

January 2004

Controlling Water Pollution from Coalbed Methane Drilling: An Analysis of Discharge Permit Requirements

Sharon Buccino

Steve Jones

Follow this and additional works at: <https://scholarship.law.uwyo.edu/wlr>

Recommended Citation

Buccino, Sharon and Jones, Steve (2004) "Controlling Water Pollution from Coalbed Methane Drilling: An Analysis of Discharge Permit Requirements," *Wyoming Law Review*. Vol. 4: No. 2, Article 2.
Available at: <https://scholarship.law.uwyo.edu/wlr/vol4/iss2/2>

This Article is brought to you for free and open access by the UW College of Law Reviews at Law Archive of Wyoming Scholarship. It has been accepted for inclusion in Wyoming Law Review by an authorized editor of Law Archive of Wyoming Scholarship.

WYOMING LAW REVIEW

VOLUME 4

2004

NUMBER 2

CONTROLLING WATER POLLUTION FROM COALBED METHANE DRILLING: AN ANALYSIS OF DISCHARGE PERMIT REQUIREMENTS

Sharon Buccino¹ and Steve Jones²

INTRODUCTION

Coalbed methane (CBM) development is dramatically changing the landscape of the Rocky Mountain West, including areas of Wyoming like the Powder River Basin and the Greater Red Desert. In the Powder River Basin, for example, 36,000 new wells are planned for the next ten to fifteen years. In addition to the miles of roads and pipelines that accompany these wells, thousands of gallons of wastewater gush from a single well each day. When released onto the ground, this water can scour stream channels dramatically increasing erosion and sedimentation. It can harm aquatic habitat, as well as fundamentally change the riparian zones of the numerous ephemeral and intermittent waters of Wyoming. It can reduce agricultural productivity of the land of Wyoming farmers and ranchers. It wastes one of the West's most precious resources – water.

1. Senior Attorney, Natural Resources Defense Council (NRDC). J.D., 1990, Stanford Law School; B.A., 1987, Yale University. She clerked for Justice Allen Compton on the Alaska Supreme Court. NRDC is a national, non-profit membership organization seeking to safeguard the Earth – its people, plants and animals, and the natural systems on which all life depends. NRDC has offices in Washington, D.C., New York City, San Francisco, and Los Angeles.

2. Watershed Protection Attorney, Wyoming Outdoor Council (WOC). J. D., 1977, University of Oregon School of Law; B. A., 1974, University of Nebraska. He is the former head of the Environmental Section of the Natural Resources Division of the Wyoming Attorney General's Office. The Wyoming Outdoor Council is a state-wide non-profit organization dedicated to the conservation and protection of Wyoming's environment, communities, and ecosystems.

When held in reservoirs, the produced water can also dramatically alter the delicately balanced ecosystems of places like the Powder River watershed, one of the few remaining healthy remnants of the many, once unspoiled rivers of the semi-arid Great Plains. 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. As Wyoming Governor Dave Freudenthal has said, "If we don't do something soon, we're going to have more stock ponds than cattle."³

The Clean Water Act's discharge permit program provides a critical mechanism for addressing the impacts of CBM development on water quality, including existing irrigation uses. It provides the legal mechanism to require CBM operators to take steps to limit the water quality impacts from their operations. It provides citizens the right to hold CBM operators, and the state officials responsible for regulating them, accountable for the damage being done.

IMPACTS OF COALBED METHANE DRILLING ON WATER QUALITY

The extraction of methane gas from coal beds, unlike traditional oil and gas drilling, requires the pumping to the surface of millions of gallons of groundwater. The removal of the water is necessary to release the gas that then migrates to the surface where it is collected, compressed, and transported in pipelines to various users. While the water is re-injected at many well sites in Colorado and Utah, this produced water is generally collected in ponds or simply released on the surface in Wyoming.

The quantities of water involved are astounding. On average, each Wyoming well releases 17,000 to 22,000 gallons of byproduct water each day during the initial years of production.⁴ In 1997, there were 360 producing wells in Wyoming's Powder River Basin.⁵ The Bureau of Land Management (BLM) forecasts 51,000 wells in the Powder River Basin operating and producing gas and water by 2010.⁶ When they are all producing, these

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

4. Thomas F. Darin & Amy W. Beatie, *Debunking the Natural Gas "Clean Energy" Myth: Coalbed Methane in Wyoming's Powder River Basin*, 31 ENVTL. L. REP. 10,566, 10,575 (2001).

5. Gary Bryner, *Coalbed Methane Development in the Intermountain West: Primer*, in COALBED METHANE DEVELOPMENT IN THE INTERMOUNTAIN WEST 1 (Natural Resources Law Center, University of Colorado School of Law CD-ROM, 2002).

6. BUREAU OF LAND MANAGEMENT, FINAL ENVIRONMENTAL IMPACT STATEMENT AND PROPOSED PLAN AMENDMENT FOR THE POWDER RIVER BASIN OIL AND GAS PROJECT (Jan.

51,000 wells will draw nearly 700 million gallons from aquifers and discharge it each day.⁷ 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 – enough to fill Flaming Gorge Reservoir five times over.⁸

The release of such massive amounts of water on the surface causes a variety of adverse environmental impacts and interferes with the use of the land by others, including ranchers and farmers who may own the surface land.⁹ Farmers and ranchers who rely on stream water for their crops and

2003) [hereafter PRB EIS], available at <http://www.wy.blm.gov/nepa/prb-feis/index.htm> (last visited Apr. 20, 2004).

7. 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 Quantity Legal Issues in Utah, New Mexico, Colorado, Montana, and Wyoming*, 17 J. ENVTL. L. & LITIG. 281, 320 (2002).

8. Dustin Bleizeffer, *Salty Big George Water Inspires Innovation*, CASPER STAR TRIB., Apr. 4, 2004. The Big George coal seam holds about seventy percent of the Powder River Basin's estimated twenty-five trillion cubic feet of recoverable CBM gas. Dustin Bleizeffer, *Big George Lives Up to Name*, CASPER STAR TRIB., Jan. 31, 2004. Anadarko Petroleum, Yates Petroleum, Devon Energy, and Williams all have highly productive wells in the area. The Wyoming Oil and Gas Conservation Commission estimates that total gas production from the Big George coal seam is 125 million cubic feet per day. Dustin Bleizeffer, *Testing Required for Big George Water*, CASPER STAR TRIB., Mar. 7, 2004. Because the Big George is thicker and deeper than originally targeted coals in the basin, it also contains more water. A single Big George well can initially produce between seventy-five and 150 gallons per minute, compared with the average well in the eastern portion of the Powder River Basin outside of the Big George zone. *Id.* Some of the first wells drilled into the Big George produced only water for nine months and more. Bleizeffer, *Big George Lives Up to Name, supra*.

9. This article focuses on the water quality impacts. It does not address the waste of water, a Western resource in many ways more precious than gas. See Kirk Johnson and Dean E. Murphy, *Drought Settles In, Lake Shrinks and West's Worries Grow*, N.Y. TIMES, May 2, 2004. The pumping and release of millions of gallons of groundwater is depleting aquifers and drying up landowners' wells. Dustin Bleizeffer, *After 17 Months, Running Water*, CASPER STAR TRIB., Feb. 16, 2004; see also U.S. DEPT. OF ENERGY, COAL BED METHANE PRIMER: NEW SOURCE OF NATURAL GAS – ENVIRONMENTAL IMPLICATIONS (2004) [hereafter DOE PRIMER], ("Coal seam aquifers may have competing water rights and be diminished as CBM production increases."), available at <http://www.all-llc.com/cbm> (last visited Apr. 20, 2004). For a discussion of water quantity issues and possible regulatory options, see Darin, *Waste or Wasted, supra* note 7. Water rights in Wyoming are regulated by the State Engineer's Office. In addition to water quality and quantity impacts, coalbed methane development can cause other types of damage. For example, the methane gas freed from the coal seams can escape in places other than the well designed to collect it, including into homes and drinking wells. Walter Mersch, *Coalbed Methane: Gas Boom, Environmental Bust*, CASPER STAR TRIB., Aug. 29, 1999. The thousands of miles of new roads, pipelines and power lines can fragment and destroy wildlife habitat. The development also threatens cultural resources and Native American sacred sites. See generally, BUREAU OF LAND MANAGEMENT, SAN JUAN FIELD OFFICE, COALBED METHANE DEVELOPMENT IN THE NORTHERN SAN JUAN BASIN OF COLORADO (1999); GEORGE WUERTHNER & REED NOSS, FINAL COMMENTS ON POWDER RIVER BASIN EIS (2002), available at <http://www.wyomingoutdoorcouncil.org/programs/cbm/resources.php> (last visited Apr. 20, 2004); Darin & Beattie, *supra* note 4, at 10,574-81.

