west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
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Earl Ray Tomblin , Governor
Randy C. Huffman , Cabinet Secretary
www.dep.wv.gov

Friday, September 09, 2016
WELL WORK PERMIT
Coal Bed Methane Well / Partial Plug

NEW RIVER ENERGY CORPORATION
POST OFFICE BOX 1020

WAYNESBURG, PA 153700000

Re: Permit approval for PC-004C
47-109-02761-00-00

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

Operator's Well Number: PC-004C
Farm Name: HEARTWOOD FORESTLAND
U.S. WELL NUMBER: 47-109-02761-00-00
Coal Bed Methane Well / Partial Plug
Date Issued: 9/9/2016

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PERMIT CONDITIONS

West Virginia Code § 22-6-11 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. All pits must be lined with a minimum of 20 mil thickness synthetic liner.

2. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.

3. Well work activities shall not constitute a hazard to the safety of persons.

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ADDENDUM TO VENTILATION PLAN
SPARTAN MINING COMPANY
ROAD FORK #51 MINE
MSHA ID# 46-01544
WVOMHST PERMIT # U-4001-05

PROCEDURE FOR MINING THROUGH HORIZONTAL COALBED METHANE WELLS

Background:

It is anticipated that the in-seam methane in some of the Mine #51 reserve areas will be reduced prior to mining by development of both horizontal and vertical coalbed methane wells, with horizontal wells being the predominant methodology. It is anticipated that the horizontal wells will be multi-lateral and of pinnate pattern, similar to the CDX Gas, Inc. wells drilled in adjacent reserve areas. The surface wellheads for the horizontal wells will typically be 800' or more above the pavement of the coal seam. Each lateral wellbore in the coal seam will be 4" to 6" in diameter, and may be up to 4,000' in length in-seam.

Mine #51 will employ the continuous mining room-and-pillar method of mining. It is anticipated that each lateral wellbore will be mined through at least once.

A factor of major importance to be considered for the case of Road Fork #51 Mine to mine through horizontal coalbed methane wells is that the mine is ventilated via a predominantly positive pressure ventilation system. This blowing type fan system greatly enhances the proposed procedures and safety procedures outlined through this addendum in that positive pressure is constantly applied against any intersected wellbore. A 9 ft diameter return shaft with exhausting fan is within the system and does assist the system is a push/pull scenario, but the positive pressure effect far overpowers the negative pressure effect leaving the exhausting fan to act primarily as a helper fan. With the open atmosphere vertical well bore, ventilation air at the intersection of the lateral well bore will effectively seek to vent itself to the open atmosphere through the well bore and vertical well, the path of least resistance. Any gas accumulating in the lateral bores will have to build to a pressure exceeding the ventilation pressure of the fan before it will vent to the mine void. This is in the direct opposite of exhaust fan systems which are the norm in the industry and have a negative pressure effect.

Wells to be encountered or intersected at this time.

Be advised that each coal bed methane well system consists of two vertical wellbores with a common set of horizontal production wellbores or branch line system. The first vertical well drilled is the well or bore from which all horizontal legs and branches are developed. The second vertical well drilled is the actual production well. This second vertical well is the conduit by which the gas is brought to the surface as well as any water or impurities that accumulate at the bottom of the vertical well during the extraction process. No vertical wells are currently proposed for cut through. See Attachment - Cross-Section of Typical Well System.

Well no PC-002A was drilled prior to PC-002B and was used to drill or establish the horizontal branch system. Its API No. is 47-109-02724. The well was then intersected by the production well PC-002B. Well PC-002A is a non-producing well.

Well no. PC-002B was drilled and began initial production on 12/12/06. Its API No. is 47-109-02725. The horizontal bore diameter is 4 5/8" diameter. The vertical well is cased with 7" diameter casing,

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cemented in place, to a depth of 726' or 87' above the coal seam. The well's maximum horizontal depth is 3,414 ft. The horizontal legs are completely within the Pocahontas No. 3 coal seam. The well is not yet abandoned but will be abandoned shortly after issuance of this revision. The current average production pressure is -3 p.s.i. (gauge) as the well is operated on vacuum. Current average production is 72 MCF/day. Maximum average production of 618 MCF/day occurred in January, 2007. The well has produced a total of 324,573 MCF through the end of 2009. A summary of the well's production history, taken from the WVDEP Office of Oil & Gas website, is attached. Peak well pressure would have occurred prior to initial production in December, 2006 and is estimated to have been 352 p.s.i. or less, based on 813' of seam cover. Average well life is estimated at 5 years.

Well no.PC-003A was drilled prior to PC-003B and was used to drill or establish the horizontal branch system. Its API No. is 47-109-02768. The well was then intersected by the production well PC-003B. Well PC-002A is a non-producing well.

Well no. PC-003B was drilled and began initial production on 12/21/06. Its API No. is 47-109-02769. The horizontal bore diameter is 4 5/8" diameter. The vertical well is cased with 7" diameter casing, cemented in place, to a depth of 909', or 184' above the coal seam. The well's maximum horizontal depth is 3,944 ft. The horizontal legs are completely within the Pocahontas No. 3 coal seam. The well is not yet abandoned but will be abandoned shortly after issuance of this revision. The current average production pressure is -1 p.s.i. (gauge) as the well is operated on vacuum. Current average production is 87 MCF/day. Maximum average production of 895 MCF/day occurred in April, 2007. The well has produced a total of 361959 MCF through the end of 2009. A summary of the well's production history, taken from the WVDEP Office of Oil & Gas website, is attached. Peak well pressure would have occurred prior to initial production in December, 2006 and is estimated to have been 473 p.s.i. or less, based on 1,093' of seam cover. Average well life is estimated at 5 years.

Equipment used to drill the well and borings was not immediately available from the well operator. The accuracy of the machine was reported from the operator as a maximum deviation of 25 feet in 3,000 feet of boring. That equates to an accuracy of +/- 0.48 degrees or 0 degrees 28 minutes and 39 seconds. We propose an accuracy factor over double that or +/- 1 degree plus an addition static barrier of 50 feet.

