well proposed to be drilled is s; (4) The owners of record of the surface tract or tracts overlying the ek, if the surface tract is to be used for the placement, construction, impoundment or pit as described in section nine of this article; (5) icant to have a water well, spring or water supply source located oad which is used to provide water for consumption by humans or ge field within which the proposed well work activity is to take place. of interests described in subsection (b) of this section hold interests in the person described in the records of the sheriff required to be a of this code. (2) Notwithstanding any provision of this article to the less the lien holder is the landowner.
	SURFACE OWNER(s)	COAL OWNER OR LESSEE
Nan	**	Name: PLEASE SEE ATTACHMENT JUL 10 2017
	ress: 505 Oxford Road	Address:
	Pullman, WV 26421	WVIototototo
Nan	ne:	The same of the same
Add	lress:	□ COAL OPERATOR
_		Name:
	SURFACE OWNER(s) (Road and/or Other Disturbance)	Address:
	***	WATER RUDVEYOR/-\/OWNER/-\ OF WATER WELL
	ne:	WATER PURVEYOR(s)/OWNER(s) OF WATER WELL, SPRING OR OTHER WATER SUPPLY SOURCE
Add	lress:	Name: NONE IDENTIFIED WITHIN 2000'
Nar	ne:	Address:
Ada	dress:	Addiess.
-	SURFACE OWNER(s) (Impoundments/Pits)	☐ OPERATOR OF ANY NATURAL GAS STORAGE
	• • •	FIELD
Nar	me:	Name:
Ado	dress:	Address:
		*Please attach additional forms if necessary

API NO. 47- 085

OPERATOR WELL NO. Pullman Unit 2H
Well Pad Name: John Campbell North Pad

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

This Notice Shall Include:

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall also include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Water Well Testing:

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well

Water Testing Laboratories:

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments.

Well Location Restrictions

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No wellpad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such

05/31/2024

OPERATOR WELL NO. Pullman Unit 2H

Well Pad Name: John Campbell North Pad

factors, if necessary.

Written Comment:

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0450

JUL 1 0 2012

Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.

Time Limits and Methods for Filing Comments.

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

Comment Requirements

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

Permit Denial or Condition

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

JUL 10 2012

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

API NO. 47- 085

OPERATOR WELL NO. Pullman Unit 2H

Well Pad Name: John Campbell North Pad

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

JUL 10 2012

Notice is hereby given by:

Well Operator: Antero Resource

Telephone: Email:

303-357-7310

amihalcin@anteroresources.com

Denver, CO 80202

Facsimile: 303-358-7315

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

Subscribed and sworm before the this

Notary Public

My Commission Expires

JUL 10 2012

AM Deberment of

WW-6A Notice of Application Attachment:

Coal Owners:

Owner:

John A. & Linda J. Campbell

Address:

505 Oxford Road

Pullman, WV 26421

Owner:

Ruth Villers

Address:

520 Park Drive

Pennsboro, WV 26415

Owner:

Naomi P. Federkiel 📈

Address:

18 Olive Street

Norwalk, OH 44857

Owner:

J.W. Prunty c/o Ruth Villers

Address:

520 Park Drive

Pennsboro, WV 26415

Owner:

Kermit Comoway, Pearl Cunningham &

Thya Neusbaum, heirs

c/o Melinda Gilbertson

Address:

900 Par Lane

Dell Rapids, SD 57022





STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS NOTICE OF INTENT TO DRILL

Pursuant to W. Va. Code § 22-6A-16(b), the Notice of Intent to Drill is only required if the notice requirements of W. Va. Code § 22-6A-10(a) have NOT been met or if the Notice of Intent to Drill requirement has NOT been waived in writing by the surface owner.

_	od pursuant to West Virginia Code § 22-		
_	- Parameter to trees the Prime code & was	6A-16(b)	
☐ HAND	CERTIFIED MAIL		
DELIVER	Y RETURN RECEIPT REQU	ESTED	
receipt requeste drilling a horize of this subsection subsection may	Va. Code § 22-6A-16(b), at least ten days ed or hand delivery, give the surface owner ontal well: <i>Provided</i> , That notice given pron as of the date the notice was provided to be waived in writing by the surface owner, facsimile number and electronic mail add	rnotice of its intent to enter upon the irsuant to subsection (a), section tento the surface owner: <i>Provided, hower.</i> The notice, if required, shall include	ne surface owner's land for the purpose of on of this article satisfies the requirements ovever, That the notice requirements of this ude the name, address, telephone number,
	eby provided to the SURFACE OWN		
Name: John A. Address: 505 Ox	. & Linda J. Campbell	Name: Address:	
-	n, WV 26421	Address.	
State:	ner's land for the purpose of drilling a hori: West Virginia Ritchie	contal well on the tract of land as for - UTM NAD 83 Easting: Northing:	506044m 4336870m
100	Union	Public Road Access:	CR 9/7
	Pullman 7.5'	Generally used farm name:	Campbell, John
	Left Fork		
Pursuant to W facsimile number related to horiz	Shall Include: Yest Virginia Code § 22-6A-16(b), this nuber and electronic mail address of the optiontal drilling may be obtained from the \$57th Street, SE, Charleston, WV 25304 (30)	erator and the operator's authorize Secretary, at the WV Department of	ed representative. Additional information of Environmental Protection headquarters,
	eby given by:		
Well Operator:	Antero Resources Appalachian Corporation	Authorized Representative:	Hannah Knopping
Address:	1625 17th Street	Address:	1625 17th Street
	Denver, CO 80202		Denver, CO 80202
Telephone:	(303) 357-7310	Telephone:	(303) 357-6412
TC 21	hknopping@anteroresources.com	Email:	hknopping@anteroresources.com
Email:		Facsimile:	

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

05/31/2024

WW-6A5 (1/12)

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS $\underline{\text{NOTICE OF PLANNED OPERATION}}$

Notice Time I Date of Notice	Requirement: notice shall be provided no late e: 06/29/2012 Date Permit Applic	r than the filing date of permit ation Filed: 06/29/2012	application.
Delivery metl	ood pursuant to West Virginia Code § 22-62	A-16(c)	
	IED MAIL HA N RECEIPT REQUESTED DE	ND LIVERY	
return receipt the planned o required to be drilling of a h damages to th	Y. Va. Code § 22-6A-16(c), no later than the requested or hand delivery, give the surface of peration. The notice required by this subset provided by subsection (b), section ten of this orizontal well; and (3) A proposed surface a surface affected by oil and gas operations to s required by this section shall be given to the	wner whose land will be used for ction shall include: (1) A copy s article to a surface owner who use and compensation agreement the extent the damages are com	or the drilling of a horizontal well notice of of this code section; (2) The information se land will be used in conjunction with the nt containing an offer of compensation for upensable under article six-b of this chapter.
(at the address Name: John	by provided to the SURFACE OWNER(s) is listed in the records of the sheriff at the time A. & Linda J. Campbell	Name:	
Address: 505 C	en, WV 26421	Address:	
State: County: District: Quadrangle: Watershed: This Notice S Pursuant to V to be provide horizontal we surface affect	the surface owner's land for the purpose of dr West Virginia Ritchie Union Pullman 7.5' Left Fork Shall Include: Vest Virginia Code § 22-6A-16(c), this notice ad by W. Va. Code § 22-6A-10(b) to a surface lil; and (3) A proposed surface use and composed by oil and gas operations to the extent the	UTM NAD 83 Easting: Northing: Public Road Access: Generally used farm name: shall include: (1)A copy of this ace owner whose land will be ensation agreement containing a e damages are compensable un	506044m 4336870m CR 9/7 Campbell, John s code section; (2) The information required used in conjunction with the drilling of a an offer of compensation for damages to the der article six-b of this chapter. Additional
information i	elated to horizontal drilling may be obtained located at 601 57 th Street, SE, Charlesto	from the Secretary, at the W	V Department of Environmental Protection
Well Operato	r: Antero Resources Appalachian Corporation	Address: 1625 17th Street	
Telephone:	(303) 357-7310	Denver, CO 80202	2
Email:	amihalcin@anteroresources.com	Facsimile: (303) 357-7315	
The Office of duties. Your needed to cappropriately	Privacy Notice: f Oil and Gas processes your personal information may be disclosed to or omply with statutory or regulatory requires secure your personal information. If you have Privacy Officer at depprivacyofficer@wv.gov	ther State agencies or third par ments, including Freedom of we any questions about our use	ties in the normal course of business or as Information Act requests. Our office will

CERTIFICATION OF AGREEMENT WITH WVDOH to fulfill WV Code 22, Article 6A, Section 20

OIL AND GAS ROAD STATEWIDE BONDING AGREEMENT 85-9978



THIS AGREEMENT, executed in duplicate, made and entered into this 28 day of Korvary, 2012, by and between the WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, hereinafter called "DEPARTMENT," and Antero Resources Appalachian Corporation, a Delawage company, hereinafter called "COMPANY."

WITNESSETH:

WHEREAS, Company has horizontal gas well drilling operations in certain areas of West Virginia; and

WHEREAS, the Department believes that the frequent and repetitive use of certain sections of highways in the State by Company, its contractors, agents, independent contractors or suppliers of drilling materials or drilling equipment, and employees contributes to increased wear and tear to public roads in the state road system in the State, including local roads ("State Owned Roads"); and,

WHEREAS, the Department and Company have entered into this Agreement to satisfy the requirements of the Department's policy entitled "Oil & Gas Road Policy" dated January 3, 2012, as issued by Paul A. Mattox, Jr., Secretary of Transportation / Commissioner of Highways, and any subsequent related policies, hereinafter called "Policy", a copy of which is made a part of this Bonding Agreement and is identified as Attachment 1.

