



west virginia department of environmental protection

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

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

Tuesday, May 15, 2018
WELL WORK PERMIT
Horizontal 6A / New Drill

ARSENAL RESOURCES LLC
6031 WALLACE ROAD EXTENSION SUITE 603

WEXFORD, PA 15090

Re: Permit approval for CHRIS JENNINGS PL2017E 213
47-077-00650-00-00

This well work permit 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 any additional specific 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 permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

A blue ink signature of James A. Martin, written in a cursive style.

Operator's Well Number: CHRIS JENNINGS PL2017E 213
Farm Name: CHRISTOPHER R. JENNINGS
U.S. WELL NUMBER: 47-077-00650-00-00
Horizontal 6A New Drill
Date Issued: 5/15/2018

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. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. 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 one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
9. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
10. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

API Number: 4707700650

PERMIT CONDITIONS

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov.

05/18/2018

18)

CASING AND TUBING PROGRAM

TYPE	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	24	New	H-40	94	80	80	CTS
Fresh Water	13.375	New	J-55	54.5	1,050	1,050	CTS
Coal							
Intermediate	9.625	New	J-55	40	2,150	2,150	CTS
Production	5.5	New	P-110	20	18,143	18,143	2,000
Tubing							
Liners							

MJK 12/5/2017

TYPE	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	24	36			0	Class A, 3% CaCl2	1.2
Fresh Water	13.375	17.5	0.38	2,730	900	Class A, 3% CaCl2	1.2
Coal							
Intermediate	9.625	12.25	0.395	3,950	1,500	Class A, 3% CaCl2	1.29
Production	5.5	8.5-8.75	0.361	12,640	9,500	Class A/50.50 Poz	1.29/1.34
Tubing					5,000		
Liners					N/A		

PACKERS

Kind:				
Sizes:				
Depths Set:				

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

The well will be started with a conductor rig drilling a 36" hole to Conductor programmed depth then running 24" casing and circulating cement back to surface. The conductor rig will move out and the drilling rig will move in and rig up. The drilling rig will then spud a 17 1/2" hole and drill to fresh water casing (Surface) to the programmed depth, Run 13- 3/8" casing and cement to surface. The rig will continue drilling a 12- 1/4" intermediate hole to the programmed depth, run 9- 5/8" casing and cement to surface. The rig will then continue to drill an 8- 3/4" hole to a designed pilot hole depth, then trip out of hole to run wireline logs. A cement kick-off plug will then be set from bottom of the pilot hole to the designed KOP. We will then drill off the cement plug and start drilling the curve and lateral section to the programmed total measured depth, run 5 1/2" casing and cement according to the program.

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

The well will be completed using a plug and perforation method and stimulated with a slickwater and sand slurry. The anticipated maximum rate will be 90 bpm and the maximum pressure will be 9,500 psi.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 21.40

22) Area to be disturbed for well pad only, less access road (acres): 6.90

23) Describe centralizer placement for each casing string:

24"- No centralizers, 13 3/8" – one bow spring centralizer on every other joint, 9 5/8" – one bow spring centralizer every third joint from TD to surface, 5 1/2" – one semi rigid centralizer on every joint from TD of casing to end of curve. Then every other joint to KOP. Every third joint from KOP to 2,250'; there will be no centralizers from 2,250 to surface.

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

24" will be grouted from surface. The 13 3/8" casing will be cemented to surface with Class A cement and no greater than 3% CaCl (calcium chloride). The 9 5/8" casing will be cemented to surface with Class A cement, & no greater than 3% calcium chloride. The 5 1/2" production string will be cemented back to 2,000' (+/- 150' above the casing shoe for the 9 5/8") with Type 1 or Class A and 50/50 Poz cement retarded (to extend pumpability) cellophane flaked for fluid loss, Bentonite gel as an extender (increased pumpability and fluid loss), a defoaming agent to decrease cement foaming during mixing to insure the cement is of proper weight to placement and possibly gypsum gas blocking additive to aid in blocking/gas migration (in combination with other additive mentioned here, helps cement achieve a "right angle" set) during the plastic phase of the cement set-up.

25) Proposed borehole conditioning procedures:

Top holes will be drilled with fresh water to KOP. At KOP, the wellbore will be loaded with synthetic oil based mud, barite-weighted mud system with such properties as to build a filter-cake on the face to the bore-hole. This will provide lubricity as well as stabilizing the well bore. We will begin rotating the drill string and mud will be circulated upon reaching TD until no further cuttings are observed coming across the shaker screens. Once clean mud is circulated back to surface, we will pull three stands of drill pipe, load the hole, pull three stands and load the hole. The weight indicator on the rig will be monitored for any occurrences of drag and if any, additional hole cleaning efforts will be applied to that section of the wellbore.

*Note: Attach additional sheets as needed.

Chris Jennings PL2017E #213		
CEMENT ADDITIVES		
	Name	Purpose
Additive #1:	Bentonite	Helping fluid loss, reducing free water
Additive #2:	Calcium Chloride	Accelerator for low temp application
Additive #3:	Celloflake	Loss circulation additive
Additive #4:	Gypsum	Used for thixotropic properties
Additive #5:	Lignosulfonate	Low temp cement retarder
Additive #6:	Naphthalene Based Dispersant	Used to improve rheological properties of cement
Additive #7:	Cellulose	Help with fluid loss

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47 07 700650
47 07 700649



Purpose

The purpose of this pad-specific Hydraulic Fracturing Monitoring Plan is to identify and notify conventional well operators near Arsenal Resources hydraulic fracturing in Preston County, WV prior to hydraulic fracturing at the following ARSENAL RESOURCES wells on the Chris Jennings PL2017E 213.

Due to the apparent presence of unique geological conditions, the potential for communication between deep geologic zones exists in this area. This potential communication, via natural gas, water, or both, may occur between hydraulically fractured wells in the Marcellus formation (approximately 8,400'TVD) and existing conventional natural gas wells in partially-depleted, relatively high permeability reservoirs at depths shallower than the Marcellus.

ARSENAL RESOURCES has determined there are no existing active or inactive wells within the 500' offset of the Chris Jennings PL2017E 213 wellbore.

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4707700650

WW-9
(4/16)

API Number 47 - _____
Operator's Well No. Chris Jennings PL2017E 213

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Arsenal Resources OP Code 494519412

Watershed (HUC 10) Sandy Creek Quadrangle Fellowsville

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

Will a pit be used? Yes No

If so, please describe anticipated pit waste: Produced water

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

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number _____)
- Reuse (at API Number Various)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain _____)

Will closed loop system be used? If so, describe: Yes, the closed loop system will contain all of the drilling medium and drill cuttings on location and then be taken to a landfill.

