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Good Policy or Good Politics?: An Examination of Some Legal and Environmental Implications of Developing Coalbed Methane as an Alternative to Foreign Oil

Shaughan Sparks Cummings* and Michael Cummings**

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I. INTRODUCTION

With oil prices soaring over one-hundred dollars a barrel,¹ energy diversification has increased in importance as an economic policy. In fact, reducing dependence on foreign oil has become a political and economic catchphrase over the last several years.² This is evidence that political leaders and others are talking about the issue and are more willing to discuss and consider alternative and/or previously untapped sources of fuel. These developing energy sources include solar and nuclear energy, hydrogen fuel, oil sands, oil shale, ethanol, and others. A complete evaluation of the pros and cons of these energy alternatives is beyond the scope of our article, but this brief mention puts our discussion in the context of the greater dialogue regarding this nation's economic and environmental future. Our article will focus on one of the lesser-known "alternative" energy sources: methane (also called "natural") gas.

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1. Associated Press, Pump Prices Rise to New Record (Apr. 18, 2008), available at <http://www.msnbc.msn.com/id/12400801/>. This is more than double what they were merely three years ago. Leigh Dethman, *Eyes on Oil Shale — Again*, Deseret News (Salt Lake) (Mar. 4, 2005) A01 (prices were around \$53 a barrel).

2. A Google search for the phrase "reduce dependence on foreign oil" returned almost thirty-four thousand hits (search conducted Mar. 11, 2008).

Natural gas provides nearly a quarter of total U.S. energy, with the nation consuming more than 50 billion cubic feet of natural gas per day.³ This resource generates the power for basic utilities such as heat and electricity.⁴ The volume of natural gas Americans consume is expected to escalate in the coming years, along with the uses for this resource. According to the U.S. Energy Information Administration (EIA), the country's natural gas consumption should increase 47 percent between 1999 and 2020.⁵

In response to this expected growth, the Bush administration has generated an energy policy the President claims will reduce the United States' dependence on foreign energy sources, as well as "clean our skies, bring greater health to our citizens and encourage environmentally responsible development in America."⁶ The energy policy focuses on giving companies incentives to cut harmful greenhouse gas emissions while diversifying the country's energy supply to include cleaner fuels.⁷ Methane is seen, at least in part, as a potential solution -- harnessing and using methane cuts down on potentially harmful emissions, while more aggressively harnessing the resource diversifies the nation's energy supply.⁸ Capturing methane keeps the potentially harmful gas from polluting the air, and the "proponents of development stress the fact that methane would not only add another resource to meet the nation's energy needs, but it burns cleaner than oil or coal."⁹ Those in favor of aggressively developing methane are encouraged by the fact that improved technology now allows for more efficient production techniques.¹⁰ Perhaps one of the primary reasons for the current political and industrial push to develop methane is its great availability within the continental United States. Both industry and government estimates indicate that three basins—the Powder River Basin in eastern Montana and Wyoming; the San Juan Basin in Colorado and New Mexico; and the Uinta Basin in Utah—each have the potential for producing 500 billion cubic feet of methane annually.¹¹ Considering the U.S. demand for

3. S. Comm. on Energy & Nat. Resources, *Oil Supply and Prices*, 108th Cong. (Feb. 13, 2003) (available at 2003 WL 329660) (statement of Mr. Red Caveney, President & CEO, American Petroleum Inst.).

4. *Id.*

5. *Id.*

6. President George W. Bush, Speech, *Announcing Global Climate Change Initiatives to the National Oceanic and Atmospheric Administration* (Silver Spring, Md., Feb. 14, 2002) (available at www.whitehouse.gov/news/releases/2002/02/20020214-5.html).

7. *Id.*

8. *Id.* With oil prices hovering over one-hundred dollars a barrel, energy diversification has increased in importance as an economic incentive. As mentioned in a previous footnote, reducing dependence on foreign oil has become a new political and economic catchphrase over the last several years. *Supra* n. 2. This is evidence that people are talking about the issue and are perhaps more willing to discuss alternatives and previously untapped sources of fuel.

9. John Dragonetti, *Coalbed Methane is Becoming a Hot Topic*, 38 Prof. Geologist 16 (Nov. 2001) (available at http://www.agiweb.org/gap/legis107/tpg_coalbed.html (posted May 13, 2002)).

10. *Id.*

11. *Id.*

natural gas,¹² production in these three basins alone would not satisfy current or future requests for the resource, but it would contribute significantly to fulfilling the need.

Due to the importance of Coal Bed Methane ("CBM") in meeting increasing energy demands, this paper attempts to shed some light on the availability of this resource within the continental United States, as well as the environmental impacts associated with developing it. Part I of this paper will discuss some of these environmental impacts. Part II will discuss the laws—both historic and modern—relevant to the conflict between the water rights of miners and other individuals. Part III discusses the historic cases and modern statutory law that can be used to protect the environment in the face of CBM development. Part IV is a short survey of state policy approaches. Part V concludes the paper by highlighting ongoing federal legislative efforts to balance the important environmental and energy interests at stake.

II. THE ENVIRONMENTAL IMPACTS OF CBM MINING

This section will introduce some of the central issues regarding CBM mining. For example, it will explain what CBM is, where it is found, how it is extracted, what the negative externalities associated with it are, as well as some other relevant issues. The available methane in Mountain West states is primarily found in coal beds, described in the following report by the USGS:

During coalification, large quantities of methane-rich gas are generated and stored within the coal on internal surfaces. Because coal has such a large internal surface area, it can store surprisingly large volumes of methane-rich gas; six or seven times as much gas as a conventional natural gas reservoir of equal rock volume can hold.¹³

In order to extract this resource, mining companies drill conventional wells into coal seams, and then pump trapped water from underground aquifers upward and out of the coal seams, thereby allowing gas to rise to the surface where it can be captured and stored.¹⁴ Although this practice carries the potential to extract large quantities of energy-producing resources, it is not without its problems. For example, in recent years, natural gas systems have been the third-largest producer of air-polluting methane emissions.¹⁵

12. *Oil Supply and Prices*, *supra* n. 3.

13. U.S. Geological Serv., *Coal-bed Methane: Potential and Concerns*, <http://pubs.usgs.gov/fs/fs123-00/fs123-00.pdf> (Oct. 2000).

14. *N. Plains Resource Council v. Fid. Exploration & Dev. Co.*, 325 F.3d 1155, 1158 (9th Cir. 2003).

15. Env'tl. Protec. Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks; 1990-2006*, http://epa.gov/climatechange/emissions/downloads/08_CR.pdf.

