COMMENTS – 2006

PAW & Member Companies

Environmental Quality Council Hearings

CHAPTER 2 WATER QUALITY RULES AND REGULATIONS

Resubmitted by

PETROLEUM ASSOCIATION OF WYOMING

August 26, 2008

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February 9, 2006

Mr. Mark Gordon
Chairman
Environmental Quality Council
Herschler Building 1W
Cheyenne, Wyoming 82002

Dear Mr. Gordon:

The Petroleum Association of Wyoming (PAW) welcomes this opportunity to present to the Environmental Quality Council (Council) information regarding the Petition to Amend Wyoming Water Quality Rule, Chapter 2, Appendix H (Petition) filed on December 7, 2005 by the Powder River Basin Resource Council (PRBRC) and several of its members.

PAW is Wyoming's largest oil and gas trade association, members of which account for over 90% of the natural gas and 80% of the crude oil produced in the state.

The Environmental Quality Council should deny PRBRC's Petition for Rulemaking (the Petition) for several reasons. First, PRBRC focuses only on agricultural use of produced water and not on wildlife propagation and other beneficial uses. Second, PRBRC's assertion, based on federal and out-of-state law, that WDEQ has the authority to regulate water quantity is erroneous. Third, PRBRC's proposed rulemaking would have many unintended consequences for all agricultural users if implemented. We have briefly outlined these issues below. Finally, PRBRC's assertion that produced water is not of good enough quality to be used for agricultural purposes is not supported by the best available scientific evidence.

<u>PRBRC's Quantification Demand Fails to Take into Account All Beneficial Uses</u>

The PRBRC's petition asks the Council to adopt rules requiring that, essentially, all oil and gas production facilities quantify exactly the amount of produced water that will be beneficially used, as allegedly required under Appendix H. This requirement is based on one very significant erroneous assumption – that the only viable beneficial use for produced water is for livestock watering. As can be seen from even a superficial reading of the PRBRC Petition, PRBRC focuses exclusively on livestock watering when seeking a quantification of produced water that can be beneficially used. The federal regulation on which WDEQ's beneficial use policy is based (40 C.F.R. Part 435) contemplates water "that has a use in agriculture or wildlife propagation." This phrase, in turn, is defined to mean, "the produced water is of good enough quality to be used for *wildlife or livestock watering or other agricultural uses."* Given the regulation, it is clear that not only does beneficial use include livestock watering, but also

wildlife propagation and other agricultural uses. Certified soil scientists Kevin C. Harvey and Dina E. Brown have published information entitled "Managed Irrigation for the Beneficial Use of Coalbed Natural Gas Produced Water: The Fidelity Experience". The publication details data collected from a successful managed irrigation operation on behalf of Fidelity Exploration and Production Company of Sheridan, Wyoming. A copy of the publication is attached for your convenience.

As you know, produced water has been used successfully for both wildlife propagation as well as agricultural irrigation. PRBRC's Petition ignores this fact. While PRBRC may have some method for calculating how much water one animal unit may drink (although it has not set forth that method in its Petition), it has not explained how to calculate how much water is used for wildlife propagation or irrigation. For example, PRBRC has in no way addressed how a producer can estimate how much water is used by a flock of geese or by a single alfalfa plant.

The petitioners are suggesting that by allowing the rule to be promulgated, the use of the water will be maximized. This is not the case. Wildlife and livestock clearly use produced water whenever it is available. The burden should lie with the petitioners to demonstrate that wildlife and livestock do not utilize the water that is available to them. In fact, the water is creating aquatic habitat that was not available prior to the discharge. The Wyoming Game and Fish Department (WGFD) has issued statements that the water discharged by oil and gas operations is beneficial to wildlife. If the proposed rulemaking is put into effect, many oil and gas producers will be forced to shut-in current water production and industry as a whole will have to rethink how produced water is handled in the future. As a result, a source of water that livestock, irrigators and wildlife have come to depend on will be eliminated and any future beneficial uses of produced water will never be realized.

Finally, the Department has already answered the question raised by the petitioners as to the use of "beneficial use". In the Department's document entitled Wyoming Water Quality Rules and Regulations, Chapter 2, Permit Regulations for Discharges to Wyoming Surface Waters, EQC Version 1, Response to Comments, June 2004, the Department responds to the petitioners' related questions:

> Commenter writes: "A quantity parameter must be included in the quality/beneficial use standard in order to have it serve any useful purpose. (Appendix H(d)(i) suffers from the same infirmities). The issue of implying all the CBM water being discharged is of beneficial use for livestock and wildlife is mostly false. While it is true that a very, very small total percentage of the CBM water is being put to beneficial use, the majority is running downstream causing damages to soil, vegetation, fisheries and downstream irrigators. The volumes of water are so great it cannot possibly all be beneficially used by cattle, wildlife or people in all of Wyoming. Allowing a paid industry consultant to make this claim of beneficial use, when the landowner will not, goes even further down the road of false claims regarding the beneficial use of water. The beneficial

use of this CBM water should be supported by the volume of water that can actually be used for livestock and wildlife by the landowner and not more should be allowed to be wasted by dumping it on the surface and allowing it to cause damage downstream."

WDEQ responds: "40 CFR 435 allows for the discharge of produced water if the water is used by wildlife or agriculture during periods of discharge. This was a provision that was supported by the Wyoming DEQ, Wyoming Game and Fish, and many landowners within Wyoming to allow for the continued use of produced water rather than re-injecting the water. It is the DEQ's opinion that there should not be a quantity limitation related to the agricultural and wildlife use determination. The federal regulations did not contemplate a maximum allowable flow rate but rather that the water being discharged was actually used by wildlife or agriculture during periods of discharge. It was not the intent of the federal regulations that all the water be consumed."

After careful consideration of all comments received during the recent rulemaking effort, the Department determined, and was supported by EPA and the Governor, that no changes to the proposed regulation were necessary. Counsel for the PRBRC has made the same argument in the past. In a letter dated April 22, 2004, PRBRC's counsel made very similar comments to the EQC that were reviewed, considered and rejected by the Council and WDEQ. On December 3, 2004 the Governor responded to a letter sent by the Petitioners' counsel, dated September 10, 2004, regarding the same comments. In the response letter, the Governor stated, "As you know, I have signed the rules. However, based on your interest and scrutiny of certain aspects of the rule, I have reviewed the issues with DEQ and find that the rule is appropriate." The Governor goes on to address the specific provisions of Appendix H stating, "... I understand that those provisions are designed to be consistent with the provisions of 40 CFR Part 435 "Oil and Gas Extraction Point Source Category" which allows for the discharge of produced water if the water is used by wildlife or agriculture during periods of discharge."

In addition, the WGFD has issued several awards for Natural Resource Stewardship for the use of these waters.

In an attached 2003 press release, the WGFD states:

Oil and Gas Reclamation and Wildlife Stewardship Award

Howell Petroleum, Midwest
Using extra water from their oil recovery operations in the Salt Creek Oil Field, Howell Petroleum has turned Petro Reservoir into a viable put-and-take trout fishery near Midwest. The water that is released into the drainage above the reservoir also benefits waterfowl and creates a valuable riparian area and reliable water source for terrestrial wildlife.

"This work provides an obvious example that oil development and environmental interests can coexist," said Bill Wichers, Game and Fish Department deputy director of external operations.
The Bureau of Land Management and Department of Environmental Quality also contributed to the Petro Reservoir project.

In addition the same press release states:

Coalbed Methane Natural Resource Stewardship Award

J.M. Huber Corporation, Sheridan
The J.M. Huber Corporation was honored for their diligence in using discharge water from their coalbed methane wells to benefit wildlife in their Lower Prairie Dog Field. Surface application of the water has enhanced forage for deer and antelope while creating cover for sage grouse, doves, pheasants, turkeys and raptors.
"The land stewardship the Huber Corporation demonstrates is beyond the scope of traditional business practices, " Wichers said.

Further a 2004 WGFD press release (attached) states:

WYOMING ENERGY COMPANIES AND ORGANIZATIONS AWARDED FOR RESOURCE STEWARDSHIP

Devon Energy, Wright

Using the water discharged from their Pine Tree coal-bed methane area near Wright, Devon Energy has created two stock ponds and upgraded six others. The planned use of water has also provided about a dozen water discharge sites and another dozen stock tanks in downstream areas.

"This judicial use of discharge water has resulted in several miles of improved riparian vegetation along normally dry draws," Wichers said. "Watering sites have been created benefiting a great variety of wildlife, and the ponds are used as nesting habitat for waterfowl and other water birds."

The discharge is also benefiting hunters as a large portion of the improved habitat is within an area enrolled as a public walk-in hunting area.

<u>WDEQ Does Not Have the Authority to Regulate Water Quantity</u>

Second, PRBRC asserts that WDEQ has the authority to regulate water quantity and, in so doing, can impose quantity limits on produced water. This assertion disregards the authority

granted to WDEQ by the Wyoming Constitution and WDEQ's enabling statutes. The Environmental Quality Act states that nothing in the Act "limits or interferes with the jurisdiction, duties or authority of the state engineer [or] the state board of control..." W.S. 35-11-1104 (a)(iii). The Wyoming Constitution, in turn, provides that the State Engineer and the Board of Control " shall, under such regulations as may be prescribed by law, have the supervision of the waters of the state and of their appropriation, distribution and diversion." Wyoming Constitution, § 97-8-002. Furthermore, the State Engineer has "general supervision of the waters of the state." Wyoming Constitution § 97-8-005.

PRBRC has cited several cases in which a court has determined that an agency can regulate water quantity in an effort to regulate water quality. However, these cases are not based on Wyoming law and do not represent the legal and regulatory framework of Wyoming. In this case, Wyoming's Constitution gives primary authority to govern water quantity to the State Engineer, and *specifically* prevents WDEQ from impinging on that authority.

The Proposed Rule Change Will Adversely Affect All Agricultural Use

Third, PRBRC's petition will have the potential to affect all discharge water from any oil or gas operation. Water that has been put to use, water that was requested by landowners for use, water that has benefited wildlife, or water that has been appropriated through the State Engineer's Office will be at risk if the petition is allowed to go to rulemaking. In several basins around Wyoming, water that has been historically discharged from oil or gas operations has been appropriated by landowners for use to water stock and to irrigate crops. These landowners have come to depend on the water that is being produced by the operations and livestock watering practices depend on the continuous presence of produced water at a specific location. PRBRC's petition has the potential to eliminate those uses which agriculture has come to depend on. Finally, the petition also has the potential to put restraints on all agricultural users who use water for livestock watering and agriculture. It is unlikely that agricultural users would be willing to meter out groundwater on a per-head or per-plant basis and that is exactly what the proposed rule change would require.

PRBRC's Assertions that Produced Water is Not Suitable for Agricultural Use is Unfounded

WDEQ, under the authorization of the Clean Water Act and the federal regulations (40 CFR 435), has set effluent limits for discharged produced water at 5000 mg/l total dissolved solids and 3,000 mg/l for sulfates. These standards apply if the water is used by wildlife or agriculture during periods of discharge. Hence, any discharged water must meet these standards in order to gain authorization and approval of WDEQ. WDEQ has issued effluent limits in coordination with the United States Environmental Protection Agency (EPA) in Chapter 2 of the Wyoming Water Quality Rules and Regulations. These limits are set to protect various uses, including livestock watering and other agricultural uses. If the water released from discharges does not meet the standards for a particular use, discharges are prohibited and the Department will not allow the water to be used in that fashion. Finally, water quality data for a

majority of produced water indicates that solids and sulfates levels in produced water are well below the limits set by the standards.

The limits requested by the Petition are clearly not substantiated by science. For example, producers have conducted water quality sampling of the background water (i.e., water quality from precipitation runoff events uninfluenced by produced water) and have found that the background water quality is in most cases of poorer quality than produced water. Ample data supporting this conclusion has been submitted to WDEQ during the WYDES discharge permit application process. The Department and the EPA are required to use sound science and other credible evidence when it comes to setting effluent limits for the various classes of use. As such, the protections afforded by the Department are sufficient to protect all beneficial uses. The PRBRC should also be held to the same standard when suggesting effluent limits and not, as they have done here, merely proposing unsubstantiated numbers out of the blue.

Conclusion

If the Council decides to allow the petition, and the Department begins a rulemaking at the request of the Council, it is our belief the Council will be requiring the Department to ignore W.S. 35-11-302 (a) (vi). The statute clearly states the administrator and the advisory board shall consider facts concerning interference with health and well being of people, animals, wildlife, aquatic life and plant life affected; the social and economic value of the source of pollution; the priority of location in the area involved; the technical practicability and economic reasonableness of reducing or eliminating the source of pollution; and the effect upon the environment. Clearly, given all discussed above, the Department would be in conflict with their governing statutes should the petition be accepted and the rules get amended.

Furthermore, PRBRC has failed to take into account other beneficial uses, such as wildlife, which the federal regulation and the Wyoming Statutes clearly contemplate. Also, PRBRC is asking WDEQ to regulate water quantity for the sake of quality in contravention of WDEQ's enabling statute. PRBRC has failed to provide any new credible evidence in support of the requested changes to the recently promulgated Water Quality Division Chapter 2 rules and regulations. Finally, the WDEQ has already responded to similar objections in the past and has not found any basis for the objections. The PRBRC has produced no new credible evidence that WDEQ and the Council have not already heard and rejected in the triennial review process and the revisions to Chapter 2 of the Wyoming Water Quality Rules & Regulations. Therefore, given the extensive review and consideration these issues have already received during the rulemaking efforts, PAW respectfully requests the EQC deny the proposed petition to amend the Chapter 2 regulations.

PAW appreciates this opportunity to comment and respectfully requests that the PRBRC's petition be denied. Thank you for your consideration of these comments and suggestions.

Sincerely,

John Robitaille
Vice President

Cc: John Corra
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February 10, 2006

Mr. Mark Gordon, Chairman
Environmental Quality Council
Herschler Building, 1W
122 West 25th Street
Cheyenne, WY 82002

Hand Delivered

RE: Filing of Comments to Petition to Amend Water Quality Rules and Regulations Chapter 2, Appendix H, on behalf of:

Petro-Canada Resources (USA) Inc.
Lance Oil and Gas Company, Inc.
Marathon Oil Company
Fidelity Exploration and Production Company
Anadarko Petroleum Corporation
Yates Petroleum Corporation
Williams Production RMT Company

Dear Mr. Gordon:

Enclosed are eight copies of comments submitted on behalf of the companies listed above to the *Petition to amend Water Quality Rules and Regulations, Chapter 2, Appendix H.* Also enclosed is a CD with electronic copies of the Comments and all Exhibits.

Please include these materials in the record for the Council's proceedings scheduled for February 16, 2006.

Sincerely,

Keith Burron

Keith S. Burron

Enc.

BEFORE THE ENVIRONMENTAL QUALITY COUNCIL
STATE OF WYOMING

JOINT RESPONSE IN OPPOSITION TO	)
PETITION TO AMEND WYOMING	)
WATER QUALITY RULE, CHAPTER 2,	)
APPENDIX H	)

The undersigned Respondents, ("Respondents"), hereby file their initial response and opposition to the above-captioned citizen petition for rulemaking ("Petition") filed by the Powder River Basin Resource Council ("PRBRC") and various individual petitioners ("Petitioners").

I. INTRODUCTION

Respondents are coal bed methane ("CBM") producers with operations in the Powder River Basin of Wyoming. Because the Respondents' interests are sufficiently aligned at this stage of the proceedings, they have elected to file this Joint Response to avoid duplication and consolidate the presentation of their views to the Environmental Quality Council ("EQC"). Each Respondent, however, reserves the right to also file individual comments and to participate individually in the event that the EQC accepts the Petition and initiates rulemaking.

II. SUMMARY OF RESPONDENTS' POSITION

Respondents urge the EQC to dismiss the Petition and decline to initiate rulemaking proceedings for legal, procedural and practical reasons. As developed fully in the arguments below, Respondents request the Petition be dismissed for the following reasons:

1. The EQC lacks jurisdiction over the Petitioners' request that the EQC exercise authority over "beneficial use" and "waste" determinations relating to waters of the state.

The Wyoming Constitution, statutes and existing Department of Environmental Quality ("DEQ") regulations vest exclusive authority over these issues in the State Engineer and Board of Control. In addition, Respondents' appropriations of water and the subsequent management of produced water are consistent with the beneficial use requirements under Wyoming law.

2. The Petition is a classic example of the "second bite at the apple." The identical issues raised in the Petition were raised by the Petitioners and others in comments to the DEQ, the Water and Waste Advisory Board ("WWAB"), the EQC and ultimately Governor Freudenthal in the recent Chapter 2 rulemaking proceedings. Now, with the ink barely dry on the new Chapter 2 rules, which took nearly four years to complete, Petitioners are attempting to reopen the rules to address issues that have already been fully considered and resolved. Neither the EQC nor the Respondents should be required to re-examine issues that were thoroughly analyzed in the recent rulemaking simply because Petitioners are dissatisfied with the result.

3. Allowing the Petition to proceed to rulemaking would undermine the reasonable investment-backed expectations of industry and other landowners, and would nullify the DEQ's ongoing watershed based permitting process. Since Petitioners allege that the majority (ninety-nine percent (99%) according to PRBRC) of discharged water is not beneficially used, they apparently seek a wholesale change to historic CBM water management practices.

4. The proposed revisions to the water quality standards for TDS, sulfate and barium are unnecessary and overly stringent.

III. ARGUMENTS

A. The EQC Should Decline to Proceed To Rulemaking On Part I of the Petition

1. Beneficial Use Determinations are Vested in the State Engineer and Board of Control.

In Part 1 of their Petition, the Petitioners argue that the EQC should amend Appendix H to Chapter 2 of the Water Quality Rules and Regulations. *See* Petition at 3-5. The Petitioners propose various amendments to Appendix H "to clarify that discharged water must actually, and not theoretically, be put to beneficial use." *Petition* at 7. Those amendments seek to have the Water Quality Division ("Division") within the DEQ limit the quantity of discharges of CBM produced water to that amount which is actually put to beneficial use. *Petition* at 3-5, 6-8. The EQC, the Division, and the DEQ are statutorily forbidden from making the beneficial use determination that Petitioners seek, and the EQC should dismiss Part 1 of the Petition without proceeding to rulemaking.

A. Water Quality, Beneficial Use Determinations and Section 35-11-1104 of the Wyoming Environmental Quality Act

The State of Wyoming has separated the regulation of water quality and water quantity issues and delegated responsibility for those two sets of issues to two distinct entities. Water quality is regulated by the Division within the DEQ. Water quantity issues, including beneficial use determinations, are the exclusive province of the Wyoming Board of Control and the Wyoming State Engineer. It is important to recognize how water quality and water quantity are regulated in Wyoming because the Petitioners are asking the EQC to ignore settled principles of Wyoming law, and improperly interfere with actions within the sole authority of the State Engineer.

1. Water Quality Regulation by the DEQ

In the Wyoming Environmental Quality Act, the Wyoming Legislature authorized the DEQ to regulate water quality through the Division. Wyo. Stat. Ann. §§ 35-11-101 to 35-11-115, 35-11-301 to 35-11-312. Consistent with its authority, the DEQ issues Wyoming Pollution Discharge Elimination System Permits ("WYPDES") for discharges of CBM-produced water. For WYPDES permits for CBM produced water, the Division authorizes the discharge so long as the "water is accessible to livestock and/or wildlife; meets the effluent limitations as specified in this appendix; and meets the criteria for the protection of livestock and wildlife as specified in the Wyoming Water Quality Rules and Regulations." Chapter 2, Appendix H(d)(i), WQRR.

2. Water Quantity and Beneficial Use Determinations by the Board of Control and State Engineer

The Wyoming Constitution places water quantity issues, and beneficial use determinations, under the control of the Wyoming Board of Control and the Wyoming State Engineer. *See* Wyoming Constitution, Article 8, Sections 2, 3, 5. The Wyoming Constitution assigns to the State Engineer the "general supervision of the waters of the state" which includes determinations of "beneficial uses." Wyoming Constitution, Article 8, Sections 3, 5. The Wyoming Supreme Court has emphasized that it is especially inappropriate to interfere with determinations of the Board of Control and State Engineer because "the Board and the State Engineer are created by the state constitution, and not from the legislature." *John Meier & Son, Inc. v. Horse Creek Conservation District of Goshen County*, 603 P.2d 1283, 1288 (Wyo. 1979).

3. Wyoming Law Prohibits the DEQ, Division, and EQC From Interfering with State Engineer's Beneficial Use Determinations

This statutory division of labor between the State Engineer and the DEQ is precise. To preserve the State Engineer's authority over water quantity and beneficial use determinations, the Wyoming Legislature mandated in the Wyoming Environmental Quality Act that the DEQ and the EQC must not interfere with the State Engineer's authority. Specifically, the Wyoming Environmental Quality Act provides in relevant part:

> § 35-11-1104. Limitation of scope of provisions.
>
> (a) Nothing in this act:
>
> ...
>
> (iii) Limits or interferes with the jurisdiction, duties or authority of the state engineer, the state board of control ....

Wyo. Stat. Ann. § 35-11-1104 ("Section 1104"). The Wyoming Environmental Quality Act is the source of statutory jurisdiction and authority for the DEQ and EQC. Section 1104 thus limits the jurisdiction and authority of the DEQ and EQC.[1] Nothing in its enabling statute authorizes the EQC to issue regulations that enlarge upon the DEQ's statutory authority and jurisdiction. *See* Wyo. Stat. Ann. § 35-11-112.

In accord with Section 1104, existing DEQ regulations provide that the beneficial use determinations concerning ground water are the sole province of the State Engineer.

Section 3. Underground Water Protected.

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[1] In addition to Wyoming, other prior appropriation states have directed their water quality agencies not to regulate water quantity in permitting point sources discharges. For example, the Colorado legislature mandated in the Colorado Water Quality Control Act that in regulating water quality, the state cannot "supersede, abrogate, or impair rights to divert water and apply water to beneficial uses in accordance with the provisions of sections 5 and 6 of article XVI of the constitution of the state of Colorado." Colo. Rev. Stat. § 25-8-104(1).

(a) All waters, including ground waters of the State, within the boundaries of the State of Wyoming are the property of the State; and control of the beneficial use of waters of the State resides with the Wyoming State Engineer.

(b) Nothing herein contained shall be construed so as to interfere with the right of any person to use water from any underground water source for any purpose identified in W.S. 35-11-102 and 35-11-103(c)(i); or to limit or interfere with the jurisdiction, duties or authorities of other Wyoming State agencies or officials.

WQRR, Chapter 8, Section 3 (emphasis added).

B. The Petitioners Are Improperly Requesting the Division to Make Beneficial Use Determinations for CBM Produced Water

The EQC should dismiss Part 1 of the Petition, and reject the amendments proposed by Petitioners, because they expressly request the EQC to direct the Division to make a beneficial use determination for CBM produced water. For example, the Petitioners seek to add the following sentence to Appendix H of the Chapter 2 WQRR: "this exemption shall be limited to that quantity of water that can be demonstrated to have actually been put to beneficial use." Petition, Proposed Amendment to Appendix H(c)(1). Further, Petitioners request the EQC to define "beneficial use" of CBNG produced water to limit it "to the extent discharge water is actually used by livestock and/or wildlife." Petition, Proposed Amendment to Appendix H(d)(i).

All of Petitioners' proposed amendments that seek to limit the quantity of CBM produced water are contrary to the constitutional and statutory limits on the Division's authority. Moreover, they conflict with existing determinations of beneficial use made by the Sate Engineer in published guidance documents for CBM development. For example, limiting discharge to the extent "actually used by livestock or wildlife" directly contradicts the State Engineer's determination that "storage of CBNG water is recognized as a beneficial use." *See,* Exhibit A, *State Engineer CBNG Surface Water Policy.* Part 1

of the Petition and the Petitioners' proposed amendments are contrary to Section 1104 and should be dismissed.

C. Wyoming's Separation of Water Quantity and Water Quality Regulation Follows the Clean Water Act.

The Petitioners contend that DEQ is "drawing an artificial line between water quantity and water quality" and that the "water quality and water quantity distinction is not supported in the law." Petition at 5. The Petitioners are wrong, and they have overlooked a cornerstone of the federal Clean Water Act.

Congress recognized when it passed the Clean Water Act that water quality regulation under the National Pollution Discharge Elimination System permitting program has the potential to interfere with state water quantity determinations and water rights allocations. Congress added a provision to prevent federally-mandated water quality regulation from interfering with state authority over water rights and water allocations. Section 510 of the Clean Water Act provides:

> Except as expressly provided in this chapter, nothing in this chapter shall ... be construed as impairing or in any manner affecting any right or jurisdiction of the States with respect to the waters (including boundary waters) of such States.

33 U.S.C. § 1370(2). In 1979, Wyoming Senator Malcolm Wallop sponsored an amendment to the Clean Water Act to reiterate that federally-mandated water quality regulation shall not interfere with state water law determinations. The Wallop Amendment provides:

> It is the policy of Congress that the authority of each State to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired by this chapter. It is the further policy of Congress that nothing in this chapter shall be construed to supersede or abrogate rights to quantities of water which have been established by any State.

33 U.S.C. § 101(g).

Beneficial use determinations by the Wyoming State Engineer are squarely on the water quantity side of the water quantity/quality distinction recognized in the Clean Water Act. See Wyoming Constitution, Article 8, Section 3; Wyo. Stat. Ann. §§ 41-3-931, 41-4-502. When Senator Wallop successfully amended the Clean Water Act to ensure that State authority over water quantity issues "shall not be superseded, abrogated or otherwise impaired" by water quality regulation, Congress was protecting beneficial use determinations by the Wyoming State Engineer from precisely the interference proposed by the Petitioners.

The Petitioners appear to believe that it is appropriate for the EQC to enact regulations that would require the Division to make beneficial use determinations because the Environmental Protection Agency's ("EPA") Effluent Limitation Guideline ("ELG") for oil and gas produced water west of the 98th meridian references produced water that has a "use" in agriculture or wildlife propagation. See 40 C.F.R. Part 435, Subpart E.

The Petitioners are inappropriately applying the ELG. The existing regulations at Appendix H to Chapter 2 of the WQRR satisfy the ELG because the Division will not issue a WYPDES permit unless it determines that CBM produced water is "accessible to livestock and/or wildlife" and "meets" the water quality "criteria for the protection of stock and wildlife" set forth in the WQRR. *See* Chapter 2, Appendix H(d), WQRR. That determination by the Division complies with the ELG provision stating that the "produced water is actually put to such use during periods of discharge." 40 C.F.R. § 435.51 (c). Nothing in the EPA's ELG at 40 C.F.R. Part 435, Subpart E requires the Division to limit the quantity of water discharged under a WYPDES permit to the amount

which is actually consumed by livestock or used by wildlife. That would be an impossible and unworkable test.

Wyoming's decision to vest exclusive authority in the State Engineer over the regulation of quantities of water produced and discharged, and determination what is beneficial use of the state's water, does not conflict with the Clean Water Act. As the Supreme Court has made clear, while states have the authority under section 401(d) of the Act to regulate water quantity issues in regulating water quality, the decision whether to do so and in what fashion remains with each state. *PUD No. 1 v. Washington Dep't of Ecology*, 511 U.S. 700 (1994). Wyoming has, through constitutional and statutory mandates, determined as a matter of public policy that regulation of water quantity issues shall be the sole province of the State Engineer and that determination is lawful under the Clean Water Act. *Id., see also Colorado Wild, Inc. v. United States Forest Service*, 122 F. Supp.2d 1190, 1193 (D. Colo. 2000) (Brimmer, J.) ("while PUD No. 1 upholds a state's right to impose minimum streamflow requirements, it does not contend that such requirements are mandated by the CWA itself.").[2]

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[2] Like *PUD No. 1*, none of the other cases cited by Petitioners holds that the Clean Water Act mandates using NPDES permits to regulate the quantity of water discharged to surface waters. The only issue before the Court of Appeals in *Quivira Mining Co. v. USEPA*, 765 F.2d 126 (10th Circuit 1985) was whether EPA could require an NPDES permit for discharges of contaminated water from uranium mining operations into certain arroyos. While the Tenth Circuit upheld EPA's assertion of jurisdiction over the arroyos as "waters of the United States," its reasoning had nothing to do with whether EPA could regulate the quantity of water discharged to these waters of the United States.

In *U.S. v. Earth Sciences, Inc*, 599 F.2d. 368 (10th Cir. 1979), cited by *Quivira Mining*, the issue before the Court of Appeals was whether under section 304(f) of the Clean Water Act, which required a study of methods for controlling nonpoint sources of water pollution and "pollution resulting from . . .mining activities," point source discharges from mining operations are exempt from NPDES permitting. The court rejected the exemption, reasoning that:

> Beginning with the Congressional intent to eliminate pollution from the nation's waters by 1985, the FWPCA was designed to regulate to the fullest extent

> possible those sources emitting pollution into rivers, streams and lakes. *The touchstone of the regulatory scheme is that those needing to use the waters for waste distribution must seek and obtain a permit to discharge that waste, with the quantity and quality of the discharge regulated.* The concept of a point source was designed to further this scheme by embracing the broadest possible definition of any identifiable conveyance from which pollutants might enter the waters of the United States.

599 F.2d at 373. The italicized language (which is the only portion Petitioner quotes), when read in conjunction with the references in the preceding sentence to "sources emitting pollution" and in the following sentence to "pollutants . . . enter[ing] the waters of the United States, is nothing more than the Tenth Circuit's unremarkable observation that NPDES discharge permits may regulate both the quantity of *waste* – as distinct from water in which it is present – that may be discharged from a point-source, as well the quality of the discharge. That is, EPA and states can and do impose limits on total daily discharge of a given pollutant, e.g., total mass, as well as on the concentration of waste in the discharge.

Riverside Irrigation District v. Andrews, 758 F.2d 508 (10th Cir. 1985) involved review of the Corps of Engineers' denial of a permit under section 404(a) of the Clean Water Act for construction of a dam on a tributary of the South Platte River. The Corps denied the permit based on its determination that the depletion in downstream water flow resulting from damming the water would adversely affect downstream critical habitat of the whooping crane. The Court of Appeals upheld the Corps' action on the ground that the Endangered Species Act "imposes on agencies a mandatory obligation to consider the environmental impacts of the projects that they authorize or fund." 758 F.2d at 512. The Court relied on the specific provisions in section 404 of the Clean Water Act that govern the Corps' issuance of permits for dredging and filling in waters of the U.S.:

> [Section 404] explicitly requires that a permit be obtained for any discharge [of dredged material] "incidental to any activity having as its purpose bringing an area of navigable waters into a use to which it was not previously subject, *where the flow or circulation of navigable waters may be impaired or the reach of such waters reduced.*" 33 U.S.C. § 1344(f)(2). . . . Thus, the statute focuses not merely on water quality, but rather on all of the effects on the "aquatic environment" caused by *replacing water with fill material.* 33 U.S.C. § 1344(f)(1)(E).

Id. (emphasis added)

Thus, the Corps' authority to consider the impact of the proposed dam on downstream flow, the Court held, is based on section 404(f)(2) of the Clean Water Act, which expressly refers to discharges of fill material and to the impact of such discharges on flow of the affected waters. Section 404 is a different provision of the Clean Water Act from section 402, under which effluent limitations are established and permits are required, and Section 404 is administered by the Corps, not by EPA or a delegated NPDES state. *Riverside Irrigation District* provides no support for the proposition that NPDES permits must regulate the volume of water discharged from a point source, as distinct from regulating the quantity of pollutants thereby discharged over a given period of time and the concentration of pollutants in the discharge. *See Earth Sciences, supra*, 599 F.2d at 373.

Wyoming has made a policy choice, reflected in the constitution and statutes, that separates the authority for water quantity and water quality determinations into two different agencies. Beneficial use determinations are the sole province of the State Engineer because it is the foundation of the State's prior appropriation water rights regime. *See* Wyoming Constitution, Article 8, Section 3; Wyo. Stat. Ann. §§ 41-3-931, 41-4-502. The DEQ issues WYPDES permits for the point source discharge of CBM produced waters into surface waters of the State. The State of Wyoming has separated water quality regulation by the DEQ from the State Engineer's functions by affirmatively forbidding the DEQ and EQC from interfering with beneficial use determinations. *See* Wyo. Stat. Ann. § 35-11-1104(a)(iii). The EQC should dismiss Part 1 of the Petition because it requests the EQC and the DEQ to take action that they *cannot* legally take: rendering beneficial use determinations for discharges of CBM produced water.[3]

2. The Petition Should Be Dismissed Because Petitioners' Issues Were Raised and Thoroughly Considered in the Recent Chapter 2 WQRR Rulemaking Proceedings.

Chapter 2, WQRR underwent extensive revisions in a rulemaking proceeding that started in 2001 and ended in November of 2004. The extensive history of the rulemaking process was summarized by the DEQ for the Governor's Office prior to the rules being signed by Governor Freudenthal in late 2004. The DEQ synopsized the proceedings as follows:

Alameda Water & Sanitation v. Reilly, 930 F.Supp. 491 (D. Colo. 1996) likewise concerns the scope of section 404, not section 402, of the Clean Water Act. The court said nothing about EPA's and states' supposed jurisdiction over the quantity of water discharged from a point source under section 402 of the Act.

[3] Even if it were not the case that the EQC lacks jurisdiction to adopt the proposed regulation, *PUD No. 1*, makes it clear that the Council may decline to do so without running afoul of the Clean Water Act.

> The Chapter 2 Rulemaking process began in April, 2001. The primary purpose of the rulemaking was to update and consolidate existing rules that were originally adopted as long ago as 1974. Over the course of the 42 months that DEQ dedicated to the Chapter 2 rule making process, eight public meetings were held and five separate written and oral public comment periods were provided. The WQD provided a written response to all comments received during the rule making process and addressed specific questions raised by the Water and Waste Advisory Board and the Environmental Quality Council.
>
> In addition, because the NPDES program is a delegated program from EPA, Region 8 EPA reviewed each of the six drafts for compliance with requirements for program primacy. EPA found that the proposed Chapter 2 rules are consistent with the federal rules.

Exhibit B, *Questions Regarding Water Quality Division Chapter 2 Rules,* p. 1 (emphasis added).

Petitioners took full advantage of the numerous opportunities to provide input and public comment during the Chapter 2 rulemaking proceedings. Indeed, the instant Petition is virtually identical to the issues raised during those proceedings. During the numerous comment and public hearings, Petitioner PRBRC, the Wyoming Outdoor Council and Kate Fox (now counsel for the Petitioners) provided numerous comments challenging the same provisions in Appendix H that they now seek to revisit. See *Exhibit C, PRBRC Comments to Chapter 2 Proposed Rules,* May 17, 2004 and *Exhibit D, Kate Fox Comments to Chapter 2 Proposed Rules*, April 22, 2004.[4]

[4] PRBRC's comments mirrored the requests in the instant Petition, urging the EQC to revise Appendix H, alleging that "implying all CBM water being discharged is of beneficial use for livestock and wildlife is mostly false" and arguing that the "beneficial use of this CBM water should be supported by the volume of water that can actually be used for livestock and wildlife by the landowner and no more should be allowed to be wasted by dumping it on the surface and allowing it cause damage downstream." Exhibit C. Ms. Fox argued in her comments concerning Appendix H that "[a] quantity parameter must be included in the quality/beneficial use standard,..." and, using the same terminology employed in the instant Petition, alleged that Appendix H "appears to be a great big loophole." Exhibit D.

The DEQ considered and formally responded to all these comments in June of 2004. Exhibit E, *Response to Comments (Excerpts)*. In particular, the DEQ addressed comments about beneficial use under Appendix H and responded by stating:

> 40 CFR 435 allows for the discharge of produced water if the water is used by wildlife or agriculture during periods of discharge. This was a provision that was supported by the Wyoming DEQ, Wyoming Game and Fish and many landowners within Wyoming to allow for the continued use of produced water rather than reinjecting the water. It is the DEQ's opinion that there should not be a quantity limitation related to the agricultural and wildlife use determination. The federal regulations did not contemplate a maximum allowable flow rate but rather that the water being discharged was actually used by wildlife or agriculture during periods of discharge. It was not the intent of the federal regulations that all of the water be consumed.

Exhibit E, pp. 36-37 (emphasis added). The DEQ's response to the beneficial use comments raised by Petitioners demonstrates that the agency fully considered the comments, addressed them in light of analogous federal regulations, considered the views of other interests such as the Game and Fish and other landowners, and concluded that no change was warranted. In addition, the DEQ also addressed Petitioners' comments about potential effects of CBM water on downstream draws and meadows. The DEQ noted that Chapter 2 and existing statutes allowed for appropriate management of these possible effects. See, *Id.* p. 17-18.

In July and August, 2004, the EQC held hearings to consider the draft Chapter 2 rules. Following the July EQC meeting, the DEQ provided a document for the EQC responding to questions raised by the EQC at the hearing. *See, Exhibit F, Response to July 7, 2004 EQC Questions.* In that document, the DEQ explained that groundwater matters, such as those raised in the instant Petition, are addressed in Chapters 3 and 8 of the WQRR, not in Chapter 2. *Id.*, p. 1. The DEQ also addressed Appendix H issues

related to protection of irrigation and soils from potential adverse effects of CBM water by referencing the agricultural protection provision of Chapter 1 Section 20. *Id.*, page 6. The Addendum to the document addresses the Effluent Guideline at 40 C.F.R. Part 435, and notes that the provisions of Chapter 2 are consistent with the guideline. *Id.*, Addendum, p. 3.

Following the EQC's approval of the regulations they were submitted to the Governor for approval. Still dissatisfied, Petitioners attempted to derail the rules by requesting that the Governor not sign them into law. On September 10, 2004, Kate Fox sent a letter to Governor Freudenthal (on her own behalf) objecting to the rules. In her letter, Ms. Fox raised the same issues, arguing that the rules ignored potential groundwater effects and were deficient because they did not address water quantity issues. *Exhibit G, September 10, 2004 letter from Kate Fox to Governor Freudenthal.*

In addition, several of the Petitioners, including PRBRC, Bernadette Barlow, Clay Rowley and Nancy Sorenson, arranged a meeting with the Governor for September 14, 2004. *Exhibit H, PRBRC Proposed Meeting Agenda.* Jill Morrison of PRBRC provided the Governor with an agenda for the meeting. With regard to the Chapter 2 rules, the agenda asserted that "the most serious problems with these proposed rules concern the failure of the DEQ to address...[t]he lack of true beneficial use of CBM water...in reality this [beneficial use] is true for maybe 1% of the total amount of discharge water." PRBRC's request as outlined in the agenda was "[w]e ask the Governor not to sign these rules until they address the above issues and are written clearly." *Id.*

DEQ provided input to the Governor's office on the issues raised by Ms. Fox, PRBRC and others Exhibit B. The DEQ's response addresses the beneficial use issues

by noting that "this issue was addressed in the public comment process." It then reiterates that:

> [i]t is the DEQ's opinion that there should not be a quantity limitation related to the agricultural and wildlife use determination. The federal regulations from which this provision originates, did not contemplate a maximum allowable flow rate... It was not the intent of the federal regulations that all of the water be consumed.

Id. at p. 1-2. After fully considering the contentions of Petitioners and Kate Fox, the Governor concluded that no changes to the rule were warranted and approved them. In a letter responding to Ms. Fox on December 3, 2004, the Governor wrote, in pertinent part:

> To get at your concern over quantity of discharge from coal bed methane dischargers, it is my hope that through the watershed based permitting approach downstream landowners can express their concerns and have a voice in how the produced water is managed....
>
> Furthermore, the rule is clear that any permit must also ensure protection of all surface water quality standards as outlined in Water Quality Rules and Regulations Chapter 1. Consequently, I do not see this provision [Appendix H] as the loophole you have suggested.

Exhibit I, *December 3, 2004 Letter from Governor Freudenthal to Kate Fox*, (emphasis added).

In summary, it is clear that the concerns of the Petitioners were fully raised and addressed by the DEQ, the WWAB, the EQC and the Governor, prior to their adoption. The residual dissatisfaction of the Petitioners over the fact that not all of their comments were addressed in the way they preferred is no justification for reopening the rules now. Indeed, to allow the Petitioners to reopen the rules after their views have been fully considered and addressed at all levels would not only be unfair to Respondents, who have worked in good faith to conduct their operations consistent with the 2004 regulations, but

it would also turn the notice and comment rulemaking procedures on their head and create uncertainty for all interested parties.

3. Reopening Chapter 2 would Interfere with Reasonable Investment-Backed Expectations of Industry and Landowners who Benefit From CBM Discharge Water, and Would Nullify the DEQ's Watershed Based Permitting Process.

After the Chapter 2 revisions were adopted by the EQC and signed by the Governor in November, 2004, CBM operators began to adjust to the new rules by planning their water management strategies to meet the requirements of the new rule. In many cases, this included planning for on and off-channel reservoirs, treatments systems, land application systems, managed irrigation and other surface discharge management options.