NOW, THEREFORE, for and in consideration of the mutual agreements hereinafter set forth, the parties agree as follows:

- For purposes of this Bonding Agreement, "Project Transportation Usage" of the Company shall be understood to mean use of one or more State Owned Roads for the delivery and removal of drilling materials and drilling equipment at the site or location of one or more of Company's horizontal gas well pad locations. To the extent reasonably practical, prior to commencing use of a State Owned Road for Project Transportation Usage after January 1, 2011, the Company shall submit to the Department a section of sections of current official WVDOH County Highway maps identifying the exact location of the proposed project and the State Owned Roads that the Company will utilize for the Project Transportation Usage.
- II. Company and Department shall within 14 days of the Company's submittal, agree to a list of these sections of State Owned Roads, hereinafter called "Project Roads List", to be utilized for each of Company's projects, identified by route number and milepost; at a time to be mutually agreed to by the parties prior to initial commencement of Project Transportation Usage of a particular State Owned Road on a Project Roads List, the Company and Department will jointly review the condition of the roads and bridges on the Project Roads List. Department will document the road type and surface condition and general right-of-way width of each section of road on the Project Road List. Either party may supplement this documentation with photographs, video or other evidence of the present condition of the road surface, shoulders, ditches, culverts, bridges or other structures or appurtenances of roads on the Project Road List, as well as approaches to the roads, utility facilities located within or along the right-of-way, or any other condition, including third-party activities, that may affect the duties and responsibilities of the parties under this Agreement. A copy of any such documentation must be made and provided to the other party within ten business days after the joint review of the roads on the Project Roads List.
- Department shall issue a Project Agreement or Project Permit, as appropriate, to Company to use State Owned Roads and may include any minor or major improvements required of Company prior to, during or after Project with the assignment of responsibilities of

JUL 1 0 2012

WV Department of Carried manual Profession both parties prior to, during and after the operator has completed well fracturing..

- IV. In the Project Agreement/Project Permit, the Department shall not require the use of State Owned Roads other than the roads proposed by Company unless the Department has safety concerns as to the Company's proposed roads. A failure to agree on roads that may otherwise be lawfully used for a particular Project Transportation Usage shall result in the designation of the State Owned Roads proposed by Company, with milepost determinations as designated by Department. This Agreement shall only cover portions of State Owned Roads designated on the Project Roads List.
- V. For the duration of Company's Project Transportation Usage of the Stated Owned Roads on the Project Roads List, whether by the Company, its contractors (while working on behalf of Company), agents, independent contractors or suppliers of drilling materials or drilling equipment, or employees, the Company agrees to pay for all reasonable maintenance and repair costs incurred by the Department to repair areas of the State Owned Roads included in the Project Roads List that were directly damaged by Company's Project Transportation Usage, as determined to be reasonably necessary and appropriate by the Department. The Department shall keep a record of all labor performed by Department employees and contractors for such maintenance and repairs and shall send an invoice for the same to Company.
- VI. Company shall be responsible for the cost of all maintenance and repairs reasonably necessary to put the existing roadways, bridges and appurtenances on the Project Roads List utilized for the Project Transportation Usage in the condition that existed immediately prior to the Project Transportation Usage. Company shall not be required to pay for maintenance or repairs to put any areas of such roadways, bridges and appurtenances on the Project Roads List in a condition better than the condition that existed immediately prior to the Project Transportation Usage. Company shall also not be required to pay for maintenance or repairs to any areas of these roadways, bridges or appurtenances on the Project Roads List that are not actually utilized for the Project Transportation Usage or for damage not caused by Project Transportation Usage.
- VII. Company shall notify the Department in writing of Company's final completion of Project Transportation Usage for particular roadways, bridges and appurtenances on the Project Roads List. Within fourteen days after its receipt of written notification of the completion of the Project Transportation Usage for all roads on a Project Roads List, the Department will review the condition of the roadways, bridges and appurtenances on the Project Roads List actually utilized for the Project Transportation Usage and advise Company of any final repairs reasonably necessary to leave these roads, bridges and appurtenances in a condition reasonably deemed by Department to be equal to their condition prior to commencement of Project Transportation Usage; and, upon completion of all such final repairs by or on behalf of Company and acceptance by Department, the Company shall be released from all further liability for maintenance or repairs to roads, bridges, or appurtenances on said Project Roads List. Any maintenance or repair work under the Project Agreement/Project Permit for roads, bridges or appurtenances on the Project Roads List may be performed by a contractor directly chosen by the Company as approved by the Department, the Department's workforce, or a private contractor hired by the Department through the public bid process in accordance with state law, all of which work shall be subject to the standards and specifications of the Department.
- VIII. In order to ensure performance of Company's performance and payment obligations under this Bonding Agreement, the Company shall post a corporate surety bond, hereinafter called "Master Bond", with the Department named as the beneficiary, which form of bond shall be subject to the consent of the Department, not to be unreasonably withheld. The amount and form of the bond shall be in accordance with the Policy as set forth above. However, the amount of the Master Bond does not limit the amount of claims that may be made by the Department against the Company under this Bonding Agreement. The Company shall provide the Master Bond to the Department within one (1) month after the execution of this Bonding Agreement. The Master Bond shall secure the good faith performance of all payment obligations of Company under the terms of this Bonding Agreement respecting the roads, bridges and appurtenances on the Project Roads List for each Project Transportation Usage undertaken by the Company, and shall remain in effect until termination of this Agreement. Company shall not be obligated to provide any other bonds, sureties, or other guarantees of performance to the Department for Company's use of State Owned Roads, except as required in this Agreement.

Earth or marked Protoction

- IX. Company shall maintain Commercial General Liability Insurance in the amount of two million dollars, with a minimum coverage of one million dollars per occurrence, for personal injury or death to persons, or for property damage, resulting from Company's Project Transportation Usage and shall present evidence of such insurance to Department upon request.
- X. Company's usage of State Owned Roads under the Project Agreement/Project Permit shall comply with all applicable Federal, State and local laws and regulations including, but not limited to, to the extent applicable, the National Environmental Policy Act, Section 404 of the Clean Water Act, Section 106 of the National Historic Preservation Act, Rare, Threatened and Endangered Species Act, Section 401 Water Quality Certification, and hazardous waste requirements. Further, upon reasonable written request of Department, Company shall furnish Department with acceptable documentation of such compliance which is in the possession of the Company.
- XI. Company shall defend, indemnify and hold Department harmless from and against any and all losses, damage, and liability, and from all claims for damages on account of or by reason of bodily injury, including death, which may be sustained, or claimed to be sustained, by any person or persons, including employees of Department, and from and against any and all claims, losses or liabilities for damages to property, arising out of the negligent or willful acts or omissions of Company, its agents, independent contractors and suppliers of drilling materials or drilling equipment, employees and contractors, in the performance of all Project Transportation Usage activities undertaken pursuant to this Agreement (collectively, "claims"). The Company shall not be responsible to indemnify, defend or hold harmless Department for any claims caused by the negligent or willful acts or omissions of the Department or its agents, employees and contractors or third parties not performing work at the direction of Company or delivering drilling equipment or drilling materials, including water, for use by or for company.
- XII. If a provision of this Agreement is or becomes illegal, invalid or unenforceable in any jurisdiction, that shall not affect the validity or enforceability of any other provision of this Agreement; or the validity or enforceability in other jurisdictions of that or any other provision of this Agreement.
- XIII. Department shall give Company a minimum of thirty days written notice of default under the terms of this Bonding Agreement and the opportunity to cure this default during such thirty-day period. If a default is not cured to the satisfaction of Department, or provision acceptable to Department is not made for a cure, Department may then elect to terminate this Bonding Agreement in whole or in part, and may in addition exercise its rights under the Master Bond or seek any other lawful relief available. Company may terminate this Bonding Agreement upon thirty days written notice to Department for any reason. In the event Company terminates this Agreement for any reason, it shall be liable for the repair and maintenance costs set forth above for prior Project Transportation Usage.
- XIV. Nothing herein shall be construed to mean that Company shall have any jurisdiction or control over any public roads in the state road system.
- XV. Company, its contractors, agents, employees and suppliers shall at all times be subject to applicable provisions of state and federal law, including without limitation laws requiring operation of vehicles in accordance with legal size and weight restrictions and posted weight limits. Oversize/overweight permits for vehicle or loads not otherwise conforming with law must be obtained in accordance with law; Department agrees to work in good faith with Company to review and grant (where authorized by law) such permits in a timely manner upon request by Company.
- XVI. This Bonding Agreement shall be construed and enforced in accordance with the laws of the State of West Virginia, as they may be amended.
- XVII. This Bonding Agreement shall be binding upon the successors and assigns of each party hereto.