Despite this possible stumbling block, the Bush administration has expressed a vision to increase methane development as an alternate energy source, while hoping to mitigate harmful methane emissions by targeting CBM. In order to effectuate this goal, the executive branch has acted through the EPA to institute a Coalbed Methane Outreach Program.¹⁶ This program assists mining companies with obtaining technology to efficiently recover methane without allowing the precious resource (and potential pollutant) to be lost into the atmosphere.¹⁷

Whether in response to governmental incentives or simply because energy costs have increased the potential profit from mining natural gas, CBM mining is currently experiencing a boom. The industry's growth is most apparent in the following five Mountain West states: Colorado, Montana, New Mexico, Utah, and Wyoming.¹⁸ The following example of development in Wyoming poignantly illustrates the exponential growth: ten years ago, Wyoming's Powder River Basin contained merely 360 producing wells, but by the end of 2010, some predictions estimate that 51,000 wells will be operating in that area.¹⁹ As CBM mining increases, the industry must confront the environmental impacts of its work. While CBM mining has great potential to accomplish the President's goal of "foster[ing] economic growth in ways that protect our environment,"²⁰ the very same practice endangers another presidential aim: protecting the water that sustains life.²¹

The major negative externalities associated with CBM mining are mostly related to its threat to the nation's water supply. Particularly, the two primary concerns are depletion of underground aquifers and contamination of rivers and streams. As mentioned above, underground aquifers are depleted because, unlike traditional oil and gas drilling, CBM mining requires pumping millions of gallons of groundwater up to the surface in order to release the trapped gas.²² Each day, a single well produces thousands of gallons of wastewater.²³ Multiplying this figure by the number of wells in a single CBM field provides a more helpful water-use statistic. For example, "[w]hen [all 51,000 wells the BLM expects in Wyoming's Powder River Basin by 2010 are] producing . . . they will draw nearly 700 million gallons

16. President George W. Bush, *Global Climate Change Policy Book*, <http://www.whitehouse.gov/news/releases/2002/02/print/climatechange.html> (Feb. 2002).

17. *Id.*

18. Dragonetti, *supra* n. 9, at 16. These five states are experiencing major industry growth because of the basins located there.

19. Sharon Buccino & Steve Jones, *Controlling Water Pollution from Coalbed Methane Drilling: An Analysis of Discharge Permit Requirements*, 4 Wyo. L. Rev. 559, 561 (2004) [hereinafter *Controlling Water Pollution*].

20. Bush, *supra* n. 6.

21. *Id.*

22. Buccino & Jones, *supra* n. 19, at 560.

23. *Id.*

from aquifers and discharge it each day.”²⁴ The BLM estimates that the industry could extract a total of up to 7.5 trillion gallons of coalbed water to produce all the recoverable coalbed methane reserves in the Powder River basin alone.²⁵ Those 7.5 trillion gallons of water expected to be extracted by the CBM industry do not account for the water that will be necessary to mine the methane in states other than Wyoming. Some believe this water removal will result in ground surface collapse.²⁶ Others are worried about the length of time it will take aquifers to refill.²⁷ The depletion of underground aquifers and ground surface subsidence are just a couple of the potential problems that may result from CBM mining.

The release of water after mining operations are complete also poses significant problems. Water extracted from coal formations has been found to contain harmful substances, such as arsenic, iron, barium and manganese.²⁸ Because of its damaging chemical and mineral content, releasing produced water onto the ground or into surface waters can wreak havoc on the natural environment. Therefore, the safest way to deal with produced water is re-injecting it into wells, which is commonly done in Colorado and Utah.²⁹ However, not all states dispose of produced water in such a way. In Wyoming, the produced water is generally collected in ponds or released onto the land surface.³⁰ In Montana, produced water has been released into surface waters such as Squirrel Creek and the Tongue River.³¹ When water is released in this way, it can “dramatically increas[e] erosion and sedimentation.”³² Also, releasing such large volumes of water onto the ground can cause local flooding. For example, “[w]ater gushing from gas wells on a neighbor’s ranch flooded the prime hay-growing fields of some Wyoming ranchers,” requiring them to ditch and channel for two years to control the flow of water.³³

In addition to flooding, releasing water onto the ground can also reduce agricultural productivity of farmers and ranchers because the water’s high

24. *Id.* at 560-61 (citing Thomas F. Darin, *Waste or Wasted?—Rethinking the Regulation of Coalbed Methane Byproduct in the Rocky Mountains: A Comparative Analysis of Approaches to Coalbed Methane Produced Water Quantity Legal Issues in Utah, New Mexico, Colorado, Montana, and Wyoming*, 17 J. Envtl. L. & Litig. 281, 320 (2002)). Though the Darin article largely inspired the current piece, it focused mainly on the water quantity issue, rather than the water quality issue.

25. *Id.* at 561 (citing Dustin Bleizeffer, *Salty Big George Water Inspires Innovation*, Casper Star Trib. (Apr. 4, 2004)).

26. Dragonetti, *supra* n. 9, at 16.

27. See Kristin Keith et al., *Coal Bed Methane Frequently Asked Questions*, <http://waterquality.montana.edu/docs/methane/cbmfaq.shtml> (“According to the Montana Bureau of Mines and Geology, monitoring and groundwater modeling indicates somewhere between a few years and 20 years for recharge to occur.”).

28. *Id.*

29. Buccino & Jones, *supra* n. 19, at 560.

30. *Id.*

31. *N. Plains Resource Council*, 325 F.3d at 1159 (9th Cir. 2003).

32. Buccino & Jones, *supra* n. 19, at 559.

33. *Id.* at 561 (citing Marianne Lavelle, *High Stakes on the Prairie*, 130 U.S. News & World Rep. 53 (Mar. 12, 2001)).

salt content. "The water causes a disproportionate concentration of sodium absorbed by the irrigated soil at the expense of calcium and magnesium, causing soil structure to break down and the soil particles to disperse."³⁴ According to former Wyoming Department of Environmental Quality (Wyoming DEQ) official Dennis Hemmer, salty water tends to "seal the soil," making farming difficult.³⁵ This compromise of soil quality ultimately prevents plant roots from absorbing water, and the soil itself from absorbing rain. Thus, the common practice of irrigating with produced water yields diminished crop returns,³⁶ and "the problem for plants continues even after the CBM water is gone."³⁷

Releasing produced water into surface waters causes equally detrimental effects. CBM wastewater can harm aquatic habitat and change riparian—river bank—zones of transitory waters.³⁸ Even holding the produced water in reservoirs can have a dramatic effect on fragile ecosystems.³⁹ The water's high saline content "affect[s] most vegetative communities, even killing many species."⁴⁰ Such wastewater also harms animal species by altering water temperatures and increasing sedimentation, which has the effect of reducing populations and diversity of fish and other aquatic life.⁴¹

The federal government is well aware of the negative effects of mixing produced water with the nation's surface waters, especially the detriments caused by salinity. Well before the Bush administration formulated an energy policy focused on more aggressively developing methane, and prior to the current CBM boom, Congress enacted the Colorado River Basin Salinity Control Act.⁴² This legislation empowered the Secretary of the Interior to reduce salinity in the Colorado River Basin, which supplies water to approximately 27 million people in the U.S., including residents of Wyoming, Utah, Colorado, and New Mexico—four of the five states most affected by the CBM boom. The legislation has been carried out primarily by seven states, including the four just mentioned, coming together to form the Colorado River Basin Salinity Control Forum (Forum).⁴³

34. *Id.* at 562.

35. *Id.* at 561.

36. *Id.* at 562.

37. *Id.*

38. *Id.*

39. *Id.* at 560.

40. *Id.* at 562 (citing George Wuerthner & Reed Noss, *Final Comments on Powder River Basin Environmental Impact Study 8* (2002) (available at <http://www.wyomingoutdoorcouncil.org/programs/cbm/resources.php>)).

41. *Id.* at 563.

42. Pub. L. No. 93-320, 88 Stat. 266 (1974). This law was enacted in June, 1974 and has been amended twice, in 1984 and 1995.

43. Colo. River Basin Salinity Control Forum, *Water Quality Standards for Salinity*, <http://crb.ca.gov/Salinity/2005/2005%20Triennial%20Review.pdf> (Oct., 2005) [hereinafter *Water Quality Standards*].