In addition, in the summer of 2004, the DEQ began a very labor and resource intensive watershed based permitting process, designed to ensure that CBM water management within sub-drainages in the Powder River Basin is carried out in a coordinated manner that will ensure compliance with Chapter 2. The process developed by the DEQ actively involves all stakeholders in a given drainage, including landowners, industry, the environmental community and interested state and federal agencies such as the BLM and the Game and Fish Department.

The Petitioners' request to have the EQC curtail surface discharges by up to ninety-nine percent (as suggested by PRBRC) would undermine the extensive planning, permitting and on-the-ground water management efforts carried out by industry in reliance on the new Chapter 2 and Appendix H. It would also have enormous economic consequences due to the very extensive investments made by industry to comply with the

applicable regulatory standards. These irretrievable financial commitments have been undertaken in good faith and in compliance with existing regulations.

Adopting a rule such as proposed by Petitioners would also render the DEQ's Watershed Based Permitting efforts moot, as there would be little or no surface discharge water to manage. It is simply not feasible to build the water infrastructure necessary to convey produced water the long distances that CBM operators routinely do to provide stock, wildlife and irrigation water at varying locations for landowners when only a minimal amount of water would be authorized to be discharged at those locations. Thus, as a practical matter, if Petitioners' objectives were realized, water management strategies would have to be changed to non-surface management methods, i.e., reinjection or massive pipeline projects.

In addition, the Petitioners' proposed rule would have negative consequences for other landowners whose livestock operations benefit from CBM discharge water. Many landowners disagree strongly with the views of the Petitioners regarding what constitutes beneficial use of CBM produced water. In fact, most of the landowners with whom CBM operators interact believe that the discharge water is beneficial to their operations.[5] In most instances, CBM operators and landowners are able to work together cooperatively to make CBM water a benefit for the landowners and to address concerns about possible negative impacts from discharges.

Sometimes, however, landowners are not willing to work cooperatively with CBM operators to resolve potential impacts. For example, the Petition alleges that Petitioner Ken and Glessie Clabaugh's ranch "has been inundated by CBM discharge

[5] Respondents are aware of several landowners who have expressed opposition to the Petition and who have or will be submitting comments for the record.

water flowing down Wild Horse Creek causing serious problems with flooding, soil and vegetation damage and problems wit moving cattle and calves." *Petition*, p. 1. However, what the Petition fails to mention is that the operators in the Wild Horse Creek Drainage have *twice* contacted Mr. Clabaugh to attempt to address and resolve his concerns. In particular, on February 17, 2005 and again on May 25, 2005, operators in the Wild Horse Creek Drainage sent Mr. Clabaugh correspondence in which they stated:

> This letter is submitted on behalf of several operators in an effort to identify, and hopefully resolve, issues and complaints regarding water flowing in the creek.
>
> The operators would like to set up an inspection of the creek on your ranch, and to meet with you at the ranch to discuss your concerns. It should be possible to develop solutions to any problems which you may identify, but they need to look at the land and the creek channel as part of that process....
>
> The purposes of this site visit are to learn about any problems and identify solutions. The operators are willing to clean debris out of the channel and to discuss other site work they could conduct to address your concerns. The operators look forward to hearing any constructive suggestions you might have.

Exhibit J, *Letters of February 17, 2005 and May 25, 2005 to Ken Clabaugh, President, Clabaugh Ranch.* Despite these repeated overtures to address Petitioner Clabaugh's concerns, Mr. Clabaugh has not been responsive. Without the cooperation of affected landowners, the operators' ability to address potential downstream impacts or concerns is severely limited. However, when both sides cooperate, such matters can be, and routinely are, addressed to the satisfaction of both the landowner and the operator.

B. The EQC Should Decline to Proceed To Rulemaking On Part II of the Petition

The PRBRC Petition urges the DEQ to promulgate new effluent limitations for sulfates, total dissolved solids and barium. Rulemaking on this issue should not proceed for two reasons. First, PRBRC made the same comments and objections during the WWQRR Chapter 1 Triennial Review process and the DEQ considered and rejected those objections on the grounds that the existing effluent limitations were protective of livestock and agricultural uses. In addition, PRBRC failed to comment and/or object during the public comment period when Chapter 2 was revised. Second, the proposed effluent limitations fail to take into account the fact that existing effluent limitations typically reflect the quality of surface water and groundwater quality that has historically been used for livestock watering, as evidenced by existing groundwater classifications under Chapter 8, WQRR.

1. Petitioners' Proposed Effluent Limitations Have Been Reviewed and Rejected by the DEQ During the Triennial Review Process

PRBRC has failed to provide any new or additional information to justify a reduction in the sulfate, TDS and barium effluent limitations. PRBRC previously has sought a number of these very same revisions to sulfate and barium effluent limitations during the 2005 WQRR Chapter 1 Triennial Review process. During that process, the DEQ set forth effluent limitations for TDS and sulfate which were intended to ensure that water was safe for livestock in the Chapter 1, Section 20 "Agricultural Use Protection Policy" which was published for public comment in August and November, 2005. PRBRC objected to the sulfate effluent limitation. PRBRC also objected to the lack of a barium effluent limitation at that time. WDEQ considered PRBRC's objections and

rejected them based on the data available to the agency. Without introducing any substantial new evidence, PRBRC is attempting an end-run around the Triennial Review process specifically established by the federal Clean Water Act to update and revise water quality standards in a considered and comprehensive fashion.

PRBRC's own statements demonstrate that they have raised the sulfate effluent limitation issue in front of the DEQ numerous times. During the Chapter 1 rulemaking session, PRBRC asserted that:

> 3,000 mg/L for Sulfates contradicts the very language presented in draft on P. 53 line 21-22. As we have pointed out to DEQ many times previously, this level of Sulfates allowed in livestock water is a detriment to animal health, growth and reproductive potential.

Exhibit K, *Analysis of Comments, Chapter 1 Rulemaking, p. 45*. WDEQ, in turn, responded:

> This concentration for sulfate is an effluent limit established in Chapter 2 of the WQR&R. It has been in use for oil and gas discharges for many years and we are not aware of any circumstances where it has been a problem.

Id. The DEQ's position is supported by the fact that none of the nineteen landowners listed in the Petition have alleged adverse health effects to livestock as the result of livestock watering using produced water. It is also important to note that, PRBRC has not alleged *anywhere* in its petition that livestock has actually suffered adverse health effects.

At the time the Chapter 1 revisions were published for public comment in 2005, PRBRC did not object to the effluent limitation for TDS set forth in the Agricultural Use Protection Policy. In its Petition, PRBRC does not provide any new information or data that justifies a revision to the TDS effluent limitation. This is clear based on the fact that

the exhibits they rely upon in support of the revised effluent limitation predate both of the DEQ's recent Chapter 1 and Chapter 2 proceedings.

With respect to barium, PRBRC challenged the lack of an effluent limitation during the Chapter 1 review and requested the same limit requested in this Petition. The DEQ, relying on its anti-degradation review for barium, responded that:

> The effluent limit for barium was established as part of an anti-degradation review that was done to achieve compliance with the human health criteria. In short, this effluent limit is adequately protective of waters in the watersheds where it applies (NE Wyoming) because the barium in these waters is primarily in the form of barium sulfate which is an inert substance with little potential for health effects.

Exhibit K, *p. 45.* This response was based on conclusions drawn in the Antidegradation Review, Analysis and Findings – Concentrations of Barium in the Surface Waters in Northeastern Wyoming Related to Discharges of Coal Bed Methane Produced Water (December 1, 2000, page 8). In that document, WDEQ determined that a 2 mg/l barium limit (based on the human health drinking water maximum contaminant level) was protective of all other uses, including agriculture.

It should be noted that the Colorado State University Cooperative Extension (the same progenitor of Petitioners' Exhibit 23, Water Analysis Livestock, undated, relied on by PRBRC in asserting a barium standard of 0.2 mg/l) no longer lists barium in its "Recommendations for levels of toxic substances in drinking water for livestock." *See,* Livestock Drinking Water Quality, Colorado State University Cooperative Extension website, updated August 24, 2004 (http://www.ext.colostate.edu/pubs/livestk/04908.html).

Finally, PRBRC did not object or provide any data or information to justify a revision to the proposed effluent limitations during the Chapter 2 rulemaking process.

Given this fact and the fact that WDEQ has already considered PRBRC's past objections, it is a waste of the agency's resources to again revisit effluent limits when no new addition information has been submitted.

2. Petitioners' Proposed Effluent Limitations Only Apply to Oil & Gas Production and Fail to Consider that Produced Water is Typically Similar to or of Better Quality than Groundwater Commonly Used for Livestock Watering.

The Petition focuses solely on revisions to Chapter 2, Appendix H, which is applicable only to oil and gas production. Hence, the proposed revisions to the Appendix H effluent limitations would impose more stringent requirements only on oil and gas production and not on any other industry. Essentially, this means that only oil and gas producers would be required to meet a standard that is more stringent than required by the Surface Water Quality Standards set forth under Chapter 1, Section 20 (which provides for the protection of agricultural use of surface waters). This imposition is untenable given the fact that other industries discharge water which is used for livestock watering and would not be subject to the same standard. This is especially true of the agriculture industry, which commonly pumps groundwater (including groundwater from the same seams as the CBM producers) for use in livestock watering.

The DEQ has determined that groundwater is acceptable for livestock watering purposes if it meets the standards for Class III groundwater. Significantly, the Chapter 8 Class III groundwater standards for sulfate, TDS and barium are identical to the existing effluent limitations prescribed in Appendix H. *See* WWQRR Chapter 8, Section 5, Table I. Requiring only oil and gas producers to meet more stringent standards than the groundwater standards is overly burdensome and inconsistent with the long-standing surface water and groundwater quality standards, which as the DEQ noted in its review of

comments in the Chapter 1 Proceeding, have not been known to cause problems for the livestock industry.

IV. CONCLUSION

For the foregoing reasons, Respondents respectfully request the EQC to dismiss the Petition and decline to proceed to rulemaking on the matters raised by the Petitioners.

RESPECTFULLY SUBMITTED this _____ day of February, 2006.

RESPONDENTS:

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_____

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CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing document together with all exhibits was served upon the following persons, on this 10th day of February by depositing the same in the US Mail, postage prepaid and addressed as follows:

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DAVE FREUDENTHAL
GOVERNOR

PATRICK T. TYRRELL
STATE ENGINEER

REVISED INTERIM POLICY MEMO

TO: State Engineer's Office

FROM: Patrick T. Tyrrell, State Engineer

DATE: April 26, 2004

SUBJECT: State Engineer's Office permitting requirements for water produced during the recovery of coal bed methane (CBNG)

THIS POLICY SUPERSEDES THE INTERIM POLICY MEMO DATED AUGUST 2, 2002.

THIS POLICY APPLIES TO BY-PRODUCT WATER DEVELOPED BY CBNG WELLS ONLY!! THE 1978 POLICY REGARDING 10 ACRE-FEET RESERVOIRS ASSOCIATED WITH GROUNDWATER ONLY DOES NOT APPLY TO CBNG WELLS!!

Prior to drilling a water well for the purpose of extracting methane gas from coal beds, a ground water (well) permit, using form U.W.5, must be obtained from the State Engineer. The beneficial use of this water, as stated on the application form, is water produced in production of coal bed methane gas. Unless specified in the well permit, there is no other beneficial use of this produced water authorized by the issuance of the well permit.

In accordance with § 41-3-301, W.S., 1977, as amended, a reservoir permit is required from the State Engineer for any impoundment that stores, for beneficial purposes, the un-appropriated waters of the state of Wyoming. Unless specified in the ground water permit, water produced in the production of coal bed methane gas has no other implied use and is considered to be un-appropriated waters of the state of Wyoming.

GROUND WATER

If the CBNG-produced water will be discharged and not used for any other beneficial purposes, no further ground water permitting is required.

If the CBNG-produced water will be used for any purposes other than coal bed methane production, these uses must be specified in the well application at the time of filing. If the CBNG-produced water will be stored in some type of impoundment, Surface Water reservoir filing procedures must be followed unless there will be no other beneficial use of the water and the impoundment is located off the channel of a

EXHIBIT
A

natural water course. Under these specific conditions, the Wyoming Oil and Gas Conservation Commission rules will apply.

SURFACE WATER

If an impoundment will be used to store CBNG-produced water for additional beneficial uses, a reservoir permit must be obtained from the State Engineer prior to commencement of construction of the impoundment.

The reservoir permitting process for on channel, CBNG-produced water impoundments falls into two general categories:

1. Impoundments with a capacity of twenty (20) acre-feet or less and with a dam height of twenty (20) feet or less.

2. Impoundments with a capacity in excess of twenty (20) acre-feet or with a dam height exceeding twenty (20) feet.

The storage of CBNG produced water is recognized as a beneficial use.

FILING METHODS

METHOD A: For use when CBNG water storage is the sole use and the operator/producer is the applicant.

Reservoir applications filed under these procedures will be limited to a life of fifteen (15) years or until the facility ceases to receive CBNG water discharges, whichever is sooner, and will carry a mandatory breach limitation to occur upon cancellation of the permit.

For impoundments that fall into category (1), Form SW-CBNG should be used and it need not be accompanied by a USGS Quadrangle map.

For impoundments that fall into category (2), the SW-3 application form must be used with a beneficial use of CBNG water storage and the application must be accompanied by a certified, blackline, mylar or linen map. The map may be certified by either a Wyoming -licensed professional engineer or land surveyor unless the impoundment falls under the auspices of the Safety of Dams Law (dam height greater than 20 feet or storage capacity of 50 acres-feet or more, in which case, the map must be certified by a Wyoming-licensed professional engineer. This certified map must be prepared in accordance with the policies established by the State Engineer's Office.

METHOD B: When the reservoir is intended to remain after storage of CBNG water ceases and the where the underlying landowner is the permit applicant or co-applicant.

For impoundments that fall into category (1), the Special Application filing procedures may be used which allow for the use of a USGS

Quadrangle map to serve as the permit map to accompany the SW-3 and SW-3A application forms. If a stock reservoir will be constructed, the SW-4 application form should be used. A stock reservoir filing using the SW-4 application form need not be accompanied by a USGS Quadrangle map.

For impoundments that fall into category (2), the SW-3 application form must be used and the application must be accompanied by a certified, blackline, mylar or linen map. The map may be certified by either a Wyoming-licensed professional engineer or land surveyor unless the impoundment falls under the auspices of the Safety of Dams Law (dam height greater than 20 feet or storage capacity of 50 acre-feet or more), in which case, the map must be certified by a Wyoming-licensed professional engineer. This certified map must be prepared in accordance with the policies established by the State Engineer's Office.

ON-CHANNEL IMPOUNDMENTS

All on-channel impoundments must have a storage permit from the State Engineer prior to commencement of any construction (or modification/improvement of an existing reservoir) of the reservoir. An existing reservoir to be used to store CBNG-produced water, without a State Engineer permit, has no standing and, as such, will be treated as if it doesn't exist and will be subject to all requirements of a new, properly-authorized CBNG reservoir constructed within the law. Any unpermitted, on-channel impoundment is subject to breach at all times.

Any new on-channel impoundment that will be built to store CBNG-produced water must be equipped with a controllable, low-level outlet pipe to allow for proper regulation. The minimum size of the low-level outlet pipe is 12 inches in diameter. A larger outlet may be required if conditions warrant. Larger drainages may require larger outlets. The potential for a call for priority regulation by downstream senior appropriators may also require the installation of a larger outlet pipe. The operator should contact the State Engineer's Office in this regard.

Any new on-channel impoundment that will be built to store CBNG-produced water may not capture natural runoff from the drainage on which it is located unless said runoff exceeds the average annual peak runoff event. To accomplish this, the on-channel facility must be equipped with a self-regulating runoff by-pass facility that will prevent flows up to and including the average annual peak runoff event from being stored. If a runoff event exceeds that of the average annual peak runoff event, that portion of the runoff in excess of the average annual peak runoff event may be stored in the impoundment but must be released to satisfy downstream, senior appropriators should it be required under priority regulation.

In lieu of the requirement for a self-regulating runoff by-pass facility, an application for a permit for an on-channel impoundment must be accompanied by a water administration plan that can demonstrate that the proposed reservoir will not negatively impact the drainage upon which the reservoir is proposed to be built. The water administration plan must either show how runoff (either the average annual peak or some lesser amount if approved by the SEO) will be made available to the drainage downstream of the reservoir irrespective of existing, downstream development (reservoirs) or channel conditions, or how in some other fashion senior, downstream water rights will be satisfied.

Any existing, permitted on-channel reservoir will not be subject to the above stipulations.

If an existing, permitted on-channel reservoir is to be enlarged to provide additional storage of coal bed methane water, a self-regulating runoff by-pass facility must be installed or a water administration plan filed. The by-pass facility and water administration plan must meet the same requirements listed above.

If the height of the dam on an existing, permitted on-channel reservoir is to be increased to provide additional freeboard, an uncontrolled primary spillway must be installed with its invert elevation at the historic high water level such as to allow inflow above the historic volume to pass through the reservoir. This primary spillway shall not be less than 12-inches in diameter and must meet the same requirements listed above for a self-regulating runoff bypass facility.

OFF-CHANNEL IMPOUNDMENTS

An off-channel impoundment may be built to store CBNG-produced water. The off-channel impoundment should be positioned so the potential to store surface runoff is minimal. By-pass facilities or berms may be used to preclude surface runoff from entering the pond. Off-channel impoundments that store no surface runoff (direct precipitation is considered to be negligible) need not be designed with an outlet. The operator must be aware that any runoff that is impounded in the reservoir may have to be passed to downstream, senior appropriators in the event of a call for priority regulation.

BENEFICIAL USE OF CBNG-PRODUCED WATER

The beneficial use of CBNG-produced water may be classified into two (2) categories:

1. Inactive use of CBNG-produced water due to evaporation and/or infiltration.

2. Active use of CBNG-produced water by discharging from the

reservoir such as land application or in a leach field.

CBNG-produced water use under category (1) needs no further discussion.

For use of CBNG-produced water under category (2) the operator must specify the points of land application on the map which accompanies the reservoir application. This is accomplished by the use of X's in the appropriate 40-acre subdivisions where water will be applied. The pipeline/nozzle system should be shown in sufficient detail so it is clear where the water will be applied. No water right will be established at the points of land application of CBNG-produced water.

Due to the fact that CBNG-produced water is not native to the drainage, a CBNG-produced water storage reservoir will be allowed multiple or continuous fills from CBNG sources only. The following limitations will be placed on any reservoir permit where water will be evacuated for CBNG-produced water use:

> Nothing herein is intended to create a water right that attaches to the land application or leach field points of use. The points of land application/leach field are shown for informational purposes only.
>
> For most of the year, this drainage has flow as a result of CBNG wells discharging in the area. Therefore, if there is not natural flow available, this water is not subject to a downstream priority call for regulation and, as such, the reservoir IS NOT subject to the one-fill rule.

BREACHING REQUIREMENTS

Dams designed to hold CBNG-produced water and natural runoff will be conditioned to allow breaching (or reduction in size) upon cessation of receiving CBNG-produced water. Contingent requirements are as follows:

1. If the structure is situated off-channel and captures no natural runoff, breaching may not be required.

2. On-channel structures may remain if down sized to stock pond capacity and dam height if the landowner's written consent is obtained.

3. All other structures are subject to a breaching requirement:

    a. The "permissive" requirement, which would apply in most cases, is worded as follows: This reservoir stores only water that is produced as a by-product of coal bed methane production. When coal bed methane

production ceases, the State Engineer may require the owner to breach the dam or reclaim the pit to allow for proper water administration.

b. The "mandatory" requirement will be used in drainages and locations where the Superintendent of the water division in which the reservoir is located has predicted administrative problems. That wording is as follows: This reservoir stores only water that is produced as a by-product of coal bed methane production. When coal bed methane production ceases, the owner of this reservoir shall breach the dam or reclaim the pit to allow for proper water administration.

The above requirements are for ponds holding only CBNG-produced water. If stock, fish and wildlife, fish propagation or other uses are included, some consideration will be given to maintaining those storage capacities post-CBNG. Landowner consent must be obtained to leave these reservoirs with the concurrence of the Superintendent. All landowner consents to leave CBNG reservoirs in place must include language committing the landowner to proper long-term maintenance of the structure.

RESERVOIR OWNERSHIP

LANDOWNER: It is acceptable to file an application for a CBNG reservoir in the name of the landowner. If no agent has been listed, the landowner will receive all correspondence regarding the application and the reservoir.

OPERATOR/PRODUCER: It is acceptable to file an application for a CBNG reservoir in the name of the operator/producer. The operator/producer must submit a certification supplying the name and address of the landowner on which the reservoir will be constructed. The certification must also certify that the operator/producer has contacted the landowner and made them aware that they intend to construct the reservoir on lands owned by the landowner. Applications filed in this manner will be issued with mandatory breach limitations to occur after CBNG water production ceases. Dam site reclamation may also be required. Once approved, a copy of the permit will be sent to the landowner as well as the operator/producer. The operator/producer will be responsible for all actions regarding the application, permit, and reservoir.

JOINT APPLICANTS: The operator/producer and the landowner may file jointly. Both parties will then be contacted about the application unless one party is designated as the agent to receive and respond to inquiries about the application during processing or the reservoir after construction. Both parties will then be responsible for inquiries about the application, permit, or reservoir. Mandatory

breach limitations will be placed on the permit unless the landowner has indicated their desire to retain the reservoir after CBNG water production is complete.

These guidelines are the State Engineer's Office requirements for dealing with CBNG-produced water. The CBNG operators should be advised that they must contact the Wyoming Oil and Gas Conservation Commission and the Department of Environmental Quality/Water Quality Division for their requirements concerning water produced from the development of coal bed methane.

EXHIBIT B

Questions Regarding Water Quality Division Chapter 2 Rules.

The Chapter 2 Rulemaking process began in April 2001. The primary purpose of the rulemaking was to update and consolidate existing rules that were originally adopted as long ago as 1974. Over the course of the 42 months that DEQ dedicated to the Chapter 2 rule making process, eight public meetings were held and five separate written and oral public comment periods were provided. The WQD provided a written response to all comments received during the rule making process and addressed specific questions raised by the Water and Waste Advisory Board and the Environmental Quality Council.

In addition, because the NPDES program is a delegated program from EPA, Region 8 EPA reviewed each of the six drafts for compliance with requirements for program primacy. EPA found that the proposed Chapter 2 rules are consistent with the federal rules.

To the assertion that the rules are long, convoluted and difficult to understand (i.e. not written clearly) the response is:

1. The rules are consistent with the federal rules.
2. The rules are in fact clear and understandable.
3. At the request of EQC, to address this very concern raised by PRBRC at the May 17, 2004 public hearing, the DEQ requested that the University of Wyoming and the Ruckelshaus Institute of Environment and Natural Resources review the document for clarity and grammar respectively. All appropriate changes were incorporated into the rule. DEQ's efforts in response to this issue are documented in DEQ's June 2004 Response to Comments document on page 39, response number 71.

Issue 1) The lack of a true beneficial use of CBM water by relying on a letter (from industry consultant's or one landowner) which states the water is beneficial for livestock and wildlife-in reality this is only true for maybe 1% of the total amount of water discharge water.

This issue was addressed during the public comment process. This issue is specific to Appendix H "Additional Requirements Applicable to Produced Water Discharges from Oil and Gas Production Facilities" of Chapter 2.

The comment is actually in reference to a DEQ Wildlife or Agricultural Use Determination policy memo dated January 27, 2004. The provisions of Appendix H (d)(i) does not require submittal of a letter but rather states that "Where discharge water is accessible to livestock and/or wildlife; meets the effluent limitations as specified in this appendix; and meets the criteria for the protection of livestock and wildlife as specified in Wyoming Water Quality Rules and Regulations Chapter 1, Wyoming Surface Water Quality Standards, the discharge will be considered in compliance with the requirements of Appendix H(a)(i) of these regulations."

EXHIBIT

B

Appendix H(a)(i) states that " The produced water discharged into surface waters of the site shall have use in agriculture or wildlife propagation. The produced water shall be of good enough quality to be used for wildlife or livestock watering or other agricultural uses and actually be put to such use during periods of discharge."

It is DEQ's opinion that there should not be a quantity limitation related to the agricultural and wildlife use determination. The federal regulations from which this provision originates did not contemplate a maximum allowable flow rate but rather that the water being discharged was actually used by wildlife or agriculture during periods of discharge. It was not the intent of the federal regulations that all of the water be consumed.

For a complete explanation of the Wildlife or Agricultural Use provisions please see the attached August 18, 2004 Addendum to the EQC.

Issue 2) The lack of public notice to downstream landowners potentially affected by CBM discharges and the lack of public comment on expanded blanket general permit.

This issue was discussed with the EQC and amendments were made to the rule to accommodate the concerns. Specifically the following language was added to the rule in Section 4 (l):

(ii) General permits will require a copy of the authorization letter be posted at the physical location of the permitted site in a prominent and safe place for public viewing.

(iii) General permits will require the permittee to notify all landowners, on whose property an outfall associated with the general permit is located, prior to submitting the Notice of Intent to the administrator.

The question and DEQ's response to the issue of adequate public notice was discussed with EQC and are documented in DEQ's June 2004 Response to Comments document on page 29, response number 55. The response states:

"Upon review of the rule and the task force recommendations, it is DEQ's opinion that there is sufficient opportunity for all interested parties to obtain information regarding a permit that is public noticed through being on the mailing list, the WDEQ web site, and posting in a paper of statewide distribution, which is the same consideration for notice provided to downstream States.

The task force recommendation being referred to is contained in Section 4.3 of the NPDES task force report. The issue identified in the report is not with the public notice

but rather notification at the beginning of the process by operators. The issues and recommendations are a bit more complex than conveyed by the first commenter. There were four recommendations listed in the report for this issue as follows:

1. CBNG operators should work, prior to development, with the surface users and the appropriate permitting agency to identify the appropriate water management techniques that will be the most beneficial for livestock, agriculture and wildlife.

2. State, local, and federal agencies should make available to surface users assistance to achieve a resource management strategy that will compliment their ranch operations.

3. A watershed permitting approach, if feasible, would facilitate communication regarding water management options among all potentially affected parties within a watershed. And

4. The NPDES permit applicant should give notice of the permit application as follows:

   a. Prior to submitting the permit application, the applicant should send a letter that notifies the surface owner or lessee of the locations of the permitted facilities, the timeframe, a general description of the water management techniques, and the name, address and phone number of a company person to contact for more information. Copies of the letters should accompany the permit application submitted to the WDEQ.

   b. The letter is sent to all identified surface users, surface owners or lessees, the surface user immediately downstream of the property subject to the permit application, and any downstream irrigator or livestock producer from the point of discharge to the confluence of the main stem river.

Issue 3) The failure to draw a connection between groundwater pumped to the surface and discharged and how that water is now impacting shallow groundwater.

This issue was raised and addressed before the Environmental Quality Council in Public Meetings held on July 7, 2004 and August 18, 2004.

The federal definition of "waters of the United States" under 40 CFR 122.2 does not include groundwater. The federal NPDES rules and the intent of the State WYPDES rules are specifically designed to address discharges to surface waters and protection of surface water quality standards consistent with W.S. 35-11-301 and 302. Groundwater protection is addressed in separate water quality rules and regulations, specifically Chapters 3 and 8.

The WQD is currently evaluating the potential groundwater concerns associated with CBM development. If it is determined by the WQD Groundwater Program that there is a need to address groundwater concerns the WQD will address these concerns under the appropriate groundwater regulations and evaluate the most efficient and sensible means of incorporating groundwater requirements with surface water quality permitting requirements.

Addendum

DEQ Response
to
EQC July 7, 2004 Questions

This addendum provides additional clarification to EQC questions raised on July 7, 2004, regarding proposed Wyoming Water Quality Rules and Regulations Chapter 2. Specifically, this addendum addresses the Agricultural and/or Wildlife Use provisions of Appendix H.

On September 15, 1975, U.S. EPA published, in Federal Register, Vol. 40, No. 179, a Notice of Interim Final Rule Making for offshore segment of the oil and gas extraction point source category (40 CFR Part 435). This interim final rule making established effluent guidelines for existing source. The Interim Final Rule did not contemplate allowing surface discharge for the onshore segment of the oil and gas extraction point source category. The following Wyoming organizations commented on the Interim Final Rule: Wyoming Department of Environmental Quality; Wyoming Environmental Institute; Powder River Basin Resource Council - Buffalo, Wyoming; Wyoming Game and Fish Department; and the Wyoming State League of Women Voters. In addition, many other states and interested parties commented on the Interim Final Rule.

On October 13, 1976, U.S. EPA published, in Federal Register, Vol. 41, No. 199, a Notice of Interim Final Rule Making for onshore segment of the oil and gas extraction point source category (40 CFR Part 435). The regulation amended Part 435 and was applicable to existing sources for the onshore subcategory, the coastal subcategory, the beneficial use subcategory and the stripper subcategory. The applicable subcategory to Wyoming was the beneficial use subcategory which where applicable to facilities where the produced water has a beneficial use when discharged to navigable waters.

The term "onshore" was defined as all land and water areas landward from the inner boundary of the territorial seas. The term "beneficial use" was defined as meaning that the produced water is of good enough quality to be used for livestock watering or other agricultural uses and is being put to such use.

435.32 (a) and (b)established the following effluent limitations for the Beneficial Use Subcategory of the Onshore Segment of the Oil and Gas Extraction Point Source Category.

(a)(1) There shall be no discharge of waste water pollutants into navigable waters from any source (other than produced water) associated with production, field exploration, drilling, well completion, or well treatment (i.e., drilling muds, drill cuttings, and produced sands).

(a)(2) Produced water discharges shall not exceed the following limitation:
Oil and grease.....45 mg/l.

(b) The discharger must show beneficial use of the produced water being discharged to qualify for this subpart.

The following Wyoming organizations commented on the Interim Final Rule: State of Wyoming; Powder River Basin Resource Council; State of Wyoming State Engineers Office; Wyoming Department of Agriculture; Wyoming Game and Fish Department; and the Wyoming State League of Women Voters; League of Woman Voters, Cheyenne, Wyoming; Wyoming Environmental Institute; City of Worland, Wyoming. In addition, many other states and interested parties commented on the Interim Final Rule. Some of the more significant issues raised were as follows:

(1) Many commenters stated that no discharge requirements for onshore oil and gas production should not be universal and that discharge of low TDS produced waters when used for cattle water, irrigation, etc. should be excluded.

EPA agreed with the comment and discharge to surface waters of produced water was allowed and left to the permit issuing agency to determine if the beneficial use provisions were being met.

(2) It was suggested that the Wyoming standard of 10 mg/l be used.

EPA stated that they would evaluate and adjust in the future if data suggested that a change was appropriate.

(3) Some commenters supplied information about the problems of taste and odor caused by produced water discharges, even when these wastes were low in TDS and were considered beneficial use discharges.

EPA responded even if beneficial use can be shown, the discharge is still subject to further regulation of applicable water quality standards.

On April 13, 1979 U.S. EPA published, in Federal Register, Vol. 44, No. 73, Federal Effluent Guidelines for the oil and gas extraction point source category (40 CFR Part 435). This was a revision to the existing provisions of Part 435. Specifically, Subpart E (435.50 -52) was amended as follows:

1. The term "Beneficial Use" was changed to "Agricultural and Wildlife Water Use Subcategory" because of the term "beneficial use" is used by agencies regulating water quantity, which created unnecessary confusion.

2. 435.50 was revised by limiting the applicability of the Agricultural and Wildlife Water Use Subcategory to onshore facilities located in the continental United States and west of the 98th meridian for which produced water has a use in agriculture or wildlife propagation when discharged into navigable waters.

3. 435.51 (c) included the following revisions: The term "use in agricultural or wildlife propagation" means that the produced water is of good enough quality to be used for wildlife or livestock watering or other agricultural uses and that the produced water is actually put to such use during periods of discharge.

4. 434.52 (a) included the following revisions:

(1) There shall be no discharge of waste pollutants into navigable waters from any source (other than produced water) associated with production, field exploration, drilling, well completion, or well treatment (i.e., drilling muds, drill cuttings, and produced sands).

(2) Produced water discharges shall not exceed the following daily maximum limitation:
Oil and grease.....35 mg/l.

The federal effluent guidelines have not been revised since 1979. The Wyoming DEQ has historically taken the position that if the produced water discharge meets the effluent limitations established to protect designated uses established in the water quality standards, through protection of water quality criteria, then there is a rebuttable presumption that the water will be used by agriculture or wildlife.

In recent years 2000-2001, U.S. EPA has requested that DEQ demonstrate how the water is being used for agriculture or wildlife. The Wyoming Game and Fish Department provided a letter to the DEQ in 2001 stating that historic conventional oil and gas discharges were a benefit to wildlife. This letter addresses the demonstration for historic discharges. New conventional oil and gas facilities must provide the DEQ with an Agricultural or Wildlife Use statement with the application to satisfy this demonstration.

Because the EPA has taken the position that the federal effluent guideline 40 CFR Part 435 does not apply to coal bed methane facilities, EPA is not requiring DEQ to require documentation of actual use. DEQ continues to support the position that there is a rebuttable presumption that the water will be used by agriculture or wildlife as long as all applicable water quality standards are met.

EXHIBIT C

POWDER RIVER BASIN RESOURCE COUNCIL

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May 17, 2004

Mr. Olin Sims, Chairman
Environmental Quality Council
Herschler Building
Cheyenne, WY 82002

HAND DELIVERED

Re: Comments on proposed rules, Chapter 2, Water Quality Rules and Regulations

Dear Chairman Sims and Council members:

Thank you for the opportunity to comment on these proposed rules changes. These comments are submitted on behalf of the Powder River Basin Resource Council and our directly affected and concerned members.

First, we would like to recognize what we know has been a long process with a great deal of work from the DEQ staff to get to this point. Given that fact, we would also like to request that the Council provide ample time for your critical review and also provide more time for public review and comment on these rules. Since these rules have been in the works for some time many of us have lost track of the process and are not attempting to become familiar with the proposed changes and we want the Council and the general public to have an adequate opportunity for review. We believe the Council can improve upon these rules and make them clearer, more comprehensible and more user friendly.

Secondly, we have some general overarching concerns regarding certain sections of the rules that we ask to carefully consider. They are:

1. Section 4. General Permits. One of our very biggest concerns involves this section of the proposed rules. We believe this section is most troubling because of the lack of public notice and opportunity for review and comment on proposed discharges that could impact someone's property or use of a stream. We believe this general permit section as written denies the public the right of due process for failure to notice what is specifically being permitted and for the right to an appeal or hearing. What opportunity would exist for the public to address their concerns regarding discharges under a general permit? How would the public or a potentially affected landowner find

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information regarding discharges from a general permit once it has been issued? We believe that the intent of allowing a general permit under the Clean Water Act was only when a class of discharges are very, very similar. How does this general permit set up that type of criteria? Specifically in this area of the rules, the authorization to discharge should make clear that it is "written" authorization.

2. Section 5. Effluent permits. Page 2-29 should include among the list of all active permits or construction approvals the approval from the State Engineer for the construction of in-channel reservoirs. This should included proof of the requirement for a bypass to be constructed around the in-channel reservoirs so that downstream water rights holders can still be assured of receiving the natural flow of the stream. There is a good deal of experience and knowledge regarding DEQ NPDES permits for CBM discharge into unpermitted reservoirs. A requirement that the reservoir be permitted before the discharge permit is issued would go a long way to addressing the problems that coordinate actions of the DEQ and the State Engineer. Additionally, the Wyoming Oil and Gas Commission permitting of off-channel pits and the required bonding should also be required to be listed and permitted prior to the issuance of the NPDES permit.

   Page 2-30, line 30 – records retention on permits should be for five years, at least as long as the permit is valid. This will assist the DEQ and the public in reviewing compliance history and permit conditions. It should be made very clear that the state has a legal right when a discharge permit is grant to enter land to inspect the facility and that discharge. The language in this section is not clear and direct.

   Page 2-39, Line 25. Why does the DEQ allow up to 9 months before a permittee is expected to be in compliance? We have observed and reviewed some NPDES permits where the permittee has been in chronic non-compliance and DEQ is endlessly sending out letters of violation or requirements to come into compliance. The damage that can be caused by the non-compliance and allowing it to continue over time can be serious. If the permitee is out of compliance it is a violation and appropriate action should be taken quickly or fines should be levied. In no other area of society is the public allowed to violate permits or licenses without consequences. Additionally, if a notice of violation is issued the permittee should be required to immediately cease the violating action even while it is appealed before the Council. This happened and the discharge water causing the problem continued for months while the notice of violation was under appeal to the EQC.

3. Section 9. Issuance or Denial of Permits or Authorizations. Powder River landowners feel very strongly that the NPDES process has completely failed to address the problem that CBM produced water is having on our clay soils and native vegetation. The rules as currently written and proposed still do not

prevent the devastating and long-term impacts to our soil and vegetation and ephemeral streams. A sodium adsorption ration (SAR) over 5 or 6 and an EC over 2000 changes the molecular structure of the soil, turning it to hard pan that will not allow water to be taken up in the roots of plants. There is virtually no cost effective reclamation for this problem and would require hauling in new topsoil. The NPDES discharge permit system is not adequately addressing this problem and we are permanently changing the structure of our soils and our native vegetation along hundreds of miles of ephemeral streambeds. We are also salt loading these streambeds with a continual discharge of this CBM water. Accordingly, two additional reasons for denial of permits should be inserted into these rules that state that, "No permit will be issued for surface discharge of CBM produced water that has the sodic and saline characteristics or/ and an SAR over 5 that will destroy the native soil and vegetation." And, "No permit shall be issued for a CBM pond or reservoir for use in storing CBM produced water exhibiting an SAR above 5 or a high EC that will cause a detrimental effect on clay bearing soils and native vegetation if the pond or reservoir is capable of allowing surface and subsurface infiltration outside of its containment surface."

4. Section 15. Public Participation The lack of public notification was one of the specific problems identified by and documented in the final October 2003 report of the DEQ NPDES Task Force. The recommendation was made that the NPDES permit applicant should send a letter of notification to the surface owner or lessee of the locations of the permitted facilities, the time frame, a general description of the water management techniques and the name, address and phone number of a company person to contact. This letter should also accompany the permit application to DEQ. The letter should also be sent to all identified surface users, surface owners, or lessee, the surface user immediately downstream of the property subject to the permit application and any downstream irrigator or livestock producer from the point of discharge tot he confluence of the main stem river. While public notice is to be provided to the owner of the property there is no requirement to notify the downstream landowner or irrigators. This should be required as the report recommended. We should give downstream landowners as much notice as the DEQ is proposing to give to downstream states.

5. Appendix H. This section needs to be carefully reviewed by the Council and substantial modified. The issue of implying all the CBM water being discharged is of beneficial use for livestock and wildlife is mostly false. While it is true that a very, very small total percentage of the CBM water is put to beneficial use, the majority is running downstream causing damages to soil, vegetation, fisheries and downstream irrigators. The volumes of water are so great that it cannot possibly all be beneficially used by all the cattle, wildlife or people in all of Wyoming. In fact, we are wasting this water by allowing it to be pumped and dumped on the surface and calling it beneficial. It is not. Additionally, further allowing a paid industry consultant to make this claim of

beneficial use, as is now allowed, when the landowner will not, goes even further down the road of false claims regarding the beneficial use of the water. The beneficial use of this CBM water should be supported by the volume of water that can actually be used for livestock and wildlife by the landowner and no more should be allowed to be wasted by dumping it on the surface and allowing it to cause damage downstream. We ask that you review this section carefully and bring the truth about actual beneficial use of this water to the rules. The truth is that much of the impacts of dumping the CBM water have been more detrimental than beneficial by dumping it downstream.

Finally, we ask that you again review the DEQ NPDES Task Force Report and see how to incorporate those recommendations more adequately into the rules. We also respectfully ask that you not rush into approving these proposed rules. We believe they need much more review, editing and clarification before they are actually an improvement over what we have now. Thank you again for the opportunity to comment.

Respectfully submitted,

Jill Morrison
Powder River Basin Resource Council

EXHIBIT D

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April 22, 2004

FILED
APR 23 2004
Terri A. Lorenzon, Director
Environmental Quality Council

Olin Sims, Chairman
Environmental Quality Council
Herschler Building 1W
Cheyenne, WY 82002

RE: Proposed changes to Chapter 2, Water Quality Rules and Regulations

Dear Chairman Sims:

I have reviewed the proposed changes to Chapter 2 of the Water Quality Rules and Regulations and have the following comments. I submit these comments on my own behalf, as someone who has worked closely with water discharge issues in Wyoming and who served on the 2003 Task Force to review and evaluate the Wyoming National Pollution Discharge Elimination System Permitting Process. I appreciate the Council's consideration of them.