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Vertical: Freshwater, Horizontal: Oil Based Mud

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

Additives to be used in drilling medium? Bentonite, Soap & Polymer Sticks, Soda Ash, Sodium Bicarbonate, Defoamer, Base Oil, Emulsifiers, Lime, Barite

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

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? Advanced Disposal Services & Chestnut Valley Landfill

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

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

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

Company Official Signature [Signature]
Company Official (Typed Name) William Veigel
Company Official Title Designated Agent

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Office of Oil and Gas
MAY 07 2018

Subscribed and sworn before me this 8TH day of DECEMBER, 20 17

[Signature]
My commission expires 9/15/2021

WV Department of Environmental Protection
OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
CAROLINA FLANAGAN
PO Box 608
Lumberport WV 26006
My Commission Expires September 16, 2018

Arsenal Resources

Proposed Revegetation Treatment: Acres Disturbed 21.4 Prevegetation pH 6.8 Average

Lime 2.67 Tons/acre or to correct to pH 6.4

Fertilizer type 10-20-20

Fertilizer amount 1000 lbs/acre

Mulch 3-4 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Orchard Grass	129	Orchard Grass	129
Rye	93	Rye	93
Clover	24	Clover	24
Timothy	45	Timothy	45

Attach:

Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions (L x W x D) of the pit, and dimensions (L x W), and area in acreage, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *Haynes J. Knutson*

Comments: Re-seed and mulch all disturbed areas as soon as reasonably possible per regulation. Upgrade erosion and sediment control measures where needed per the West Virginia Erosion and Sediment Control Field Manual, if necessary.

Title: Inspection Date: 12/5/2017

Field Reviewed? () Yes () No

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ARSENAL

R E S O U R C E S

SITE SAFETY PLAN

CHRIS JENNINGS PL2017E #213 WELL PAD

911 Address:

2548 Scotch Hill Rd.

Thornton, WV 26440

Harold J. Kuntz
12/5/2017

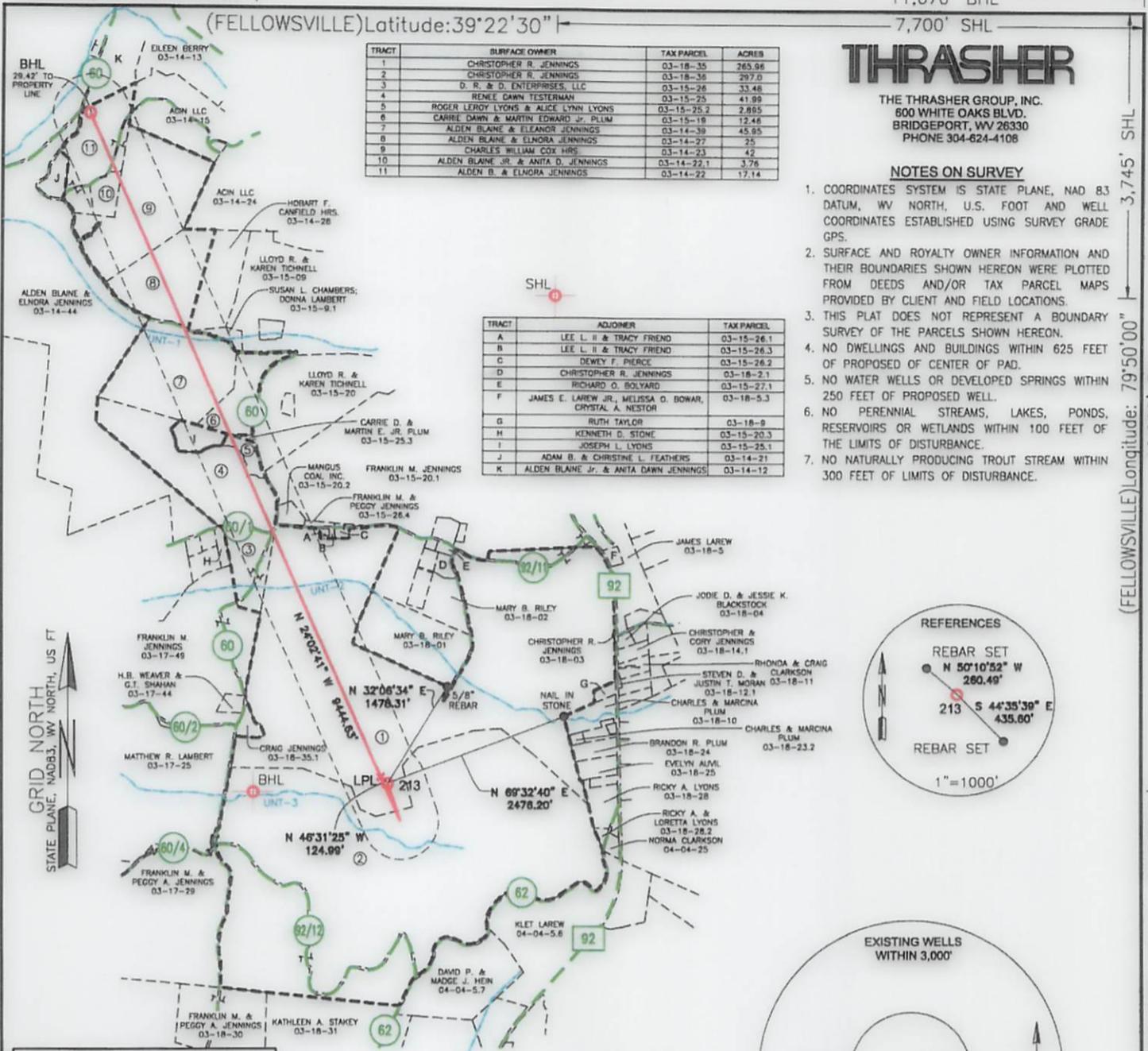
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(NEWBURG)Latitude:39°25'00"

11,670' BHL

(FELLOWSVILLE)Latitude:39°22'30"

7,700' SHL



TRACT	SURFACE OWNER	TAX PARCEL	ACRES
1	CHRISTOPHER R. JENNINGS	03-18-35	265.96
2	CHRISTOPHER R. JENNINGS	03-18-36	207.0
3	D. R. & D. ENTERPRISES, LLC	03-15-26	33.46
4	RENKE DAWN TESTERMAN	03-15-25	41.89
5	ROGER LEROY LYONS & ALICE LYNN LYONS	03-15-25.2	2.865
6	CARRIE DAWN & MARTIN EDWARD JR. PLUM	03-15-19	12.46
7	ALDEN BLAINE & ELEANOR JENNINGS	03-14-39	45.95
8	ALDEN BLAINE & ELEANOR JENNINGS	03-14-27	25
9	CHARLES WILLIAM COX HRS	03-14-23	42
10	ALDEN BLAINE JR. & ANITA D. JENNINGS	03-14-22.1	3.76
11	ALDEN B. & ELEANOR JENNINGS	03-14-22	17.14

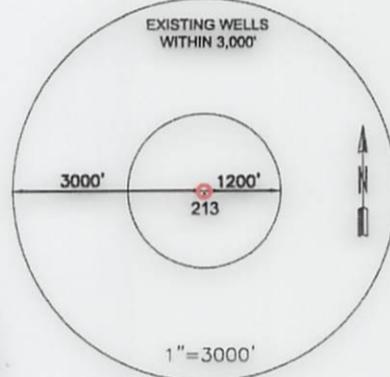
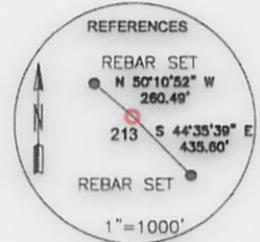
TRACT	ADJOINER	TAX PARCEL
A	LEE L. II & TRACY FRIEND	03-15-26.1
B	LEE L. II & TRACY FRIEND	03-15-26.3
C	DEWEY F. PIERCE	03-15-26.2
D	CHRISTOPHER R. JENNINGS	03-18-2.1
E	RICHARD O. BOLYARD	03-15-27.1
F	JAMES E. LAREW JR., MELISSA O. BOWAR, CRYSTAL A. NESTOR	03-18-5.3
G	RUTH TAYLOR	03-18-9
H	KENNETH D. STONE	03-15-20.3
I	JOSEPH L. LYONS	03-15-25.1
J	ADAM B. & CHRISTINE L. FEATHERS	03-14-21
K	ALDEN BLAINE JR. & ANITA DAWN JENNINGS	03-14-12

THRASHER

THE THRASHER GROUP, INC.
600 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE 304-624-4106

NOTES ON SURVEY

- COORDINATES SYSTEM IS STATE PLANE, NAD 83 DATUM, WV NORTH, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED OF CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.