Procedure for Mining Within 50' + 1 Degree Factor of A Horizontal Wellbore:

Prior to mining within 50' + 1 degree deviation or accuracy factor (tangent of 1 degree multiplied by the length of the horizontal wellbore at the anticipated cut-through point) of a horizontal wellbore, Spartan Mining Company ("Spartan") will verify that the following procedures have been performed on the well:

1. Prior to the mining unit entering the minimum barrier zone established for the CBM well and/or well bores or set of intersections, a notice from a professional engineer will be submitted to the District Manager noting that a review of the proposed method(s) to prepare coal bed methane wells for intersection has been completed and that the applicability of the proposed system or procedures in regard to the mine specific conditions is appropriate. A section advancing seven

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entries, all entries intersecting a single well bore would be deemed a set of intersections and one would be deemed

2. The well will be vented to outside atmospheric pressure for at least 8 hours.
3. A volume of fresh water sufficient to fill the horizontal (lateral) wellbores, plus 25%, will be injected into the well. Fresh water will be injected at an approximate flow rate of 2,500 gph. Fresh water only injection will be gravity fed, not pressure injected. A daily record of water quantities pumped and pumping times will be recorded and maintained.
4. A volume of gel, sufficient to fill the horizontal wellbores plus 25% excess, will be injected into the well. Gel formulation will be a simple mixture of made up of 2% to 4% bentonite and fresh water with no other additives. The bentonite and water formulation will be pumped at an approximate flow rate of 2,500 gph and with either (a) sufficient pressure to attain a bottom hole pressure of approximately 500 p.s.i., or (b) sufficient volume to equal or exceed 200% of the volume of the horizontal wellbores. Because no gel has yet been pumped or injected, no background data has been gathered or obtained for this area or these strata and therefore no gel infiltration and permeability reduction data are yet available. A daily record of gel quantities pumped and pumping times will be recorded and maintained.
5. The well bore will be filled to the surface with fresh water, if possible, and allowed to stand for at least 72 hours, with the water level being supplemented as required. In the alternative, water will be injected into the wellbore for 72 hours at an average rate of 2 gallons per minute or more.
6. A record will be prepared, maintained and signed by the drill/pump operator outlining the procedures of all well or hole preparations. Specifics to be recorded shall at a minimum be as follows: 1. Time of well or hole opening for venting purposes and duration. 2. Any test results showing levels of venting gases and times. 3. Water injection showing quantities, times, pumping pressure and flow rates. 4. Gel formulation. 5. Gel quantity. 6. Pumping pressures. 7. Pumping times. 8. Quantities, flow rates and pumping times for well evacuations or bailing shall be documented as well.

Procedure for Mining Through A Horizontal Wellbore (Initial Minethrough):

Prior to mining through the first lateral wellbore of a horizontal coalbed methane well, Spartan will verify that the following procedures have been performed on the well:

a. The water will be bailed from the vertical section of the wellbore, as close to the coal seam elevation as practical using normal bailing equipment.
b. The surface wellhead will be maintained open, so as to bring the vertical section of the wellbore to outside atmospheric pressure.

In addition, Spartan will:

c. Notify the MSHA District Manager and the appropriate WVOMHST representative at least 72 hours prior to the anticipated minethrough time.

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SPARTAN MINING COMPANY
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MSHA ID# 46-01544
WVOMHST PERMIT # U-4001-05

d. Drivage sites or site lines shall be installed prior to mining within 80 ft. of the projected well cut-through. Drivage sites or site lines set in excess of 100 ft. prior to well bore intersection will not be deemed to comply with this requirement.

e. A mobile sled or trailer will be stocked and maintained with equipment and supplies as outlined herein on the working section at all times. The sled or trailer will be positioned at or near (not to exceed 500 feet outby) the last open crosscut near the projected mine through immediately upon reaching the minimum barrier distance. The trailer or sled will be labled as "Firefighting Equipment and Emergency Supplies for CBM Minethroughs" to distinguish it from general supply or stationary equipment stores. Equipment or supplies required on this sled or trailer are:

1. Firefighting equipment to include a minimum of two 10-pound fire extinguishers, 240 pounds of rock dust, fire hose of sufficient length to reach the working face and capable of delivering at least 50 gallons per minute of water at a minimum pressure of 50 psi.. The fire hose shall be located in the last open crosscut and shall be connected and ready for use but shall not be required being charged with water during the cut-through.
2. Roof support supplies sufficient to handle emergency or unplanned roof control situations associated with the well mine through.
3. Ventilation supplies sufficient to handle emergency or unplanned ventilation situations associated with the well mine through.
4. An emergency plug or plugs to plug the mined through well bore in the event such measures are required or become necessary.

f. An airflow quantity of at least 9,000 CFM and mean air velocity of 60 fpm shall be supplied at the mine face. This quantity shall be required beginning at the minimum barrier distance line and shall continue until mining has progressed 20 ft. past the initial mine through point. In no circumstances shall the quantity be less than that approved in the current ventilation plan if greater.

g. Cut depths will be limited to 20 ft. from the end of the line curtain beginning at the minimum barrier distance line and continue until mining has progressed 20 ft. past the initial mine through point.

h. MMU's to be performing mine throughs in areas shown as part of this revision will maintain stoppings between intake and return air courses up to and including the third connecting crosscut outby the working face.

i. Service all equipment to be used in the immediate area of the mine through and assure it's permissibility, prior to use , once every 24 hours during which the mine through is anticipated or is occurring.

j. Calibrate the continuous miner methane monitor, prior to use, once every 24 hours during which the mine through is anticipated or is occurring.

k. When mining, tests for methane with a hand held methane detector at least every 10 minutes from the time mining commences at the minimum barrier distance line or within thirty feet of the wellbore, whichever is greater and continue until such time as the well is intersected. Tests for methane with a hand held detector will be made immediately prior to mining through the wellbore regardless of timing.

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l. De-energize all equipment and thoroughly examine the area when the wellbore is intersected. The area will be determined safe by a certified person before mining is resumed.

m. Once the wellbore is intersected and the area is determined safe, mining may resume. Hand held methane detector tests, however, will continue at least every 10 minutes while mining, until mining has progressed 20 feet past the initial mine through point.

n. Once the wellbore is intersected and the area has been determined safe, mining shall continue a sufficient distance to permit adequate ventilation in or around the area of the well.

o. No open flame shall be permitted in the area until adequate ventilation has been established around the wellbore.

p. During the actual cutting process, no individuals shall be allowed on the return side until the well bore has been intercepted and the area has been examined by a certified person and declared safe.

q. All workplace examinations shall be conducted on the return side of the continuous miner while the continuous miner is idle.

r. The working place shall be free from accumulations of coal dust and coal spillage. Rock dust shall be placed on the roof, rib and floor to within 20 feet of the face when mining through the wellbore.

s. No person shall be permitted in the area of the mine through operation except those actually engaged in the operation, including company personnel, representatives of the miners, personnel from MSHA and personnel from the appropriate State agency.

t. Alert all personnel in the mine to the planned intersection of the well prior to their going underground if the planned intersection is to occur during their shift. This warning shall be repeated for all shifts until the well has been mined through.

u. The mine through operation shall be under the direct supervision of a certified individual. Instructions concerning the mine through operations shall be issued only by the certified individual in charge.