First, I would say the rule revisions are absolutely necessary, and it is clear that many people have put a great deal of work into them. As sometimes happens after such an effort, the end result is unnecessarily complicated, convoluted, repetitive, and in places just plain makes you want to pull your hair out. The purpose of rulemaking is to put flesh on the framework of laws enacted by the legislature; so that regulators, regulated, and the affected public can know what is required for compliance with the law. Proper rulemaking requires a fine balance between providing specific regulatory guidance and maintaining administrative flexibility. The Chapter 2 rules fail on both counts; providing so much detail in some respects as to be incomprehensible (see the definition of "authorization," or §5(b)), and in important substantive areas setting no clear criteria (see §4 on general permits).

1. Substantive matters

A. § 2 Applicability - Waters of the State

"Waters of the State" are defined in the Environmental Quality Act as "all surface and groundwater, including waters associated with wetlands, in Wyoming." W.S. 35-11-103(c)(vi). The Chapter 2 rules, however, are limited to discharges to Wyoming surface waters. Chapter 8 rules cover groundwater. This segregation overlooks the reality, which is that surface water and groundwater are interconnected. For example, seepage from reservoirs (discharge storage plans rely heavily upon infiltration rates) does not simply disappear when the water goes underground. Seepage and channel infiltration do have the capacity to impact groundwater. Groundwater, in turn, frequently reappears at the surface in the form of return flows. This interconnection should,

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D

at the least, be recognized. In the past the DEQ has sometimes taken the view that water out of sight is out of mind. This view is incorrect and results in ineffective regulation of Wyoming water quality.

I suggest an addition to §2 Applicability, which states:

Groundwater and surface water are interconnected, and these rules shall be applied in conjunction with the Chapter 8 rules governing groundwater.

It may be that the Federal Law requires these rules only to be applied to surface water. Does DEQ intend to do the minimum required by federal law, or will it do what is right for Wyoming?

B. General Permits §4

Section 4 is alarmingly void of firm standards for issuance of general permits. A general permit is essentially a vehicle for the expedited issuance of categories of permits, without the notice required for individual permits. While general permits have the advantage of providing applicants with a great deal of speed and flexibility, they also can be fertile ground for regulatory abuses, as they allow for minimal administrative scrutiny and no public scrutiny, once the General Permit has been issued. General permits should be allowed only with effective checks and balances.

Section 4(a)(iii) would allow the Administrator, in his discretion, to issue a general permit for all CBM discharges, within a geographic area defined by the Administrator. After issuance of the general permit, operators would need only submit a notice of intent to add discharges. Affected persons would have no notice of the additional discharges, no opportunity to comment, and no opportunity to appeal to the EQC. (The time for appeal is linked to the date of issuance of the general permit, and expires 60 days after issuance. New discharges, even discharges in completely new drainages, could be added for years). A general permit deprives the public of its due process rights to notice and an opportunity for a hearing. General permits should be issued, if at all, only with strict safeguards. These rules lack such safeguards.

At a minimum, the General Permit rule should set forth criteria for when a discharge is more appropriately controlled under a general permit than under an individual permit, including consideration of the public interest and the potential cumulative effect of all discharges under a general permit on the environment in general and any drainage in particular. (See for example, the criteria at §4(b)(v)[1] for discharges without a notice of intent.) Special consideration should be given to the fact that regular people have enough difficulty tracking permit issuance for identified discharges in their drainages; how can they be expected to take notice of a general permit for

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[1] §4(b)(v)requires the Administrator to consider:
the types of discharges, the expected nature of the discharges; the potential for toxic and conventional pollutants in the discharges; the expected volumes of the discharges; other means of identifying the discharges covered by the permit; and the estimated number of discharges covered by the permit.

unspecified drainages and unspecified quantities of water? These types of identifying information must be required in the general permit, because otherwise affected persons cannot have adequate notice of the potential impacts to them.

Also at a minimum, in addition to the opportunity for affected persons to petition the Administrator under §4(i)(ii) for issuance of individual permits, the decision of the Administrator must be appealable to the EQC.

Before leaving §4, I must say that §4(b)(i – iv) is gobbledygook. I think what it means is that nobody should discharge without first receiving authorization. If so, there are clearer ways of saying so. If not, there are clearer ways of saying so.

C. Effluent permits §5

Section 5(a)(v)(T), requiring listing of associated permits, does not mention the Wyoming State Engineer, a key player in many water discharge scenarios. For instance, many Water Management Plans, particularly in the case of CBM, depend upon reservoirs for storage of effluent. In many cases the reservoirs have not yet been permitted because of the SEO permitting backlog. Yet the reservoirs are constructed and the NPDES permits issued on the basis of their role in the Water Management Plan. Aside from begging the question – what is the point of a reservoir permit, which is outside the scope of these proceedings -- the situation results in permitting discharges based on shaky building blocks. If the reservoir permit is eventually denied, or granted with conditions incompatible with the Water Management Plan (because, for instance, it interferes with senior rights), then the Water Managemant Plan and the NPDES permit are no good. These rules entirely ignore this scenario, although it is common and is well-known to the DEQ. **The Chapter 2 rules should require proof that a valid State Engineer reservoir permit has been issued before any DEQ permit that depends on a reservoir for water management is issued.**

Section 5(b), establishing timelines for the DEQ to process permit applications, ignores the clear findings of the Task Force on the NPDES permitting process. The Task Force Report states: "Since 2000, the median number of days required to obtain a NPDES permit fell from 163 days to 79 days – a 51% decrease." Appendix C, Task Force Report.[2] There is no delay in DEQ's issuance of NPDES permits. The major delays in DEQ processing identified by the Task Force (§4.1.3) were in reviewing the monitoring reports submitted by permittees. These delays go to monitoring and enforcement, not to permit issuance. The truth is that DEQ resources are dedicated disproportionately to permit issuance rather than monitoring and enforcement. If permitting lags, it will be because the volume requires more staff and resources. The time frames for completeness review and decisions on permits address a problem that does not exist and impose unnecessary administrative burdens. (§5(b) is also one of the most obtuse and impenetrable portions of these rules -- reason alone to get rid of it.)

D. Public Participation § 15

[2] The Task Force Report can be found on the DEQ/WQD website under NPDES Point Source.

The NPDES Task Force found that there was insufficient notification of NPDES discharges (§4.3), and it recommended that notification be provided to "all identified surface water users, surface owners or lessees, the surface user immediately downstream of the property subject to the permit application, and any downstream irrigator or livestock producer from the point of discharge to the confluence of the main stem river." (Task Force Report, § 4.3 ¶4.) This is important because discharges can have an important effect on non-surface owners downstream, and they should have notice. These categories of people should be included at § 15(a) as persons who should receive notice.

The response to comments provisions should also be revised. As written, the Administrator need only include in his response to public comments which provisions have been changed and the reason for the change (§5(g)(ii)). Of more interest to the commenter would be the reason that proposed changes have not been made. The language of §5(e), regarding responses to comments from affected states, states that the Administrator "shall take these comments into account," and shall include in his response "a written explanation of his reasons for failing to accept any of the comments." Surely the citizens of Wyoming deserve the same deference.

E. Appendix H – Oil & Gas

Appendix H, S(a)(i) requires that:

> produced water discharged into surface waters of the state shall have use in agriculture or wildlife propagation. The produced water shall be of good enough quality to be used for wildlife or livestock watering or other agricultural uses and actually be put to such use during periods of discharge.

This requirement continues the practice, familiar in CBM effluent permitting, of requiring a showing that the water will be put to beneficial use. This might give you a warm fuzzy feeling about the quality of the water being discharged. Do not be deceived. The requirement that a showing be made the water is of a quality to be used for wildlife or livestock watering serves a limited purpose of setting a base quality. It serves no other purpose. The reason is that there is no consideration whatsoever of quantity. Consider the scenario in which CBM wells produce water over a 100-square-mile area where previously there had been no reliable water source. It would be a good thing for a small herd of antelope and a few head of cows to have water available. That's all that's required by the current practice or by these proposed rules. But, will a few tire tanks satisfy the wildlife and cattle needs? What about several 15-acre-foot reservoirs? And what about the water that is being flushed down the drainage and into the mainstem? Many downstream ranchers and irrigators (including the State of Montana) do not welcome the water. It is a simplistic and dishonest standard to say that's okay because there's an antelope up there somewhere that may be thirsty. A quantity parameter must be included in the quality/beneficial use standard in order to have it serve any useful purpose. Of course this will present challenges in defining the parameter (and maybe even lengthen these rules), but it is worth making them mean something. (Appendix H(d)(i) suffers from the same infirmities.)

Appendix H (d)(ii) appears to be a great big loophole, again relying on the false premise

that a "letter of agricultural or wildlife use" from a landowner makes it all okay. It doesn't. One landowner (who stands to gain from royalties or a surface use agreement) cannot vouch for the desirability of the water that has significant impacts far down the drainage beyond his own land.

A major flaw throughout these rules is the failure to consider drainage-wide impacts (for example, in Appendix H and in the notice provisions).

2. Form of the Rules

Rules first of all ought to be an effective communication tool for the regulated and for the public. Any rules containing so many definitions that their roman numerals surpass the understanding of ordinary mortals fail in this fundamental purpose of rulemaking. (Who knows how many lxxviii is?) The Chapter 2 rules are 100 pages long; twice that with the appendices (A through N). They contain 13 "definitions" and 110 "supplemental definitions" (that's ex, I looked it up).

The rules are clearly the result of a great deal of commendable work. Now it would be an act of mercy to sent them back and require someone with a fresh eye to take a red pen to them. For example:

A. Applicability § 2

This section requires that all effluent discharges into surface waters of the state be permitted, and then lists exceptions. It doesn't say that, however, instead it backs into it with some convoluted language and an inexplicable distinction between §2(a) and §2(b) (§2(a) says all discharges are to be permitted, except. . . §2(b) lists the exceptions). Section 2(c)"no conveyance of property rights or exclusive privilege," belongs in §1, General Provisions; it doesn't go to applicability (and after the first time, it doesn't need to be said again in other sections – like §5(i)(K)). Section 2(d), Permit modifications, etc. is thoroughly addressed in §12, Permit or Authorization Modifications, and §13, Permit and Authorization Terminations. There is no need to say it here. The purpose of §2(e) is obscure and should probably be deleted. If it can be justified, it should find a home in Definitions (like §3(b)(xcv), Surface waters of the State).

These may seem to be trivial edits, but they would go a long way towards putting the incomprehensible within reach of the humans residing in Wyoming. The same type of editing would greatly benefit the rest of these rules. I'm not going to do it; I assume someone is well-paid for the job.

B. Definitions §3

These are, as stated above, excrutiatingly and unnecessarily comprehensive. For example, do they really need separate (and lengthy) definitions of "pollution" (§3(a)(ix)) and "pollutant" (§3(b)(lxxix))? Are they going to call it the "CWA" (§3(b)(xx)), the "Federal Act" (§3(b)(xxxi), or the "Clean Water Act" (§1(a))?

3. Rulemaking Procedure – a reminder

The rulemaking process frequently employed by the DEQ of encouraging input through

stakeholder process, public meetings and advisory boards is a good one. Nobody should be lulled into the belief, however, that any of that process can take the place of the public comment procedure. Although often rules are nearly fully-formed by the time they are noticed for public hearing, it is a mistake to think that very significant changes may not be made as a consequence of public comment. The Administrative Procedures Act, which governs rulemaking, requires that the public receive at least 45 days notice of an agency's intent to adopt, amend or repeal rules. It requires that all interested persons be afforded a reasonable opportunity to submit data, views, or arguments. And the law requires the agency to "consider fully all written and oral submissions respecting the proposed rule." W.S. §16-3-103. Public comment, and the agency's careful consideration of the public comment, are an essential part of rulemaking, and no amount of "process" can replace it.

These rules need significant improvement in both form and substance before they can be unleashed on the people of Wyoming. My comments are only meant to highlight some of what I consider to be the most significant issues. Thank you for considering them.

Sincerely,

DAVIS & CANNON

Kate M. Fox

Kate M. Fox

KMF:ck

EXHIBIT E

EXHIBIT
E

Wyoming Water Quality Rules and Regulations

Chapter 2

PERMIT REGULATIONS FOR DISCHARGES TO WYOMING SURFACE WATERS

EQC Version 1

RESPONSE TO COMMENTS

June 2004

Comments Provided by:

1.	Biodiversity Conservation Alliance	-	Jeff Kessler	(Laramie, WY)
2.	Davis & Cannon, Attorneys at Law	-	Kate Fox	(Cheyenne, WY)
3.	Petroleum Association of Wyoming	-	John Robitaille	(Casper, WY)
4.	Wyoming Game and Fish Dept.	-	Bill Wichers	(Cheyenne, WY)
5.	Yates Petroleum	-	Lisa Norton	(Artesia, NM)
6.	Melanie Arnett	-	Melanie Arnett	(Laramie, WY)
7.	Claiborne K. Rowley	-	Claiborne K. Rowley	(Sheridan, WY)
8.	Bryan Wyberg	-	Bryan Wyberg	(Coon Rapids, MN)
9.	Western Watershed Project	-	Jonathan Ratner	(Pinedale, WY)
10.	Rev. Dr. Rock H. Schuler	-	Rev. Dr. Rock H. Schuler	(Lansdale, PA)
11.	Wyoming Outdoor Council	-	Steve Jones	(Lander, WY)
12.	Longreach Buffalo Company, LLC	-	Roy Liedtke	(Gillette, WY)
13.	Wyoming Farm Bureau	-	Ken Hamilton	(Laramie, WY)
14.	Wyoming Mining Association	-	Marion Loomis	(Cheyenne, WY)
15.	Marjorie West	-	Marjorie West	(Arvada, WY)
16.	Powder River Basin Resource Council	-	Jill Morrison	(Sheridan, WY)
17.	Jake Strohman	-	Jake Strohman	(Cheyenne, WY)

32	Section 5(a)(vi)(T)	Section 5. Effluent Permits. Page 2-29 should include among the list of all active permits or construction approvals the approval from the State Engineer for the construction of in-channel reservoirs. This should include proof of the requirement for a bypass to be constructed around the in-channel reservoirs so that downstream water rights holders can still be assured of receiving the natural flow of the stream. A requirement that the reservoir be permitted before the discharge permit is issued would go a long way to addressing the problems that coordinate actions of the DEQ and the State Engineer. The Wyoming Oil and Gas Commission permitting of off-channel pits and the required bonding should also be required to be listed and permitted prior to the issuance of the NPDES permit.	The DEQ agrees that it is useful in the DEQ's continued efforts to coordinate closely with these agencies for an applicant to list any permits or construction approvals received or applied for by the State Engineers Office and the Oil and Gas Conservation Commission. However, as related to the comment of requiring SEO and OGCC permits, the same argument could be made that a NPDES permit is required prior to issuance of a State Engineers permit. As recommended by the NPDES task force there has been improved coordination between the agencies to ensure that actions by the agencies do not affect the actions of the other agency. It should be noted that the Wyoming State Engineer was added to the governmental agency mailing list in Section 15 (d).	Added the State Engineers Office and the Oil and Gas Conservation Commission to Section 5(a)(vi)(T) as IX and X.
33	Section 3(a)	The Oil and Gas Commission requires a groundwater assessment from the DEQ before it will issue a permit for off-channel reservoirs. The DEQ should require at least that much before issuing its discharge permits, particularly when on-channel reservoirs are an integral part of the water management plan. This could find a place at Section 5(a), with a requirement for certification of Chapter 3 compliance. This new Chapter 3 ignores the connection between surface water and groundwater. For discharges that will clearly reach groundwater, the permittee should be required to meet the requirements of Wyoming's groundwater regulations as well. Any discharge to a reservoir that is designed to leak its contents to groundwater, for instance, should also be required	The OGCC is requiring the groundwater assessment from the DEQ for off-channel reservoirs pursuant to an MOA between the two agencies. The WQD has separate rules for groundwater protection and the groundwater program is currently evaluating the need for and circumstances when groundwater evaluations might be necessary for on-channel reservoirs. If the groundwater program determines a need for requiring groundwater monitoring associated with specific types of NPDES discharges, existing statutes and the proposed rule will allow for the incorporation of these requirements in the applications and permits.	No Change Recommended

		to obtain a groundwater discharge permit, and the permittee should be required to provide assurances that the discharge will not unduly pollute the groundwater in question. DEQ should require a groundwater assessment be made before issuing any discharge permits, especially if on-channel reservoirs are part of a water management plan. Should address the fact that surface and groundwater are connected. They are not two separate entities. Seepage of CBM water from reservoirs can and does resurface downgradient causing the usefulness of draws and meadows, which are our most productive lands.		
34	Section 5(a)(v)(T)	The Chapter 2 rules should require proof that a valid State Engineer reservoir permit has been issued before any DEQ permit that depends on a reservoir for water management is issued.	The same argument could be made that a NPDES permit is required prior to issuance of a State Engineers permit. As recommended by the NPDES task force there has been improved coordination between the agencies to ensure that actions by the agencies do not affect the actions of the other agency. It should be noted that the Wyoming State Engineer was added to the governmental agency mailing list in Section 15 (d).	No Change Recommended
35	Section 5(a)(vii)	The term for permits described in this chapter is five years. Consequently it seems prudent to require that records kept to satisfy a permit requirement be stored for five years also, rather than the proposed three (years).	It should be recognized that permits are not all five years in length. Five years just happens to be the maximum length of a permit allowed. Regardless, the length of permit is irrelevant in evaluating this issue. The question to be answered is will there be any added value to requiring a permittee to maintain 5 years of data rather than 3 years. Because the information will be used for conducting compliance inspections and there is a greater interest in more recent information, the DEQ concludes that there would be no added value to this requirement. Furthermore, to avoid confusion amongst the regulated community it would make sense to maintain the 3 year time frame consistent with EPA and surrounding states.	No Change Recommended

		idea of a public meeting suggests that it is up to the discretion of the Administrator to determine how it will be conducted, whether individuals are allowed to speak at the hearing, and whether any formalities will be observed.		
58	Section 17	We urge you to retain the existing public hearing rule that provides for a public hearing before the EQC when public interest is substantial. And, we urge you to modify the proposed rule to provide clear criteria for when such a hearing should be scheduled.	The changes to the Public Hearing provisions is to allow a mechanism for public participation through a public meeting to resolve issues regarding permits during the draft phase of the permit without compromising the ability for persons to appeal permits to the Environmental Quality Council at a later time based upon the decision of the Director. The Hearing Section was added to make clear the opportunities for hearings with Environmental Quality Council.	No Change Recommended However, modifications to this section have been made as described on DEQ changes at the end of this document #80.
59	Section 18	Page 2-97, Section 18 Public Information. A description of information availability similar to the description found in Section 15, Public Participation, needs to be included or referenced in Section 17.	A complete set of all file information is maintained only in the Cheyenne office and availability of public information is subject to W.S. 35-11-1101 as stated in the draft rule. It is the DEQ's opinion that a description of availability similar to the description found in Section 15 is not appropriate as the intent of these two provisions is dissimilar.	No Change Recommended
60	Appendix H	Appendices H needs to address the current practices of DEQ/WQD with regard to allowing discharges to "on-channel reservoirs," off-channel reservoirs, total containment ponds or containment units. Currently, DEQ/WQD has ignored the fact that the ponds that have been allowed pursuant to these NPDES permits by the DEQ/WQD are in fact "treatment works" as that term is defined by W. S. 35-11-103(c)(iv), in that they are most certainly "used for treating, stabilizing or holding wastes." These ponds are, as WDEQ must admit, constructed by the permittee for the purpose of receiving the produced water. Therefore, DEQ/WQD must permit them as a "sewerage system, treatment works, disposal system or other facility... capable of causing or contributing to pollution..." requiring a permit	The DEQ has determined that these CBM reservoirs (on-channel and off-channel) are surface waters of the state and therefore appropriately protected under the provisions of Wyoming Water Quality Rules and Regulations Chapter 1, Wyoming Surface Water Quality Standards and NPDES permitting requirements. The DEQ is currently evaluating the potential groundwater concerns related to the use of the reservoirs. If it is determined by the WQD	No Change Recommended

		to construct pursuant to W. S. 35-11-301(a)(iii). Appendices H, which addresses produced water, should state clearly that anyone discharging into such ponds must also obtain a permit pursuant to Chapter 3 of the regulations. This is needed because these ponds are invariably unlined. Unlined ponds will leak their contents to the groundwater. This means that there is a very serious potential, for all reservoirs allowed by these permits, that they will pollute groundwater, and possibly surface water, depending on the hydrologic connectivity of the aquifer below the reservoir to surface waters further downgradient. By allowing these reservoirs to go unpermitted (i. e. no permit to construct), DEQ/WQD is ignoring its duties under the EQA, and is leaving open the distant possibility of pollution to waters of the state, in violation of W. S. 35-11-301(a)(i), which is not be regulated by DEQ/WQD at all, since no groundwater monitoring is contemplated or required by any of these NPDES permits. Appendix H should require that any permit application involving disposal into unlined reservoirs include submittals of construction design plans and specifications, subsurface geology, percolation tests, distances to groundwater and surface water, quality of groundwater, and monitoring wells. Currently, DEQ/WQD does not require any of this information to be submitted. DEQ/WQD's pit siting guidelines are a bit of an improvement over nothing, but they are not even referred to in these Appendices. The alluvial aquifer is in direct connection with the Powder	Groundwater Program that there is a need to address groundwater concerns the DEQ will address these concerns under the appropriate groundwater regulations and evaluate the most efficient and sensible means of incorporating groundwater requirements with surface water quality permitting requirements.	

		River, and its tributaries. Contaminants from produced water carried through that system will eventually reach the Powder River, at the surface. Appendices H should therefore be redone to address this very serious issue. DEQ/WQD should not be allowed to continue in its current practice of allowing discharges to total containment ponds, or containment units, when those ponds or units themselves are not permitted pursuant to W. S. 35-11-301(a)(iii).		
61	Appendix H	Page H-1, Appendix H, Lines 8 through 18. It is urged that this appendix be revised to better describe the factors associated with permit application requirements that are specific to all produced water discharges and their impact on soil and vegetation, in addition to lesser impact on animals and humans.	Appendix H is clear in its intent and is designed to protect designated uses as defined in Wyoming Water Quality Rules and Regulations Chapter 1, which includes a narrative standard for the protection of Agricultural Water Supply and numeric human health criteria for individual constituents.	No Change Recommended
62	Appendix H	The rule lacks content involving permitting retention ponds used for disposal or storage of coal bed methane produced water. Mention is simply limited to stating that the Wyoming Oil and Gas Conservation Commission manages/permits certain types of surface containment. However, the Wyoming State Engineer's Office and the Wyoming Department of Environmental Quality also manage/permit certain types of surface containment structures. It would be helpful to anyone using the proposed Chapter 2 if it provided enlightenment enabling readers to distinguish between the differences in agency responsibility.	Permitting of CBM ponds is beyond the scope of the NPDES program. Permitting of CBM ponds is done by the State Engineers Office and the Oil and Gas Conservation Commission. This rule is not an appropriate forum for enlightening enabling readers about the responsibilities of different State agencies.	No Change Recommended
63	Appendix H (d)(v)	The Wyoming Game and Fish Department is still receiving requests for beneficial use statements for historic discharges. There is still some confusion with the statement in Appendix H, Section d(v), first sentence that says: A... or a signed statement by the Wyoming Game and Fish Department was	The WDEQ is aware of the Wyoming Game and Fish Department (WGF) concerns with new requests for beneficial use statements. The proposed revisions would limit the need for such determinations and does not reference the WGF as a source for beneficial use statements. The only reference to WGF is (in	No Change Recommended

		provided in which it is stated that the discharge in question is of value to fish or wildlife@. This confusion could be corrected if, in line 3, the following was added: A...may be granted on a case by case basis if, ***in the original application***, a signed....@. If our interpretation is incorrect, then we request the Wyoming Game and Fish Department be removed entirely from this sentence.	reference only) related to historic beneficial use statements that were provided under existing regulations which is necessary to preserve the status of those existing permits.	
64	Appendix H(d)(i)	Suggest the following language change: (d)(i) "Where discharge water is accessible to livestock and/or wildlife, meets the effluent limitation as specified ~~in this appendix~~ paragraph (b)(viii) or modified effluent limitations as specified in paragraph (d)(ii); and meets the criteria for the protection of livestock and wildlife as specified in Wyoming Water Quality Rules and Regulations Chapter 1, Wyoming Surface Water Quality Standards, the discharge will be considered in compliance with the requirements of Appendix H (a)(i) of these regulations." This change essentially makes it clear that if a permittee is authorized to discharge under a modified effluent limitation and complies with the modified effluent limitation, the permittee will be considered in compliance with Appendix H.	This change is unnecessary because modified effluent are included in the appendix and are therefore covered by the provisions of H(d)(i). Further, there are more effluent limitations besides those specified in paragraph (b)(viii).	No Change Recommended
65	Appendix H (a)(i)	A quantity parameter must be included in the quality/beneficial use standard in order to have it serve any useful purpose. (Appendix H(d)(i) suffers from the same infirmities)	40 CFR 435 allows for the discharge of produced water if the water is used by wildlife or agriculture during periods of discharge. This was a provision that was supported by the Wyoming DEQ, Wyoming Game and Fish and many landowners within Wyoming to allow for the continued use of produced water rather than re-injecting the water. It is the DEQ's opinion that there should not be	No Change Recommended

		Appendix H. The issue of applying all the CBM water being discharged is of beneficial use for livestock and wildlife is mostly false. While it is true that a very, very small total percentage of the CBM water is put to beneficial use, the majority is running downstream causing damages to soil, vegetation, fisheries and downstream irrigators. The volumes of water are so great that it cannot possibly all be beneficially used by all the cattle, wildlife or people in all of Wyoming. Allowing a paid industry consultant to make this claim of beneficial use, when the landowner will not, goes even further down the road of false claims regarding the beneficial use of the water. The beneficial use of this CBM water should be supported by the volume of water that can actually be used for livestock and wildlife by the landowner and not more should be allowed to be wasted by dumping it on the surface and allowing it to cause damage downstream.	a quantity limitation related to the agricultural and wildlife use determination. The federal regulations did not contemplate a maximum allowable flow rate but rather that the water being discharged was actually used by wildlife or agriculture during periods of discharge. It was not the intent of the federal regulations that all of the water be consumed	
66	Appendix H	Appendix H(d)(ii) appears to be a great big loophole, again relying on the false premise that a letter of agricultural or wildlife use from a landowner makes it all okay. One landowner cannot vouch for the desirability of the water that has significant impacts far down the drainage beyond his own land.	The provision related to the "letter of agricultural or wildlife use" is only one of the requirements of this section and is consistent with other provisions of this appendix. As stated in earlier in this provision the administrator will make the decision on modified limits based on the merits of a Use Attainability Analysis to ensure all designated uses are protected.	No Change Recommended

67	Appendix H	The quantity of produced CBM water must be beneficial to livestock and wildlife. The beneficial use statement must come from the landowner or the person who leases the land. Any beneficial use statement coming from the CBM gas companies should be considered to be totally useless.	The wildlife and/or agriculture use statement is intended to verify that when the water is discharged to the surface that it will be used by agriculture or wildlife. The demonstration can be reasonably made by the landowner or other qualified individuals. The DEQ does agree that agricultural use determinations would likely need to be made by the landowner or lessee.	No Change Recommended
68	Appendix J	What is the federal counterpart to Appendix J? We believe this Appendix adds to the duplication of environmental permitting between two DEQ divisions (WQD and LQD). Allow just one division to oversee and regulate the construction and maintenance of sedimentation control structures and storm water runoff.	The federal counterpart to Appendix J is 40 CFR 434. The relevance of this appendix to these rules is that this appendix covers discharge regulations directly applicable to Coal Mines. Appendix J is reflective of what is currently in Wyoming Water Quality Rules and Regulations Chapter 10. The DEQ agrees that there have been some modifications to the federal regulations in 40 CFR 434 that are not included in Appendix J but should be. The applicable provisions to Chapter 3 were incorporated in the existing state NPDES Rules and Regulations Chapter 10 in 1985 to address minimum design standards for surface coal mining sedimentation control facilities. The provisions of Chapter 10 were incorporated into the proposed Chapter 2 rule to consolidate the NPDES permitting rules into a single rule package. Through an internal working agreement with the Land Quality Division (LQD) and the Water Quality Division (WQD), reviews of the sedimentation control facilities for compliance with the Chapter 10 requirements are done by the LQD and a Chapter 3 WQD application is not required. LQD has indicated that they intend to incorporate the minimum design standards for surface coal mining sedimentation ponds into their rules and guidance that will satisfy the requirements of Appendix A of the current WQD Chapter 10 regulations. Therefore, reference to the minimum design standards	No Change Recommended

EXHIBIT F

RESPONSE TO
JULY 7, 2004
EQC QUESTIONS

Section 2 - General Applicability

Page 2-3, paragraph (d) "Interpretation of "waters of the United States". All references to the CWA where there is reference to the phrase "water(s) of the United States" shall be interpreted as "surface waters of the state" for purposes of this rule. This interpretation does not expand the CWA implementation authorities of federal agencies."

1. Provide a narrative clarification of this section.

In the CWA reference is made to "Waters of the United States". Corresponding federal regulations, are written with specific reference to protecting "Waters of the United States". In 2001, the U.S. Supreme Court ruled that Clean Water Act jurisdiction did not extend to intra state isolated waters and that the regulation of such water was appropriately the responsibility of state and local authorities.

The Wyoming Environmental Quality Act (WQA) 35-11-103(c)(vi) defines "waters of the state" as all surface and groundwater, including waters associated with wetlands, within Wyoming. Consequently, the definition of "waters of the state" includes more surface waters and is much broader than what is covered by the federal definition of "waters of the United States".

Under the provisions of W.S. 35-11-301 no person shall cause, threaten or allow the discharge of any pollution or wastes into the waters of the state or alter the physical, chemical, radiological, biological or bacteriological properties of any waters of the state except when authorized by a permit issued pursuant to the provisions of the Environmental Quality Act.

The federal regulations, including effluent limitations, only apply to "waters of the United States". Because the state definition of "waters of the state" is much broader it is necessary to interpret the federal regulations to be applicable to all waters of the state not just those waters that are also "Waters of the United States". Otherwise all "waters of the state" which are not "Waters of the United States" would not be provided the same level of environmental protection.

It is the WQD's opinion that it is critical to the health of the state's surface water's to provide the same level of protection to all surface waters within the state of Wyoming. Therefore it is necessary to interpret the federal use of "waters of the United States" as "surface waters of the state" for the purposes of protecting Wyoming's surface waters under these regulations.

2. Does groundwater apply? If not, why not?

The federal definition of "waters of the United States" under 40 CFR 122.2 does not include groundwater. The federal NPDES rules and the intent of the State WYPDES rules are specifically designed to address discharges to surface waters and protection of surface water quality standards. Groundwater protection is addressed in separate water quality rules and regulations, specifically Chapters 3 and 8.

EXHIBIT
F

Section 3 - Definitions

1. Do we need definitions contained in the statute or should they be left out?

Including relevant definitions from the statute is done to make the rule package more user friendly. This practice is consistent with the approach used in Wyoming Water Quality Rules and Regulations Chapter 1, Wyoming Surface Water Quality Standards adopted by the EQC in 2001.

2. Is the definition of "Affected lands" contained in Appendix J? How does it apply to storm water?

The term is not used in Section 6 - Storm water. The term "affected lands" is used in paragraph (c) lines 19 and 21 on page J-5 of Appendix J. The provision in Appendix J is a carryover from Chapter 10 and is included to provide a mechanism to allow draining of sedimentation ponds under certain conditions in order to maintain the 10 year 25 year storage capacity. Although the drainage from affected lands consists of only storm water, the storm water provisions in Section 6 are much broader and industrial storm water permitting requirements are still applicable.

3. In the definition of BMPs on page 2-6, line 34 should be "and/or".

The proposed rule has been modified to reflect this change.

4. In the definition of CFR on page 2-7, line 2 should reference July 1, 2004.

The proposed rule has been modified to reflect this change.

5. The definition of "process wastewater" should exclude "pit pumpage" from mines. Consider going back to the original definition in Chapter 10.

"Pit pumpage" from mining activities is appropriately included in the definition of "process wastewater" for the following reasons:

1. *The pit pumpage clearly falls within the definition of "pollution" that would be regulated under the Wyoming Environmental Quality Act.*

2. *The definition is consistent with the federal regulations. Excluding "pit pumpage" from the definition would arguably lead to rules that are less stringent than the federal regulations which is not allowable under the conditions of state program authority.*

3. *The original definition of "process water" in Chapter 10 did include " water originating from a pit or shaft in which mining is occurring or has occurred,...", therefore the definition of process wastewater is consistent with Chapter 10.*

6. Consider changing the name of "silvicultural point source" to something more reflective of the activity.

The DEQ has evaluated the merits of changing the name of "silvicultural point source". Because this term and definition are consistently applied in the federal regulations and in state regulations since 1972 and the regulated community is accustomed to the term and not objecting, changing the definition may cause more confusion and inconsistency than retaining the term. Therefore, the WQD does not recommended changing the term "sivicultural point source".

Section 4 - General Permits

1. On page 2-21, paragraph (i)(ii) - How do interested persons know when an authorization is issued?

The DEQ agrees that this is a valid concern and suggests that, consistent with current practices under the storm water general permit authorizations, all authorizations along with the general permit be posted at the physical location covered by the authorization. The following language has been added to Section 4 (l):

(l) Permit conditions:

(i) General permits will include all conditions determined necessary by the state for protection of the surface waters of the state.

(ii) General permits will require a copy of the authorization letter be posted at the physical location of the permitted site in a prominent and safe place for public viewing.

Section 5 - Effluent Permits

1. On page 2-28, paragraph (v)(O) - Clarify in a narrative the meaning and purpose of this provision.

The provision is specifically requested for use in calculation of mixing zones. In preparing the mixing zone calculation, it is necessary to know how far into and how deep the discharge outfall is.

2. On page 2-29, paragraph (v)(T) - Specify the types of SEO and OGCC permits and address the need for LQD and AQD permits.

Reference to the specific types of SEO and OGCC permits has been added. Reference to LQD and AQD is sufficiently covered in the provision requesting any other relevant state permits.

3. Readdress comment #37 regarding the timing of permits.

The WQD after considering public comment through the rule making process with the Advisory Board concluded that it was reasonable to not subject an applicant to a 180 day waiting period before finding out the application was incomplete. A 45 day comment period was determined to be reasonable for a completeness review. This information was shared with the NPDES Task force at the time rule making was being considered. The WQD and NPDES Task force concluded that it was not necessary or appropriate to include a minimum time for technical reviews because the complexities will vary. The task force did recommend that the WQD stay within the existing average time frames for permit review and issuance.

Section 7 - Isolated Wetlands

1. Provide an explanation of how this section will be implemented (Specific Criteria)

The primary goal is to achieve no net loss of naturally occurring wetland function and value in the state. Man-made wetlands that were created as mitigation for some previous disturbance are treated the same as naturally occurring wetlands. Below is the process that will be considered when attaining this goal.

The applicant will evaluate the size of the wetland disturbance.

If the disturbance is one acre or less, then the project is permitted by rule provided that there is no discharge of solid wastes, hazardous wastes, hazardous materials, hazardous constituents radioactive material or any toxic substance (Section 7((j)).

If the disturbance is greater than one (1) acre, then the applicant will submit a notice of intent (NOI) for coverage under an isolated wetland mitigation general permit. The WQD will work to develop and issue the general permit. With the NOI, the applicant will also submit a mitigation plan. A mitigation plan that utilizes Wetland Baked Credits will be approved by WQD in accordance to the Wyoming Statewide Wetland Mitigation Bank, Guidelines for Interpretation and Implementation, April 1995. The guideline shall, at a minimum provide for:

- *Criteria under which mitigation credits may be earned;*
- *Geographical and other appropriate limitations for the application of mitigation bank credits;*
- *Criteria for the use, banking or sale of banked credits;*
- *The approval by the department for the earning, using, banking, transfer or selling of mitigation bank credits; and*

- *Requirements for the maintenance and submission by the department of records concerning ecological function and wetland value losses, and credit and debit accounts for each mitigation bank.*

All NOIs received will be evaluated for completeness within 30 days of receipt. If the NOI is determined to be incomplete, a notice will be provided to the operator describing the additional information needed for a complete NOI. Please refer to Section 4(f) for more details related to the processing procedures for NOIs.

If appropriate, the WQD will issue a written authorization under the isolated wetland mitigation general permit.

2. Address concern that this section is being implemented through a guidance document that is not subject to public review and comment and can change.

The Wyoming Statewide Wetland Mitigation Bank, Guidelines for Interpretation and Implementation, April 1995 is a guideline document that is not a defined set of regulations but rather an expression of the department's policy. This document may be modified in the future, however, any changes must be approved by the Advisory Board.

3. Address the need for public notification and notifying downstream landowners.

The WQD has considered the suggestion to incorporate notification requirements for downstream landowners and concluded that notifying downstream landowners is not necessary. Since the wetlands are considered to be isolated waters, it is unlikely that downstream landowners will be affected by the activity. However, according to Section 7(b)(iv), the mitigation plan must include the name(s) and address(s) of adjacent property owners who may be affected by the activity.

Section 15 - Public Participation

1. Address notification of downstream landowners.

The WQD has reevaluated this suggestion and stand by our previous response to this comment. It is WQD's opinion that there is sufficient opportunity for interested parties to obtain information regarding a permit through the provisions that are included in Section 15, which are the same consideration for notice provided to downstream States. The NPDES Task Force also provided recommendations that suggest the operators should work, prior to development, with the surface users and the appropriate permitting agency to identify the appropriate water management techniques that would be the most beneficial for livestock, agriculture, and wildlife. In addition, watershed permitting, once implemented, will help to facilitate communication regarding water management options among potentially affected parties within a watershed.

All Appendices

1. In all Appendices look for consistency in the location of definitions (front or back).

The WQD reviewed the Appendices and concluded that where there are discrepancies in formatting of definition locations it was because the definitions where applicable only to those provisions of the appendix. Therefore, the WQD concluded that the location of definitions within the appendices was appropriate and no changes were made.

Appendix B, C and D

1. Should Coal Mines be subject to these Appendices in addition to Appendix J?

Yes, the provisions of Appendices B, C and D pertain to application requirements consistent with federal regulations at 40 CFR 122.21(g), 40 CFR 122.21 (k) and 40 CFR 122.21 (h) respectively. The provisions of Appendix J pertain to effluent limits specific to coal mines. The provisions of Appendices B, C and D were not expressly combined with Appendix J because Appendices B, C and D apply to more than just coal mines.

Appendix H

1. Consider SAR and Ec limits for irrigation. Provide a narrative effluent end of pipe limit in Appendix H.

In January 2002, the Wyoming DEQ, through the Water Quality Division (WQD) organized a workgroup to help the agency evaluate the need for numeric criteria for SAR and Ec. In January 2004, the WQD issued it's findings and conclusions from the work completed by the workgroup and are attached to this memorandum. For the reasons described in the attached "Finalization of the Recommendations of the SAR/EC Workgroup" it is the WQD's opinion that the agency recommendations will satisfactorily address concerns with Ec and SAR. Specifically, the recommendations to address concerns/problems associated with interpretation and application of the numeric standard the WQD is pursuing the following:

- *Development of a Chapter 1, Section 20 Implementation Policy that would be public noticed and brought before the Water and Waste Advisory Board. The WQD anticipates completion and public notice of a draft document by October 2004.*

- *Clarification on what is meant by the term "measurable decrease". This clarification would be incorporated into the aforementioned Implementation Policy.*

2. Provide a narrative explanation of beneficial use.

The Clean Water Act requires that effluent limits be established in permits that are based on technologies available to treat pollutants in addition to limits based on water quality standards for protecting the designated uses of receiving streams. The national Effluent Limitation Guidelines (ELG) associated with the Oil and Gas Point Source Category predate the development of coal bed methane extraction technology; however, the technology is similar enough to conventional gas extraction that, in the professional judgement of the Wyoming Department of Environmental Quality (WDEQ), these ELGs are appropriately applied to coal bed methane gas production.

According to the federal regulations, "no discharge" is allowed for onshore operations, unless the discharge of produced water occurs west of the 98th meridian and is used for agricultural purposes and/or wildlife propagation. The basis for this "no discharge" exemption (subpart E of 40 CFR 435) is that, within certain limits, produced water can be a benefit to wildlife, stock, irrigation and the health and diversity of an arid environment. The regulations further state that the produced water shall be of good enough quality to be used for wildlife or livestock watering, or other agricultural uses and that the produced water is actually put to such uses during periods of discharge.

This federal effluent guideline was revised in the mid 1970's from earlier versions to allow surface discharge west of the 98th meridian after EPA received comments supporting surface discharges were received from the Wyoming Game and Fish Department, Wyoming Department of Environmental Quality, and several members of the Agricultural Community.

Appendix J

1. On Page J-3 - Should reference to Appendix B and C be taken out?

No, the provisions of Appendices B, C and D pertain to application requirements consistent with federal regulations at 40 CFR 122.21(g), 40 CFR 122.21 (k) and 40 CFR 122.21 (h) respectively. The provisions of Appendix J pertain to effluent limits specific to coal mines. The provisions of Appendices B, C and D were not expressly combined with Appendix J because Appendices B, C and D apply to more than just coal mines.

