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Competing Ownership Claims And Environmental Concerns In Coalbed Methane Gas Development In The Appalachian Basin*

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I. INTRODUCTION

Coalbed methane, coalseam gas, occluded natural gas, and gob gas are several names for a substance that was once viewed as a nuisance and a hazard to underground coal producers. Coalbed methane is now the object of the latest development in the energy industry.

The increased production of coalbed methane in the Appalachian Basin indicates that it is a valuable and newly tapped energy resource.¹ One of the reasons for the heightened interest in developing coalbed methane as a source of fuel is the tax credit offered by I.R.C. § 29 (1986).² This section of the Internal

* Special thanks to J. Steven Griles, co-author of *Some Environmental Considerations of Coalbed Methane Development*, Third Annual Coalbed Methane Special Institute, Eastern Mineral Law Foundation (November 1990). The Griles-McClanahan paper served as a principal source for the environmental topics covered in this article. Second, the author would like to thank and recognize M. Jill Morgan, co-author of *Coalbed Methane Gas Development - Issues in the Appalachian Basin*, Fifteenth Kentucky Annual Mineral Law Seminar (October 1990) and *Competing Ownership Claims to Coalbed Methane in the Appalachian Basin*, *The Landman*, July-August 1990, at 19-23. Thanks also to Julie A. Long, an associate with the law firm Penn, Stuart, Eskridge & Jones, Abingdon, Virginia; J.D., University of Richmond; B.A., University of Virginia, who assisted with the preparation of this article.

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¹ McClanahan & Morgan, *Coalbed Methane Gas Development - Issues in the Appalachian Basin*, FIFTEENTH ANNUAL MINERAL LAW SEMINAR § I-1 (Oct. 1990).

² Morgan & McClanahan, *Competing Ownership Claims to Coalbed Methane in the Appalachian Basin*, *THE LANDMAN*, (July-Aug. 1990), at 19; see I.R.C. § 29 (1986); I.R.C. § 29(f)(1) (Law. Co-op. 1991). Section 29 permits producers of alternative fuels to claim a non-refundable income tax credit for the production of oil, gas and synthetic

Revenue Code was designed to encourage development of domestic nonconventional energy resources. The tax credit had an initial expiration date of January, 1991,³ but Congress has extended the deadline to apply to wells drilled before January, 1993.⁴

Increased production of coalbed methane and recognition of the gas as an increasingly important source of energy has generated a host of legal issues and has elicited response from environmental agencies. One of the most important legal issues surrounding the development of coalbed methane is the question of which estate owner actually has title to the coalbed methane.⁵ Environmental concern stems from the effects of gas extraction. Removing coalbed methane either prior to or contemporaneously with the extraction of coal is both economically attractive and efficient and has been demonstrated to be beneficial to the environment.⁶

Some of the larger mining companies are currently pursuing the production of coalbed methane, both for the sale of the

fuels derived from nonconventional sources and sold to non-related persons. Generally, the credit is \$3.00 multiplied by the barrel-of-oil equivalent of the qualifying fuel. The credit is phased out as the wellhead price of uncontrolled domestic oil rises to specified oil levels. In order to claim the credit, the fuels must be produced: (1) in facilities placed in service after December 31, 1979, and before January 1, 1993; or, (2) from wells drilled after December 31, 1979, and before January 1, 1993. Finally, such fuels must be sold before January 1, 2003.

³ See Morgan & McClanahan, *supra* note 2; see also Baker, *The Section 29 Fuel Tax Credit — Possibilities for Extension?*, Coalbed Methane Special Institute, E. MIN. L. FOUND. (Nov. 1989); Brody, *Coalbed Methane Development - Ownership and Related Issues*, THE LANDMAN, 51, 55-56 (May-June 1991). See generally Gardner, *Rewrite of Oil and Gas Act Highlights Annual Meeting*, THE AM. OIL & GAS REP., June 1990, at 55.

⁴ I.R.C. § 29(f)(1) (Law. Co-op. 1991); see also Brody, *supra* note 3, at 56.

⁵ The problem arises when there is more than one owner of the coalbed methane and other minerals. Even if there is one owner, prior severance of certain mineral rights may also create conflicts between the coalbed methane operator and other mining operations. See Norvell, *Competing Uses of Coal & Oil & Gas Estates in Coalbed Methane Development*, Third Annual Coalbed Methane Special Institute, E. MIN. L. FOUND., at 1 (Nov. 1990).

⁶ Griles & McClanahan, *Some Environmental Considerations of Coalbed Methane Development*, Third Annual Coalbed Methane Special Institute, E. MIN. L. FOUND., 14.01, 14.04 (Nov. 1990). One commentator has noted,

[p]remining production of methane for commercial purposes prevents waste of a valuable natural resource, contributes to the eventual safe mining of the coal while lowering the mining costs, and, also, may avoid environmental degradation because venting of coalbed methane may have contributed to the "greenhouse effect."

Norvell, *supra* note 5, at 2.

produced gas and for the degasification effect on mining.⁷ Degasification, capturing coalbed methane before it is released into the atmosphere, may aid in reducing the greenhouse effect.⁸ Although certain environmental benefits exist in coalbed methane mining, federal and state environmental laws presently serve as a check on the potential for damages caused during the extraction of coalbed gas.⁹

This article first addresses the issue of coalbed methane ownership and focuses on the three major decisions reviewing competing ownership claims to coalbed methane. Next, the article reviews recent legislative enactments pertaining to the ownership question. Moving from the question of ownership, the Congressional legislation and environmental regulations which may be used to combat hazards associated with the development of coalbed methane production are reviewed. Finally, the potential environmental benefit of reducing the greenhouse effect that may be achieved when coalbed methane developers use degasification to extract methane gas from coal seams is discussed.¹⁰

II. COMPETING OWNERSHIP CLAIMS TO COALBED METHANE

Coalbed methane, found in coal seams, is similar to natural gas in physical and chemical properties.¹¹ This similarity in molecular structure to natural gas has led to the argument that a gas lessee has the right to develop the coalbed methane. However, the location of the methane, that is in the coal seam itself, adsorbed onto the coal, provides support to the coal owners who claim ownership of the coalbed methane.¹²

Statutes and court decisions are scarce on the question of ownership because coalbed methane has only recently been rec-

⁷ Boyer, *Coalbed Methane Activity in the Arkoma, Black Warrior, Central Appalachian, Forest City, San Juan and Sand Wash Basins*, Third Annual Coalbed Methane Special Institute, (E. MIN. L. FOUND. 1990).