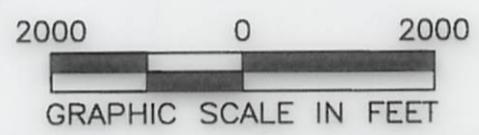


SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,357,877.621
EASTING: 598,175.635
LANDING POINT LOCATION (LPL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,357,903.367
EASTING: 598,147.564
BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,360,511.825
EASTING: 596,931.355



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 2270



<p>(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS</p> <p>WVDEP OFFICE OF OIL & GAS 601 57TH STREET CHARLESTON, WV 25034</p>	MINIMUM DEGREE OF ACCURACY: 1/200 PROVEN SOURCE OF SURVEY GRADE GPS ELEVATION: (NAVD 88, US FT)	OPERATOR'S WELL #: PL2017E 213 API WELL #: 47 STATE 77 COUNTY PERMIT 00650
	WELL TYPE: OIL WASTE DISPOSAL PRODUCTION DEEP GAS <input checked="" type="checkbox"/> LIQUID INJECTION STORAGE SHALLOW <input checked="" type="checkbox"/>	WATERSHED: SANDY CREEK DISTRICT: LYON COUNTY: PRESTON SURFACE OWNER: CHRISTOPHER R. JENNINGS OIL & GAS ROYALTY OWNER: CHRISTOPHER R. JENNINGS
DRILL <input checked="" type="checkbox"/> DRILL DEEPER REDRILL FRACTURE OR STIMULATE <input checked="" type="checkbox"/> PLUG OFF OLD FORMATION PERFORATE NEW FORMATION CONVERT PLUG & ABANDON CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY)	TARGET FORMATION: MARCELLUS(LATERAL), HUNTERSVILLE CHERT(PILOT)	ESTIMATED DEPTH: 8,262(LATERAL), 8,374'(PILOT) TVD 18,143 TMD
WELL OPERATOR: ARSENAL RESOURCES ADDRESS: 6031 WALLACE ROAD EXTENSION #300 CITY: WEXFORD STATE: PA ZIP CODE: 15090	DESIGNATED AGENT: WILLIAM VEIGEL ADDRESS: 65 PROFESSIONAL PLACE, SUITE 200 CITY: BRIDGEPORT STATE: WV ZIP CODE: 26330	DATE: 04-04-2018 DRAWN BY: R. DOERR SCALE: 1" = 2000' DRAWING NO: 030-3213 WELL LOCATION PLAT

05/18/2018

WW-6A1
(5/13)

Operator's Well No. Chris Jennings PL2017E 213

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
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See Attached

**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

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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: Arsenal Resources
 By: William Veigel 
 Its: Designated Agent

Attachment to WW-6A1, CHRIS JENNINGS 213

Letter Designation/Number Designation on Plat	Grantor, Lessor, Assignor, etc.	Grantee, Lessee, Assignee, etc.	Royalty	Book/Page	Acreage
1/2	Christopher R. Jennings	Magnum Land Services, LLC	0.135	696/265	863.1
	Magnum Land Services, LLC	Belmont Resources, LLC		711/286	
	Belmont Resources, LLC	Sinclair Oil & Gas Company		724/859; 738/382	
	Belmont Resources, LLC and Sinclair Oil & Gas Company	Enerplus Resources (USA) Corporation		725/326	
	Enerplus Resources (USA) Corporation	Mar Key, LLC		782/50	
3/4/5/6/7/8/9/10/11	Franklin M. Jennings and Peggy A. Jennings	R.P. Land Company, LLC	0.18	763/160	1790.66
	R.P. Land Company, LLC	Mar Key, LLC		740/1	
3/4/5/6/7/8/9/10/11	D R and D Enterprises, LLC (Darlene V. Murray and Dorrin Rolland Jennings created an LLC, held jointly (50% each))	R.P. Land Company, LLC	0.18	772/288	587.39645
	R.P. Land Company, LLC	Mar Key, LLC		740/1	
7/8/10/11	Alden B. Jennings and Elnora Jennings, husband and wife	R.P. Land Company, LLC	0.18	753/182	403.04
	R.P. Land Company, LLC	Mar Key, LLC		740/1	

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Agreement to Drill, Complete and Operate Oil & Gas Wells

This Agreement to Drill, Complete and Operate Oil & Gas Wells (this "Agreement"), by and among Mountaineer Keystone LLC, a West Virginia limited liability company ("Mountaineer Keystone"), PDC Mountaineer, LLC, a Delaware limited liability company ("PDC"), and PDC Mountaineer Holdings, LLC, a Delaware limited liability company ("PDC Holdings"), is effective as of October 15, 2014. (the "Effective Date") and sets forth the terms pursuant to which Mountaineer Keystone will drill, complete and operate the Wells (as defined below) on behalf of PDC and PDC Holdings. Mountaineer Keystone, PDC, and PDC Holdings are each a "Party" and are collectively the "Parties". In consideration of the foregoing and the respective agreements hereinafter set forth and the mutual benefits to be derived therefrom, the Parties, intending to be legally bound, hereby agree as follows:

1. **Term:** This Agreement is effective from the Effective Date until terminated by Mountaineer Keystone on the one hand or PDC and PDC Holdings on the other hand with 30 days' written notice to the other Party or Parties, as applicable (the "Term").
2. **Authorization to Operate:** PDC and PDC Holdings authorize Mountaineer Keystone to undertake and perform, on PDC and PDC Holdings behalf, all operations, including without limitation permit applications, well pad preparation, drilling and completing wells, and marketing gas, oil and other hydrocarbons therefrom with respect to all oil and gas wells to be drilled on oil and gas leasehold acreage held by PDC or PDC Holdings. PDC, PDC Holdings and Mountaineer Keystone are affiliates with a common parent. Mountaineer Keystone was formed to operate oil and gas leasehold acreage held by PDC, PDC Holdings and certain other affiliates. Mountaineer Keystone agrees that it shall, in a good and workmanlike manner and in accordance with industry standards as they prevail in the area, drill, complete and operate oil and gas wells on leasehold acreage owned by PDC or PDC Holdings from time to time as directed by PDC or PDC Holdings (collectively, the "Wells").
3. **No Third Party Beneficiary:** This Agreement is for the benefit of the Parties and is not for the benefit of any third party.
4. **Counterparts:** This Agreement may be simultaneously executed in several counterparts and via facsimile or similar electronic transmittal, each of which shall be deemed to be an original and taken together shall constitute one and the same instrument.

