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west virginia department of environmental protection

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Office of Oil and Gas  
601 57<sup>th</sup> Street, S.E.  
Charleston, WV 25304  
(304) 926-0450  
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Harold D. Ward, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Friday, June 7, 2024

WELL WORK PLUGGING PERMIT  
Coal Bed Methane Well Plugging

ARCH RECLAMATION SERVICES LLC  
100 TYGART DR

GRAFTON, WV 26354

Re: Permit approval for COALQUEST 8  
47-001-02829-00-00

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.

Upon completion of the plugging well work, the above named operator will reclaim the site according to the provisions of WV Code 22-6-30. Please be advised that form WR-38, Affidavit of Plugging and Filling Well, 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: COALQUEST 8  
Farm Name: MARTIN, EVELYN G.  
U.S. WELL NUMBER: 47-001-02829-00-00  
Coal Bed Methane Well Plugging  
Date Issued: 6/7/2024

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

4700102829P

## 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

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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.
4. 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.

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1) Date April 3, 2024  
2) Operator's  
Well No. COAL QUEST #8  
3) API Well No. 47-001 - 02829

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

APPLICATION FOR A PERMIT TO PLUG AND ABANDON A CAM WELL

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

5) Location: Elevation 1321.3' Watershed Stillhouse Run  
District Pleasant County Barbour Quadrangle Brownnton (266)

6) Well Operator Arch Reclamation Services LLC 7) Designated Agent Charles E. Duckworth  
Address 100 Tygart Drive Address 100 Tygart Drive  
Grafton, WV 26354 Grafton, WV 26354

8) Oil and Gas Inspector to be notified 9) Plugging Contractor  
Name Randall M. Kirchberg Name Coastal Drilling East, LLC  
Address P.O. Box 1052 Address 130 Meadows Ridge Road  
Buckhannon, WV 26201 Mt. Morris, PA 15349

10) Work Order: The work order for the manner of plugging this well is as follows:  
**See Exhibit No. 1 and MSHA 101-C Exemption**

Wolf Run Mining LLC (47-001-00288)  
Sentinel Mine (MSHA ID# 46-04168)  
MSHA 101-C Docket No. M-2009-050-C

Approximate coal seam top = LK Seam = 837.55'  
Approximate coal seam bottom = LK Seam = 842.39'

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

Work order approved by inspector Randall M. Kirchberg Digitally signed by Randall M. Kirchberg  
Date: 2024.04.05 08:47:35 -04'00' Date April 5, 2024

Exhibit Number 1 for CoalQuest #8  
47-001-02829 - Pinnate

Arch Reclamation Services, LLC will utilize the following methods to plug CBM wells.

CBM wells are a directionally drilled well with horizontal wellbores through the Lower Kittanning (LK) and/or Upper Kittanning (UK) coal seam(s).

The wellbores through the LK coal will be water infused, gel infused, cemented or grouted for first intersection of pinnates in accordance with WVOMHS&T and MSHA.

A gamma log will be conducted from the surface to the attainable bottom. Casing is not expected to be located in the Lower Kittanning coal seam. If casing is present, starting at a point 5' below through 5' above the coal to be mined, any casing shall be ripped, cut or perforated on no greater than a 5' interval.

After intersection of LK pinnates, the vertical wellbore will be cleaned out to the total depth or attainable bottom. This wellbore shall be plugged with Class A expanding cement, from a point 10' above the LK coal seam or attainable bottom to the surface (solid plug).

(Because UK pinnates exist, and it is desirable to continue venting methane from the UK pinnates, the vertical wellbore shall be plugged from the point 10' above the LK seam or attainable bottom, to the bottom of the UK seam. **This method would be deemed a Partial Plug.**)

After mining/venting the UK seam is complete, OR if there are no UK pinnates, final and complete plugging of the vertical wellbore to surface with Class A expanding cement will be utilized. This method would be deemed a Final Plug. A wellbore marker will be installed as required.

AT THE POINT OF FINAL PLUGGING  
 THE ENTIRE PINNATE CBM SYSTEM WILL  
 BE INFUSED WITH CEMENTING MATERIAL,  
 THE VOLUMES FOR THE LATERAL LEGS  
 REFERENCED ON THE NEXT PAGE HAVE  
 BEEN CALCULATED TO ENTIRELY FILL  
 ALL OF THE LATERAL LEGS FOR FINAL PLUGGING.

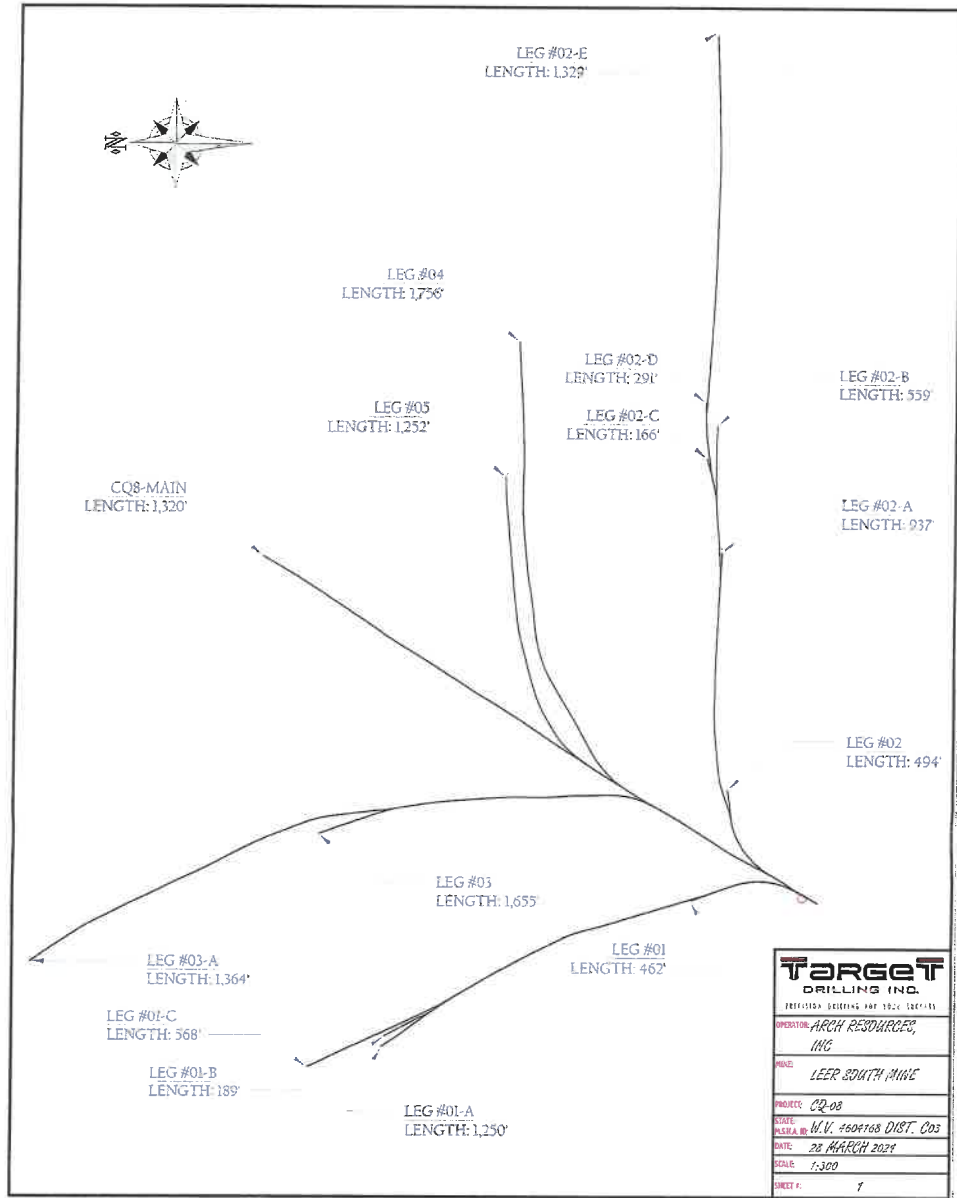
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# ARCH LEER SOUTH CQ8 Lower Kittanning CBM Well Plugging Plan Utilizing Target Drilling's Mixed and Pumped Proprietary Polymer Gel. Date Plan Prepared—March 28, 2024



**TARGET DRILLING INC.**  
 PROFESSIONAL DRILLING AND LOGGING SERVICES  
 OPERATOR: ARCH RESOURCES, INC.  
 WELLS: LEER SOUTH #008  
 PROJECT: CQ-08  
 STATE: W.V. #501168 DIST. C03  
 DATE: 28 MARCH 2024  
 SCALE: 1:300  
 SHEET #: 1

CQ 8 LK CBM Well Polymer Plugging Volumes Per AutoCAD Map Provided by ARCH to Target Drilling	
March 28, 2024	
MD = Measured Depth	Total [feet]
Curve to Cavity	440
Coal Laterals or Legs:	
Main	1320
1, 1A, 1B, 1C,	2469
2, 2A, 2B, 2C, 2D, 2E	3776
3, 3A	3019
4	1756
5	1252
<b>TOTAL [4.75" Dia.] Lateral or Leg Coal Footage</b>	<b>14032</b>
<b>CBM Leg Volume Gallons [Total Leg Footage x 0.92 g/ft]</b>	<b>12909</b>
<b>LK Coal Cavity Volume [1.5' ID X 4.5' LK Coal] [Gallons]</b>	<b>237</b>
<b>100% CQ 8B LK CBM Well Laterals With Cavity [Gallons]</b>	<b>13146</b>
<b>200% CQ 8B LK CBM Well Laterals With Cavity [Gallons]</b>	<b>26293</b>
<b>300% CQ 8B LK CBM Well Laterals With Cavity [Gallons]</b>	<b>39439</b>

Plugging will be done in accordance with the approved 101C Petition for Modification and Polymer Gel Pumping Can Be Stopped if Measured Gel Pressure Reaches 100 PSI or if ~ 300 % Volume of Laterals is Pumped. Volumes and pressures above the minimum is acceptable, if deemed suitable by the mine.