⁸ See *infra* Gibbs & Hogan, note 102; Albritten, note 103, and accompanying text.

⁹ See generally Griles & McClanahan, *supra* note 6, at 14.04, 14.07-14.15 (reviewing various federal environmental legislation as well as Virginia regulations including the Federal Clean Water Act, the Federal Clean Air Act, the Safe Water Drinking Act and Virginia permitting procedures).

¹⁰ With regard to all of these issues, the purpose of this article is to provide a broad overview of the points of consideration for each issue as would concern a coalbed methane operator or a legal practitioner in this field.

¹¹ See Morgan & McClanahan, *supra* note 2, at 19.

¹² *Id.*

ognized as a profitable alternative energy source. This paucity means that at present coalbed gas developers are left in limbo on the issue of ownership rights in mining methane gas.

A. Cases involving the ownership of coalbed methane

It is appropriate to begin every analysis regarding ownership of coalbed methane with a review of the mineral severance deed through which the mineral owners claim title to their respective mineral estates. All mineral leases covering the tract pinpointed for development should also be examined. The ideal situation occurs where there has been no severance of minerals, and there are no current oil and gas or coal leases covering the property. In this situation, the coalbed methane developer would obtain a lease from the fee owner and be relatively secure in the fact that there will not be competing claims to the coalbed methane.

Complications in the leasing process occur when a mineral severance has taken place and the coal, oil and gas are owned or leased by different persons or entities. While arguments can be made for the ownership to be vested in either the oil and gas owner, coal owner or surface owner, only three courts have been faced with the specific question of coalbed methane ownership.

In the much discussed case of *United States Steel Corp. v. Hoge*,¹³ the Pennsylvania Supreme Court was asked to determine the ownership of coalbed methane, found in the "Pittsburgh" or "River" vein of coal owned by United States Steel Corporation ("U.S. Steel"), which underlaid certain tracts of land owned by Hoge, Cowan and Murdock ("Hoge").¹⁴ U.S. Steel acquired ownership of the coal through a severance deed dated July 23, 1920. The severance deed granted, in pertinent part, "all the rights and privileges necessary and useful in the mining and removing of said coal, including . . . the right of ventilation."¹⁵ Hoge's predecessor in title reserved "the right to drill and operate through said coal for oil and gas without being held liable for any damages."¹⁶

In formulating its conclusion, the court considered the history of gas development, the general nature of coal ownership

¹³ 468 A.2d 1380 (Pa. 1983).

¹⁴ *Id.* at 1381.

¹⁵ *Id.* at 1382.

¹⁶ *Id.*

rights, and the language contained in the severance deed in question. The court held that, as a general rule, such gas as is present in coal must necessarily belong to the coal owner, so long as it remains within his property and subject to his exclusive dominion and control.¹⁷ In examining the language in the severance deed, the court gave "effect to all its terms and provisions, and constru[ed] the language in light of conditions existing at the time of its execution."¹⁸

At the time of the severance deed, the court found that commercial exploitation of coalbed gas was very limited and sporadic.¹⁹ Thus, even though the unrestricted term "gas" was used in the reservation clause, the court did not believe the parties intended to reserve all types of gas.²⁰ The court found "implicit in the reservation of the right to drill through the severed coal seam for 'oil and gas' a recognition of the parties that the gas was that which was generally known to be commercially exploitable."²¹ The reservation was limited by the court to the right to drill through the coal seam to reach the oil and gas lying below the coal strata.

In the second case involving ownership questions, *Rayburn v. USX Corp.*,²² the United States District Court for the Northern District of Alabama also held that title to the coalbed methane was vested in the coal owner. The court's decision, however, was "based solely on the language of the deed in question and not a declaration that in all instruments the interpretation will be the same."²³ The language in the 1960 severance deed on which the court based its decision is, in pertinent part, as follows:

Grantors herein covenant and agree that any right to explore for or produce oil and gas, or to drill wells for the exploration for or production of oil and gas in the above-described lands shall be subject to the requirement that all coal seams located in said lands penetrated in such exploration or drilling opera-

¹⁷ *Id.* at 1383.

¹⁸ *Id.* at 1384.

¹⁹ *United States Steel Corp.*, 468 A.2d at 1384.

²⁰ *Id.*

²¹ *Id.* at 1385.

²² No. 85-G-2661-W (N.D. Ala. 1987) (memorandum opinion and order), *aff'd without opinion*, 844 F.2d 796 (11th Cir. 1988).

²³ *Id.*

tions shall be encased or grouted off . . . (Emphasis added).²⁴

The court found this language to be clear and unambiguous. The clearly expressed intent of the parties was that the methane in the coalbed not be available to any well drilled by oil and gas lessees or assigns.²⁵

Another action involving the issue of coalbed methane ownership is presently pending in the Circuit Court of Mobile County, Alabama - *Pinnacle Petroleum Co. v. Jim Walter Resources, Inc.*²⁶ Pinnacle Petroleum Company ("Pinnacle") derived its interest in the oil and gas underlying the property in dispute through a printed form oil and gas lease dated August 31, 1978, from E.L. Hendrix and wife, to Alabama Basic Land Enterprises, Inc. Typewritten onto the first page of the Hendrix lease was the statement that "This lease does not include coal."²⁷

Jim Walter Resources, Inc. ("Jim Walter") derived its interest in the coal through a lease dated December 6, 1984, from The First National Bank of Tuscaloosa, Trustee, to the United States Pipe and Foundry Company. The coal lease referenced the Hendrix oil and gas lease and indicated that the coal lessee could remove and dispose of the coal seam gas subject to any right of the oil and gas lessee or its assignees.²⁸ The coal lease also made specific provisions for the removal of coal seam gas and royalty payments should the coal seam gas be sold.²⁹

One of Pinnacle's arguments on its motion for partial summary judgment was that its gas lease covered coalbed methane because methane is technically a "gas."³⁰ Another argument was based on the legal theory that after extraction of the coal is completed, the mined area reverts to the grantor.³¹ Since a gob

²⁴ *Id.*

²⁵ To the contrary, in the federal arena, the Solicitor's Office of the United States Department of the Interior (the "Department") issued an opinion on May 12, 1981, as to the coalbed methane ownership question. The Solicitor concluded that a reservation of "coal" does not include coalbed methane, but a reservation of "gas" does include gas found in coal deposits. Ownership of and Right to Extract Coalbed Gas in Federal Coal Deposits, Opp. Solicitors Office, U.S. Dept. of Interior, 538 at 544-45 (May 12, 1981).