[Signature Page Follows]

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IN WITNESS WHEREOF, Mountaineer Keystone, PDC, and PDC Holdings have caused their duly authorized representatives to execute this Agreement as of the Effective Date.

MOUNTAINEER KEYSTONE LLC

By: 
Name: Robert Kessel
Title: CEO

PDC MOUNTAINEER, LLC

By: 
Name: Robert Kessel
Title: CEO

PDC MOUNTAINEER HOLDINGS, LLC

By: 
Name: Robert Kessel
Title: CEO

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Agreement to Drill, Complete and Operate Oil & Gas Wells

This Agreement to Drill, Complete and Operate Oil & Gas Wells (this "Agreement"), by and among Arsenal Resources LLC, a West Virginia limited liability company ("Arsenal"), River Ridge Energy, LLC, a Delaware limited liability company ("River Ridge"), and River Ridge Energy, Holdings, LLC, a Delaware limited liability company ("River Ridge Holdings"), is effective as of March 1, 2017. (the "Effective Date") and sets forth the terms pursuant to which Arsenal will drill, complete and operate the Wells (as defined below) on behalf of River Ridge and River Ridge Holdings. Arsenal, River Ridge, and River Ridge Holdings are each a "Party" and are collectively the "Parties". In consideration of the foregoing and the respective agreements hereinafter set forth and the mutual benefits to be derived therefrom, the Parties, intending to be legally bound, hereby agree as follows:

1. **Term:** This Agreement is effective from the Effective Date until terminated by Arsenal on the one hand or River Ridge and River Ridge Holdings on the other hand with 30 days' written notice to the other Party or Parties, as applicable (the "Term").
2. **Authorization to Operate:** River Ridge and River Holdings authorize Arsenal to undertake and perform, on River Ridge and River Ridge Holdings behalf, all operations, including without limitation permit applications, well pad preparation, drilling and completing wells, and marketing gas, oil and other hydrocarbons therefrom with respect to all oil and gas wells to be drilled on oil and gas leasehold acreage held by River Ridge or River Ridge Holdings. River Ridge, River Ridge Holdings and Arsenal are affiliates with a common parent. Arsenal was formed to operate oil and gas leasehold acreage held by River Ridge, River Ridge Holdings and certain other affiliates. Arsenal agrees that it shall, in a good and workmanlike manner and in accordance with industry standards as they prevail in the area, drill, complete and operate oil and gas wells on leasehold acreage owned by River Ridge or River Ridge Holdings from time to time as directed by River Ridge or River Ridge Holdings (collectively, the "Wells").
3. **No Third Party Beneficiary:** This Agreement is for the benefit of the Parties and is not for the benefit of any third party.
4. **Counterparts:** This Agreement may be simultaneously executed in several counterparts and via facsimile or similar electronic transmittal, each of which shall be deemed to be an original and taken together shall constitute one and the same instrument.

[Signature Page Follows]

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IN WITNESS WHEREOF, Arsenal, River Ridge, and River Ridge Holdings have caused their duly authorized representatives to execute this Agreement as of the Effective Date.

ARSENAL RESOURCES LLC

By: Joel E. Symonds
Name: Joel E. Symonds
Title: Vice President - Land

RIVER RIDGE ENERGY, LLC

By: Joel E. Symonds
Name: Joel E. Symonds
Title: Vice President - Land

RIVER RIDGE HOLDINGS, LLC

By: Joel E. Symonds
Name: Joel E. Symonds
Title: Vice President - Land

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West Virginia Secretary of State — Online Data Services

Business and Licensing

Online Data Services Help

Business Organization Detail

NOTICE: The West Virginia Secretary of State's Office makes every reasonable effort to ensure the accuracy of information. However, we make no representation or warranty as to the correctness or completeness of the information. If information is missing from this page, it is not in the The West Virginia Secretary of State's database.

MAR KEY LLC

Organization Information								
Org Type	Effective Date	Established Date	Filing Date	Charter	Class	Sec Type	Termination Date	Termination Reason
LLC Limited Liability Company	7/11/2011		7/11/2011	Domestic	Profit			

Organization Information								
Business Purpose	2111 - Mining, Quarrying, Oil & Gas Extraction - Oil and Gas Extraction - Crude Oil and Natural Gas Extraction			Capital Stock				
Charter County				Control Number	99Q1F			
Charter State	WV			Excess Acres				
At Will Term	A			Member Managed	MBR			
At Will Term Years				Par Value				

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Authorized Shares

Addresses	
Type	Address
Designated Office Address	65 PROFESSIONAL PLACE SUITE 200 BRIDGEPORT, WV, 26330
Mailing Address	6031 WALLACE ROAD EXTENSION SUITE 300 WEXFORD, PA, 15090 USA
Notice of Process Address	CORPORATION SERVICE COMPANY 209 WEST WASHINGTON STREET CHARLESTON, WV, 25302
Principal Office Address	6031 WALLACE ROAD EXTENSION SUITE 300 WEXFORD, PA, 15090 USA
Type	Address

Officers	
Type	Name/Address
Member	ARSENAL RESOURCES ENERGY LLC 6031 WALLACE ROAD EXTENSION SUITE 300 WEXFORD, PA, 15090
Organizer	PAUL M HERZING 560 EPSILON DR. PITTSBURGH, PA, 15238 USA
Type	Name/Address

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Annual Reports
Date filed

05/18/2018

3/30/2017
6/20/2016
6/30/2015
4/28/2014
6/28/2013
5/8/2012
Date filed

For more information, please contact the Secretary of State's Office at 304-558-8000.

Tuesday, November 28, 2017 — 9:44 AM

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People Powered. Asset Strong.

November 28, 2017

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

RE: Ownership of Roadways; CHRIS JENNINGS Pad

Dear Mr. Martin:

In preparation of filing a permit application for the above referenced well, the Title Department of Arsenal Resources has conducted a thorough title examination in order to determine the ownership of the oil and gas underlying all roadways crossed by the proposed wells. The findings of the title examination show that some of the roadways crossed by the proposed wells are owned in fee by the West Virginia Department of Transportation, Division of Highways and that some are only right of ways. If owned in fee by the West Virginia Department of Transportation, Division of Highways, a lease covering its interest in the roadway or roadways has been properly obtained and provided in the application materials. If a right of way only, the oil and gas underlying such roadway or roadways is owned by the adjoining landowners and is also covered by the leaseholds provided in the application materials.

If you have any questions, concerns or need further information, please do not hesitate to contact me at the address listed below.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Ryan Brode'.

Ryan Brode
Title Attorney

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6031 Wallace Road Ext, Suite 300
Wexford, PA 15090
P: 724-940-1100
F: 800-428-0981
www.arsenalresources.com

05/18/2018

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

Date of Notice Certification: 12/08/2017

API No. 47- _____

Operator's Well No. Chris Jennings PL2017E 213

Well Pad Name: Chris Jennings PL2017E

Notice has been given:

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>598,175.635</u>
County: <u>Preston</u>	UTM NAD 83 Northing: <u>4,367,877.621</u>
District: <u>Lyon</u>	Public Road Access: <u>CR 92/11</u>
Quadrangle: <u>Fellowsville</u>	Generally used farm name: <u>Christopher R. Jennings</u>
Watershed: <u>Sandy Creek</u>	

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following: *PLEASE CHECK ALL THAT APPLY <input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED <input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED <input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or <input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH) <input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION <input checked="" type="checkbox"/> 5. PUBLIC NOTICE <input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION		OOG OFFICE USE ONLY <input type="checkbox"/> RECEIVED/ NOT REQUIRED <input type="checkbox"/> RECEIVED <input type="checkbox"/> RECEIVED/ NOT REQUIRED <input type="checkbox"/> RECEIVED <input type="checkbox"/> RECEIVED <input type="checkbox"/> RECEIVED
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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 personal service, the return receipt card or other postal receipt for certified mailing.