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U.S. Department of Labor  
DEC 16 2011

In the matter of:  
Wolf Run Mining Company  
Sentinel Mine  
I.D. No. 46-04168

Mine Safety and Health Administration  
1100 Wilson Boulevard  
Arlington, Virginia 22209-3939

Petition for Modification



Docket No. M-2009-050-C

**Proposed Decision and Order**

On October 29, 2009, a petition was filed seeking a modification of the application of 30 C.F.R. § 75.1700 to Petitioner's Sentinel 2 Mine located in Barbour County, West Virginia. The petitioner alleges that the alternative method outlined in the petition will at all times guarantee no less than the same measure of protection afforded by the standard.

Section 30 C.F.R. § 75.1700 provides:

Each operator of a coal mine shall take reasonable measures to locate oil and gas wells penetrating coalbeds or any underground area of a coal mine. When located, such operator shall establish and maintain barriers around such oil and gas wells in accordance with State laws and regulations, except that such barriers shall not be less than 300 feet in diameter, unless the Secretary or his authorized representative permits a lesser barrier consistent with the applicable State laws and regulations where such lesser barrier will be adequate to protect against hazards from such wells to the miners in such mine, or unless the Secretary or his authorized representative requires a greater barrier where the depth of the mine, other geologic conditions, or other factors warrant such a greater barrier.

The extraction of methane from coal seams and surrounding strata is a rapidly growing component of the domestic natural gas supply. Recent innovations in drilling techniques have resulted in development of several types of wells and production methods to extract coalbed methane (CBM) resources. Drill holes are deviated in both the horizontal and vertical planes using these techniques. These techniques differ from vertical gas wells and require different techniques in order to plug the wells. Procedures to address the potential hazards presented by CBM wells must be implemented to protect the coal miners who will be exposed to these wells. When coal mines intersect inadequately plugged CBM wells, methane inundations, ignitions and explosions are possible.

The alternative method proposed by Petitioner would include well plugging procedures, water infusion and ventilation methods, and procedures for mining through each CBM well and/or its branches.

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**Finding of Fact and Conclusion of Law**

The Sentinel 2 Mine is an underground coal mine that operates in the Lower Kittanning Seam. The mine includes one slope and two shafts, employs nearly 245 people, and operates three shifts per day, six days per week. The mine currently has three working sections utilizing continuous mining machines. On average, the Sentinel Mine produces 8,000 tons of run-of-mine coal daily. The coal bed ranges from 60 to 108 inches in height and the mine is ventilated by one blowing fan. The second quarter 2011 total liberation results for the mine were 4,139,677 cubic feet of methane in 24 hours.

Sentinel Mine extracts CBM from the coal seam prior to mining in order to reduce methane emissions and, thus, the incidence of face ignitions. The wells are drilled from the surface using directional drilling technology to develop horizontal branches within the coal seam being mined. Drill holes may be deviated in both the horizontal and vertical planes using these techniques. Multiple horizontal branches may be developed from a single well and multiple seams may be developed from a single well. The drilling industry has trademarked several different proprietary names for these drilling processes. For purposes of this Order, these proprietary drilling processes will be referred to as generic "surface directional drilled" (SDD) wells.

On February 16, 2010, MSHA conducted an investigation of Sentinel's petition and filed a report of its findings and recommendations with the Administrator for Coal Mine Safety and Health. Based on information gathered during the investigation, MSHA evaluated Petitioner's proposed alternative method and, as amended by the terms and conditions of MSHA, concluded that it would provide the same measure of protection afforded by 30 C.F.R. § 75.1700. The alternative method has been successfully used to prepare CBM wells for safe intersection by using one or more of the following methods: (1) Cement Plug, (2) Polymer Gel, (3) Bentonite Gel, (4) Active Pressure Management and Water Infusion, and (5) Remedial Work. The alternate method will prevent the CBM well methane from entering the underground mine.

Petitioner's proposed alternative method includes provisions from previously approved petition requests that permit a smaller barrier and/or permit mining through properly plugged oil and gas wells. These alternative methods have proven safe and effective when properly implemented. In addition, Sentinel's petition request also includes additional provisions that are specific to SDD wells.

Accordingly, after a review of the entire record, including the petition and MSHA's investigative report, Wolf Run Mining Company is granted a modification of the application of 30 C.F.R. § 75.1700 to its Sentinel 2 Mine, and this Proposed Decision and Order (PDO) is issued.

**ORDER**

Wherefore, pursuant to the authority delegated by the Secretary of Labor to the Administrator for Coal Mine Safety and Health, and pursuant to Section 101(c) of the Federal Mine Safety and Health Act of 1977, 30 U.S.C. § 811(c), and 30 C.F.R. Part 44, a modification of the application of 30 C.F.R. § 75.1700 at the Sentinel 2 Mine is hereby:

**GRANTED**, to allow mining within or through the 300 foot barrier around SDD oil and gas wells, conditioned upon compliance with the following terms and conditions:

**1. DISTRICT MANAGER APPROVAL REQUIRED**

A minimum working barrier of 300 feet in diameter shall be maintained around all SDD wells until approval to proceed with mining has been obtained from the District Manager. This barrier extends around all vertical and horizontal branches drilled in the coal seam. This barrier also extends around all vertical and horizontal branches within overlying coal seams subject to caving or subsidence from the coal seam being mined when methane leakage through the subsidence zone is possible. The District Manager may choose to approve each branch intersection, each well, or a group of wells as applicable to the conditions. The District Manager may require a certified review of the proposed methods to prepare the SDD wells for intersection by a professional engineer in order to assess the applicability of the proposed system(s) to the mine-specific conditions.

**2. MANDATORY PROCEDURES FOR PREPARING, PLUGGING, AND REPLUGGING SDD WELLS**

**a. MANDATORY COMPUTATIONS AND ADMINISTRATIVE PROCEDURES PRIOR TO PLUGGING OR REPLUGGING**

1. **Probable Error of Location** - Directional drilling systems rely on sophisticated angular measurement systems and computer models to calculate the estimated location of the well bore. This estimated hole location is subject to cumulative measurement errors so that the distance between actual and estimated location of the well bore increases with the depth of the hole. Modern directional drilling systems are typically accurate within one or two degrees depending on the specific equipment and techniques. The probable error of location is defined by a cone described by the average accuracy of angular measurement around the length of the hole. For example: a hole that is drilled 500 vertical feet and deviated into a coal seam at a depth of 700 feet would have a probable error of location at a point that is 4,000 feet from the hole collar (about 2,986 ft. horizontally from the well collar) of 69.8 ft. ( $4,000 \text{ ft.} \times \sin(1.0$



degree)) if the average accuracy of angular measurement was one degree and 139.6 ft if the average accuracy of angular measurement was two degrees. In addition to the probable error of location, the true hole location is also affected by underground survey errors, surface survey errors, and random survey errors.

2. Minimum Working Barrier Around Well - For purposes of this Order, the minimum working barrier around any coalbed methane well or branches of a coalbed methane well in the coal seam is 50 feet plus the probable error of location. For example: for a hole that is drilled 500 vertical feet and deviated into a coal seam at a depth of 700 feet using drilling equipment that has an average accuracy of angular measurement of one degree, the probable error of location at a point that is 4,000 feet from the hole collar is 69.8 ft. Therefore, the minimum working barrier around this point of the well bore is 120 ft. (69.8 ft. plus 50 ft., rounded up to the nearest foot). The 50 additional feet is a reasonable separation between the probable location of the well and mining operations. When mining is within the minimum working barrier distance from a coalbed methane well or branch, the mine operator must comply with the provisions of this Order. Coalbed methane wells must be prepared in advance for safe intersection and specific procedures must be followed on the mining section in order to protect the miners when mining within this minimum working barrier around the well. The District Manager may require a greater minimum working barrier around coalbed methane wells where geologic conditions, historical location errors, or other factors warrant a greater barrier.