²⁶ No. CV 87-3012 (Cir. Ct., Mobile Co., AL. July 28, 1989) (order partially granting defendant's motion for summary judgment).

²⁷ See Morgan & McClanahan, *supra* note 2.

²⁸ *Id.*

²⁹ *Id.*

³⁰ *Id.*

³¹ See International Salt Co. v. Geostow, 878 F.2d 570, 575 (2d Cir. 1989).

well produces methane only after mining occurs in that area, this method was a post mining method of extraction and so the methane should have reverted to the coal lessor.³²

Jim Walter relied primarily on the *Hoge* and *Rayburn* decisions in arguing that the coalbed methane was owned by the coal estate as a result of: (1) the characteristics of coalbed methane; (2) the history of coalbed methane production; (3) the acknowledged right to remove the coal included the incidental right to remove the coalbed methane; and, (4) the conveyancing instruments revealed the intent of the parties as to the coalbed methane ownership and development.³³

In its July 28, 1989 order, the court held that Jim Walter, as the coal lessee, had the exclusive right to produce coalbed gas and so had the exclusive right to produce coalbed gas³⁴ from the property that was the subject of the lawsuit.³⁴ The action remained on the docket to settle factual disputes about whether any of the gas produced by Jim Walters was gas other than coalbed methane³⁵

These decisions only indicate that the language in the severance and lease instruments are the basis on which courts will hinge their decisions. The decisions do not provide clear answers as to which estate owners must be leased in every fact situation in order to secure a clear, unchallenged path to develop the coalbed methane resources. Such decisions must be based upon a review of mineral severance deeds, mineral leases covering the targeted tract, and the applicable statutes and regulations, if any, that govern such development. The answer that would best minimize any risk would be to obtain an agreement between the surface and all mineral estate owners as to ownership and royalty distributions, and obtain subordination agreements from any prior mineral lessees. It is not likely, however, that such an agreement will be easily reached between two or more claimants, and, of course, obtaining such an agreement may: (1) require an excessive amount of economic resources; and, (2) be so time-consuming that the tax credit offered by I.R.C. § 29 (1986) cannot be utilized. In any event, the more cautious coalbed methane developer should at least negotiate leases with all sur-

³² See *Morgan & McClanahan*, *supra* note 2.

³³ *Id.*

³⁴ See *Pinnacle Petroleum Co.*, No. CV-87-3012.

³⁵ *Id.*

face, coal, and oil and gas owners in jurisdictions that do not provide for the force pooling³⁶ of competing claims.

There are also three pending cases regarding coalbed methane ownership in Colorado, Montana, and Virginia. The action filed in the United States District Court for the District of Colorado, *Southern Ute Indian Tribe v. Amoco Production Co.*, No. 91-2273, demonstrates the types of claims which may arise when title disputes occur after marketing and production begins. The plaintiff, Southern Ute Indian Tribe ("Southern") claims ownership of the coalbed methane by virtue of its ownership of the coal underlying the lands in dispute. Southern asserts that the approximately 125 defendants, including Amoco Production Company ("Amoco") and nearly twenty (20) other oil company defendants, wrongfully produced and marketed its coalbed methane gas and that the coalbeds from which the methane was produced have been devalued. The claims asserted by Southern include: (1) a claim for declaratory relief quieting title to the coalbed methane gas in Southern; (2) a claim for trespass damages; (3) a claim for willful trespass; (4) a claim for punitive and exemplary damages; (5) a claim for damages as a result of coal seam alteration of structure and volumetric shrinkage; and, (6) a claim for damages for violation of its civil rights under 42 U.S.C. § 1983.³⁷

In an action to quiet title to certain fee lands in Carbon County, Montana, styled *Carbon County v. Mary R. Baird*, No. DV90-120,³⁸ defendants raised the issue of coalbed gas ownership underlying certain lands subject to the quiet title action. In 1990, Florentine Exploration & Production, Inc. ("Florentine"), obtained an oil and gas lease from Carbon County that granted Florentine the right to explore for and develop "oil and all gas including coal seam methane of whatsoever nature or kind."³⁹ A 1984 coal deed on the same property, however, granted to

³⁶ Force pooling is a legal remedy providing for the compulsory joinder of non-consenting ownership rights in properties contained within a drilling unit. Force pooling is an exercise of the state's police power to protect and promote correlative rights. John S. Lowe, *OIL AND GAS LAW IN A NUTSHELL* (1983); Howard R. Williams et al., *CASES AND MATERIALS ON THE LAW OF OIL AND GAS* ch. 8, §§ 1.A and 2.D (4th ed. 1983). See also note 51.

³⁷ Charles L. Kaiser & Mark D. Bingham, *Coalbed Gas Exploration and Development on Federal and Other Lands in the West*, Coalbed Gas Development Special Institute, ROCKY MTN. MIN. LAW FOUND. & E. MIN. LAW FOUND. (Apr. 1992).

³⁸ *Id.*

³⁹ *Id.*

certain defendants "all coal and coal rights with the right of ingress and egress to mine and remove the same."⁴⁰ The court must, therefore, determine if coalbed gas was conveyed by the 1984 coal deed or the 1990 oil and gas lease. A trial is scheduled for July 23, 1992.

B. Legislative enactments addressing coalbed methane development and ownership.

Various states in the Appalachian Basin have enacted statutes and/or rules and regulations designed to encourage and streamline the development of coalbed methane.