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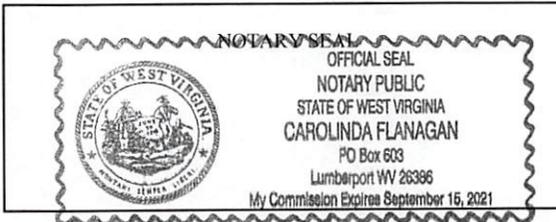
MAY 07 2018

Certification of Notice is hereby given:

THEREFORE, I William Veigel, 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: Arsenal Resources
By: William Veigel
Its: Designated Agent
Telephone: 724-940-1224

Address: 6031 Wallace Road Extension, Suite 300
Wexford, PA 15090
Facsimile: (304) 848-9134
Email: cflanagan@arsenalresources.com



Subscribed and sworn before me this 8TH day of DEC, 2017.
Carolinda Flanagan Notary Public
My Commission Expires 9/15/2021

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.

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

Notice Time Requirement: notice shall be provided no later than the **filing date of permit application.**

Date of Notice: 12/8/17 **Date Permit Application Filed:** 12/8/17

Notice of:

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

Delivery method pursuant to West Virginia Code § 22-6A-10(b)

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice WSSP Notice E&S Plan Notice Well Plat Notice is hereby provided to:

SURFACE OWNER(s)
Name: Christopher R. Jennings
Address: P.O. Box 86
Newburg, WV 26410

Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: Christopher R. Jennings
Address: P.O. Box 86
Newburg, WV 26410

Name: _____
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)
Name: Christopher R. Jennings
Address: P.O. Box 86
Newburg, WV 26410

COAL OWNER OR LESSEE
Name: ACIN, LLC Attn: George Angus
Address: 5260 Irwin Road
Huntington, WV 26705

COAL OPERATOR
Name: Kingwood Mining Inc. Attn: Mark Miller
Address: 4615 Yorks Run Road
Newburg, WV 26410

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: Christopher R. Jennings
Address: P.O. Box 86
Newburg, WV 26410

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: _____
Address: _____

*Please attach additional forms if necessary

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API NO. 47-**4707700650**
OPERATOR WELL NO. Chris Jennings PL2017E 213
Well Pad Name: Chris Jennings PL2017E

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 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.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

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.

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 well pad 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

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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 factors, if necessary.

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. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

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. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

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

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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.

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.

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.

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Office of Oil and Gas
DEC 9 2017
WV Department of
Environmental Protection

WW-6A
(8-13)

4707700650
API NO. 47-
OPERATOR WELL NO. Chris Jennings PL2017E 213
Well Pad Name: Chris Jennings PL2017E

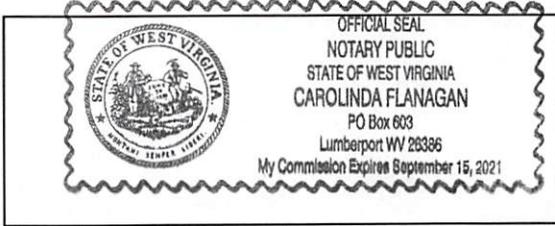
Notice is hereby given by:

Well Operator: Arsenal Resources
Telephone: 724-940-1224
Email: cflanagan@arsenalresources.com

Address: 6031 Wallace Road Extension, Suite 300
Wexford, PA 15090
Facsimile: (304) 848-9134

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.



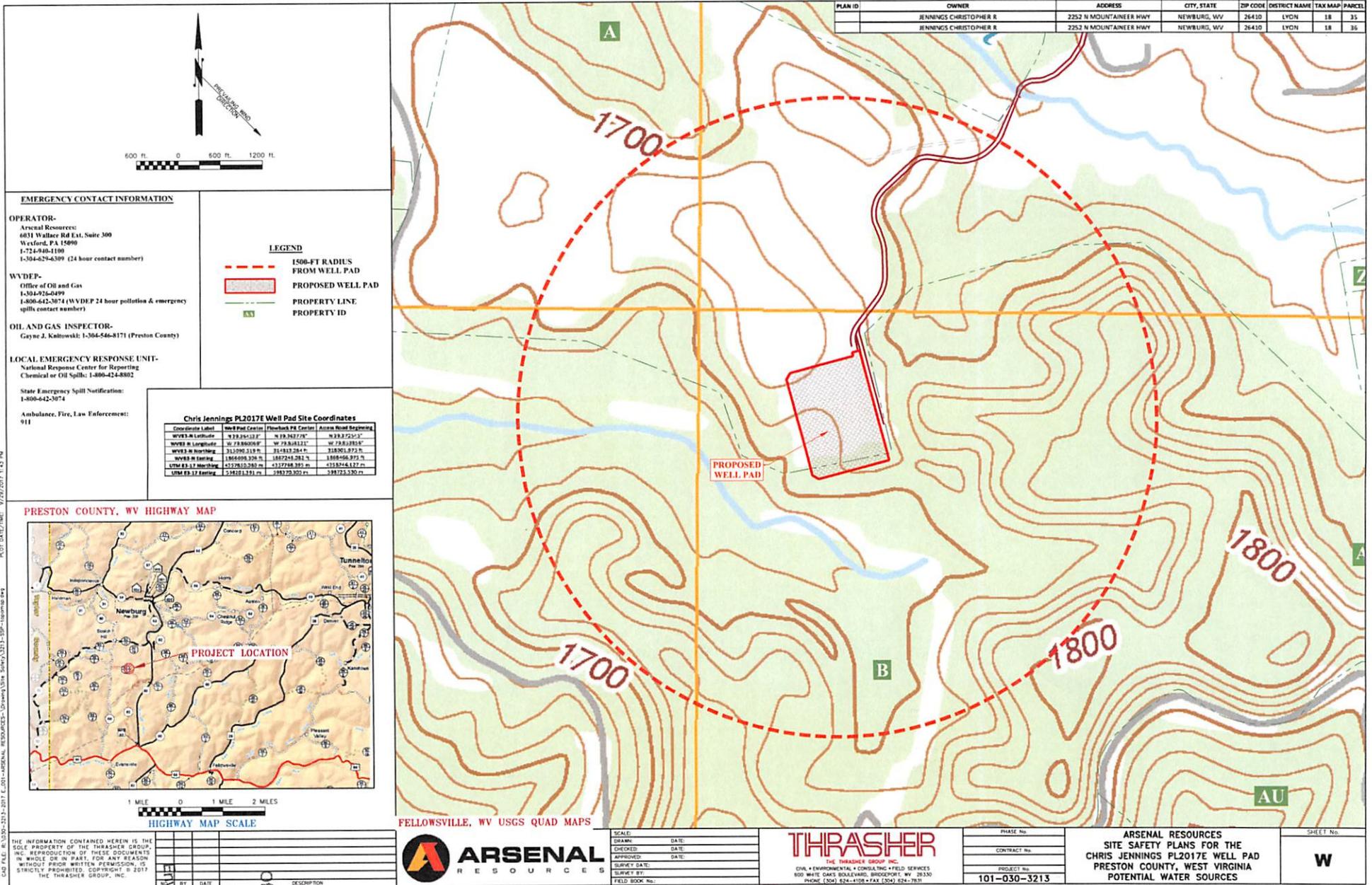
Subscribed and sworn before me this 8TH day of DEC. 2017.