ANDepartment of Environmental Projection IN WITNESS WHEREOF, the parties hereto have caused this Bonding Agreement to be executed by their duly authorized officers effective as of the date first above written.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS

Donen Baria

Ву: _

State Highway Engineer

Rachel Bouchard

ANTEND RESOURCES APPARACHAN CORPO

By:

Title: VP ACCOUNTING GARD ADMINIST DATION

(To be executed in duplicate)

APPROVED AS TO FORM THIS DAY OF Man 20/2

ATTORNEY LEGAL DIVISION WEST VIRGINIA DEPARTMENT OF HIGHWAYS

RECEIVED

JUL 10 2012

WV Department of Environmental Protection

85-9578

Form WW-9 Additives Attachment

SURFACE INTERVAL

- 1. Fresh Water
- 2. Soap -Foamer AC
- 3. Air

INTERMEDIATE INTERVAL

STIFF FOAM RECIPE:

- 1) 1 ppb Soda Ash / Sodium Carbonate-Alkalinity Control Agent
- 2) 1 ppb Conqor 404 (11.76 ppg) / Corrosion Inhibitor
- 3) 4 ppb KLA-Gard (9.17 ppg) / Amine Acid Complex-Shale Stabilizer
- 4) 1ppb Mil Pac R / Sodium Carboxymethylcellulose-Filtration Control Agent
- 5) 12 ppb KCL / Potassium Chloride-inorganic Salt
- 6) Fresh Water 80 bbls
- 7) Air

PRODUCTION INTERVAL

- 1. Alpha 1655
 - Salt Inhibitor
- 2. Mil-Carb
 - Calcium Carbonate
- 3. Cottonseed Hulls
 - Cellulose-Cottonseed Pellets LCM
- 4. Mil-Seal
 - Vegetable, Cotton & Cellulose-Based Fiber Blend LCM
- 5. Clay-Trol
 - Amine Acid Complex Shale Stabilizer
- 6. Xan-Plex
 - Viscosifier For Water Based Muds
- 7. Mil-Pac (All Grades)
 - Sodium Carboxymethylcellulose Filtration Control Agent
- 8. New Drill
 - Anionic Polyacrylamide Copolymer Emulsion Shale Stabilizer
- 9. Caustic Soda
 - Sodium Hydroxide Alkalinity Control
- 10. Mil-Lime
 - Calcium Hydroxide Lime
- 11. LD-9
- Polyether Polyol Drilling Fluid Defoamer
- 12. Mil Mica
 - Hydro-Biotite Mica LCM



13. Escaid 110

Drilling Fluild Solvent - Aliphatic Hydrocarbon

14. Ligco

Highly Oxidized Leonardite - Filteration Control Agent

15. Super Sweep

Polypropylene - Hole Cleaning Agent

16. Sulfatrol K

Drilling Fluid Additive - Sulfonated Asphalt Residuum

17. Sodium Chloride, Anhydrous

Inorganic Salt

18. D-D

Drilling Detergent - Surfactant

19. Terra-Rate

Organic Surfactant Blend

20. W.O. Defoam

Alcohol-Based Defoamer

21. Perma-Lose HT

Fluid Loss Reducer For Water-Based Muds

22. Xan-Plex D

Polysaccharide Polymer - Drilling Fluid Viscosifier

23. Walnut Shells

Ground Cellulosic Material - Ground Walnut Shells - LCM

24. Mil-Graphite

Natural Graphite - LCM

25. Mil Bar

Barite - Weighting Agent

26. X-Cide 102

Biocide

27. Soda Ash

Sodium Carbonate - Alkalinity Control Agent

28. Clay Trol

Amine Acid complex - Shale Stabilizer

29. Sulfatrol

Sulfonated Asphalt - Shale Control Additive

30. Xanvis

Viscosifier For Water-Based Muds

31. Milstarch

Starch - Fluid Loss Reducer For Water Based Muds

32. Mil-Lube

Drilling Fluid Lubricant

Environmenta, totellion

List of Anticipated Additives Used for Fracturing or Stimulating Well

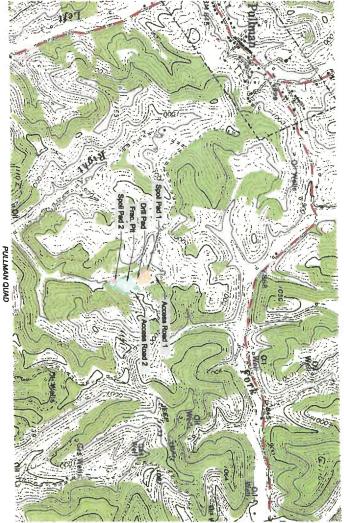
Additives	Chemical Abstract Service Number (CAS #)
Fresh Water	7732-18-5
2 Phosphobutane 1,2,4 tricarboxylic acid	37971-36-1
Ammonium Persulfate	7727-54-0
Anionic copolymer	proprietary
Anionic polymer	proprietary
BTEX Free Hydrotreated Heavy Naphtha	64742-48-9
Cellulase enzyme	(Proprietary)
Demulsifier Base	(Proprietary)
Ethoxylated alcohol blend	Mixture
Ethoxylated Nonylphenol	68412-54-4
Ethoxylated oleylamine	26635-93-8
Ethylene Glycol	107-21-1
Glycol Ethers	111-76-2
guar gum	9000-30-0
Hydrogen Chloride	7647-01-0
Hydrotreated light distillates, non-aromatic, BTEX free	64742-47-8
Isopropyl alcohol	67-63-0
liquid, 2,2-dibromo-3-nitrilopropionamide	10222-01-2
Microparticle	proprietary
Petroleum Distillates (BTEX Below Detect)	64742-47-8
Polyacrylamide	57-55-6
Propargyl Alcohol	107-19-7
Propylene Glycol	57-55-6
Quartz	14808-60-7
Sillica, crystalline quartz	7631-86-9
Sodium Chloride	7647-14-5
Sodium Hydroxide	1310-73-2
Sugar	57-50-1
Surfactant	68439-51-0
Suspending agent (solid)	14808-60-7
Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7

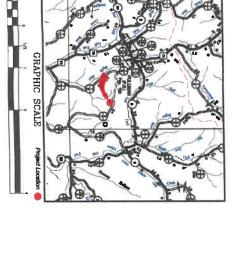


JOHN CAMPBELL L NORTH DRILL PAD

ANTERO RESOURCES APPALACHIAN CORPORATION FINAL SITE DESIGN, CONSTRUCTION PLAN, & **EROSION & SEDIMENT CONTROL PLANS**









Tom Corethers, PE, PS - Homor Brathers Engineers 304-624-6445 Office 3lll Yetzer, PS, EI, - Allegheny Surveys Inc. 104-848-5035 Off. 304-819-4937 Cell

\aron Kunzler, Construction Manager I05-227-8344

urveyor & Engineer

LOODPLAIN SHOWN ON DRAWINGS: HEC-RAS STUDY COMPLETED: Ryan Ward, Environmental Engineer (ALLSTAR) 186-213-2666, ext 311 Off. 304-692-7477 Cell

DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN FLOODPLAIN:

8

¥. 8

N/N

FLOODPLAIN CONDITIONS

PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR:

uthonySmith - Construction 04-869-3405 Off. 304-673-6196 Cell

roject Contacts

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







Design Certification

6-29-2012 5-8-2012 DATE

REVISED QUANTITIES & SPOIL AREA
REVISED WELL TABLE & AFFECTED PARCELS DATA

REVISIONS

Date: 4-27-2012
Scale: AS SHOWN
Designed By: IDR & TBC

AUG

1 INCH = 1 MILE

.ocation Restrictions:

Prop. Well Comp.
WV-N NAD83 N.
WV-N NAD83 E:
LAT NAD83: 31
LON NAD83: 8

Prop. Well Villers Unit 2H WAV-N NACIDS N: 251268-32 WAV-N NACIDS E: 1583178-10 LAT NACIDS: 39"1081-83" LON NACIDS: 80"55"47-85"

Prop. Well Kuhn Unit 1H WY-N NAD83 N: 281278.52 WY-N NAD83 E: 1683172.38 LAT NAD82: 39'10'51.71" LON NAD83: 80'55'47.73"

Prop. What Campball Unit 3 WY-N NADS3 N: 261301.11 WY-N NADS3 E: 1863165.20 LAT NADS3: 39"10'51.96" LON NADS3: 60"36'V7.36"

POP H

Well Pullman Unit 1H NAD83 N: 251273.28 NAD83 E: 1663150.24 NAD83: 30*10*51.68* NAD83: 80*55*48.01*

Prop. Wed Snodgress Unit 2H WV-M NADES N: 251726.09 WV-M NADES E: 1583156.97 LAT NADES: 90'10'5'1.00' LDN NADES: 90'10'5'47.59'

Prop. Wed Villem Link 1H WV-N NACR3 N: 281256.09 WV-N NACR3 E: 1563101.09 LAT NACR3: 39*10'51.5165" LDN NACR3: 80*55'47.86"

All Pad and Fractu re Pit limits comply with the following restrictions.

- ting well or developed spring used for human or domestic animals. Billing or barn greater 2500 SF used for poultry or dairy measured
- the pad. disturbance to wetlands, perennial streams, natural or ertificial lake,
- 250' from an exist
 625' occupied dwe from the center of
 100' from edge of
 pond or reservolr.
 300' from edge of
 100' of surface or disturbance to naturally reproducing trout streams ground water intake to a public water supply.

HEET INDEX

SHEET / LOCATION MAP.

LILE OF QUANTITIES.

ROUTIONS PLAN.

RECTION GENERAL AND E&S NOTES.

ITE DESIGN.

ITE PROPILE & CROSS SECTIONS.

IT PROPILE & CROSS SECTIONS.