livestock are concerned about the high salinity (measured by electrical conductivity, EC, or total dissolved solids, TDS) of CBM produced water.¹⁰ In the words of former Wyoming Department of Environmental Quality (DEQ) official Dennis Hemmer, salty water “tends to seal the soil so you can’t grow your crops.”¹¹ The simple volume of water can cause problems. Water gushing from gas wells on a neighbor’s ranch flooded the prime hay-growing fields of Wyoming ranchers Bill and Marge West. “We have been ditching and channeling the last two years” to control the flow of water, West says.¹²

In addition, CBM water can have a high sodium absorption ratio (SAR). The SAR value of water is often referred to as sodicity. Use of surface waters with high SARs for irrigation can reduce the productivity and yield of the irrigated cropland.¹³ The water causes a disproportionate concentration of sodium adsorbed by the irrigated soil at the expense of calcium and magnesium, causing soil structure to break down and the soil particles to disperse.¹⁴ This reduces the permeability of soils and consequently decreases the storage of plant-available water in the soil. It can increase both runoff and erosion.¹⁵ The fine textured and clay soils common to the Powder River Basin are particularly sensitive to the addition of sodium, as they tend to disperse rapidly.¹⁶ The sodium reacts with calcium in the clay soils to form line crystals. This prevents plant roots from picking up the water and gives the muddy soils their distinctive slickness. In the words of Ken Peacock, hydrologist for BLM’s Buffalo Field Office, “The problem is what happens on the ground.”¹⁷ The problem for plants continues even after the CBM water is gone, as the gummy soil acts as a barrier to normal rainfall.¹⁸

The high salinity and sodicity of CBM water and the increased flow in streams it causes can degrade aquatic and riparian habitat. High salt content will affect most vegetative communities, even killing many species.¹⁹

10. See, e.g., Judy Pasternak, *Coal-Bed Methane Puts Basic Needs of Water, Energy at Odds*, LOS ANGELES TIMES, Mar. 27, 2001, at A5.

11. Marianne Lavelle, *High Stakes on the Prairie*, U.S. NEWS & WORLD REP., Mar. 12, 2001, at 53.

12. *Id.*

13. PRB FEIS, *supra* note 6, at 3-47.

14. *Id.*

15. J. DAVID ALLEN, EXPERT COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT AND DRAFT PLANNING AMENDMENT FOR THE POWDER RIVER BASIN OIL AND GAS PROJECT 3 (2002), available at <http://www.wyomingoutdoorcouncil.org/programs/cbm/resources.php> (last visited Apr. 20, 2004).

16. PRB EIS, *supra* note 6, at 3-47.

17. Dustin Bleizeffer, *Bad Water Makes Industry Thirst for Fresh Approach*, CASPER STAR TRIB., Apr. 4, 2004.

18. *Id.*

19. WUERTHNER & NOSS, *supra* note 9, at 8. See also, Confluence Consulting Inc., Powder River Biological Survey and Implications for Coalbed Methane Development, Mar. 2004, at 63 [hereafter Confluence Study], available at <http://www.powderriverbasin.org/> (last vis-

Increased flow from CBM discharges can cause excessive erosion, scraping stream banks bare of native vegetation.²⁰ Such conditions can encourage the spread of non-native weeds. The effects of discharged water from CBM operations are likely to be particularly severe in ephemeral and smaller perennial streams²¹ that characterize many of the drilling areas.²² By damaging aquatic habitat, increased stream flow can result in loss of productivity and diversity of benthic communities and forage fish.²³ Water temperatures and sedimentation can increase reducing populations and diversity of fish and other aquatic life.²⁴ In short, rapidly expanding CBM development threatens to flood Wyoming's historically arid short-grass steppe with immense quantities of water heavily loaded with salts and ions.

THE CLEAN WATER ACT DISCHARGE PERMIT PROGRAM

The main legal mechanism for controlling the water pollution from CBM wells is the discharge permit program required by Section 402 of the federal Clean Water Act (CWA).²⁵ The CWA prohibits the discharge of any pollutant from a point source into navigable waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit.²⁶ A discharger must either obtain an individual permit or in some cases coverage under a general permit may be available.²⁷

As discussed below, the U.S. Environmental Protection Agency (USEPA) has delegated responsibility for issuing NPDES permits to the

ited May 4, 2004) (high concentrations of dissolved solids in Powder River Basin's Spotted Horse Creek, a site receiving continuous CBM discharge flows, threatens an important channel catfish rearing area downstream in the Powder River). This study, commissioned by the Powder River Basin Resource Council, was designed to describe and analyze current "baseline conditions" in the Powder River and its tributaries Clear Creek and Piney Creek at current levels of CBM development. The study was also designed to evaluate the impacts of the current level of development on overall stream integrity, including fish populations, aquatic communities, and habitat. *Id.*

20. ALLEN, *supra* note 15, at 3; *see also* DOE PRIMER, *supra* note 9, at 10 ("Riparian ecosystems may be negatively affected by the release of large quantities of produced water.").

21. DOE PRIMER, *supra* note 9, at 8.

22. In January 2003, the USEPA and the U.S. Army Corps of Engineers announced that they were considering narrowing the jurisdiction of the Clean Water Act to exclude ephemeral and intermittent streams as "isolated waters." 68 Fed. Reg. 1991 (Jan. 5, 2003). Such action could dramatically limit the application of the CWA in the West where many of the streams are intermittent. In response to strong opposition, including from some states, the Bush Administration announced that it would not proceed with this change – at least for now. Eric Pianin, *EPA Scraps Changes to Clean Water Act; Plans Would Have Reduced Protection*, WASHINGTON POST, Dec. 17, 2003, at A20.

23. JAMES A. GORE, EXPERT COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE POWDER RIVER BASIN OIL AND GAS PROJECT (2002), available at <http://www.wyomingoutdoorcouncil.org/programs/cbm/resources.php> (last visited Apr. 20, 2004).

24. WUERTHNER & NOSS, *supra* note 9, at 7.

25. 33 U.S.C. § 1342 (2004).

26. *Id.* §§ 1311(a), 1342.

27. 40 C.F.R. § 122.28 (2004).

Wyoming Department of Environmental Quality (DEQ). The state, however, must operate within minimum standards established by federal law.²⁸ Citizens have the right under the CWA to sue a CBM operator in federal court for failing to obtain the required permit or violating the permit's conditions.²⁹ Citizens may sue Wyoming DEQ in state court for improperly issuing (or failing to issue) a discharge permit.³⁰ For example, a permit may not contain adequate limits to ensure compliance with state water quality standards and protect existing water uses.

A. Produced Water

CBM operators require a discharge permit for the produced water released at well sites. The United States Court of Appeals for the Ninth Circuit has explicitly held that "unaltered groundwater produced in association with methane gas extraction, and discharged into [a] river, is a 'pollutant' within the meaning of the CWA."³¹ The court found that CBM water was "industrial waste," one of the categories explicitly listed within the CWA's definition of "pollutant."³² According to the court, because the CBM operator Fidelity was engaged in a commercial enterprise and the CBM water was an unwanted byproduct, it fell squarely within the ordinary meaning of "industrial waste."³³

The Fifth Circuit has also explicitly found that the discharge of water "produced" during the extraction of oil and gas is an "industrial waste" regulated by the CWA.³⁴ The Act provides for a limited exception from the

28. 33 U.S.C. § 1342(b).

29. *Id.* § 1365(a)(1). Federal district courts have jurisdiction over such actions. Citizens must provide 60 days notice to the operator, as well as to USEPA and the state. *Id.* § 1365(b)(1)(A). Citizens may not pursue federal litigation if either USEPA or the state "has commenced and is diligently prosecuting a civil or criminal action in a court of the United States, or a State." *Id.* § 1365(b)(1)(B).

30. In order for USEPA to delegate the NPDES program to a state, the state must provide for citizen enforcement of the program. *Id.* § 1251(e). See WYO. STAT. ANN. § 35-11-1001 (LexisNexis 2003). A citizen must challenge the permit administratively first before going to court.