Carolinda Flanagan Notary Public

My Commission Expires 9/15/2021

RECEIVED
Office of Oil and Gas
DEC 9 2017
WV Department of
Environmental Protection

05/18/2018



EMERGENCY CONTACT INFORMATION

OPERATOR:
 Arsenal Resources
 4031 Wallace Rd Ext. Suite 300
 Weyford, PA 15089
 1-724-940-1100
 1-304-629-6399 (24 hour contact number)

WVDEP:
 Office of Oil and Gas
 1-304-926-6499
 1-800-642-3074 (WVDEP 24 hour pollution & emergency spills contact number)

OIL AND GAS INSPECTOR:
 Gayne J. Koltowski: 1-304-546-8171 (Preston County)

LOCAL EMERGENCY RESPONSE UNIT:
 National Response Center for Reporting
 Chemical or Oil Spills: 1-800-424-8802

State Emergency Spill Notification:
 1-800-642-3074

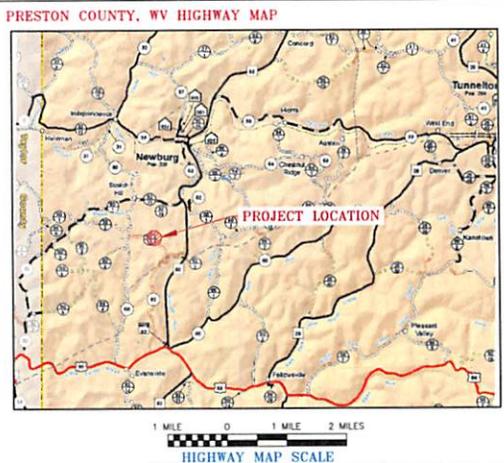
Ambulance, Fire, Law Enforcement:
 911

LEGEND

- 1500-FT RADIUS FROM WELL PAD
- PROPOSED WELL PAD
- PROPERTY LINE
- PROPERTY ID

Chris Jennings PL2017E Well Pad Site Coordinates

Coordinate Label	Well Pad Center	Flowback Pit Center	Access Road Beginning
WV03 N Lentholt	N 33.324137°	N 39.763773°	N 33.372525°
WV03 N Lentholt	W 23.860094°	W 23.861811°	W 23.832833°
WV03 N Newburg	315290.519 ft	314913.284 ft	314901.873 ft
WV03 N Lentholt	1862499.326 ft	1867241.281 ft	1868456.873 ft
UTM #2-12 Northing	1572512.283 m	1572763.393 m	1572464.172 m
UTM #2-12 Easting	1542013.931 m	1581725.302 m	1581723.330 m



FELLOWSVILLE, WV USGS QUAD MAPS



SCALE:	DATE:
DRAWN:	DATE:
CHECKED:	DATE:
APPROVED:	DATE:
SURVEY DATE:	
SURVEY BY:	
FIELD BOOK No.:	

PHASE No. _____
 CONTRACT No. _____
 PROJECT No. **101-030-3213**

ARSENAL RESOURCES
 SITE SAFETY PLANS FOR THE
 CHRIS JENNINGS PL2017E WELL PAD
 PRESTON COUNTY, WEST VIRGINIA
 POTENTIAL WATER SOURCES

SHEET No.	W
-----------	----------

LAYOUT FILE: W010
 CAP FILE: W010-3213-2017_E-001-ARSENAL_RESOURCES-Drawing1.dwg
 PLOT DATE/TIME: 6/29/2017 11:42:50 AM

RECEIVED
 Office of Oil and Gas
 Environmental Protec
 DEC 9 2017

**STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY**

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

Date of Notice: 05/02/2017 **Date of Planned Entry:** 05/09/2017

RECEIVED
Office of Oil and Gas
MAY 07 2018

Delivery method pursuant to West Virginia Code § 22-6A-10a

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Department of Environmental Protection

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

SURFACE OWNER(s)

Name: Christopher R. Jennings
 Address: P.O. Box 86
Newburg, WV 26410
 Name: _____
 Address: _____
 Name: _____
 Address: _____

COAL OWNER OR LESSEE

Name: See Attached
 Address: _____

MINERAL OWNER(s)

Name: Christopher R. Jennings
 Address: P.O. Box 86
Newburg, WV 26410
 *please attach additional forms if necessary

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>39.694385, -79.860372</u>
County: <u>Preston</u>	Public Road Access: <u>CR 92/11</u>
District: <u>Lyon</u>	Watershed: <u>Sandy Creek</u>
Quadrangle: <u>Fellowsville</u>	Generally used farm name: <u>Christopher R. Jennings</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production 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). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: Arsenal Resources
 Telephone: 724-940-1224
 Email: cflanagan@arsenalresources.com

Address: 6031 Wallace Road Extension, Suite 300
Wexford, PA 15090
 Facsimile: (304) 848-0134

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.

Arsenal Resources
Chris Jennings Pad
WW-6A3 – Notice of Plat Survey, Attachment

Coal Owner:

ACIN, LLC
Attn: George Angus
5260 Irwin Road
Huntington, WV 26705



Coal Operator:

Kingwood Mining Inc.
Attn: Mark Miller
4615 Yorks Run Rd.
Newburg, WV 26410

RECEIVED
Office of Oil and Gas
DEC 9 2017
WV Department of
Environmental Protection



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Jim Justice
Governor

Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

November 30, 2017

James A. Martin, Chief
Office of Oil and Gas
Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Subject: DOH Permit for the Chris Jennings Pad, Preston County

Chris Jennings PL2017E 213 Well Site

Dear Mr. Martin,

The West Virginia Division of Highways has issued Permit #04-2017-0789 for the subject site to Arsenal Resources for access to the State Road for the well site located off of Preston County Route 92/11 SLS.

The operator has signed a DISTRICT WIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT for DOH District 4 and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

Gary K. Clayton
Regional Maintenance Engineer
Central Office Oil & Gas Coordinator

Cc: Kelly Davis
Arsenal Resources
CH, OM, D-4
File

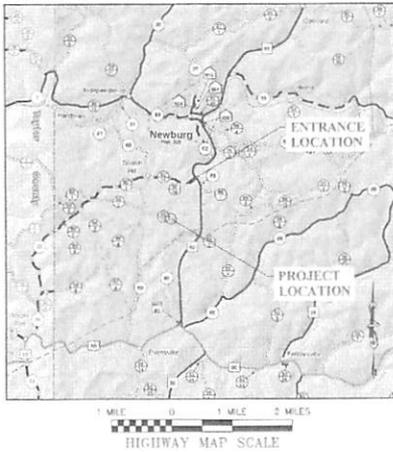
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Office of Oil and Gas
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WV Department of
Environmental Protection