Procedure for Mining Through A Horizontal Wellbore (Subsequent Minethroughs):

Prior to mining through a lateral wellbore of a coalbed methane well which has already had at least one lateral wellbore mined through, Spartan will verify that the following procedures have been performed on the well:

a. The water will be bailed from the vertical section of the wellbore, as close to the coal seam elevation as practical using normal bailing equipment.

b. The surface wellhead will be maintained open, so as to bring the vertical section of the wellbore to outside atmospheric pressure.

In addition, Spartan will:

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c. Prior to the mining unit entering the minimum barrier zone of subsequent intersections or sets of intersections, a notice from a professional engineer will be submitted to the District Manager noting that a review of the proposed method(s) to prepare coal bed methane wells for intersection has been completed and that the applicability of the proposed system or procedures in regard to the mine specific conditions is still appropriate.

d. Drivage sites or site lines shall be installed prior to mining within 80 ft. of the projected well cut-through. Drivage sites or site lines set in excess of 100 ft. prior to well bore intersection will not be deemed to comply with this requirement.

e. A mobile sled or trailer will be stocked and maintained with equipment and supplies as outlined herein on the working section at all times. The sled or trailer will be positioned at or near (not to exceed 500 feet outby) the last open crosscut near the projected mine through immediately upon reaching the minimum barrier distance. The trailer or sled will be labled as "Firefighting Equipment and Emergency Supplies for CBM Minethroughs" to distinguish it from general supply or stationary equipment stores. Equipment or supplies required on this sled or trailer are:

1. Firefighting equipment to include a minimum of two 10-pound fire extinguishers, 240 pounds of rock dust, fire hose of sufficient length to reach the working face and capable of delivering at least 50 gallons per minute of water at a minimum pressure of 50 psi.. The fire hose shall be located in the last open crosscut and shall be connected and ready for use but shall not be required being charged with water during the cut-through.
2. Roof support supplies sufficient to handle emergency or unplanned roof control situations associated with the well mine through.
3. Ventilation supplies sufficient to handle emergency or unplanned ventilation situations associated with the well mine through.
4. An emergency plug or plugs to plug the mined through well bore in the event such measures are required or become necessary.

f. An airflow quantity of at least 9,000 CFM and mean air velocity of 60 fpm shall be supplied at the mine face. This quantity shall be required beginning at the minimum barrier distance line and shall continue until mining has progressed 20 ft. past the initial mine through point. In no circumstances shall the quantity be less than that approved in the current ventilation plan if greater.

g. Cut depths will be limited to 20 ft. from the end of the line curtain beginning at the minimum barrier distance line and continue until mining has progressed 20 ft. past the initial mine through point.

h. MMU's to be performing mine throughs in areas shown as part of this revision will maintain stoppings between intake and return air courses up to and including the third connecting crosscut outby the working face.

i. Service all equipment to be used in the immediate area of the mine through and assure it's permissibility, prior to use , once every 24 hours during which the mine through is anticipated or is occurring.

j. Calibrate the continuous miner methane monitor, prior to use, once every 24 hours during which the mine through is anticipated or is occurring.

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k. When mining, tests for methane with a hand held methane detector at least every 10 minutes from the time mining commences at the minimum barrier distance line or within thirty feet of the wellbore, whichever is greater and continue until such time as the well is intersected. Tests for methane with a hand held detector will be made immediately prior to mining through the wellbore regardless of timing.

l. De-energize all equipment and thoroughly examine the area when the wellbore is intersected. The area will be determined safe by a certified person before mining is resumed.

m. Once the wellbore is intersected and the area is determined safe, mining may resume. Hand held methane detector tests, however, will continue at least every 10 minutes while mining, until mining has progressed 20 feet past the initial mine through point.

n. Once the wellbore is intersected and the area has been determined safe, mining shall continue a sufficient distance to permit adequate ventilation in or around the area of the well.

o. No open flame shall be permitted in the area until adequate ventilation has been established around the wellbore.

p. During the actual cutting process, no individuals shall be allowed on the return side until the well bore has been intercepted and the area has been examined by a certified person and declared safe.

q. All workplace examinations shall be conducted on the return side of the continuous miner while the continuous miner is idle.

r. The working place shall be free from accumulations of coal dust and coal spillage. Rock dust shall be placed on the roof, rib and floor to within 20 feet of the face when mining through the wellbore.

s. No person shall be permitted in the area of the mine through operation except those actually engaged in the operation, including company personnel, representatives of the miners, personnel from MSHA and personnel from the appropriate State agency.

t. Alert all personnel in the mine to the planned intersection of the well prior to their going underground if the planned intersection is to occur during their shift. This warning shall be repeated for all shifts until the well has been mined through.

u. The mine through operation shall be under the direct supervision of a certified individual. Instructions concerning the mine through operations shall be issued only by the certified individual in charge.

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Other Plan Specifics

~~Mining with a Parallel Wellbore~~

When mining parallel with a horizontal wellbore, every attempt will be made to adjust projections to intersect the wellbore in the crosscuts as opposed to continuously in the advancing entry. However, should mining be conducted such that it advances parallel and continuously cutting the wellbore, the following modifications will be made to the procedures. All other requirements and precautions listed herein shall apply.

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1. Cut depths will be limited to 20 ft. from the end of the line curtain.
2. Upon completion of the cut, the workplace shall be thoroughly examined by a certified person and declared safe.
3. No person(s) shall be allowed on the return side until the cut has been completed and the area declared safe by a certified person.
4. Tests for methane with a hand-held methane detector at least every 10 minutes from the time mining commences while mining and while bolting until the cut-through is completed.

Over Drilling

No vertical wells are currently proposed for cut-through.

Separation of airways connected by horizontal bores

Should a wellbore be intersected multiple times and subsequently provide an open wellbore or conduit between different or uncommon splits of air, the hole will be plugged with a minimum of a temporary plug as soon as all required safety precautions are met and it is declared safe to do so by a certified person. A permanent plug will be installed as soon as practical but shall not be required until the section has advanced a full line of crosscuts inby the wellbore intersection or 120 ft. Permanent plugging may consist of: 1.) the wellbore will be completely filled with cement for a length of at least 3 feet or its equivalent or 2.) manufactured plugs or casings cemented into place that are typically used in conjunction with drivable horizontal long hole drilling machines with a sampling port and that use cement and or epoxy compounds. Wellbore connections between common or like air splits will not require any plugs.