S ROADS PROFILES.
S ROADS CROSS SECTIONS.
S ROADS CROSS SECTIONS.
S ROADS CROSS SECTIONS.
S ROADS CROSS SECTIONS.

S ROADS CROSS SECTIONS.

S ROADS CROSS SECTIONS.

S ROADS PROFILES. 0111011 22 ço 0

201 COVER SHEET/LOCATION MAP JOHN CAMPBELL NORTH **DRILL PAD SITE** UNION DISTRICT RITCHIE COUNTY, WV





Hornor 1902 Bros. Engineers Civil, Mining, Environmental and Consulting Engineering 140 South Third Street, Post Office Box 388, Clarksburg, West Virginia, 28301 (304) 624-6445



AFFECTED TAX PARCELS: 1328.3

UNION DISTRICT

TM 13 - PCL 28 John Campbell

WB 377205 120.25 Acres

(Affected area from Proposed Access Roads = 1,503 feet, 3.02 Acres)

(Affected area from Proposed Flac, Pi = 3,12 Acres)

(Affected area from Proposed Flac, Pi = 3,12 Acres)

(Affected area from Proposed Flac, Pi = 3,12 Acres)

Allegheny Surveys, Inc. 172 Thompson Drive Bridgeport, WV 26330 (304) 848-5035

set Virginia Coordinate System of 1983 also Plana Grid North wattons NAVDIA tabilished By Stragy Grade GPS

05/31/20

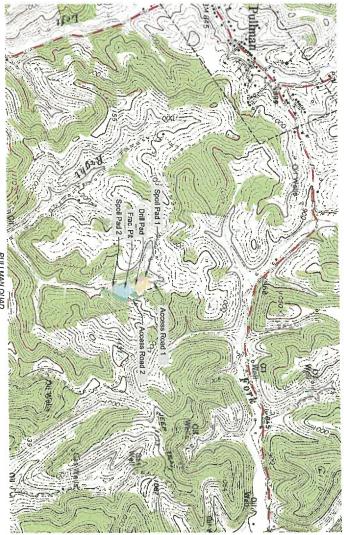




JOHN CAMPBELL NORTH DRILL PAD

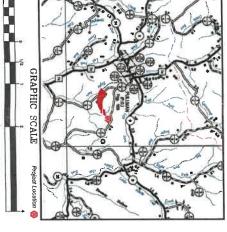
ANTERO RESOURCES APPALACHIAN CORPORATION FINAL SITE DESIGN, CONSTRUCTION PLAN, & **EROSION & SEDIMENT CONTROL PLANS**











Requires that you call two business

(Section XIV: Chapter 24-C) West Virginia State Law

days before you dig in the state of

West Virginia.

Know what's below.

The drawings, construction notes, and reference diagrams effected hereto have been prepared in accordance with the West Virginia Code of Stele Rules, Division of Environmental Protection, Office of Oil and Gas §35-4-21 The information reflects a temporary frac pit pond. The computed The information reflects at temporary frac pit pond.

5-8-2012 DATE

REVISED QUANTITIES & SPOIL AREA

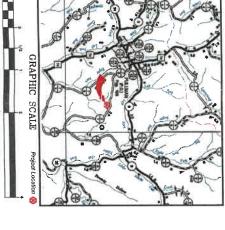
Scale: AS SHOWN
Designed By: IDR & TBC
File No. CHANGE STATES
FILE CONTROL OF STATES CONTROLS
FILE C

REVISIONS

Design Certification

Gall before you dig.

IT'S THE LAW!!





Dusty Woods 817-771-1436

John Kawcak, Engineer 817-368-1553

DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN FLOODPLAIN: PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR:

FLOODPLAIN CONDITIONS

Ryan Ward, Environmental Engineer (ALLSTAR) 966-213-2666, ext 311 Off. 304-692-7477 Cell

AnthonySmith - Construction 304-869-3405 Off. 304-673-6196 Cell

Bill Yetzer, PS, El, - Allegheny Surveys Inc. 304-848-5035 Off. 304-619-4937 Cell

Surveyor & Engineer

FLOODPLAIN SHOWN ON DRAWINGS:

ACREAGE OF CONSTRUCTION IN FLOODPLAIN:

54085C0225C

N N ¥ Ö Ö

N N

Tom Corathers, PE, PS - Homor Brothers Engineers 304-624-6445 Office

MISS Utility of West Virginia

1-800-245-4848



Prop. Well Pullman Unit 2H WV-N NADB3 N: 251281.48 WV-N NADB3 E: 1563144.51 LAT NADB3: 33*10'51.76' LON NADB3: 80"55'48.08'

Prop. Well Snodgrass Unit 2H WV-N NADB3 N: 251265,09 WV-N NADB3 E: 1563155.97 LAT NADB3: 39*10'51,60" LON NADB3: 60'55'47.93'

Prop. Well Campbell Unit 2H WV-N NADB3 N; 251292.91 WV-N NADB3 E; 1553160.92 LAT NADB3; 39*10'51.97" LON NADB3; 80'55'47.88"

Prop. Well Villers Unit 2H WY-N NAD83 N; 261268.32 WY-N NAD83 E; 1963178.10 LAT NAD83; 39'10'51,63" LON NAD83; 80'55'47.66'

Prop. Well Kuhn Unit 1H WV-N NADB3 N: 251276.52 WV-N NADB3 E: 1563172.38 LAT NADB3: 39*10'51.71* LON NADB3: 80"5547.73'

Well Location Restrictions:

All Pad and Fracture Pit limits comply with the following restrictions.

- * 250' from an existing well or developed spring used for human or domestic animals.
 * 262' occupied dwelling or ham greater 2500 SF used for poultry or dairy measured from the center of the pad.
 * 100' from edge of disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir.
 * 200' from edge of disturbance to naturally reproducing trout streams.
 * 100' of surface or ground water intake to a public water supply.

SHEET INDEX

COVER SHEET / LOCATION MAP	

COVER SHEET/LOCATION MAP DRILL PAD SITE

UNION DISTRICT RITCHIE COUNTY, WV







Since 1902 Bros. Engineers Civil, Mining, Environmental and
Consulting Engineering
140 South Third Street, Post Office Box 388,
Clarksburg, West Virghic, 26301 (304) 624-6445



AFFECTED TAX PARCELS: 155/3

AFFECTED TAX PARCELS: 155/3

UNION DISTRICT

TM 13 - PCL 28 John Campbell

WB 37/205 120.25 Acres
(Affected area from Proposed Access Roads = 1,314 feet, 2.32 Acres)
(Affected area from Proposed Drill Pad = 2,74 Acres)
(Affected area from Proposed Prac. Pit = 3,12 Acres)
(Affected area from Proposed Spoil Piles = 1,67 Acres)

Allegheny Surveys, Inc. 172 Thompson Drive Bridgeport, WV 26330 (304) 848-5035

West Virginia Coordinate System of 1983 State Plane Grid North Elevations NAVD88 Established By Survey Grade GPS



JOHN CAMPBELL NORTH

Well Site: John Campbell North Drill Pad & Frac.	Drill Pa	ad & Frac.	1
			PRICE
1 Clearing Grubbing E&S Controls	2	000	CALL
A. Clearing & Grubbing	AC	9.98	49
	AC	3,80	4
- 1	듞	1,984	69
	두	258	49
2. Excavation (Cut Only)			
~ I	ΕA	2	69
B. Drill Pad	CY	7,382	69
	СХ	20,049	49
	CΥ	7,276	67
- 1	S	4,321	69
- 1	듀	732	69
	듀	1,394	tn
			69
1. Rip Rap	SY	476	49
2. Synthetic Matting (TRM)	ΥS	418	69
3. Jute Matting	SY	54	69
II.	F	1,030	4
K. 24" Sump	EA	12	69
3. Stone	100	:	9
	T CINO	1 4	9 6
B. #3 Stone (Ditch Checks)	TONS	3.5	e
4. Aggregate Surfacing			\$
	SY	7,421	69
	SY	7,421	69
C. Drill Pad 1' Minus Crusher Run Aggregate (2")	TONS	704	es
Drill Pad 3" Clean Aggregate (6")	SNOT	1,759	69
	SNOT	645	69
		1,768	€
. Access Roads Geotextile Fabric (US 200)		2,653	S
5. Frac, Water Pit Liner - 60 mil.			
	SY	6,864	9 4
	SY	6,864	69
6. Road Culverts (5 Total)			
	F	190	49
7. A. Hydro Seeding	AC	6.65	€4
Iω.	-	084	,
B. 16' Double Swing Gate	<u> </u>	G	↔ ←
9. Reclamation	AC	5.01	A 6A
TOTAL			4

- TOPSOIL QUANTITY FOR THIS SITE IS ESTIMATED AT A UNIFORM THICKNESS OF 6° OVER THE ENTIRE EXCAVATED AREA. ACTUAL QUANTITY MAY VARY.
- Ņ AREAS RECEIVING JUTE MATTING AND SYNTHETIC MATTING (TRM) ARE TO BE SEEDED, LIMED AND FERTILIZED PRIOR TO INSTALLATION OF MATERIALS.