31. *Northern Plains Resource Council v. Fidelity Exploration*, 325 F.3d 1155, 1157 (9th Cir. 2003), *cert. denied*, 124 S. Ct. 434 (2003). Although this case addressed a discharge directly into the Tongue River, the rationale applies equally to discharges of produced water onto the surface. Any water discharged to the surface will quickly flow through channels and ditches into the navigable waters of the U.S. Courts have explicitly found that pollution that reaches navigable waters by way of infiltration into groundwater triggers an obligation for an NPDES permit. See, e.g., *Idaho Rural Council v. Bosma* 143 F. Supp. 2d 1169, 1180 (D. Idaho 2001); *Friends of Santa Fe County v. LAC Minerals, Inc.*, 892 F. Supp. 1333, 1357 (D.N.M. 1995); *Sierra Club v. Colorado Refining Co.*, 838 F. Supp. 1428, 1433 (D. Colo. 1993).

32. *Northern Plains Resource Council*, 325 F.3d at 1160-61 (citing 33 U.S.C. § 1362(6)).

33. *Id.* at 1161.

34. *Sierra Club, Lone Star Chapter v. Cedar Point Oil Co.*, 73 F.3d 546, 568 (5th Cir. 1996).

definition of pollutant for water derived from gas extraction if the water is disposed of in a well and will not result in the degradation of other water bodies.³⁵ Generally, CBM water is not disposed of in a well and therefore does not fall within this exemption.³⁶

The fact that a CBM operator does not add anything to the water discharged does not exclude it from the definition of “pollutant.” What is relevant is whether the operator has altered the quality of the receiving water, rather than whether the operator has altered the water that is discharged. As the Ninth Circuit said, “[b]y discharging CBM water into the Tongue River, Fidelity alters the water quality of the Tongue River.”³⁷ This result is consistent with the position taken by several other courts previously.³⁸

The heart of the discharge permit is the effluent limits it contains. The CWA requires two kinds of limits – one based on available technology and the second based on water quality.³⁹ USEPA has established national technology-based minimum discharge requirements, called effluent limitation guidelines, for the oil and gas industry. These guidelines generally prohibit discharges of produced water.⁴⁰ The guidelines provide two exceptions to the prohibition. The first is limited to small wells, producing ten barrels or less of *crude oil*. This exception is not applicable to wells producing only methane gas.⁴¹ The second exception is relevant to CBM operations. It applies to wells west of the 98th meridian producing water that is of good enough quality to be used for wildlife or livestock watering or other agricultural uses *and* is actually put to such use during periods of discharge.⁴² The USEPA guidelines allow the discharge of such water, but limit the amount of oil and grease in the water to 35 mg/L.⁴³

These federal guidelines, however, were written before the dramatic

35. 33 U.S.C. § 1362(6)(B).

36. *Northern Plains Resource Council*, 325 F.3d at 1161.

37. *Id.* at 1162.

38. *Micosukee Tribe v. S. Fla. Water Mgmt. Dist.*, 280 F.3d 1364, 1367 (11th Cir. 2002) (holding that discharge of polluted water into navigable water requires permit even though defendant did not introduce additional pollutants) *rev'd on other grounds*, 124 S. Ct 1537 (2004); *Catskill Mountains Chapter of Trout Unlimited, Inc. v. City of New York*, 273 F.3d 481 (2d Cir. 2001) (holding that water piped from one river to another was considered a discharge of pollution for CWA purposes). Unlike Montana, the State of Wyoming has always treated CBM water as “pollution.” It meets the definition of pollution as applied to water quality under Wyoming statute. WYO. STAT. ANN. § 35-11-103(c)(i) (LexisNexis 2003). In addition, Wyoming regulations explicitly require NPDES permits for the discharge of produced water from oil and gas production that “enters or threatens to enter surface waters of the State.” WYO. RULES & REGS., DEP’T OF ENVTL. QUALITY, WATER QUALITY Ch. 7, § 3(a) (Weil’s 2003).

39. 33 U.S.C. § 1311(b).

40. 40 C.F.R. § 435.32 (2004).

41. 40 C.F.R. § 435.60.

42. *Id.* § 435.51(c).

43. *Id.* § 435.52.

expansion of CBM development in the West. Characteristics particular to water produced by CBM operations, such as its salinity, total dissolved solids and metals, are not addressed in the current USEPA regulations. To address this inadequacy of the current guidelines, USEPA's Region 8 is developing effluent limitations based on available technology that is economically achievable for CBM activities in the Rocky Mountain states.⁴⁴ The limitations will represent Region 8's "best professional judgment" regarding how to handle CBM produced water.⁴⁵ USEPA Region 8 is evaluating the technical feasibility and cost of allowing: (1) discharge with minimal treatment; (2) discharge with advanced treatment; (3) discharge with beneficial use; and (4) zero discharge (i.e., evaporation, shallow injection, or deep injection).⁴⁶ Region 8's limits should establish a floor regarding what states, such as Wyoming, require in the discharge permits they administer.

The ultimate purpose of the discharge permits is to ensure compliance with water quality standards. If technology-based limits are insufficient to meet water quality standards, the CWA requires NPDES permits to contain additional limits.⁴⁷ The CWA gives states the responsibility for setting water quality standards, with approval by USEPA.⁴⁸ The standards are based on designated uses for the waters of a state.⁴⁹ The State of Wyoming has classified the waters of the state and identified designated uses for each class in DEQ's regulations.⁵⁰ The designated uses for Class 2 waters, for example, are fish and drinking supplies.⁵¹ Appendix B to the regulations provides the specific limits of various pollutants to protect the various uses.⁵²

In addition to its limits, NPDES permits provide the legal mechanism to require CBM operators to monitor the quantity and quality of by-product water from their operations and its impact on the environment. Discharge permits may also include best management practices to minimize the impact of CBM operations on the environment and other land users.

44. EPA Region 8 "Best Professional Judgment" (BPJ) Determination of Effluent Limitations That Represent Best Available Technology Economically Achievable (BAT) for Coalbed Methane (CBM) Activities, 66 Fed. Reg. 46,455 (Sept. 5, 2001); *see also* <http://www.epa.gov/Region8/water/wastewater/npdeshome/cbm/cbm.html> (last visited Apr. 20, 2004).

45. BPJ Determination, *supra* note 44.

46. JOHN A. VEIL, ARGONNE NATIONAL LABORATORY, U.S. DEP'T OF ENERGY, REGULATORY ISSUES AFFECTING MANAGEMENT OF PRODUCED WATER FROM COAL BED METHANE (2002), *available at* <http://www.gwpc.org/News-2002/cbm-prod-water-rev902.pdf> (last visited Apr. 20, 2004).

47. 33 U.S.C. §§ 1311(b)(1)(C), 1312(a) (2004).

48. *Id.* § 1313(c).

49. *Id.* § 1313(c)(2)(A); *see also* 40 C.F.R. § 131.2 (2004).

50. WYO. RULES & REGS., DEP'T OF ENVTL. QUALITY, WATER QUALITY Ch. 1, § 4 (Weil's 2003).

51. *Id.* § 4(b).

52. *Id.* at App. B.

B. Stormwater

In addition to regulating the discharge of water produced during the operation of a CBM well, the NPDES program regulates discharges of stormwater from construction. Stormwater refers to runoff that results from rains and snow.⁵³ Culverts, drains, and naturally occurring ditches caused by a human activity are considered point sources requiring an NPDES discharge permit if they are industrial or municipal discharges.⁵⁴ Construction is considered an industrial activity.⁵⁵

While the CWA does not require a permit for stormwater discharges from oil and gas *operations*, it does currently require such a permit for stormwater discharges from *construction* activities.⁵⁶ These activities include construction of new or improved access roads, well pads, storage areas, parking areas, and pipelines. Construction activities cause excessive sediment to flow into the nation's waterways, harming drinking water supplies and aquatic life. At oil and gas sites, there is the additional problem of toxics, including benzene, toluene, and heavy metals. While toxics may not necessarily be a problem at a completely new drilling site, significant construction is occurring at existing sites where oil and waste products can be easily disturbed and enter the nation's waters.