In Virginia, the legislature attempted to answer the ownership question by codifying a legal presumption favoring the surface owner regarding migratory gases below the surface.⁴¹ This statute, Virginia Code sections 55-154.1, was considered by the Circuit Court for Wise County, Virginia, in *Equitable Resources Exploration, Inc. v. Richardson*.⁴² The case centered around an 1890 severance deed in which the grantee was conveyed the coal and other minerals and the right to enter on the land and excavate, mine, prepare for market, and remove said coal and other minerals. The surface owners attempted to block the laying of a gas pipeline across their tracts. Basing one of their defenses on the migratory gas provision in the Virginia Code,⁴³ the surface owners argued that this statute vested them with ownership of

⁴⁰ *Id.*

⁴¹ VA CODE ANN. § 55-154.1 (Michie 1986) provided:

Mineral rights regarding migratory gases; pending litigation; power of court. - A. Except as otherwise provided by law, on or after January 1, 1978, all migratory gases, including but not limited to propane and methane, shall be conclusively presumed to be the property of the owner of the surface real property beneath which such migratory gases are or may be located.

B. Litigation involving the legal construction of lease agreements entered into prior to the effective date of this section shall be governed by the applicable law in effect at the time the agreement or agreements were entered into. The circuit court in which such proceedings involving the construction of such leases are heard may permit, in the discretion of the court, commercial extraction of migratory gases; provided, however, that the court shall order reasonable royalties from the sale of such gases to be placed in an escrow account until the ownership of such gases is determined by final court order.

⁴² No. C-88-123. Memorandum from Judge Robert Stump of the Thirtieth Judicial Circuit of Virginia (Sept. 1, 1988) (on file with author).

⁴³ See VA. CODE ANN. § 55-154.1 (Michie 1986).

all natural gas underlying their surface tracts. In its September 1, 1988 memorandum opinion, the court stated that the statute did not apply in this case since there was a prior 1890 conveyance of oil and gas rights.⁴⁴ The court reasoned that if the mineral severance was prior to the effective date of the statute, any other interpretation would be an unconstitutional taking of property without compensation.⁴⁵

In the 1990 legislative session, however, the Virginia legislature repealed this statute which became effective July 1, 1990.⁴⁶ In its repeal of the statute, the legislature also firmly stated that the

repeal of . . . [Va. Code Ann. § 55-154.1 (Michie 1986)] shall not be deemed to affect any claim arising from a deed, lease or instrument of conveyance in the chain of title which the owner of surface real property may have to migratory gases which are or may be located beneath such surface real property. Specifically, the repeal of . . . [§ 55-154.1], which vested a presumption in favor of the surface owner, shall not in turn create a presumption in favor of any mineral owner.⁴⁷

Without deciding the ownership question, the 1990 Virginia legislature did create an administrative and regulatory environment that will allow the continued development of coalbed methane when it passed the Virginia Gas and Oil Act.⁴⁸ The Virginia Act is significant because coalbed methane production is expressly covered by the Act and is the most recent state legislation that attempts to resolve the conflict between coalbed methane production and coal mining operations.⁴⁹ The most important provision regarding the development of coalbed methane, however, is the section on pooling of mineral interests.⁵⁰ In situations where there are conflicting claims to the ownership of coalbed methane gas, the Gas and Oil Board is required to enter an

⁴⁴ See Memorandum, *supra* note 42.

⁴⁵ *Id.*

⁴⁶ See Va. Code Ann. § 55-154.1 (Michie 1986) (repealed by Acts of 1990, H.B. No. 939 (1990) & (Michie Supp. 1991)).

⁴⁷ *Id.*

⁴⁸ See Va. Code Ann. §§ 45.1-1.1 to 45.1-361.40 (Michie Supp. 1991).

⁴⁹ See Norvell, *supra* note 5, at 12.

⁵⁰ Va. Code Ann. §§ 45.1-361.21 to -.22 (Michie Supp. 1991). See also Bragg & Patten, *supra* note 2, at Overhead 6, "Section-By-Section Summary Reported Committee Print 7/31/91 Coal Policy."

order pooling all interests or estates in the drilling unit.⁵¹ In addition, the Board is required to establish an escrow account into which the operator must deposit proceeds attributable to the disputed interest.⁵² Within thirty days of receipt of notification of the final legal determination of entitlement, the Gas and Oil Board will order the payment of the principal and accrued interest to all persons legally entitled to the funds.⁵³ This method of pooling and payment, of course, allows for coalbed methane development without ownership determination prior to drilling.⁵⁴

Unlike Virginia, the Alabama legislature has not addressed the specific issue of which estate owner is entitled to the royalties from coalbed methane production or provided for an escrow system. The legislature has, however, adopted rules and regulations governing the permitting, drilling and production of coalbed methane gas.⁵⁵ These rules set forth unit size, spacing, casing and drilling requirements for coalbed methane wells.⁵⁶

⁵¹ *Id.* § 45.1-361.22(A). Several Gas and Oil Board decisions pursuant to this statute have been appealed to the Circuit Court of Buchanan County, Virginia, in the cases styled *Ashland Exploration, Inc. v. OXY USA Inc.*, Chancery Action Nos. 4-91, 5-91, 6-91, 7-91, 60-91, 61-91, 62-91, 84-91, 85-91, 103-91, 136-91, 179-91 and 186-91. These conflicts have arisen between Ashland Exploration, Inc. ("Ashland"), as the oil and gas lessee, and OXY USA Inc., as the designated operator with power of attorney for Island Creek Coal Company, the coal lessee. Ashland asserts it is the only claimant to the coalbed methane under Va. Code Ann. § 45.1-361.22 (Michie Supp. 1991), since it is the oil and gas lessee. In addition, Ashland is challenging the constitutionality of the force pooling statute arguing that the Gas and Oil Board's decisions violate its due process rights, constitute a taking of its property and impair its contract rights. At this time, oral arguments have been held on motions to dismiss and motions for summary judgment, but no decisions have been rendered.

⁵² *Id.* § 45.1-361.22(2).

⁵³ *Id.* § 45.1-361.22(5).

⁵⁴ The Virginia Department of Mines, Minerals and Energy ("DMME") adopted an Emergency Order for Coalbed Methane, CBM-1-30790 (Mar. 7, 1990), pursuant to Va. Code Ann. § 45.1-293 (Michie 1989). These regulations address the more technical requirements for the development and production of coalbed methane gas; e.g., allowable production rates, permit application requirements, casing requirements and testing, venting and flaring of coalbed methane wells. *Cf.* Va. Code Ann. § 45.1-361.22(A). These emergency regulations have recently been replaced by new gas and oil regulations that became effective September 25, 1991. The new regulations pertaining to coalbed methane gas wells appear in part III of V.R. 480-05-22.1 §§ 3.01 to 3.11 (effective Sept. 25, 1991).