3. Ventilation Plan Requirements - The ventilation plan shall contain a description of all SDD coalbed methane wells drilled in the area to be mined. This description should include the well numbers, the date drilled, the diameter, the casing information, the coal seams developed, maximum depth of the wells, abandonment pressures, and any other information required by the District Manager. All or part of this information may be listed on the 30 C.F.R. § 75.372 map. The ventilation plan shall include the techniques that the mine operator plans to use to prepare the SDD wells for safe intersection, the specifications and steps necessary to implement these techniques, and the required operational precautions that are required when mining within the minimum working barrier. In addition, the ventilation plan will contain any additional information or provisions related to the SDD wells required by the District Manager.

4. Ventilation Map - The ventilation map specified in 30 C.F.R. § 75.372 shall contain the following information:

- i. The surface location of all coalbed methane wells in the active mining area and any projected mining area as specified in 30 C.F.R. § 75.372(b)(14);
- ii. Identifying information of coalbed methane wells (i.e. API hole number or equivalent);
- iii. The date that gas production began from the well;
- iv. The coal seam intersection of all coalbed methane wells;
- v. The horizontal extents in the coal seam of all coalbed methane wells and branches;
- vi. The outline of the probable error of location of all coalbed methane wells; and
- vii. The date of mine intersection and the distance between estimated and actual locations for all intersections of the coalbed methane well and branches.

b. **MANDATORY PROCEDURES FOR PLUGGING OR REPLUGGING SDD WELLS**

The mine operator shall include one or more of the following methods to prepare SDD wells for safe intersection in the mine ventilation plan. The methods approved in the ventilation plan must be completed on each SDD well before mining encroaches on the minimum working barrier around the well or branch of the well in the coal seam being mined. If methane leakage through subsidence cracks is a problem when retreat mining, the minimum working barrier must be maintained around wells and branches in overlying coal seams or the wells and branches must be prepared for safe intersection as specified in the mine ventilation plan.

1. Cement Plug - Cement may be used to fill the entire SDD hole system. Squeeze cementing techniques are necessary for SDD plugging due to the lack of tubing in the hole. Cement should fill void spaces and eliminate methane leakage along the hole. Once the cement has cured, the SDD system may be intersected multiple times without further hole preparation. Gas cutting occurs if the placement pressure of the cement is less than the methane pressure in the coal seam. Under these conditions, gas will bubble out of the coal seam and into the unset cement creating a pressurized void or series of interconnected pressurized voids. Water cutting occurs when formation water and standing water in the hole invades or displaces the unset cement. Standing water has to be bailed out of the hole or driven into the formation with compressed gas to minimize water cutting. The cement

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pressure must be maintained higher than the formation pressure until the cement sets to minimize both gas and water cutting. The cementing program in the ventilation plan must address both gas and water cutting.

Due to the large volume to be cemented and potential problems with cement setting prior to filling the entire SDD system, adequately sized pumping units with back-up capacity must be used. Various additives such as retarders, lightweight extenders, viscosity modifiers, thixotropic modifiers, and fly ash may be used in the cement mix. The volume of cement pumped should exceed the estimated hole volume to ensure the complete filling of all voids. The complete cementing program, including hole dewatering, cement, additives, pressures, pumping times and equipment must be specified in the ventilation plan. The material safety data sheets (MSDS) for all cements, additives and components and any personal protective equipment and techniques to protect workers from the potentially harmful effects of the cement and cement components should be included in the ventilation plan. Records of cement mixes, cement quantities, pump pressures, and flow rates and times should be retained for each hole plugged.

SDD holes may be plugged with cement years in advance of mining. However, the District Manager shall require suitable documentation of the cement plugging in order to approve mining within the minimum working barrier around coalbed methane wells.

2. Polymer Gel - Polymer gels start out as low viscosity, water-based mixtures of organic polymers that are crosslinked using time-delayed activators to form a water-insoluble, high-viscosity gel after being pumped into the SDD system. Although polymer gel systems never solidify, the activated gel should develop sufficient strength to resist gas flow. A gel that is suitable for treating SDD wells for mine intersection will reliably fill the SDD system and prevent gas-filled voids. Any gel chemistry used for plugging SDD wells should be resistant to bacterial and chemical degradation and remain stable for the duration of mining through a SDD system.

Water may dilute the gel mixture to the point where it will not set to the required strength. Water in the holes should be removed before injecting the gel mixture. Water removal can be accomplished by conventional bailing and then injecting compressed gas to squeeze the water that accumulates in low spots back into the formation. Gas pressurization should be continued until the hole is dry. Another potential problem with gels is that dissolved salts in the formation waters may interfere with the cross-linking reactions. Any proposed gel mixtures must be tested with actual formation waters.

Equipment to mix and pump gels should have adequate capacity to fill the hole before the gel sets. Back-up units should be available in case something breaks while pumping. The volume of gel pumped should exceed the estimated hole volume to ensure the complete filling of all voids and allow for gel to infiltrate the joints in the coal seam surrounding the hole. Gel injection and setting pressures should be specified in the ventilation plan. To reduce the potential for an inundation of gel, the final level of gel should be close to the level of the coal seam and the remainder of the hole should remain open to the atmosphere until mining in the vicinity of the SDD system is completed. Packers may be used to isolate portions of the SDD system.

The complete polymer gel program, including advance testing of the gel with formation water, dewatering systems, gel specifications, gel quantities, gel placement, pressures, and pumping equipment must be specified in the ventilation plan. The MSDS for all gel components and any personal protective equipment and techniques to protect workers from the potentially harmful effects of the gel and gel components should be included in the ventilation plan. A record of the calculated hole volume, gel quantities, gel formulation, pump pressures, and flow rates and times should be retained for each hole that is treated with gel. Other gel chemistries other than organic polymers may be included in the ventilation plan with appropriate methods, parameters, and safety precautions.

3. Bentonite Gel - High-pressure injection of bentonite gel into the SDD system will infiltrate the cleat and butt joints of the coal seam near the well bore and effectively seal these conduits against the flow of methane. Bentonite gel is a thixotropic fluid that sets when it stops moving. Bentonite gel has a significantly lower setting viscosity than polymer gel. While the polymer gel fills and seals the borehole, the lower strength bentonite gel must penetrate the fractures and jointing in the coal seam in order to be effective in reducing formation permeability around the hole. The use of bentonite gel is restricted to depleted CBM applications that have low abandonment pressures and limited recharge potential. In general, these applications will be mature CBM fields with long production histories.


A slug of water should be injected prior to the bentonite gel in order to minimize moisture-loss bridging near the well bore. The volume of gel pumped should exceed the estimated hole volume to ensure that the gel infiltrates the joints in the coal seam for several feet surrounding the hole. Due to the large gel volume and potential problems with premature thixotropic setting, adequately sized pumping units with back-up capacity are required. Additives to the gel may be required to modify viscosity, reduce filtrates, reduce surface tension, and promote sealing of the cracks and

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joints around the hole. To reduce the potential for an inundation of bentonite gel, the final level of gel should be approximately the elevation of the coal seam and the remainder of the hole should remain open to the atmosphere until mining in the vicinity of the SDD system is completed. If a water column is used to pressurize the gel, it must be bailed down to the coal seam elevation prior to intersection. 

The complete bentonite gel program, including formation infiltration and permeability reduction data, hole pretreatment, gel specifications, additives, gel quantities flow rates, injection pressures and infiltration times, must be specified in the ventilation plan. The ventilation plan should list the equipment used to prepare and pump the gel. The MSDS for all gel components and any personal protective equipment and techniques to protect workers from the potentially harmful effects of the gel and additives should be included in the ventilation plan. A record of hole preparation, gel quantities, gel formulation, pump pressures, and flow rates and times should be retained for each hole that is treated with bentonite gel.

4. Active Pressure Management and Water Infusion - Reducing the pressure in the hole to less than atmospheric pressure by operating a vacuum blower connected to the wellhead may facilitate safe intersection of the hole by a coal mine. The negative pressure in the hole will limit the quantity of methane released into the higher pressure mine atmosphere. If the mine intersection is near the end of a horizontal branch of the SDD system, air will flow from the mine into the upstream side of the hole and be exhausted through the blower on the surface. On the downstream side of the intersection, if the open hole length is short, the methane emitted from this side of the hole may be diluted to safe levels with ventilation air. Conversely, safely intersecting this system near the bottom of the vertical hole may not be possible because the methane emissions from the multiple downstream branches may be too great to dilute with ventilation air. The methane emission rate is directly proportional to the length of the open hole. Successful application of vacuum systems may be limited by caving of the hole or water collected in dips in the SDD system. Another important factor in the success of vacuum systems is the methane liberation rate of the coal formation around the well – older, more depleted wells that have lower methane emission rates are more amenable to this technique. The remaining methane content and the formation permeability should be addressed in the ventilation plan.

Packers may be used to reduce methane inflow into the coal mine after intersection. All packers on the downstream side of the hole must be equipped with a center pipe so that the inby methane pressure may be measured or so that water may be injected. Subsequent intersections should

not take place if pressure in a packer-sealed hole is excessive. Alternatively, methane produced by the downstream hole may be piped to an in-mine degas system to safely transport the methane out of the mine or may be piped to the return air course for dilution. In-mine methane piping should be protected as stipulated in "Piping Methane in Underground Coal Mines," MSFHA IR 1094, (1978). Protected methane diffusion zones may be established in return air courses if needed. Detailed sketches and safety precautions for methane collection, piping and diffusion systems must be included in the ventilation plan (30 C.F.R. § 75.371(ee)).