Energy legislation now being considered by Congress would expand the statutory exemption to include "all field activities or operations associated with exploration, production, processing, or treatment operations, or transmission facilities, including activities necessary to prepare a site for drilling and for the movement and placement of drilling equipment, whether or not such field activities or operations may be considered to be construction activities."⁵⁷ The expanded exemption would provide oil and gas activities a blanket exemption from requirements that all other industries have to comply with. USEPA has no evidence whatsoever that construction at oil and gas sites causes less pollution than other construction activities. In fact, because of the presence of toxics, oil and gas activities are likely to cause more problems.

The existing permit requirements provide the legal mechanism for

53. 40 C.F.R. § 122.26(a)(13).

54. 33 U.S.C. § 1342(p). *See, e.g.*, *Sierra Club v. Abston Const. Co., Inc.*, 620 F.2d 41, 45 (5th Cir. 1980) ("Conveyances of pollution formed either as a result of natural erosion or by material means . . . may fit the statutory definition [of a point source]."); *North Carolina Shellfish Growers Ass'n v. Holly Ridge Associates, LLC.*, 278 F. Supp. 2d 654, 680 (E.D.N.C. 2003) ("The Court therefore finds the gullies and rills that have formed along the ditches to be point sources under the CWA.")

55. 40 C.F.R. § 122.26(a)(14)(x).

56. 33 U.S.C. § 1342(l)(2).

57. S. 2095, 108th Cong. § 327 (2004), available at <http://thomas.loc.gov> (last visited Apr. 20, 2004).

ensuring that CBM operators follow best management practices to limit the impact of their construction activities on water quality and other land users. A variety of methods exist to control water pollution from construction activities including silt fences and vegetative stabilization. Wyoming DEQ provides links to numerous resources regarding best management practices.⁵⁸ If Congress exempts oil and gas construction from the permit requirements, the public and regulatory agencies will lose their legal leverage to ensure that CBM operators follow readily available measures to limit the adverse effects of their construction activities.

WYOMING IMPLEMENTATION OF DISCHARGE PERMITS

As stated above, the USEPA has delegated issuance of NPDES discharge permits to the State of Wyoming. DEQ's Water Quality Division issues these permits. DEQ must provide the public thirty days to comment on all draft permits.⁵⁹ A citizen can request that their name be added to a list of parties designated to receive copies of notices for all permit applications.⁶⁰ DEQ must provide a copy of the draft permit to anyone who requests it.⁶¹ DEQ must also provide federal agencies, such as the USEPA and the Bureau of Land Management, notice and the opportunity to comment on draft NPDES permits for CBM discharges.⁶² The public has a right to request a public hearing on the permit.⁶³ DEQ will hold a public hearing if the Administrator determines that "there is a significant degree of public interest in holding such a hearing, after resolving instances of doubt in favor of holding such a hearing."⁶⁴

Once DEQ issues a permit, a citizen can challenge its adequacy by filing a petition for review with the Water Discharge Permit Subcommittee of the Environmental Quality Council.⁶⁵ The petition must be filed within 60 days of the permit issuance.⁶⁶ Wyoming regulations specify what the petition must contain and the process that must be followed.⁶⁷ The petitioner must serve the permit applicant with a copy of the petition and all other

58. WYOMING DEQ, NPDES STORM WATER PERMIT PROGRAM, available at <http://deq.state.wy.us/wqd/stormwater.asp> (last visited Apr. 20, 2004); see also USEPA, STORM WATER PHASE II COMPLIANCE ASSISTANCE GUIDE (Mar. 2000), available at <http://www.epa.gov/npdes/pubs/comguide.pdf> (last visited Apr. 20, 2004); STORMWATER MANAGERS' RESOURCE CENTER, EROSION AND SEDIMENT CONTROL FACT SHEETS, available at <http://www.stormwatercenter.net/test.htm> (last visited Apr. 20, 2004).

59. WYO. RULES & REGS., DEP'T OF ENVTL. QUALITY, WATER QUALITY, Ch. 2, § 13(b)(3) (Weil's 2003).

60. *Id.* § 13(b)(2).

61. *Id.* § 4(c).

62. *Id.* § 13(d).

63. *Id.* § 14(a).

64. *Id.*

65. *Id.* at Ch. 1, § 15.

66. *Id.* § 16.

67. *Id.* § 3.

pleadings and motions.⁶⁸ Normally, a citizen who challenges a permit would have to bear his or her own costs and expenses. If the challenge involves an enforcement action for failure to comply with a permit, rather than a challenge to the content of the permit itself, a citizen can under limited circumstances recover costs and expenses from the permittee.⁶⁹ A person participating in an enforcement action, however, can also be liable to the permittee for costs and expenses including attorneys' fees if the Council finds that the "person initiated or participated in enforcement action in bad faith for the purpose of harassing or embarrassing the permittee."⁷⁰

A citizen may challenge a permit in state district court, but only after protesting the decision administratively first.⁷¹ Rule 12 of the Wyoming Rules of Appellate Procedure governs the process for judicial review of administrative action. The citizen must file a petition for review with the district court within 30 days of service of the final administrative decision.⁷² The petition for review must contain a statement showing jurisdiction and venue, identify the issues of law to be addressed by the district court, and attach a copy of the agency decision as an appendix.⁷³ The citizen is responsible for providing to the district court and paying for a transcript of any administrative hearing that may have occurred and all evidence considered.⁷⁴

DEQ has regulated CBM produced water in a variety of ways depending on the quality of the water, as well as where the water drains.⁷⁵ Permits issued by Wyoming DEQ must ensure compliance with the water quality standards of downstream states, as well as with Wyoming water quality standards.⁷⁶ In some areas, such as the Belle Fourche and Cheyenne River basins, DEQ simply allows the discharges to flow out onto the ground and down the various rivers and creeks in the drainages of northeast Wyo-

68. *Id.* § 3(b)(ii).

69. *Id.* at Ch. 5, § 2(a)(i).

70. *Id.* § 2(a)(ii)(A). These cost recovery rules apply to state proceedings. A citizen or citizen organization successfully challenging a CBM operator for discharging without a permit or for violations of a permit can recover costs and fees in federal court. 33 U.S.C. § 1365(d) (2004). Citizen groups are generally not liable for the other side's costs and fees if they lose in federal court. While a citizen may enforce violations of a permit in either state or federal court, a citizen may generally only sue DEQ over the content of a permit in state court.

71. WYO. STAT. ANN. § 35-11-1001 (LexisNexis 2003).

72. WYO. R. APP. P. 12.04.

73. WYO. R. APP. P. 12.06.

74. WYO. RULES & REGS., DEP'T OF ENVTL. QUALITY, PRACTICE & PRO., Ch. 1, § 8(b) (Weil's 2003).

75. Currently, there are 837 active NPDES permits for CBM operations. Twenty-seven individual permits have been issued by DEQ in 2004. There are 15 pending individual applications. Email from Leah Krafft, DEQ, NPDES Permit Program, to Sharon Buccino, Senior Attorney, Natural Resources Defense Council (NRDC) (Mar. 15, 2004) (on file with author).

76. 33 U.S.C. § 1311(b)(1)(C) (2004); 40 C.F.R. § 122.4(d) (2004) (made applicable to state programs by 40 C.F.R. § 123.25). *See also* Arkansas v. Oklahoma, 503 U.S. 91, 105 (1992).

ming. These waters flow into South Dakota. South Dakota has established water quality standards for sodium adsorption ratio (SAR) and total dissolved solids (TDS).⁷⁷ DEQ has set effluent limits designed to meet South Dakota's water quality standards as part of its discharge permits for the Belle Fourche and Cheyenne River drainages.⁷⁸ Generally, the water pumped from the ground by CBM operations in this area meets those limits without any treatment whatsoever and consequently is simply dumped on the surface.

Further to the west and the northwest, however, in the Powder River and Tongue River basins, the water pumped from the ground is more sodic and has higher concentrations of salt. These waters flow into Montana. Consequently, Montana has been more aggressive in limiting the discharges in Wyoming. The State of Montana has issued water quality standards that cover two of the most serious pollutants typically found in CBM discharges: sodium adsorption ratio (SAR) and electrical conductivity (EC).⁷⁹ Montana has established different standards for irrigation and non-irrigation seasons. The standards also vary depending upon the drainage involved.⁸⁰ The four drainages now potentially affected by Wyoming CBM discharges are Rosebud Creek, the Tongue River, the Powder River, and the Little Powder River. In addition, Montana is developing a Total Maximum Daily Load (TMDL)⁸¹ for the Powder River basin. The TMDL could further limit CBM discharges in Wyoming that affect the Powder River. Moreover, the Northern Cheyenne Indian Reservation is interested in regulating the water quality of the Tongue River that forms part of its border with Montana.