<u>'</u>	275	274	ROAD 1	MAIN ACCESS BOAD 1
NET (CY)	FILL (CY)	CUT (CY)		DESCRIPTION
	ES	GRADING VOLUMES	GRAD	
12.314	14.526	4,733,343	112,691	999 (TOP BERM)
9.838	12.050	3,926,459	93,480	997
7622	9.834	3,204,292	76,287	995
5003	7.865	2,562,817	61,015	993
320	6.132	1,998,018	47,568	991
2:409	4.621	1,505,801	35,850	989
1008	3.320	1,081,702	25,753	987
2.	2.212	720,903	17,163	985
40	1.285	418,556	9,965	983
	0.521	169,882	4,045	981
0	0	0	0	979 (BOTTOM)
UNINCISED ACRE-FT	ACRE-FT	GALLONS	BARRELS	ELEVATION
	ES	FRAC PIT VOLUMES	FRAC	

GRA	ADING VOLU	JMES	
DESCRIPTION	CUT (CY) FILL (FILL (CY)	NET (CY)
MAIN ACCESS ROAD 1	274	275	<u></u>
MAIN ACCESS ROAD 2	3,810	869	2,941
DRILL PAD	8,807	18,221	-9,414
FRAC PIT	21,717	14,371	7,346
FRAC PIT ACCESS ROAD	4,410	2	4,408
SPOIL PADS	0	5,282	-5,282
TOTAL	39,018	39,020	-2

LOD AREAS (ACRES	RES)
DESCRIPTION	AREA
MAIN ACCESS ROAD 1	0.28
MAIN ACCESS ROAD 2	2.04
FRAC PIT ACCESS ROAD	0.70
DRILL PAD	2.65
FRAC PIT	3.12
WASTE & SPOIL PADS	1.19
TOTAL	9.98
TOTAL WOODED AREA	3.80

GRADING

CUT SLOPE FILL SLOPE FRAC PIT INTERIOR

PAD CONTAINMENT BERM SLOP CUT SWELL FACTOR FILL SHRINK FACTOR

πĭ

2:1 2:1 3:1 1.5:1 1.05 1.00 1014.0

PAD ELEVATION:

SCHEDULE OF QUANTITIES
JOHN CAMPBELL NORTH DRILL PAD SITE UNION DISTRICT RITCHIE COUNTY, WV

The earthwork quantities provided are an estimate for consideration. The quantities shown may be greater or less than actually excavated. The engineer is not responsible for variances from the estimated quantities and does not certify to their accuracy.

5-8-2012 DATE

REVISED QUANTITIES & SPOIL AREA

REVISIONS



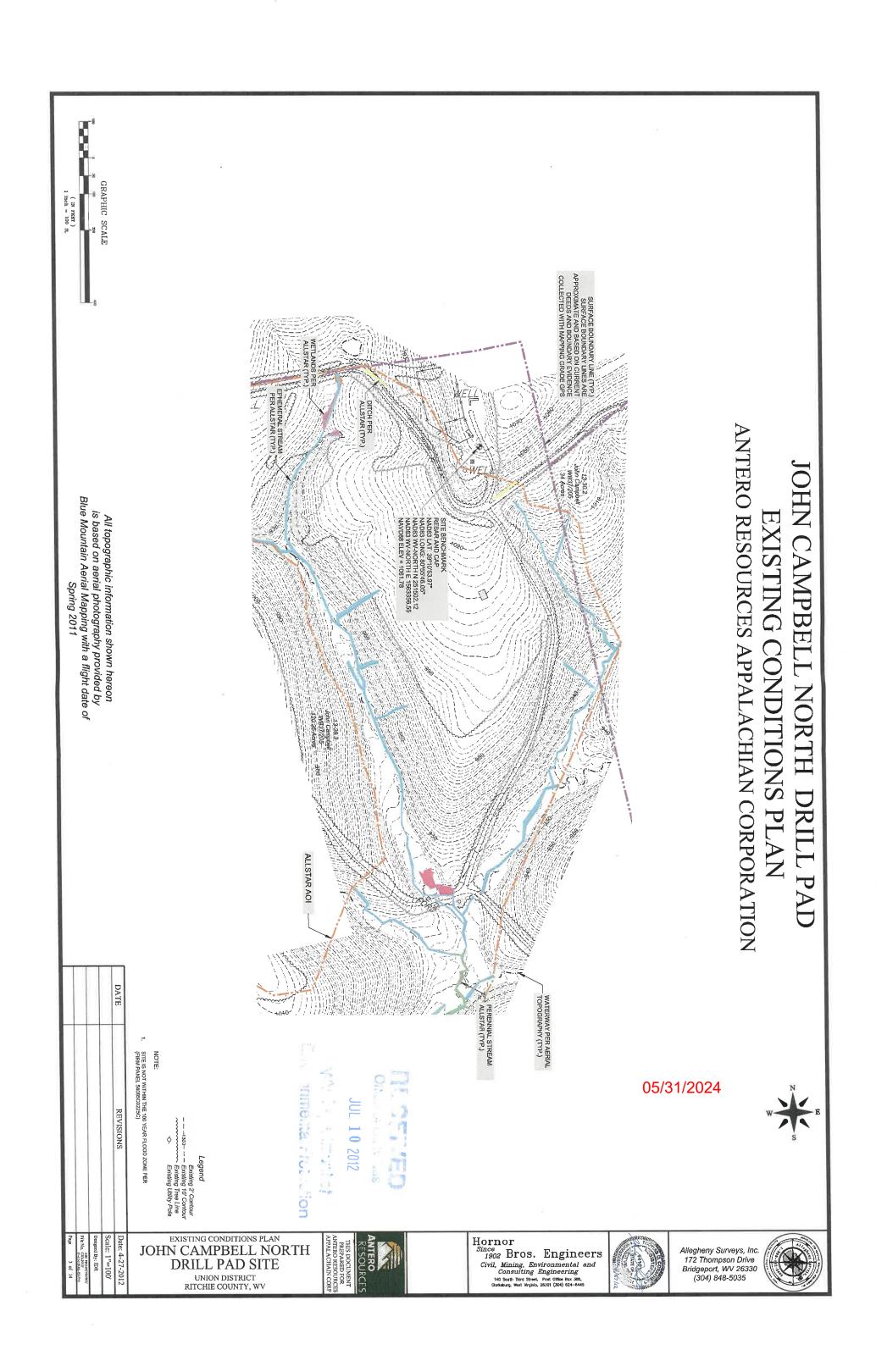
Hornor

Since 1902 Bros. Engineers 1902 Bros. Engineers Civil, Mining, Environmental and Consulting Engineering 140 South The Street, Peter Ottos Box 388, Carbaburg, West Verpria, 28301 (204) 624-6445