Water infusion prior to intersecting the well will temporarily limit methane flow. Water infusion may also help control coal dust levels during mining. High water infusion pressures may be obtained prior to the initial intersection by the hydraulic head resulting from the hole depth or by pumping. Water infusion pressures for subsequent intersections are limited by leakage around in-mine packers and limitations of the mine water distribution system. If water infused prior to the initial intersection, the water level in the hole must be lowered to the coal seam elevation before the intersection.

The complete pressure management strategy including negative pressure application, wellhead equipment, and use of packers, in-mine piping, methane dilution, and water infusion must be specified in the ventilation plan. Procedures for controlling methane in the downstream hole must be specified in the ventilation plan. The remaining methane content and formation permeability should be addressed in the ventilation plan. The potential for the coal seam to cave into the well should be addressed in the ventilation plan. Dewatering methods should be included in the ventilation plan. A record of the negative pressures applied to the system, methane liberation, use of packers and any water infusion pressures and application time should be retained for each intersection.

5. Remedial work – If problems are encountered in preparing the holes for safe intersection, then remedial measures must be taken to protect the miners. For example: if only one-half of the calculated hole volume of cement could be placed into a SDD well due to hole blockage, holes should be drilled near each branch that will be intersected and squeeze cemented using pressures sufficient to fracture into the potentially empty SDD holes. The District Manager will approve remedial work in the ventilation plan on a case-by-case basis.

**3. MANDATORY PROCEDURES AFTER APPROVAL HAS BEEN GRANTED BY THE DISTRICT MANAGER TO MINE WITHIN THE MINIMUM WORKING BARRIER AROUND THE WELL OR BRANCH OF THE WELL**

- a. The mine operator, the District Manager, the miners' representative, or the State may request a conference prior to any intersection or after any intersection to discuss issues or concerns. Upon receipt of any such request, the District Manager shall schedule a conference. The party requesting the conference shall notify all other parties listed above within a reasonable time prior to the conference to provide opportunity for participation.
- b. The mine operator must notify the District Manager, the State and the miners' representative at least 48 hours prior to the intended intersection of any coalbed methane well.
- c. The initial intersection of a well or branch of a well typically has a higher risk than subsequent intersections. The initial intersection typically indicates if the well preparation is sufficient to prevent the inundation of methane. For the initial intersection of a well or branch, the following procedures are mandatory:
  1. When mining advances within the minimum barrier distance of the well or branches of the well, the entries that will intersect the well or branches must be posted with a readily visible marking. For longwalls, both the head and tailgate entries must be so marked. Marks must be advanced to within 100 feet of the working face as mining progresses. Marks will be removed after well or branches are intersected in each entry or after mining has exited the minimum barrier distance of the well.
  2. Entries that will intersect vertical segments of a well shall be marked with drivage sights in the last open crosscut when mining is within 100 feet of the well. When a vertical segment of a well will be intersected by a longwall, drivage sights shall be installed on 10-foot centers starting 50 feet in advance of the anticipated intersection. Drivage sights shall be installed in both the headgate and tailgate entries of the longwall.
  3. The operator shall ensure that fire-fighting equipment, including fire extinguishers, rock dust, and sufficient fire hose to reach the working fact are of the mine-through (when either the conventional or the continuous mining method is used) is available and operable

during all well mine-throughs. The fire hose shall be located in the last open crosscut of the entry or room. The operator shall maintain the water line to the belt conveyor tailpiece along with a sufficient amount of fire hose to reach the farthest point of penetration on the section. When the longwall mining method is used, a hose to the longwall water supply is sufficient. All fire hoses shall be connected and ready for use, but do not have to be charged with water, during the cut-through.

4. The operator shall ensure that sufficient supplies of roof support and ventilation materials are available at the working section. In addition, emergency plugs, packers, and setting tools to seal both sides of the well or branch shall be available in the immediate area of the cut-through.
5. When mining advances within the minimum working barrier distance from the well or branch of the well, the operator shall service all equipment and check for permissibility at least once daily. Daily permissibility examinations must continue until the well or branch is intersected or until mining exits the minimum working barrier around the well or branch.
6. When mining advances within the minimum working barrier distance from the well or branch of the well, the operator shall calibrate the methane monitor(s) on the longwall, continuous mining machine, or cutting machine and loading machine at least once daily. Daily methane monitor calibration must continue until the well or branch is intersected or until mining exits the minimum working barrier around the well or branch.
7. When mining is in progress, the operator shall perform tests for methane with a handheld methane detector at least every 10 minutes from the time that mining with the continuous mining machine or longwall face is within the minimum working barrier around the well or branch. During the cutting process, no individual shall be allowed on the return side until the mine-through has been completed and the area has been examined and declared safe. The shearer must be idle when any miners are in by the tail drum.
8. When using continuous or conventional mining methods, the working place shall be free from accumulations of coal dust and coal spillages, and rock dust shall be placed on the roof, rib, and



floor within 20 feet of the face when mining through the well or branch. On longwall sections, rock dust shall be applied on the roof, rib, and floor up to both the headgate and tailgate gob.

9. Immediately after the well or branch is intersected, the operator shall de-energize all equipment, and the certified person shall thoroughly examine and determine the working place safe before mining is resumed.
10. After a well or branch has been intersected and the working place determined safe, mining shall continue inby the well a sufficient distance to permit adequate ventilation around the area of the well or branch.
11. No open flame shall be permitted in the area until adequate ventilation has been established around the well bore or branch. Any casing, tubing or stuck tools will be removed using the methods approved in the ventilation plan.
12. No person shall be permitted in the area of the mine-through operation inby the last open crosscut during active mining except those actually engaged in the operation, including company personnel, representatives of the miners, personnel from MSHA, and personnel from the appropriate State agency.
13. The operator shall warn all personnel in the mine to the planned intersection of the well or branch 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 or branch has been intersected.
14. The mine-through operation shall be under the direct supervision of a certified person. Instructions concerning the mine-through operation shall be issued only by the certified person in charge.
15. All miners shall be in known locations and in constant two-way communications with the responsible person under 30 C.F.R. § 75.1501 when active mining occurs within the minimum working barrier of the well or branch.
16. The responsible person required under 30 C.F.R. § 75.1501 is responsible for well intersection emergencies. The well intersection

procedures must be reviewed by the responsible person prior to any planned intersection.

17. A copy of the order shall be maintained at the mine and be available to the miners.
18. The provisions of this order do not impair the authority of representatives of MSHA to interrupt or halt the mine-through operation and to issue a withdrawal order when they deem it necessary for the safety of the miners. MSHA may order an interruption or cessation of the mine-through operation and/or a withdrawal of personnel by issuing either a verbal or a written order to that effect to a representative of the operator, which order shall include the basis for the order. Operations in the affected area of the mine may not resume until a representative of MSHA permits resumption of mine-through operations. The mine operator and miners shall comply with verbal or written MSHA orders immediately. All verbal orders shall be committed to writing within a reasonable time as conditions permit.
- d. For subsequent intersections of branches of a well, appropriate procedures to protect the miners shall be specified in the ventilation plan.

4. **MANDATORY PROCEDURES AFTER SDD INTERSECTIONS**

- a. All intersections with SDD wells and branches that are in intake air courses shall be examined as part of the pre-shift examinations required under 30 C.F.R. § 75.360.
- b. All other intersection with SDD wells and branches shall be examined as part of the weekly examinations required under 30 C.F.R. § 75.364.

5. **OTHER REQUIREMENTS**

- a. Within 30 days after this Order becomes final, the operator shall submit proposed revisions for its approved 30 C.F.R. Part 48 training plan to the District Manager. These proposed revisions shall include initial and refresher training regarding compliance with the terms and conditions stated in the Order. The operator shall provide all miners involved in the mine-through of a well or branch with training regarding the requirements of this Order prior to mining within the minimum working barrier of the next well or branch intended to be mined through.

- b. Within 30 days after this Order becomes final, the operator shall submit proposed revisions for its approved mine emergency evacuation and firefighting program of instruction required by 30 C.F.R. § 75.1501. The operator shall revise the program to include the hazards and evacuation procedures to be used for well intersections. All underground miners shall be trained in this revised program within 30 days of the approval of the revised mine emergency evacuation and firefighting program of instruction.

Any party to this action desiring a hearing on this matter must file in accordance with 30 C.F.R. § 44.14, within 30 days. The request for hearing must be filed with the Administrator for Coal Mine Safety and Health, 1100 Wilson Boulevard, Arlington, Virginia 22209-3939.