Plugging A Wellbore or Leg

Should a wellbore be intersected and should it then be determined by mine management that the wellbore or leg will not be intersected again or subsequently for reasons as determined by mine management, it may be permanently plugged. The hole may be left open as in the normal sequence outlined herein and then plugged, it may be first temporarily plugged as soon as all required safety precautions are met and it is declared safe to do so by a certified person or it may be immediately permanently plugged. A permanent plug may be installed at the determination of mine and can be installed as soon as all required safety precautions are met and it is declared safe to do so by a certified person. Permanent plugging may consist of: 1.) the wellbore will be completely filled with cement for a length of at least 3 feet or its equivalent or 2.) manufactured plugs or casings cemented into place that are typically used in conjunction with drivable horizontal long hole drilling machines with a sampling port and that use cement and or epoxy compounds. In the event a wellbore is permanently plugged, its location will be will be located by survey within 1 week of the installation of such permanent plug and such information posted to the permanent maps.

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MSHA ID# 46-01544
WVOMHST PERMIT # U-4001-05

Intersection Map to Be Kept On the Mining Section

A map shall be kept on the section showing all projected mining, all CBM gas wells with the vertical holes and their horizontal bores or legs for that area, outlines of minimum safety barrier to each bore for that area and anticipated intersections with those bores. The section map will be updated at a minimum of once per shift and preferably at the ending of each shift. Updating will consist of the progression of mining, all hole intersections, the date holes were intersected, the number of the intersection and how far from the anticipated intersection the actually was. Such information will then be transferred to the wall map or 1200 map outside at the mine office in a like manner. Connections or intersections with the wellbores will be located by survey within 1 week of their connection and such information posted to the permanent maps. Any large discrepancies in actual location verses anticipated location will be reported to mine management and adequately evaluated for need of corrective action. Large discrepancy will be considered "outside of the probable error of 1 degree.

Specific times when actions are to be taken.

Specific times when checks or tests are made, supplies and/or emergency equipment are delivered and positioned or driveage sights are outlined throughout these guidelines. However, unless otherwise stated they are required upon reaching the minimum required barrier.

Equipment List

List all equipment to be used to prepare and pump the water and gel: Equipment used to prepare and pump the water and gel will include a truck-mounted triplex pump and mixing vat of the type used to mix and pump cement in gas well applications. We will likely use BJ Services or Schlumberger on these holes so we can get a computer printout of the weight and volume of the gel mix. The exact make and model of the pump and vat used by the contractor will not be known until the day we use it. Fresh water only injection will be gravity feed not pressure injected.

MSDS and PPE

See attached, MSDS sheets for bentonite clay. Bentonite is the only component to be injected into the wells other than fresh water.

No special personal protective equipment (PPE) is required in using bentonite compounds. Normal PPE is required at all times on the active site such as metatarsal hard toe boots, eye protection, noise protection, reflective high visibility clothing, gloves and hard hat.

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Minimum Air quantities.

A quantity of at least 9,000 CFM, but no less than the approved ventilation plan amount, of intake air shall be supplied at the mine face. A minimum quantity of 15,000 cfm shall be maintained in the LOB when mining within the minimum required barrier.

Ongoing Examinations

a. All intersections with wells, legs, horizontal bores or branches that are in the intake air courses shall be examined as part of the preshift examinations required under 75.360.

b. All other intersections with wells, legs, horizontal bores or branches shall be examined as part of the weekly examinations required under 75.364.

c. All examinations shall be recorded in the appropriate record book and shall be specific to the hole, leg, and intersection number with location.

Mine Map Requirements

The mine map shall show all wells in the current and projected areas of the mine as per 75.372(a)(14) and shall include:

a. Identify CBM wells (i.e. API hole # or equivalent)

b. Date gas production began.

c. Seams intersected.

d. All vertical holes and all horizontal segments with an outline of minimum barriers.

e. Dates holes were intersected and the distance of variance.

Review By Responsible Person

The responsible person required per 30 CFR 75.1501 is responsible for well intersection emergencies. The well intersection procedures shall be reviewed by the responsible person prior to any planned well intersection or cut-through.

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1) Date _____, 2016
2) Operator's Well No. PC-004C
3) API Well No. 47- 109 - 02761

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

APPLICATION FOR A PERMIT TO PLUG AND ABANDON

4) Well Type: Oil ____/ Gas X / Liquid injection ____/ Waste disposal ____/
(If "Gas, Production X or Underground storage ____) Deep ____/ Shallow X

5) Location: Elevation 2149.575' Watershed Rich Branch of Guyandotte River
District Center County Wyoming Quadrangle Pineville, WV

6) Well Operator New River Energy Corporation
Address P.O. Box 1020
Waynesburg, PA 15370

7) Designated Agent _____
Address _____

8) Oil and Gas Inspector to be notified
Name Brian Ferguson BKF
Address Box 124 Big Trace Fork Road
Hart, WV 25524

9) Plugging Contractor
Name Ultra Production Company, LLC
Address PO Box 289
Cedar Bluff, VA

10) Work Order: The work order for the manner of plugging this well is as follows:

To facilitate coal mining operations, the horizontal CBM well PC-004C is intended to be plugged in a 3 stage process. The first stage will be the infusion of approximately 106,000 gallons of water into the Pocahontas 3 coal seam. The second stage will be the injection of a 2% bentonite solution in 39,000 gallons of water at an approximate rate of 100 gallons per minute. The third stage will be the injection of approximately 224,000 gallons of water. The vertical portion of this well will remain open for additional treatment or for other purposes as required by the mining company; however, when deemed necessary, the vertical portion of the well will be plugged using cement throughout the total vertical section to the surface.

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WV Department of
Environmental Protection

Notification must be given to the district oil and gas inspector 24 hours before permitted work can commence.

Work order approved by inspector Brian K Ferguson Date 8/4/16
BRIAN K FERGUSON

Location: Elevation: 2149.575' Quadrangle: Pineville 10902761 PP

District: Center County: Wyoming

Latitude: 8909 Feet South of 37 Deg. 35 Min. 00 Sec.
Longitude: 5311 Feet West of 81 Deg. 32 Min. 30 Sec.