2. Why does "process water" include pit pumpage? Recommend removing.

"Pit pumpage" from mining activities is appropriately included in the definition of "process wastewater" for the following reasons:

1. *The pit pumpage clearly falls within the definition of "pollution" that would be regulated under the Wyoming Environmental Quality Act.*

2. *The definition of is consistent with the federal regulations. Excluding "pit pumpage" from the definition would arguably lead to rules that are less stringent*

than the federal regulations which is not allowable under the conditions of state program authority.

3. *The original definition of "process water" in Chapter 10 did include " water originating from a pit or shaft in which mining is occurring or has occurred,... ", therefore the definition of process wastewater is consistent with Chapter 10.*

Addendum

DEQ Response
to
EQC July 7, 2004 Questions

This addendum provides additional clarification to EQC questions raised on July 7, 2004, regarding proposed Wyoming Water Quality Rules and Regulations Chapter 2. Specifically, this addendum addresses the Agricultural and/or Wildlife Use provisions of Appendix H.

On September 15, 1975, U.S. EPA published, in Federal Register, Vol. 40, No. 179, a Notice of Interim Final Rule Making for offshore segment of the oil and gas extraction point source category (40 CFR Part 435). This interim final rule making established effluent guidelines for existing source. The Interim Final Rule did not contemplate allowing surface discharge for the onshore segment of the oil and gas extraction point source category. The following Wyoming organizations commented on the Interim Final Rule: Wyoming Department of Environmental Quality; Wyoming Environmental Institute; Powder River Basin Resource Council - Buffalo, Wyoming; Wyoming Game and Fish Department; and the Wyoming State League of Women Voters. In addition, many other states and interested parties commented on the Interim Final Rule.

On October 13, 1976, U.S. EPA published, in Federal Register, Vol. 41, No. 199, a Notice of Interim Final Rule Making for onshore segment of the oil and gas extraction point source category (40 CFR Part 435). The regulation amended Part 435 and was applicable to existing sources for the onshore subcategory, the coastal subcategory, the beneficial use subcategory and the stripper subcategory. The applicable subcategory to Wyoming was the beneficial use subcategory which where applicable to facilities where the produced water has a beneficial use when discharged to navigable waters.

The term "onshore" was defined as all land and water areas landward from the inner boundary of the territorial seas. The term "beneficial use" was defined as meaning that the produced water is of good enough quality to be used for livestock watering or other agricultural uses and is being put to such use.

435.32 (a) and (b)established the following effluent limitations for the Beneficial Use Subcategory of the Onshore Segment of the Oil and Gas Extraction Point Source Category.

(a)(1) There shall be no discharge of waste water pollutants into navigable waters from any source (other than produced water) associated with production, field exploration, drilling, well completion, or well treatment (i.e., drilling muds, drill cuttings, and produced sands).

(a)(2) Produced water discharges shall not exceed the following limitation:
Oil and grease.....45 mg/l.

(b) The discharger must show beneficial use of the produced water being discharged to qualify for this subpart.

The following Wyoming organizations commented on the Interim Final Rule: State of Wyoming; Powder River Basin Resource Council; State of Wyoming State Engineers Office; Wyoming Department of Agriculture; Wyoming Game and Fish Department; and the Wyoming State League of Women Voters; League of Woman Voters, Cheyenne, Wyoming; Wyoming Environmental Institute; City of Worland, Wyoming. In addition, many other states and interested parties commented on the Interim Final Rule. Some of the more significant issues raised were as follows:

(1) Many commenters stated that no discharge requirements for onshore oil and gas production should not be universal and that discharge of low TDS produced waters when used for cattle water, irrigation, etc. should be excluded.

EPA agreed with the comment and discharge to surface waters of produced water was allowed and left to the permit issuing agency to determine if the beneficial use provisions were being met.

(2) It was suggested that the Wyoming standard of 10 mg/l be used.

EPA stated that they would evaluate and adjust in the future if data suggested that a change was appropriate.

(3) Some commenters supplied information about the problems of taste and odor caused by produced water discharges, even when these wastes were low in TDS and were considered beneficial use discharges.

EPA responded even if beneficial use can be shown, the discharge is still subject to further regulation of applicable water quality standards.

On April 13, 1979 U.S. EPA published, in Federal Register, Vol. 44, No. 73, Federal Effluent Guidelines for the oil and gas extraction point source category (40 CFR Part 435). This was a revision to the existing provisions of Part 435. Specifically, Subpart E (435.50 -52) was amended as follows:

1. The term "Beneficial Use" was changed to "Agricultural and Wildlife Water Use Subcategory" because of the term "beneficial use" is used by agencies regulating water quantity, which created unnecessary confusion.

2. 435.50 was revised by limiting the applicability of the Agricultural and Wildlife Water Use Subcategory to onshore facilities located in the continental United States and west of the 98th meridian for which produced water has a use in agriculture or wildlife propagation when discharged into navigable waters.

3. 435.51 (c) included the following revisions: The term "use in agricultural or wildlife propagation" means that the produced water is of good enough quality to be used for wildlife or livestock watering or other agricultural uses and that the produced water is actually put to such use during periods of discharge.

4. 434.52 (a) included the following revisions:

(1) There shall be no discharge of waste pollutants into navigable waters from any source (other than produced water) associated with production, field exploration, drilling, well completion, or well treatment (i.e., drilling muds, drill cuttings, and produced sands).

(2) Produced water discharges shall not exceed the following daily maximum limitation:
Oil and grease.....35 mg/l.

The federal effluent guidelines have not been revised since 1979. The Wyoming DEQ has historically taken the position that if the produced water discharge meets the effluent limitations established to protect designated uses established in the water quality standards, through protection of water quality criteria, then there is a rebuttable presumption that the water will be used by agriculture or wildlife.

In recent years 2000-2001, U.S. EPA has requested that DEQ demonstrate how the water is being used for agriculture or wildlife. The Wyoming Game and Fish Department provided a letter to the DEQ in 2001 stating that historic conventional oil and gas discharges were a benefit to wildlife. This letter addresses the demonstration for historic discharges. New conventional oil and gas facilities must provide the DEQ with an Agricultural or Wildlife Use statement with the application to satisfy this demonstration.

Because the EPA has taken the position that the federal effluent guideline 40 CFR Part 435 does not apply to coal bed methane facilities, EPA is not requiring DEQ to require documentation of actual use. DEQ continues to support the position that there is a rebuttable presumption that the water will be used by agriculture or wildlife as long as all applicable water quality standards are met.

EXHIBIT G

September 10, 2004

Governor Dave Freudenthal
Capitol Bldg, Room 124
Cheyenne, WY 82002

RE: Chapter 2, Water Quality Rules and Regulations

Dear Governor Freudenthal:

I have reviewed the Chapter 2 of the Water Quality Rules and Regulations and I am writing to express my opposition to their adoption. The revision of the Chapter 2 rules presented an opportunity to modify the NPDES permitting process to address the unique challenges presented by CBM development. This is an opportunity that unfortunately has been passed up. The revised rules perpetuate the misconceptions that have marked a sometimes disastrous approach to management of CBM discharge water by the Wyoming DEQ.

For example, Chapter 2 ignores what has turned out to be one of the greatest concerns created by CBM water discharge – that is, impact to groundwater. Recent studies by the BLM have supported what many scientists as well as landowners have known, that much of the CBM water being "managed" by infiltration is not simply vanishing when it goes out of sight underground; instead, it is having a significant impact on the groundwater quantity and quality, an impact which will have long term effects of unknown magnitude. The DEQ has chosen to ignore these impacts in the Chapter 2 rules, although it obviously recognizes their importance, as it initiated a "policy" for groundwater compliance monitoring June 14, 2004 (enclosed). The rules should address groundwater concerns, with associated enforcement powers.

Appendix H seems to continue some of the worst practices of the old NPDES permitting. Section (a)(i) requires that:

> produced water discharged into surface waters of the state shall have use in agriculture or wildlife propagation. The produced water shall be of good enough quality to be used for wildlife or livestock watering or other agricultural uses and actually be put to such use during periods of discharge.

This requirement continues the practice, familiar in CBM effluent permitting, of requiring a showing that the water will be put to beneficial use. This might give you a warm fuzzy feeling about the quality of the water being discharged. Do not be deceived. The

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requirement that a showing be made the water is of a quality to be used for wildlife or livestock watering serves a limited purpose of setting a base quality. It serves no other purpose. The reason is that there is no consideration whatsoever of quantity. Consider the scenario in which CBM wells produce water over a 100-square-mile area where previously there had been no reliable water source. It would be a good thing for a small herd of antelope and a few head of cows to have water available. That's all that's required by the current practice or by these proposed rules. But, will a few tire tanks satisfy the wildlife and cattle needs? What about several 15-acre-foot reservoirs? And what about the water that is being flushed down the drainage and into the mainstem? Many downstream ranchers and irrigators (including the State of Montana) do not welcome the water. It is a simplistic and dishonest standard to say that's okay because there's an antelope up there somewhere that may be thirsty. A quantity parameter must be included in the quality/beneficial use standard in order to have it serve any useful purpose.

Appendix H (d)(ii) appears to be a great big loophole, again relying on the false premise that a "letter of agricultural or wildlife use" from a landowner makes it all okay. It doesn't. One landowner (who stands to gain from royalties or a surface use agreement) cannot vouch for the desirability of the water that has significant impacts far down the drainage beyond his own land.

Finally, I object to these rules because they are long and incomprehensible. Rules should be a communication tool that is accessible to the folks they impact, not just to lawyers hired by industry. These rules create an impenetrable thicket, making government all the more unapproachable. Please hold out for plain English.

I submit these comments on my own behalf, as someone who has worked closely with water discharge issues in Wyoming and who served on the 2003 Task Force to review and evaluate the Wyoming National Pollution Discharge Elimination System Permitting Process.

I have seen the September 3, 2004 letter Steve Jones of the Wyoming Outdoor Council sent you, and I agree with the points he makes.

Sincerely,

DAVIS & CANNON

Kate M. Fox

Cc: John Wagner

EXHIBIT H

From: "Jill Morrison" <jillm@powderriverbasin.org>
To: "Steve Ellenbecker" <sellen@state.wy.us>
Date: 9/11/2004 11:07:27 AM
Subject: Proposed agenda

Dear Steve,

I apologize for the delay in getting this to you. I'd hoped to have it out by last night but I'm obviously too optimistic on what I can accomplish when I'm over committed. At any rate, I hope this is helpful for you and the Governor. We are very appreciative of both your time and efforts. Please call me or email if you have any questions or I can clarify any issues. Thank you again. Jill

Jill Morrison
Organizer
Powder River Basin Resource Council
23 North Scott
Sheridan, WY 82801
(307) 672-5809

check our website: www.powderriverbasin.org

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Powder River Basin Resource Council
September 14th, Meeting
Governor Freudenthal & Steve Ellenbecker

Attendees:
Nancy Sorenson – Powder River chair, member of the legislative select committee and landowner and mineral owner near Spotted Horse;

Bernadette Barlow – Powder River board member, longtime rancher on Deadhorse Creek, dealing with downstream impacts from CBM discharges;

Eric Barlow – rancher on and veterinarian on Deadhorse Creek, Powder River leader on split estate issues and CBM development impacts;

Allison and Dr. Richard Cole – Landowners on Beatty Spur, lost water well due to being surrounded by over one hundred CBM wells in their area. After many months of negotiations with the CBM industry they still have not resolved and six homes are now without functioning water wells. The state engineer's office has not helped the situation. Allison is a leader in her homeowner's association and in Powder River.

Clay Rowley – longtime ranch family at the Powder River and Clear Creek confluence, geologist, former DEQ employee and Powder River leader on split estate issues and addressing CBM impacts.

Kevin Lind – Powder River staff director.
Pennie Vance – Powder River organizer on agriculture issues and energy development issues, legislative liaison.
Gillian Malone – Powder River organizer on renewable energy and CBM development impacts.
Jill Morrison – Powder River organizer on coal mining and CBM development impacts and issues.

Proposed Agenda

1. **Legislative Select committee on split estate** – Nancy Sorenson recently sent the Governor an update, discussing the committee's first meeting and pointing out some of the shortcomings with the committee. The request: Help is needed is for the committee members who are landowners and non-legislators to get some advise and/or tips from the Governor and/or his staff on how to be more effective committee members, how to steer the committee from the oil and gas track to a more balanced agenda for landowner rights. Ideas for strategies in dealing with the committee? Additionally, there seems to be a movement in recent governmental meetings to almost despise citizen involvement, attempts to humiliate citizen involvement and generally be rude by those chairing committee's. Can the Governor come out from his bully pulpit in support of welcoming citizen involvement and helping lead some vocal support for civility in our democratic processes?

2. **The failure of the State Engineer's office** to address the loss of water wells From CBM development, impacts of downstream water rights from new dams created by the construction of in-channel CBM pits and the destruction of downstream vegetation and soil from CBM discharges. The state engineer's office is not addressing the problems, they acting as a shield for the industry and not working for the people of Wyoming. The request: How can the Governor help to make the state engineer's office more responsive to the Wyoming citizen and make industry more accountable for their actions?

3. **Development on Wyoming's terms** the main argument and claim by the Attorney General's office before Judge Alan Johnson in the 10th circuit appeal of the BLM Final EIS authorizing the 51,000 CBM wells. The state of Wyoming argued on the side of industry and the BLM in this case. They argued the state is the "gatekeeper" for CBM development and as such the state will not let anything damaging happen, landowner's will not be left without water, water will not be discharged that is damaging, etc, etc". Request: We find this claim in direct contradiction with many landowners' experiences. Again the various state agencies, particularly SEO, WOGCC and DEQ have not prevented problems with CBM. They are not addressing the problem but rather seem to be shielding industry. Why the disconnect between what the AG is arguing and what is happening? Like the above request how can this administration under Governor Freudenthal really make development happen on "Wyoming's terms"? We need the state to address and protect landowner's and Wyoming's citizen and make industry accountable for their actions and damages. We need support for dealing with water wells, stopping the waste of groundwater and damage occurring on the surface, getting bonding for full reclamation and restoration, dealing with air quality problems and dust, getting adequate funds back to local government's so they can afford to address the development impacts like maintaining county roads, etc.

4. **Water Quality Division's new Chapter 2 rules.** These rules are long, convoluted and difficult to understand. The most serious problems with these proposed rules concern the failure of the DEQ to address three issues: 1) The lack of true beneficial use of CBM water by relying on a letter (from industry consultant's or one landowner) which states the water is beneficial for livestock and wildlife – in reality this is only true for maybe 1% of the total amount of discharge water. 2) the lack of public notice to downstream landowners potentially affected by CBM discharges and the lack of public comment on the expanded use of a blanket general permit; 3) the failure to draw a connection between groundwater pumped to the surface and discharged and how that water is now impacting shallow groundwater. Request. We ask that the Governor not sign these rules until they address the above issues and are written clearly.

EXHIBIT I

DAVE FREUDENTHAL
GOVERNOR

THE STATE OF WYOMING

STATE CAPITOL
CHEYENNE, WY 82002

Office of the Governor

December 3, 2004

RECEIVED
DEC 06 2004

Ms. Kate Fox
Davis & Cannon
2710 Thomes Avenue
P.O. Box 43
Cheyenne, WY 82003

RE: Chapter 2, Water Quality Rules and Regulations

Dear Ms. Fox:

Thank you for your letter of September 10, 2004 and your interest in the Chapter 2, Water Quality Rules and Regulations. The State NPDES rules were in serious need of updating and the rule as proposed by the WDEQ is a significant improvement from the existing rule. As you know, I have signed the rules. However, based on your interest and scrutiny of certain aspects of the rule, I have reviewed the issues with DEQ and find that the rule is appropriate.

Your concern regarding groundwater was addressed by the Environmental Quality Council (EQC) during the rule making process. The DEQ explained to the EQC that the federal definition of "waters of the United States" under 40 CFR 122.2 does not include groundwater. The federal NPDES rules and the intent of the State WYPDES rules are specifically designed to address discharges to surface waters and the protection of surface water quality standards.

I agree that there are groundwater issues associated with the management of coal bed methane produced water. However, adding groundwater rules to Chapter 2, "Permit Regulations for Discharges to Wyoming Surface Waters" is not necessary because groundwater protection is already addressed in separate water quality rules and regulations, specifically Chapters 3 and 8. Further, the WQD Groundwater Pollution Control program has recently made implementation changes to appropriately address groundwater issues associated with coal bed methane water management practices.

As to your concern about the agricultural or wildlife provisions of Appendix H, I understand that those provisions are designed to be consistent with the provisions of 40 CFR Part 435 "Oil and Gas Extraction Point Source Category" which allows for the discharge of produced water if the water is used by wildlife or agriculture during periods of discharge. The state of Wyoming has supported this position since 1975. The Wyoming DEQ has historically taken the position that if the produced water discharge meets the effluent limitations established to protect downstream surface water quality standards, then the water is suitable for use by agriculture and/or wildlife.

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In recent years, 2000-2001, U.S. EPA has requested that DEQ demonstrate how the water is being used for agriculture or wildlife. The Wyoming Game and Fish Department provided a letter to the DEQ in 2001 stating that historic conventional oil and gas discharges were a benefit to wildlife. This letter addresses the demonstration for historic oil and gas discharges. New conventional oil and gas facilities must provide the DEQ with an Agricultural or Wildlife Use statement with the application to satisfy this demonstration.

To get at your concern over quantity of discharge from coal bed methane dischargers, it is my hope that through the watershed based permitting approach downstream landowners can express their concerns and have a voice in how the produced water is managed. Regarding downstream States, like Montana, the WDEQ is actively engaged in and making progress through constructive dialogue on the appropriate management of coal bed methane water and the protection of our neighboring states' water quality standards.

After looking at Appendix H (d)(ii), it is apparent to me that the "letter of agricultural or wildlife use" is only one of the conditions imposed by this provision. The provisions of Appendix H (d) (ii) also state that the Water Quality Administrator shall review all requests for modification of effluent limits submitted under this section and make a determination based upon the technical merits of a Use Attainability Analysis. Furthermore, the rule is clear that any permit must also ensure protection of all surface water quality standards as outlined in Water Quality Rules and Regulations Chapter 1. Consequently, I do not see this provision as the loophole you have suggested.

You raised the issue of the rule length and comprehensibility with the WDEQ and the EQC during the rule making process. To address this concern the WQD obtained the services of the University of Wyoming and the Ruckelshaus Institute of Environment and Natural Resources to review the rule for clarity and grammar. The WDEQ incorporated appropriate changes provided by the University and the Ruckelshaus Institute. The WDEQ has developed a consolidated rule, addressing all regulated sectors, which is consistent and clearer in many respects than the federal regulations.

I want to thank you again for your interest in these rules and for your participation in the process to develop regulations for discharges to surface waters of the state. The WDEQ is committed to the continued improvement of the WYPDES program by implementing the NPDES Task Force recommendations, implementing watershed based permitting, and making much need improvements to outdated rules.

Sincerely,

Dave Freudenthal
Governor

cc: John Corra

EXHIBIT J

Randall T. Cox
Attorney and Counselor At Law
A Professional Corporation

Kendrick Professional Building
400 South Kendrick Ave., Suite 304
Gillette, Wyoming 82716

Admitted in Wyoming and Montana

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e-mail: rt@coxhorning.com

February 17, 2005

Ken Clabaugh
President
Clabaugh Ranch, Inc.
P. O. Box 12
Arvada, Wyoming 82831

Re: Water Issues

Dear Mr. Clabaugh:

Several parties operating gas wells in the Wild Horse Creek drainage have been meeting with the Wyoming Department of Environmental Quality regarding management of produced water in the Wild Horse Creek drainage. This letter is submitted on behalf of several of the operators in an effort to identify, and hopefully resolve, issues and complaints regarding water flowing in the creek.

Operators have been informed that water is flowing onto the Clabaugh Ranch land in Wild Horse Creek, although they have not been able to directly confirm this. The operators would like to set up an inspection of the creek on the ranch, and to meet with you at the ranch to discuss your concerns. It should be possible to develop solutions to any problems which you may identify, but they need to look at the land and the creek channel as part of that process. The operators would need to bring technical consultants with them for the inspection and meeting.

Officials with the Wyoming DEQ, Water Quality Division, would be invited to attend this inspection and discussion.

The purposes of this site visit are to learn about any problems and identify solutions and avoid litigation or other legal proceedings. The operators are willing

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to clean debris out of the channel and to discuss other site work they could conduct to address your concerns. The operators look forward to hearing any constructive suggestions that you might offer.

Please contact my office so that I can contact operators to schedule the meeting.

Thank you for your cooperation.

Sincerely,

Original Signed By:
Randall T. Cox

Randall T. Cox

c: John Corra, DEQ
John Wagner, DEQ
Vicci Colgan, Attorney General's office

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May 25, 2005

7004 0750 0000 3256 0698

Ken Clabaugh
President
Clabaugh Ranch, Inc.
P. O. Box 12
Arvada, Wyoming 82831

Re: Water Issues

Dear Mr. Clabaugh:

Several parties operating gas wells in the Wild Horse Creek drainage have been meeting with the Wyoming Department of Environmental Quality regarding management of produced water in the Wild Horse Creek drainage. This letter is submitted on behalf of several of the operators in an effort to identify, and hopefully resolve, issues and complaints regarding water flowing in the creek.

The operators would like to set up an inspection of the creek on your ranch, and to meet with you at the ranch to discuss your concerns. It should be possible to develop solutions to any problems which you may identify, but they need to look at the land and the creek channel as part of that process. The operators would need to bring technical consultants with them for the inspection and meeting.

Officials with the Wyoming DEQ, Water Quality Division, would be invited to attend this inspection and discussion, if you wish.

The purposes of this site visit are to learn about any problems and identify solutions. The operators are willing to clean debris out of the channel and to discuss other site work they could conduct to address your concerns. The operators look forward to hearing any constructive suggestions that you might offer.

Please contact my office so that I can contact operators to schedule the meeting. If you have a new attorney handling water matters, please ask him or her to contact me. If you would prefer, feel free to contact David Gremel at Petro-Canada in Gillette, 686-1240.

Thank you for your cooperation.

Sincerely,

Randall T. Cox

c: John Corra, DEQ
John Wagner, DEQ
Vicci Colgan, Attorney General's office
Tom Toner, Esq.

ANALYSIS OF COMMENTS

Subject: Comments received and Wyoming DEQ/WQD responses relative to the Second Draft of Chapter 1 - Proposed Rules and associated policy documents before the Water & Waste Advisory Board which were published in August, 2005.

A second draft of proposed revisions to the Chapter 1 Surface water standards (Triennial Review) were published for public review in August 2005. Written public comments on the proposed rules and associated implementation policies were solicited by the Advisory Board and a public meeting was held on September 13 where the board also received oral testimony and extended the written comment period until October 1. This document summarizes the comments received and includes the Department of Environmental Quality's responses. The tables that follow are a compilation of these comments and DEQ/WQD responses. In the tables, the comments have been organized according to topic and paraphrased to create a manageable summary.

*** Comments marked with a triple asterisk (red typeface) indicate that the DEQ is recommending a modification to the proposed rules relative to that comment. Where multiple commenters are indicated in the attached tables, the actual comment should be attributed to the first name in the list. The others made essentially the same point in their comments.

EXHIBIT K

List of Comments Received

Code	Submitted by	Type
SA	Adami, Steve	Pvt
GB	Barlow, Glenn	Pvt
DB	Belus, David	Pvt
CRC	Clark Resource Council	Env
DC	Davis & Cannon	Pvt
DHCC	Deadhorse Creek Cattle Company (Helen Jones)	Pvt
DD	Doncaster, Dennis	Pvt
TH	Hubbard, Todd	Pvt
JBH	Jorden Bischoff & Hiser (Yates Petroleum)	Ind
DJ	Joslyn, Don	Pvt
LCCC	Laramie County Conservation District	CD
CL	Lawrence, Chip	Pvt
NM	McCoy, Nancy	Pvt
PAW	Petroleum Association of Wyoming	Ind
PRBRC	Powder River Basin Resource Council	Env
ES	Schwartz, Edward	Pvt
EPA	U.S. EPA	Gov
FWS	U.S. Fish & Wildlife Service	Gov
USFS	U.S. Forest Service	Gov
WW	Western Watersheds Project	Env
MW	West, Marjorie	Pvt
WACD	Wyoming Association of Conservation Districts	CD
WDA	Wyoming Dept. of Agriculture	Gov
WOC	Wyoming Outdoor Council	Env

CD - Conservation District
Env - Environmental Organization
Gov - Government Agency
Ind - Industry Representative
Pvt - Private Individual

PUBLIC COMMENTS

The tables that follow contain public comments and DEQ responses organized according to the Chapter 1 section or implementation policy referenced by each. The original comments contain more detail and in many instances have been paraphrased to produce a manageable summary. Where a comment is attributed to more than one commenter, the actual language reflects what was submitted by the first person indicated in the "From" column. The other commenters simply raised the same issue and had the same viewpoint.

PRBRC	53 Lines 21 "Acutely toxic" is not a safe or reasonable assurance for livestock health. Production agriculture depends upon healthy, thrifty animals to gain weight and optimize reproduction potential. "Not acutely toxic" falls short of assuring industry of non-injury. Language suggestion: Delete Line 20-22.	The entire sentence referenced by the commenter reads: *The basic concept in protecting a livestock watering use is to ensure that water quality is not acutely toxic to livestock or does not contain pollutants in concentrations that would affect growth or reproduction.* It does reference protecting growth and reproduction and the chemical criteria provided are appropriate for those purposes.
PRBRC	p. 53 Line 27 3,000 mg/L for Sulfates contradicts the very language presented in draft on P. 53 line 21-22. As we have pointed out to DEQ many times previously, this level of Sulfates allowed in livestock water is a detriment to animal health, growth and reproductive potential.	This concentration for sulfate is an effluent limit established in Chapter 2 of the WQR&R. It has been in use for oil and gas discharges for many years and we are not aware of any circumstances where it has been a problem.
PRBRC	Barium is another constituent the DEQ is not providing levels that are protective for livestock watering. The Utah State University Extension Service has published a document stating that the safe upper limit concentration of barium in drinking water for livestock is .2 mg/l or 200 ppm. Colorado State University Cooperative Extension Agency has stated that water containing more than .3mg/L or 300 ppm is unacceptable for livestock consumption. The DEQ proposed barium limit is 1.8 mg/l or 1800 ppm.	The effluent limit for barium was established as part of an antidegradation review that was done to achieve compliance with the human health criteria. In short, this effluent limit is adequately protective of waters in the watersheds where it applies (NE Wyoming) because the barium in these waters is primarily in the form of barium sulfate which is an inert substance with little potential for health effects.
PRBRC	54 Line 1-4 The "exception" language is questionable in regards to "background water quality." Is this considered water quality in the natural flow regimen, unaffected by pre-CBM by-product water or upstream oil and gas activity? The short coming of this definition has been pointed out in previous comments. This "background" reference is made repeatedly in this document and should be defined and adjusted accordingly. Historic main stem data should be filtered for effects of oil and gas activity,	"Background" in the context which it is used here is intended to mean natural background.

February 10, 2006

Mr. Mark Gordon
Chairman
Environmental Quality Council
Herschler Building 1W
Cheyenne, Wyoming 82002

Dear Mr. Gordon:

Fidelity Exploration & Production Company (Fidelity) an oil and gas production company with coal bed natural gas (CBNG) production in the Powder River Basin greatly appreciates this opportunity to comment on the Powder River Basin Resource Council's (PRBRC) petition to amend Wyoming Water Quality Rule, Chapter 2, Appendix H (Petition) filed on December 7, 2005 with the Environmental Quality Council (Council). Fidelity strongly endorses the recommendation submitted by the Petroleum Association of Wyoming (PAW) to deny the Petition.

Fidelity agrees with the PAW that the Petition is flawed because: 1) the Petition narrowly defines beneficial uses on livestock watering, wrongly ignoring wildlife propagation and other beneficial uses such as managed irrigation; 2) the WDEQ has no statutory authority to regulate water quantity which is under the supervision of the State Engineer's Office; 3) the Petition would have unintended consequences for all agricultural users if implemented; and 4) PRBRC's assertion that CBNG produced water is not of good enough quality to be used for agricultural purposes is unsubstantiated.

As PAW's letter discusses, 40 C.F.R. Part 435 contemplates water "that has a use in agriculture or wildlife propagation." Certified soil scientists Kevin C. Harvey and Dina E. Brown published *"Managed Irrigation for the Beneficial Use of Coalbed Natural Gas Produced Water: The Fidelity Experience"* (copy enclosed). The publication presents data collected from successful managed irrigation projects conducted over four full irrigation seasons starting in 2002 operated by and on behalf of Fidelity on properties located near our CBNG production operations near Sheridan, Wyoming. These successful applications of CBNG produced water that yield valuable forage crops to the landowners while conditioning and protecting the soils are just one example of a much broader definition of beneficial use than the petitioners suggest.

In addition, proposed potential onerous monitoring requirements could impact all irrigation operations if the Petition were implemented as is and would exclude scientifically-based managed irrigation as a beneficial use. The PRBRC and the other petitioners seem content to ignore the science and programs being developed to enhance agricultural and stock development in this arid region. If this managed irrigation water management tool were eliminated from beneficial uses, the unintended consequence is that the Council would impede landowners rights to this wonderful benefit of enhanced forage crop production.

Another problem with the Petition, its supporting documents and statements are the many inaccuracies contained therein. For example, the Petition implies on page 20 and accompanying footnote 31 in the "What are the alternatives?" section that Fidelity treats the produced water with RO to reduce salinity to make the water usable for irrigation at the Wrench Ranch project. That is false, not only at the Wrench Ranch project area, but at all of Fidelity's managed irrigation sites in Wyoming. As Harvey and Brown reported, it is unnecessary to treat water using RO at properly managed irrigation sites. Next in that section under "Minimize water production", the PRBRC list a litany of developing technologies, implying that they are proven solutions to complex water production and management challenges. That is irresponsible and wrong. The only proven mechanism to induce adsorbed coalbed natural gas to flow and be produced in commercial quantities is through depressurization by water extraction. Industry is continually working on developing new technologies, some of which were listed without any substantive analyses, to reduce impacts and enhance gas production. Developmental technologies like those the petitioner's listed, however, are years in the making and often not commercially successful.

Another example of PRBRC's inaccuracy appears under "Reinjection" where the Petition ignores the geologic and hydrologic constraints to injecting produced water into the production coal seams as discussed in the CDM report entitled, *"Technical Review and Analysis of Kuipers' / NPRC Documents Related to the Water Management of CBNG Produced Water in the Power River Basin"*, December 21, 2004. The insistence on the practicality of "reinjection" ignores the fact that the availability of suitable reservoirs is very limited in the Powder River Basin. Wyoming Department of Environmental Quality Director John Corra stated in a letter dated June 30, 2005 (copy attached) to the Montana Water Pollution Control Advisory Council that out of 308 CBNG Class V injection wells in Wyoming only 60 are active injecting about 3% of the total water produced.

Fidelity encourages the Council to deny the Petition because it defines beneficial use too narrowly, is calling for DEQ oversight of CBNG produced water quantity outside of its statutory authority, contains many inaccuracies, wrongly characterizes the CBNG produced water quality, and could result in unintended consequences on all agricultural uses.

Respectfully,

Greg Petruska, P.E.
Water Resources Manager

Cc: John Corra
John Wagner
Todd Parfitt

Dave Freudenthal, Governor

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

John Corra, Director

June 30, 2005

Montana Water Pollution Control Advisory Council
c/o Mr. Bob Bukantis
Montana DEQ
Water Quality Planning Bureau
P.O. Box 200901
Helena, MT 59620

RECEIVED
JUL 0 5 2005
DEQ
Planning Division

RE: Northern Plains Resource Council Petition

Dear Council:

My name is John Corra, and I am the Director of the Department of Environmental Quality for the State of Wyoming. References have been made in the petition to how we manage CBNG waters. I respectfully submit the following comments in order to provide you with some information about our program and to clarify a few points that have been brought by the *NPRC* in its petition submitted to the *MBER* on May 17, 2005.

Wyoming DEQ Response to Development

The Wyoming Pollutant Discharge Elimination System (WYPDES) program has issued 262 CBNG surface water discharge permits (2,205 outfalls) in the Powder River watershed, 85 (598 outfalls) in the Little Powder River watershed and 33 (332 outfalls) in the Tongue River Watershed.

Our permitting approach has been conservative to ensure that Wyoming and Montana agricultural activities are protected as are all other designated uses. Direct discharge of CBNG produced water into the mainstreams has not been allowed except where the water is treated. For discharges that have shown the potential to impact the mainstream, either through direct discharge or conveyance from a tributary, our historic policy has been to require end of pipe limits that are designed to be protective of the most sensitive uses. This has included requirements to meet end-of-pipe limitations equivalent to the Montana numeric water quality standards for Ec and SAR.

As this CBNG development has progressed to the north and west, we have encountered a decline in the quality of the water being discharged. As such, we have encouraged treatment, zero discharge, and other water management options that further ensure developers do not harm existing uses of either state's waters. I anticipate that the trend toward treatment will increase. The careful management of discharge permits in Wyoming has been successful in protecting and maintaining the water quality standards of both states, including protection of designated uses.

Herschler Building • 122 West 25th Street • Cheyenne, WY 82002 • http://deq.state.wy.us

ADMIN/OUTREACH	ABANDONED MINES	AIR QUALITY	INDUSTRIAL SITING	LAND QUALITY	SOLID & HAZ. WASTE	WATER QUALITY
(307) 777-7758	(307) 777-6145	(307) 777-7391	(307) 777-7369	(307) 777-7756	(307) 777-7752	(307) 777-7781
FAX 777-3610	FAX 777-6462	FAX 777-5616	FAX 777-6937	FAX 777-5864	FAX 777-5973	FAX 777-5973

Clarification of Re-Injection of CBNG Produced Water

Reference is made in the Northern Plains Resource Council petition to the prevalence of re-injecting water. We wish to clarify this activity by providing the correct statistics for this activity in Wyoming. A total of 308 CBNG Class V injection wells have been permitted in Wyoming to date. Of this total, 60 are active and injecting a combined 14,592,692 barrels/year (1.68 million gallons per day). This is approximately 3% of the total water produced.

Clarification on NPRC Supporting Documentation

I believe it is important that the Council clearly understand that the foundation for much of the NPRC petition is a February 2003 draft document prepared by the United States Environmental Protection Agency (EPA), which was under review by the Department of Energy. This draft document has not had the benefit of input based on full public review and comment. Furthermore, the draft document has been stamped "DO NOT CITE OR QUOTE" on every page. Therefore, reliance on this draft EPA document and other documents that rely on the information contained in the draft EPA document would not be appropriate or advisable.

Lastly, reference is made to my department's position that we intend to use up all assimilative capacity and simply meet the Montana standards at the border for the Tongue and Powder and Little Powder rivers. I can assure you that we have not reached any conclusions about this. The two-state agencies met in the Fall of 2004 and identified common interests and brain-stormed a list of 10 different options on how we can co-manage this development. We met again in May of this year and furthered our efforts, but neither state took a position. I present this only to assure you that Wyoming shares the common interest in protecting all existing designated uses and that we are committed to cooperating with Montana to the maximum extent possible, through continued dialogue, sharing of information and shared input on draft permits, both in Wyoming and Montana. I feel that we have made good progress, and look forward to completing the discussion this year. For reference, I have attached a letter from Governor Freudenthal to the MBER on this matter.

I would be happy to provide you with any further clarification regarding this matter. Please feel free to contact me at 307-777-7192 (jcorra@state.wy.us.) or you may contact John Wagner, Water Quality Administrator 307-777-7072 (jwagne@state.wy.us) or Todd Parfitt, WYPDES Program Manager at 307-777-6709 (tparfi@state.wy.us).

Sincerely,

John V. Corra
Director

cc: John Wagner, WQD Administrator
Todd Parfitt, WYPDES Program Manager
Richard Opper, Director, Montana DEQ
Art Compton, Montana WQD
Mary Flanderka, Governor's Office
John Masterson, Governor's Office
Debbie Thomas, EPA Region 8

DAVE FREUDENTHAL
GOVERNOR

THE STATE OF WYOMING

STATE CAPITOL
CHEYENNE, WY 82002

Office of the Governor

June 2, 2005

Mr. Joe Russell, Chairman
Montana Board of Environmental Review
1035 First Avenue West
Kalispell, MT 59901

Re: Petition for Rulemaking submitted by Northern Plains Resource Council and Others, May 17, 2005

Dear Mr. Russell and Members of the Board:

Mr. John Corra, Director of the Wyoming Department of Environmental Quality, has brought this petition to my attention. The petition, submitted by the Northern Plains Resource Council and numerous ranching entities and individual ranchers, ostensibly addresses coalbed methane extraction in Montana, yet makes it explicitly clear several times that it is actually aimed at limiting production occurring in Wyoming.

The petition is inaccurate in several instances, especially in its statements of positions allegedly taken by the Wyoming Department of Environmental Quality in meetings with the Montana Department of Environmental Quality on coalbed methane production water quality issues. The State of Wyoming has consistently maintained at each of those meetings that it is working with the State of Montana on these issues. For example, the meeting notes referred to on page 65 of the petition actually list a wide range of options that the states would study. In fact, Wyoming made it very clear that we wished to avoid taking positions until both states had a chance to explore mutually acceptable options. Based on reasons like this, the petition is exceedingly premature. The meetings should continue, and any action on the petition should be deferred. I believe this would be a much better approach than having the Board of Environmental Review initiate rulemaking

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based on this petition, which is aimed at sidestepping the meetings between Montana and Wyoming concerning these same issues.

I appreciate your consideration in this matter, and refer you to Mr. Corra for any questions or comments.

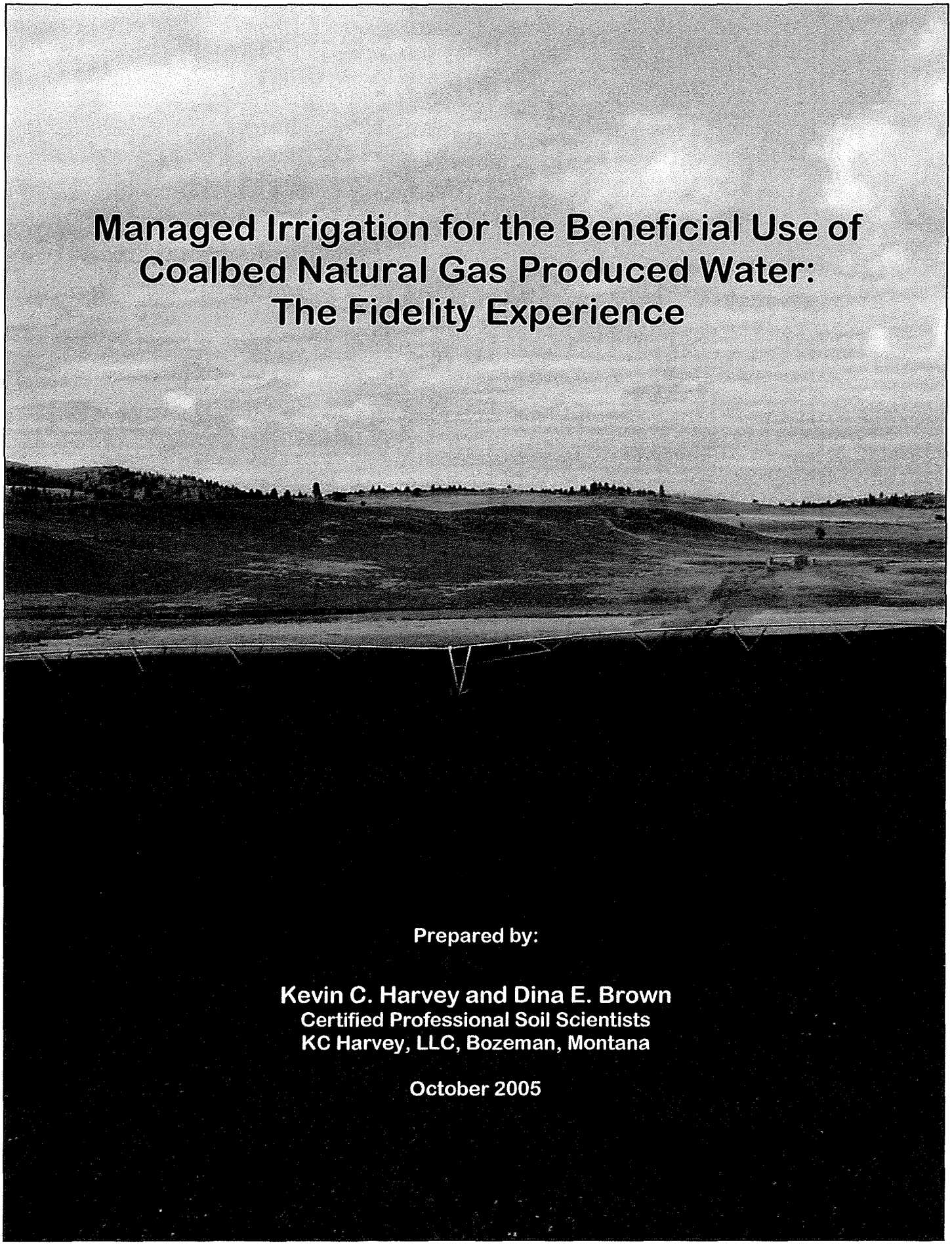
Best regards,

Dave Freudenthal
Governor

DF:JC:pjb

cc: Honorable Brian Schweitzer, Governor of Montana
Mr. Eric Hayes
John Corra, Wyoming DEQ

Managed Irrigation for the Beneficial Use of Coalbed Natural Gas Produced Water: The Fidelity Experience



Prepared by:

Kevin C. Harvey and Dina E. Brown
Certified Professional Soil Scientists
KC Harvey, LLC, Bozeman, Montana

October 2005

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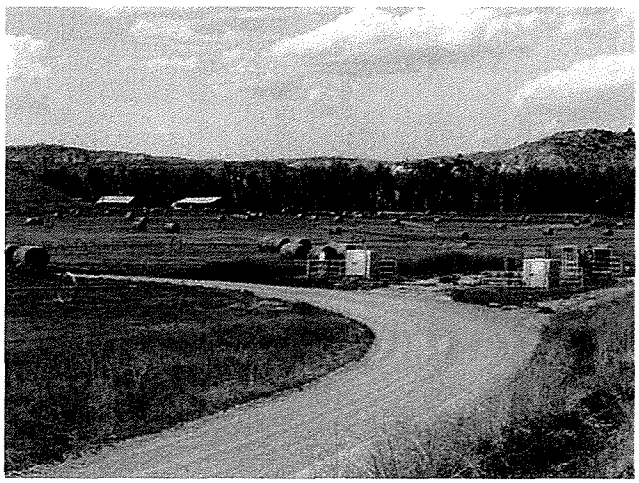
Introduction

The methods for managing and using groundwater produced by coalbed natural gas (CBNG) operations have become an important issue that is being debated by the public, Federal and State agencies, special interest groups, and energy companies. The purpose of this publication is to provide information about using produced water in a beneficial manner to produce forage for livestock and wildlife in the Powder River Basin of southeastern Montana and northeastern Wyoming. The information, data, and processes described in this publication are based on the research and development, and the full-scale managed irrigation operations performed on behalf of and by Fidelity Exploration & Production Company (Fidelity) of Sheridan, Wyoming.