If a hearing is requested, the request shall contain a concise summary of position on the issues of fact or law desired to be raised by the party requesting the hearing, including specific objections to the proposed decision. A party other than Petitioner who has requested a hearing may also comment upon all issues of fact or law presented in the petition, and any party to this action requesting a hearing may indicate a desired hearing site. If no request for a hearing is filed within 30 days after service thereof, the Proposed Decision and Order will become final and must be posted by the operator on the mine bulletin board at the mine.

*Charles J. Thomas*


---

Charles J. Thomas  
Deputy Administrator for  
Coal Mine Safety and Health

Certificate of Service

I hereby certify that a copy of this proposed decision was served personally or mailed, postage prepaid, this 16 day of December, 2011, to:

April Min  
ICG, LLC  
300 Corporate Center Drive  
Scott Depot, WV 25560

  
\_\_\_\_\_  
Shameka Green  
Secretary

cc: Mr. C.A. Phillips, Director, West Virginia Department of Energy, Division of  
Mines and Minerals

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Office of Oil and Gas  
APR 08 2014  
WV Department of  
Environmental Protection



4700102829

Select County: (001) Barbour  Select datatypes:  (Check All)

Enter Permit #: 02829

Location  Production  Plugging

Owner/Completion  Stratigraphy  Sample

Pay/Show/Water  Logs  Btm Hole Loc

Table Descriptions  
 County Code Translations  
 Permit-Numbering Series  
 Usage Notes  
 Contact Information  
 Disclaimer  
 WVGES Main  
 Pipeline-Plus New

**Well: County = 1 Permit = 02829** [Link to all digital records for well](#)

Report Time: Friday, June 07, 2024 9:36:14 AM

WV Geological & Economic Survey:

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LONG_DD	UTME	UTMN
4700102829	Barbour	2829	Pleasant	Brownton	Philippi	39.214275	-80.1386	574365.2	4340908.8

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4700102829	10/9/2006	Original Loc	Completed	Evelyn G Martin		8	Coal Quest			CDX Gas, LLC			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_DCM	
4700102829	10/9/2006	8/27/2006	1321	Ground Level	Elk Crk(Ovrfl)	Allegheny Fm	Lo Kittanning coal	Development Well	Development Well	Methane (CBM)	Rotary	Unstrm/Casd	915					915	

Pay/Show/Water Information:

API	CMP_DT	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOT	FM_BOT	G_BEF	G_AFT	O_BEF	O_AFT	WATER_QNTY
4700102829	10/9/2006	Methane Pay	Gas	Vertical			854	Lo Kittanning coal	268				

Production Gas Information: (Volumes in Mcf) \* 2023 data for H6A wells only. Other wells are incomplete at this time.

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4700102829	CDX Gas, LLC	2007	244,411	0	0	0	17,308	38,744	1,793	1,026	41,237	50,819	41,511	22,385	29,588
4700102829	CDX Gas, LLC	2008	268,160	31,193	25,539	27,181	27,217	23,927	25,502	22,388	14,482	18,117	19,171	16,887	16,556
4700102829	Vitruvian Exploration, LLC	2009	141,066	15,396	13,701	14,166	12,917	12,892	11,785	11,796	10,841	8,124	8,365	10,314	10,769
4700102829	Vitruvian Exploration, LLC	2010	90,315	9,971	5,388	4,049	6,302	10,316	9,167	8,557	7,916	7,048	7,552	6,853	7,196
4700102829	Vitruvian Exploration, LLC	2011	60,491	6,933	6,002	6,202	5,784	5,782	5,419	5,382	4,625	4,733	4,929	4,700	0
4700102829	Geomet Operating Company, Inc.	2011	4,430	0	0	0	0	0	0	0	0	0	0	0	4,430
4700102829	Geomet Operating Company, Inc.	2012	51,331	4,724	4,336	4,692	4,068	3,907	3,719	3,688	3,863	3,994	4,349	4,881	5,110
4700102829	Geomet Operating Company, Inc.	2013	39,777	5,104	4,583	4,930	4,362	3,985	3,740	3,796	2,407	1,828	1,843	1,611	1,588
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2014	12,229	0	0	0	1,448	1,284	1,199	1,626	1,405	1,411	1,393	1,201	1,262
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2015	14,178	1,067	1,343	1,237	1,197	1,360	1,279	1,244	1,190	1,141	1,168	1,005	947
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2016	7,697	994	736	831	931	890	895	861	737	822	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2017	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Summit Appalachia Operating Company, LLC	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Wolf Run Mining LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Arch Reclamation Services LLC	2022	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Oil Information: (Volumes in Bbl) \*\* some operators may have reported NGL under Oil \* 2023 data for H6A wells only. Other wells are incomplete at this time.

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_OIL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4700102829	CDX Gas, LLC	2007	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	CDX Gas, LLC	2008	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Vitruvian Exploration, LLC	2009	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Vitruvian Exploration, LLC	2010	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Vitruvian Exploration, LLC	2011	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Geomet Operating Company, Inc.	2011	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Geomet Operating Company, Inc.	2012	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Geomet Operating Company, Inc.	2013	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Geomet Operating Company, Inc.	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2015	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2016	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2017	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Summit Appalachia Operating Company, LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Wolf Run Mining LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Arch Reclamation Services LLC	2022	0	0	0	0	0	0	0	0	0	0	0	0	0

Production NGL Information: (Volumes in Bbl) \*\* some operators may have reported NGL under Oil \* 2023 data for H6A wells only. Other wells are incomplete at this time.

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_NGL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4700102829	Geomet Operating Company, Inc.	2013	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2015	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2016	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Summit Appalachia Operating Company, LLC	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Wolf Run Mining LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Arch Reclamation Services LLC	2022	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Water Information: (Volumes in Gallons) \* 2023 data for H6A wells only. Other wells are incomplete at this time.

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_WTR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2016	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	ARP MOUNTAINEER PRODUCTION, LLC	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Summit Appalachia Operating Company, LLC	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Wolf Run Mining LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102829	Arch Reclamation Services LLC	2022	0	0	0	0	0	0	0	0	0	0	0	0	0

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV	DATUM
4700102829	Original Loc	Morgantown Ss/Murphy	Well Record	212	Reasonable	18	Reasonable	1321	Ground Level
4700102829	Original Loc	Buffo Ss/1st Cow Rn	Well Record	568	Reasonable	31	Reasonable	1321	Ground Level
4700102829	Original Loc	Mahonig Ss/Big Dunk	Well Record	629	Reasonable	101	Reasonable	1321	Ground Level
4700102829	Original Loc	Up Kittanning coal	Well Record	806	Reasonable	4	Reasonable	1321	Ground Level
4700102829	Original Loc	Lo Kittanning coal	Well Record	850	Reasonable	4	Reasonable	1321	Ground Level

Wireline (E-Log) Information:

\* There is no Scanned/Raster Log data for this well

\* There is no Digitized/LAS Log data for this well

\* There is no Scanned or Digital Logs available for download

There is no Plugging data for this well

There is no Sample data for this well

06/07/2024

Coal Quest 8  
Coal Quest 8 A

17 S 574302 4340828  
Coal Quest 8 A

17 S 574356 E 4340901 N  
Coal Quest # 8

Jun  
07/12/2024

06/07/2024

Google Earth

Image © 2024 CNES / Airbus

30 m



State of West Virginia  
Division of Environmental Protection  
Section of Oil and Gas

Well Operator's Report of Well Work

Farm name: **Evelyn G. Martin** Operator Well No.: **CoalQuest #8**

LOCATION: Elevation: **1321'** Quadrangle: **Brownton 7.5'**

District: **Pleasant** County: **Barbour**  
Latitude: **13020** Feet South of **39** Deg. **15** Min. **00** Sec.  
Longitude: **3900** Feet West of **80** Deg. **07** Min. **30** Sec.

Company: **CDX GAS, LLC**  
**12 Roush Drive**  
**Morgantown, WV 26501**

Agent: **Joseph A. Zupanick**

INSPECTOR: **Craig Duckworth**  
Permit Issued: **06/29/06**  
Well work commenced: **08/27/06**  
Well Work completed: **10/09/06**

Casing & Tubing Size	Used in Drilling	Left in Well	Cement Fill Up Cu. Ft.
9 5/8"	300'	300'	C.T.S.
7"	750'	750'	C.T.S.