Company: CDX Gas, LLC
101 North Kanawha Street
Beckley, WV 25801

Agent: Michael McCown

Inspector: Barry Stollings
Permit Issued: 8/24/2006
Well Work commenced: 10/20/2006
Well Work completed: 11/27/2006
Verbal plugging
Permission granted on:
Rotary x Cable _____ Rig
Total depth (ft) 1366'.
Fresh water depths (ft) N/A
Salt water depths (ft) N/A
Is coal being mined in the area (Y/N)? Y
Coal depths (ft): 1259'.

Casing & Tubing Size	Used in Drilling	Left in Well	Cement Fill up Cu.ft.
13 3/8"	66	66	45.8
9 5/8 "	717	717	224.6
7"	1190	1190	178.9
2 7/8"	1259	1259	Hanging

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Office of Chief
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WV Department of Environmental Protection

OPEN FLOW DATA

Producing formation (Pocahontas 3) Pay zone depth (ft) 1259'

Gas: Initial open flow N/A Mcf/d Oil: Initial open flow ____ Bbl/d
Final open flow N/A Mcf/d Final open flow ____ Bbl/d
Time of open flow between initial and final tests: _____ hours
Static rock pressure _____ psig (surface pressure) after _____ hours

Second Producing formation _____ Pay zone depth _____(ft)
Gas: Initial open flow ____ Mcf/d Oil: Initial open flow ____ Bbl/d
Final open flow ____ Mcf/d Final open flow ____ Bbl/d
Time of open flow between initial and final tests: _____ hours
Static rock pressure _____ psig (surface pressure) after _____ hours

Third Producing formation _____ Pay zone depth _____(ft)
Gas: Initial open flow ____ Mcf/d Oil: Initial open flow ____ Bbl/d
Final open flow ____ Mcf/d Final open flow ____ Bbl/d
Time of open flow between initial and final tests: _____ hours
Static rock pressure _____ psig (surface pressure) after _____ hours

Note: ON BACK OF THIS FORM, PUT THE FOLLOWING: 1) DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2) THE WELL LOG WHICH IS A SYSTEMATICK DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

Charles T. Akers
For: CDX Gas, LLC

By: _____

Date: _____

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WYOMING 2761

10902761PP

Operator: PC-004C
API No. 47- 109- 2761
Location: Wyoming County

Details of Perforated Intervals, Fracturing or Stimulation, Physical Change, Etc. – N/A

Well Log & Geologic Record - Depths from G.L.

Lithology	Depth in feet Top	Bottom
Casing	0	30
Shale	30	60
Sandy Shale	60	65
Shale	65	165
Sandy Shale	165	180
Shale	180	215
Sandy Shale	215	270
Shale	270	327
Sandy Shale	327	385
Shale	385	445
Sandy Shale	445	505
Shale	505	560
Sandy Shale	560	640
Shale	640	660
Sandy Shale	660	725
Shale	725	780
Sandy Shale	780	880
Shale	880	890
Sandy Shale	890	925
Shale	925	985
Sandy Shale	985	1010
Shale	1010	1045
Sandy Shale	1045	1065
Shale	1065	1072
Sandy Shale	1072	1145
Shale	1145	1215
Sandy Shale	1215	1225
Shale	1225	1259
Coal (cavity)	1259	1263
Sandy Shale	1263	1310
Shale	1310	1366
	TD 1366	

MAR 1 6 2007

10902761 PP
PKF

Ultra Production Company, LLC
Plugging Volumes
PC-004C

	Footage	Diameter (in)	Volume (CuFt)	Beginning X Coord	Beginning Y Coord.	Ending X Coord.	Ending Y Coord.
PC-004C	1,366	7	364.88	450557.841	4157050.253	-	-
Leg 1	3,776	4.5	416.89	450569.437	4157019.981	451202.670	4156058.685
Leg 2	2,125	4.5	234.61	450583.806	4157002.021	451215.775	4156994.276
Leg 3	1,865	4.5	205.91	450653.057	4156888.810	451212.067	4156822.635
Leg 4	1,415	4.5	156.15	450784.601	4156688.013	451210.912	4156626.016
Leg 5	1,054	4.5	116.40	450910.356	4156502.970	451209.572	4156439.876
Leg 6	1,502	4.5	165.79	450893.573	4156527.725	450911.741	4156073.035
Leg 7	2,305	4.5	254.40	450724.974	4156769.729	450731.616	4156069.787
Leg 8	3,018	4.5	333.12	450593.753	4156983.162	450553.713	4156068.687