What is Managed Irrigation?

Managed irrigation with unaltered groundwater produced during CBNG operations is defined as: *the application of soil science, water chemistry, agricultural engineering and agronomic principles to utilize CBNG-produced water in a beneficial manner to produce forage for livestock and wildlife while protecting soil physical and chemical properties.* Managed irrigation practices include:

- selection of appropriate irrigation sites with suitable topography, soils, and hydrology;
- close cooperation with the landowner to ensure that the beneficial objectives of irrigation and the production of a crop are achieved;
- water balance analyses to support irrigation system sizing and design;
- water treatment or soil amendments to mitigate the potential affects associated with the sodium bicarbonate chemistry of produced water;
- irrigation scheduling and maintenance of a suitable leaching fraction to prevent the accumulation of salts in the root zone;



- selection and maintenance of a suitable crop that is tolerant of expected soil moisture and salinity levels;
- prevention and control of irrigation water runoff;

- periodic monitoring of water, soil, and vegetation during the life of the project; and
- site closure planning and implementation in accordance with landowner objectives.

Managed irrigation is one alternative out of several available for managing CBNG-produced water. Its suitability as a water management alternative depends on many factors, including produced water chemistry, site and soil characteristics, landowner objectives, and project economics. As such, its suitability can only be evaluated on a project- and site-specific basis.

How is Managed Irrigation Different from Land Application Disposal?

A common misconception in the Powder River Basin is that managed irrigation and land application disposal or "LAD," are different names for the same process. Managed irrigation is substantially different from land application disposal in several ways. Managed irrigation, as defined above, is designed, located, and operated in an agronomic manner to grow a forage crop, protect soil physical and chemical conditions, and to minimize any potential environmental impacts. In contrast, land application disposal operations apply wastewater to the surface with the goal of simply disposing of and/or treating wastewater within the soil-plant system. Additionally, land application disposal typically relies on the maximum soil infiltration rate to maximize the discharge and treatment of wastewater. Whereas, managed irrigation application rates are based on the evapotranspiration requirements of the crop and the prescribed agronomic leaching requirement.

Where Does the Water Come From?

The water that is generated during the production of CBNG in the Powder River Basin is commonly referred to as "produced water." CBNG-produced water is naturally occurring groundwater. If present, the natural gas can be recovered from wells when groundwater contained in the coal seams is pumped to the surface to reduce pressure. The CBNG production process does not change the chemical nature of the water within the coalbed aquifer. All groundwater contains a mixture of naturally occurring chemicals. The chemicals dissolved in coalbed water result from natural processes that occur as rainfall and snowmelt percolate through the soils and deeper geologic formations during recharge of the groundwater system. These natural processes result in groundwater that is rich in sodium and bicarbonate minerals.

Why is the Water a Concern?

CBNG-produced water is often of higher quality than other available water sources in the Powder River Basin of Montana and Wyoming. Groundwater from coal seams is commonly used for domestic purposes, including drinking. Because of its low to moderate level of salinity,

it is a very good source of water for livestock and wildlife use. However, because of the naturally elevated levels of sodium and bicarbonate ions dissolved in the water, irrigating with this water, if not properly managed, could be problematic.

The suitability of water used for irrigation depends on a number of factors including the type of crops grown, the soil type, irrigation methods, and the types and quantity of salts dissolved in the water. Water quality guidelines for assessing irrigation water suitability generally consist of four components; salinity, sodicity, alkalinity, and specific ion toxicity. The most comprehensive and widely used guidelines were formulated for the Food and Agriculture Organization (FAO) of the United Nations by Ayers and Westcot (1985) and the University of California by Hansen and others (1999).

Salinity

All irrigation waters contain a mixture of naturally occurring dissolved salts. Soils irrigated with water will contain a similar mix of salts, but the concentration of salts in the irrigated soils is usually higher than in the applied water. Salts can be defined as minerals that dissolve in water, e.g., table salt, which is sodium chloride. Typical salt constituents in water and soil include calcium, magnesium, sodium, potassium, sulfate, chloride, carbonate, and bicarbonate. The concentration of salts in water is measured two ways -- total dissolved solids (TDS) or electrical conductivity (EC). TDS, measured in milligrams per liter (mg/L) is a laboratory method to measure the dissolved salts present in a sample. EC, measured in deci-Siemens per meter (dS/m), is a field or laboratory method that provides a reliable and widely used index of salinity. As the dissolved salt content of a sample increases, its ability to conduct electricity also increases, which can be readily measured. EC is the most commonly used measure of water and soil salinity because it is a rapid and inexpensive test.

The salinity of irrigation water does not directly effect soil physical properties. Instead, the presence of increased salts hinder the plant's ability to extract water from the soil and are a concern if the salt level is high enough to affect crop yield. Plant species vary with respect to salt tolerance. Generally, most forage and field crops grown in southeastern Montana and northeastern Wyoming are moderately to strongly salt tolerant. For example, based on research conducted by the USDA Natural Resource Conservation Service (NRCS) at the Bridger Plant Materials Center in Bridger, Montana, the soil salinity threshold where alfalfa begins to exhibit yield declines is 4.0 dS/m (Bridger Plant Materials Center, 1996). With careful management and suitable crops, water with EC ranging from 4.0 to 7.5 dS/m has been used successfully for irrigation (Rhoades et al., 1992). CBNG water from the Powder River Basin has an average salinity of around 2.0 dS/m, which is suitable for irrigation.

Sodicity

For CBNG-produced water, the key issue with respect to irrigation suitability is the naturally occurring sodium levels and its potential affect on soil infiltration and permeability. The infiltration and permeability of clayey soils can decrease if an abundance of sodium ions are adsorbed by the clay minerals in soil. Excessive adsorbed or exchangeable sodium can occur in clayey soils as a result of sustained use of irrigation water that is relatively high in sodium and relatively low in calcium and magnesium. Consequently, the ratio of sodium to calcium and magnesium ions in irrigation water is an important property affecting the infiltration and

permeability of a soil. The index used to measure the hazard related to sodium abundance or sodicity is the sodium adsorption ratio or SAR.

The SAR can be calculated from the sodium, calcium, and magnesium concentrations using the formula:

$$SAR = [Na^{+}] \div \sqrt{\frac{[Ca^{++}] + [Mg^{++}]}{2}}$$

where the chemical concentrations are in milliequivelents per liter (meq/L).

Clay minerals in soils are negatively charged and consequently attract ions with a positive charge such as sodium, calcium and magnesium. When sodium comprises more than about 15% of the exchangeable ions in the soil, the clay minerals can begin to repel one another causing the soil structure to degrade (i.e., swell and disperse). The swelling of clay minerals and continued dispersion, and subsequent degradation of soil structure, can reduce the rate of water infiltrating the soil and the permeability of water through the soil. In general, soils with moderately high, to high, clay contents are at higher risk.

What is not apparent from the SAR formula is the fact that the higher the salinity of the water, the higher the SAR can be without impacting soil structure and impairing soil infiltration and permeability. Put another way, for a given SAR, infiltration rates generally increase as salinity (measured by the EC) increases. The changes in soil infiltration and permeability occur at varying SAR levels. Ayers and Westcot (1985) and Hansen et al. (1999) describe the relationship between salinity and sodicity in irrigation water and the potential effects on soil infiltration and permeability.

Most CBNG-produced waters in the Powder River Basin of Montana and Wyoming have relatively high SAR values making them potentially unsuitable for irrigation on most soils. Therefore, to beneficially use this water for forage production, some type of water treatment (e.g., sodium removal) or soil/water conditioning (e.g., calcium addition) may be required to mitigate the effects of the elevated SAR.

Alkalinity

Alkalinity is a measure of the buffer capacity of water or the ability to neutralize an acid. The major form of alkalinity in CBNG-produced water is bicarbonate. Bicarbonate present in irrigation water will react with the available calcium and magnesium and form insoluble calcium carbonate (lime) or magnesium carbonate precipitates. As indicated in the SAR formula above, a reduction of available calcium and magnesium raises the effective SAR of the water. Bicarbonate concentrations in CBNG-produced water from the Powder River Basin typically range from 750 mg/L to 3,000 mg/L. These relatively high values for irrigation water can cause pH increases in water and soil, and subsequent increases in water and soil SAR. To prevent the reduction in available (or added) calcium, the bicarbonate alkalinity must be neutralized with an acidifying agent (for example, sulfur soil amendments, which oxidize to produce sulfuric acid).

Specific Ion Toxicity

While generally not a concern with respect to CBNG water in the Powder River Basin, sodium, chloride, and boron ions can be toxic to certain crops if their concentrations are too high in irrigation water. Damage from sodium and chloride toxicity usually occurs only in woody plants such as tree and vine crops where soil salinity is extremely high or when saline water is used for sprinkler irrigation. Chloride concentrations in CBNG-produced water from the Powder River Basin are typically very low. Since tree and vine crop types are not usually grown on managed irrigation sites, or by local farmers and ranchers in the Powder River Basin, sodium and chloride toxicity is not an issue. Boron concentrations in produced water are typically below detectable levels to very low levels and should not be a potential toxicity problem.

How Did Fidelity Develop Managed Irrigation?

Background

In 2000, early in the development of CBNG production in Montana and Wyoming, Fidelity recognized that a larger volume of produced water might be generated than could be discharged through the National Pollutant Discharge Elimination System process. Fidelity began seeking options for managing the produced water, including beneficial uses of the unaltered groundwater. One such possibility was using the produced water to irrigate a forage crop that local ranchers could use in their cattle operations.

However, irrigation with CBNG-produced water had never been done. Could the produced water be safely used for irrigation? As discussed above, sodium in irrigation water can be a hazard to soils because it causes clay particles in soil to disperse and form a hard surface crust. This crust can then become a barrier to water movement and plant growth. If, however, enough calcium is present in the soil, the clay particles will stay aggregated. Therefore, adding calcium to the soil-water system will negate the impacts of the sodium. Water or soil with relatively more sodium than calcium has a high SAR and is considered sodic. Often CBNG-produced water is referred to as saline, or having a high salt content. But in reality it is the sodicity, not the salinity that is the primary concern. Salinity levels in CBNG-produced waters are actually quite moderate.

In addition to relatively high SAR levels, the CBNG water is naturally enriched with bicarbonate alkalinity. In alkaline waters such as the CBNG groundwater, any added calcium will react with the bicarbonate and drop out of solution as lime, or calcium carbonate. The calcium in calcium carbonate then becomes unavailable to keep the clay particles in the soil aggregated. So, to irrigate with CBNG-produced water, the bicarbonate needs to be neutralized with an acid so that calcium can be added to negate the effects of the sodium. The practice of neutralizing bicarbonate alkalinity and adding calcium is based on established soil and water chemistry principles, and decades of farming experience.

Modeling and Initial Laboratory Testing

To test the possibility of irrigating with the CBNG-produced water from its Wyoming production areas, Fidelity embarked on a long series of scientific tests that were performed by soil science and water chemistry experts. First, geochemical equilibrium models were developed for CBNG-

produced water. The modeling results indicated that by using standard agricultural amendments such as elemental sulfur and gypsum, the produced water could be used for irrigation. Sulfur reacts in the soil with oxygen and water to produce sulfuric acid, which in turn neutralizes the bicarbonate alkalinity. The gypsum (calcium sulfate dihydrate) dissolves to yield soluble calcium to lower the SAR and reduce the risk to soil structure. This process is discussed in more detail below.

The modeling results were then validated in the laboratory using "jar tests." The jar tests involved blending differing ratios of produced water with appropriate amounts of an acidifying agent (sulfuric acid) and sources of calcium (e.g., gypsum and calcium chloride). Results of the modeling and jar tests indicated that the ability existed to "condition" the CBNG-produced water for irrigation.

Results of Bench-Scale Testing

The promising results from the modeling and jar tests led to a "bench-scale" laboratory test using actual columns of soil and CBNG-produced water from the Tongue River drainage in the Powder River Basin. The soil was collected from a candidate irrigation area within Fidelity's Wyoming production area. The produced water was collected from a CBNG well in the same area and exhibited an EC of 2.5 dS/m and an SAR of 60.

To start the test, 18-inch long, undisturbed columns of soil, were collected in eight-inch diameter plastic pipes, and brought into the laboratory. In the bench-scale laboratory test, three treatment approaches were tested: (1) amendments applied directly to the soil; (2) amendments added to the produced water; and, (3) blending the produced water with irrigation water from a local water source. Soil and water amendment rates were based on the chemistry of the water and the results of geochemical equilibrium modeling. The amendment rates were designed to reduce the SAR of the soil-water system to approximately 8. Experimental controls, consisting of: (1) produced water with no treatment; and (2) water from the Tongue River were also included in the testing. The soil columns were irrigated for 84 days to simulate several years of irrigation in the field.

To determine the effects of the treatments, soil samples from the columns were measured for pH, EC, and SAR. Results from four of the treatments and from a control column that was not irrigated or treated are shown in Table 1. At the conclusion of the test, average soil pH values were within the typical range for most undisturbed range soils of 6.5 to 8.4. As expected, soil EC increased in all treatments when compared to baseline conditions. Also as expected, the largest increase in soil EC was seen in the soil applied amendment treatment. However, soil samples from all treatments exhibited average EC values of less than 4 dS/m, below the 4 to 12 dS/m range of soil salinity thresholds for western rangeland and forage plant species (Bridger Plant Materials Center, 1996).

Table 1
Results of soil sampling and analysis from the Fidelity laboratory bench-scale tests.

Treatments	Average pH	Average Electrical Conductivity (dS/m)	Average Sodium Adsorption Ratio
Gypsum and sulfur applied to the soil; CBNG-produced water applied to the soil	7.8	2.9	7.5
Gypsum and sulfuric acid added to the CBNG-produced water; CBNG-produced water applied to the soil	7.5	2.8	8.9
Untreated CBNG-produced water applied to the soil	8.3	1.6	20
Untreated Tongue River water applied to the soil	7.7	0.69	0.69
Non-irrigated control (no water or treatments were applied to the soil)	7.9	0.41	0.44

Except for the produced water control treatment, the soil SAR values for each treatment were well below the established sodic soil threshold value of 13 (Brady, 1990) and the management target of 10. As anticipated, irrigation of the soil column with CBNG-produced water (with no soil amendments) resulted in an average soil SAR of 20. The soil within this column was clearly dispersed, reducing infiltration and permeability to near zero. In contrast, irrigation with CBNG-produced water on soil, amended with elemental sulfur and gypsum resulted in an average soil SAR of 7.5. Effects on soil structure and permeability of the soil column amended with calculated amounts of sulfur and gypsum were not apparent. The laboratory column test demonstrated the feasibility of using the agricultural soil amendments, elemental sulfur and gypsum, in combination with the CBNG-produced water to safely irrigate the soils.

Results of Full-Scale Testing

The successful bench-scale test led to a full-scale, 100-acre pilot test, where sulfur and gypsum amendments were applied to the soil and produced water was applied using center-pivot irrigation equipment. The post-irrigation soil samples exhibited little change in pH compared to the pre-irrigation samples. As expected, the average surface soil EC levels in the amended soils increased following irrigation, from 0.38 to 2.4 dS/m. The purpose of gypsum amendments was to add calcium to the soil system to balance the effect of sodium added by the produced water. Following irrigation, the average dissolved calcium concentration increased substantially. SAR values in the amended soils increased only slightly after irrigation, consistent with the 6.5 inches of water that was applied. The full-scale test successfully demonstrated that the elemental sulfur effectively controlled the bicarbonate in the produced water and allowed the added calcium in the gypsum to counter-balance the sodium introduced in the produced water.

Results of Long-Term Operations

Since the successful full-scale pilot test, Fidelity has embraced managed irrigation as one of its preferred methods for managing CBNG-produced water and irrigates over 850 acres in its Tongue River project area of Wyoming. With careful addition of elemental sulfur and gypsum

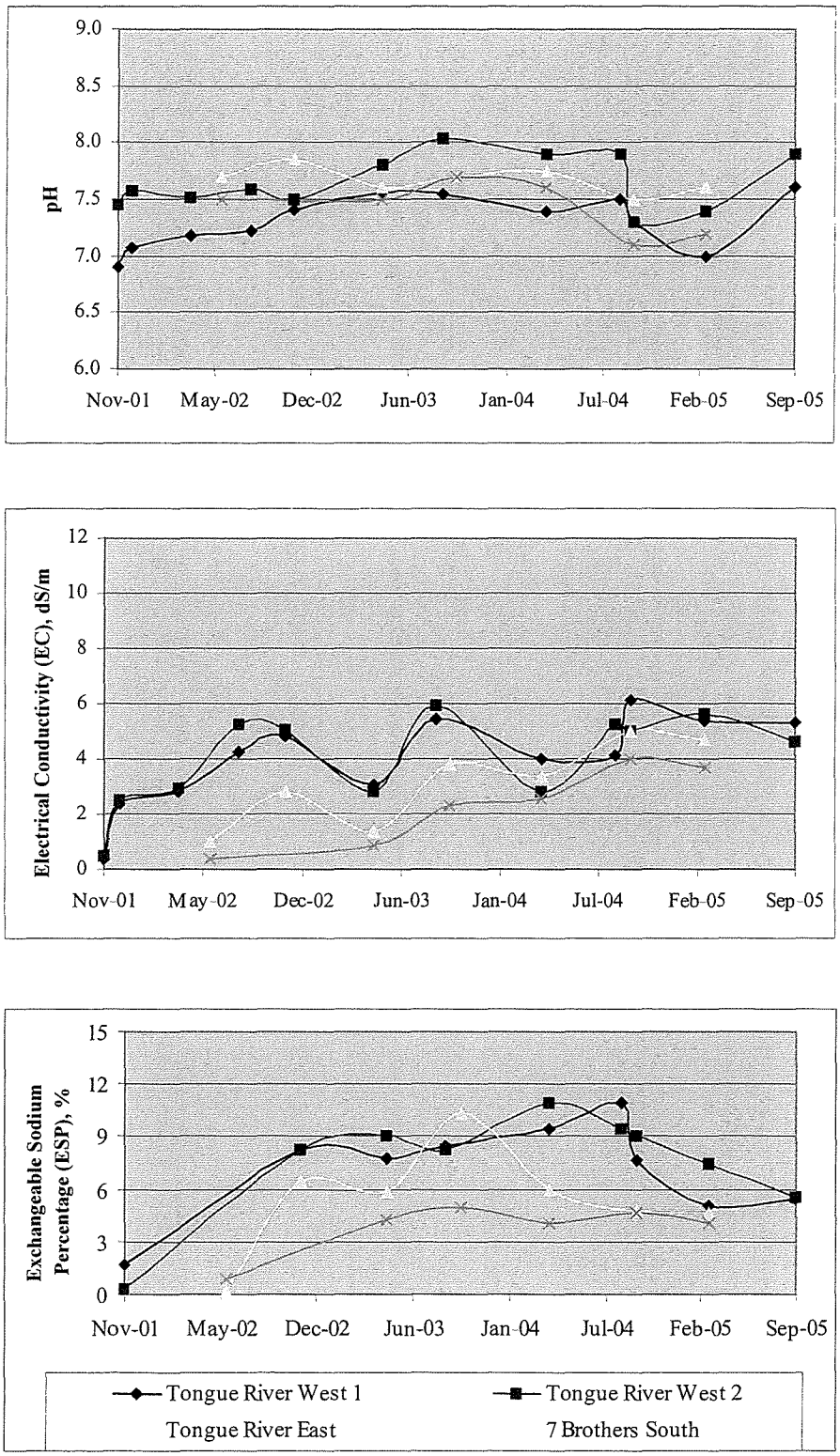
amendments to the soil surface, irrigation with CBNG-produced water is producing up to 4 tons per acre of alfalfa annually for local ranchers. This has been done during a period of severe drought.

To protect the soil resource, Fidelity employs an intensive soil-monitoring program. The monitoring program includes, among other things, soil sampling at the beginning and end of every irrigation season to track the soil chemical and physical condition. Soil sampling results from four of Fidelity's managed irrigation areas that have been irrigated as long as four years are shown in Figure 1. Each of the four project areas shown in Figure 1 is irrigated using center pivot irrigation equipment and each receives between 20 and 25 inches of CBNG-produced water annually. The EC of the produced water used to irrigate the areas generally ranges between less than 2 and 2.5 dS/m, while the SAR ranges between about 20 and 60. All four areas support healthy stands of alfalfa.

To begin with, soil samples were collected from each irrigation area before managed irrigation operations were started to document "baseline" conditions. The samples were analyzed in a laboratory for pH, EC, SAR, and exchangeable sodium percentage (ESP), among other things (ESP is a more accurate laboratory method that measures the amount of sodium ions held on the soil exchange sites, while soil SAR was developed as a less expensive method to estimate ESP). Pre-irrigation soil pH levels generally ranged between 6 and 8.5. Pre-irrigation EC levels generally ranged between less than 1 and 5 dS/m, while the ESP usually ranged between less than 1 and 5 percent.

Over time soil pH levels in samples collected from Fidelity's four managed irrigation areas have generally remained between 7.0 and 8.0 and have not greatly changed from pre-irrigation values. Soil EC levels have increased over time in the samples collected from the managed irrigation areas and have generally stabilized between 4.0 and 6.0 dS/m, as predicted. Soil EC levels were expected to increase with the addition of "salts" from the sulfur and gypsum soil amendments and from the CBNG-produced water. As can be seen in the fluctuating EC levels in Figure 1, winter and spring precipitation result in a decrease in EC due to natural leaching of the salts down through the soil profile. ESP values are shown in Figure 1 and are used to monitor the sodicity of the soil, similar to soil SAR results. In the soil samples collected in the Fidelity managed irrigation areas, ESP values increased initially, at the start of operations, and then generally stabilized over time. This response was expected and indicates that the added calcium has reached equilibrium with the sodium being added by the produced water during irrigation. For reference, sodic soils are defined as having ESP levels greater than 15% (U.S. Salinity Laboratory Staff, 1954). All of the Fidelity managed irrigation areas have ESP levels that are well below 15%, and are generally below 10%.

Figure 1
Median pH, average electrical conductivity, and average exchangeable sodium percentage in surface soil (0 to 6 inches) samples from four Fidelity managed irrigation areas.



Managed irrigation with CBNG-produced water results in changes to the soil chemistry during operations, including fluctuating soil salinity levels that can increase up to approximately 6.0 dS/m, and an increase in soil ESP up to a maximum of about 10%. After completion of managed irrigation operations, an application of gypsum to the soil surface, followed by natural precipitation that will move the calcium in the gypsum down into the soil and leach residual salts, likely resulting in a final soil EC of less than 3 dS/m and an ESP of less than 5 percent.

How Does Fidelity Implement Managed Irrigation?

The research and development program discussed above, along with four years of full-scale operational experience, has led to the development of a process for evaluating, designing, operating, monitoring, and closing CBNG managed irrigation systems in an environmentally sound manner. This process has been successfully employed by the authors of this document and their clients on managed irrigation projects totaling over 2,000 acres in the Powder River Basin of Wyoming. The primary components of the managed irrigation process are as follows:

- Irrigation Water Quality Suitability Assessment
- Soil Amendment Prescriptions
- Project Water Balance Estimates
- Site Selection
- Site Characterization
- Crop Selection
- Selection and Design of Irrigation Systems
- Soil Water Balance Modeling and Irrigation Scheduling
- Water, Soil, Crop, and Meteorological Monitoring
- Development of Irrigation and Crop Management Plans
- Site Closure Planning

Each of these components is discussed below.

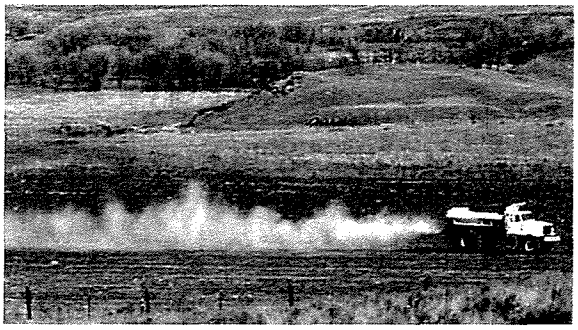
Irrigation Water Quality Suitability Assessment

As discussed above, to assess the suitability of produced water for irrigation, four specific areas are addressed: salinity, sodicity, alkalinity, and specific ion toxicity using the criteria specified in Ayers and Westcot (1985) and Hanson et al. (1999). This is the first step in any managed irrigation project to determine overall project feasibility. Soil and/or water conditioning prescriptions are then developed (if necessary) based on the chemistry of the irrigation water to allow long-term irrigation with CBNG-produced water.

Soil Amendment Prescriptions

The naturally occurring sodicity of CBNG-produced water, as measured by the SAR, is the primary concern to be addressed before this water can be used for irrigation and forage production. The SAR formula presented above indicates that two general treatment methods would result in a reduction in SAR prior to irrigation: (1) removal of sodium, or (2) addition of calcium and/or magnesium (the scientific literature suggests that calcium is more effective than magnesium in lowering the effect of sodium in soils, therefore, magnesium addition will not be

discussed further). Salt removal water treatment systems (e.g., reverse osmosis, ion exchange, etc.) are technically feasible; however, due to operational and economic limitations and issues associated with concentrated reject waters, they are not usually used in conditioning water for managed irrigation projects. The process of calcium addition, however, is a common practice used today in the Powder River Basin.



The level of bicarbonate alkalinity limits the maximum amount of calcium that can be dissolved in produced water. The minimum SAR is achieved by maximizing the dissolved calcium concentrations in the soil-water system. This requires the addition of an acid to neutralize the bicarbonate alkalinity, control pH, and maintain the solubility of the added calcium. The approach selected by Fidelity for managed irrigation in the Powder River Basin involves the application of conventional agricultural soil amendments such as elemental sulfur and gypsum (calcium sulfate dihydrate) to the soil.

The elemental sulfur product oxidizes in the presence of air, water, and soil microbial activity to form sulfuric acid, which in turn dissociates to sulfate and hydrogen ions (protons) as follows:

Oxidation of sulfur (S): $S + 1.5O_2 + H_2O = H_2SO_4$

Dissociation of sulfuric acid (H_2SO_4): $H_2SO_4 = 2H^+ + SO_4^{2-}$

Sulfuric acid neutralizes the bicarbonate alkalinity and controls soil pH as follows:

Neutralization of bicarbonate (HCO_3^{2-}): $H^+ + HCO_3^{2-} = H_2O + CO_2$

Gypsum provides dissolved calcium to the soil or water as follows:

Dissolution of gypsum ($CaSO_4.2H_2O$): $CaSO_4.2H_2O = Ca^{2+} + SO_4^{2-} + 2H_2O$

The added calcium effectively competes against sodium for the negatively charged exchange sites on soil clay particles. The positively charged divalent calcium ions (two positive charges) are more strongly attracted to clay particles in soil than are monovalent sodium ions (one positive charge), resulting in a stronger bond between the clay particles. Clay particles that are strongly bound by calcium ions are less likely to swell and disperse.

Geochemical equilibrium models such as PHREEQC and MINTEQA are used to calculate the amount of sulfur and gypsum amendments necessary to reduce the SAR of the applied CBNG-produced water to a suitable target level. The quantity of sulfur and gypsum amendments applied to a managed irrigation site depends on the chemistry of the water (i.e., the alkalinity and sodium levels) and the expected quantity of irrigation water necessary to grow the crop. Soil amendment rates for irrigation sites within the Powder River Basin typically range between 0.5

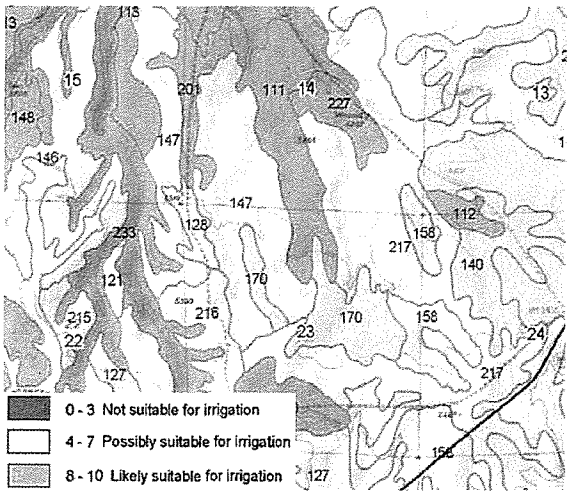
and 1.5 tons per acre per year for sulfur, and 2 and 6 tons per acre per year for gypsum. Soil amendment scheduling is site-specific. Typically, soil amendments are applied directly to the soil in the spring, prior to the initiation of irrigation for the season.

Project Water Balance Estimates

Development of irrigation plans for CBNG-produced water requires a detailed understanding of water production at CBNG project startup and throughout the estimated operational life of the well field. In other words, how much water will we have available from CBNG operations and when will we have it? Estimates of the project water balance are made using spreadsheet-based water balance models. These simulations guide initial irrigation planning, design, and operations.

Site Selection

Candidate irrigation sites are identified in the general area of the CBNG project by screening the soils using geographical information system (GIS) technology and published USDA-NRCS soil survey data. The GIS-based screening examines topography, soil texture, soil permeability, and soil depth to categorize the soils on maps as "very likely suitable," "possibly suitable," and "not likely suitable" for managed irrigation. Other site selection factors include vegetation presently growing on the site, surface hydrology and depth to groundwater, current land use, landowner preferences, and the overall improvement potential (e.g., can the site be improved as in the case of overgrazed upland areas). If the screening demonstrates that there is a high likelihood of suitable soils in the area, a more thorough site and soil evaluation would be required (see below).



Site Characterization

An on-site evaluation of the candidate irrigation site is necessary to determine the specific soil types present, current soil chemical and physical properties, and overall suitability of the site. The on-site evaluation is also necessary to collect soil data to assist in the design of the irrigation system, establish baseline (pre-irrigation) soil conditions, and to meet U.S. Bureau of Land Management (BLM) requirements for produced water management planning.

An Order 1 soil survey (as defined by the USDA-NRCS) is completed for all managed irrigation sites. This equates to approximately one soil profile description test pit per five to ten acres of area investigated (more for highly variable soils, less for more homogeneous soils). Test pits are excavated with a backhoe to a depth of 60 inches. At each test pit, a soil profile description is

performed in accordance with USDA-NRCS protocols (Soil Survey Division Staff, 1993). Bulk samples are collected from each soil horizon and submitted to a contract laboratory for analysis of pH, EC, SAR, saturation percentage, ESP, percent lime, percent organic matter (surface horizon only), fertilizer requirements, bulk density, and soil texture (percent sand, silt and clay). In addition, baseline soil infiltration rates are estimated by infiltrometer tests conducted near several of the test pit locations representing each soil-mapping unit.

Crop Selection

Crops typically grown under managed irrigation systems in the Powder River Basin are alfalfa and native forage grass mixes. Crop selection is based primarily on landowner preference, soil type, available equipment for harvesting, and the projected root zone salinity level resulting from the CBNG-produced water in equilibrium with the soil amendments. For alfalfa, the average root zone EC at which alfalfa is expected to begin to decline is 4.0 dS/m (Bridger Plant Materials Center, 1996). Alfalfa can tolerate much higher average root zone EC levels (i.e., up to 8.0 dS/m) before significant yield reductions or mortality occurs. Native forage grass species can typically tolerate much higher average root zone salinity levels than alfalfa. For example, tall wheatgrass can tolerate an average root zone soil EC level of 12 dS/m before yield begins to decline (Bridger Plant Materials Center, 1996).

Most managed irrigation projects are constructed on private land for a landowner who wants and can use the extra forage for livestock. Most of the sites utilized for managed irrigation in the recent past have been overgrazed, upland range areas that support little in the way of native plants. Typically, these sites are vegetated with sagebrush, introduced grass species, prickly pear cactus, and weedy species such as cheat grass. Managed irrigation projects have successfully rehabilitated these small areas into productive forage sources for both livestock and wildlife.

Selection and Design of Irrigation Systems

Several mechanized and non-mechanized irrigation systems are available for applying CBNG water to managed irrigation sites, including center pivot sprinklers, side roll/wheel line sprinklers, hand moved or fixed solid set sprinklers, big gun sprinklers, surface drip, subsurface drip, gated pipe flood, and ditch flood. The preferred system is the center pivot sprinkler because the significant advantages in automation, overall control, runoff control, distribution of water, operation costs, and reliability outweigh the capital costs. The selection of a particular system is based on topography, soil conditions, landowner preferences, size of the site, crop type, post-irrigation land use, available labor, and project economics.

Soil Water Balance Modeling and Irrigation Scheduling

A spreadsheet-based soil-water balance model is used to determine the amount and timing of irrigation required to produce a healthy forage crop and to ensure that sound agronomic leaching practices are followed. With a soil-water balance analysis, all water inputs to the soil and outputs from the soil are identified and balanced according to the following equation (Natural Resources Conservation Service, 2001):

> Total Irrigation Water Applied = Crop Requirement + Leaching Fraction + Irrigation Losses – Precipitation – Change in Soil-Water Content.

For sprinkler irrigation systems, several assumptions, actual data, and calculations are used in developing the soil-water balance and resulting irrigation schedule. Typically, 25 to 30 inches of CBNG-produced water are applied per season to grow crops such as alfalfa and forage grasses in the Powder River Basin.

With irrigation, the EC of the CBNG-produced water by itself should not cause any serious increases in soil salinity. However, amendments applied to the soil to negate the possible effects of the sodicity (SAR) of the produced water will cause an increase in soil EC, requiring leaching with excess water. Salt removal through leaching with excess water is required to minimize the concentration of salts in the root zone. This is termed the "leaching requirement." In most cases, a leaching requirement (fraction) of 10 to 20 percent will result in a soil EC approximately equivalent to the EC resulting from the equilibration of the produced water with the soil amendments. At the end of each irrigation season, actual (as opposed to projected) soil-water balances are prepared for each irrigation site with site-specific climatic data and total irrigation amounts. These soil-water balances will indicate whether the required leaching fraction has been achieved during the past irrigation season.

Discussion of the soil water balance and the amount of water to be applied to support crop growth and a suitable leaching requirement suggests potential interaction with shallow groundwater. In order for groundwater to be significantly influenced by managed irrigation systems, or any source of water applied to the surface, saturated flow must exist through the soil/unsaturated zone and into the groundwater. As defined above, managed irrigation is not a process whereby water is applied to the ground on a continual basis throughout the year. CBNG-produced water is applied in an agronomic manner, in accordance with crop needs, soil water holding capacities, climatic characteristics, soil infiltration rates, and leaching requirements. Irrigating crops in a way that results in saturating the soil to the point where water is moving in a continuous wetting front under gravity to the groundwater table is not desirable or practical but rather detrimental to vegetation. A continuous wetting front flowing by gravity through soil and bedrock is termed "saturated flow." When the soil water content is less than saturation, water movement is termed "unsaturated flow." Water moving through the soil under unsaturated flow conditions moves from areas of higher water content to lower water content, which means water can move diffusely in almost any direction.

Following managed irrigation practices, which utilize the soil-water balance approach to irrigation scheduling, CBNG-produced water is applied in amounts that will be evaporated from the soil and transpired through the roots and out the plant leaves during crop growth. Under these conditions, little or no net movement of water occurs beneath the root zone. As discussed above, additional water is applied during the irrigation season to ensure that salts do not accumulate within the root zone. This leaching requirement typically equates to approximately 5 to 10 inches of additional water spread out over the entire year including precipitation. Therefore, this limited volume of water applied over an entire year is not expected to create saturated flow conditions beneath the root zone down to groundwater. This condition is especially true where irrigation areas are located on upland range sites having significant depth to groundwater.

Irrigation scheduling is critical in minimizing potential runoff and erosion from irrigation areas, and potential runoff/discharge into streams. If irrigation systems were not carefully controlled and monitored, the application rates would exceed the soil infiltration rate. Managed irrigation systems are designed and operated in a way that supplies enough water to meet the demands of the crop, provides for an adequate leaching requirement, and applies water at or below the infiltration rate of the soil.

Water, Soil, Crop, and Meteorological Monitoring

The purpose of the soil, water, crop, and meteorological monitoring plan is to ensure that the managed irrigation site is operated in a manner that (1) promotes the beneficial use of CBNG water to produce forage, (2) maintains soil productivity and sustainability, and (3) minimizes the possible impacts associated with saline and sodic water irrigation. The data collected from soil, water, crop and meteorological monitoring are used to determine the overall performance of the managed irrigation system as well as to make adjustments to irrigation scheduling and soil amendment application rates. Site monitoring documents how the managed irrigation system is performing and data collected during monitoring are utilized in the creation of annual operations and monitoring reports.

Development of Irrigation and Crop Management Plans

The annual irrigation and crop management plan addresses seasonal landowner and land use goals, crop selection, site preparation, seeding, irrigation system operations, harvesting/grazing plans, soil amendment application rates and scheduling, irrigation scheduling, leaching requirements, and monitoring. This document serves as the overall planning, operations, and monitoring guide. The irrigation and crop management plan is revised each winter based on the monitoring results and other input from the previous irrigation season, and the operational requirements for the upcoming irrigation season.

Site Closure Planning

A critical component of the managed irrigation planning process is site closure. Issues to be addressed during site closure planning are:

- What are the post-irrigation land use goals and landowner preferences?
- Will the site continue to be cropped or will it be put back into native vegetation?
- Will the irrigation equipment be removed or will it be left in place to be used by the landowner?
- If the irrigation equipment is to remain, what are the water sources available for continued irrigation?
- What do we expect in the way of post-irrigation soil physical and chemical conditions?
- Will the chemistry of the soil require adjustment to meet post-irrigation land use and landowner goals?

- What level of post-irrigation monitoring will be required to meet post-irrigation land use and landowner goals?

Some of the answers to these questions can be anticipated at project startup, while others can be answered only after conducting and evaluating the managed irrigation activities. In any event, the primary goal of site closure is to leave a physically and chemically stable site capable of moving towards a sustainable vegetative community that meets or exceeds landowner goals.

Conclusions

The production of natural gas in the Powder River Basin of Montana and Wyoming and the concurrent production of unaltered groundwater are occurring in a region that is naturally arid during a time of unprecedented drought. Research and development programs and full-scale irrigation projects have demonstrated that CBNG water can be beneficially used to grow forage where there was none, while protecting the soil resource. Since Fidelity first embarked on developing this process for beneficially using produced water, several other CBNG producers in the Powder River Basin have added managed irrigation to their water management "tool kit." Two to three tons per acre of alfalfa are routinely produced with CBNG irrigation water in the Powder River Basin of Wyoming. Managed irrigation has evolved into a practice that is based on established soil science, water chemistry, and agronomic principles, and should be evaluated as a water management and beneficial use alternative on a project- and site-specific basis.