DEQ has provided CBM operators several options to deal with produced water where it cannot simply be discharged to the surface. The one routinely used is the construction of reservoirs to hold the water. These reservoirs are generally of two types. Option 1B reservoirs are those located in a "closed Class 3 basin" (usually this is a drainage that is ephemeral or intermittent), known as on-channel reservoirs. Option 1A reservoirs are those

77. SOUTH DAKOTA RULES & REGS., SURFACE WATER QUALITY STANDARDS, 74:51:01:52, 74:51:01:53, available at <http://legis.state.sd.us/rules/rules/> (last visited May 12, 2004).

78. Gary Beach, Administrator, Water Quality Division, Dept. of Environmental Quality, Updated Permitting Options for Coal Bed Methane Permit Applications, December 10, 2001, at 3 [hereafter DEQ Updated Options] (discharges must meet effluent limits of 2000 umhos/cm for specific conductance and 10 for SAR unless applicant provides a demonstration of why alternate effluent limits will provide adequate protection of irrigation uses).

79. MONTANA RULES AND REGS. § 17.30.670.

80. *Id.*

81. A TMDL establishes a wasteload allocation that a particular waterbody can assimilate, while providing for natural background and a margin of safety, before violating water quality standards. 40 C.F.R. § 130.7. The CWA requires states and USEPA to develop a TMDL for all water bodies that violate state water quality standards. 33 U.S.C. § 1313(d) (2004). Once a TMDL is established it is divided among the various point and nonpoint sources that affect the water body. See USEPA, *Introduction to TMDLs*, available at <http://www.epa.gov/owow/tmdl/intro.html> (last visited May 12, 2004).

not located in a drainage, i.e. they are perched or constructed so that no runoff or precipitation enters the reservoir other than direct vertical precipitation. They are often referred to as off-channel reservoirs.⁸² Both types of reservoirs do not have outlets, other than overflow outlets for potential flood events. Both types of reservoirs are unlined, and in fact are designed to leak their contents out of the reservoirs and into the surrounding soils and groundwater table.

Normally, the construction of such a reservoir would require a permit as a treatment works under Wyoming statute.⁸³ The reservoirs are designed to hold pollution. They are not designed or built for the purpose of holding natural water flows – stream flow and precipitation. Rather, they were built to hold waste: specifically the CBM produced water.

Treating the reservoirs as treatment works would have inhibited CBM operations. In order to obtain a permit for a treatment works, the permit applicant must demonstrate that the reservoir poses no threat of discharge of pollution of groundwater and there must be a subsurface study undertaken that can demonstrate compliance with groundwater protections.⁸⁴ As mentioned above, the reservoirs were designed to leak into groundwater. If they were lined and did not, they would fill up and their utility for holding the CBM water would be gone. In fact, the NPDES permit requires a CBM operator who wants to use a reservoir to submit a “water balance” that demonstrated that the rate of loss of water (considering inflow, infiltration, evaporation, evapotranspiration, and, if appropriate, surface discharge), would “balance,” i.e. there would be enough loss of water to match the water flowing into the reservoir from the discharge.⁸⁵

Rather than reviewing plans to construct CBM reservoirs as treatment works under Chapter 3 of the Wyoming Water Quality Rules and Regulations, DEQ has chosen to treat the reservoirs like waters of the state. Stock watering ponds are not permitted as treatment works, DEQ reasoned, and these reservoirs are like stock watering ponds. In fact, in some instances, cattle do use these ponds to drink the water. So, a neat solution suggested itself. No permit to construct would be required. And there would be no necessity to try to protect groundwater – since stock watering ponds do not pose a threat to groundwater – at least not as far as DEQ was concerned.

DEQ has taken two other steps to make getting an NPDES permit for CBM produced water easier for operators. The result has been less pro-

82. *Id.* at 2.

83. WYO. STAT. ANN. § 35-11-301(a)(iii) (LexisNexis 2003).

84. WYO. RULES & REGS., DEP'T OF ENVTL. QUALITY, WATER QUALITY, Ch. 3, § 17 (Weil's 2003).

85. DEQ Updated Options, *supra* note 78, at 2.

tection for the waters and less opportunity for public involvement in the decisions. In April 2002, DEQ issued a general permit that authorized the discharge of CBM water to “off channel containment units,” or total containment ponds, without the necessity for the permittee to apply for an individual permit.⁸⁶ A CBM operator must submit certain information to the DEQ at least thirty days prior to the planned use of the pond. Then DEQ issues an “authorization letter.” The operator is then subject to the terms of the general permit. No public process is involved. Not only is the public denied the opportunity to comment on authorizations under the general permit, but DEQ does not provide any public notice whatsoever of the proposed authorizations. While the public did have the opportunity to comment on the general permit when it was being developed, no opportunity exists to comment on the site-specific impacts of a particular CBM operation.

In addition, DEQ took steps to make the general permit’s effluent limits as easy to meet as possible for CBM operators. DEQ adopted a *categorical Use Attainability Analysis*. This “analysis” simply pronounced as a fact that all CBM reservoirs that were off-channel reservoirs should be classified as Class 4C waters.⁸⁷ Class 4C waters are waters that cannot support aquatic life, the category of lowest quality that exists.⁸⁸ Waters of that category have lower water quality standards, and therefore, lower (i.e. less strict) effluent limitations can be imposed on the permittee for discharges to Class 4C waters.

Wyoming regulations require that a use attainability analysis be made on a case-by-case basis. A lower classification is justified, on an individual basis, only where the original classification or designated use is not feasible because “[h]uman caused conditions or sources of pollution prevent

86. DEQ, *Authorization to Discharge Produced Water from Coal Bed Methane Wells into Off-Channel Containment Units*, Apr. 19, 2002 [hereafter DEQ Off-channel General Permit], available at <http://deq.state.wy.us/wqd/npdesprogram/downloads/13044scan-doc.pdf> (last visited May 12, 2004).

87. On April 22, 2002, DEQ issued a decision notice, adopting a Categorical Use Attainability Analysis for Isolated Effluent Dominated Waters (“CUAA”) (on file with author). The CUAA applies to artificially created ponds, reservoirs and other impoundments

that are 1) developed in an upland area that is outside of the 100 year floodplain and any alluvial deposits associated with a stream or river channel; 2) not connected by a defined channel or other conveyance to a surface tributary system; and 3) the source of water except for occasional precipitation and snow melt is totally derived from effluent, permitted by the State under the provisions of an NPDES permit.

Id.

88. WYO. RULES & REGS., DEP’T OF ENVTL. QUALITY, WATER QUALITY, Ch. 1, § 4(d)(iii) (Weil’s 2003).

the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place”⁸⁹

Nevertheless, DEQ made a blanket determination that all the off-channel containment reservoirs did not deserve any better than a Class 4C classification because they were “effluent dominated.” DEQ seemed to ignore arguments by CBM operators that the water was just like that found in rivers and streams since they did not add anything to it. The result will be a landscape fundamentally changed – dotted by man-made reservoirs designated for minimal use.

The general permit for off-channel reservoirs imposes limited requirements on CBM operators. The permit limits chlorides in the produced water to 2000 mg/l and total dissolved solids to 5000 mg/l.⁹⁰ It limits dissolved lead to 100 ug/l, dissolved copper to 0.5 mg/l, and dissolved cadmium to ug/l.⁹¹ The permit requires monitoring of the discharge.⁹² It also requires monitoring of the water within the reservoirs every six months for total selenium, specific conductance, chlorides, and sulfates.⁹³ It does not, however, mandate any groundwater monitoring.⁹⁴

Some CBM operators in Wyoming are experimenting with atomizing to disperse some of the produced water. This involves spraying the water in a mist over the land. In some cases, this may be used as an irrigation method. Under these circumstances, if an operator is using an atomizer for agricultural purposes at agronomic rates, DEQ has not required a permit.⁹⁵ Arguably, even an atomizer used for agriculture would require an NPDES permit since it is a point source that results in discharges to waters of the state. If an atomizer is being used simply for disposal of the water, DEQ would require a permit.⁹⁶ DEQ prohibits the use of water from a reservoir simply for disposal; it must be used for agricultural purposes.⁹⁷

Regarding stormwater, DEQ has developed a general NPDES construction permit.⁹⁸ CBM operators who clear, grade, excavate, or otherwise

89. *Id.* § 33(b)(iii).