Chris Jennings PL2017E 213			
FRACTURING ADDITIVES			
	PURPOSE	TRADE NAME	CAS #
Additive #1:	Friction Reducer	WFRA-405	Proprietary
Additive #2:	Scale Inhibitor	SI-1000	7440-21-3
Additive #3:	Biocide	BIOCLEAR 2000	25314-61-8
Additive #4:	Gelling Agent	LGC-15	9000-30-0
Additive #5:	Corrosion Inhibitor	AI-300	111-76-2
Additive #6:	Gel Breaker	AP-One	7727-54-0
Additive #7:	Acid	HCl - 7.5%	7647-01-0

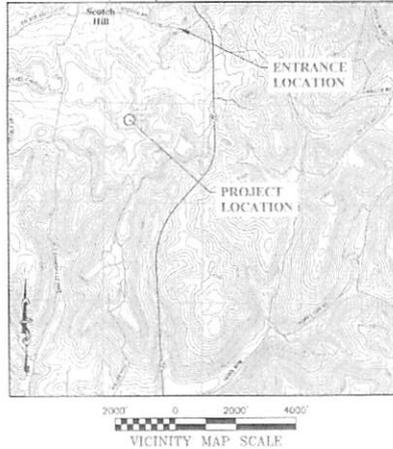
RECEIVED
Office of Oil and Gas
DEC 9 2017
WV Department of
Environmental Protection

05/18/2018

PRESTON COUNTY, WV HIGHWAY MAP



FELLOWSVILLE, WV QUAD MAPS



ONE CALL UTILITY SYSTEM CONTACT INFO



CONTRACTOR SHALL NOTIFY THE ONE-CALL SYSTEM OF THE INTENDED EXCAVATION OR DEMOLITION NOT LESS THAN FORTY (40) HOURS, EXCLUDING SATURDAY, SUNDAY, AND FEDERAL, FEDERAL OR STATE HOLIDAYS, NOR MORE THAN TEN (10) WORK DAYS PRIOR TO THE BEGINNING OF SUCH WORK.

ARSENAL RESOURCES

CONSTRUCTION PLANS FOR THE

CHRIS JENNINGS PL2017E

LYON DISTRICT, PRESTON COUNTY, WV

OCTOBER 2017



SHEET INDEX

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2	EXISTING CONDITIONS
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10	EXISTING STORAGE ACCESS ROAD PLAN & PROFILE
11-16	WELL PAD ACCESS ROAD SECTIONS
17	WELL PAD PLAN
18	WELL PAD PROFILE
19	WELL PAD SECTIONS
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21	FLOWBACK PIT & STAGING AREA PROFILE
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32-34	TYPICAL SECTIONS
35-42	DETAILS

DRIVING DIRECTIONS FROM NEWBURG, WV

1. TRAVEL EAST ON PRESTON COUNTY ROUTE (CR 13) FOR APPROXIMATELY 0.3 MILES
2. TURN RIGHT ON TO REDDENVILLE ROAD (CR 12)
3. TRAVEL SOUTH APPROXIMATELY 1.5 MILES ON WV 40
4. TURN RIGHT ON TO SCOTCH HILL ROAD (CR 4211)
5. TRAVEL WEST APPROXIMATELY 0.2 MILES ON CR 4211
6. TURN LEFT ON TO CHRIS JENNINGS 2017E WELL PAD ACCESS ROAD

SITE COORDINATES

Coordinate Label	Well Pad Center	Flowback PIT Center	Access Road Beginning
WV8-N Latitude	N 39 364131"	N 39 361775"	N 39 372545"
WV8-N Longitude	W 79 860067"	W 79 858211"	W 79 857956"
WV8-N Northing	315090.518 m	314813.784 m	314001.975 m
WV8-N Easting	1886498.326 m	1867248.082 m	1858466.973 m
UTM 83-17 Northing	4357850.080 m	4357768.035 m	4357846.124 m
UTM 83-17 Easting	598201.391 m	598203.305 m	598225.945 m

SURFACE HOLE COORDINATES

Coordinate Label	Well Number											
	201	202	203	204	205	206	211	212	213	214	215	216
WV8-N Latitude	N 39 364296"	N 39 364103"	N 39 364110"	N 39 364117"	N 39 364124"	N 39 364131"	N 39 364837"	N 39 364810"	N 39 364784"	N 39 364757"	N 39 364731"	N 39 364704"
WV8-N Longitude	W 79 859289"	W 79 859285"	W 79 859281"	W 79 859277"	W 79 859273"	W 79 859269"	W 79 860282"	W 79 860337"	W 79 860384"	W 79 860435"	W 79 860485"	W 79 860535"
WV8-N Northing	314011.569 m	314033.444 m	314052.218 m	314070.992 m	314089.766 m	314108.540 m	315201.652 m	315191.882 m	315182.114 m	315172.346 m	315162.578 m	315152.810 m
WV8-N Easting	1866170.884 m	1866209.552 m	1866248.220 m	1866286.888 m	1866325.556 m	1866364.224 m	1866402.892 m	1866441.560 m	1866480.228 m	1866518.896 m	1866557.564 m	1866596.232 m
UTM 83-17 Northing	4357801.809 m	4357802.843 m	4357803.877 m	4357804.911 m	4357805.945 m	4357806.979 m	4357881.438 m	4357880.562 m	4357879.686 m	4357878.810 m	4357877.934 m	4357877.058 m
UTM 83-17 Easting	598225.964 m	598226.895 m	598227.826 m	598228.757 m	598229.688 m	598230.619 m	598235.080 m	598234.813 m	598234.546 m	598234.279 m	598234.012 m	598233.745 m

Property Owner (District - Tax Map - Parcel)	Well Pad Disturbance (Ac.)	Total Disturbance (Ac.)
Jennings Christopher R (1-18-15)	4.00	14.50
Jennings Christopher R (1-18-16)	0.00	6.90
Total Disturbance	4.00	21.40

ENVIRONMENTAL IMPACTS	
Feature ID	Total Disturbance (Ac.)
WJ15A	0.022
WJ15B	0.017
WJ15C	0.010
WJ14	0.037
TOTAL =	0.096



CONTACT INFORMATION

THE THRASHER GROUP, INC.
R. BRAD MESSENGER, PE
OFFICE: 304-624-4108
EMAIL: brmesse@thrashereng.com

ARSENAL RESOURCES
EDDIE CARDER
OFFICE: 724-940-1204
EMAIL: ecarder@arsenalresources.com

APPROVED FOR PERMITS DATE: 10/30/17 BY: RBM
 APPROVED FOR BID DATE: _____ BY: _____
 APPROVED FOR CONSTRUCTION DATE: _____ BY: _____

REVISION NUMBER	REVISED SHEETS	BY	DATE	DESCRIPTION
1	17, 29, & 38	JCA	01/15/18	LABELLED ALL WELL PAD SUMPS, ADDED BERM BREACH LOCATIONS, ADDED RECLAMATION NOTES, & ADDED SEEP COLLECTION TRENCH DETAIL

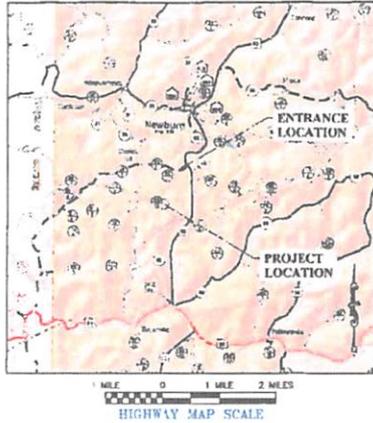
THRASHER
THE THRASHER GROUP, INC.
600 WHITE OAKS BOULEVARD - BRIDGEPORT, WV 26330
PHONE (304) 624-4108 • FAX (304) 624-7831