Allegheny Surveys, Inc. 172 Thompson Drive Bridgeport, WV 26330 (304) 848-5035





CONSTRUCTION, GENERAL AND EROSION AND SEDIMENT

CONSTRUCTION SPECIFICATIONS

- THE FRAC PIT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND THE SCOPE OF WORK AND SHALL CONFORM GENERALLY WITH THE GRADES, BERMS, DEPTHS AND DIMENSIONS SHOWN.
- THE CONSTRUCTION DOCUMENTS SHOW THE EXISTING AND NEW GRADES AND BERMS, ETC. THAT ALL CUT AND FILL ESTIMATES ARE BASED UPON. THE ENGINEER'S ESTIMATES OF THE QUANTITIES ARE ONLY ESTIMATES AND MAY CHANGE BASED ON ACTUAL FIELD CONDITIONS.
- THE GRADES, BERMS, DEPTHS, AND DIMENSIONS MAY CHANGE BASED ON ACTUAL FIELD CONDITIONS. THE ENGINEER RESERVES THE RIGHT TO CHANGE GRADES, BERMS, DEPTHS AND DIMENSIONS AS NECESSARY TO MEET FIELD CONDITIONS.
- THE CONTRACTOR SHALL PROVIDE THE ENGINEER ALL REASONABLE FACILITIES AND PROVIDE INFORMATION AND SAMPLES AS REQUIRED BY THE ENGINEER FOR PROPER MONITORING AND TESTING OF MATERIAL WORKMANSHIP.
- THE COMTRACTOR SHALL HAVE ON SITE AT ALL TIMES INHERLOONSTRUCTION IS IN PROCRESS A COMPITEINT SUPERINT THOROUGHLY FAMILUR WITH THE CONSTRUCTION OF EARTH BERMS AND EMBAUKMENTS, THE CONSTRUCTION OF EARTH BERMS AND EMBAUKMENTS, THE CONFACTION OF EARTH BERMS AND EMBAUKMENTS, THE
- 24" SILT SOCK OR SILT FENCE SHALL BE WSTALLED PRIOR TO CLEARING AND GRUBBING AS SHOWN ON THE DRAWINGS IN ACCORDANCE WITH WU DEP BEST MANAGEMENT PRACTICES MANUAL CHAPTER 3. SURFACE WATER SHALL BE DIVERTED AWAY FROM ALL EXCANATIONS AND THE FACE OF ALL FILLS TO PREVENT FLOODING AND SOFTENING OF THE SUBGRADE OR COMPACTED MATERIALS.
- CLEARING AND GRUBBING SHALL REMOVE ALL BRUSH, TREES, ROOTS, STIMPS, FENCES, SIGNS OR ANY OTHER MATERIAL THAT IS NOT TO BE RELISED FOR THE CONSTRUCTION. SOME STIMPS MAY REMAIN AT THE APPROVAL OF THE ENGINEER. NO CLEARING DEMIS SHALL BE BURED ON-SITE WITHOUT THE LANDOWNER'S AND ENGINEER'S WRITTEN PERMISSION. ANY DEBRIS BURNAL SITE SHALL BE SEEDED AND MULCHED.
- TOP SOIL SHALL BE STRIPPED AND STOCKPILED WITH APPROPRIATE STABILIZATION AND SILT FENCE TO PREVENT EROSION. THE TOP SOIL SHALL BE REUSED DURING THE RECLAMATION PROCESS OR ON THE FACE OF THE IMPOUNDMENT PRIOR TO SEEDING.
- TOE CUTS OF 12' MINIMUM WIDE SHALL BE EXCAVATED ON ALL RECEIVING SLOPES TO PROVIDE A BASE FOR THE IMPOUNDMENT BERM.
- PRIOR TO PLACING ANY FILL, THE EXPOSED SUBGRADE SHALL BE COMPACTED AND PROOF ROLLED TO PRODUCE A STABLE AND UNVIELDING SITE.
- 12. ALL FILL SHALL BE PLACED IN LOOSE LIFTS OF UP TO 12" AND SHALL BE COMPACTED TO AT LEAST 55% OF THE LABORATORY MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCOTOR TEST MICTIOD (ASTMD 568), THE MOISTURE CONTENT SHALL BE COMPACTION. CONTRACTORS IN CONTRACTOR IN PROPERTY THE CONTRACTOR IN TO FACILITY TO EXOMPACTION. CONTRACTOR IN PROPERTY THE CONTRACTOR IN THE CONTRACTOR SHALL DO INFLACED EIGENSTY TESTS EVERY THIRD LIFT OF SOIL AND SHALL BE DONE IN TWO RANDOM PLACES ON EACH STRAIGHT SIDE OF THE IMPOUNDMENT BEAM, FIELD DENSITY TESTS FOR COMPACTION SHALL BE LOCATION AND RESULTS AND PROVIDED TO THE ENGINEER ON REQUEST, AREAS THAT FAIL FOR COMPACTION SHALL BE LOCATION AND RESULTS AND PROVIDED FOR COMPLANCE. IN LIEU OF STANDARD PROCITOR TESTING, THE CONTRACTOR MAY PROOF FOUL THE SOIL EVERY 24" OF SOIL LIFT WITH A LOCADD 15 TON TANDEM DUMP TRUCK. SOIL THAT FOR COMPACTION SHALL BE MAY PROOF FOUL THE SOIL EVERY 24" OF SOIL LIFT WITH A LOCADD 15 TON TANDEM DUMP TRUCK. SOIL THAT FOR COMPACTION SHALL BE SHALL BE DESCRIFT THAN 11" SHALL BE REMOVED, BE CREATER THAN 11" SHALL BE REMOVED BE RECOMPACTED AND RETESTED. COMPACTION OF SOIL UNDER THE FEAR WHEELS SEARCHED THAN 12" SHALL BE REMOVED BE RECOMPACTED AND RETESTED. COMPACTION OF SOIL UNDER THE FEAR WHEELS SEARCHED THAN 12" SHALL BE REMOVED BE RECOMPACTED AND RETESTED. 11. FRAC PIT BERMS SHALL BE UNIFORMLY GRADED SOIL FREE FROM AGGREGATE EXCEEDING 6". THE FILL SHALL BE FREE OF ALL ORGANIC MATERIAL, STUMPS , BRUSH, OR OTHER DELETERIOUS MATTER.
- ON-SITE FILL SHALL BE USED TO THE MAXIMUM EXTENT POSSIBLE. ANY IMPORTED FILL SHALL BE CERTIFIED BY THE CONTRACTOR TO BE CLEAR OF ALL HAZARDOUS SUBSTRACES OR MATERIALS. IF MATERIAL IS ENCOUNTERED THAT CANNOT BE RIPPED BY A CAT DO WITH A SUGILET TOWN RIPPER, THEN THE CONTRACTOR SHALL CONTACT THE REVISITED WHO WILL USIT THE SITE AND DETERMINE IF THE MATERIAL MAY BE USED AS IS OR MUST BE REMOVED BY OTHER MEANS. IF UNBUTTIBALE SOILS UN THE SUBGRADE ARE FOUND THEY SHALL BE REMOVED AND REPLACED WITH APPROPRIATE FILL AT THE CONTRACTORS EXPENSE AND THE ENGINEER'S DIRECTION.
- 14, IF SPRINGS OR SEEDS ARE ENCOUNTERED, SUBSURFACE DRAINAGE FEATURES SHALL BE INSTALLED PRIOR TO FILL PLACEMENT, CONTACT ENGINEER FOR EVALUATION AND RECOMMENDATION OF CORRECTIVE MEASURES.
- THE FILL TOE FOR ALL FILL EMBANKMENTS SHALL BE BENCHED OR KEYED INTO THE NATURAL SOIL, ALL FILL TOES SHALL BE SUPPORTED BY COMPETENT BEDROCK OR SOIL MATERIAL.
- 18. FILL PLACED AGAINST EXISTING SLOPES SHALL BE BENCHED INTO THE EXISTING MATERIAL DURING FILL PLACEMENT TO REDUCE THE POTENTIAL FOR DEVELOPMENT OF A SMOOTH INTERFACE BETWEEN THE FILL AND EXISTING SLOPE. ANY SOFT AREAS SHALL BE OVER-EXCAVATED TO A FIRM MATERIAL AND BACKFILLED WITH A WELL COMPACTED STRUCTURAL FILL.
- FILL REQUIRED TO OBTAIN DESIGN GRADES SHALL BE PLACED AS CONTROLLED, COMPACTED FILL. THE FILL SHALL BE FREE OF TRASH, WOOD, TOPSOIL, ORGANICS, COAL, COAL MINE REFUSE, FROZEN MATERIAL AND PIECES OF ROCK GREATER THAN 5' IN ANY DIMENSION.
- 19. DURING PLACEMENT OF MATERIAL, MOISTEN OR AERATE EACH LAYER OF FILL, AS NECESSARY, TO OBTAIN THE RECUIRED COMPACTION, FILL SHOULD NOT BE PLACED ON SURFACES THAT ARE MUDDY OR FROZEN, OR HAVE NOT BEEN APPROVED BY PRIOR PRODE-POLUNIA, FREE WATER SHALL BE PREVENTED FROM APPEARING ON THE SURFACE DURING OR SUBSEQUENT TO COMPACTION OPERATIONS.
- SOIL MATERIAL WHICH IS REMOVED BECAUSE IT IS 1700 WET TO PERMIT PROPER COMPACTION MY HE SPREAD AND ALLOWED TO DRY. DRYING CAM ME FACHLIVED BY DISCONDE OR HARROWING LIVILIT, HE MODEL TO BE COMPACTED. AN ACCEPTABLE LEVEL. WHEN THE SOIL IS TOO DRY, WATER MAY BE UNIFORMLY APPLIED TO THE LAYER TO BE COMPACTED.
- 21. THE FILL OUTSLOPES SHALL BE OVERBUILT AND TRIMMED BACK TO DESIGN CONFIGURATIONS TO VERIFY PROPER COMPACTION.
- 22. GRANULAR MATERIALS, SUCH AS AASHTO NO, 57 STONE SHALL BE COMPACTED TO 85% OF ITS RELATIVE DENSITY, AS DETERMINED BY ASTM D 4253 AND D 4254 TEST METHODS.
- 23. THE INSIDE OF THE FRAC PIT SHALL BE BOTH SMOOTH DRUM ROLLED AND FREE OF PROTRUDING OR SHARP ROCKS IN ORDER TO RECEIVE THE LINER. PRIOR TO THE LINER INSTALLATION THE CONTRACTOR SHALL CONTRACT THE SURVEYOR TO DO AN AS-BUILT SURVEY OF THE IMPOUNDMENT TO ENSURE CONFORMANCE WITH THE ENGINEER'S DEAWNINGS. THE SURVEYOR SHALL PROVIDE THE INFORMATION TO THE ENGINEER WHO WILL MAKE DETERMINATIONS ON ANY VARIATION FROM THE DRAWNINGS AND DIRECT THE CONTRACTOR TO DO CORRECTIVE WORK.
- LINER SHALL BE POLYFLEX IMPERVIOUS TEXTURED HDPE GEOMEMBRANE, 60MIL, INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. THE TOP OF THE LINER SHALL BE TURNED DOWN INTO A 4" ANCHOR TRENCH AT THE TOP OF THE BERN AND BACKFILLED WITH SELECT FILL AS SHOWN ON THE DRAWINGS OR AS REQUIRED BY THE LINER MANUFACTURER. HOTOGRAPHIC DOCUMENTATION SHALL BE "TAKEN BY THE CONTRACTOR AND PROVIDED TO THE ENGINEER OF THE OLLOWING ACTIVITIES; I.SITE AFTER OLEANING AND GRUBBING; 2. THE SITE AFTER TOPSOLL BEMOVIAL; 3, TOE KEY AND ISPECTION TREMON CONSTRUCTION, 4, DALY PHOTOS OF CUT AND FILL OPERATIONS; 5, PROOF-ROLLING TESTS.
- PRIOR TO AS-BUILT CERTIFICATION, THE CONTRACTOR SHALL PROVIDE THE ENABLERE WITH A COMPLETE BINDER THAT INCLUDES ALL THATIO DOCUMENTATION, ALL COMPACTION HEST REPORTS, REBUILTS AND MARS, A REPORT TO PALL CUIT AND THE ASSENCE ARE REPORTS OF A REPORT OF ALL CUIT AND THE ASSENCE ARE REPORTS. THE ASSENCE A

- ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND SPECIFICATIONS AND SITE CONDITIONS OR ANY INCOMSISTENCIES OR AMBIGUITIES IN DRAWINGS OR SPECIFICATIONS SHALL BE MEMERIATELY REPORTED TO THE ENCINEER, IN WRITING, WHO SALL, PROMPTLY ADDRESS SUCH PROBLEMS, WORK DONE BY THE CONTRACTOR AFTER THE DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES, OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
- WORK ON THIS PROJECT SHALL CONFORM TO THE LATEST EDITIONS OF THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE HANDBOOK, IN THE EVENT OF CONFLICT BETWEEN THE DESIGN, SPECIFICATIONS, OR PLANS, THE MOST STRINGENT WILL GOVERN.