Verbal Plugging  
Permission granted on:  
Rotary **X** Cable Rig  
Total Depth (feet) **915'**  
Fresh water depths (ft) **none**  
Salt water depths (ft) **none**  
Is coal being mined in area (Y/N)? **y**  
Coal Depths (ft): **806-810, 850-854**

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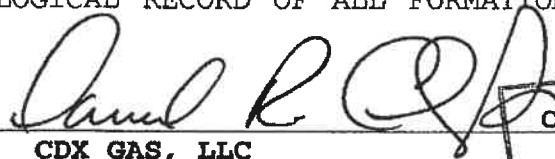
APR 08 2024

OPEN FLOW DATA

Producing formation **Lower Kittanning Coal** Pay zone depth (ft) **see creat.**  
Gas: Initial open flow **na** MCF/d Oil: Initial open flow **na** Bbl/d  
Final open flow **268** MCF/d Final open flow **na** Bbl/d  
Time of open flow between initial and final tests **4** Hours  
Static Rock pressure **210** psig (surface pressure) after **48** Hours

Second producing formation **Upper Kittanning Coal** pay zone depth (ft) \_\_\_\_\_  
Gas: Initial open flow \_\_\_\_\_ MCF/d Oil: Initial open flow \_\_\_\_\_ Bbl/d  
Final open flow **comingled** 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 STIMULATION, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

For:   
**CDX GAS, LLC**

By: **Daniel R Chapman, Geologist**

Date: **October 20, 2006**

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Office of Chief  
NOV 02 2006  
WV Department of  
Environmental Protection

06/07/2024

4700102829P

1<sup>st</sup> Stage: No stimulation

sand, shale	0	212	No water reported
Morgantown Sandstone	212	230	
sand, shale	230	475	
Saltsburg Sandstone	475	486	
shale	486	568	
Buffalo Sandstone	568	599	
shale	599	629	
Mahoning Sandstone	629	730	
sand, shale	730	806	
Upper Kittanning Coal	806	810	
sand, shale	810	850	
Lower Kittanning Coal	850	854	
sand, shale	854	915	TD

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WV Department of  
Environmental Protection

06/07/2024



4700102829P

WW-4A  
Revised 6-07

1) Date: April 3, 2024  
2) Operator's Well Number  
COAL QUEST #8

3) API Well No.: 47 - 001 - 02829

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

4) Surface Owner(s) to be served:	5) (a) Coal Operator
(a) Name <u>Brian and Rebecca Wentz</u>	Name <u>CoalQuest Development, LLC</u>
Address <u>3161 Stewarts Run Road</u>	Address <u>100 Tygart Drive</u>
<u>Bridgeport, WV 26330</u>	<u>Grafton, West Virginia 26354</u>
(b) Name _____	(b) Coal Owner(s) with Declaration
Address _____	Name _____
	Address _____
(c) Name _____	Name _____
Address _____	Address _____
6) Inspector <u>Randall M. Kirchberg</u>	(c) Coal Lessee with Declaration
Address <u>P.O. Box 1052</u>	Name _____
<u>Buckhannon, WV 26201</u>	Address _____
Telephone <u>(681) 781-9890</u>	

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.

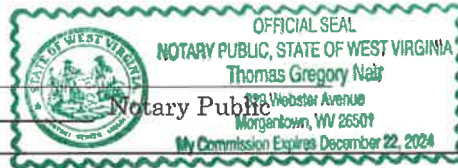
RECEIVED  
Office of Oil and Gas  
APR 08 2024

The reason you received these documents is that you have rights regarding the application which are summarized in the instructions on the reverse 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.

Well Operator Arch Reclamation Services LLC  
 By: Charles E. Duckworth  
 Its: Designated Agent  
 Address 100 Tygart Drive  
Grafton, West Virginia 26354  
 Telephone (304) 265-9704

Subscribed and sworn before me this 3rd day of April 2024  
My Commission Expires December 22, 2024



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 [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

06/07/2024

**SURFACE OWNER WAIVER**

4700102829P

Operator's Well  
Number

COAL QUEST #8

**INSTRUCTIONS TO SURFACE OWNERS NAMED ON PAGE WW4-A**

The well operator named on page WW-4A is applying for a permit from the State to plug and abandon a well. (Note: If the surface tract is owned by more than three persons, then these materials were served on you because your name appeared on the Sheriff's tax ticket on the land or because you actually occupy the surface tract. In either case, you may be the only owner who will actually receive these materials.) See Chapter 22 of the West Virginia Code. Well work permits are valid for 24 months. If you do not own any interest in the surface tract, please forward these materials to the true owner immediately if you know who it is. Also, please notify the well operator and the Office of Oil and Gas.

**NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.  
WHERE TO FILE COMMENTS AND OBTAIN ADDITIONAL INFORMATION:**

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

**Time Limits and methods for filing comments.** The law requires these materials to be served on or before the date the operator files his Application. You have **FIVE (5) 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.

**Comments must be in writing.** Your comments must 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.

The Chief has the power to deny or condition a well work permit based on comments on the following grounds:

- 1) The proposed well work will constitute a hazard to the safety of persons.
- 2) The soil erosion and sediment control plan is not adequate or effective;
- 3) Damage would occur to publicly owned lands or resources;
- 4) The proposed well work fails to protect fresh water sources or supplies;
- 5) The applicant has committed a substantial violation of a previous permit or a substantial violation of one or more of the rules promulgated under Chapter 22, and has failed to abate the violation...".

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**If you want a copy of the permit as it is issued or a copy of the order denying the permit, you should request a copy from the Chief.**

**VOLUNTARY STATEMENT OF NO OBJECTION**

I hereby state that I have read the instructions to surface owners and that I have received copies of a Notice and Application For A Permit To Plug And Abandon on Forms WW-4A and WW-4B, and a survey plat.

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

FOR EXECUTION BY A NATURAL PERSON  
ETC.

FOR EXECUTION BY A CORPORATION,

_____	_____	_____	_____
Signature	Date	Name	_____
		By	_____
		Its	_____
			Date

Signature

Date

06/07/2024

4700102829P



# ARCH RECLAMATION SERVICES LLC

April 3, 2024

Brian and Rebecca Wentz  
3161 Stewarts Run Road  
Bridgeport, West Virginia 26330

Re: Plugging Permit – API # 47-001-02829 – Well No. COAL QUEST #8

Dear Mr. and Mrs. Wentz:

As required by the permit process of the WV Department of Environmental Protection – Office of Oil and Gas enclosed please find a copy of the plugging permit application for the above referenced well that Arch Reclamation Services LLC plans to submit to the WV Department of Environmental Protection, Office of Oil and Gas.

If you have no objection to the plugging, permit application, please sign the page, titled Surface Owner Waiver and return in the enclosed self-addressed stamped envelope.

If you should have any questions concerning this application, please feel free to contact Charles Duckworth at (304) 265-9704 or me at (304) 265-9778 or via email at [gnair@archrsc.com](mailto:gnair@archrsc.com).

Sincerely,

Greg Nair  
Manager Surface Mine Planning

Enclosures

CERTIFIED MAIL NO. 9589 0710 5270 1400 7227 97  
RETURN RECEIPT REQUESTED

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WV Department of  
Environmental Protection

100 Tygart Drive

Grafton, West Virginia 26354

304-265-9700

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9589 0710 5270 1400 7227 97

U.S. Postal Service™  
CERTIFIED MAIL® RECEIPT  
Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com)

Certified Mail Fee	\$ 4.46
Extra Services & Fees (check box, add fees as appropriate)	
<input checked="" type="checkbox"/> Return Receipt (hardcopy)	\$ 5.00
<input type="checkbox"/> Return Receipt (electronic)	\$
<input type="checkbox"/> Certified Mail Restricted Delivery	\$
<input type="checkbox"/> Adult Signature Required	\$
<input type="checkbox"/> Adult Signature Restricted Delivery	\$

Postage  
\$ 2.83  
Total Postage and Fees  
\$ 10.88

Sent To  
Street and Apt. #  
City, State, ZIP+4

Brian and Rebecca Weitz  
3161 Stewarts Run Road  
Bridgeport, West Virginia 26330  
47-001-02829



PS Form 3800, January 2022 PSN 7530-02-000-9000 See Reverse for Instructions

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WW-4B

4700102829P

API No. 47-001-02829  
 Farm Name Martin, Evelyn G.  
 Well No. COAL QUEST #8

**INSTRUCTIONS TO COAL OPERATORS  
OWNERS AND LESSEE**

The well operator named on the obverse side of WW-4 (B) is about to abandon the well described in the enclosed materials and will commence the work of plugging and abandoning said well on the date the inspector is notified. Which date shall not be less than five days after the day on which this notice and application so mailed is received, or in due course should be received by the Department of Environmental Protection Office of Oil & Gas.

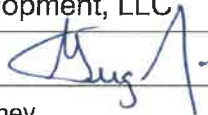
This notice and application is given to you in order that your respective representatives may be present at the plugging and filling of said well. You are further notified that whether you are represented or not the operator will proceed to plug and fill said well in the manner required by Section 24, Article 6, Chapter 22 of the Code and given in detail on obverse side of this application.

NOTE: If you wish this well to be plugged according to 22-6-24(d) then as per Regulation 35CSR4-13.9 you must complete and return to this office on form OB-16 "Request by Coal Operator, Owner, or Lessee for plugging" prior to the issuance of this plugging permit.

**WAIVER**

The undersigned coal operator X / owner \_\_\_\_\_ / lessee \_\_\_\_\_ / of the coal under this well location has examined this proposed plugging work order. The undersigned has no objection to the work proposed to be done at this location, provided, the well operator has complied with all applicable requirements of the West Virginia Code and the governing regulations.