⁵⁵ See A.R. 400-4-1 to 400-4-6 (1991). However, involuntary pooling orders, that may require the integration of tracts and interests under the conventional oil and gas statutes in Alabama, may also apply to interests in coalbed methane. See ALA. CODE § 9-17-13 (Supp. 1990) and §§ 9-17-80 to 88 (1975); see generally McDavid, *CBM Conservation Issues - Spacing, Pooling and Unitization: A Legislative and Regulatory*

In Pennsylvania, permit and pooling applications for coalbed methane are filed in accordance with the statutes and regulations for shallow gas wells.⁵⁷ The definition of gas in Pennsylvania does not specifically include coalbed methane,⁵⁸ but the definition of well states that the term "well" does not include a bore hole drilled or being drilled to degasify coal seams under certain conditions.⁵⁹ By inference, the Pennsylvania Act would appear to apply to wells used for the commercial production of coalbed methane.⁶⁰

III. ENVIRONMENTAL ISSUES SURROUNDING COALBED METHANE DEVELOPMENT

Removing coalbed methane from coal seams prior to or contemporaneously with the extraction of coal has many environmental as well as economic benefits. Perhaps most significantly for environmental purposes, removing and capturing the

Survey as to Alabama, Colorado, Pennsylvania, Virginia and West Virginia, at 9.27 (E. MIN. L. FOUND. 1990) (reviewing state regulations and statutes on pooling orders and well spacing).

⁵⁶ A.R. 400-4, *et seq.* (1991).

⁵⁷ See McDavid, *supra* note 55, at 9.34 (stating "there are no provisions under Pennsylvania law or under the rules promulgated by the Department of Environmental Resources at present which allow for involuntary pooling . . . since coalbed methane gas wells are considered non-conservation wells.").

⁵⁸ PA. STAT. ANN. tit. 58, § 601.103 (1991).

⁵⁹ The term "well" will not include a bore hole if:

- (1) the bore hole is: (a) used to vent methane to the outside atmosphere from an operating coal mine; (2) regulated as part of the mining permit pursuant to the Clean Streams Law and the Surface Mining Conservation and Reclamation Act; and, (3) drilled by the operator of the operating coal mine for the purpose of increased safety; or,
- (2) the bore hole is used to vent methane to the outside atmosphere pursuant to a state or federally funded abandoned mine reclamation project.

Id.

⁶⁰ H.B. 4238 was introduced in the West Virginia legislature, however, the bill never advanced beyond committee.

For a model statutory proposal, see W.F. Mason, Jr., *Statutory Solutions to Ownership Disputes*, Coalbed Gas Development Special Institute, ROCKY MTN. LAW FOUND & E. MIN LAW FOUND (Apr. 1992).

In addition, federal legislation in the form of U.S. House Bill H.R. 4186, the Coalbed Methane Development Act of 1992, has been introduced in the House of Representatives by Congressman Rahall. The purpose of H.R. 4186 is to amend the Mineral Leasing Act to facilitate the development of coalbed methane gas, particularly in states where development is impeded by ownership disputes, litigation, or uncertainties regarding coalbed methane gas ownership.

coalbed methane prior to its release into the atmosphere decreases the release of gases into the earth's atmosphere. This reduction in the discharge of hydrocarbons may aid in the reduction of the greenhouse effect.

Along with environmental benefits, coalbed methane production conversely places potential burdens on the environment. The application of the recently enacted environmental regulation must, therefore, be considered by coalbed methane producers.

A. *Environmental Regulation*

1. *Laws Regulating Disposal of "Produced Waters"*

Water deposits may accumulate during coal formation. Water produced during well development must be pumped to the surface before developers may extract the coalbed gas. This produced water usually contains minerals and other substances which may create environmental consequences.⁶¹ For example, produced water may corrode holding tanks or well casings resulting in spills or leaks, and dissolved solids may contaminate fresh groundwater.⁶² Much of the current litigation surrounds groundwater and surface contamination from produced water because there are few presently feasible alternatives to correct the problem.⁶³ As a result, the primary environmental concern coalbed methane producers face is complying with federal law and regulations in the disposal of produced water.⁶⁴

Coalbed gas producers may dispose of produced water via surface discharge, underground injection and evaporation.⁶⁵ Both land application and surface water discharge have been demonstrated to be cost-effective and technically feasible.⁶⁶ Produced

⁶¹ See Griles & McClanahan, *supra* note 6.

⁶² Dancy & Dancy, *Environmental Concerns for Oil & Gas Operators*, THE LANDMAN, (May-June 1991), at 63-67.

⁶³ *Id.*

⁶⁴ See Griles & McClanahan, *supra* note 6; see generally Dancy & Dancy, *supra* note 62, at 63.

⁶⁵ Rigg, *Environmental Regulations Applicable to Coal Degas Production*, Coalbed Methane Special Institute, E. MIN. L. FOUND. (Nov. 1988) [hereinafter cited as Rigg].

⁶⁶ Simpson, *The Effects of Coalbed Methane Produced Waters on Biological Communities*, Coalbed Methane Special Institute, E. MIN. L. FOUND. (Nov. 1988); Pamela L. Matthews & Jeffrey B. Groy, *Federal and Western States Environmental Regulation of Coalbed Gas Development*, Coalbed Gas Development Special Institute, ROCKY MTN. MIN. LAW FOUND. & E. MIN. LAW FOUND. (Apr. 1992); Isaias Ortiz,

waters that are sufficiently clean and free of pollutants may qualify for land application.⁶⁷ Produced waters may also qualify for discharge into surface waters, providing the water satisfies the standards for regulating acceptable toxic levels.⁶⁸

Coalbed developers in certain jurisdictions may also dispose of produced water using underground injection wells.⁶⁹ Permits for underground wells must comply with the Safe Drinking Water Act ("SDWA")⁷⁰ which Congress enacted to protect drinking water supplies. The surface discharge disposal processes are regulated by the Federal Clean Water Act.⁷¹ The Act was adopted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."⁷² To accomplish this objective, the Act established a permit system to control the discharge of effluents containing pollutants into waters in accordance with EPA standards.⁷³ The Clean Water Act also establishes national water quality standards. If a state wishes to conduct its own water pollution control program, it must implement a plan that conforms to federal standards. If a state does not adopt a water quality program or a state's water pollution control program does not meet EPA's approval, the EPA will conduct the program.⁷⁴

Environmental Issues Affecting Coalbed Methane Gas Development in the Appalachian Basin, Coalbed Gas Development Special Institute, ROCKY MTN. MIN. LAW FOUND. & E. MIN. LAW FOUND. (Apr. 1992); A. George Mason, Jr., *State and Local Issues Affecting the First Class IID UIC Well in Virginia*, Coalbed Gas Development Special Institute, ROCKY MTN. MIN. LAW FOUND. & E. MIN. LAW FOUND. (Apr. 1992).