*Coordinate Values: UTM - NAD 83 - 17 North - Meters

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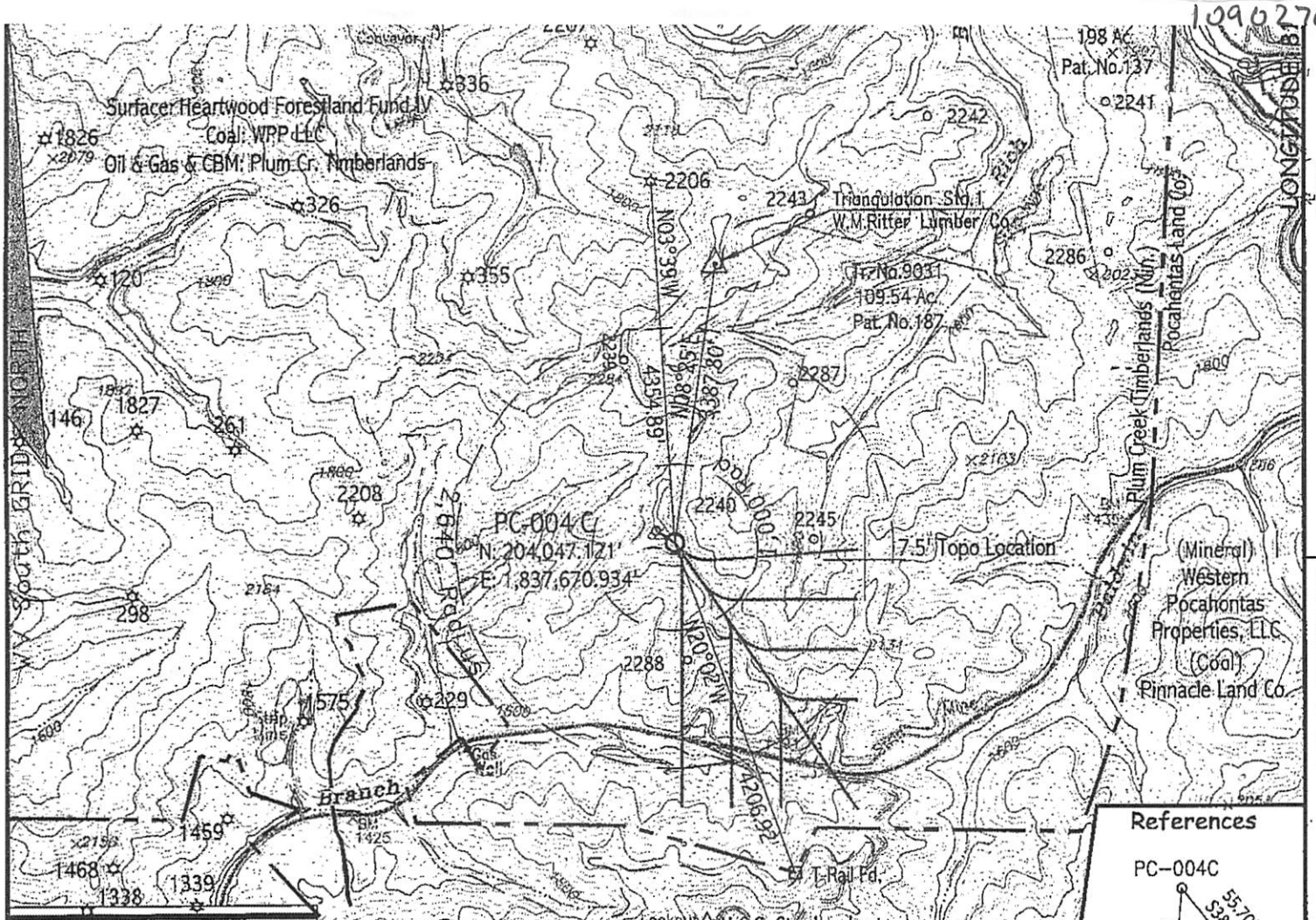

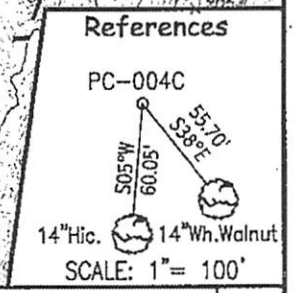

1. TIES TO WELLS OR CORNERS ARE BASED ON W.V. STATE PLANE NAD 27 ZONE SOUTH.
2. LEASE BOUNDARY SHOWN HEREON TAKEN FROM D.B. 421 PAGE NO. 01 OF RECORD IN WYOMING COUNTY C.H.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS.
4. WELL LAT./LONG. ESTABLISHED BY DGPS(RTK-SURVEY GRADE).

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
NO KNOWN WATER WELLS WITHIN 1,000' OF THIS LOCATION.

Benchmark Surveying, Inc.
Suite 4 50 Caney Branch Road
Chapmanville, W.V. 25508
304-855-7646
304-855-7647 Fax

FILE NO. CDX GAS
DRAWING NO. 2006-088
SCALE 1" = 2,000'
MINIMUM DEGREE OF ACCURACY 1:2,500'
PROVEN SOURCE OF ELEVATION Keeport H.A.R.N. Sta. via Survey Grade GPS/RTK

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
(SIGNED) [signature]
P.S. 837-SU

KENNETH D. BIAS
LICENSED
No. 837-SU
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR
SEAL

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

DATE: September 14th, 2006
OPERATOR'S WELL NO. PC-004 C
API WELL NO.
47 - 109 - 02761-6-R
STATE COUNTY PERMIT

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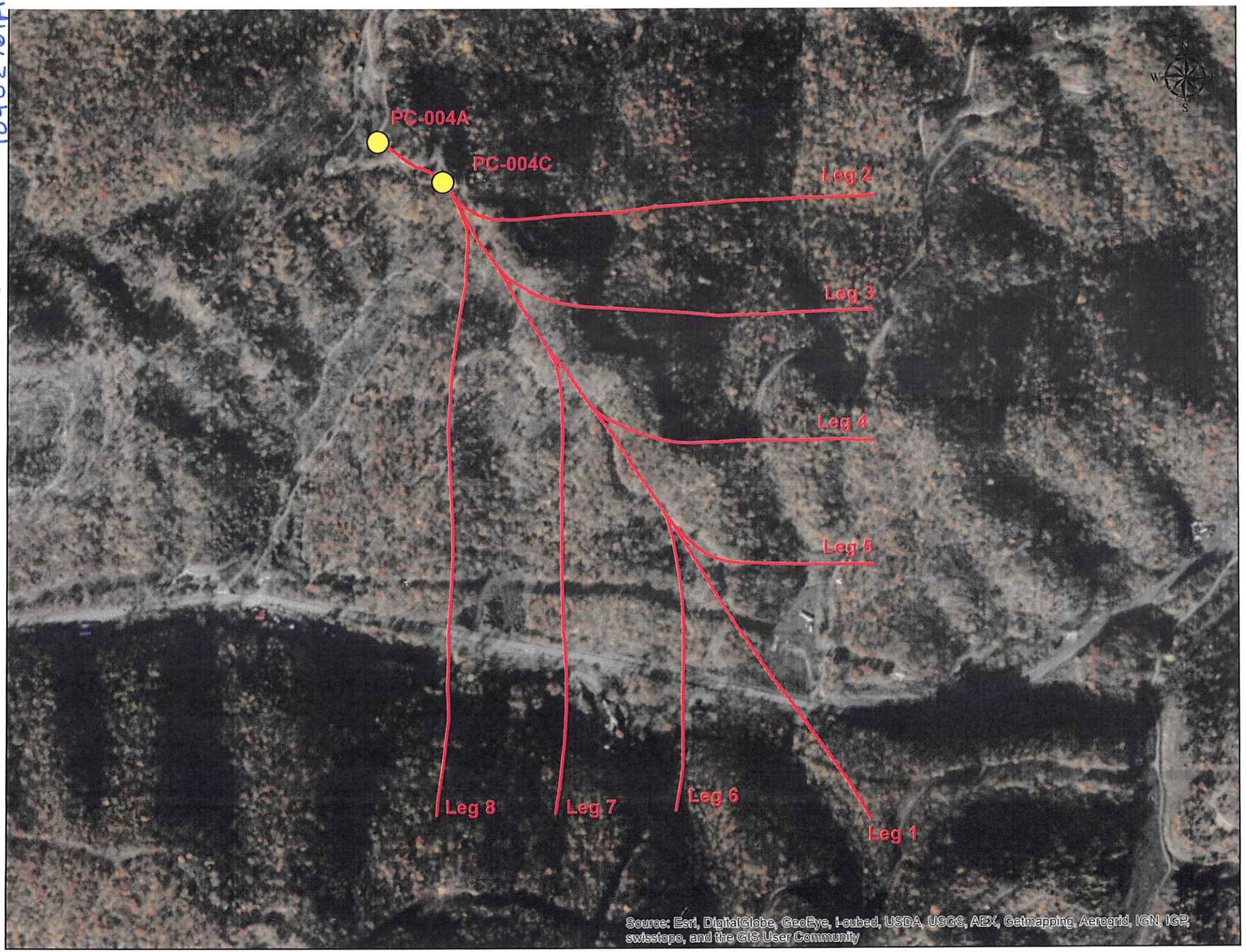
WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS,") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X CBM X
LOCATION: ELEVATION 2,169.62' WATER SHED Wolfpen Branch of Indian Creek of Guyandotte River
DISTRICT Center COUNTY Wyoming
QUADRANGLE Pineville
SURFACE OWNER Heartwood Forestland Fund IV, L.P. ACREAGE ___
OIL & GAS ROYALTY OWNER Plum Creek Timberland LEASE ACREAGE 63,000
LEASE NO. ___
PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER REDRILL ___ FRACTURE OR