Date: 4/3/2024

CoalQuest Development, LLC  
 By: Greg Nair   
 Its Power of Attorney

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**POWER OF ATTORNEY**

**COALQUEST DEVELOPMENT LLC  
TO  
GREG NAIR**

**Dated: January 1, 2024**

**Expires: December 31, 2024**

KNOW ALL MEN BY THESE PRESENTS: That CoalQuest Development LLC, a limited liability company formed under the laws of the State of Delaware (the "Company"), acting by and through Rosemary L. Klein, its duly authorized Secretary, has and does hereby appoint Greg Nair its true and lawful Attorney-in-Fact with power and authority, for and on behalf, and in the name of the Company, during the period herein specified, and subject to the restrictions and limitations set forth in this Power, to execute, acknowledge and deliver in the ordinary and regular course of the Company's business, applications for mining, environmental, safety, and health permits, permit transfers, or permit bond releases or bond adjustments, amendments, supplements or modifications to such permits, certificates, gas well plugging applications, shallow well drilling permit applications, or other instruments directly related to such amendments, supplements or modifications, monthly production reports, air quality, water quality or other environmental reports, quarterly discharge monitoring reports and any other like or similar reports required to be filed with any local, state or federal governmental agency.

The Attorney herein appointed shall be authorized to act pursuant to this Power from the date hereof only so long as such Attorney shall remain an employee of Arch Resources, Inc. or any subsidiary thereof, or until December 31, 2024, or until such earlier time as this instrument has been revoked, annulled, rescinded or set aside by an instrument of revocation filed with the Secretary of the Company, whichever first occurs.

IN WITNESS WHEREOF, the Company has caused this Power of Attorney to be executed on its behalf, and its seal to be hereunto affixed as of the day and year first above written, by the undersigned, Rosemary L. Klein, duly authorized Secretary of the Company.

COALQUEST DEVELOPMENT LLC

By:                     RKL                      
Rosemary L. Klein  
Secretary

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STATE OF MISSOURI     )  
  ) ss  
COUNTY OF ST. LOUIS    )

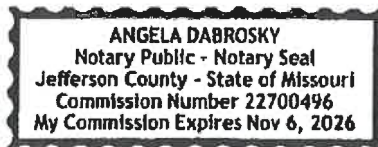
On this 14<sup>th</sup> day of December, 2023, before me, the undersigned notary public, personally appeared Rosemary L. Klein, known to me to be the person whose name is subscribed to the within instrument and acknowledged that she executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

*Angela Dabrosky*

\_\_\_\_\_  
Notary Public

My Commission Expires: Nov. 6, 2026



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WW-9  
(5/16)

4700102829P

API Number 47 - 001 - 02829  
Operator's Well No. COAL QUEST #8

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

Operator Name Arch Reclamation Services LLC OP Code

Watershed (HUC 10) Stillhouse Run Quadrangle Philippi (545)

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: N/A

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

Proposed Disposal Method For Treated Pit Wastes:

- 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 Tanks - See attached letter)

Will closed loop system be used? If so, describe: Yes, Gel circulated from tank thru well bore ad returned to tank.

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

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

Additives to be used in drilling medium? Bentonite, Bicarbonate or Soda

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

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

-Landfill or offsite name/permit number? Wolf Run Mining LLC - Permit No. O-113-83

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 [Signature]  
Company Official (Typed Name) Charles E. Duckworth  
Company Official Title Designated Agent

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Subscribed and sworn before me this 3rd day of April

Thomas Duckworth  
My commission expires 12/22/2024



06/07/2024



Proposed Revegetation Treatment: Acres Disturbed 1.50 / 2.0 Prevegetation pH

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20 or equivalent

Fertilizer amount 500 lbs/acre

Mulch Hay Bales Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Orchard Grass	12	Orchard Grass	12
Landino Clover	3	Landino Clover	3
Timothy	10	Timothy	10

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: Randall M. Kirchberg Digitally signed by Randall M. Kirchberg Date: 2024.04.05 08:47:01 -04'00'

Comments:

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Title: Oil and Gas Inspector Date: April 5, 2024

Field Reviewed? ( ) Yes (XXXXXX) No

4700102829P

A Subsidiary of



## ARCH RECLAMATION SERVICES LLC

---

April 3, 2024

WV Department of Environmental Protection  
Office of Oil and Gas  
601 – 57<sup>th</sup> Street, S.E.  
Charleston, West Virginia 25304

To Whom It May Concern:

As per the WV Department of Environmental Protection, Office of Oil and Gas request, Arch Reclamation Services LLC, submits the following procedures utilizing pit waste.

Upon submitting a well work application (without a general permit for Oil and Gas Pit Waste Discharge Application), Arch Reclamation Services LLC, will construct no pits, but instead will use mud tanks to contain all drilling muds.

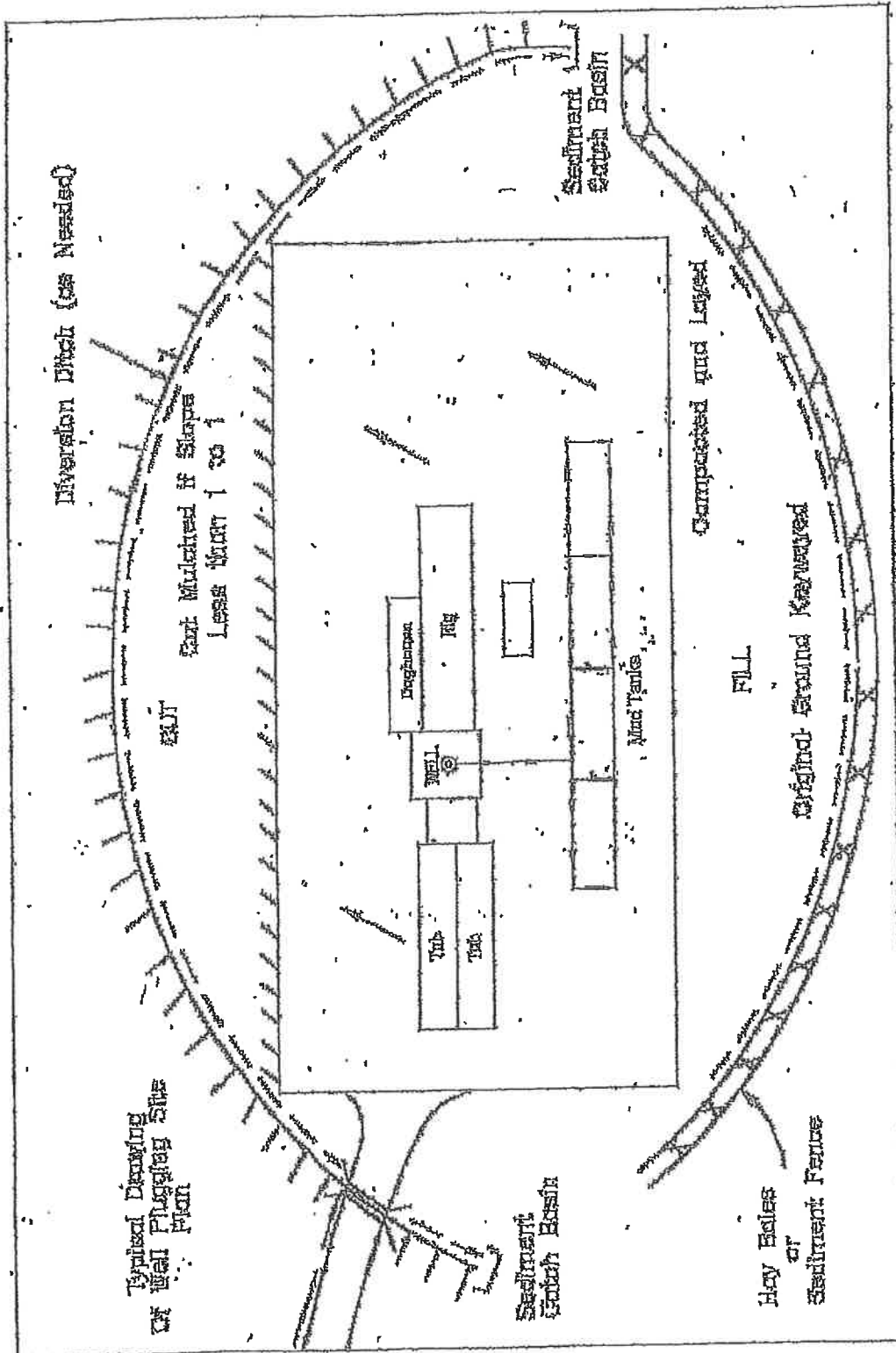
Once the well is completed, that material (minus the cave material) will be trucked to the next well to be plugged or to Wolf Run Mining LLC DEP impoundment facilities O-113-83 or to an approved facility that can handle the material.