⁶⁷ *Id.*

⁶⁸ Griles & McClanahan, *supra* note 6.

⁶⁹ In other jurisdictions, however, there is much opposition to this method of disposal. For example, in Virginia a recent decision regarding a proposed injection well in Dickenson County was rendered in a circuit court case styled *Dickenson County Bd. of Supervisors v. Equitable Resources Energy Co.*, Civil Action No. CL90-117. The court in *Dickenson* held that local county solid waste ordinances were of no effect to prevent the operation of an injection well pursuant to permits issued by the Environmental Protection Agency and the Virginia Department of Mines, Minerals and Energy.

⁷⁰ 42 U.S.C.S. §§ 300f, et seq. (Law. Co-op. 1987 & Supp. 1991) The two major components of the SDWA regulate public water systems and underground well injections. There are five classes of injection wells. 40 C.F.R. § 144.6 (1990). Oil and natural gas production and storage wells are considered Class II wells. *Id.* The criteria and standards applicable to Class II wells are found at 40 C.F.R. §§ 146.21-.25 (1990).

⁷¹ 33 U.S.C.S. §§ 1251-1376 (Law. Co-op. 1987 & Supp. 1991 (adding §§ 1377-87)). The Clean Water Act also governs the placing of a well site in a waterbody or wetland and the discharge of produced waters. 33 U.S.C.S. §§ 1311-1345 (Law. Co-op. 1987).

⁷² 33 U.S.C.S. § 1251(a) (Law. Co-op. 1987).

⁷³ 33 U.S.C.S. § 1341 (Law. Co-op. 1987).

⁷⁴ 33 U.S.C.S. § 1313(a)-(b) (Law. Co-op. 1987).

Permitting or regulatory procedures under the Clean Water Act include the National Pollutant Discharge Elimination System ("NPDES").⁷⁵ A NPDES permit is required for virtually every point source, or place of potential pollutant discharge.⁷⁶ The regulations govern discharges from point sources into navigable waters. The discharges which the Clean Water Act regulates can be broadly grouped into three categories: 1) conventional; 2) toxic; and, 3) non-conventional, non-toxic.⁷⁷ Conventional pollutants include biochemical oxygen demand, total suspended solids (nonfilterable), pH, fecal coliform, and oil and grease.⁷⁸ Toxic pollutants include any agent or material listed in § 307(a)(1) of the Clean Water Act which after discharge will, on the basis of available information, cause toxicity.⁷⁹ Non-conventional, non-toxic pollutants include pollutants which are neither listed as "toxic" under § 307(a) nor listed under § 304(4) of the Clean Water Act.

State application procedures and requirements for NPDES permits may vary. Virginia's permit process illustrates how the process works.⁸⁰ In Virginia, "owner" is defined to include, *inter alia*, any corporation, organization, association, firm, company or person that owns or exercises control over or is respon-

⁷⁵ 33 U.S.C.S. § 1342 (Law. Co-op. 1987).

⁷⁶ 33 U.S.C.S. § 1342 (Law. Co-op. 1987 & Supp. 1991). "Point Source" is defined as any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture. 33 U.S.C.S. § 1362(14) (Law. Co-op. Supp. 1991).

⁷⁷ 33 U.S.C.S. 1314(4), 1317 (Law. Co-op. Supp. 1991).

⁷⁸ 40 C.F.R. § 401.16 (1990).

⁷⁹ 40 C.F.R. § 401.15 (1990).

⁸⁰ Land application of produced waters is governed in Virginia by the rules and regulations promulgated in accordance with VA. CODE ANN. §§ 62.1-44.2 to -44.34:12. (Michie 1987). Recently the sections controlling the discharge of oil into waters have been amended. In addition, the legislature recently created the Virginia Spill Response Council which has the responsibility of providing an annual report to monitor and evaluate recent technical developments. VA. CODE ANN. §§ 62.1-44.34:14 to -44.34:28 (Michie Supp. 1991). The regulations contain an anti-degradation policy for groundwater and specify groundwater standards by constituent and concentration. V.R. 680-21-04 - 21-06.6 (July 1, 1988). The release of produced waters into surface waters is governed in Virginia by the State Water Control Law, VA. CODE ANN. §§ 62.1-44.2 to 44.34:28 (Michie 1987 & Michie Supp. 1991). Historically in Virginia produced waters have contained high concentrations of sodium chloride. V.R. 680-21-02.3 (July 1, 1988) allows in-stream discharge as long as chloride concentrations do not exceed 250 mg/liter and TDS do not exceed 500 mg/liter.

sible for any discharge of wastes into state waters, or any facility or operation that has the capability to alter the physical, chemical, or biological properties of state waters.⁸¹ Anyone proposing a new discharge is required to submit an application for a permit to the State Water Control Board ("SWCB") 180 days prior to the date planned for commencing construction of a pollution emitting facility.⁸² Construction may not begin until a permit is issued. The application must be filed in the regional office of the SWCB in the area where the project is located. The local government must notify the SWCB that the discharge facility is consistent with local land use and zoning ordinances.⁸³ The SWCB then must process the application within four months of the date it receives a completed application.⁸⁴ Prior to public notice and public hearing, the SWCB must make a temporary decision to issue or deny the permit application. If the permit application is denied, the SWCB advises the owner as to what is required to obtain approval. If the permit is tentatively approved, the SWCB prepares a draft permit and publishes the decision.⁸⁵ After public notice and a hearing, if required, the Executive Director of the SWCB may issue a permit.⁸⁶

The fundamental purpose of a NPDES permit is to establish, for particular point sources, maximum acceptable quantities and concentrations of various types of pollutants which may be discharged from the point source into state waters. Effluent limitation regulations are listed by industry.⁸⁷ Virginia has incorporated these federal effluent regulations into its permit regulations.⁸⁸

With the amendment of the Clean Water Act of 1987, the Virginia State Water Control Board adopted a Toxics Management Program.⁸⁹ Pursuant to the requirements of the program, any owner who: (1) discharges a pollutant that has demonstrated actual or potential toxicity, or contains toxic pollutants; (2) falls into one of the Standard Industrial Classification codes in the

⁸¹ VA. CODE ANN. § 62.1-44.3 (Michie Supp. 1991).