The Forum uses state water-quality reviews (required at least once every three years),⁴⁴ in addition to federal EPA-approved water quality standards for salinity, to control salinity in the Colorado River System.⁴⁵ One particular part of the Forum's work involves managing the interception of groundwater produced in mining operations in order to reduce the water's salinity before it mixes with the rest of the Colorado River.⁴⁶ The Forum's vision is that intercepted ground water will yield a no-salt return whenever practical.⁴⁷ In order to achieve this objective of a no-salt return, the Forum works within the framework of the National Pollution Discharge Elimination System (NPDES) permit program, which requires all mine operators intending to release produced water into the Colorado River to first obtain a discharge permit from the applicable state.⁴⁸ States belonging to the Forum make permit issuance contingent upon mining companies' submission of information such as "the location of the development, direction and rate of ground-water flow, chemical quality and quantity of ground water, [] relevant data on surface streams and springs" and alternative plans to reduce or eliminate salt discharge.⁴⁹

The permit issuing agency may waive the no-salt discharge requirement in two cases—"where the discharged salt load reaching the main stem of the Colorado River is less than one ton per day or 350 tons per year, whichever is less," or "when the ground water to be intercepted normally would reach the river system in a reasonable time frame and would contain approximately the same or greater salt load than if intercepted, and if no significant localized problems would be created."⁵⁰ By implementing Forum guidelines, the seven Colorado River Basin states are able to coordinate their salinity control efforts, including a requirement that miners make detailed considerations of the consequences of releasing produced water. It should be noted that the Forum guides state NPDES-permit-issuing agencies to consider not only environmental impacts, but also miners' costs in dollars per ton of salt removed,⁵¹ as well as miners' recommendations regarding which alternative plan for reduction of salt discharge should be adopted.⁵²

Crops and natural plant life aren't the only potential casualties of improper handling of CBM wastewater. The wastewater produced from CBM

44. *Id.*

45. *Id.*

46. *Id.* at 7, A-18. The Forum adopted its Policy for Implementation of Colorado River Salinity Standards through the NPDES Permit Program for Intercepted Groundwater on Oct. 20, 1982.

47. *Id.* at A-18.

48. *Id.*

49. *Id.* at A-19.

50. *Id.* at A-18.

51. *Id.* at A-19. Costs are incurred in constructing, operating, and maintaining facilities to remove the salt from the produced water.

52. *Id.* Such recommendations include an evaluation of the technical, economic, and legal practicability of achieving no discharge of salt.

mining—although it constitutes only a small percentage of nationwide water use—has the potential to have a much larger and more harmful impact on us than its simple proportion would indicate. According to the United States Geological Survey, water used for mining accounted for less than three percent of the nation's water use in 2000.⁵³ However, because all household water comes from either a ground-water source, such as a well, or from a surface-water source, such a river, lake, or reservoir,⁵⁴ there is great potential for negative impacts on drinking water quality. Another way to think about the potential harm is that each person uses about 80-100 gallons of water per day, which comes from both ground and surface sources.⁵⁵ The quality of both sources is increasingly being degraded in the Mountain West states due to the wastewater byproducts of CBM mining.

III. LAWS INTENDED TO MITIGATE THE ENVIRONMENTAL IMPACT OF CBM MINING

A. *Historic Case Law: Setting Forth a Balancing Approach*

Although degraded water from CBM is a relatively new societal challenge, the conflict has long existed between miners' water rights and those of common citizens. In 1913, the Supreme Court confronted this issue in *Arizona Copper Co. v. Gillespie*.⁵⁶ This case involved a private citizen's suit to enjoin a mining company from polluting public waters with waste material. Gillespie and his predecessors in title had used local river water to irrigate the land for approximately four decades.⁵⁷ But when the mine increased its activity and adopted practices which increasingly degraded the water, Gillespie found the water unfit for irrigation.⁵⁸ The Supreme Court reasoned that "[w]hatever the relative importance of the great mining...works using the water on the upper reaches of the...river and its tributary streams, and of the agriculturalists using the same water below, from either a public or a private point of view, the right of the lesser interest is not thereby subordinated to the greater."⁵⁹ Although the Court opined that the miners had a legitimate interest in using the water, it rejected the view that this interest condoned water pollution.

The Court recognized the need to balance the seemingly conflicting interests of allowing miners to pollute water in the course of their operations,

53. U.S. Geological Serv., *Summary of Water Use in the United States, 2000*, <http://ga.water.usgs.gov/edu/wateruse2000.html> (last accessed March 29, 2007). Though the figures are not precise, mining likely makes up 1-2 percent. The less than three percent figure includes withdrawals for aquaculture, livestock, and mining collectively.

54. *Id.*

55. *Id.*

56. 230 U.S. 46 (1913).

57. *Id.* at 52.

58. *Id.* at 55.

59. *Id.* at 55-56.

and keeping the water free from pollutants for agriculturalists and other would-be water users. The Court's holding might have been different depending on the intensity of the water pollution and the availability of compromises, as reflected by the Court's balancing test: "[w]hat deterioration in the quality of the water will constitute an invasion of the rights of the lower appropriator will depend upon the facts and circumstances of each case, with reference to the use to which the water is applied."⁶⁰

The Court's reasoning in Gillespie provides a useful framework by which modern courts may confront the water issues implicated in CBM mining. Parallels between *Arizona Copper Co.* and CBM water conflicts include the legal nature of the enterprises in which miners are engaged and their associated need to deposit mine water to maintain successful business operations. Nonetheless, as the Supreme Court reasoned in *Arizona Copper Co.*, legal business ventures do not automatically justify polluting public or private land or waters.⁶¹

In this same vein, the Montana Supreme Court noted as far back as 1897 that miners' water rights must be "exercised with reference to the general condition of the country and the necessities of the people, and not so as to deprive a whole neighborhood or community of it use, and vest an absolute monopoly in a single [user]."⁶² With respect to possible injury to private property resulting from mining operations, the Montana Supreme Court held that mining deposits in water are permissible to a point, but not to the extent that the deposits substantially injure or ruin neighboring property, through either debris deposits on the land or in the water. The Montana Supreme Court particularly noted the common law prohibition against changing the natural flow of water running through neighboring land, as well as the freedom of neighbors to avoid flooding on their land caused by miners' water use.⁶³ Specifically, the court commented that "the owner of land through or along which a stream flowed had a right to [for the water to] flow in its natural channel, undiminished substantially in quantity, and unpolluted in quality, whether he derived any practical benefit from such stream or not."⁶⁴ The court laid liability for injuring a neighbor's property squarely on the shoulders of the miners—even if miners acted affirmatively to prevent such injury.⁶⁵

60. *Id.* at 57 (citing *Atchison v. Peterson*, 87 U.S. 507 (1874)).

61. *Pollution of Stream by Mining Operations*, 39 A.L.R. 891 (1925); *See Arizona Copper*, 230 U.S. at 57 (with regard to private property rights, the Supreme Court said, "[N]o invasion of private property rights should be inferred or implied from the right to use water for mining purposes" (citing *Woodruff v. North Bloomfield Gravel Min. Co.*, 18 F. 753 (1884))); *see also Esmond v. Chew*, 15 Cal. 137 (1860).

62. *Fitzpatrick v. Montgomery*, 50 P. 416, 417 (Mont. 1897).

63. *Id.*

64. *Id.*

65. *Id.* at 418 (citing *Hill v. Smith*, 27 Cal. 476 (1865); *Levaroni v. Miller*, 34 Cal. 231 (1867)).