Sincerely,

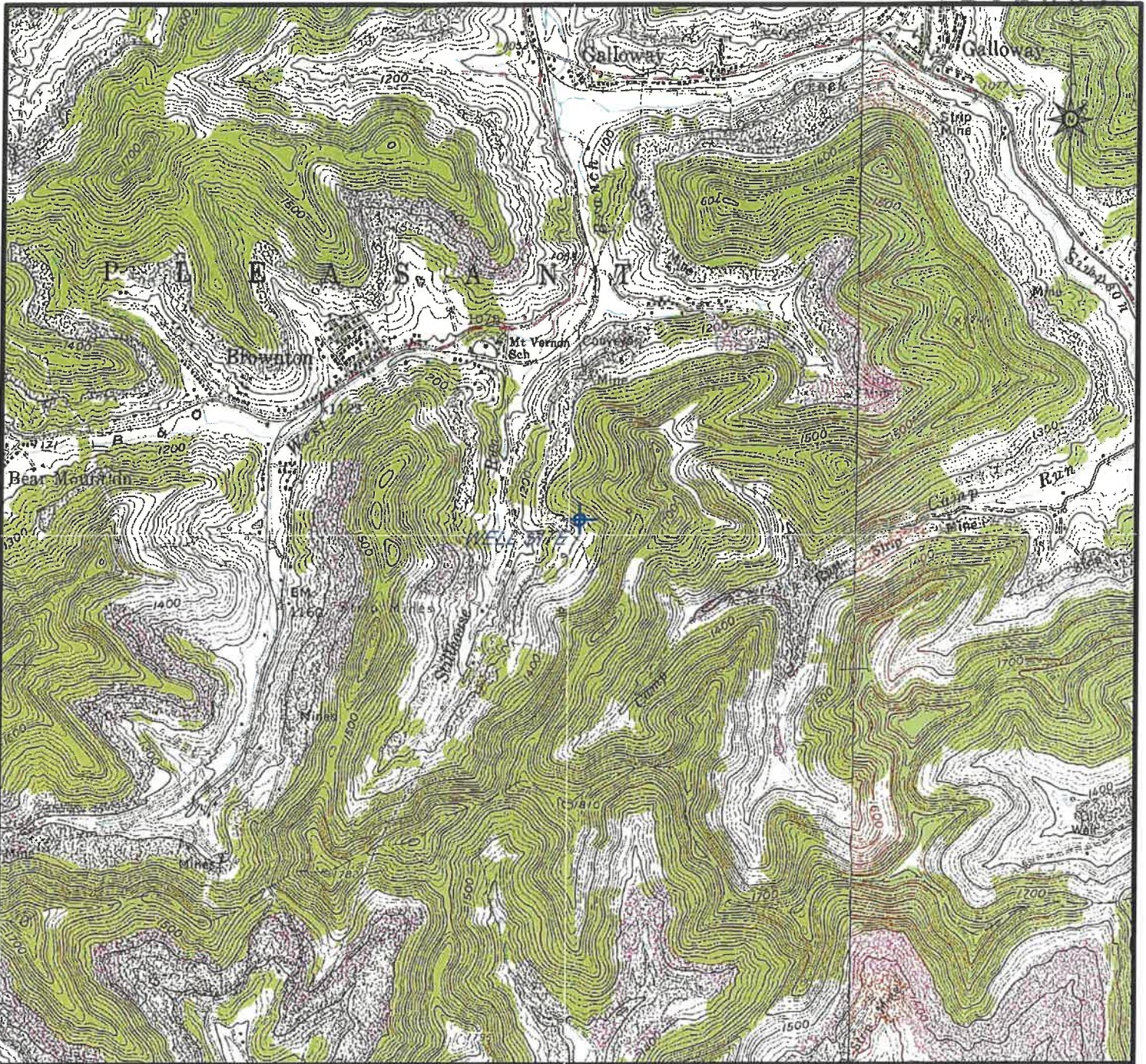
A handwritten signature in black ink, appearing to read "C. E. Duckworth", written over a white background.

Charles E. Duckworth  
Designated Agent

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APR 08 2024

LATITUDE: 39° 12' 50"  
 LONGITUDE: 80° 08' 20"  
 NEAREST WATERCOURSE: Stillhouse Run  
 NEAREST TOWN: Phillip

OPERATOR'S WELL NO. CQ-8  
 API WELL NO. 47-001-02829  
 STATE 001 COUNTY PERMIT

WELL TYPE: OIL    GAS X LIQUID INJECTION    WASTE DISPOSAL     
 (IF "GAS") PRODUCTION X STORAGE X DEEP    SHALLOW X  
 LOCATION: ELEVATION 1321.3 WATERSHED     
 DISTRICT Pleasant COUNTY Barbour  
 QUADRANGLE Brownton and Phillip 7 1/2'

SURFACE OWNER: Brian and Rebecca Wentz ACREAGE 46.00  
 OIL & GAS ROYALTY OWNER: Brian and Rebecca Wentz LEASE ACREAGE 63.00  
 LEASE NO.   

PROPOSED WORK: DRILL X CONVERT    DRILL DEEPER    REDRILL     
 FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION     
 PERFORATE NEW FORMATION     
 OTHER PHYSICAL CHANGE IN WELL (SPECIFY)   

PLUG AND ABANDON X CLEAN OUT AND REPLUG     
 TARGET FORMATION Lower and Upper Kittanning ESTIMATED DEPTH 912'  
 WELL OPERATOR Arch Reclamation Services LLC DESIGNATED AGENT Charles E. Duckworth  
 ADDRESS 100 Tygart Drive, Grafton, WV 26354 ADDRESS 100 Tygart Drive, Grafton, WV 26354

DRAWN	
DATE	BY
03/24	TAN
REVISED	
DATE	BY

**ARCH** RESOURCES **Arch Reclamation Services LLC**  
 A Subsidiary of Arch Resources, Inc.  
 100 Tygart Drive, Grafton, WV 26354

API WELL NO. 47-001-02829  
 WELL #CQ-8  
 LOCATION MAP

APPROVED		TOPOGRAPHIC CONTOUR INTERVAL = 20'	Scale: 1"=2000'	File No.: 47-001-02829.dgn	Sheet No.: 1 of 1
DATE	BY				

WW-7  
8-30-06



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

API: 47-001-02829 WELL NO.: COAL QUEST #8

FARM NAME: Martin, Evelyn G.

RESPONSIBLE PARTY NAME: Arch Reclamation Services LLC

COUNTY: Barbour DISTRICT: Pleasant

QUADRANGLE: Brownton

SURFACE OWNER: Brian and Rebecca Wentz

ROYALTY OWNER: Brian and Rebecca Wentz

UTM GPS NORTHING: 4340679.41

UTM GPS EASTING: 574341.75 GPS ELEVATION: 1311.24'

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 \_\_\_\_\_ : Post Processed Differential \_\_\_\_\_  
Real-Time Differential \_\_\_\_\_

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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.

Power of Attorney Title April 3, 2024 Date

4700102829P

**POWER OF ATTORNEY**

**ARCH RECLAMATION SERVICES LLC  
TO  
GREG NAIR**

**Dated: January 1, 2024**

**Expires: December 31, 2024**

KNOW ALL MEN BY THESE PRESENTS: That Arch Reclamation Services LLC, a limited liability company formed under the laws of the State of Delaware (the "Company"), acting by and through Rosemary L. Klein, its duly authorized Secretary, has and does hereby appoint Greg Nair its true and lawful Attorney-in-Fact with power and authority, for and on behalf, and in the name of the Company, during the period herein specified, and subject to the restrictions and limitations set forth in this Power, to execute, acknowledge and deliver in the ordinary and regular course of the Company's business, applications for mining, environmental, safety, and health permits, permit transfers, or permit bond releases or bond adjustments, amendments, supplements or modifications to such permits, certificates or other instruments directly related to such amendments, supplements or modifications, monthly production reports, air quality, water quality or other environmental reports, quarterly discharge monitoring reports and any other like or similar reports required to be filed with any local, state or federal governmental agency.

The Attorney herein appointed shall be authorized to act pursuant to this Power from the date hereof only so long as such Attorney shall remain an employee of Arch Resources, Inc. or any subsidiary thereof, or until December 31, 2024, or until such earlier time as this instrument has been revoked, annulled, rescinded or set aside by an instrument of revocation filed with the Secretary of the Company, whichever first occurs.

IN WITNESS WHEREOF, the Company has caused this Power of Attorney to be executed on its behalf, and its seal to be hereunto affixed as of the day and year first above written, by the undersigned, Rosemary L. Klein, duly authorized Secretary of the Company.

ARCH RECLAMATION SERVICES LLC

By: RKL  
Rosemary L. Klein  
Secretary

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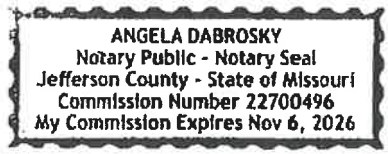
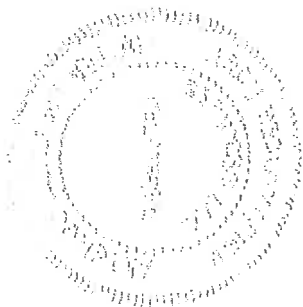
STATE OF MISSOURI     )  
  ) ss  
COUNTY OF ST. LOUIS    )

On this 14<sup>th</sup> day of December, 2023, before me, the undersigned notary public, personally appeared Rosemary L. Klein, known to me to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Angela Dabrosky  
Notary Public

My Commission Expires: Nov. 6, 2026



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