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Dina Brown is a board-certified professional soil scientist (CPSSc No. 32073) with 15 years experience providing environmental consulting services to the private and public sector, leading university extension programs, and practicing environmental engineering for the federal government. Ms. Brown holds a B.S. in Civil/Environmental Engineering from Texas A&M University, and a M.S. in Forest Science/Soil Science from Oregon State University. Her technical strengths are in soil science, soil morphology, surface water resources, environmental engineering, and statistics. Ms. Brown's specific experience includes wastewater land

application; applied research and development; sodic soil reclamation; oil contaminated soil reclamation; NPDES permit compliance; land application of biosolids; commercial on-site wastewater treatment; industrial stormwater management; water treatment; and, regulation development. She has particular expertise in the management of produced water for the oil and gas industry and in characterizing the soils of northeastern Wyoming and southeastern Montana.

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February 9, 2006

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Re: Petition to Amend Wyoming Water Quality Rule, Chapter 2, Appendix H

Dear Director Lorenzon:

On December 7, 2005, The Powder River Basin Resource Council et al. ("Petitioners") filed a Petition with the Environmental Quality Council ("EQC") to amend Wyoming Water Quality Rules and Regulations ("WQRR"), Chapter 2, Permit Regulations for Discharges to Wyoming Surface Waters. Williams Production RMT Company ("Williams") believes that the current Water Quality Rules adequately control coalbed methane ("CBM") facility discharges. The proposed amendments would interfere with the current water appropriation, distribution and diversion system in Wyoming, and would expand the current Wyoming Pollutant Discharge Elimination System ("WYPDES") permitting program beyond the limits of its statutory authority.

More importantly, the PRBRC proposal would not meet the purported objective of maximizing the beneficial use of Wyoming water. To the contrary, by forcing re-injection and other alternative disposal methods, it would have the unintended consequence of wasting water and limiting its availability for use by Wyoming farmers, ranchers and others. The Petitioners' purported support of treatment options is only a panacea, since many of the treatments are not technologically proven and each creates its own disposal issues.

No amendment of the WQRR is needed at this time. Williams respectfully requests that the EQC deny the petition to initiate rulemaking.

I. Background

The Wyoming Constitution provides that the Board of Control, which includes the State Engineer and superintendents of water divisions, shall "have the supervision of the waters of the state and of their appropriation, distribution and diversion." Wyo. Const. Art. 8, § 2; Wyo. Stat. Ann. § 97-8-002. The State Engineer's Office has the primary responsibility for the regulation of quantities of water used, discharged and

distributed throughout Wyoming. It is the State Engineer's job to make sure that State waters are put to beneficial use.

In contrast, the Wyoming Department of Environmental Quality's ("DEQ") authority to regulate water is focused on the quality of State waters and discharges into these waters. DEQ regulates water quality by implementing regulations developed to meet requirements under both the Wyoming Environmental Quality Act and the federal Clean Water Act ("CWA"). Wyo. Stat. Ann. § 35-11-101 et seq.; 33 U.S.C. § 1251 et seq. The broad purpose of the Environmental Quality Act is to protect State air, land and water resources. Wyo. Stat. Ann. § 35-11-102. Similarly, in the area of water quality protection, the CWA prohibits the unauthorized discharge of pollutants into waters of the United States. 33 U.S.C. § 1311. At the time the United States Congress passed the CWA, it wanted to control the amount of various contaminating substances discharged so that water quality could be improved or maintained. The CWA originally focused on the control of the discharge of conventional polluting substances e.g., BOD, TSS and pH, and was amended to include toxic and priority polluting substances. 33 U.S.C. §§ 1314(a)(4), 1317(a)(1).[1]

The WYPDES permit program, Wyoming's version of the CWA's pollutant discharge permit program, establishes limits on the discharge of specific chemical compounds. By controlling the discharge of specific chemical compounds, the WYPDES permit program ensures that water discharges have the potential to meet certain uses, e.g., agricultural or wildlife. The purpose of this program is not to ensure that such discharges are 100% used since the program must operate within existing constraints for the control of water within the State. The CWA expressly states, "[T]he authority of each State to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired [by the CWA permit program]. 33 U.S.C. § 1251(g); Wyo. Stat. Ann. § 35-1-1104(a).

II. State Engineer Controls Water Quantity and Beneficial Use

The Petitioners request that the EQC change the WYPDES permit program in a fundamental way. The Petitioners want DEQ to police and control the quantities and distribution of waters in the State and want DEQ to ensure that each and every drop of CBM water discharged is used. Such a request is misguided. The amendment the Petitioners request cannot be implemented for practical reasons and should not be considered for constitutional and statutory reasons.

DEQ currently evaluates and regulates CBM facility discharges in a comprehensive, thorough way. DEQ authorizes certain produced water discharges from CBM production facilities, if such discharges meet specified standards. WQRR, Chs. 1, 2. The standards have been methodically and carefully developed. The Appendix

[1] Coal bed methane produced water contains certain conventional pollutant parameters which are regulated.

H(a)(i) standard is one of many limits placed on CBM produced water discharges. Appendix H(a)(i) requires that discharged produced water be suitable for agriculture or wildlife use and be put to such use during periods of discharge. This current standard makes sense.

The Petitioners seek to maximize the beneficial use of produced water discharges by demanding proof of 100% actual use of discharges by livestock, wildlife or agriculture. This is unreasonable and impractical. Wyoming adopted the Appendix H(a)(i) standard because it knew that discharges of produced water from facilities in the arid western United States could be used beneficially. See Exhibit 1 (Petitioners' Exhibit 5). However, in an arid climate, the goal has never been to consume 100% of existing surface water or to dispose of discharged water without any use. Such assumptions remain true of CBM produced water today.

In Wyoming, where surface water has generally been scarce, water use develops from the presence of water. Contrary to Petitioners' assertion, produced water in Wyoming is generally being used. Wildlife, livestock and plants are attracted to and collect where they find water. It is impossible to predict how much water an animal or plant will use from a water source or on what schedule in any given year. Petitioners' proposed amendment to the WQRR would require WYPDES permit applicants to forecast animal and plant consumption patterns which cannot be determined. The proposed amendment would require DEQ to confirm such predictions for a specific drainage and then regulate quantities of produced water discharged under WYPDES permits to ensure that such consumption needs were met. Permittees would be required to adjust the timing and amount of discharges to meet agricultural irrigation schedules and livestock and wildlife drinking schedules. Requiring WYPDES permittees to release water with such precision is impractical.

The Petitioners' proposed amendment also would have an effect beyond how oil and gas operations, whether conventional or CBM, are operated. It would have a direct effect on and interfere with appropriated water rights. Despite the claims of many of the Petitioners, farmers and ranchers in many drainages depend on and frequently use substantial quantities of discharged produced water for agricultural and livestock propagation purposes. Appropriated water rights incorporate certain assumptions about produced water discharge levels and are dependent on the release of such water. The proposed amendment would adversely affect many of these appropriated water rights, again interfering with water quantity allocations established by the State Engineer. If 100% use criteria were required before a permittee could discharge water, the operator could choose to cease producing gas in a certain area or choose to consider options where there is <u>no</u> beneficial use, thus depriving Wyoming farmers and ranchers of a plentiful source of water for their crops and livestock. In many cases, the Petitioners' proposal, if adopted, would harm the very citizens in rural agricultural communities it seeks to protect. The Petitioners' "all or nothing" approach does not meet the water needs of many landowners in arid Wyoming.

On the other hand, assuming a WYPDES permittee could prove 100% use of produced water, the permitee could continue to discharge as much water as it produced, without ever reducing the quantity of water discharged. This would meet Petitioners' 100% use goal but could exacerbate rather than solve flooding or other issues accurately or inaccurately attributed to produced water discharges.

The proposed amendment would distort the purpose of the WYPDES program and would interfere enormously with the distribution of water in the State. The State Engineer, not the DEQ, is the regulatory entity authorized to distribute and divert waters of the State on specific schedules to meet the multiple water resource demands within the State. For that reason, our legislature expressly precluded the DEQ from interfering with the jurisdiction, duties or authority of the State Engineer or the Board of Control. Wyo Stat. Ann. § 35-1-1104(a).

The practical effects of the Petitioners' proposal would be significant. The WYPDES permit program is not a program meant to manipulate the quantity and distribution of water in Wyoming. It is essentially a water quality permit program and should remain one.

III. Appropriate WYPDES Standards Exist

Chapters 1 and 2 of the WQRR currently provide DEQ with appropriate directions and standards to protect Wyoming water quality consistent with the mandates of the Wyoming Environmental Quality Act and the CWA. Wyoming very recently completed its triennial review of Chapter 2 of WQRR. Citizens had numerous opportunities to comment and participate in the amendment of the WQRR, including any revisions to Appendix H. The EQC already considered and rejected proposals strikingly similar to that of the Petitioners during the 2004 deliberations. No revisions to these rules are necessary, particularly to regulate water quantity per se.

The WYPDES permit application is detailed and extensive. See Exhibit 2 (WYPDES Permit Application). DEQ evaluates requests for WPDES discharges on an area-specific basis; DEQ considers the type of facility whose discharges will be authorized and the nature of downstream facilities which require protection. Before granting a WYPDES permit, the permit applicant supplies data and DEQ evaluates whether the proposed representative discharge contains any of 25 chemical parameters, including barium, pH, chlorides and sodium adsorption ratio. Id. at § 14. DEQ also evaluates control measures that the applicant proposes to implement to prevent erosion of the receiving water channel and measures used to meet chemical parameters. Id. at §§ 9, 10. DEQ reviews the applicant's flow volume estimates and considers the nature and quality of the receiving water before issuing a WYPDES permit. Id. at §§ 15, 16; WQRR, Ch. 1.

The Appendix H(a)(i) limit is not the only basis for determining whether a CBM facility can discharge produced water in Wyoming. Appendix H also identifies multiple additional criteria which a permittee must meet in order to discharge CBM produced

water. Some of these criteria include numeric limits on certain identified substances e.g., chlorides, sulfates, total dissolved solids, and other criteria describe general principles which must be met e.g., erosion control. Appendix H, b(ii), (iv), (vii).

DEQ has not turned a blind eye to quantity, but rather has incorporated it appropriately into its regulatory control of specific contaminant discharges. The combination of the numeric limits and other general principles makes the Appendix H criteria more stringent than the federal discharge criteria for conventional oil and gas operations. Exhibit 1; 40 C.F.R. § 135.52.

IV. Nexus Required Between Water Quality and Water Quantity

The Petitioners readily admit that DEQ evaluates the interplay of water quantity and water quality in many contexts. Exhibit 3 (Petition to Amend Wyoming Water Quality Rule, Ch. 2 Appendix H, pp. 13-14). However, the CWA and implementing regulations in Wyoming do not and should not require that DEQ establish volume limits per se on produced water discharges in WYPDES permits. The CWA cases the Petitioners cite also do not support such an interpretation of DEQ's WYPDES permitting authority.

The Petitioners cite no 10th Circuit cases which involved requests for NPDES authorization of discharges, much less authorization for discharges of produced water in an arid region.[2] Several of the cases cited involved requests for authorization to discharge dredged and fill materials into waters of the United States in connection with the proposed construction of dams. *PUD No. 1 of Jefferson County v. Washington Dept. of Ecology,* 511 U.S. 700 (1994); *Riverside Irrigation District,* 758 F.2d 508 (10th Cir. 1985); *Alameda Water & Sanitation Dist. v. Reilly,* 930 F. Supp. 486 (D. Colo. 1996). Section 404 of the CWA authorizes the U.S. Army Corps of Engineers ("Corps") to issue permits for the discharge of dredged or fill material into regulated waters. 33 U.S.C. § 1344(a). Before issuing a Section 404 permit, the Corps must evaluate whether a proposed discharge of fill material complies with certain EPA guidelines; the guidelines require the agency to evaluate potential impacts of the discharge to the physical, chemical and biological characteristics of the aquatic ecosystem including current patterns and downstream flows. 40 C.F.R. § 230.11. (Emphasis added).

The CWA discharge authorization requested in the cases cited by the Petitioners is not the same authorization requested under the WYPDES program. By definition, dam construction requires that fill material (dirt, rock, concrete) be placed in an

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[2] The Petitioners did cite one 9th Circuit case that dealt with CBM produced water. *Northern Plains Resource Council v. Fidelity Exploration and Development Co.*, 325 F.3d 1155 (9th Cir. 2003). However, this case addressed the question of whether the discharge of produced water required an NPDES discharge permit in the first instance, and not whether the quantity of water was appropriately regulated under such a permit.

existing stream or channel which typically transports water. The fill material blocks the regular flow of the water, thus impacting the physical characteristic of the aquatic ecosystem. The courts in each of these cases discussed water quality in connection with water quantity since water quantity (the existing stream flows) would be altered (significantly reduced) if the CWA permits were granted.

The Petitioners have not identified any cases where a state asserted authority to regulate the volume of water discharged directly into a waterway, as opposed to cases where the discharge of fill material was regulated due to potential impacts on stream flow. The Petitioners quote language from *United States v. Earth Sciences,* 599 F.2d 368 (10th Cir. 1979) and *Quivira Mining Co. v. U.S. Envt'l Prot. Agency,* 765 F.2d 126 (10th Cir. 1985) in support of the assertion that the DEQ should regulate water quantity as part of the WYPDES program. The courts in these cases did not evaluate a state's ability to regulate the quantity of water discharged under a program like the WYPDES permit program. The language the Petitioners quoted from these cases merely offers a general paraphrasing of the purposes of the CWA, unsubstantiated by statutory analysis.

V. **Request for Petition Denial**

DEQ must ensure and regulate the quality of whatever quantities of water a WYPDES permit applicant proposes to discharge into the State's surface waters. DEQ, through the WYPDES permit program, allows certain discharges which the Department determines will not degrade the quality of Wyoming's waters. There is no need to amend Chapter 2, Permit Regulations for Discharges to Wyoming Surface Waters. The Petition should be denied.

Sincerely,

Joe Olson/ear

Joe Olson
Facilities Engineer

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Direc

April 25, 2005

FILED

FEB 10 2006

Terri A. Lorenzon, Director
Environmental Quality Council

Mr. Stephen Tuber
Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance
U.S. EPA, Region 8
999 18th Street - Suite 300
Denver, CO 80202-2466

RE: Factors Considered for Developing BPJ Limits for Coal Bed Natural Gas

Dear Mr. Tuber:

This document has been prepared in response to EPA's September 16, 2004 letter to WDEQ in response to the March 5, 2001 *Petition for Corrective Action or Withdrawal of the State of Wyoming's Authority to Administer the Clean Water Act's National Pollutant Discharge Elimination System Program* filed by the Wyoming Outdoor Council and the Powder River Basin Resource Council. More specifically, this document addresses Allegation I.A.2 ***"The WDEQ does not apply the Best Professional Judgment factors, a violation of the CWA"*** and the request by EPA for WDEQ to explain how it considered the factors for developing BPJ limits (40 CFR 125.3), deciding to rely on the oil and gas effluent limitations guideline (40 CFR 435) as guidance for developing BPJ limitations for coal bed methane (CBNG).

Please feel free to contact Todd Parfitt of my staff at 307-777-6709 or tparfi@state.wy.us with any questions regarding this matter.

Sincerely,

John Corra
Director
Department of Environmental Quality

JVC/jd/5-0488
Attachment
cc: John Wagner, WQD Administrator
Todd Parfitt, WYPDES Program Manager
Vicci Colgan, Senior Assistant Attorney General

WILLIAMS
EXHIBIT 1

Wyoming Pollutant Discharge Elimination System (WYPDES) Program
Basis for Technology-Based Effluent Limits
in
Coal Bed Methane (Natural Gas) WYPDES Permits

This document provides the basis for the technology-based effluent limits that have been incorporated into WYPDES permits for the coal bed natural gas (CBNG) industry. These limits are based upon review and consideration of: current knowledge and factual information about CBNG production; the national effluent limitations guidelines (ELGs) for the Coal Mining Point Source Category (40 CFR 434); ELGs for the Oil and Gas Extraction Point Source Category (40 CFR 435); U.S. EPA NPDES Permit Writers' Manual, December 1996; and the 1976 Development Document for the Oil and Gas Extraction Point Source Category.

The Wyoming Department of Environmental Quality (WDEQ), Water Quality Division, Wyoming Pollution Discharge Elimination System (WYPDES) program was granted authority to implement the NPDES program under the Federal Water Pollution Control Act in 1974. The federal Clean Water Act, Wyoming Environmental Quality Act and Wyoming Water Quality Rules and Regulations Chapter 2 require operators who discharge pollutants to a water of the United States, or a surface water of the state under state statute, to obtain a WYPDES permit for the discharge.

The primary industrial activity with surface water discharge in the State of Wyoming is the oil and gas industry. In the early 1970s, conventional oil production was the predominate oil and gas activity within the state. Natural gas development has also been occurring within the state since the 1970's, but in a more limited capacity. CBNG development in Wyoming began in the late 1980's and by the end of 1997, there were 578 active WYPDES permits for oil and natural gas production facilities, 47 of these permits were for CBNG facilities.

During the late 1990s, technological advances provided the oil and gas industry with the ability to extract methane from coal bearing formations in a more economic, efficient and prolific manner. As a result, CBNG development spread rapidly throughout the Greater Powder River Basin. Initial development occurred in the Belle Fourche River Basin and eventually moved into the Cheyenne, Tongue and Powder River Basins. The number of active CBNG permits began to rapidly increase in 1999 and 2000. As of March 3, 2005 there were 1268 active oil and natural gas permits; 823 of these permits were for CBNG facilities.

When establishing effluent limits in WYPDES permits, water quality-based and technology-based effluent limits are always evaluated, taking into consideration all appropriate federal and state regulations. Determination of water quality-based limits is based upon Chapter 1 of the Wyoming Water Quality Rules and Regulations. Technology-based limits can be based upon ELGs or, in the absence of ELGs, best professional judgment (40 CFR 125.3). Technology-based effluent limits for the oil and gas industry in Wyoming are based upon Wyoming Water Quality Rules and Regulations Chapter 2 Appendix H which are consistent with the federal ELGs for the Oil and Gas Extraction Point Source Category (40 CFR Part

435) except that the WDEQ rules provide more stringent controls than the federal rules and the WDEQ rules specifically addresses CBNG produced water.

EPA has taken the position that no ELGs apply to CBNG. However, EPA has recognized that NPDES permit writers can develop BPJ limits by using one of two different methods. A permit writer can either transfer numerical limitations from an existing source such as a similar NPDES permit or an existing ELG, or derive new numerical limitations. WDEQ has used the first method to develop CBNG BPJ limits.

A summary of WDEQ's rationale for developing BPJ limits (40 CFR 125.3) for CBNG relying on the oil and gas effluent limitations guideline (40 CFR 435) as guidance are as follows:

1. Comparison of CBNG Discharges to 40 CFR 434 Coal Mining Point Source Category and 40 CFR 435 Oil and Gas Extraction Point Source Category

A. Comparison of CBNG Discharges to 40 CFR 434

The WYPDES Program evaluated ELGs for the Coal Mining Point Source Category (40 CFR, Part 434). The ELG for the Coal Mining Industry applies to discharges from any coal mine at which the extraction of coal is taking place or is planned to be undertaken and to coal preparation plants and associated areas. The primary Standard Industrial Classification Categories evaluated by the Development Document are:

1111 Anthracite Mining

1112 Anthracite Mining Services

1211 Bituminous Coal and Lignite Mining, and

1213 Bituminous Coal and Lignite Mining Services

The effluent limitations for the coal mining industry include: pH, Total Suspended Solids, Total Iron and Total Manganese. CBNG discharges typically have a pH of 7.5-8.0 standard units; Total Iron is typically a constituent of concern, Total Suspended Solids are typically not a concern and Total Manganese is not a constituent of concern.

The activities conducted by the coal mining industry were compared to those of the CBNG industry. The activities typically conducted by the mining industry were clearly dissimilar. Specifically, the coal mining industry does not rely on drilling activities, commercial extraction of methane gas or the discharge of similar volumes of produced water for their operations.

Based on the review, the WDEQ concluded that there was valuable insight to be gained from evaluating water quality data from coal mine operations, however, because the industrial activities were so dissimilar, using 40 CFR 434 as guidance for developing BPJ limitations for (CBNG) was deemed inappropriate.

B. Comparison of CBNG Discharges to 40 CFR 435

CBNG development is a subset of the oil and gas industry as is conventional oil and conventional natural gas development. CBNG operations are reviewed in the context of oil and gas development as a whole. Comparisons are made to conventional oil and gas technology based on regulations, which have been in place for nearly 30 years.

To determine the appropriateness of relying on 40 CFR 435 as per 40 CFR 125.3, the WYPDES Program conducted an evaluation of 40 CFR 435 and the 1976 Development Document for the Oil and Gas Extraction Point Source Category. According to the development document, the study covered pollutants arising from the production of crude petroleum and natural gas, drilling oil and gas wells, and oil and gas field exploration services. The document makes no explicit exclusion of varying types of oil and gas operations.

CBNG is exceptionally pure compared to conventional natural gas, in that it contains very small proportions of heavier hydrocarbons and other gases. Natural gas is termed "dry" when it is almost pure methane, lacking other commonly associated hydrocarbons, which is the case with CBNG. When other hydrocarbons are present the natural gas is referred to as "wet". The concept of "dry" natural gas is recognized in the 1976 Development Document for the Oil and Gas Extraction Point Source Category, which states "...Gas wells may produce dry gas but usually also produce varying quantities of light hydrocarbon liquids (known as gas liquids or condensate) and salt water."

Segments of the industry covered by the Oil and Gas Extraction Point Source Category are based on the following Standard Industrial Classification (SIC) Codes:

1311 Crude Petroleum and Natural Gas

1381 Drilling Oil and Gas Wells

1382 Oil and Gas Field Exploration Services

1389 Oil and Gas Field Services, not classified elsewhere

These SIC codes were compared to the 1987 Standard Industrial Classification Manual which defines SIC codes for various industrial activities. The Major Group for the Oil and Gas Extraction Category (Major Group 13) includes establishments engaged in:

(1) producing crude petroleum and natural gas;
(2) extracting oil from oil sands and oil shale;
(3) producing natural gasoline and cycle condensate; and
(4) producing gas hydrocarbon liquids from coal at the mine site.

Types of activities included in this major category include exploration, drilling, oil and gas well operation and maintenance, the operation of natural gasoline and cycle plants, and the gasification, liquefaction and pyrolysis of coal at the mine site.

Based on the review of Part 435, the Development Document and the 1987 Standard Industrial Classification Manual, the WDEQ concludes that CBNG activities are similar in nature to those activities outlined in 40 CFR 435. CBNG is clearly within the Major Group 13 and more specifically within the SIC code 1311, which is clearly an industry that was evaluated and included in the Development Document.

EPA established BPT ELGs for the Onshore subcategory (Subpart B) and Agricultural and Wildlife Water Use subcategory (Subpart E) for the Oil and Gas Extraction Point Source Category, on April 13, 1979. EPA imposed a zero discharge requirement for all pollutants in the Onshore subcategory (40 CFR 435.32):

"...there shall be no discharge of wastewater pollutants into navigable waters from any source associated with production, field exploration, drilling, well completion, or well treatment (i.e., produced water, drilling muds, drill cuttings, and produced sand)."

For the Agricultural and Wildlife Water Use subcategory, EPA imposed a zero discharge requirement for all pollutants with the exception of some produced waters (40 CFR 435, Subpart E). To qualify this exemption:

(1) The produced water must be generated from facilities that are engaged in production, drilling, well completion, and well treatment in the oil and gas extraction industry and be located in the continental United States and west of the 98th meridian (40 CFR 435.50).
(2) The produced water must be used in agriculture or wildlife propagation when discharged into navigable waters (40 CFR 435.50).
(3) The produced water discharges must not exceed an oil and grease daily maximum limitation of 35 mg/l (40 CFR 435.52(b)).

EPA defined the term "use in agricultural or wildlife propagation" by stating "the produced water is of good enough quality to be used for wildlife or livestock water or other agricultural uses, and the produced water is actually put to such use during periods of discharge." (40 CFR 435.51(c)). The provisions of 40 CFR 435 make no mention of water quantity necessary to support stock and/or wildlife use.

In 1979, WDEQ promulgated Water Quality Rules and Regulations Chapter 7, "Surface Discharge of Water Associated with the Production of Oil and Gas," which was the WDEQ equivalent to the federal ELG 40 CFR 435 except that the Chapter 7 rules provided more stringent controls than the federal rules. In the early development stages of CBNG the WDEQ applied the requirements of Chapter 7 as the technology based effluent limitations. In November 2004, WDEQ promulgated revised Chapter 2 rules, which incorporated and updated the provisions of Chapter 7 as Appendix H and explicitly identified CBNG as an industrial activity covered under the oil and gas technology based limitations.

For oil and gas discharges, including CBNG, permits issued from 1974 through 2000 by Wyoming, it was assumed that in the arid west region, the produced water would be used for agricultural or wildlife propagation as long as water quality standards and effluent limitations were met. Historically, documentation related to this requirement was not contained or

required in the permit applications or permit files for WYPDES permits. It is WDEQ's belief and understanding that federal permits issued on Indian Lands have been processed in a similar manner. However, in 2000, at the request of Region 8 EPA, the WYPDES Program modified the CBNG permit application to require the applicant to provide a demonstration of compliance with Subpart E.

In September 2001, the EPA provided written comments related to several CBNG permits that the WYPDES Program was proposing to issue. The comments primarily focused on the statements of basis (SOBs) for CBNG permits which invoked WWQRR Chapter 7 and 40 CFR 435. The EPA suggested that the SOBs should describe the beneficial use for the discharged water and that the quality support such a use. The nature of EPA's comments clearly suggested to WDEQ that EPA concurred with the approach of relying on the oil and gas effluent limitations guideline (40 CFR 435 and WWQRR Chapter 7) as guidance for developing BPJ limitations for CBNG.

While not initially stated in the SOBs for the proposed permits, the permit files contained application information regarding the identification of the use(s) for the discharged water and the potential water quality of the proposed discharge. In December 2001, the WYPDES Program began including statements in the SOBs of each CBNG permit to specifically address how the produced water would be used.

Although the ELG associated with the Oil and Gas Point Source Category predates the development of CBNG extraction technology, based on the comparison outlined above, it is the professional judgment of WDEQ that discharges related to CBNG facilities are similar enough to other types of natural gas extraction that the technology-based effluent limits contained in WWQRR Chapter 7 (now WWQRR Chapter 2, Appendix H) and 40 CFR 435 are appropriately applied. EPA acknowledged acceptance of Wyoming's reliance on the technical and economic assumptions of the federal effluent guidelines for the oil and gas extraction point source category (40 CFR 435) to establish technology based effluent limitations for CBNG in its February 26, 2003 letter to WDEQ.

2. Comparison of Water Management Options

The oil and gas industry has historically been forced to manage produced water and other production related wastes based on the constraints of water quality based effluent limitations, technology based effluent limitations and other state regulatory requirements, such as compliance with the Colorado River Salinity Control Forum policies. Because of these constraints the oil and gas industry has historically disposed of produced water by injection, disposal pits and ponds, land application, discharge to surface waters of the state that are not waters of the United States, and discharge to surface waters of the state that are waters of the United States.

Injection:

Injection has been used by the oil and gas industry primarily in the Green River and Snake River Drainage Basins due to high total dissolved solids concentrations in the produced water and the Colorado River Salinity Control Forum policies that are enforced through the

WYPDES program under WWQRR Chapter 6. Similarly, injection has been successfully utilized for CBNG produced water disposal, but on a limited scale, largely due to technological constraints.

Disposal Pits and Ponds:

One method of produced water management historically used by the oil and gas industry has been the use of disposal pits and ponds, typically for evaporation and concentration of brine waste. Similarly, CBNG produced water has been disposed of in pits and ponds. However, because the quality of CBNG produced water is of much higher quality (i.e. meets all Class 4 and most Class 3 water quality criteria at the point of discharge), evaporation plays a small role in the actual management of the produced water. The pits and ponds associated with CBNG produced water are categorized as surface waters of the state and are designed to infiltrate into and recharge shallow aquifers versus evaporation ponds, which are constructed with a liner.

Discharge to Surface Waters of the State that are Not Waters of the United States

As mentioned earlier, water quality-based and technology-based effluent limits are always evaluated for all oil and gas discharges. Waters of the state that are not waters of the United States, such as off-channel pits and ponds, are not subject to federal oversight or federal rules including BPJ or ELGs. However, because the WDEQ promulgated rules consistent with the federal rules for all surface waters of the state, WWQRR Chapter 2 is applied to these discharges.

Discharge to Surface Waters of the State that are Waters of the United States

Historical oil and gas produced water discharges to surface waters of the state that are waters of the United States have been and continue to be subject to the provisions of WWQRR Chapter 7 (now Chapter 2, Appendix H) and 40 CFR 435, as well as, WWQRR Chapter 1. Similarly, CBNG discharges are subject to the same regulations, including the management of drilling muds and other liquids associated with the drilling of wells. In all cases these drilling muds and other associated liquids are not permitted to be discharged to surface waters of the state.

Land Application

Land application has historically been an option for the oil and gas industry to manage disposal of produced water provided they meet the criteria of WWQRR Chapter 3 and obtain a permit from the WDEQ. Similarly, land application is an option for CBNG produced water and has been utilized by several companies for production of a variety of crops and vegetation.

3. Comparison of Water Quality Data

Since the beginning of large scale CBNG development in Wyoming, the DEQ has evaluated the range of possible ground water quality from coal seams based on the following data sources:

A. Land Quality Division records.
B. Water Quality Division records.
C. State Engineers Office records.
D. Oil and Gas Conservation Commission records.
E. USGS records.
F. Wyoming Geological Survey records.
G. Industry records.
H. Other miscellaneous sources.

Based on these reviews the DEQ has identified constituents of concern associated with the groundwater being produced and discharged from CBNG operations across the state. These constituents have been continually monitored. Findings from the evaluation of the data have revealed that iron, SAR and Ec are the primary constituents/parameters of concern. Other parameters such as barium, arsenic and whole effluent toxicity have been identified as concerns in isolated areas.

The 1976 Development Document for the Oil and Gas Extraction Point Source Category identified the significant or potentially significant wastewater constituents as oil and grease, fecal coliform, oxygen demanding parameters, heavy metals, total dissolved solids, and toxic materials. It is the WDEQ's opinion that the fecal coliform and oxygen demanding parameters referenced in the Development Document relate to the off-shore drilling operations where disposal of sewage wastewater would be involved in the process. Because the on-shore category does not include the discharge of sewage wastewater they are excluded from the comparison evaluation. The remaining constituents of concern in the Development Document are the same as the constituents of concern identified for CBNG discharges.

Additionally, the Development Document states that "...the wastes associated with this category result from the discharge of produced water, drilling muds, drill cutting, well treatment and produced sands for all subcategories..." Similar to conventional oil and gas operations, CBNG operations produce drilling muds, drill cuttings and other associated liquids. Appendix H(b)(ix) of Chapter 2 prohibits discharges associated with drilling and well completion (i.e., drilling muds and cuttings) to be discharged to the surface, consistent with 40 CFR 435.

Over the years, the WYPDES Program has collected and reviewed thousands of water quality data from hundreds of facilities. Based upon this data, there have been relatively few instances where additional constituents have required numerical effluent limits to be incorporated into CBNG permits. Concentrations of dissolved iron typically have high concentrations regardless of the location of the discharge point within the Greater Powder River Basin. However, because iron oxidizes rapidly, concentrations are easily and commonly managed through aeration. Metals, such as total barium, total aluminum, total

49senic, dissolved copper, dissolved lead, dissolved zinc and chlorides, on occasion have been identified as having a potential to exceed water quality standards. However, elevated concentrations of these metals are not consistently seen in the produced water.

In certain areas of CBNG development the discharge water has exhibited high sodium adsorption ratio (SAR) values, primarily due to the relative absence of calcium and magnesium. Discharges of CBNG produced water have been managed to ensure protection of Wyoming's narrative standard, Chapter 1, Section 20 "Agricultural Use" and to ensure protection of down stream surface water quality standards of adjacent states (Montana and South Dakota). CBNG surface discharges have been managed primarily through the use of containment ponds in the headwaters. However, other management techniques, such as reverse osmosis and ion exchange, for treatment of the produced water for SAR and specific conductance, are beginning to emerge as potential options on a small scale. As the technology and economics of these alternative management techniques evolve, they will likely become more widely used.

Summary

After consideration of information described above, the WYPDES Program concluded and maintains that it is appropriate to rely on WWQRR Chapter 2 Appendix H (formerly WWQRR Chapter 7) and the ELGs for the Oil and Gas Extraction Point Source Category (40 CFR Part 435) for establishing technology based effluent limits and equally appropriate for developing BPJ limits (40 CFR 125.3) for CBNG.

Finally, the state is aware that EPA is currently developing a guidance document for developing technology-based limits for CBNG operations and an economic analysis of the Powder River Basin. This document is draft and not available for quoting or citing at this time. However, if and when this document is finalized, the WDEQ will review and consider the merits of the guidance document.

If EPA determines that it is necessary to develop a federal ELG for CBNG and proceeds to develop a CBNG ELG the WDEQ would defer to the federal ELG.

TTP/jd/5-0492

FILED

FEB 10 2006

Terri A. Lorenzon, Director
Environmental Quality Council

SUBMIT IN TRIPLICATE

Agency Use Only
Application Number
WY00 _____
Date Received:
_____ (mo/day/yr)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

APPLICATION FOR PERMIT TO SURFACE DISCHARGE PRODUCED WATER FROM COAL BED METHANE NEW DISCHARGES, RENEWALS, OR MAJOR MODIFICATIONS

Revised 12-19-03

PLEASE PRINT OR TYPE

1. Check the box corresponding to the type of application being applied for

   ☐ New CBM permit

   ☐ CBM permit renewal Permit number _____

   ☐ CBM permit major modification Permit number _____

2. Select a permit option

   ☐ Option 1A - complete containment to an off-channel man made containment unit(s) (class 4C), no discharge allowed to surface waters of the state outside the containment unit.

   ☐ Option 1B - complete containment to a natural closed basin or playa lake (class 3A), no discharge allowed to surface waters of the state outside the basin or playa.

   ☐ Option 2 - surface discharge to class 2 or 3 receiving stream of the Belle Fourche River or Cheyenne River drainage (class 2ABWW).

   ☐ Option 2 - surface discharge to class 2 or 3 receiving stream of the Powder River or Little Powder Rivers (class 2ABWW).

   ☐ Option 2 – surface discharge to class 2 or 3 receiving streams of the Tongue, Clear Creek, or Crazy Woman Creek (class 2AB)– this option requires the permittee to demonstrate that quality of the effluent at the discharge point is equal to or better than the ambient quality of the perennial class 2 receiving water.

3. Name, mailing address, e-mail address, location and telephone number of the individual or company which owns the facility producing the discharge.

Name:

_____

Street Address:

_____

City, State, and Zip Code:

_____

Telephone Number:

_____

E-Mail Address:

_____

WILLIAMS
EXHIBIT 2

4. Name(s) and mailing address(es) of owner(s) of the surface rights on whose land the discharge occurs (in cases where the land is owned by the state or federal government but surface rights are leased to a private individual, provide lessee's name and address)

Name:

_____

Street Address:

_____

City, State, and Zip Code:

_____

Telephone Number:

_____

5. Name of the facility producing the discharge (this is the facility name that will appear on the NPDES permit. It is not necessary to name every well contributing to this facility's discharge in this section)

_____

6. For Option 1A or 1B permit, attach a water balance that demonstrates, considering total maximum projected discharge inflows, natural precipitation, evaporation and infiltration, that the containment unit will be adequately sized to contain all projected discharge and stormwater runoff from a 100 year, 24 hour storm event. If actual flow rates are available, use the maximum flow rate from all active wells within the previous six months of operation in the water balance.

7. For an Option 2 permit utilizing on-channel reservoirs, attach a water balance and mixing analysis documenting the amount of CBM discharge that, under normal operating conditions, can be contained within the reservoirs, the amount and circumstances under which the reservoirs will discharge, and the expected water quality upon discharge from the reservoirs.

8. Attach a description and a clear, legible, detailed topographic map of the discharging facility. Include the following:
   - **a.** A legend
   - **b.** Well locations
   - **c.** Ponds
   - **d.** Reservoirs
   - **e.** Stock tanks
   - **f.** Discharge points (outfalls)
   - **g.** Immediate receiving streams
   - **h.** Water quality monitoring stations
   - **i.** Irrigation compliance points
   - **j.** Location of nearest downstream irrigator.
   - **k.** Section, Township, and Range information

   If any of the above are not applicable please indicate in the description and include a brief explanation as to why the item is not applicable)

9. Describe the control measures that will be implemented to prevent significant damage to or erosion of the receiving water channel at the point of discharge.

_____

_____

10. Describe the control measures that will be implemented to achieve water quality standards and effluent limits. If proposing to utilize a treatment process, provide a detailed description of the treatment process, including, but not limited to: Water quality analyses demonstrating the effluent quality before and after treatment; waste stream volumes and planned method of disposal; aquatic life toxicity data for any chemicals being used in the treatment process; description of how the chemicals will be handled at the facility and the potential for any impacts to waters of the state in the event of a spill; and diagrams of the facility indicating the water treatment path. Additional sheets and diagrams may be attached.

_____

_____

11. Outfall locations must be established as part of a preliminary field reconnaissance survey using GPS or conventional survey equipment and documented in Table 1. Please document the type of equipment used, the expected accuracy of your measurements, and a brief rationale for locating the outfalls at the requested sites below.

_____

_____

12. Complete the attached **Table 1**. Provide all the information in the table for each proposed discharge point or monitoring point. If proposing changes (a major modification) to an existing facility, **clearly** indicate the desired changes on the table. Additional tables may be attached. Use the format provided.

13. Complete the attached **Table 2**. Provide all the information in the table for each well associated with this proposed discharge authorization. If proposing changes (a major modification) to an existing facility, **clearly** indicate the desired changes on the table. Additional tables may be attached. Use the format provided.

14. Provide the results of water analyses for a sample collected from a location representative of the quality of the water being proposed for discharge for the 25 chemical parameters listed below. The sample must be collected from well(s) or outfall(s) within a twenty mile radius of the proposed facility's location, and from the same coal formation(s) and the same approximate depth(s) as proposed in this application. If filing an application for a permit renewal or modification, the representative sample must be collected from the facility being proposed for renewal or modification. Explain why this sample is representative of the produced water to be discharged.

Samples from co-mingled coal seams are acceptable as long as the sample(s) meet the following criteria:

A. all of the coal seams being proposed for development are represented in the co-mingled sample,

B. the ratio of each coal seam's contribution is approximately the same in the sample and the proposed development,

C. documentation is provided to verify the criteria listed in A. and B.

The analyses must be conducted in accordance with approved EPA test procedures (40 CFR Part 136). Include a signed copy of your lab report that includes the following:

a. detection limits
b. results of each of the 25 chemical parameters at the chemical state given below
c. quarter/quarter, section, township and range of the sample collection location
d. Time and date of sample collection

e. Time and date of analysis for each parameter
f. Analyst's initials for each parameter
g. Detection limit for each parameter as achieved by the laboratory
h. NPDES permit number and outfall number, where the sample was collected.
i. Origin of produced water (coal seam)

If more than one coal seam is being proposed for development, the permittee must submit a lab analysis and complete information characterizing water quality from each coal seam being proposed for development. If the permittee is proposing to include discharges from a coal seam not previously developed at this facility, the permittee must submit a lab analysis and complete information characterizing water quality from the new coal seam being proposed for development. Analyses must be provided in the units listed below.

Parameter* **(See notes following the table on chemical states)**	**Required Detection Limits and Required Units**
Alkalinity, Total	**1 mg/l as $CaCO_3$**
Aluminum, Total Recoverable	**50 µg/l**
Arsenic, Total	**1 µg/l**
Barium, Total	**100 µg/l**
Bicarbonate	**10 mg/l**
Cadmium, Dissolved	**5 µg/l**
Calcium, Total	**50 µg/l, report as meq/l**
Calcium, Total	**50 µg/l, report as mg/l**
Chlorides	**5 mg/l**
Chlorides	**5 mg/l**
Copper, Dissolved	**10 µg/l**
Dissolved Solids, Total	**5 mg/l**
Hardness, Total	**10 mg/l as $CaCO_3$**
Iron, Dissolved	**50 µg/l**
Lead, Dissolved	**2 µg/l**
Magnesium, Total	**100 µg/l, report as meq/l**
Magnesium, Total	**100 µg/l, report as mg/l**
Manganese, Dissolved	**50 µg/l**
Mercury, Dissolved	**1 µg/l**
pH	**to 0.1 pH unit**
Radium 226, Total	**0.2 pCi/l**
Selenium, Total Recoverable	**5 µg/l**
Sodium Adsorption Ratio	**Calculated as unadjusted ratio**
Sodium, Total	**100 µg/l, report as meq/l**
Sodium, Total	**100 µg/l, report as mg/l**
Specific Conductance	**5 micromhos/cm**
Sulfates	**10 mg/l**
Zinc, Dissolved	**50 µg/l**

**Discharges into drainages other than the Powder River geologic basin may require analysis of additional parameters, please contact the WDEQ for a separate list.*

15. For new facilities, provide the expected (estimated) flow volume from each well in gallons per day, and provide the rationale behind the flow volume estimate. For existing facilities, provide actual flow data from all wells within the last six months.