90. DEQ Off-Channel General Permit, *supra* note 86, at I.B.2.

91. *Id.*

92. *Id.* at I.B.3.

93. *Id.* at I.B.4.

94. *Id.* at I.B.1.d. DEQ may require groundwater monitoring on a case-by-case basis. *Id.*

95. DEQ, State Engineer’s Office, Wyoming Oil and Gas Commission, *Summary of Questions and Answers Period for Coalbed Methane Permitting Coordination Meeting*, Jan. 7, 2002, at 1, available at <http://deq.state.wy.us/wqd/npdesprogram/cbm/downloads/2-0127a-ltr.pdf> (last visited May 12, 2004).

96. *Id.*

97. *Id.*

98. DEQ, *Authorization to Discharge Storm Water Associated with Large Construction Activity Under the National Pollutant Discharge Elimination System (NPDES)*, June 1, 2002 [hereafter *Authorization to Discharge Storm Water Associate with Large Construction Activ-*

disturb five or more acres must seek coverage under this general permit (or obtain an individual permit) prior to disturbing any soil at the site.⁹⁹ The five acres do not need to be contiguous nor do they need to be disturbed all at one time. A phased project that will ultimately disturb five or more acres must be covered at the start of construction.¹⁰⁰ The permit requires the operator to submit a storm water pollution prevention plan identifying specific erosion and sediment controls and methods for inspection and maintenance.¹⁰¹ The permit explicitly provides that “storm water discharges from construction sites shall not cause pollution, contamination, or degradation to waters of the state.”¹⁰² In addition, the pollution prevention plan “shall ensure that the storm water discharges do not cause a violation of Wyoming Water Quality Standards.”¹⁰³ Storm water permit coverage is required until the site is “finally stabilized,” which requires that all soil disturbing activities are complete and vegetative coverage has been established with a density of at least seventy percent of the native background cover on all disturbed areas that have not been paved over or covered by permanent structures.¹⁰⁴

IMPROVEMENT NEEDED

Several improvements are needed in DEQ’s discharge permitting to ensure that the agency fulfills its responsibility to protect water quality from the impact of CBM development. First, the agency needs more resources. In an effort to approve new wells as quickly as possible, too little effort and time is going into ensuring that existing wells are in compliance with permit conditions intended to limit damage to the environment and other land uses. Effective monitoring is needed to ensure that the permit conditions are adequate to protect the environment and other uses of the land. In addition, more thorough analysis and stricter controls for both off-channel and on-channel reservoirs are needed. Finally, options other than surface discharge and containment, such as reinjection should be considered.

ity], available at <http://deq.state.wy.us/wqd/npdesprogram/Storm/downloads/2-0924-doc.pdf> (last visited May 4, 2004).

99. 40 C.F.R. § 122.26(a)(v)(D)(2) (2004); see also DEQ, *NPDES Storm Water Permits and the Oil and Gas Industry Including Coalbed Methane*, at 2 [hereafter *NPDES Storm Water Permits*], available at <http://deq.state.wy.us/wqd/npdesprogram/Storm/downloads/12800-doc.pdf> (last visited April 23, 2004).

100. NPDES Storm Water Permits, *supra* note 99, at 1.

101. Authorization to Discharge Storm Water Associated with Large Construction Activity, *supra* note 98, at Part IV.3.

102. *Id.* at Part VI.A.

103. *Id.* at Part VI.B.

104. NPDES Storm Water Permits, *supra* note 99, at 3. In March 2003, the federal requirement for a stormwater permit was extended to construction activities disturbing one acre or more. 40 C.F.R. § 122.26(b)(15). USEPA, however, has excused oil and gas activities less than five acres from getting a stormwater permit until 2005. 68 Fed. Reg. 11,325 (Mar. 10, 2003) (to be codified at 40 C.F.R. pt. 122).

A. *DEQ Needs More Resources*

DEQ simply does not have the information it needs to fulfill its responsibilities to prevent damage to the environment and other uses of the land.¹⁰⁵ Effective monitoring of baseline conditions and changes that are occurring to water quality, fish populations, aquatic communities, and habitat health is essential to allowing development to move forward in a way that preserves Wyoming's treasured natural resources and the varied uses of its lands. Such monitoring is not occurring now.

The limited analysis that has been done of the impacts to water quality from CBM development demonstrates the potential for significant harm. A study conducted by Confluence Consulting for the Powder River Basin Resource Council concluded that higher SAR values and other pollutants from CBM discharges threaten several fish populations in the Powder River watershed, as well as making water in the basin less useful for irrigation and encouraging noxious weed invasions.¹⁰⁶ For example, noxious salt cedar is rapidly displacing native cottonwoods along stream banks affected by CBM discharges.¹⁰⁷ The salt cedar is more tolerant of the salts the CBM discharges are adding to the soils. According to the Confluence Study, "the role of increased salt loading from CBM development to favor salt cedar over cottonwoods may have ramifications for many other species including wildlife and fish."¹⁰⁸ Bald eagles and great blue herons, for example, rely on cottonwoods for roosting and nesting.¹⁰⁹

In addition, tests conducted by DEQ of coalbed methane produced water from Burger Draw in the Powder River Basin found the water toxic to various forms of stream life.¹¹⁰ The tests measured Whole Effluent Toxicity (WET). DEQ is planning to require more testing of water from the Big George coal seam.¹¹¹ According to DEQ, once the toxins have been identified, the agency will require CBM producers to develop a plan for mitigating the problem, either by filtering the toxins out of the water or impounding the water.¹¹² These problems should be addressed and treatment options put in

105. As a result of the inadequacies of DEQ's NPDES program, the Wyoming Outdoor Council and Powder River Basin Resource Council petitioned EPA in March 2001 to withdraw Wyoming's authority to issue permits. In response, the EPA identified eighteen areas where it believed that DEQ had failed to properly implement the program. DEQ officials continue to work with EPA to address these problems. Dustin Bleizeffer, *CBM Inspection, Monitoring Get Extra Funding*, CASPER STAR TRIB., Mar. 17, 2004.

106. Confluence Study, *supra* note 19, at 1.

107. *Id.* at 65.

108. *Id.*

109. *Id.*

110. Dustin Bleizeffer, *Testing Required for Big George Water*, CASPER STAR TRIB., Mar. 7, 2004.

111. *Id.*

112. *Id.*

place before, rather than after, DEQ has permitted the dramatic expansion of CBM methane wells in the state.

Up until 2004, DEQ had only one full time equivalent (FTE) employee conducting inspections in the Powder River Basin. Given the approximately 4000 CBM water discharge points in the area, this meant the inspector could perform a compliance inspection on each site only once during the five-year lifetime of its permit.¹¹³ DEQ has had to rely on self-monitoring reports by industry, but many companies are simply not submitting them as required.¹¹⁴ To help address this situation, the Wyoming legislature provided DEQ's Water Quality Division three million dollars in additional funds.¹¹⁵ In addition, the governor signed HB 12 which provides for NPDES permit fees of \$100 per year.¹¹⁶ While a step in the right direction, such action is undoubtedly not enough to handle the anticipated rush to drill an additional 36,000 CBM wells in the next ten to fifteen years.

B. Off-Channel Reservoirs Require Construction Permits that Protect Groundwater and Provide for Reclamation.

Title 35, chapter 11, section 301(a)(iii) of the Wyoming statutes requires CBM operators to obtain a construction permit before using off-channel reservoirs to store produced water. The statute provides: that “[n]o person, except when authorized by a permit issued pursuant to the provisions of this act, shall . . . construct, install, modify or operate any sewerage system, treatment works, disposal system or other facility, excluding uranium mill tailing facilities, capable of causing or contributing to pollution.”¹¹⁷ The statute defines “treatment works” as “any plant or other works used for the purpose of treating, stabilizing or holding wastes.”¹¹⁸ There is no dispute that the produced water is a waste product of CBM development. The reservoirs are specifically constructed to hold the unused produced water. Consequently, these reservoirs fall squarely within the definition of “treatment works.”