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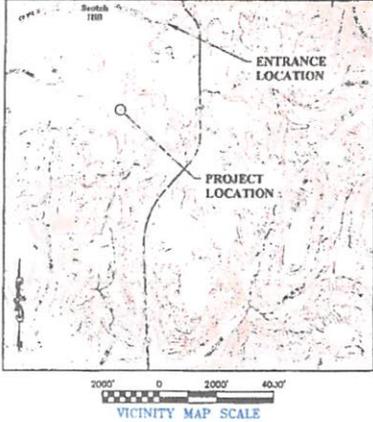
4707700650

CAD FILE: B:\2017-2018\2017_E_2017_ARSENAL_RESOURCES\Users\rbm\171218-004.dwg PLOT DATE/TIME: 1/13/2018 9:13 AM USER: jennings_r

PRESTON COUNTY, WV HIGHWAY MAP



FELLOWSVILLE, WV QUAD MAPS



ONE CALL UTILITY SYSTEM CONTACT INFO

WEST VIRGINIA 811
 CONTRACTOR SHALL NOTIFY THE ONE-CALL SYSTEM OF THE INTENDED EXCAVATION OR DEMOLITION NOT LESS THAN FORTY-EIGHT (48) HOURS, EXCLUDING SATURDAYS, SUNDAYS AND LEGAL FEDERAL OR STATE HOLIDAYS, NOR MORE THAN 120 WORK DAYS PRIOR TO THE BEGINNING OF SUCH WORK.

WV Department of Environmental Protection

RECEIVED
 Office of Oil and Gas
 DEC 9 2017

ARSENAL RESOURCES CONSTRUCTION PLANS FOR THE CHRIS JENNINGS PL2017E LYON DISTRICT, PRESTON COUNTY, WV OCTOBER 2017

DRIVING DIRECTIONS FROM NEWBURG, WV

1. TRAVEL EAST ON PRESTON COUNTY ROUTE (CR 23) FOR APPROXIMATELY 0.3 MILES
2. TURN RIGHT ONTO REDEVELL PKE (WV 92)
3. TRAVEL SOUTH APPROXIMATELY 1.2 MILES ON WV 92
4. TURN RIGHT ONTO SCOTCH HILL ROAD (CR 9211)
5. TRAVEL WEST APPROXIMATELY 0.2 MILES ON CR 9211
6. TURN LEFT ONTO CHRIS JENNINGS 2017E WELL PAD ACCESS ROAD

SITE COORDINATES

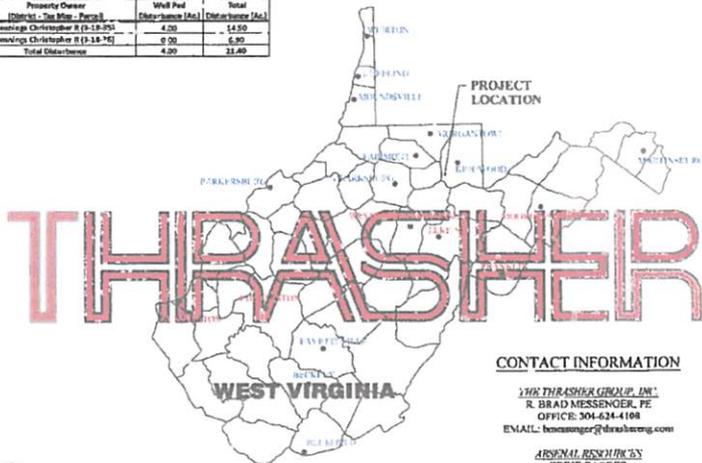
Coordinate Label	Well Pad Center	Flowback Pit Center	Access Road Beginning
WV93-N Longitude	N 79.524317°	N 79.501772°	N 89.872045°
WV93-N Latitude	W 79.862009°	W 79.869131°	W 79.831864°
WV93-N Height	317005.19 ft	314813.384 ft	314903.879 ft
UTM 89-17 Easting	1866693.306 m	1867248.042 m	1868424.979 m
UTM 89-17 Northing	4833795.080 m	4832768.809 m	4834246.124 m
UTM 89-17 Height	598201.891 m	598170.926 m	598275.866 m

SURFACE HOLE COORDINATES

Coordinate Label	Well Number										
	201	208	209	204	205	206	211	210	214	215	216
WV93-N Longitude	N 79.264091°	N 79.264107°	N 79.264110°	N 79.264117°	N 79.264116°	N 79.264132°	N 79.264237°	N 79.264810°	N 79.264794°	N 79.264773°	N 79.264774°
WV93-N Latitude	W 79.869847°	W 79.869832°	W 79.869835°	W 79.869842°	W 79.869841°	W 79.869842°					
WV93-N Height	314933.082 ft	314931.644 ft	314936.719 ft	314937.729 ft	314941.367 ft	314943.943 ft	315201.650 ft	315191.087 ft	315183.824 ft	315171.683 ft	315182.898 ft
UTM 89-17 Easting	1866759.894 m	1866769.557 m	1866779.318 m	1866788.882 m	1866798.546 m	1866808.209 m	1866818.390 m	1866828.174 m	1866838.338 m	1866848.818 m	1866859.202 m
UTM 89-17 Northing	4832793.894 m	4832799.643 m	4832805.478 m	4832811.312 m	4832817.146 m	4832822.979 m	4832828.813 m	4832834.647 m	4832840.481 m	4832846.315 m	4832852.149 m
UTM 89-17 Height	598229.84 m	598230.893 m	598231.846 m	598232.799 m	598233.752 m	598234.705 m	598235.658 m	598236.611 m	598237.564 m	598238.517 m	598239.470 m

Property Owner	Well Pad	Total
(Square Feet)	(Square Feet)	(Square Feet)
James Christopher II (1-18-95)	4.00	4.00
James Christopher II (1-18-76)	0.00	6.90
Total Disturbance	4.00	10.90

ENVIRONMENTAL IMPACTS	
Feature ID	Total Disturbance (Sq. Ft.)
WV18A	0.022
WV18B	0.017
WV18C	0.019
WV18D	0.027
TOTAL =	0.086



CONTACT INFORMATION

THE THRASHER GROUP, INC.
 R. BRAD MESSENER, PE
 OFFICE: 304-624-4108
 EMAIL: bradmesner@thrashereng.com
 ARSENAL RESOURCES
 EDDIE CARTER
 OFFICE: 724-949-1284
 EMAIL: ecarter@arsenalresources.com

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35-42	DETAILS

Handwritten signature and date:
 12/5/2017



APPROVED FOR PERMITS DATE: 10/30/17 BY: RBM
 APPROVED FOR BID DATE: BY:
 APPROVED FOR CONSTRUCTION DATE: BY:

REVISION NUMBER	REVISED SHEETS	BY	DATE	DESCRIPTION

THRASHER
 THE THRASHER GROUP, INC.
 600 WHITE OAKS BOULEVARD - BRIDGEPORT, WV 26330
 PHONE (304) 624-4102 • FAX (304) 624-7831

4707700650