B. Federal Statutes

Citizens seeking to bring suit for water pollution caused by CBM mining have two main legal mechanisms under which to plead their case: the National Environmental Policy Act of 1969 (NEPA)⁶⁶ and the Clean Water Act (CWA).⁶⁷

Congress enacted NEPA in order to preserve the environment from human damage.⁶⁸ Although NEPA does not include a provision giving individual citizens standing to sue, federal case law indicates that individual citizens have been able to sue anyway.⁶⁹ They have generally brought their causes of action under the 1946 Administrative Procedures Act.⁷⁰

Citizen suits are often brought under the CWA as well. The CWA aims to safeguard the "chemical, physical and biological integrity" of the national water supply through diverse means, including elimination of pollutant discharge into the navigable waters and oceans of the United States.⁷¹ In order to carry out these aims, Congress delegated regulatory responsibility to the states, giving them granting authority over NPDES permits. Under this regulatory scheme, citizens may enforce CWA regulations by suing a CBM operator in federal court for failing to obtain a permit or violating the permit's conditions.⁷² Citizens may also bring a state court suit against the state agency responsible for issuing NPDES permits for improperly issuing or failing to issue a permit.⁷³

Defining two main concepts, point source and navigable water, is essential for understanding application of the CWA to CBM mining. A point source is the "discernible and identifiable source from which pollutants are discharged."⁷⁴ If CBM water is contaminated enough to be considered a pollutant, then its discharge can be regulated under the CWA. Second, navigable waters are defined as "[a] body of water that is used, or typically can be used, as a highway for commerce with ordinary modes of trade and travel on water."⁷⁵ Under the Commerce Clause of the United States Constitution, Congress has broad jurisdiction over all navigable waters of the United States.⁷⁶ These definitions leave much uncertainty as to which bodies of water are protected under the CWA, but more recent developments in

66. 42 U.S.C. §§ 4321-4368a.

67. 33 U.S.C. §§ 1251-1387.

68. 42 U.S.C. §§ 4321-4368a.

69. Mises Inst. Working Papers Series, Timothy D. Terrell & A.H. Barnett, *Regulation and Standing to Sue* 9-10, <http://www.mises.org/journals/scholar/standing6.PDF> (Mar. 24-25, 2000) (presented at Austrian Scholars Conference) (citing *United States v. SCRAP*, 412 U.S. 669 (1973)).

70. *Id.*

71. 33 U.S.C. § 1251(a).

72. Buccino & Jones, *supra* n. 19, at 564 (citing 33 U.S.C. §§ 1251(e), 1365(a)(1)).

73. *Id.*

74. Black's Law Dictionary 1195 (Bryan A. Garner ed., 8th ed., West 2004).

75. *Id.* at 1057.

76. *Ward v. Coleman*, 598 F.2d 1187 (10th Cir. 1979), *rev'd in part on other grounds*; *U.S. v. Ward*, 448 U.S. 242 (1980).

the law have addressed some of these ambiguities. For example, the 1972 amendments to the CWA established that where a river is navigable in fact, its tributary is also a "navigable water" of the United States for purposes of the Federal Water Pollution Control Act.⁷⁷ A recent Supreme Court case, *Rapanos v. United States*, addressed the "navigable waters" issue in the context of wetlands.⁷⁸ However, *Rapanos*, as a plurality decision, did not bring the clarity that some had eagerly anticipated when the Court decided to hear the case.⁷⁹ In fact, the Circuits have split with regard to which opinion (plurality, concurrence, or dissent) provides the holding.⁸⁰

Additionally, the CWA's anti-degradation policy requires state water quality standards to prevent further degradation of the Nation's waters.⁸¹ Thus, states must operate within minimum standards established by federal law. Applying these regulations, when the Montana DEQ stated that allowing produced water to be added to Montana waterways "[might] degrade, and limit uses of, the receiving water," the Ninth Circuit Court of Appeals held that such a practice constituted pollution under the CWA.⁸² This finding squares with Congress's declared purpose of the CWA.⁸³

Notwithstanding the CWA's strict standards which bind the states, there are possible loopholes in the law which allows pollution from CBM-produced water. First, "[t]he [CWA] provides for a limited exception from the definition of pollutant for water derived from gas extraction if the water is disposed of in a well and will not [degrade] other water bodies."⁸⁴ Thus, although the evidence cited above shows that CBM-produced water causes harmful effects even when not mixed with other water sources or released onto the ground, it is nonetheless legal to store such water in a well and use it for personal, agricultural, or ranching purposes. Also, some bodies of water do not fall under the definition of navigable waters covered by the CWA. Thus, harmful discharges of CBM-produced water may be permitted by law depending on the body of water with which produced water

77. Federal Water Pollution Control Act Amendments of 1972 (FWPCA), Pub. L. No. 92-500, 86 Stat. 816 (codified at 33 USC. §§ 1251-1387).

78. *Rapanos v. U.S.*, 547 U.S. 715 (2006) (addressing the definition of "navigable waters" for purposes of the CWA).

79. This is because in a case lacking a majority consensus, the controlling opinion is supposed to be the one concurring in the judgment on the "narrowest grounds." *Marks v. United States*, 430 U. S. 188, 193 (1977). However, in a case like *Rapanos*, the narrowest grounds are not exactly clear.

80. See *U.S. v. Robison*, 505 F.3d 1208 (11th Cir. 2007) (adopting the "significant nexus" test of Kennedy's concurring opinion), *N. Cal. River Watch v. City of Healdsburg*, 496 F.3d 993, 999-1000 (9th Cir. 2007) (same), *U.S. v. Gerke Excavating, Inc.*, 464 F.3d 723, 724-25 (7th Cir. 2006) (same); contrast *U.S. v. Johnson*, 467 F.3d 56, 64 (1st Cir. 2006) (stating that CWA jurisdiction can be satisfied under EITHER Scalia's plurality test or Kennedy's concurrence).

81. *N. Plains Resource Council*, 325 F.3d at 1162 (citing PUD No. 1 of *Jefferson Co. v. Wash. Dept. of Ecology*, 511 U.S. 700, 705 (1994); 40 C.F.R. § 131.12 (anti-degradation policy regulation)).

82. *Id.* at 1162.

83. 33 U.S.C. § 1251.

84. *Buccino & Jones*, *supra* n. 19, at 564 (citing 33 U.S.C. § 1362(B)).

mixes. Likewise, only discharges from point sources may be regulated under the CWA.

IV. LAWSUITS BROUGHT UNDER NEPA AND CWA

As touched on above, conflicts between miners' and other individuals' water rights have been litigated in American courts for over a century. However, until 2002, no litigation existed concerning potential NEPA or CWA violations caused by CBM mining. Although there is still little case law on the matter, the federal courts have begun to establish CBM precedent. Between 2002 and the present, federal district and appellate courts have produced four important decisions on this point.

The first of these decisions was *San Juan Citizens' Alliance v. Babbitt*,⁸⁵ decided in 2002 in the District of Colorado. The San Juan Citizens' Alliance (an environmental group) and the Southern Ute Grassroots Organization,⁸⁶ brought suit against the Bureau of Land Management (BLM) and its former secretary for allowing CBM production that caused environmental harm without first conducting an EIS to analyze the environmental impacts.⁸⁷ The plaintiffs sought injunctive relief to compel the BLM to prepare an EIS before permitting any further CBM drilling in the San Juan Basin or issuing more CBM well permits.⁸⁸ When the plaintiffs originally brought suit in 2000, the BLM had already allowed the density of CBM wells to double;⁸⁹ continued using enhanced production methods despite "significant new information or a general lack of information" regarding how such activities would impact the environment;⁹⁰ and "issued and relied upon an uninformed and unsubstantiated 'Interim Criteria' for allowing continued development prior to completion of...NEPA analysis."⁹¹ The BLM took such actions based on an Environmental Analysis (EA) conducted ten years earlier, and a statewide oil and gas leasing and development final EIS issued nine years earlier.⁹² Based on these facts, the court set aside defendants' motion to dismiss,⁹³ holding that the BLM's actions in this case constituted a final agency decision, which represented a justiciable

85. 228 F. Supp. 2d 1224 (2002).