Even if the reservoirs were not considered “treatment works,” they are certainly a “facility . . . capable of causing or contributing to pollution.” Wyoming statute defines “pollution” as “contamination or other alteration of the physical, chemical or biological properties of any waters of the state.”¹¹⁹

113. Dustin Bleizeffer, *Report: DEQ Lacks Enforcement*, CASPER STAR TRIB., Feb. 2, 2004.

114. *Id.*

115. Dustin Bleizeffer, *CMB Inspection, Monitoring Get Extra Funding*, CASPER STAR TRIB., Mar. 17, 2004.

116. H.R.B. 12, 57th Leg., Spec. Sess. (Wyo. 2004) (enacted Mar. 4, 2004).

117. WYO. STAT. ANN. § 35-11-301(a)(iii) (LexisNexis 2003).

118. *Id.* § 35-11-103(c)(iv).

119. *Id.* § 35-11-103(c)(i). The definition of pollution excludes water derived in association with oil or gas production, but only if disposed of in a well. *Id.*

As discussed above, CBM produced water is “pollution.” It changes the quality of the water into which it is discharged or migrates. “Waters of the state” mean all surface and groundwater.¹²⁰ The CBM reservoirs are not generally lined and are in fact designed to leak.¹²¹ Consequently, the wastewater the reservoirs hold is likely to enter groundwater aquifers and in some cases surface waters.

In order to avoid regulating the off-channel reservoirs as treatment works, DEQ has treated the reservoirs themselves as part of the “waters of the state,” rather than a mechanism contributing pollution to the waters of the state. Wyoming law, however, simply does not support DEQ’s interpretation. DEQ’s own regulations define “surface waters of the state,” as “all perennial, intermittent and ephemeral defined drainages, lakes, reservoirs and wetlands which are not man-made retention ponds used for the treatment of municipal, agricultural or industrial waste.”¹²² Thus, the regulations explicitly exclude the man-made reservoirs constructed to retain the industrial waste water produced by CBM operations.

In order to obtain the necessary construction permit, a proposed operator must demonstrate that “the facility poses no threat of discharge to groundwater.”¹²³ The permit applicant must provide data that either demonstrates that no discharge to groundwater will occur, including “by direct or indirect discharge, percolation or filtration” or that the “quality of wastewater will not cause any violation of groundwater standards.”¹²⁴

Since the reservoirs are designed to leak, however, CBM operators are not in a position to demonstrate the absence of any potential discharge to groundwater. Consequently, the regulations require a CBM operator to undertake a subsurface study that can demonstrate compliance with Wyoming Water Quality Rules and Regulations for the protection of groundwater.¹²⁵ The regulations specify what the study must contain, including information on: (1) the type, quantity, source, and chemical, physical, radiological, and toxic characteristics of the CBM produced water that will be stored; (2)

120. *Id.* § 35-11-103(c)(vi).

121. DOE PRIMER, *supra* note 9, at 48 (“Artificial impoundments can cause water infiltration into the soil and migration into surface water, and accidental releases of wastes can migrate into water bodies.”).

122. WYO. RULES & REGS., DEP’T OF ENVTL. QUALITY, WATER QUALITY, Ch. 1, § 2(a)(xlv) (Weil’s 2003).

123. *Id.* at Ch. 3, § 17(a). If no possibility of discharge from the reservoirs to groundwater or surface water existed, no discharge permit would be necessary. The construction permit would serve the necessary function of addressing potential degradation of water quality. Unfortunately, DEQ has chosen not to require construction permits and the discharge permits they are issuing do little to address the environmental threats from hundreds of man-made reservoirs of CBM water that will soon dot portions of the Wyoming landscape.

124. *Id.*

125. *Id.* § 17(b).

existing water wells within one-quarter mile radius of the proposed facility, as well as all domestic and public water supplies located within a one mile radius of the facility; and (3) pre-operational wells to accurately characterize the subsurface environment.¹²⁶ These requirements would help DEQ proceed to permit CBM discharges with information about water quality impacts, rather than with ignorance, as they are now.

In addition to the collection of data prior to the construction, Wyoming regulations applicable to treatment works require CBM reservoirs to monitor the quality of affected or potentially affected surface water and groundwater.¹²⁷ Monitoring is required both during operations, as well as after operations are complete.¹²⁸ Although not explicitly required, the regulations provide DEQ the authority to modify a permit based on the monitoring information collected.¹²⁹ Little, if any, of this monitoring is occurring now.

Furthermore, DEQ should explicitly include in any reservoir construction permit it issues to a CBM operator provisions providing for reclamation after completion of operations. With a decade or more, in some cases, of saline/sodic water dumped into them, CBM reservoirs in some areas will become barren, salt-laden areas. As a condition of their construction permit, CBM operators should be required to remove and appropriately dispose or bury affected soils in reservoirs.

Although neither DEQ construction permit requirements nor the off-channel general NPDES permit provide for reclamation, regulations by the Wyoming Oil and Gas Conservation Commission (WOGCC) do.¹³⁰ In addition, the WOGCC requires bonding for reservoir pits. The bond is designed to ensure that the reservoirs

shall be operated and maintained in such a manner as to not damage the environment or to not cause undue harm to health and safety of employees and people residing in close proximity to the pit and that upon permanent abandonment of the project or last use of the pit, the pit shall be closed and the adjacent areas reclaimed in accordance with the rules and regulations of the Commission.¹³¹

The bonds are based upon a cost estimate done by a Wyoming registered

126. *Id.* § 17(b)(i), (v) & (vi).

127. *Id.* § 17(e).

128. *Id.* § 17(d).

129. *Id.* § 15 (Weil's 2003).

130. WYO. RULES & REGS., DEP'T OF ENVTL. QUALITY, OIL GEN., Ch. 4, § 1(gg) (Weil's 2003).

131. *Id.* Ch. 3, § 4(h).

engineer, based upon the costs of reclamation or “closure” of the reservoirs. The bonds generally range between \$12,000 and \$100,000 per reservoir.¹³²

C. Tighter Controls are Necessary for In-Channel Reservoirs and Direct Discharges to Wyoming Water

Because of the specific requirements, like bonding, that the Wyoming Oil and Gas Conservation Commission has begun to require for off-channel reservoirs, CBM operators in Wyoming are increasingly turning to on-channel ones. DEQ’s construction permit requirements should apply to both on-channel reservoirs and off-channel reservoirs. In fact, because they are located within a drainage, discharge and harm to the state’s surface waters is even more likely when the reservoirs are built within drainages, rather than outside them.

It is puzzling that on-channel reservoirs are allowed at all. DEQ’s own regulations explicitly prohibit such reservoirs. The regulations state,

Skim ponds used for the purpose of treating produced water and disposal pits used for the retention of drilling muds and other liquid and solid wastes associated with the drilling of oil and gas wells shall not be located:

- (a) Within the ordinary high water mark of perennial rivers, streams or creeks; and
- (b) In the bottoms of rivers, streams or creeks, draws, coulees, or other natural drainages into which natural runoff may flow and/or enter.¹³³

As discussed previously, the only purpose for the reservoirs is to dispose of the tremendous amount of water produced, but not used, in the process of extracting methane gas. CBM reservoirs are built for the “retention of . . . liquid . . . wastes associated with the drilling of oil and gas wells” and pursuant to DEQ’s water quality regulations should not be located in natural drainages.¹³⁴

In addition, WOGCC regulations prohibit on-channel reservoirs. The regulations provide, “Pits of any kind shall not be constructed in drainages, or in the floodplain of a flowing or intermittent stream, or in an area

132. Telephone Interview with Janie Nelson, WOGCC (Mar. 19, 2004).

133. WYO. RULES & REGS., DEP’T OF ENVTL. QUALITY, WATER QUALITY, Ch. 7, § 9 (Weil’s 2003).

134. *See id.*

where there is standing water during any portion of the year.”¹³⁵ While WOGCC changed its regulations in 2002 to allow for the infiltration (or “percolation”) of CBM water from unlined pits into the surrounding soils and groundwater for off-channel reservoirs, the Commission explicitly retained the ban on on-channel reservoirs for that (or any) purpose.

DEQ must also address anti-degradation requirements when allowing discharges into surface waters. The purpose of the Clean Water Act is to protect existing high quality waters, as well as clean up polluted ones.¹³⁶ Federal law requires states to adopt and implement a policy that prohibits the reduction of water quality except in limited circumstances and after the public has a say in the decision.¹³⁷ Wyoming’s anti-degradation regulations provide that all existing water uses must be fully maintained and protected.¹³⁸ For this reason, DEQ cannot authorize the discharge of CBM water without first identifying any existing irrigation or other uses of the water into which the discharge will flow. DEQ has an affirmative obligation to ensure that the proposed discharge will not interfere with the existing uses.