- ALL DRAIN INLETS SHALL BE PROTECTED FROM SILTATION, INEFFECTIVE PROTECTION DEVICES SHALL BE REPLACED AND THE INLET CLEANED. FLUSHING IS NOT AN ACCEPTABLE MEANS OF CLEANING.
- THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL PUBLIC OR PRIVATE UTILITIES WHICH LIE IN OR ADJACENT TO THE CONSTRUCTION SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR, AT HIS OR HER EXCENSE, OF ALL EXISTING UTILITIES DAMAGED UNRING CONSTRUCTION, FORTY-EIGHT HOURS PRIOR TO ANY EXCAVATION THE CONTRACTOR SHALL CALL MISS UTILITY AT (800) 552-7001.
- ALL MATERIALS USED FOR FILL OR BACK FILL SHALL BE FREE OF WOOD, ROOTS, ROCKS, BOULDERS OR ANY OTHER NON-COMPACTABLE SOIL TYPE MATERIALS, UNSATISFACTORY MATERIALS ALSO INCLUDE MAN MADE FILLS AND REFUSE DEBRIS DERIVED FROM ANY SOURCE.
- FILL SHALL BE PLACED IN LIFTS AT A MAXIMUM UNCOMPACTED DEPTH OF 12-INCHES WITH SOIL FREE FROM AGGREGATES EXCREDING 6".
- CONTRACTOR SHALL SUBMIT AND ADHERE TO A GENERAL GROUNDWATER PROTECTION PLAN.

- THE CONTRACTOR SHALL ARRANGE FOR A PRE-CONSTRUCTION CONFERENCE WITH THE APPROPRIATE EROSION AND SEDIMENT CONTROL INSPECTOR 48 HOURS PRIOR TO BEGINNING WORK.
- ALL EROSION CONTROL DEVICES AS SHOWN OR AS REQUIRED, ARE TO BE CONSTRUCTED TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE WEST VIRIGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL AND ARE TO BE IN PLACE PRIOR TO ALL CONSTRUCTION.
- EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED CONTINUOUSLY, RELOCATED WHEN AND AS NECESSARY AND SHALL BE CHECKED AFTER EVERY RAINFALL. SEEDED AREAS SHALL BE CHECKED REGULARLY AND SHALL BE WATERED, FERTILIZED, RESEEDED AND MULCHED AS NECESSARY TO OBTAIN A DENSE STAND OF GRASS.

- PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LOWGER THAN 21 DAYS, PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE FEAR.
- DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES.
- SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAXES PLACE.

₫.

MAINTENANCE, AND OTHER CONSIDERATIONS AND GROUND WATER PROTECTION. ALL EROSION AND SEDIMENT CONTROL IMPASURES WILL BE CHECKED DAILY AND AFTER SACH RAINFALL OF G.5 MACH OR MORE: THEY WILL BE INSPECTIBLY FOR INDEPENDENCE. CHECKED BY CHECKED BY

- ALL DISTURBED AREAS NOT PAWED OR BUILT UPON SHALL BE HYDRO-SEEDED AND FERTILIZED, PERFORM PERMANENT TOP SOILING, SEEDING AND FERTILIZING AS SOON AFTER FINISH GRADING AS POSSIBLE. SEEDING SHALL COMPLY WITH THE FOLLOWING:
- TOPSOIL 4 INCH MINIMUM FOR PERMANENT TURF

EROSION AND SEDIMENT CONTROL NARRA

PROJECT DESCRIPTION: THE PURPOSE OF 1 MEASURES, IN PREPARATION FOR THE CONK COUNTY, THE CONSTRUCTION HOLLIDES WATER CONTROLS, AND INCIDENTAL WORK. PROJECT IS 9.98 ACRES.

THIS PROJECT IS TO GRADE AND INSTALL EROSION AND SEDMENT CONTROL STRUCTION OF A GAS WELL PAD NEAR PLUMAN, WEST WRIDIN, A INSTORM NO ACCESS ROADS, ONE FRAC, WATER IMPOUNDMENT, DRILL IPAD, STORM INTELLIBERT OF THE TOTAL APPROXIMATE LAND DISTURBANCE ASSOCIATED WITH THIS

- EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MANITAINED DAILY, RELOCATED WHEN NECESSARY AND SHALL BE CHECKED REGULARLY AND SHALL BE OFFICKED REGULARLY AND SHALL BE WATERED, FERTILIZED. OFFICKED ROBORD AND SHALL BE WATERED, FERTILIZED. RESEEDED AND MILCHED AS NECESSARY TO OBTAIN A DENSE STAND OF GRASS.

- INSTALLATION OF CONCRETE, CORRUGATED METAL, OR HDPE STORM PIPE SHALL BE IN CONFORMANCE WITH THESE DRAWINGS.

EROSION AND SEDIMENT CONTROL MEASURES; UN EROSION AND SEDIMENT CONTROL PRACTICES SHE STANDARDS AND SPECIFICATIONS OF THE CURREN MANAGEMENT PRACTICE MANUAL THE CONTRACTIVE SHEETE AND CONSTRUCT ALD EVICES BASED ON THE SPECIFICATIONS OF THE WEST VIRGININ MANUTO UN LESS OTHERWISE MAVIES OR APPROVED BY SEDIMENT CONTROL MEASURES.

MINTENANCE. ALL 31 SLOPES AND TIEDER, DITCHES AND OTHER CONTROLS
SION AREAST HESE AREAS SHALL RECOVERING SEA MANTAMED DAILY AND AFTER
ANTER THE LOSAL GOVERNMEN SEASON. THE REAL MINDORTY TO
ANTER THE LOSAL GOVERNMEN SEASON. THE REAL MINDORTY TO
THORAL REASON CONTROL MENSING ANTEREST AND THE MAINTENANCE FOR THE OT TAVIOTIONAL SEASON.
SES IN PLACE ARE TOO TRAVIOTIONAL SEASON. THE SEASON THE AND ANTEROPORT TO MINIMAM
ANTEREST WILLESS OTHERWISE INDICATED AND MAINTENANCE ACCORDING TO MINIMAM
ANTEREST WEIGHIA REGISION AND SEDMENT CONTROL BEST
THE CHREENT WEST VIEGUIA REGISION AND SEDMENT CONTROL BEST
THE CHREENT WEST VIEGUIA REGISION AND SEDMENT CONTROL BEST
CONTROL OFFINAL OR AN ANTEROPOSED ENCOSION AND
PROVED BY A VARIANCE. SEE PLANS FOR ALL PROPOSED EROSION AND

CRITICAL EROSION AREAS-CONTROL MAINTI
SHALL BE CONSIDERED CRITICAL EROSION.
EACH RAIN FALL OF 0.5 INCHES OR GREATER
RECOMMEND THE PLACEMENT OF ADDITION
DURING CONSTRUCTION THAT THE ONES IN

SOILS: NO SOIL STUDIES OR SUBSURFACE INVESTIGATIONS WERE PERFORMED FOR THIS PROJECT.

ADJACENT PROPERTY: THE SITE IS BORDERED ON ALL SIDES BY UPLAND (MyDWOODS).

EXISTING SITE CONDITIONS: THE EXISTING SITE IS OPEN GRASSLAND AND UPLAND HARDWOODS WITH GENTLE TO WODERATELY STEEP TOPOGRAPHY WITH 5% TO 20% SLOPES, NO EROSION IS NOTICED ON SITE, OR IN ANY NATURAL DRAINAGE WAYS.

Allegheny Surveys, Inc.