86. *Id.* at 1227. The Southern Ute Grassroots Organization is a "tribal organization involved in intra-tribal policies of the Southern Ute Indian Tribe." This organization was interested in the CBM mining in the San Juan Basin because some of the mining was taking place on tribal lands. *Id.* at 1226.

87. *Id.* at 1232.

88. *Id.* at 1226-27.

89. The BLM originally approved one well per 320 acres, but reduced the spacing requirement to one well per 160 acres without conducting any additional environmental impact studies. Pursuant to this approval, several hundred additional wells were anticipated in the area. *San Juan Citizens' Alliance*, 228 F. Supp. 2d at 1227-28.

90. *Id.* at 1228.

91. *Id.* at 1230.

92. *Id.* at 1227. From the court's opinion, it seems that both the EA and EIS referred to broadly-explored environmental impacts of oil and gas mining operations, without emphasizing the particular impacts of CBM mining, despite the fact that new information was continually becoming available.

93. *Id.* at 1233.

cause of action under NEPA.⁹⁴ Citing precedent, the court noted that "NEPA does not require an agency to reach a particular substantive outcome . . . however agencies must comply with NEPA to the fullest extent possible."⁹⁵

Following *San Juan Citizens' Alliance*, the Ninth Circuit Court of Appeals established that CBM wastewater is a pollutant under the federal CWA in *Northern Plains Resource Council v. Fidelity Exploration and Development Company*.⁹⁶ The case concerned Fidelity's CBM extraction in the Montana Powder River Basin, and later discharge of the water byproduct into the Tongue River. The Northern Plains Resource Council brought a citizen suit under the CWA, alleging that dumping the wastewater into the Tongue River violated the prohibition against "unlawfully discharg[ing] pollutants into the navigable waters of the United States."⁹⁷ Fidelity claimed that the water was not 'produced water' because the company did not add any chemicals to it. The company further maintained that releasing such water into the Tongue River could not constitute pollution "simply because the discharged water is unaltered and transported from one body of water to another."⁹⁸ Despite these contentions, the court held that CBM groundwater was a pollutant under the CWA.⁹⁹ The court's opinion included the following reasons for this important holding: (1) the CBM water distinctly differed in levels of salinity, suspended solids, and metals, which altered the quality of the Tongue River; (2) since CBM water comes from deep underground aquifers, it would not combine with the Tongue River but for Fidelity's mining practices; (3) Fidelity's own soil expert concluded that the produced water's high ratio of sodium as compared to calcium and magnesium posed permeability risks for soil and was thus unfit for irrigation without mixing or treating the soil; and (4) CBM-produced water qualified as a pollutant because it was industrial waste.¹⁰⁰ The Ninth Circuit's holding on this point was not novel. Rather, it was grounded in persuasive rulings from other circuit courts. For example, the Fifth Circuit had previously held produced water to be industrial waste.¹⁰¹

94. *Id.* at 1229.

95. *Id.* at 1230 (citing *Marsh v. Or. Nat. Resource Council*, 490 U.S. 360, 371 (1989); *Env'tl. Def. Fund, Inc. v. Andrus*, 619 F.2d 1368, 1374 (10th Cir. 1980); 42 U.S.C. § 4332 (2000)).

96. 325 F.3d 1155 (9th Cir. 2003).

97. *Id.* at 1158.

98. *Id.* at 1163.

99. *Id.* at 1160.

100. *Id.* at 1158-61. "[I]ndustrial waste' is any useless byproduct derived from the commercial production and sale of goods and services. Because Fidelity is engaged in the production of methane gas for commercial sale and because CBM water is an unwanted byproduct of the extraction process, CBM water falls squarely within the ordinary meaning of 'industrial waste.' Even Fidelity referred to CBM water as 'wastewater' in its application to the EPA for an NPDES permit". *Id.* at 1160.

101. *Id.* at 1161 (citing *Sierra Club, Lone Star Ch. v. Cedar Point Oil Co.*, 73 F.3d 546, 568 (5th Cir. 1996)).

Northern Plains' second holding was that state law could not exempt a mining operation from CWA requirements.¹⁰² Prior to discharging CBM-produced water, Fidelity contacted the Montana Department of Environmental Quality (MDEQ) about its contemplated actions. MDEQ responded with the opinion that Fidelity did not need a permit.¹⁰³ The problem with MDEQ's conclusion was that the EPA objected to the provision of the Montana code which purported to grant the exemption.¹⁰⁴ Though the district court found in Fidelity's favor, citing the need to defer to the EPA's approval of Montana's permitting program,¹⁰⁵ the district court apparently did not concur with the EPA's position on the matter. Furthermore, neither the EPA nor Montana has authority to grant CWA exemptions; only Congress can take such actions.¹⁰⁶

The third important decision, *Pennaco Energy, Inc. v. U.S. Dep't of the Interior*, a 2004 Tenth Circuit ruling, clarified/reinforced the requirements for a CBM EIS under NEPA.¹⁰⁷ Pennaco had successfully bid for issuance of oil and gas leases from the BLM. However, when environmental groups appealed this decision to the Interior Board of Land Appeals (IBLA), the reviewing agency determined that proposed use of the leases to mine CBM raised new environmental issues that had not been previously addressed. Although the BLM had completed two EISs prior to granting the leases to Pennaco, the studies had not contemplated CBM mining as the intended use.¹⁰⁸ Thus, the environmental groups centered their complaint on the contention that "environmental impacts of CBM development and extraction are not comparable to the impacts of other oil and gas development," and that consequently, NEPA required the BLM to prepare a new EIS addressing the environmental impacts specifically related to CBM mining.¹⁰⁹ The IBLA ruled that the BLM had failed to take a hard look at the impacts associated with CBM mining (mentioning specifically the effects on air quality and water quality and quantity), and thus had not satisfied its obligations under NEPA. On appeal, the district court reinstated the BLM's permit issuance.

102. *N. Plains Resource Council*, 325 F.3d at 1155.

103. *Id.* at 1159. MDEQ based this conclusion on Montana Code Annotated § 75-5-401(1)(b), which states: "Discharge to surface water of groundwater that is not altered from its ambient quality does not constitute a discharge requiring a permit under this part if: (i) the discharge does not contain industrial waste, sewage, or other wastes; (ii) the water discharged does not cause the receiving waters to exceed applicable standards for any parameters; and (iii) to the extent that the receiving waters in their ambient state exceed standards for any parameters, the discharge does not increase the concentration of the parameters." *Id.*

104. *Id.* In particular, the EPA said "the fact that a discharge does not increase the concentration of a particular parameter does not exempt it from permitting requirements." *Id.*

105. *Id.* at 1164.

106. *Id.* at 1164-65.

107. 377 F.3d 1147 (10th Cir. 2004).

108. *Id.* at 1152.

109. *Id.* at 1153.