OCT 13 2006

ORM WW-6

COUNTY NAME Wyoming

1090276 1pp


PC-004A
PC-004C
Leg 2
Leg 3
Leg 4
Leg 5
Leg 8
Leg 7
Leg 6
Leg 1
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

109 02761PP

WW-4A
Revised 6-07

1) Date:
2) Operator's Well Number
PC-004C

3) API Well No.: 47 - 109 - 02761

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF APPLICATION TO PLUG AND ABANDON A WELL

4) Surface Owner(s) to be served:
(a) Name: Heartwood Forest Land Fund
Address: 19045 Stone Mountain Road
Abingdon, VA 24210

(b) Name:
Address:

(c) Name:
Address:

6) Inspector: Brian Ferguson
Address: Box 124 Big Trace Fork Road
Harts, WV 25524
Telephone: 304-550-6265

5) (a) Coal Operator
Name: Spartan Mining Co.
Address: 208 Business Street
Beckley, WV 25801

(b) Coal Owner(s) with Declaration
Name: Western Pocahontas Properties, LLC
Address: 5260 Irwin Road
Huntington, WV 25705

Name:
Address:

(c) Coal Lessee with Declaration
Name: Spartan Mining Co.
Address: 208 Business Street
Beckley, WV 25801

TO THE PERSONS NAMED ABOVE: You should have received this Form and the following documents:

(1) The application to Plug and Abandon a Well on Form WW-4B, which sets out the parties involved in the work and describes the well its and the plugging work order; and
(2) The plat (surveyor's map) showing the well location on Form WW-6.

The reason you received these documents is that you have rights regarding the application which are summarized in the instructions on the reverses side. However, you are not required to take any action at all.

Take notice that under Chapter 22-6 of the West Virginia Code, the undersigned well operator proposes to file or has filed this Notice and Application and accompanying documents for a permit to plug and abandon a well with the Chief of the Office of Oil and Gas, West Virginia Department of Environmental Protection, with respect to the well at the location described on the attached Application and depicted on the attached Form WW-6. Copies of this Notice, the Application, and the plat have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery to the Chief.

VANCE J. BALDWIN
NOTARY PUBLIC
STATE AT LARGE, KENTUCKY

Well Operator: New River Energy Corp.
By: Michael R. Blackburn
Its: ~~President~~ Vice President
Address: 158 Portal Road / P.O. Box 1020
Waynesburg, PA 15370
Telephone: 724-627-4511

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Environmental Protection

Subscribed and sworn before me this 10th day of August 2016
Vance J. Baldwin Notary Public
My Commission Expires 02/06/2020

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a 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 of your personal information, please contact DEP's Chief Privacy Officer at depprivacyoffier@wv.gov.

10902761PP

WW-9
(5/16)

API Number 47 - 109 - 02761
Operator's Well No. PC-004C

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name New River Energy Corporation OP Code 309919

Watershed (HUC 10) 0507010103 Quadrangle Pineville, WV

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: _____

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

Proposed Disposal Method For Treated Pit Wastes:

PARTIAL PLUG INVOLVING INFUSION OF FLUID. NO WELL EFFLUENT.

_____ Land Application (if selected provide a completed form WW-9-GPP)
_____ Underground Injection (UIC Permit Number _____)
_____ Reuse (at API Number _____)
_____ Off Site Disposal (Supply form WW-9 for disposal location)
_____ Other (Explain _____

Will closed loop systembe used? If so, describe: N/A

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

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

Additives to be used in drilling medium? N/A

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. N/A

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

-Landfill or offsite name/permit number? _____

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 April 1, 2016, 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 Michael R. Blackburn

Company Official (Typed Name) Michael R. Blackburn

Company Official Title Vice President

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WV Department of Environmental Protection

Subscribed and sworn before me this 10th day of August, 20 16

Vance J. Baldwin Notary Public

VANCE J. BALDWIN NOTARY PUBLIC STATE AT LARGE, KENTUCKY

My commission expires 02/06/2020

10902761 PP

Form WW-9

Operator's Well No. PC-004C

Proposed Revegetation Treatment: Acres Disturbed 0.5 Prevegetation pH _____

Lime 2 Tons/acre or to correct to pH 6.0

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 0.5 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Tall Fescue	40	Tall Fescue	40
Orchard Grass	6	Orchard Grass	6
Perennial Rye Grass	39	Perennial Rye Grass	39
Red Clover	17	Red Clover	17

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, provide water volume, include dimensions (L, W, D) of the pit, and dimensions (L, W), and area in acres, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [signature]

Comments: _____

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Title: OIL & GAS INSPECTOR Date: 8/4/16

Field Reviewed? (X) Yes ( ) No

109 02761 P

WW-9- GPP
Rev. 5/16

Page _____ of _____
API Number 47 - 109 - 02761
Operator's Well No. PC-004C

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

Operator Name: New River Energy Corporation

Watershed (HUC 10): 0507010103 Quad: Pineville, WV

Farm Name: Heartwood Forest Land

1. List the procedures used for the treatment and discharge of fluids. Include a list of all operations that could contaminate the groundwater.