172 Thompson Drive

Bridgeport, WV 26330 (304) 848-5035

OFF SITE AREAS: THERE SHALL BE NO BORROW AREA OUTSIDE OF THE PRODOSED GRADING AND CONSTRUCTION AREA

- MATERIALS USED TO FILL AROUND DRAINAGE STRUCTURES IN UTILITY TRENCHES OR ANY OTHER DEPRESSION REQUIRING FILL OR BACK FILL SHALL BE COMPACTED TO 55% OF MAXIMUM DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST AS SET FORTH IN ASTM STANDARD DESS. HE CONTRACTOR SHALL, FROR TO ANY OFERSTRONS IN MOVEL WITH THE SOIL TESTED OR BACK FILLING, SUBMIT THE RESULTS OF THE PROCTOR TEST TOGETHER WITH A CERTIFICATION THAT THE SOIL TESTED IS REPRESENTANCED FHE MATERIALS TO BE USED ON THE PROCTOR TEST SHALL BE CONDUCTED BY A CERTIFICATION REPRESENTANCE OF THE MATERIALS TO BE USED ON THE PROCED THE ROUTED THE MATERIALS TO BE USED ON THE RESULT OF THE MATERIALS TESTED THE CERTIFICATIONS MADE BY A LICENSED PROFESSIONAL ENGINEER REPRESENTANCE THE LABORATORY. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THESE TESTS AND THEIR SUBMITTALS.
- ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER, FAILURE TO CONDUCT DENSITY TESTS SHALL BE CAUSE FOR NOWACCEPTANCE OF THE FACILITY, TESTS SHALL BE CONDUCTED AT THE SOLE COST OF THE CONTRACTOR OR HIS AGENT
- 11. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION.
- SATISFACTORY MATERIALS FOR USE AS FILL FOR PAD AREAS INCLUDE MATERIALS CLASSIFIED IN ASTIM D-2817AS GW, GP, GM, GC, SW, SP, SM, SC, SM, AND CL GROUPS. THE MOISTURE CONTENT SHALL BE CONTROLLED WITHIN PLUS OR MINUS 4% OF THE OPTIMUM TO FACILITATE COMPACTION, GENERALLY, URSATISFACTORY MATERIALS INCLUDE MATERIALS CLASSIFIED IN ASTIM D-2867 AS FT, CH, MH, CL, OH AND ANY SOIL TOO WET TO FACILITATE COMPACTION. CH AND MH SOILS MAY BE USED SUBJECT TO APPROVAL, OF THE RIGHIERER SOILS SHALL HAVE A MINIMUM DRY DENSITY OF 52 LBCF PER ASTIM D-888 AND SHALL HAVE A PLASTICITY INDEX LESS THAN 17.

EROSION CONTROL NOTES

- ALL DISTURBED AREAS NOT PAVED OR BUILT UPON ARE TO BE FERTILIZED AND HYDRO-SEEDED WITH STRAW AND COTTON PRODUCT WITH TACK AGENTS BY THE CONTRACTOR IN ACCORDANCE WITH THE CURRENT WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL.
- ALL DRAIN INLETS SHALL BE PROTECTED FROM SILTATION. INEFFECTIVE PROTECTION DEVICES SHALL BE IMMEDIATELY REPLACED AND THE INLET CLEANED. FLUSHING IS NOT AN ACCEPTABLE METHOD OF CLEANING.

- STABILIZATION NEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS IMPOUNDMENTS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
- ALL TEMPORARY EROSION AND SEDMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FIRM STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, INVESS OTHERWISE AUTHORIZE ENGINEER, TRAPPED SEDMENTA HAD THE DISTINGED SOIL MEASUR SESULTING FROM THE DISTOSITION OF TEMPOR MEASURES SHOLL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDMENTATION.

- FERTILIZER 500 POUNDS PER ACRES OF 10-20-10 FERTILIZER OR EQUIVALENT POUNDAGE OF DIFFERENT ANALYSIS. WORK INTO SOIL PRIOR TO SEEDING.
- MULCH WOOD FIBER OR CHOPPED STRAW AT RATE OF 2 TONS PER ACRE. HYDRO-MULCH AT RATE OF 30 BALES PER ACRE.

5-8-2013 DATE

REVISED QUANTITIES & SPOIL AREA

Scale: N.T.S.

resigned By: JDR

CEVISIONS

SEED - 46 LBS. PER ACRE TALL FESCUE AND 20 LBS. PER ACRE PERENNIAL RYE GRASS. TO BE SEEDED BY HYDRO-SEEDER.

C. CONSTRUCT ALL PROPOSED SEDIMENT CONTROL DEVICES AS SOON AS CLEARING AND GRUBBING OPERATIONS ALLOW. DIVERSIONS AND SEDIMENT BASINS SHALL BE SEEDED AND MULCHED IMMEDIATELY. GRADING OPERATIONS AS REQUIRED. CUT SLOPES AND FILL SLOPES SHALL BE TOPSOILED AS NEEDED. DITCH LINES SHALL BE CLEANED, ALL DITCHES WILL HAVE AT LEAST GRASS LINING PROTECTION OR GREATER BASED ON DITCH SLOPE WITH THE FOLLOWING DETERMINATION; 0 TO 4% - ORGANIC JUTE MATTING, 4 TO 10% - SYNTHETIC MATTING (TRM), AND 10% - 20% - RIPRAP. ACE AT AN AREA DETERMINED IN THE FIELD WHERE EROSION WILL NOT TAKE AND MULCHED. SILT FENCE SHALL BE CONSTRUCTED AROUND TOPSOIL

B. CONSTRUCT THE CONSTRUCTION ENTRANCE.

A PRE-CONSTRUCTION CONFERENCE WILL DRAWINGS AND PROVIDE ANY REQUESTED

BE HELD ON SITE WITH CONTRACTOR TO REVIEW THE CONSTRUCTION GUIDANCE.

SEQUENCE OF EVENTS:

MANAGEMENT STRATEGIES: CONSTRUCTION AS SCOUN AS POSSIBLE: THE JOB SUPERINTEN OF ALL EROSION AND SEDIMENT CONTROL ME EROSION AND SEDIMENT CONTROLS SHALL BISTABILIZED.

NI WILL BE SEQUENCED SO THAT GRADING OPERATIONS WILL BEGIN AND END ENDERN SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE MEASURES, AFTER SOHEVING, ADDIQUATE STABLIZATION THE TEMPORARY BE REMOVED AND ANY AREAS DISTURBED DURING THIS PROCESS SHALL BE

VEGETATIVE PRACTICE TOPSOILING: TOPSOIL WILL BE STRIPPED FROM THE SITE AND STOCKPILED IN MA AREA OFTERMINED IN THE FELLO. UPON THE COMPLETION OF THE PROJECT TOPSOIL WILL BE PLACED ON ALL DISTURBED AREAS, LET TORNAM FOR HOTH AREA OF A MANIMAN DEPTH OF A CHACHES, TEMPORARY SEEDING: ALL DEBUGED AREAS, LET TORNAM FOR THAN AREA OF A MANIMAN DEPTH OF A CHACHES, THE PROPARED SEED OF THE THE OF YEAR WILL BE THE BASIS FOR THE SEED TO MAY URBE. THE THE OF SEAR WILL BE THE DASIS FOR THE SEED TO MAY URBE. PRANAMENT SEEDING, ALL SEEDOR AREAS, WILL BE RESECUED TO DETAIN AN ADEQUATE STAND OF GRASS. PERMANENT SEEDING SHALL BE PLACED WITHIN SEVEN DAYS UPON ACHIEVING FINAL GRADE. WATER, MILLCH, AND RESEED AS NECESSARY TO OBTAIN AN ADEQUATE STAND OF GRASS.

1902 Bros. Engineers

Civil, Mining, Environmental and
Consulting Engineering
140 South Third Street, Post Office Box 368,
Contraburg, West Virginia, 28301 (304) 824–8445

STRUCTURAL PRACTICES:

DIVERSION DITCHES: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.

DIVERSION BERMS: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.

DIVERSION BERMS: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.

OUTLET PROTECTION: WILL BE CONSTRUCTED AS SHOWN ON THE PLANS.

CLEAR AND GRUB, REMOVE TOPSOIL AND PUPLACE, TOPSOIL STOCKPILE TO BE SEEDED STOCKPILES.

Hornor





CULVERT INLET AND OUTLET PROTECTION SHALL BE CONSTRUCTED IMMEDIATELY UPON PLACEMENT OF INLETS AND CULVERTS. INSTALLATION OF MATTING AND/OR RIP RAP TO OCCUR ONCE DITCHES ARE CONSTRUCTED.

WHEN FINAL GRADE IS ACHIEVED, TOPSOIL TO BE PLAGED DO ALL DISTURBED AREAS NOT LINED, HYDRO-SEED ALL DISTURBED AREAS AND REALINED. AS DIL SAWHELE SHOULD BE TAKEN AND TESTED TO DETERMINE RECOMMENDED BY A REALINED AS A MINIMUM LINE AT A RATIE OF 4 RATIES IF NO GOLDES SAWHELE IS THAKEN THE MEN BY TOWN PER ACRE. FERNILEE AT A PARE BY BUSING PER ACRE. SEED WITH 45 LBS, PER ACRE OF PARLINDAL RYE GRASS.

LIME, FERTILIZER, AND SEED WILL BE APPLIED BY USING A HYDRO-SEEDER, HYDRO-MUTCH PRODUCTS SHALL BE MIXED AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

CONSTRUCTION, GENERAL AND E&S NOTES JOHN CAMPBELL NORTH

WHEN SITE IS STABILIZED, ALL EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED AND REPARSTABILIZE THOSE AREAS IN ACCORDANCE WITH STATE STANDARDS.

FINAL SEEDING MUST OCCUR WITHIN 7 DAYS OF FINAL GRADING.

MAKE MODIFICATIONS FOR PERMANENT STORM WATER MANAGEMENT.

FINAL SITE INSPECTION.

PERMANENT STABILIZATION: ALL AREAS LEI WITH PERMANENT SEEDING IMMEDIATELY F DORMANT FOR LONGER THAN 21 DAYS. SEE

FT UNCOVERED BY EITHER BUILDINGS OR PAVEMENT SHALL BE STABILIZED TOLLOWING FINISH GRADING AND WITHIN 7 DAYS. AT NO TIME SHALL LAND LAY SEQUENCE OF EVENTS FOR RATES.

DRILL PAD SITE

UNION DISTRICT RITCHIE COUNTY, WV