_____

_____

16. For applications for new facilities, are any of the required chemical constituents in the laboratory analysis present in concentrations above Wyoming Water Quality Standards?

☐ **YES** ☐ **NO**

If the answer to question # 16 is yes, answer 16.a. – 16.b below. If no, proceed to question 18.

a. Which constituents?

_____

b. Has this constituent been addressed in the response to question 10?

_____

17. For applications for existing facilities, has the facility ever exceeded permit limits or water quality standards?

☐ **YES** ☐ **NO**

If the answer to question 17 is yes, answer 17.a. – 17.b. If no, proceed to question 18.

a. Which constituents?

_____

b. Has the exceedance been addressed?

_____

c. Describe how the exceedance is being addressed.

_____

_____

18. Is there active irrigation, (including but not limited to irrigation of cultivars or flood irrigation) in the drainage of the discharge?

☐ **YES** ☐ **NO**

If the answer to question #18 is yes, then documentation demonstrating one of the following must be provided:

A. Effluent will meet SAR and specific conductance (EC) values that are equal or of better quality to ambient values in the mainstem or highest quality receiving stream; or

B. Demonstrate that a higher level of EC and SAR at the point of irrigation diversion can be tolerated by irrigated soils and crops without a significant reduction in crop yield and soil quality/permeability.

This information should include, but is not limited to the following:

a. Location and description of irrigated crop land between the discharge points and mainstem, including maximum local tolerance thresholds to SAR, EC, and sodium of each crop.
b. Description of irrigation practices including when and how frequent irrigation occurs.
c. Soil characteristics for each area where irrigation occurs which includes:Classification of soils and soil type (i.e. sandy loam, clay, etc.) Composition of soils (% clay, silt, sand), type of soils, texture and permeability
d. Baseline soil parameters in all actively irrigated areas which includes soil SAR, EC, Na, Mg, Ca, permeability, and exchangeable sodium percentage (ESP).
e. Determine the maximum SAR and EC of water that can be applied to the least tolerant and most sensitive identified irrigated soil type and crop, which would not result in a short and/or long-term reduction in soil infiltration/permeability or yield.
f. Provide the location (township, range, section, quarter quarter and lat/long coordinates) of point(s) upstream from the first downstream point of irrigation diversion/use between the outfalls and mainstem and/or provide the location(s) of the irrigation diversion/use that requires the least flow to operate.
g. An evaluation that demonstrates the proposed discharge will be in compliance with Section 20, Chapter 1 of the Wyoming Water Quality Rules and Regulations.
h. If necessary to protect irrigated crops and/or soils, describe changes that must be made in traditional irrigation practices to protect downstream irrigation activities.
i. A monitoring plan, if necessary to gauge changes in water/soil quality and make adjustments before substantial reduction in crop production and soil permeability would occur.
j. Citations of reference for all the above information must be provided.

19. Name(s) and address(es) of all downstream irrigators between the outfalls and the mainstem must be provided.

Name:

_____

Street Address:

_____

City, State, and Zip Code:

_____

Telephone Number:

_____

20. Section 40 CFR Part 435 Subpart E requires that the permittee document agricultural and wildlife uses of produced water. Provide documentation that the produced water will be used for agriculture or wildlife during periods of discharge. Agriculture and wildlife use includes irrigation, livestock watering, wildlife watering and other agricultural uses. Agricultural and wildlife use documentation includes (but is not limited to) a certified letter from a landowner(s), a formal written statement from a state, federal or local resource management agency, or a formal written statement with supporting documentation from a natural resources or environmental professional accompanied by the credentials of the natural resources or environmental professional. Agriculture and wildlife use documentation must be provided for each outfall included in the application. Agricultural and wildlife certification must be submitted for each outfall's discharge, and must have original signatures.

I (CEO or other authorized person) certify that I am familiar with the information contained in this application and that to the best of my knowledge and belief, such information is true, complete, and accurate. I am requesting _____ outfalls in this application.

_____ _____

Printed Name of Person signing* Title*

Signature Date

*All permit applications must be signed in accordance with 40 CFR Part 122.22, "for" or "by" signatures are not acceptable.

Section 35-11-901 of Wyoming Statutes provides that:
Any person who knowingly makes any false statement, representation, or certification in any application ... shall upon conviction be fined not more than $10,000 or imprisoned for not more than one year, or both.

Mail this application to:

NPDES Permits Section
Department of Environmental Quality/WQD
122 West 25th Street, Herschler Building, 4W
Cheyenne, WY 82002

Please include unique footer information on each page of this application and on all supporting documentation using the following format:
Company Name: Year/Month/Day/NEW, MOD, RENEWAL/10 Digit HUC Code/Permit # (if a modification or renewal) or Application # (from this particular company) for that particular day

TABLE 1: OUTFALL INFORMATION

Discharge Point # (Outfall)	Immediate Receiving Stream	Mainstem	Distance from outfall to mainstem (stream miles)	Quarter / Quarter	Section	Township	Range	Latitude *(decimal degree format, accuracy to nearest 5 seconds)*	Longitude *(decimal degree format, accuracy to nearest 5 seconds)*	County	Reservoir Permit Application Submitted to SEO?	SEO Reservoir Permit #	Reservoir Name	SEO Reservoir Requirements
001														
002														
003														
004														
005														
006														
007														
008														
009														
010														
ICP1														
ICP2														
TRIB														
WQMS - Up														
WQMS - Down														

ICP - Irrigation Compliance Point, TRIB - Tributary water quality monitoring station, WQMS - Up - upstream mainstem water quality monitoring station, WQMS- Down - downstream mainstem water quality monitoring station

Additional sheets may be attached as necessary. Use the format provided.

TABLE 2 - WELL INFORMATION

Well Name	API Number	Coal Seam	Well Depth	Discharges to Outfall #*

**AWAO - all wells to all outfalls*

Additional sheets may be attached as necessary. Use the format provided.

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FEB 10 2006

Tom A. Lorenzon, Director
Environmental Quality Council

time. To sustain irrigation, irrigators must add additional water above the needs of the crop to leach excess salt from the root zone.[17]

- Increased flows can raise local ground water tables and slow infiltration that is crucial to leaching salts from soils.
- Timing of flows, regardless of quality, is important for seedling growth and soil leaching.
- Salt loading is the effect of quality times volume. For example, if a billion gallons of water is produced per day, and it contains 2000 ppm salts, then 8,000 tons of salt per day will be generated. The salt will go either into the soil or down the creek, where there will be significant adverse consequences to crops or aquatic habitat.

DEQ recognizes the interplay of water quantity and water quality in many contexts. Consider, for example, the Mixing Zone and Dilution Allowances Implementation Policy, which can only be calculated if one of the factors is the mean daily flow.[18] The majority of WYPDES permit applications in the Powder River Basin

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> fraction are the most important factors affecting the salinity of the soil water. The salinity of the soil water is important, since the salinity of the soil water, rather than the salinity of the irrigation water itself, is the critical factor resulting in any decrease in crop yield. Continued irrigation will result in the salinity of the soil water coming into equilibrium with the salinity of the irrigation water. The actual relationship will be dependent on the average salinity of the irrigation water and the actual leaching fraction.

Horpestad, Abe, *Water Quality Technical Report, Water Quality Impacts from Coal Bed Methane Development in the Powder River Basin, Wyoming and Montana*, Dec. 10, 2001. Exhibit 9.

[17] Munn, Ex. 6.

[18] Wyoming Surface Water Quality Standards, Implementation Policies for Antidegredation Mixing Zones Turbidity and Use Attainability Analysis, p. 16, 3rd draft, November, 2005. http://deq.state.wy.us./wqd/surfacestandards/Triennial/Policies_3rd.pdf

are submitted with mixing calculations and water budgets. This is because they count on natural flows for dilution, and none of those calculations can be made without considering the quantity factor. WYPDES permits do in fact contain a limit to the quantity of water discharged under the permits. This is because the concentration of a particular constituent is only one factor in determination of the total load – quantity is essential to that calculation. DEQ is in the process of implementing a new policy to control total salt load in order to meet limits in flows to Montana. The Powder River Basin sodium management plan allocates total sodium discharges to producers, calculated by TDS (quality) times quantity. Here again, DEQ cannot regulate load without regulating water quantity. Yet DEQ turns a blind eye to quantity in Chapter 2, Appendix H, and in doing so it hamstrings its own ability to effectively regulate CBM water.

EPA has also recognized the various impacts that can result from both quantity and quality of CBM water, and advised DEQ that "large quantities of produced water discharged to small tributaries with erosive soils and geology can have unanticipated adverse impacts on wildlife habitat and/or agriculture."[19] EPA has further explained:

> The many potential environmental impacts from CBM operations are diverse. Possible impacts include: reduced flow or loss of domestic water wells, mortality and reduced growth and vigor of vegetation, erosion, soil compaction, and loss of topsoil. One of the major concerns associated with CBM production in the Powder River Basin is disposal of the produced water. The surface disposal of CBM-produced water may result in erosion or damage to drainages and associated vegetation within the area. Even though CBM discharge is essentially sediment-free, discharge to streams and creeks can increase sediment loading due to increased erosion.[20]

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[19] 1/5/01 Reed letter to Krafft, Ex. 3.

[20] EPA Guidance for Developing Technology-Based Limits for Coalbed Methane Operations: Economic Analysis of the Powder River Basin, February, 2003. Interagency

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FEB 10 2006

Terri A. Lorenzon, Director
Environmental Quality Council

Rocky Mountain Oil Operations
Northern U.S. Business Unit

Marathon Oil Company

1501 Stampede Avenue
Cody, WY 82414
Telephone 307/527-4861

February 10, 2006

Mr. Mark Gordon
Chair, Wyoming Environmental Quality Council
Herschler Building
Room 1714
Cheyenne, Wyoming 82002

RE: Petition of Powder River Basin Resources Council, et al. to Amend Wyoming Water Quality Rule, Chapter 2, Appendix H

Dear Mr. Gordon:

Marathon Oil Company is one of Wyoming's largest producers of natural gas. We produced over 57 million MCF of natural gas and more than nine million barrels of oil in Wyoming in 2005. Marathon's oil and gas operations account for many jobs, which support families and communities across the state.

Marathon has joined in the consolidated comments submitted to the Council by a number of oil and gas producers. Marathon firmly believes that, as those consolidated comments make clear, the Council should reject the Powder River Basin Resource Council (PRRC) petition without the need for further proceedings because, among other reasons, the requested action would interfere with the State Engineer's authority to regulate the production and use of water in Wyoming. The purpose of these

production and use of water in Wyoming. The purpose of these supplemental comments is to provide the Council with some additional information about how produced water from Marathon operations is beneficially used and why the water is an important resource on which ranchers have come to rely. To ensure the continued availability of water for beneficial agricultural use and wildlife propagation, the Council should decline to initiate PRBRC's requested proceedings to amend the Water Quality Rules.

Availability of Water for Agricultural or Wildlife Propagation

PRBRC and the other Petitioners apparently assume that, in order for water to be put to beneficial use for agriculture or wildlife propagation, all the water must actually be used for irrigation or consumed by livestock or wildlife. Because not every drop of CBNG produced water that is discharged to rivers and creeks is used for irrigation or consumed today, Petitioners suggest, water is " wasted." Petitioners apparently seek a rule under which DEQ must determine "how much the cows or antelope will actually drink" and limit discharges of produced water to that quantity. Petition at 8.

Petitioners' proposal would entangle DEQ in decisions committed to the State Engineer under state law and could seriously interfere with the State Engineer's responsibility to regulate the production, diversion and use of water in Wyoming. And, Petitioners' proposal is not feasible. There is no practical way to predict accurately how much water livestock and wildlife will drink from a given stream or stream segment during a given period of time, or to verify the amount consumed after the fact from that stream. Nor would it be feasible for producers to constantly adjust up and down the rate at which

a given well or field generates produced water so as not to exceed the volumes consumed or expected to be consumed by livestock or wildlife.

Setting aside these very important practical problems, Petitioners' focus on volumes of water consumed ignores the fact that, in order for animals to drink water in a stream, the water must be continuously available. Thus, stream flow must be adequate at all times to support a supply of fresh water for livestock or wildlife in the vicinity that may visit and consume water from the flowing supply at any time.

Petitioners' unrealistic proposal also obscures the myriad ways that produced water, which under current regulations must meet all applicable permit limits and effluent limitations, actually serves to propagate wildlife. Consumption by wildlife represents a tiny fraction of the beneficial use of produced water in the propagation of wildlife. Flowing water can support the growth of riparian vegetation on which antelope and other ruminants forage, providing an expanded food supply that supports a larger population of forage-dependent animals in a given area and allows animals to expand their geographic range. This vegetation also can provide expanded or new habitat for many other species and can host a more diverse population of animals, birds and other wildlife than would otherwise exist at those locations.

Generally speaking, streams that receive CBNG water support vegetation in direct proportion to the volume of water in the stream. Thus, restriction or elimination of the produced water flows into these streams would reduce stream flow, which could result in a proportional decline in vegetation. The loss of vegetation would, in turn, directly and

adversely affect the food supply for various species and result in a corresponding loss of habitat.

In some streams, produced water discharges support more robust and diverse aquatic resources than could otherwise live in those receiving waters. Fish thrive in a number of streams that receive produced water. Again, the size of the fish population that can be supported by a given stream, other things being equal, generally is a function of the discharge, depth and velocity of water in the stream. If properly managed, the impacts of CBNG discharges on fish communities should be minimal.

Limiting CBNG produced water discharges to volumes that cattle and antelope will drink – even assuming such a limit were technically feasible –could have seriously detrimental effects on the food supply that supports terrestrial wildlife in the vicinity of the receiving stream and on fish and other wildlife that depend on the river for habitat.

In addition to these direct benefits to wildlife, ponds associated with discharge systems can create new nesting and migration feeding/resting habitat for many species of migratory waterfowl and other water birds, and valuable new fisheries and recreational opportunities for the public.

Historic Beneficial Use of Produced Water

In many areas of Wyoming, the ranching community has long made use of produced water from oil and gas operations. In particular, ranchers have a history of reliance on produced water in the Big Horn Basin. Indeed, ranchers have repeatedly made clear to Wyoming DEQ that, without produced water from our oil and gas fields, their ranching operations would be far less viable.

Almost 20 years ago, when Wyoming DEQ was considering water quality standards that could have precluded discharges of produced water, ranchers who depend on Marathon's and other operators' produced water discharges to various rivers and streams spoke out against any requirement for re-injection or other restriction of this supply. Over 30 ranchers whose properties received produced water from Wyoming oil and gas fields went on record in 1988 to oppose any restriction. *See* Exhibits1.A-.U attached to this letter. One rancher whose property is crossed by the Medicine Bow River wrote:

> [A]ny proposed standard changes or restrictions on existing standards that would result in stopping or restricting the water contribution [from Marathon's operations] to the Medicine Bow River would be detrimental for the following reasons: First, our cattle and horses drink this water daily and thrive on it. Second, the deer and antelope and other wildlife use this water on its course down to the river and seem to prefer it to river water when the river water is available. Third, and most important, the Medicine Bow River . . . is dry some two years out of three . . . . Your supply of additional water provides a small continuing supply of water for the wildlife all along this portion of the river until it comes up again in the fall.

Letter from Edward J. Ledder, Medicine Bow River Ranch, to Terry Skinner, Marathon (Oct. 18, 1988) [Ex. 1.A]. Ranch managers near Thermopolis wrote about the importance of produced water in arid conditions:

> [T]reater-water has become a necessity for maintaining the current economical and ecological conditions of the area. Treater water provides stock water and irrigation water for ranching operations. Probably of equal importance to the area is the fact that treater-water provides water and stream bank vegetation for wildlife habitat.

Letter from Matt M. Brown and Teresa H. Brown (October 25, 1988) [Ex. 1.B].

Many ranchers explained that they use produced water for irrigation, including one rancher who received water produced from the Hamilton Dome oil field who wrote, "we

have increased our crop production 300% with the use of the oil field water in the last 20 years." Letter from Allan Baird to Marvin Blakesley, Marathon (Oct. 28, 1988) [Ex 1.C]. Another noted the importance of the in-stream flow as a backup supply for livestock when electric pumps break down and may be out of service for a significant amount of time. *See* Letter from Irene S. Schultz to Eugene Grant, Marathon (Oct. 19, 1988) [Ex.1.D]

Many ranchers noted the benefits to wildlife from the increased supply of water to the riparian habitat. As one stated:

> The creek banks are much more stable with the water in the creek at all times. There are beavers and ducks on the creek all the time now. There is much more cover for the pheasants, other wild birds and wild game animals.

Letter from John Baird to Marathon (Oct. 30, 1988) [Ex. 1.E]. Another explained:

> Water in all of this area is a precious commodity. Pronghorn antelope, mule deer, game birds, eagles, rabbits, coyotes, wild horses, beaver, ducks, and many other animals, as well as domestic livestock depend on the water and/or riparian habitat provided by Dry Creek. And Dry Creek in turn depends on the water discharged by Marathon from Oregon Basin.

Letter from Dave Grabbert, Grabbert Ranch to Eugene Grant, Marathon (Oct. 19, 1988) [Ex. 1.F.][1]

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[1] The Bureau of Land Management made the same point to Wyoming DEQ in the 1988 proceeding:

> Our interest in water quality, from point source discharges, is primarily related to the surface discharge of water produced in conjunction with oil and gas production and the various beneficial uses to which this water is presently applied. In the Cody Resource Area, produced water is providing benefits to riparian vegetation, waterfowl and shorebird habitat, and drinking water sources for livestock and terrestrial wildlife. We view this produced water as an important benefit to our management of the public lands.

Letter from Thomas E. Enright, BLM to John Wagner, WDEQ (Nov. 3, 1988) [Ex. 2]

Produced water from Marathon operations is no less important for beneficial agricultural use today than it was in 1988. In 2002 and 2003, the ranching community strongly supported the renewal of Marathon's NPDES permits to discharge produced water from Marathon's Pitchfork, Gebo, North Sunshine and Steamboat fields. Comments provided by Turnell Cattle Company, Sanford Ranches, Antler Ranch, Inc., PAR Ranch, Larsen Ranch Co., Wyoming Horses, the Baquin family and other ranchers echo the points made in 1988 concerning the benefit of produced water discharge both to livestock and to wildlife. *See* Ex. 3.A-.L.

All of these ranchers emphasized the economic importance of the water supplies to their operations. One said that produced water from the Sunshine Field is the "only live water source for our livestock and the economic viability of this portion of agricultural land is dependent on the continued discharge of the water." Letter from Michael Q. May, Antlers Ranch (Feb. 22, 2002) [Ex 3.A]. Another noted simply that, with respect to discharges from Marathon's Circle Ridge field: "I can't say enough about how important this discharged water is to my cattle, and therefore, my livelihood, especially in drought years like the past two when all other water sources have dried up. Letter from James H. Fike, Jr. (Jan. 18, 2002) [Ex. 3.B]. As one rancher summed up the benefits to both agriculture and wildlife:

> The water [from Pitchfork Field] is of good quality and is used by my cattle throughout most of the year. The water provides an important year round water source for several of my pastures. We also utilize the water for irrigation of our crop lands. Rawhide Creek, above the Pitchfork Field, often goes dry during the summer. The produced water provides a steady flow throughout the year. The water also provides many beneficial uses to wildlife, including deer, antelope, sage grouse, chukar, and Hungarian

> partridge. Some non-game species of fish and wildlife are also dependent on this discharged water.

Letter from Jack Turnell, Turnell Cattle Co., to Marvin Blakesley, Marathon (Mar. 15, 2002) [Ex. 3.C]. Another rancher noted that, on his property, produced water from the Gebo Field created and sustained a several mile long riparian zone in the lower end of Coal Draw, prior to entry into the Big Horn River, which would not have existed without the flow of produced water. Letter from Norman Sanford, Sanford Ranches to Marvin Blakesley, Marathon (Feb. 25, 2002) [Ex. 3.D].[2]

The statements of these ranchers, some as recently as 2003, leave no doubt that produced water can be and is beneficially used for agricultural operations, as well as supporting the wildlife that congregates near the receiving streams. It is indisputable that many downstream ranching operations value Marathon's produced water. They have testified to the importance of this water as a resource for agriculture and wildlife. One would anticipate that ranchers who employ produced water from coalbed natural gas ("CBNG") operations have had similar experiences. Indeed, Marathon understands that the Council will receive comments reflecting benefits akin to those experienced by

[2] In 2001, in connection with the renewal of Marathon's NPDES permits, the Wyoming Game and Fish Department provided information "concerning the beneficial use by wildlife of production water produced at several of your oil fields." According to Game and Fish:

> The Gebo, North Sunshine and Pitchfork fields all produce water that is used yearlong by many species of wildlife. In particular, pronghorn antelope, sage grouse, Hungarian and chukar partridge benefit by using these water sources. In addition mule deer and numerous species of nongame birds use these water sources on a daily basis. The presence of these water sources increases the distribution and abundance of most wildlife species.

Letter from John Emmerick and Ron McKnight, WGFD, to Marvin Blakesley, Marathon (Dec. 21, 2001) [Ex. 4].

conventional oil and gas operations. Thus, experience strongly suggests that the Council should avoid any disruption or curtailment of produced water discharges.

The Environmental Quality Council must realize that the changes to the current Chapter 2 Appendix H proposed by the Powder River Basin Resource Council would eliminate many historical surface water discharges across the state. Loss of these perennial water sources would hurt many agricultural operators in Wyoming. These proposed changes would also be extremely detrimental to existing fish and wildlife populations, which have become dependent on these water sources over the past 60 to 80 years. Therefore, Marathon respectfully urges the Environmental Quality Council to deny and take no further action on the Petition.

Sincerely,

Marvin Blakesley/DAS

Marvin Blakesley
Adv. HES Professional
Marathon Oil Company

3922486v1

1.A

cc
FAP

EDWARD J. LEDDER
Medicine Bow River Ranch
Post Office Box 410
Medicine Bow, Wyoming 82329

October 18, 1988

Marathon Oil Company
Box 2690
Cody, Wyoming 82414

Attention: Mr. Terry Skinner
Production Superintendent

Dear Mr. Skinner:

This will confirm our conversation in which you indicated that environmental action might be taken to stop the flow of fresh water produced from your well on our property and diverted into the Medicine Bow River which runs thru our Medicine Bow River Ranch for some five miles.

As a retired Chairman, CEO of Abbott Laboratories with production facilities in many of our states, I am generally in favor of the environmental controls which our Federal, State, and Local authorities have placed on industry, farming, ranching, etc.

In this particular case I am not.

I understand that you are required to test this water going into the Medicine Bow River every quarter, that you do conduct these tests properly and up to this point the discharge meets the requirements established.

As a rancher, if you were required to stop discharging this water into the river, we personally would not be affected on a commercial basis because we already have adequate wells to feed our livestock and horses. At the worst we might be required to drill one additional well.

I believe however that any proposed standard changes or restrictions on existing standards that would result in stopping or restricting the water contribution to the Medicine Bow River would be detrimental for the following reasons:

First, our cattle and horses drink this water daily and thrive on it. I have checked with the former owners and they confirm that their cattle, horses, and sheep have used this water over the years with no problem. (They also confirm that they put this in correspondence when requested a year or two ago.)

Second, the deer and antelope and other wildlife use this water on its course down to the river and seem to prefer it to river water when the river water is available. (It is warm and stays open a good part of the year.)

Third, and most important, the Medicine Bow River (at least in the five mile stretch thru our ranch) is dry some two years out of three according to the former owners and local knowledge. Your supply of additional water provides a small continuing supply of water for the wildlife all along this portion of the river until it comes up again in the fall.

You supply enough water to maintain the pools in the riverbed which the ducks use and which hold some 20" German Brown Trout. Hence it permits these fish to live and multiply that would otherwise perish. This seems to us to be a very strong reason to continue the present flow of water you are supplying rather than restrict it in any way assuming the quality of water is maintained as it has been in the past.

If you have any questions on the above or any other area of the proposed restriction on what we consider to be a very desirable practice, please get back to us.

Sincerely,

EDWARD J. SEDDER
Medicine Bow River Ranch

TOP QUALITY
FEEDER CATTLE

Diamond Bar Ranch

Matt M. Brown
Teresa H. Brown Manager

Box 30, Owl Creek Route
THERMOPOLIS, WY 82443

Office: 307-867-2944
Home: 307-867-2422

October 25, 1988

To Whom It May Concern:

I just recently learned of the hearings before the EPA to require oil companies to reinject their treater-water. I am totally against the reinjection of this valuable community asset. I live in a very arid area of Wyoming where treater-water has become a necessity for maintaining the current economical and ecological conditions of the area. Treater-water provides stock water and irrigation water for ranching operations.

Probably of equal importance to the area is the fact that treater-water provides water and stream bank vegatation for wildlife habitat. This vegetation also prevents stream bank erosion such as the erosion found in seasonaly dry areas where there is not any natural vegatation to check water and hold the soil.

I have two pastures that depend almost entirely on treater-water from the Hamilton Dome oil field for stock water. I also have two pastures that depend souly on treater-water from the C. W. Webster Oil Field on Black Mountain and is used as a source for stock water. This treater-water is a dependable year around source of stock water. Due to its warm temperature, my livestock and the wildlife of the area thrive on it during the cold winter months.

I feel that this is an issue of great importance to this area and that hearings by the EPA on the reinjection of treater-water should be held in this area that will be affected.

The people affected by the EPA's decision on this issue should have proper access to the hearing process.

Sincerely,

Matt M. Brown

Teresa H. Brown

October 28, 1988

Marvin Blakesley
Marathon Oil Co.
P.O. Box 2690
Cody, WY 82414

To whom it may concern:

In regard to the beneficial use of the water in Cottonwood Creek that comes out of the Hamilton Dome oil field. I have lived here all of my life (47 yrs) and we have increased our crop production by 300% with the use of the oil field water in the last 20 years. The livestock do better on the water because there is more volume and it decreases the selenium content in the water. High selenium can cause death, abortions, and several other problems in livestock. With the constant flow of water in the creek there is improved vegetation for wildlife and the creek banks are more stable so there is less erosion. I've seen ducks live here on the creek year around. As far as the quality of the water, I've seen rainbow trout here along with minnows by the millions so it is not all that bad. If the water from the oil field is put back underground as proposed, it will cause a financial burden on both the stockmen and farmers who depend on it and the oil companies that are involved. As far as I'm concerned, the water out of Hamilton Dome is of more benefit to all people concerned left where it is coming down the creek.

Thank you,

Allan Baird

Allan Baird

711 RANCH COMPANY
Route 1, Box 255 3655 Greybull Highway
Cody, Wyoming 82414

R. W. (Bill) Schultz, Pres.

October 19, 1988

Oregon Basin Field
Park Co, Wyo.

Mr. Eugene Grant
Marathon Oil Company
P.O. Box 2690
Cody, Wyoming 82414

Dear Mr. Grant:

I received word, the Environmental Protection Agency will force Marathon Oil Company to cease producing water in Oregon Basin. This disturbs me for we have been using this water as a supplement to our own water system. Our main source of water in the Basin consists of a series of water tanks supplied by an electric pump. When our system breaks down we rely exclusively on the Marathon water for our livestock. Sometimes it takes many days to get the system working again, depending on the problem. It would be an exhausting and expensive ordeal to have to haul water from our ranch well.

Also, the E.P.A. is probably not aware that deer, antelope, small animals and birds use this water which they seem to prefer to our own water tanks. As you know, waterholes in Oregon Basin are few and far between.

I hope the E.P.A. will reverse its decision. In an area as arid as this one, every source of water is an asset.

Sincerely,

Irene Schultz

Irene Schultz

Star Route
Ralston, Wyoming
October 30, 1988

Marathon Oil Company
P. B. Box 2690
Cody, Wyoming

To Whom it may Concern:

I am writing in regard to the Hamilton Dome Oil Field water. We, as ranchers, would be in serious trouble without it. My folks have been on Cottonwood Creek for over fifty years. The last twenty-five years have been much more productive than the first twenty-five due to the extra water from the oil field. We own about 2,000 acres along the creek, of which we irrigate about 25%. This would be impossible without the water from the Hamilton Dome oil field.

There used to be a selinium problem in the water that caused alkali disease. This could result in abortions, paralysis, or blindness in the livestock. With the steady flow of the water in the creek now, these problems have nearly be eradicated.

The riparion habitat has improved immensely. The creek banks are much more stable with the water in the creek at all times. There are beavers and ducks on the creek all the time now. There is much more cover for the pheasants, other wild birds and wild game animals.

I think no matter where the water is in this arid western region of the United States, we are making a terrible mistake by putting it back under the ground. If the water is suitable for irrigation, wildlife, and livestock, us itll

Respectfully submitted,

John Baird

John Baird

Grabbert Ranch
Emblem, Wyoming
October 19, 1988

Eugene Grant
Marathon Oil
Cody, Wyoming

Dear Mr. Grant:

I understand that the EPA is concerned about the water that Marathon is discharging into Dry Creek from the Oregon Basin oil field. If this water were to cease flowing, there are some significant down stream problems that will surely occur.

The purpose of this letter is to point out some of these problems of which the EPA say not be aware.

As back ground information, I would like to point out that the Oregon Basin area recieves less than 10 inches of average annual precipitation, and is somewhat arid country. Down stream to the northeast the average annual precipitation declines gradually to about 5 inches of average annual precipitation, where Dry Creek flows into the Big Horn River, about 50 miles from Oregon Basin. This is definitely arid country. Also, the annual precipitation is variable in this area. In some years only half of the average annual precipitation falls.

Water in all of this area is a precious commodity. Pronghorn antelope, mule deer, game birds, eagles, rabbits, coyotes, wild horses, beaver, ducks, and many other animals, as well as domestic livestock depend on the water and/or riparian habitat provided by Dry Creek. And Dry Creek in turn depends on the water discharged by Marathon from Oregon Basin. This discharged water in Oregon Basin provides half of the stream flow at the point it enters Dry Creek, I would roughly guess. Earlier this summer the water discharged by Marathon provided all of the stream flow. Dry Creek was dry above this point. There was no other water in Dry Creek between Oregon Basin and Emblem. The creek did go dry in places, but there were occasional pools where the stream bed and water table overlapped. If this water were no longer discharged I would expect the water table to drop and the creek to go dry for many miles. There is no doubt in my mind that the wildlife species and numbers have adjusted to this dependable flow of water over the many years since this water began to flow.

Crabbert Ranch has been grazing cattle and sheep in Oregon Basin for more than 40 years and our livestock have come to depend on this source of water. Our cattle spend more time in Oregon Basin than the sheep do and have been drinking this discharged water with no apparent bad effects. The cattle can drink from Dry Creek above where the oil field water enters the creek or from the stream of discharged water. They are free to choose. I know they prefer high quality water, but they find this discharged water convienient when they are grazing that area of the pasture. Conception rates, percent calf crop, weaning weights, and other measures of livestock preformance have been very good.

If this water were not available, we would be forced to develop another source of stock water to prevent overgrazing in other areas of the pasture. Stockwater development has the highest priority on this ranch, but money and time are both limiting factors. There is so much work and maintainance to be done that some other project would have to be put off.

Our early spring and winter range is located 30 miles on down Dry Creek near Emblem, Wyoming. The lack of stock water in Dry Creek at critical times would be both inconvienient and costly. The loss of trees and bushes in the creek bottom would mean less shelter for livestock and less habitat for wildlife.

Between Oregon Basin and Emblem there are other ranchers who also depend on the water discharged from the Oregon Basin oil field into Dry Creek. Deseret Ranch, Chris Renner Ranch, Hoodoo Ranch, YU Ranch, Don Schlaf Ranch, and the Don Schlenker Ranch would surely like to see more water in Dry Creek, not less.

In summary, if this water is no longer allowed to flow from Oregon Basin, some of the effects will be as follows:

1. Decline in wildlife numbers.
2. Loss of riparian habitat.
3. Loss of hunting and recreational opportunities.
4. Economic hardship to local ranches.

I am not qualified to say how bad some of these chemicals in the water are. I am not aware of any bad effects. But water has such a wonderful effect on this land, I want all I can get.

Sincerely,

Dave Crabbert

Dave Crabbert

To Whom it may concern

Attn: Marvin Blakesley:
Marathon Oil Company
PO Box 2690
Cody, Wyo. 82414

Dear Mr. Blakesley:

It has been brought to our attention there is a move to put all treater water from the Hamilton Dome and Grass Creek oil fields back underground. We the users believe we should have a voice in a matter that will so drastically effect us.

It is our belief this would be a mistake, since that would create a fiancial burdan on those depending on the water of Cottonwood and Grass Creek for stock water and water for irragation. This would causes a bigger water shortage, had there not been treater water this past summer, the creek would have been totaly dry. Since this water has been used for years, we the users cannot attribute any harmful effect to land or animals as some environmentalist groups would have the public believe.

Sincerely

Merle Pitz

Larry D. Spranger (Det. Mtnc.)

Hamilton Dome, Wy.
Nov. 4, 1988

To Whom It May Concern:

As operator of one of the larger cattle ranches on Cottonwood Creek, in the vicinity of Hamilton Dome, Hot Springs County, Wyoming, we are requesting that the serious detriment to our operation and others in the area be considered if the discharges of fresh water from the local oil companies are suspended as planned.

We winter the cattle at the ranch headquarters each year. Water for the cattle was always a problem, being in short supply, and often freezing dry in the winter months. The addition of the discharged water not only assured us of adequate water for the cattle, but practically assured us of water that didn't freeze over, except in very extreme temperatures.

Irrigation water for summer use is always short, and in the dryer years some of our fields get very little water. Since we have had the use of the discharge water, we've been able to produce more hay, making wintering of the cattle easier.

Please consider these facts in making your decision.

Sincerely,

Rhodes Ranch, Inc.
Box 61
Hamilton Dome, Wy. 82427

Frank Rhodes
President

Cheyenne, Wyo.
Oct 28, 1946

Marathon Oil Drill
P.O. Box 2042
Cody, Wyo 82414
Re: Hamilton Dome Oil Drill

Gentlemen:

We are satisfied by the fact Oct 28, 1946 that the water from the Hamilton Dome Oil Drill may be put under guard.

Many accidents have taken place on Cottonwood since 1936. Before the water from the H.D. Drill started running to the Creek we had a serious problem with our cattle drinking the alkali water causing alkali disease. Now that the water is shut off all of the time, we don't have that problem.

The Hamilton Dome Oil Drill water is equally as worthless to us as is the water in Cottonwood Creek Dam, as both water and vegetation are poisonous.

We would appreciate it immensely if you look into it at your leisure.

Yours truly,
David S. Gee Jr.
Homer E. Gee
Tyler R. Cockburn

Hamilton Dome
Nov 1, 1988

To whom it may concern

I very much object to the oil companies putting the treated water back into the ground.

As we have come to depend on it for livestock and wild game water also for irrigation for about 25 or 30 years.

It is the only water that has been flowing in Cottonwood Creek at the ranch this year since August.

The only water on our B.L.M. winter and spring allotment is what comes from the treaters at Hamilton Dome.

Ramel Everhart

Farmers and Ranchers
Cottonwood Creek
Worland, Wy 82401

November 7, 1988

EPA
C/O Pat Childers
Marathon Oil Company
P.O. Box 2690
Cody, Wy 82414

Dear EPA,

We are writing this letter concerning the Hamilton Dome and Grass Creek water. The water is checked every day to make sure there is no chemicals in it.

Since the water has been running, it has improved the area ten times of what it was. We use the water to irrigate the farms along the creek.

The livestock, wildlife, and the water fowl use the water to survive. There is nothing wrong with the water. Why take something away that is so very useful and put it underground where it won't be useful to anyone or anything?

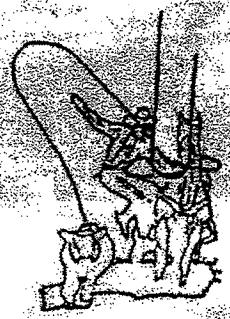
Why spend all this money on something that is going to hurt the farmers, ranchers, livestock, wildlife, and water fowl? Without the water we would be hurting. The water has helped us the way it is right now.

In closing, we wish that you will reconsider and think about the wildlife, the land, and the livestock and leave the water as it is.

Sincerely,

Jim Hyer
Box 574
Worland, Wyo

Farmers and Ranchers
of Cottonwood Creek
Hamilton Dome and
Grass Creek



JIM WILSON
Box 312
Kirby, WY 82430
(307) 864-2001

October 21, 1988

To Whom It May Concern:

The usage of the water that is released from the Little Sand Draw oil field is a definite advantage to the livestock that is wintered in that area. Because the water runs for several miles through the range, it lets the cattle graze the forage in a much more even manner. Also since the water has been available, the wildlife has increased due to the improved habitat.

The loss of this water would hurt the cattle grazing as well as the wild life.

Thank you for you consideration.

Sincerely,

Jim Wilson

Jim Wilson

RECEIVED
Cabot Operations Inc.
OCT 21 1988
Houghton Oil Co.
Cabot Wyo.

RECEIVED
OCT 24 1988
Environmental and Safety

Jones Creek Wyo 82202
Star Rte - Box 336
Oct 19 1988

Mr Jerry Skinner
Marathon Oil Co
P.O. Box 2690
Cody Wyo 82414

Sir

Your representative here, Mr Paul Petty, has asked me to contact you with regard to usage of surplus water from oil wells.

I have used it as the only source of water for my cattle in winter pasture and can assure you that cattle do very well on it, in fact I feel salt and minerals than otherwise, we find many minerals being in it, does I believe as well as known and have seen some small trouble. I have seen my cattle fill up on that warm water on some little cold windy days and head for the ridge tops & start grazing while other non-used cattle were bunched up behind a windbreak. If you have any questions feel free to call me at 307-334-3306 or I'd be glad to be of any service.

J C Stallcup

HOODOO RANCH
P.O. BOX 850 — CODY, WYOMING 82414

GEORGE BROWN
MANAGER

Half Moon Fe
Prac Co, Wyo

October 20, 1988

Eugene Grant
Marathon Oil
P O Box 2690
Cody, Wy

Eugene,

Concerning you telephone call in regards to treater water made me realize how much we have come to rely onit as our major, and in come cases only source of water, not only for livestock but wildlife as well.

In a normal year treater water from Half Moon Oil Field furnishes ninety percent of the water for the whole drainage of Sulphor Creek and this year close to a hundred percent. This is also true of Oregon Basin in regards to the Dry Creek drainage.

If and when we lose this water it will not only have a tremendous impact on livestock and wildlife but will change the ecology of these areas, which amounts to thousands of acres.

This should be of great concern not only to us, but everyone in the state. If I can be of any help in this matter please let me know.

Sincerely,

George Brown

Box 535
Cody

Half Moon Field
Park Co, Wyo

Marathon Oil Co.
P.O Box 2690
Cody, Wyoming
82414

Mr. Eugene Great

Dear Sir ;

In reference to your telephone call of this morning.
As far as I can tell the water running through our grazing
land from the Half Moon oil field is perfectly good for
livestock to drink.

I have been observing the cattle for years when they graze
on the land that the Half Moon oil well waterthrough our
land. There has never been any ill efects to the cattle from
from the cattledrinking the oil well water.

I n fact the cattle will drink what ever water is closest
to them. Either resivour water or oil well water.

It is of my opinon that this water is perfectly safe
for any animal to drink.

This property is curently owned by myself and my two
brothers Paul and Fred Zinn Adresses will be furnished
opon demand.

Bert Bell is curently leasing the land for grazing.

If there is any further information necessary.
My name is Martin J Zinn Box 535 Cody, Wyo, Zip 82414 .

Thank You

Martin J Zinn

Pulse Pipe
Pace Co

To whom it may concern:

I have been advised that Marathon Oil Co. may be requested to pump all water water underground at the Yeild. This would be extremely detrimental to our winter grazing program as our cattle depend almost entirely on the water in the cold winter months as other sources are frozen beyond use. This water is warm and never freezes. I strongly urge that this policy not be implemented.

Thank you
Pat Thomas
T. Roach

Oct 15, 1955

Union Oil Co.
Box 1347
Billings, Mont.
Attn: H.L. Cox

Regarding our conversation on discharging water from your water filter located in Sec 28, T. 4 N., Page 91 west.