On subsequent appeal, the Tenth Circuit was called upon to decide whether the IBLA acted arbitrarily and capriciously in their determination that the relevant leases should not have been issued prior to the preparation of additional NEPA documents.¹¹⁰ The court ruled that IBLA considered all relevant factors, and that its decision was supported by evidence in the administrative record. The court reasoned that “[a]t the time of the original EIS, no one anticipated or planned for the rapid development of [CBM]... Consequently, there is a need for a new EIS” which will specifically contemplate CBM mining and the issues of water quantity and air quality associated with its expansion.¹¹¹ This case articulates that the timing of the EIS is important, because without a full understanding of the potential uses, the possible negative effects cannot adequately be determined, a requirement under NEPA.

The most recent decision concerning CBM mining and water pollution is *Wyoming Outdoor Council v. United States Army Corps of Engineers*.¹¹² This case was decided in 2005 in the District of Wyoming under both NEPA and the CWA. Environmental groups based their lawsuit on the U.S. Army Corps of Engineers’ decision to issue a permit under the CWA, allowing discharge of dredge and fill materials produced by CBM mining in Wyoming’s Powder River Basin.¹¹³ The environmental groups alleged that the Corps: (1) failed to consider the cumulative impacts of permit issuance; (2) failed to consider and disclose the impacts of permit issuance to the area’s private landowners; and (3) unreasonably relied on mitigation to conclude there would be no significant impact on wetlands.¹¹⁴

As to the first allegation concerning the Corps failure to consider the cumulative impacts of permit issuance, the court noted that while the Corps was not required to analyze all cumulative impacts of CBM development within the state, it was required to assess the cumulative impacts foreseeable from its issuance of a dredge and fill permit.¹¹⁵ The court held that the Corps’ failure to consider the cumulative impacts of issuing a dredge and fill permit was arbitrary and capricious.¹¹⁶

110. *Id.* at 1156.

111. *Id.* at 1158-59.

112. 351 F. Supp. 2d 1232 (D. Wyo. 2005).

113. *Id.* at 1236.

114. *Id.* at 1241, 1245, 1248. The Wyoming Outdoor Council and Powder River Basin Resources Council, Biodiversity Associates, and Jerry Freilich, petitioners, actually asserted six violations of NEPA. However, the three violations cited above are applicable to the present discussion.

115. *Id.* “The Corps is obligated to assess cumulative impacts relating to projects in which the use of [a dredge and fill permit] is essential to completion of the project to determine whether the impacts of those projects on the human environment will be significant.” *Id.*

116. *Id.* at 1243 (citing 5 U.S.C. §706(2)(A)). The court reasoned that “[a]lthough the Corps’ primary function in issuing §404 permits under the CWA is to protect the integrity of the waters of the United States, 33 U.S.C. §1251(a), like any other federal agency taking action that could affect the human environment, its NEPA analysis in issuing a §404 permit must include consideration of cumulative impact to the ‘natural and physical environment,’ 40 C.F.R. §1508.14, not just impacts to wetlands” *Id.* at 1243 (citing 5 U.S.C. § 706(2)(A)).

The court next addressed the allegation of the Corps' failure to consider and disclose to private landowners the impacts of issuing a dredge and fill permit for the CBM development in the area. Because the Corps considered only that landowners of non-federal lands and minerals have full consideration over how their land is used, it found that local landowners would not be significantly impacted by issuing a dredge and fill permit in the area. However, the Corps failed to consider the difficulties faced by surface owners of split-estates.¹¹⁷ The established law with respect to split-estates is that "the surface owner has no right to deny access or surface disturbance that is 'reasonably necessary' to oil and gas production."¹¹⁸ The Corps was aware that surface owners of local split-estates were already suffering due to CBM extraction on their lands.¹¹⁹ Accordingly, the court commented that it could not accept "the Corps' summary dismissal of the reasonably foreseeable impacts to private ranchlands."¹²⁰ The court held the Corps' failure to recognize the foreseeable impacts and give a cogent reason why they are not significant was also arbitrary and capricious.¹²¹

The court also took issue with the Corps' use of projected mitigation success to conclude there would be no significant environmental impact. Although the Corps projected that 574 acres of wetlands would be filled, it noted that only two-thirds of such fill would be permanent, and of this two-thirds-portion of permanently filled wetlands, 90-percent would be replaced.¹²² Thus, the Corps' predicted that what would begin as 574 acres of filled wetlands would yield a loss of only seven acres of wetlands per year.¹²³ This prediction formed the basis of the Corps' finding of no significant impact (FONSI).¹²⁴ The court noted that mitigation measures can validly form the basis of a FONSI, however the mitigation measures (1) must be more than a mere possibility; (2) must minimize the environmental impacts to the extent that an EIS is not warranted; and (3) must be supported by enough analysis and data to allow a court to ensure the Corps has complied with NEPA.¹²⁵ While the Corps met the applicable standard with respect to the first element,¹²⁶ it failed the second two elements because it neglected to base its planned mitigation measures on any data whatsoever. Such lack of support compelled the conclusion that the mitigation measures would not minimize environmental impacts to the point that an EIS would

117. *Wyo. Outdoor Council*, 351 F. Supp. 2d at 1245.

118. *Id.* at 1245-46. The established law in this area is that the mineral estate is dominant.

119. *Id.* at 1246. One rancher complained the CBM gas company broke the surface owner agreement, failed to control water discharges, and interfered with ranch operations, which harmed the rancher's livestock. *Id.*

120. *Id.*

121. *Id.* at 1246-47.

122. *Id.* at 1250, n. 7.

123. *Id.* at 1250.

124. *Id.*

125. *Id.* at 1250-51.

126. *Id.* at 1250.

not be warranted.¹²⁷ This analysis led to the court's finding that the Corps was arbitrary and capricious in relying on mitigation to support its conclusion of FONSI.¹²⁸

The Corps defended its shortcomings on the ground that cumulative effects should be "predicted to the extent reasonable and practical."¹²⁹ However, the court noted that the federal regulation describing what may be reasonably predicted obligates the permitting authority to collect and solicit information from other sources regarding the expected environmental impacts.¹³⁰ The same regulation requires the permitting authority to document and consider that information while deciding whether to issue the permit.¹³¹ Because of the Corps' failure to obtain and consider necessary outside information, the court judged the Corps as being arbitrary and capricious in its duty under the CWA to assess the cumulative impacts of issuing dredge and fill permit.

In sum, these four cases on point supply numerous rules helpful to understanding federal law regarding CBM and its environmental impacts. The rules from these cases, as aggregated, set out that: (1) BLM decisions not to issue an EIS with regard to CBM mining operations constitute a final agency decision, allowing suit under NEPA;¹³² (2) CBM-produced water is a pollutant within the meaning of the CWA and therefore barred from being released into navigable waters of the United States;¹³³ (3) neither states nor the EPA can authorize exceptions to the CWA because such power is reserved only to Congress;¹³⁴ (4) an EIS specifically contemplating CBM mining and its associated environmental impacts must be issued *prior* to leases allowing extraction and development;¹³⁵ (5) NEPA requires permit issuing agencies to consider the cumulative impacts of permit issuance;¹³⁶ (6) NEPA also requires permit issuing agencies to consider and disclose the impacts of permit issuance to the area's private landowners;¹³⁷ (7) NEPA only allows mitigation measures to justify a finding of FONSI when such measures are imposed by statute or regulation, or form an integral part of the project proposal; minimize the environmental impacts to the extent that an EIS is not warranted; and are well supported by analysis and data;¹³⁸ and

127. *Id.* at 1252 ("The Corps has set forth no specific plan for monitoring and has even acknowledged...that it 'has done a poor job of tracking past impacts on both wetlands and other waters.'").