⁸² V.R. 680-14-01 (July 1, 1988); Permit Regulation § 2.1.A.2 (1988).

⁸³ VA. CODE ANN. § 62.1-44.15:3(A) (Michie Supp. 1991).

⁸⁴ *Id.* § 62.1-44.16(1)(b) (1987).

⁸⁵ Griles & McClanahan, *supra* note 6, at 14.13.

⁸⁶ *Id.*

⁸⁷ 40 C.F.R. §§ 405 *et seq.* (1990).

⁸⁸ Permit Regulation § 1.4.A (1988).

⁸⁹ V.R. 680-14-03 (Nov. 1, 1988).

regulations; or, (3) has a wastewater flow greater than 50,000 gallons per day may be subject to specific effluent criteria.⁹⁰ Initially, a chemical and biological monitoring program for toxic pollutants must be undertaken. If the effluent fails to meet certain criteria, the effluent is considered to have demonstrated actual or potential toxicity, and the permittee must prepare a toxicity reduction evaluation plan.⁹¹

2. *The Clean Air Act*⁹²

The other potentially significant environmental concern associated with coalbed methane production is the generation of air pollutants. While the release of the coalbed gas itself is not an activity that requires permitting, coalbed methane production may require permitting for compressor stations and related gas-fired equipment such as separators and dehydrators.⁹³ Similarly, if the coalbed methane is used on-site for power generations, EPA permits may be required.⁹⁴

The Clean Air Act was enacted with the goal of protecting and enhancing the nation's air resources in an effort to promote public health and welfare.⁹⁵ The Clean Air Act directed the EPA to establish national ambient air quality standards ("NAAQS") for certain criteria pollutants including particulate matter, sulfur oxides, nitrogen dioxide, carbon monoxide, ozone, and lead.⁹⁶ Ambient air standards are health based, meaning they specify the level of air quality necessary to protect public health, with a margin of safety.⁹⁷ The Clean Air Act created a partnership between the federal and state governments for enforcing EPA standards.⁹⁸ The federal government, through the EPA, established NAAQS while the states are principally responsible for

⁹⁰ Toxics Management Regulation § 2.1A (1988).

⁹¹ Toxics Management Regulations §§ 2-7 (1988).

⁹² 42 U.S.C.S. §§ 7401-7642 (Law. Co-op. 1989). (Recent additions to the Clean Air Act are codified at 42 U.S.C.S. §§ 7651-7671q (Law. Co-op. Supp. 1991).)

⁹³ Schraufnagel, McBane & Kuuskraa, *Coalbed Methane Development Faces Technology Gaps*, *Oil & Gas J.*, Feb. 5, 1990 at 54 [hereinafter Schraufnagel, McBane & Kuuskraa]; Rigg, *supra* note 62.

⁹⁴ See Griles & McClanahan, *supra* note 6, at 14.14.

⁹⁵ 42 U.S.C.S. § 7401(b) (Law. Co-op. 1989 & Supp. 1991).

⁹⁶ 40 C.F.R. §§ 50.1-.12 (1990).

⁹⁷ 40 C.F.R. 50.2 (1990).

⁹⁸ 40 U.S.C.S. 7402 (Law. Co-op. 1989).

implementing and enforcing standards through EPA-approved state implementation plans.⁹⁹

The NAAQS are stated in terms of the maximum concentration levels of pollutants or annual mean measurements for the ambient air. The minimum air quality goals for the states are set by the NAAQS, and are translated into source by source emission limitations in the state implementation plan.¹⁰⁰ In determining whether a permit must be obtained, the producer must determine the types and levels of emissions released into the atmosphere.¹⁰¹

B. Reducing the Greenhouse Effect and the Environmental Benefit Resulting from Coal Degasification

Coalbed gas, whose primary component is methane, is a hydrocarbon. Because hydrocarbons are suspected of causing an increase in the greenhouse effect and potentially global warming, coalbed gas production may help contribute to a slowing of this phenomenon by capturing methane previously vented into the atmosphere.¹⁰²

According to the greenhouse effect theorists, the effect occurs as sunlight passes through the atmosphere and warms the earth. The earth reflects or radiates heat, some of which returns to space; gases close to the earth's surface absorb the remainder.¹⁰³ These "greenhouse gases" absorb the heat reflected and emitted by the earth, and the earth becomes warmer than it would be without an atmosphere.¹⁰⁴

Of the thirteen greenhouse gases, five are considered most consequential to the greenhouse effect: Carbon dioxide (CO²), Chlorofluorocarbons (CFC), Nitrous Oxide (N²O), Ozone (O³), and Methane (CH⁴).¹⁰⁵ Carbon dioxide is considered to be a

⁹⁹ *Id.*

¹⁰⁰ 40 C.F.R. § 62 (1991).

¹⁰¹ 40 C.F.R. § 50 (1990) (criteria pollutants); 40 C.F.R. § 61 (1991) (hazardous pollutants).

¹⁰² Griles & McClanahan, *supra* note 6; Gibbs & Hogan, *Policy Options: Methane*, EPA J., (Mar.-Apr. 1990), at 23-25 [hereinafter cited as Gibbs & Hogan].

¹⁰³ Albritton, *What We Know; What We Don't Know*, EPA J., (Mar.-Apr. 1990), at 4-7 [hereinafter cited as Albritton]; Presentation; *Understanding The Greenhouse Effect and Global Climate Change*, AMERICAN COAL FOUNDATION (1990) [hereinafter cited as *Understanding the Greenhouse Effect*].