The only fluid involved in the operation is fresh water; therefore, no threat to groundwater contamination exists.

2. Describe procedures and equipment used to protect groundwater quality from the list of potential contaminant sources above.

N/A

3. List the closest water body, distance to closest water body, and distance from closest Well Head Protection Area to the discharge area.

Unnamed tribuatry of Indian Creek is 0.4 miles from the location

4. Summarize all activities at your facility that are already regulated for groundwater protection.

N/A

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5. Discuss any existing groundwater quality data for your facility or an adjacent property.

10902761P

WW-9- GPP
Rev. 5/16

Page _____ of _____
API Number 47 - _____ - _____
Operator's Well No. PC-004C

N/A

6. Provide a statement that no waste material will be used for deicing or fill material on the property.

No waste material will be used for deicing or fill material.

7. Describe the groundwater protection instruction and training to be provided to the employees. Job procedures shall provide direction on how to prevent groundwater contamination.

N/A

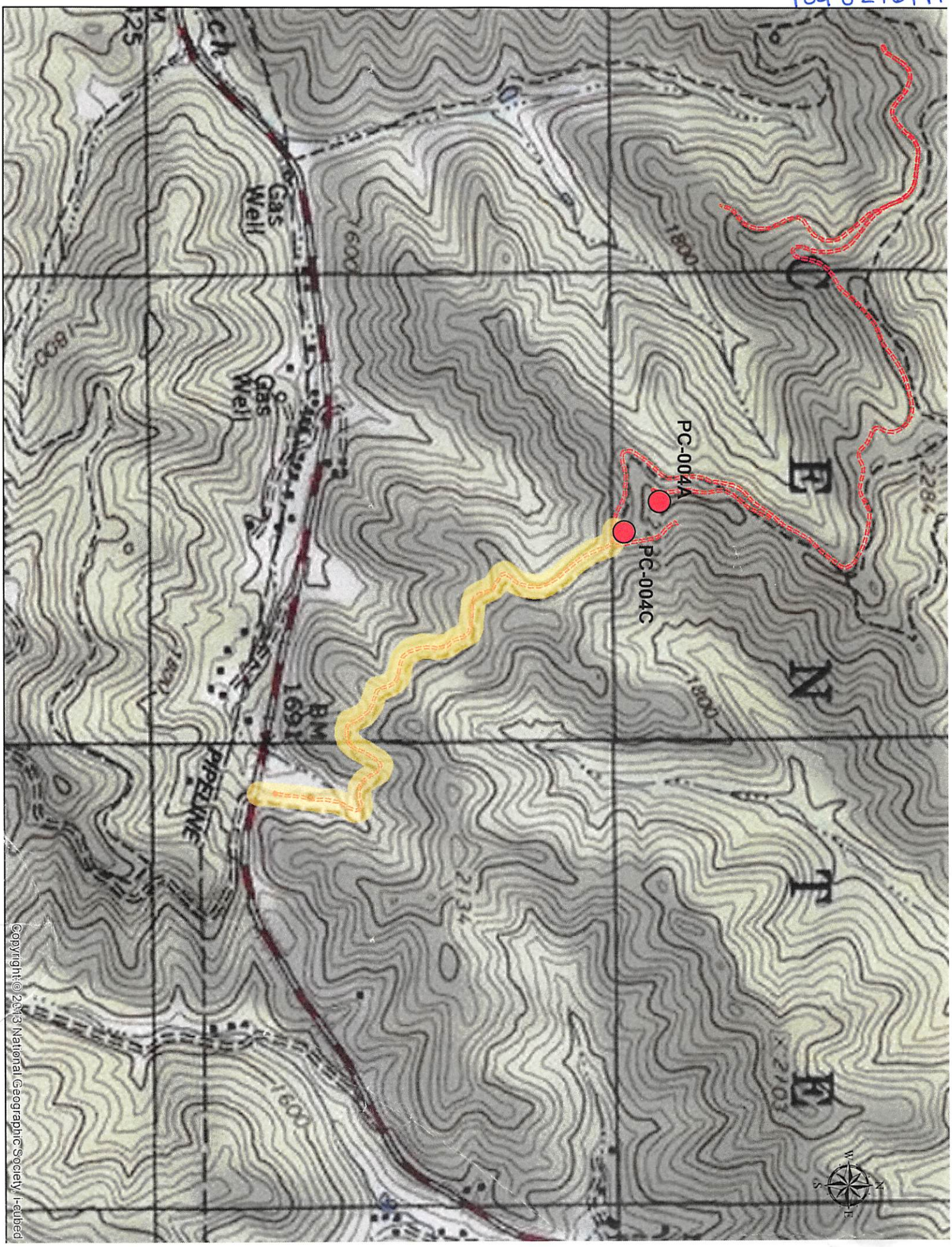
8. Provide provisions and frequency for inspections of all GPP elements and equipment.

N/A

Signature: _____

Date: 8/2/16

10902761PP



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109 02761 PP

WW-7
8-30-06

West Virginia Department of Environmental Protection
Office of Oil and Gas
WELL LOCATION FORM: GPS

API: 47-109-02761 **WELL NO.:** PC-004C

FARM NAME: Heartwood Forest Land

RESPONSIBLE PARTY NAME: New River Energy Corporation

COUNTY: Wyoming **DISTRICT:** Center

QUADRANGLE: Pineville, WV

SURFACE OWNER: Heartwood Forest Land Fund

ROYALTY OWNER: Plum Creek Timberlands

UTM GPS NORTHING: 4157172.736

UTM GPS EASTING: 450442.758 **GPS ELEVATION:** 2149.575

The Responsible Party named above has chosen to submit GPS coordinates in lieu of preparing a new well location plat for a plugging permit or assigned API number on the above well. The Office of Oil and Gas will not accept GPS coordinates that do not meet the following requirements:

1. Datum: NAD 1983, Zone: 17 North, Coordinate Units: meters, Altitude: height above mean sea level (MSL) – meters.
2. Accuracy to Datum – 3.05 meters
3. Data Collection Method:

Survey grade GPS ____: Post Processed Differential _____

Real-Time Differential _____

Mapping Grade GPS X: Post Processed Differential _____

Real-Time Differential X

4. **Letter size copy of the topography map showing the well location.**

I the undersigned, hereby certify this data is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Office of Oil and Gas.

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Signature	Business Development Manager Title	7 - 27 - 16 Date