128. *Id.*

129. *Id.* at 1257 (citing 40 C.F.R. §230.11(g)(2)).

130. *Wyo. Outdoor Council*, 351 F. Supp. 2d at 1257.

131. *Id.*

132. *San Juan Citizens' Alliance*, 228 F. Supp. 2d at 1233.

133. *N. Plains Resource Council*, 325 F.3d at 1158-61.

134. *Id.* at 1164-65.

135. *Pennaco Energy*, 377 F.3d at 1160 (stating that the law requires "the direct, indirect, and cumulative impacts [to be] analyzed before the [BLM] makes an irreversible commitment").

136. *Id.*

137. *Wyo. Outdoor Council*, 351 F. Supp. 2d at 1246-47.

138. *Id.* at 1250-51.

(8) agencies may only issue permits under the CWA after legitimate research and conclusion that the cumulative effect of issuing such a permit would not cause more than minimal environmental impacts.¹³⁹

V. A COMPARISON OF HOW STATES HAVE TREATED CBM THREATS TO THE WATER SUPPLY

In addition to the previous discussion of federal statutes, regulations, and case law regarding CBM mining and its environmental consequences, it is informative to examine the treatment of this issue within the five states most affected by the CBM boom. Once again, these states are Colorado, Montana, New Mexico, Utah, and Wyoming. This section will address them in that order. Regardless of relevant state laws and regulations, federal preemption and supremacy ensure that NEPA and CWA, where applicable, trump any state attempts to regulate CBM mining. Nevertheless, state regulation and policy-making may fill in certain gaps in applicable federal law.

A. Colorado

Colorado's major CBM regions are the Raton Basin and what has been called the "most prolific CBM Basin in the world"—the San Juan Basin.¹⁴⁰ Although there are rich resources to exploit, CBM growth within the state is not accelerating as quickly as in other Mountain West states. However, that may be due to the fact that there are already many wells in place. As of 2002, there were 1200 wells producing in the San Juan Basin, with plans for to put additional 960 in place.¹⁴¹ The Raton Basin has 821 producing wells as of 2002, with plans to drill 1293 more.¹⁴²

In 2006, Colorado's general assembly expressed its intent to promote economic development of the state's mineral resources, including coalbed methane. The assembly noted that "[s]uch work shall require appropriate consideration to public safety and environmental concerns."¹⁴³ This concern expressed by the state legislature reflects Colorado's interest in balancing energy needs with environmental protection. Supporting the same ideal, the Colorado Supreme Court noted in 1997 that mineral and surface estates are mutually dominant and must "exercise their rights 'in a manner consistent

139. *Id.* at 1254-55.

140. Thomas F. Darin, *Waste or Wasted? – Rethinking the Regulation of Coalbed Methane Byproduct Water in the Rocky Mountains: A Comparative Analysis of Approaches to Coalbed Methane Produced Water Quality Legal Issues in Utah, New Mexico, Colorado, Montana and Wyoming*, 17 J. Envtl. L. & Litig. 281, 308 (2002).

141. *Id.* at 309.

142. *Id.*

143. Colo. Rev. Stat. Ann. §34-1-104.5. Colo. Rev. Stat. Ann. § 34-1-104.5 (West 2007).

with the other.”¹⁴⁴ This statement notably conflicts with the more common position that surface estates are subservient to mineral estates.¹⁴⁵

B. Montana

As discussed above, CBM interest within Montana is concentrated in the Powder River Basin. By 2002, 247 producing wells had yielded 1.8 trillion gallons of produced water within the space of only twenty months.¹⁴⁶ Between 2002 and 2020, 10,000 to 26,000 new wells are expected to be producing in the basin.¹⁴⁷ The state has expressed both an interest in protecting its water supply, as well as a willingness to compromise the water supply through CBM mining. The Montana Constitution states that “[a]ll surface, underground, flood, and atmospheric waters within the boundaries of the state are the property of the state for the use of its people and are subject to appropriation for beneficial uses provided by law.”¹⁴⁸ It is difficult to imagine how the state will reconcile this commitment to put state water to beneficial use when such voluminous quantities are being extracted from underground aquifers in order to develop CBM. Montana law used to prohibit wasting ground water; however, the legislature amended its law in 2001 to allow for the discharge of CBM water.¹⁴⁹ The water code specifically addresses CBM water, saying “the management, discharge, or reinjection of ground water produced in association with a coalbed methane well’... may not be construed as waste.”¹⁵⁰ Interestingly, though Montana struggles to put such large quantities of produced water to beneficial uses, unlike Colorado, Utah, and New Mexico, oil and gas companies within the state do not reinject produced water into underground wells.¹⁵¹

C. New Mexico

New Mexico is home to the largest CBM field in the country—the San Juan Basin.¹⁵² As of 2002, CBM mining in the area had produced at least

144. J. Benjamin Winburn, *The Coalbed Methane Boom: The Push for Energy Independence Raises Questions about Water and the Rights of America's Homesteaders*, 19 Tul. Envtl. L.J. 359, 383 (citing *Gerrity Oil & Gas Corp. v. Magness*, 946 P.2d 913, 927 n.8 (Colo. 1997)).

145. See Wyo. Outdoor Council, 351 F. Supp. 2d at 1246.

146. Darin, *supra* n. 140, at 313.

147. *Id.* (citing Bureau of Land Mgt., U.S. Dept. of Int., *Statewide Draft Oil and Gas EIS and Amendment of the Powder River and Billings Resource Mgmt. Plans* MIN-5, MIN-22 (2002), <http://deq.state.mt.us/coalbedmethane/drafteis/draftpubliceis.pdf>).

148. *Id.* at 314 (citing Mont. Const. art. IX, § 3(3)).

149. *Id.* at 315 (citing Mont. Code Ann. §§ 85-2-505(1), 85-2-505(1)(e) (2001)).

150. Darin, *supra* n. 140, at 315.

151. *Id.* at 317.

152. Walter B. Ayers, *Coalbed Methane in the Fruitland Formation* (available at <http://www.searchanddiscovery.net/documents/halbouty03/images/0035.PDF>) (“The San Juan Basin of Colorado and New Mexico is the leading producer of coalbed gas in the world.”).

5.6 billion gallons of wastewater.¹⁵³ The number of wells in the San Juan Basin is expected to total 5072 by 2022, which would raise the total wastewater produced in the area to 10 billion gallons.¹⁵⁴

New Mexico water that comes from reservoirs above 2500 feet and may be potable is subject to regulation by the State Engineer.¹⁵⁵ Any person who desires to appropriate such groundwater must submit a permit application stating the beneficial purpose for which the water will be used, subject to the terms of the state constitution and water code.¹⁵⁶ Such applicants must also specify the quantity of water to be used.¹⁵⁷ The State Engineer has the discretion to deny the application if he finds that the proposed water use is contrary to the public's interest in water conservation or detrimental to the public welfare.¹⁵⁸ However, drilling for oil and gas that occurs below 2,500 feet and results in a byproduct of non-potable water is not subject to such permit requirements.¹⁵⁹

D. Utah

Utah's Wasatch Plateau is one of the newest and most productive areas of coalbed methane activity in the United States.¹⁶⁰ However, the state's major source of CBM is the Uinta Basin.¹⁶¹ Most of the water used to retrieve coalbed methane in the Uinta basin is reinjected into disposal aquifers not meant for future retrieval.¹⁶² According to estimates by the Utah Bureau of Land Management, the Uinta Basin will have a thousand CBM wells by 2012,¹⁶³ which would result in water loss of 2 billion gallons of water per year.¹⁶⁴ The Utah water code says that "all waters in this state, whether above or under the ground, are hereby declared to be the property of the public" and "[b]eneficial use shall be the basis, the measure and the limit of all rights to the use of water..."¹⁶⁵ In general, the State Engineer is charged with preventing waste or loss of ground water.¹⁶⁶ However, because of a 1953 exception applicable to oil and gas byproduct water, CBM-produced water falls under the jurisdiction of the Utah Board and Division

153. Darin, *supra* n. 140 at 305. (statistic reflects total cumulative wastewater produced between 1989 and 2002).

154. *Id.*

155. *Id.* at 305-308.