¹⁰⁴ *Understanding the Greenhouse Effect*, *supra* note 103.

¹⁰⁵ *Understanding The Greenhouse Effect*, *supra* note 103, at 1; see Morganstern & Tirpak, *The Greenhouse Gases*, EPA, J., (Mar.-Apr. 1990), at 8-9 [hereinafter cited as Morganstern & Tirpak].

primary contributor to the greenhouse effect, yet carbon dioxide is the least efficient radiator. Per unit, the other greenhouse gases are more radiative and contribute more to the greenhouse effect. Methane, a very effective absorber of infra-red radiation, is thought to be second to carbon dioxide in contributing to the greenhouse effect.¹⁰⁶

The environmental benefit achieved by reducing levels of methane in the atmosphere may also be understood after considering certain chemical and physical properties of the gas. Methane not only absorbs infra-red radiation at a greater rate than carbon dioxide;¹⁰⁷ high levels of the released gas increase water vapor in the stratosphere.¹⁰⁸ Water vapor, which is also a greenhouse gas, increases the greenhouse effect.¹⁰⁹ If reducing the quantity of methane will also decrease the amount of water vapor in the air, then a dual problem may be solved by degasification. Reducing methane in the air may curtail the effects of global warming because methane has an atmospheric life of ten years, unlike other greenhouse gases which have lives of 100 years or more.¹¹⁰ Methane's shorter atmospheric life combined with its absorption factor allows any reduction in the emission of methane to have a more immediate impact on the greenhouse effect than equivalent reductions in CO², CFCs or N²O emissions because atmospheric methane may be reduced at a faster rate than other gases.¹¹¹ Consequently, using the degasification procedure to extract coalbed gas is one of the more promising areas for methane emissions control.¹¹²

The amount of methane that is technically recoverable during coalbed degasification is estimated to be about 30-50% of the amount released during underground mining operations.¹¹³ The amount of gas actually recovered depends upon a number of

¹⁰⁶ *Understanding The Greenhouse Effect*, *supra* note 103, at 1; Morganstern & Tirpak, *supra* note 105, at 8.

¹⁰⁷ Blake & Rowland, *Continuing Worldwide Increase in Tropospheric Methane, 1978-1987*, 239 *SCIENCE* 1129-30 (Mar. 4, 1988).

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ Gibbs & Hogan, *supra* note 103, at 23.

¹¹¹ *Id.* See also *Understanding the Greenhouse Effect*, *supra* note 103, at 1.

¹¹² Sources of atmospheric methane include the following: landfills; oil and gas exploration, recovery, use and pipeline leakage; agricultural sources, including animal husbandry, rice cultivation, and livestock; and mining of coal seams. Gibbs & Hogan, *supra* note 102, at 23-25; Morganstern & Tirpak, *supra* note 105, at 8.

¹¹³ Gibbs & Hogan, *supra* note 102, at 24.

variables, including the methane content of the coal in the strata and geologic conditions at the site.¹¹⁴ Thus far, quantifying the levels of methane trapped in and released from the coalbed seams remains an inexact science.¹¹⁵ Nonetheless, the degasification process, or recapture of methane gas that would otherwise be discharged into the atmosphere, can only aid in reducing the greenhouse effect and better the environment.¹¹⁶ The Northwest Fuel Development, Inc., and Department of Energy waste fuel utilization project at the Beth Energy Cambria Mine 33 in Pennsylvania endeavors to accomplish these goals.¹¹⁷ The project uses the combustion of gob gas and sealed mine emissions for power generation in small internal combustion engines.¹¹⁸ The utilization of the waste fuel provides an environmentally sound method of disposing of the gob gas while generating energy to operate the mine, thus reducing costs and increasing profits.

IV. CONCLUSION

The recent advent of coalbed methane development and its use as an important natural resource has generated both legal and environmental issues that still defy resolution at present. The sparse and fact specific case law does not answer the legal questions for all jurisdictions. However, recent legislative activity and activity in committees on oil and gas development indicate

¹¹⁴ Ayers & Kelso, *Knowledge of Methane Potential For Coalbed Resources Grows, But Needs More Study*, OIL & GAS J., (Oct. 23, 1989), at 64-67; McElhiney, Koenig & Schraufnagel, *Evaluation of Coalbed-Methane Reserves Involves Different Techniques*, OIL & GAS J., (Oct. 30, 1989), at 63-72.

¹¹⁵ Because of the uncertainty in measuring the quantity of coalbed methane gas and uncertainty about the absolute levels of emissions from coal mining activity, estimates of the total amount of methane trapped in coalbed seams and the amount that is emitted during mining operations vary. Globally, it is estimated that coal mining activities are responsible for 30-50 million metric tons of methane emissions, with estimates running from 20 million to as high as 60 million. This figure comprises 7% of the global methane emissions, and approximately 10% of global anthropogenic methane emissions. It is further estimated that coal mine emissions will increase approximately 25% over the next decade. Griles & McClanahan, *supra* note 6, (citing Layne, Siriwardane, & Byrer, *Assessment of Gas Production Potential From Coalbeds and Adjacent Strata*, Society of Petroleum Engineers Gas Technology Symposium (June 9, 1988), reprinted in, International Workshop on Methane Emissions From Natural Gas Systems, Coal Mining and Waste Management Systems 493 (Apr. 9-13, 1990)).

¹¹⁶ Griles & McClanahan, *supra* note 6.

¹¹⁷ Soot & Massa, *Coal Mine Methane Emissions: Quality, Quantity and Potential for Power Generation*, Pittsburgh Coalbed Methane Forum, E. MIN. L. FOUND. (Oct. 1990).

¹¹⁸ *Id.*

that new laws will continue to emerge to help define the ownership rights of coalbed methane developers.

With regard to the environmental issues, the heightened concern about environmental hazards means that all interested parties should pay heed to both federal and state permitting procedures regulating water disposal and air pollution. Although still debated among theorists, coalbed methane developers should adopt and cultivate the position that degasification reduces the greenhouse effect. In addition to the economic benefits of coalbed methane production, the added incentive of improving the environment may be another boost to the industry.