Additional limitations apply when the discharge may affect Class 1 waters. These waters have been designated as outstanding national resources and any reduction in their water quality is absolutely prohibited.¹³⁹ All surface waters within the boundaries of national parks and congressionally designated wilderness areas as of January 1, 1999, are designated as Class 1 waters.¹⁴⁰ In addition, portions of the mainstem of the Green River, the Middle Fork of the Powder River, and the mainstem of the Tongue River (as well as the North and South Forks) are Class 1 waters.¹⁴¹

135. WYO. RULES & REGS., DEP’T OF ENVTL. QUALITY, OIL GEN., Ch. 4, § 1(w) (Weil’s 2003).

136. 33 U.S.C. § 1251(a) (2004) (explaining that the purpose of the chapter is to “restore and maintain . . . the Nation’s waters”).

137. 40 C.F.R. § 131.12 (2004).

138. WYO. RULES & REGS., DEP’T OF ENVTL. QUALITY, WATER QUALITY, Ch. 1, § 8 (Weil’s 2003).

139. 40 C.F.R. § 131.12(a)(3); WYO. RULES & REGS., DEP’T OF ENVTL. QUALITY, WATER QUALITY, Ch. 1, § 4(a) (Weil’s 2003).

140. DEQ, Water Quality Division, *Wyoming Surface Water Classification List*, June 21, 2001, at A-1, available at <http://deq.state.wy.us/wqd/surfacestandards/Downloads/2-3648-doc.pdf> (last visited May 13, 2004).

141. To the extent that these on-channel reservoirs are located in waters of the United States, the dams that are built as part of the on-channel reservoir construction must also be permitted pursuant to Section 404 of the Clean Water Act. 33 U.S.C. § 1344 (2004). Dredge and fill activities taking place in waters of the United States must be permitted by the U. S. Army Corps of Engineers, or states that have assumed primacy over the program. In Wyoming, it is the Corps that issues those permits. In an effort to ease its administrative permitting burden, the Corps issued a general permit to cover most on-channel reservoirs, thus eliminating the Corps’ obligation to issue individual permits for them. This permit is known as GP 98-08. General Permit 98-08, available at <http://www.nwo.usace.army.mil/html/od-rwy/gp9808.pdf> (last visited May 13, 2004). GP 98-08 allows the construction of dams for

D. DEQ Should Consider Other Treatment Options

Two alternatives to reservoirs exist that may reduce the environmental harm from CBM produced water – reinjecting the produced water and treating it to improve its quality before discharging it. Neither method has been widely used in Wyoming. Reinjection could avoid the tremendous waste of the water that is produced. The water once withdrawn can be injected back into the ground to remain a part of some groundwater aquifer. The issue that often arises is which aquifer. CBM companies often maintain that injection into certain aquifers is not possible because the aquifer is “full.” In other words, the aquifer is under pressure and the injection of additional water is not feasible except at considerable cost, due to the need to employ a great deal of pressure to be able to inject the water into the aquifer in question. But with respect to some formations, injection may be feasible. Using an aquifer deeper than the coal seam from which the methane is being withdrawn could provide a feasible means for injection.¹⁴²

These aquifers are often 5000 or 6000 feet from the surface. The water quality of these aquifers is generally brackish and poorer than the CBM water that would be injected into it. There is no question that such aquifers could be effectively used, without the need for costly pressurized reinjection. The complaint concerning this approach is that such reinjection would result in the “waste” of the CBM water, since it would be commingled with much worse water in the aquifers themselves. Yet, this may provide a better option than the waste now occurring. There is far more water being stored in reservoirs than could ever be used by livestock or wildlife. Much of it is simply evaporating or flowing downstream and out of the state without being utilized. At least with a reinjection approach, the water is being saved underground, and could be used at some time in the future when filtering techniques improve, for some beneficial purpose.

Some companies are experimenting with treating the produced water so that it can be used for irrigation of crops. Western Gas Resources is using

on-channel reservoirs built in connection with oil and gas development in waters of the United States if the dam affects up to .3 acre of wetlands or waters of the United States or less. It is applicable throughout Corps’ Omaha district, covering most of Wyoming including all of the Powder River Basin. This permit has been challenged in court by the Wyoming Outdoor Council, Powder River Basin Resource Council, and Biodiversity Conservation Alliance, in a case in Federal District Court in Wyoming before Judge William F. Downes. Wyoming Outdoor Council et al. v. U.S. Army Corps of Engineers, No. 02-CV-155-D (D.D.C. filed Jan. 15, 2002, transferred to D. Wyo. Aug. 27, 2002). In March of 2004, the Corps gave public notice that it was considering promulgating a new general permit that would cover on-channel reservoirs with dams that affect up to .5 acre of wetlands, or waters of the United States, within a geographic area limited to the Powder River Basin. See <http://www.nwo.usace.army.mil/html/od-rwy/pn/pn03-04.pdf> (last visited May 13, 2004).

142. See, e.g., DOE PRIMER, *supra* note 9, at 49 (“In the case of CBM, large quantities of produced water could be stored in depleted aquifers or coal seams where gas has been depleted.”).

equipment operated by Sheridan-based Emit Water Discharge Technology to treat water from sixty-one wells in the Powder River Basin.¹⁴³ The process sends discharged water through a vertical loop that is packed with resin. A chemical reaction extracts the sodium, as well as chloride, sulfate and other ions. According to Tim Mullen, a project engineer for Western Gas Resources, "It's kind of like the opposite of the water softener system you have in your house. . . . While a water softener uses calcium and magnesium to put sodium into the water, the treatment plants reverse the process by removing the sodium, essentially 'hardening' the water."¹⁴⁴ The process produces a concentrated brine solution that must be disposed of, but that represents only one percent of the total volume of water treated.¹⁴⁵

The technology, however, remains unproven. While Powder River Gas, which is developing Quanneco's leases in Montana indicated in its wastewater permit application that they will use the treatment process, Montana regulators have concerns. While the process brings the SAR down, it can cause the electrical conductivity to increase and also cause problems in meeting other numeric water quality standards set by Montana like the ammonia standard.¹⁴⁶

CONCLUSION

In sum, CBM produced water threatens to alter fundamentally the landscape and sensitive ecosystems of large areas of Wyoming. The environmental consequences resulting from on-channel reservoirs and direct discharges to surface waters appear to be severe, altering the stream ecosystems for the drainages where they are utilized. The impact on agriculture is also significant – often ruining downstream use of the water for irrigation – either because there is not enough water, or because what is available is too saline or too high in sodium. Off-channel reservoirs pose less risk to stream channels, but their impact upon groundwater, while largely unknown, is quite likely to be significant given the volumes of water involved.

143. Eryn Gable, *Treatment Promises to Make Water Discharges Suitable for Irrigation*, Land Letter, Feb. 26, 2004, available at <http://www.eenews.net/Landletter.htm> (last visited May 13, 2004). See also Dustin Bleizeffer, *Bad Water Makes Industry Thirst for Fresh Approach*, CASPER STAR TRIB., Apr. 4, 2004.

144. *Id.*

145. *Id.*

146. Email from Leona Waldhausen, Northern Plains Resource Council, to Sharon Buccino, Senior Attorney, Natural Resources Defense Council (NRDC) (Mar. 1, 2004) (on file with author). Another technology being considered is sulfur burners. Harmon Systems International is conducting a "sulfur burning" water treatment project for CBM producer JM Huber Corp. Dustin Bleizeffer, *Salty Big George Water Inspires Innovation*, CASPER STAR TRIB., Apr. 4, 2004. The burners provide a controlled combustion process that oxidizes sulfur and produces acid. This lowers the pH of water passing through the burner. *Id.* According to a Harmon Systems partner, a sulfur burner can treat produced water from a group of about a dozen wells or more at a cost of "pennies on the barrel." *Id.*

Discharge permits offer both DEQ and the affected public a mechanism to ensure that CBM operators address the potential damage they may cause to water quality. DEQ should require ground and surface water monitoring, both of baseline conditions, as well as changes to water quality during operation. In addition, if DEQ continues to rely on reservoirs, CBM operators must take sufficient steps to ensure reclamation when their operations are complete. Better solutions, such as reinjection of the water, may exist and should be thoroughly analyzed before simply allowing a CBM operator to dump large amounts of water into newly created reservoirs or onto the surface of the land.