156. *Id.* at 305 (citing N.M. Const. art. XVI, §§ 1, 3; N.M. Stat. § 72-12-1 (2002)).

157. *Id.* at 306 (citing N.M. Stat. § 72-12-3(A) (2002)).

158. *Id.* (citing N.M. Stat. § 72-12-3(E)).

159. *Id.* (citing N.M. Stat. § 72-12-25).

160. Dragonetti, *supra* n. 9.

161. Wyo. Outdoor Council, 351 F. Supp. 2d at 1246.

162. *Id.*

163. Darin, *supra* n. 140 at 302 (citing interview with Floyd Johnson, Assistant Field Manager, Price Field Office, Utah Bureau of Land Mgmt., in Lander Wyo. (Apr. 1, 2002)).

164. *Id.*

165. Utah Code Ann. §§ 73-1-1, 73-1-3 (Lexis 2002).

166. Utah Code Ann. § 73-2-1(3)(a)(b)(iii)(B) (Lexis 2002)).

of Oil, Gas, and Mining (DOGM).¹⁶⁷ Instead of requiring oil and gas by-product water to be put to beneficial use—the requirement applied to all other water—the DOGM need only meet the lower standard of “regulat[ing]...[its] disposal...in a manner which protects the environment, limits liability to producers, and minimizes the volume of waste.”¹⁶⁸ The statutes now in place only contemplated conventional oil and gas development and its associated brine. However, if CBM development escalates in Utah as it is expected to do, the statutory scheme will likely need to be revisited by the state legislature in order to confront issues associated with a greater volume of water of different quality than that produced by oil and gas operations in the past.

E. Wyoming

In Wyoming, many citizens have reacted negatively to what they perceive as the state’s failure to implement safeguards to protect the water supply as CBM mining increases.

The State of Wyoming is proceeding rapidly with CBM development with little data about the impacts on the state’s invaluable water quality or quantity, let alone baseline data about current conditions. There can be little doubt, however, that pumping millions of gallons out of the ground and dumping it on the surface or in reservoirs will dramatically change the appearance and use of the land.¹⁶⁹

Commenting on this problematic issue within his state, Wyoming Governor Dave Freudenthal has said, “If we don’t do something soon, we’re going to have more stock ponds than cattle.”¹⁷⁰

VI. CONCLUSION

The official position of President Bush is that the development of coal-bed methane is “an integral part of the nation’s energy supply.”¹⁷¹ He looks to develop CBM because (1) it is a clean burning fuel located in abundance within U.S. borders, which will diversify the nation’s energy sources, and (2) by focusing on giving incentives to businesses within this industry, harmful emissions of methane may be reduced, in accordance with the President’s climate change agenda. Furthermore, possibility of rich financial gain by engaging in the CBM industry acts as a natural incentive for some Americans to support the President’s initiative. The situation seems

167. Utah Code Ann. § 73-3-8(2) (Lexis 2002)).

168. Utah Admin. Code r. 649-9-1.1 (Dec. 1, 2002)).

169. Buccino & Jones, *supra* n. 19, at 560.

170. Associated Press, *Freudenthal: Coal-bed Water Quality Must be Addressed*, CASPER STAR TRIB., Apr. 12, 2004.

171. *N. Plains Resource Council*, 325 F.3d at 1158.

ideal, until one considers the tremendous quantity of water produced as a byproduct of CBM mining. As of yet, no productive uses for CBM-produced water have been identified—a situation which poses grave environmental risks. The situation is alarming because both surface and ground waters—the nation's primary sources of this essential resource—are affected by CBM mining.

The legislative means of preventing water pollution, the CWA, requires that states approve methane well applications, and prohibits further degradation of the nation's waters. However, the Bush administration plans to ease the process for approving permit applications, seeing the action as an important step needed to accommodate the significant increase in applications expected throughout the nation.¹⁷² Such a change cannot be made administratively absent congressional approval. Thus far, it is uncertain how Congress will act with respect to these issues. Four bills were introduced in Congress last session with respect to CBM. The first two bills, both introduced in January 2007, emphasize developing coalbed methane and giving incentives to businesses, in the form of tax credits, to engage in such development.¹⁷³ However, the latter two bills, introduced in February and March, address both developing coalbed methane and protecting the nation's water supply.¹⁷⁴ The *More Water and More Energy Act of 2007* was introduced in the House by Congressman Udall of Colorado, passed by the House and referred to the Senate on March 20, 2007.¹⁷⁵ While the issues regarding CBM and CBM-produced water pose difficult and unanswered questions for American society, the national legislature is in the process of addressing some of these questions.

More recently, in April of 2008, a panel of the National Academy of Sciences and federal regulators met to lay the foundation for a study of the effects of CBM production on ground and surface water. Though certain environmental advocates deride the actions as insufficient, others are hopeful.¹⁷⁶ Additionally 2008 is an election year—one would think that the current presidential candidates would have addressed the CBM issue, but the campaign websites of the three major candidates contain no such discussion.¹⁷⁷ Hopefully this omission is the result of a need for brevity on their

172. *Id.*

173. See Investment in Energy Independence Act of 2006, H.R. 683, 100th Cong. (Jan. 24, 2007); Coal-to-Liquid Fuel Production Act of 2007, S. 155 (Jan. 4, 2007); Coal-to-Liquid Fuel Production Act of 2007, H.R. 370 (Jan. 10, 2007) (available at <http://thomas.loc.gov/cgi-bin/thomas>).

174. See Western Waters and Farm Lands Protection Act (Introduced in the House as H.R.1180.IH) and More Water and More Energy Act of 2007 (Engrossed as Agreed to or Passed by House as H.R.902.EH).

175. *Id.*

176. Associated Press, *Coal-bed Methane Data Review Begins*, April 9, 2008, available at <http://news.moneycentral.msn.com/printarticle.aspx?feed=AP&date=20080409&id=8460398>.

177. See Obama for America, Energy & Environment Page, available at <http://www.barack-obama.com/issues/energy/> (last accessed April 28, 2008) (The page mentions renewable fuels, gasoline fuel economy, and cleaner coal, but there is no mention of CBM or natural gas.); Hillary Clinton for

respective websites, rather than because the candidates have neglected these important environmental and energy issues.

President, Powering America's Future: New Energy, New Jobs, *available at* <http://www.hillary-clinton.com/Issues/energy/> (last accessed April 28, 2008) (similar to Obama's—no mention of CBM or natural gas); John McCain 2008, Stewards of Our Rich Natural Heritage, *available at* <http://www.john-mccain.com/Informing/Issues/65bd0fbe-737b-4851-a7e7d9a37cb278db.htm> (last accessed April 28, 2008) (though the page contains a video of Senator McCain discussing energy and environment, the textual portion of the page merely contains vague statements regarding the importance of natural resources—the only specific “solution” he mentions is nuclear energy).