I would like to keep it like it is. The water discharge furnishes water for livestock on the west prong of Coal Creek also a nesting area for birds & geese.

Sincerely,

Leonard D. Lewis
2099 Hilgard Road
Billings, Mont. 59101

Gillette, Wyoming
October 14, 1983

Dear Sir,

Attached is a quitclaim deed of your 4-9 Federal Unit, Lot 27 T46N R70W. Continue good, old Light Sweet Oil flow allowed to overflow into bad creek, as it has the past two years. That water in the winter time allows my stock a space. That water also for the few days with another source of open water also for the few days that we slowly increasing in number for past seven years. Thus the land into the bottom of creek and not for the 4-9 battery. For people except will fall prevent to change the area, and blow in plenty of your oil water, and it keeps the deer & pronghorn, and informing Cowboy Ranch water at the 4-9 outflow, thus gives the north east part of that pasture, and security. Thank Lance operator Yours Oil, have plenty of farmer, angry relations, and without having to have good quality water but, water supplies, etc.

Arlen
Arlen V. Nelson

Jayson Unit #4-9
Hilight Field
Campbell Co.
R 20 BOPD T 180 BWPD

Ed T. McKINNEY
Ravling Route, Box 30
Lander, Wyoming 82520

October 6, 1988

Tim J. Noack
Union Oil Company of California
P.O. Box 79
Worland, Wyoming 82401

Dear Mr. Noack:

After a recent visit with your field foreman, Mr. Gerald B. Carr, I was informed that I may be losing the use of your oilfield produced water from your Derby Field in Fremont County, due to changes in federal law governing surface discharge waters. I would like to assure you that the waters I obtain from your Derby Field are put to beneficial use by me for my farming and ranching concerns. In the winter months I utilize the waters for watering of my cattle and horses. In the spring and summer this same water is used for irrigating my hay. The loss of this water source would severely impact my ranching operations and I would appreciate your efforts toward maintaining this source.

Sincerely,

Ed T. McKinney

Ed T. McKinney

[illegible] 15, 1[illegible]

To Whom It May Concern:

We need and use the [illegible] water [illegible], [illegible] Steamboat Butte Field in Fremont County, Wyoming.

This water seems to be the only water available for our cattle in this area.

Sincerely,

James Bergen
Glenn Bergen
Jim Bergen III

To whom it may concern:

The following ranchers, sportsman, and other interested persons feel that the lease water going into creeks is a benefit to livestock and wildlife.

Ruby A Ross
Gordon T Ross
Robert A Ross
Stewart Sipes
Luther O Gentry
Peter H. Engelhardt
Larry T Lower
Ray Robb
John T Robb
Harold D. Miller
Patrick A Miller
Buck T Miller
James R Middleton
Jerry A. Middleton
Peter P Miller
John Olson
Michael T. Hart
George W Lower
Bill Brown
JC Williams
Walter Ford Jr.
Pat Hart

Terrence L Hart
Wally Lee
Greg P Rock
Ray Moore
Walt Hart
Eric Jones
Ron Green
Dave Ellis
M.D. Lawrence
William O. Bunt
Ralph Hayes
Bill Miller
Howard F Hawley
Ken Larson
Mike Cain
Jay Kinkead
Ted J Jones
Steve Brown
Mary Hayes
Dwight Lin
Phil Jones
Jim Freeman

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
CODY RESOURCE AREA
P.O. BOX 518
CODY, WYOMING 82414

9194
(190)

C. F. Childers
R. P. Hagen
F. M. Lynch
M. E. Hawley
Forest M. Hall

November 03, 1988

Mr. John Wagner
Water Quality Division
Wyoming Dept. of Environmental Quality
Herschler Bldg., 4th Floor West
Cheyenne, WY 82002

Dear Mr. Wagner:

We understand that the Wyoming Department of Environmental Quality, Water Quality Division, is in the process of drafting new "Wyoming Surface Water Quality Standards" for EPA review and approval. The Bureau of Land Management, Cody Resource Area, would appreciate an opportunity to review and comment upon any proposed changes to the existing standards.

Our interest in water quality, from point source discharges, is primarily related to the surface discharge of water produced in conjunction with oil and gas production and the various beneficial uses to which this water is presently applied. In the Cody Resource Area, produced water is providing benefits to riparian vegetation, waterfowl and shoreline habitat, and drinking water sources for livestock and terrestrial wildlife. We view this produced water as an important benefit to our management of the public land.

If you should have any questions regarding our interest in the new regulations, or the beneficial uses of produced water in the Cody Resource Area, please contact Thor Stephenson or Eric Greenquist of my staff.

Sincerely,

Thomas E. Zuright

Thomas E. Zuright
Area Manager

CC: Marathon Oil Company

ANTLERS RANCH, INC.
PO Box 156
Cody, WY 82414

February 22, 2002

re: Antlers Ranch, Inc. - Marathon Oil Co.

Gentlemen:

I am the President of Antlers Ranch, Inc. The formation water being discharged from the treater in the Sunshine Field flows through Antlers Ranch deeded property and provides a necessary and vital part of the water supply for our ranching operation. Actually the discharged water can be diverted so that it flows either into the Gooseberry drainage or into the Wood River drainage. This water is the only live water source for our livestock and the economic viability of this portion of agricultural land is dependant upon the continued discharge of the water.

The water is also used extensively for riparian and wildlife habitat. I know that numerous species of deer, antelope and other wildlife depend upon this water to utilize this area.

Hopefully, you will continue to discharge the water as it is tremendously important to our ranch and also the wildlife using the area.

If there are any questions, please let me know.

Sincerely,

ANTLER RANCH, INC.

Michael Q. May, President

January 18,2002

To Who It May Concern:

This letter is in reference to the water discharge that Marathon Oil Company releases into Five Mile Creek from their Circle Ridge Oil Field. I have ranched in this area for over fifty years and if it weren't for this discharged water my cattle and the wildlife in the area would have virtually no water. I appreciate the care Marathon Oil Company gives to the quality of water they release, making it drinkable for the animals. I can't say enough about how important this discharged water is to my cattle, and therefore, my livlihood, especially in drought years like the past two when all other water sources have dried up.

Thank you,

James H. Fike Jr.

James H. Fike Jr.

March 15, 2002

Marvin Blakesley
Marathon Oil Company
1501 Stampede Avenue
Cody, Wyoming 82414

RE: Produced Water From Pitchfork Oilfield

Dear Mr. Blakesley

I am providing the following information concerning the beneficial uses of produced water from Marathon's Pitchfork Oilfield.

The produced water that is discharged from the Pitchfork Oilfield is beneficial to my ranching operation. The water flows from Marathon's facilities into Rawhide Creek, and then flows several miles before entering the Greybull River. The water is of good quality and is used by my cattle throughout most of the year. The water provides an important year round water source for several of my pastures. We also utilize the water for irrigation of out crop lands. Rawhide Creek, above the Pitchfork Field discharge, often gone dry during the summer. The produced water provides a steady flow throughout the year.

The water also provides many beneficial uses to wildlife, including deer, antelope, sage grouse, chukar, and Hungarian partridge. Some non-game species of fish and wildlife are also dependent on this discharged water.

Any loss of this water would be detrimental to my ranching operations and would create a negative environmental impact.

Sincerely,

Jack Turnell
Turnell Cattle Company

February 25, 2002

Marvin Blakesley
Marathon Oil Company
1501 Stampede Avenue
Cody, Wyoming 82414

RE: Produced Water From Gebo Oilfield

Dear Mr. Blakesley

As per our recent telephone conversation, I am providing the following information concerning the beneficial uses of produced water from Marathon's Gebo Oilfield.

The produced water that is discharged from the Gebo Oilfield is vital to my livestock operation. The water flows from Marathon's facilities into Coal Draw, and then flows several miles before entering the Big Horn River. Coal Draw is normally dry, except during heavy rains or snow melt. The produced water provides the only water flow in Coal Draw during most of the year. The water is of good quality and is used by my cattle throughout most of the year. The water is warm, thus providing an unfrozen water source during the winter months. The warm water helps my cattle maintain weight during the winter months, because they do not have to burn calories to heat the water to body temperature. If this water was not present, I would have to haul water to my livestock, at considerable cost to my ranching operations.

The water also provides many beneficial uses to wildlife, including deer, antelope, pheasant, chukar, and Hungarian partridge. Muskrats, ducks, and many non-game species of wildlife are also dependent on this discharged water.

The produced water provides a several mile long riparian zone along Coal Draw, which would not be present without the discharged water. It creates wetlands in the lower end of Coal Draw, prior to entry into the Big Horn River.

Any loss of this water would be detrimental to my ranching operations and would create a negative environmental impact.

Sincerely,

Norman Sanford

Norman Sanford
Sanford Ranches

January 8, 2002

Mr. Marvin Blakesley
Marathon Oil
1501 Stampede Ave
Cody, WY 82414

Dear Mr. Blakesley,

We've been asked to write concerning North Sunshine Field water discharge. Water discharge from North Sunshine is absolutely vital for the integrity of Kinney Creek and Gooseberry Creek.

Water discharge is important in maintaining water volume in Gooseberry Creek during years of normal precipitation and essential in maintaining creek volume in drought years. Creek volume is important for maintenance of wildlife habitat, riparian areas, irrigation flow, fire suppression, and livestock interests.

In several instances, North Sunshine water discharge is the only form of water for livestock, wildlife, and riparian area health and this is especially true in drought years. Discharged water enters Gooseberry Creek at the mouth of Kinney Creek and during the 2001 summer season Gooseberry Creek was dry above the Kinney Creek entrance.

Discharged water is essential to irrigation along Gooseberry Creek in years of normal moisture and during drought periods. Irrigation water volume on Gooseberry Creek is directly affected by water discharged from North Sunshine.

Increased water volume in Kinney Creek and Gooseberry Creek may, in the future, be beneficial in wildfire suppression.

In summary, North Sunshine water discharge is vital to the health and well being of riparian areas, wildlife habitat, and livestock interests along Kinney Creek and Gooseberry Creek.

Sincerely,

Paddy Renner

Paddy Renner
PAR Ranch

LARSEN RANCH CO.
976 Road 4DT
Meeteetse, Wyoming 82433
January 3, 2002

re: Gooseberry Creek

To Whom It May Concern:

As President of Larsen Ranch Co., I want to advise you regarding the formation water being discharged from the treater in the Sunshine Field which flows across Antlers Ranch, Inc. onto Larsen Ranch Co. property and into the drainage of Gooseberry Creek.

For our ranch, the water in discharged treater water is vitally important. It is the only live water source for livestock in our 3,000 acre pasture. The economic importance of this water source is vital. We could not use this piece of ground in the same way if the water source was eliminated. We strongly support the continued discharge being allowed.

The water is also used extensively by the wildlife. It provides important habitat for the wildlife and ultimately supplements water in Gooseberry Creek for our livestock and irrigation. The water in Gooseberry Creek is important for riparian habitat for numerous species of birds and mammals.

During the summer of 2001, Gooseberry Creek was intermittently dry. Approximately three (3) miles above the point where the treater water empties into the Creek, the Creek was totally dry. The beaver in the area had to move downstream approximately one mile below where the treater water empties into the Creek because their other dam was left dry by the drought. The beaver built a large dam in that area which is again providing important habitat for the wildlife.

During the wildfire in the summer of 2001, the beaver dam was the only place where helicopters could fill the buckets to drop on the fire.

Over the years there has been some attempts at stocking fish on Gooseberry Creek, but because of the low flow of Gooseberry Creek and the high summer temperatures, these efforts have not been successful. However, any hope of maintaining or increasing the habitat and/or fisheries is importantly dependent upon the supplement from the treater water into Gooseberry Creek.

We would be more than glad to show any interested parties the importance of this water not only to Larsen Ranch Co., but also for wildlife and other habitat in the vicinity. We support the continued use of this water for a supplemental source of water to this area.

Sincerely,
LARSEN RANCH CO.

Ralph C. Larsen

Ralph C. Larsen, President

WYOMING HORSES
366 N PAVILLION RD.
PAVILLION, WY 82523
(307) 856-5708 or (307) 856-8552

January 3, 2002

Marvin Blakesly
Marathon Oil Co.
1501 Stampede Ave.
Cody, WY 82414

Dear Marvin;

Our ranch is located on Five Mile Creek four miles north of Pavillion, Wyoming. We have been here since 1973 and ours is the first ranch on the Midvale Irrigation Project that Five Mile Creek passes through. We have 200 to 300 head of livestock that drink the water that flows down Five Mile during the year. Without the water that is discharged from the Marathon oil wells above us we may not have had stock water during the drought years of 1979, 2000, and 2001.

There is a good supply of minnows and small fish in the creek as well as abundant wildlife that drink and live in proximity to the creek.

Thank you for the steady supply of fresh water.

Yours truly,

Lonnie Mantle

Wyoming Horses
Lonnie & Grace Mantle
Bob & Dar Vogel

Nov. 30,2003

Attn: Marvin Blakesly
Marathon Oil Company
1501 Stampede AveCody, Wyo. 82414

Dear Sir:

The Barquin family and their children and grandchildren have been using the produced water form the Marathon Steamboat field for sixty years or more to water the cattle. This water flows from the Mission Pond to the river.

We need this water because it is discharged year around and it is the only water available for the livestock and the wildlife.

For some of this area this produced water is the only water available and if not discharged, the range could not be fully utilized with out the cost of providing water. This is particularly true in drought years, when other sources of water are reduced or dry up.

Since the water is hot when discharged, it is available longer in the winter without having to break ice. Cattle may maintain their weight and survive cold weather better because they do not have to expend as much energy bringing the water they drink to body temperature.

Besides the livestock, the wildlife, which includes deer, elk, antelope, waterfowl, game birds and beaver also utilize this water year round.

We would certainly like to see this produced water flow year round. It is necessary for the continuation of our livestock operations.

Sincerely,

James Barquin Jr.
James D. Barquin Jr

Jim Barquin III
Jim Barquin III

Jolene Scheer
Jolene A. Scheer

Ty Nicholls
Ty Nicholls

Brodie Nicholls
Brodie Nicholls

[redacted]

2429 Hwy 26
Riverton, Wy. 82501

November 12, 2003

Marvin Blakeslee, HES
Marathon Oil Company
1501 Stampede Ave.
Cody, Wy. 82414

Mr Blakeslee,

I am writing in regards to the Steamboat Fields discharged water. There is a stream that runs year around through our property that gets its water from this discharged water. We have cattle, horses, and goats that drink from it. There are also deer, coyotes, rabbits, pheasants, chuckers, eagles, and other wild animals that benefit from it.

Thank you for providing this benefit of the water to us.

Sincerely,

Doug and Linda Hill

FIVE MILE RANCH
LIMITED LIABILITY COMPANY
179 Indian Ridge Road
Pavillion, Wy. 82523

January 9, 2002

Mr. Marvin Blakesley
Marathon Oil Company
1501 Stampede Avenue
Cody, Wy. 82414

Dear Mr. Blakesley,

I am writing this letter in support of Marathon's EPA discharge permit. The water discharged into Five Mile Creek is a benefit to us in watering livestock. We have 1200 acres on the northwest edge of the Midvale Irrigation project and water 1500 – 2000 cattle each winter from Five Mile Creek. The flow in Five Mile during dry years is almost totally due to Marathon's discharge on our farm because we are on the northwest edge of the irrigation project and do not benefit from irrigated ground drains into the creek. We support the continuation of Marathon's permit to discharge into Five Mile Creek.

Sincerely,

Bill W. Garland

Richard Pattison

153 Pattison Farms Rd.

Pavillion, WY. 82523

Marvin Blakesley

1501 Stampede Ave.

Cody, WY 82414

Re: Marathon Oil's contribution to the stream flow in 5-Mile Creek

Dear Mr. Blakesley,

I am writing to you to inform you, that I am a landowner in Midvale Irrigation District. My property lies along the Five Mile Creek Drainage and I have two water gaps on the drainage. I also own land that has an additional two water gaps. Last year Philip Ranch placed sheep and cattle on my properties and used two of the four water gaps. The last two years have been drought years and water shortages. Even with this drought condition, the stream flows have stayed up with consistent flows. Without the flow from Marathon's oilfields at Circle Ridge and Maverick Springs, the constant flow in 5 Mile Creek would not been possible and in all probability would have dried up. Pleased be informed that any loss of streamflow in Five Mile Drainage would jeopardize my being able to furnish pasture with a good water supply. Any water supply into the drainage that would be turned off or restricted, would hinder my cash flow from pasture rental.

Thank you for your time.

Sincerely,

Richard Pattison

Darwin Griebel
Star Route - Box 2815
Kinnear, Wyoming 82516

Dear Mr. Blakeley & Mike Dlick,

I am an enrolled member of the Eastern Shoshone Indian Tribe. I am a permittee on range unit # 38 and depend heavily on the production water for my livestock — without it all the ranches within the Marathon production area from Circle Ridge to Pavillion would go out of business.

Not only would the ranchers be affected but wildlife such as antelope, deer, antelope, wild horses, etc. would be distinct. Without production from Marathon Fork Mile Creek will dry up and all of the above so over.

I pray we do not lose the production water which affects all the ranchers and critters.

Sincerely,

Darwin T. Griebel

WYOMING
GAME AND FISH DEPARTMENT

December 21, 2001

Marvin Blakesley
Marathon Oil Company
1501 Stampede Ave.
Cody, WY 82414

Dear Mr. Blakesley:

I have the following information in regards to your request concerning the beneficial use by wildlife of production water produced at several or your oil fields.

The Gebo, North Sunshine and Pitchfork fields all produce water that is used yearlong by many species of wildlife. In particular pronghorn antelope, sage grouse, Hungarian and chukar partridge benefit by using these water sources. In addition mule deer and numerous species of nongame birds use these water sources on a daily basis. The presence of these water sources increases the distribution and abundance of most wildlife species.

The Gebo field drains into an unnamed tributary to the Big Horn River. Production water that meets DEQ standards is beneficial to the mainstem river fishery by providing additional water. The North Sunshine field drains into Gooseberry Creek -- a Class 4 water supporting wild, native populations of mountain suckers, longnose dace, fathead minnows and a few brook trout. The Pitchfork field drains into the Rawhide Creek drainage -- a Class 3 water supporting wild and native Yellowstone cutthroat, Snake River cutthroat, white suckers, mountain suckers, silvery minnows and longnose dace. Production water that meets or exceeds DEQ standards is beneficial to the aquatic resources in these drainages where water shortages are chronic.

Sincerely,

John Emmerich
Wildlife Management Coordinator

Ron McKnight
Regional Fisheries Supervisor
2820 State Highway 120
Cody, WY 82414

Benefits to Wildlife from the Application of Water Produced by Coal Bed Natural Gas Development

Prepared by Larry D. Hayden-Wing, Ph.D.
Wildlife Ecologist
February 13, 2006

OVERVIEW

The production of coal bed natural gas (CBNG) in Wyoming has become a major industry and the discharge of large amounts of produced water associated with these operations is a major issue. Although this circumstance has generated opinions regarding the disposal and use of these waters, it has also created the opportunity to do something beneficial with the water. This paper focuses on the potential for using these pumped waters for the beneficial use of wildlife.

The value of wetlands is well known, and the establishment of new wetland areas through the application of produced water would significantly increase the biological diversity of areas and regions where CBNG is being developed. Over time, the function and value of these newly-created wetland areas would equal those associated with natural wetlands. A summary of these functions and values is shown in Table 1.

Table 1. Examples of functions and values for wetlands (adapted from various sources).

Functions	Examples of Functions	Examples of Values
Hydrology	Aquifer recharge/discharge Water storage and regulation Climate control	Water quality/quantity Flood control
Biogeochemical cycling and storage	Nutrient source/transformer/sink Sediment and organic matter sink	Water quality Erosion control
Bioproductivity and decomposition	Net primary productivity Carbon storage/release Detritus output for aquatic organisms Mineralization and release of N, S, C, and P	Food chain support Water quality Recreation Commercial products
Ecosystem processes	Habitat for plant and animal species* Food chain support Maintenance of biotic diversity	Recreation/aesthetics** Commercial products Water quality/quantity

* Wetlands provide food and water or shelter to over 90% of Wyoming's wildlife; 75-80% of all waterfowl breed in or around wetlands; 43% of all federally-listed species are dependant upon wetlands for survival (Cheyenne Botanical Gardens 2003).

** Hunting, fishing, trapping, photography, bird watching, outdoor classrooms of environmental education, and the enjoyment of open spaces.

WILDLIFE WATER NEEDS

Water can benefit wildlife in a number of ways, both directly and indirectly and these major benefits are summarized below:

Direct Benefits

- Drinking
- As habitat - many species like waterfowl and fish live in or on the water.

Indirect Benefits

- The production of food
- The production of cover

The degree to which produced water meets wildlife needs and produces benefits varies according to the location of discharge sites on the landscape and the number and types of discharge facilities. The timing, quantity, and duration of produced water discharge will have a cumulative beneficial impact upon wildlife and their habitats that are adjacent or proximal to discharge sites. Because many of the areas where CBNG is being developed have a naturally semi arid climate and suffer periodic drought conditions, the addition of produced water to these parched landscapes is likely to produce benefits to wildlife that are both immediate and pronounced. The lack of water in general, and during drought in particular, is stressful to wildlife and can threaten their survival. The surface discharge of produced water in these areas can provide an alternative water source for wildlife during stressful drought periods and help to alleviate limiting conditions caused by lack of water.

PREREQUISITES

To insure that the surface application of produced water provides benefits to wildlife, the adherence to the following protocol is recommended:

- Development of a water management plan that has been approved or developed by a land management agency such as the Bureau of Land Management (BLM), Forest Service (FS), or Natural Resource Conservation Service (NRCS).

- Certification of and input to the management plan by the Wyoming Game and Fish Department and the Fish and Wildlife Service.

- Water quality and quantity must be controlled or adjusted so as to insure that its application to the land surface and discharge into retention ponds, reservoirs, and downstream waterways produces beneficial effects.

OBJECTIVES

Gary Beach, a former administrator of the Water Quality Division of the WDEQ set forth the following criteria to demonstrate that the surface discharge of produced water would generate benefits to wildlife. According to these five criteria, a beneficial use for wildlife can be demonstrated by:

- Enhancing existing habitat for wildlife
- Creating new habitat for wildlife
- Increasing wildlife populations
- Allowing existing wildlife populations to disperse
- Benefitting both resident and migratory wildlife populations

APPLICATION METHODS

Examples of primary applications of produced water that can be beneficial to wildlife:

- Surface irrigation
- Creation of new water bodies
- Enhancement of existing water bodies
- Downstream discharge
- Provision of dispersed watering tanks

WYOMING SPECIES

A large number of mammals, birds, reptiles, amphibians, and fish occur within the areas in Wyoming where CBNG is currently being developed. For purposes of this document, the potential benefits of produced water to wildlife are described for each of the wildlife groups defined in WDEQ, Land Quality Division Guideline Number 5 (WDEQ 1994) relative to the five criteria set forth by Gary Beach in 2002 at a planning meeting in which the format and content of Beneficial Use Statements were discussed.

Big Game (Wild Ungulates)

As detailed below, the surface discharge of produced water can generate benefits for big game animals (mule deer, white-tailed deer, elk, and pronghorn) that meet all five of Gary Beaches' criteria for beneficial use.

Enhance Existing Habitat for Wildlife - Produced water is expected to improve forage quality and quantity adjacent to water discharge sites through increasing vegetative vigor, growth, and diversity. If new reservoirs and other watering sites are constructed and distributed widely over the production area, perennial water for wild ungulates would be

provided at sites and during seasons where water was previously unavailable. Because produced water is relatively warm, a certain amount of ice-free water would be expected to be available to ungulates even during the winter months. The increased availability of free water is of great value to animals in a region of limited precipitation, and is particularly critical during drought periods.

Create New Habitat for Wildlife - Development of new water sources and their eventual discharge into existing ephemeral channels and other water courses will create new foraging habitat through increased annual production of vegetation and eventual establishment of wetland species. Thermal/hiding cover will also be increased and would provide increased protection for deer and pronghorn fawns from predation during this critical stage of their development. The use of produced water for the irrigation of palatable forage crops in strategic locations would create new feeding areas and increase the availability of nutritious forage.

Increase Wildlife Populations - Increasing the number of watering points would reduce distances animals need to travel to get to water and will decrease caloric expenditures and exposure to predators during trips to watering areas. This is particularly important during the winter months, drought periods, and the fawning period in early summer. Wild ungulates commonly consume snow during the winter as a water source. However, the utilization of relatively warm, ice-free produced water during the winter would be beneficial in that it would reduce the physiological expenditure of calories required to melt snow. These reductions in the expenditure of calories and exposure to predators would collectively contribute to the survival potential of wild ungulates in areas surrounding the produced water developments and enhance the potential for increases in populations. The improvement in forage quantity and quality adjacent to produced water discharge sites and the application of irrigation water to nutritious forage crops will also contribute to the potential for increasing carry capacities for wild ungulates (Yoakum and Spalinger 1979, Wallmo 1981, Halls 1984). The increase in hiding cover for fawns would increase their survival rate and allow for a higher recruitment rate into the population.

Allow Existing Wildlife Population to Disperse - The placement of reservoirs and watering sites in areas where no perennial water was previously available would increase the potential for better dispersal of wild ungulates and a more even and complete utilization of forage resources across the range. The careful distribution of forage crop irrigation site across the area would also contribute to a more uniform dispersal of animals.

Benefit both Resident and Migratory Wildlife Populations - Both resident and migratory wild ungulate populations would benefit from the surface discharge of produced water.

Upland Game Birds

The surface discharge of produced water can generate benefits for upland game birds (greater sage-grouse, sharp-tailed grouse, wild turkey) that meet all five of Gary Beaches' criterial for beneficial use.

Enhance Existing Habitat for Wildlife - The discharge of produced water would generally enhance the existing habitats of upland game birds by increasing vegetation diversity and annual production. Although some improvements in all seasonal habitats are likely, brood-rearing habitats in particular would benefit from increased grass and forb diversity and growth adjacent to wet areas. Increases in existing insect populations associated with vegetation near new perennial water sources is also likely to occur and will provide improved brood foraging opportunities. Perhaps more importantly, a suitable new niche for an entire guild of riparian/wetland-obligate insect species, that are presently absent, would be created. Insects such as damselflies and dragonflies, civil bruet, common skimmers, darners, and numerous fly species, would significantly increase diversity and expand the food web for a large number of avian species, including upland game birds.

Create New Habitat for Wildlife - Development of new water sources and their eventual discharge into ephemeral and other water courses would create new habitat for upland game birds. The new areas of perennially moist vegetation and enhanced growth near produced water discharge points and along historically ephemeral water courses are likely to be used as brood-reading and foraging areas by upland game birds. Upland game birds in Wyoming are adapted to moderately dry habitats, and benefit from moist or wet areas, especially during the brood-rearing period (Peterson 1970, Eng 1986). The use of produced water for the irrigation of palatable forage crops in strategic locations would create new feeding areas and increase the availability of nutritious forage.

Increase Wildlife Populations - The use of surface produced water to create new reservoirs and moist to wet drainage courses along with the irrigation of forage crops would help to increase upland game populations in three ways. First, the quality of quality of existing brood-rearing habitats would be improved through the addition of surface water. Second, the number of areas that provide brood-rearing habitat will be increased through the creation of new produced water discharge points. The creation of new moist areas will produce lush patches of vegetation that provide hiding cover, insects, and forbs that are critical to the survival of young birds. Third, the use of produced water for the irrigation of palatable forage crops in strategic locations would create new feeding areas, increase the availability of nutritious forage, and increase the carrying capacity of the area.

Allow Existing Wildlife Population to Disperse - The creation of new produced water discharge points increases the potential for better dispersal of upland game birds during the early summer when hens with broods are seeking forbs and insects which are particularly important to young birds. Also, the use of produced water for the irrigation of palatable forage crops in strategic locations would help to disperse upland game birds during the late summer and early fall months by creating new feeding areas with moist, nutritious forage that could be used during a time of the year when moist natural forage is limited.

Benefit both Resident and Migratory Wildlife Populations - Although upland game birds populations in Wyoming make seasonal movements, most are not considered to be migratory. Thus, the benefits of the surface discharge of produced water would apply mostly to resident populations. However, certain greater sage-grouse populations in

Wyoming do migrate and would benefit in the ways listed above during the nesting, brood-rearing, and late summer/early fall periods of the year.

Raptors

The surface discharge of produced water can generate benefits for raptors that meet all five of Gary Beaches' criteria for beneficial use.

Enhance Existing Habitat for Wildlife - An increase in availability of raptor prey species would be expected to occur due to increases in both the numbers and diversity of small mammal, bird species, and large insects that inhabit areas adjacent to the produced water discharge points and outflow channels. A variety of small mammal, bird, and large insect species are associated with riparian habitats, and the increase in area, growth, and vigor of riparian vegetation that would result from the discharge of produced water is expected to provide improved habitat for them, and result in an increase in the abundance of raptor prey species.

Create New Habitat for Wildlife - New foraging habitats for raptors would be created through the surface application of produced water. Water discharged into reservoirs and stream channels, as well as that used to irrigate forage crops, would provide new habitats for raptor prey species and create foraging areas for raptors that previously did not exist. If fish are stocked in newly created water bodies, the potential for attracting and supporting fish eating raptor species such as bald eagles and ospreys would be enhanced.

Increase Wildlife Populations - The increase in prey base abundance and diversity described above creates the potential for an increase in raptor chick production and survival. The increase in prey availability may also allow more breeding pairs of raptors to establish territories and further contribute to increased raptor production.

Allow Existing Wildlife Population to Disperse - The increased dispersion and production in prey populations would increase the potential for more raptor pairs to occupy the area and for them to extend their territories into areas not previously used because of limited prey production.

Benefit both Resident and Migratory Wildlife Populations - Improvements in prey base abundance and diversity would benefit both resident and migratory species of raptors.

Waterfowl and Shorebirds

The surface discharge of produced water can generate benefits for waterfowl and shorebirds that meet all five of Gary Beaches' criteria for beneficial use.

Enhance Existing Habitat for Wildlife - Existing habitat for waterfowl and shorebirds would be enhanced by the surface discharge of produced water by providing additional water flow in streams which were previously ephemeral and increasing water availability in existing water reservoirs.

Create New Habitat for Wildlife - Produced water stored in newly developed retention reservoirs would in time create new nesting, brood-rearing, and foraging habitats for waterfowl and shorebirds through the development of submergent, emergent and shoreline vegetation. The food base, comprised of plants, insects, reptiles, amphibians, and fish, that would be created would support a wide variety of waterfowl and shorebird species.

Increase Wildlife Populations - Waterfowl and shorebird populations would increase due to the creation of new habitats and the improvement of existing habitats resulting from the surface discharge of produced water. These improvements would increase carrying capacity and production through increases in nesting and brood-rearing habitats. The emergent and adjacent vegetation around the reservoirs would increase the potential for brood survival by providing escape cover and foraging areas.

Allow Existing Wildlife Population to Disperse - The creation of new, more widely dispersed habitats (ponds and reservoirs) would result in less concentration of both resident and migratory waterfowl and shorebirds on existing water bodies and produce better dispersal of birds over the area.

Benefit both Resident and Migratory Wildlife Populations - Resident and migratory populations of waterfowl and shorebirds would benefit from the increased number of ponds, reservoirs, and marshy areas that are the product of the surface discharge of produced water. During seasonal migration periods the birds would benefit from the existence of a greater number of open water stopover points where they can rest and replenish energy reserves. Resident species would benefit by having improved foraging, nesting, brood-rearing, and escape habitats.

Passerine Birds

The surface discharge of produced water can generate benefits for passerine birds that meet all five of Gary Beaches' criteria for beneficial use.

Enhance Existing Habitat for Wildlife - The surface discharge of produced water would enhance existing habitats by increasing the growth and vigor of vegetation on and around produced water discharge areas, thereby enhancing passerine nesting and foraging habitats.

Create New Habitat for Wildlife - New nesting and foraging habitats for riparian-reliant passerine birds would be created by the increase in emergent and mesic species of vegetation associated with the surface discharge of produced water into new ponds, reservoirs, and ephemeral stream channels.

Increase Wildlife Populations - The increased nesting habitat and food sources provided to passerines by increased vegetation growth and vigor due to the surface discharge of produced water will contribute to increased brood production and survival. These new habitats would also increase the number of stopover points for certain passerine species during migration periods and could increase survival rates of migrants.

Allow Existing Wildlife Population to Disperse - The application of surface discharge water over the area creates new and more widely dispersed foraging and nesting habitats for passerine bird species, which, in turn, would increase their dispersal over the area.

Benefit both Resident and Migratory Wildlife Populations - Riparian vegetation resulting from produced water release and storage would provide increased stopover points where certain species of passerine birds can rest and forage during migration periods. Resident species would also benefit by having more and improved nesting, brood-rearing, and escape habitat.

Other Mammals

The surface discharge of produced water can generate benefits for other mammals (rodents, rabbits, hares, predators) that meet four of Gary Beaches' five criteria for beneficial use.

Enhance Existing Habitat for Wildlife - The access to water and improved vegetation quality quantity, and diversity adjacent to wet areas created by the surface discharge of produced water would provide improved foraging and reproduction habitats for some species of mammals.

Create New Habitat for Wildlife - Perennial surface water and associated vegetation produced by the surface discharge of produced water would provide new habitats for mammals such as muskrats, voles, shrews, and a variety of other rodents. The perennial water habitats and the increased prey populations they produce would also create additional foraging areas and food items for predatory mammal species.

Increase Wildlife Populations - Increases in populations of small herbivorous mammal species are likely due to the increase of the food base and suitable habitats created by the surface discharge of produced water. These increases in small mammal populations would, in turn, contribute to increases in populations of predatory mammal species such as foxes, coyotes, raccoons, and skunks.

Allow Existing Wildlife Population to Disperse - The increased dispersal of small mammal habitats resulting from the creation of wet areas due to the surface discharge of produced water would result in an increase in the dispersal of mammalian species which would expand their ranges to take advantage of the new resources.

Reptiles and Amphibians

The surface discharge of produced water can generate benefits for reptiles and amphibians that meet all five of Gary Beaches' criteria for beneficial use.

Enhance Existing Habitat for Wildlife - The surface discharge of produced water would enhance existing habitats by increasing the soil moisture levels and the growth, vigor, and diversity of vegetation on and around produced water discharge areas. Such changes to

the existing habitats would make them more suitable for reptiles and amphibians by increasing the moisture levels and food items required by these species.

Create New Habitat for Wildlife - Prey abundance (insects, small mammals, and young reptiles and amphibians) would increase in the newly created wet habitats in and around perennial and ephemeral waters and moist habitats and would provide many new habitats that are suitable for foraging, breeding, and young rearing of reptile and amphibian species.

Increase Wildlife Populations - Reptiles and amphibians would benefit from the establishment of new reservoirs in historically dry areas. The water from the surface discharge of produced water is likely to provide new spawning and young-rearing areas for amphibians and increase the adult population in these wet habitats. The increase in the small mammal prey base may also increase reptile populations around produced water sources.

Allow Existing Wildlife Population to Disperse - The increased distribution of the new riparian habitats created by the surface discharge of produced water would result in a corresponding increase in the distribution of reptile and amphibian populations over the area. Amphibian and reptile dispersal into currently uninhabited areas may also provide the opportunity for small-scale range expansions for some species.

Benefit both Resident and Migratory Wildlife Populations - Although reptile and amphibian populations exhibit seasonal movements, they are not normally considered to be migratory. However, the new riparian habitats created by the surface discharge of produced water could attract and support herptiles from other areas, as well and benefitting resident populations.

Fish

The surface discharge of produced water will generate benefits for fish if the reservoirs with suitable waters are stocked. This has been done in a number of cases and in some places created has new recreational fisheries.

Threatened, Endangered, Proposed, Candidate, and Sensitive Species

There are a number of wildlife species of concern that are know to occur in areas of CBNG development. Overall the surface discharge of produced water will generate benefits for most of these species that are the same as described in other sections of this paper.

SUMMARY

Of the wildlife groups defined in the WDEQ, Land Quality Division Guideline Number 5, all would benefit from surface discharge of produced water. Cumulatively, the surface discharge of produced water would enhance existing wildlife habitats and create new wildlife habitats which would lead to increased populations and dispersal of both resident and migratory wildlife species. Because the major areas of CBNG development in

Wyoming have a generally arid climate and experience periodic prolonged droughts, new water sources produced by the surface discharge of produced water would provide an immediate, as well as a long-term, benefit to wildlife. The value of perennial water supplies suitable for wildlife consumption and of an adequate quality and quantity to enhance and create wild habitats cannot be overemphasized.

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FILED

FEB 14 2006

Terri A. Lorenzon, Director
Environmental Quality Council

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February 14, 2006

Mr. Mark Gordon, Chairman
Wyoming Environmental Quality Council
Herschler Building - 1st Floor West
122 W. 25th Street
Cheyenne, WY 82002

RE: Merit Energy Company Comments on the Petition to Amend Water Quality Rules and Regulations, Chapter 2, Appendix H

Dear Mr. Gordon:

Enclosed please find a copy of Merit Energy Company's comments regarding the Petition to Amend Chapter 2, Appendix H, of the Wyoming's Water Quality Rules and Regulations. Please include these comments as part of the record for the Council's consideration at its February 16, 2006 meeting.

Yours very truly,

John A. Sundahl

JAS:ew
Enclosure as stated.

FILED
FEB 14 2008
Terri A. Lorenzon, Director
Environmental Quality Council

BEFORE THE ENVIRONMENTAL QUALITY COUNCIL
OF THE STATE OF WYOMING

IN THE MATTER OF THE PETITION OF POWDER RIVER BASIN RESOURCE COUNCIL TO AMEND WYOMING WATER QUALITY RULES, CHAPTER 2, APPENDIX H	))))	DOC #05-3102

COMMENTS OF MERIT ENERGY COMPANY

Merit Energy Company (Merit) thanks the Environmental Quality Council for the opportunity to submit comments on this very important and far-reaching issue. It is the position of Merit that the Petition of the Powder River Basin Resource Council should be rejected for two reasons. First, the Department of Environmental Quality and the Environmental Quality Council lack the statutory authority to regulate water quantity or determine beneficial use. That authority is vested in the State Engineer and the Board of Control. Second, the proposal will result in a severe economic loss to Wyoming communities, the labor force, agricultural, and the State of Wyoming through loss of business, a loss of wildlife and livestock habitat and beneficial use, and loss of tax revenues.

THE PETITION IS BEYOND THE STATUTORY AUTHORITY OF THE DEQ AND EQC AND CONFLICTS WITH THE CONSTITUTIONAL POWERS GRANTED TO THE STATE ENGINEER AND BOARD OF CONTROL

It is well settled in Wyoming law that an administrative agency has limited powers and can do no more than it is statutorily authorized to do. *U.S. West Communications, Inc. v. Wyoming Public Service Commission*, 988 P. 2d 1061, 1068 (Wyo. 1999). Because an administrative agency has only the powers granted to it by statute, the

justification for the exercise of any authority by the agency must be found within the applicable statute. *French v. Amax Coal West*, 960 P.2d 1023, 1027 (Wyo 1998). An agency may not exceed the authority expressly delegated to it by the Legislature when the agency is promulgating regulations. *State Department of Revenue and Taxation v. PacifiCorp*, 872 P.2d 1163, 1166 (Wyo. 1994). Therefore, a statute will be strictly construed when determining the authority granted to an administrative agency, and reasonable doubt of the existence of the authority must be resolved against the exercise thereof. *In re LePage*, 18 P.3d 1177, 1180 (Wyo. 2001). "A doubtful power does not exist." *Id.* at 1181, quoting *French v. Amax Coal West*, 960 P.2d 1023, 1027 (Wyo 1998). "Any agency decision that falls outside the confines of the statutory guidelines articulated by the legislature is contrary to law and cannot stand." *LePage*, 18 P.3d at 1180, quoting *Tri County Telephone Assc., Inc. v. Wyoming Public Serv. Com'n.*, 910 P.2d 1359, 1361 (Wyo. 1996). When the Petition before this Council is measured against these fundamental principles of Wyoming law, there is only one conclusion -- -- the proposal is not authorized by law and is beyond the power of the Environmental Quality Council.

A search of the statutes that authorize the Environmental Quality Council, the Department of Environmental Quality, and in the Water Quality Division do not reveal any specific authority for the regulation of water quantity. The authority to regulate water quantity rests solely with the Wyoming State Engineer and the State Board of Control by Constitution. Article 8, §5 of the Wyoming Constitution addresses the powers of the State Engineer, who by Constitution "shall have general supervision of the waters of the state and of the officers connected with its distribution." Article 8, §2 of the

Wyoming Constitution provides that the Board of Control shall "have the supervision of the waters of the state and of their appropriation, distribution, and of the various officers connected therewith." The Board of Control has broad powers, both direct and the implied. *White v. Wheatland Irrigation District*, 413 P.2d 252, 258 (Wyo. 1966).

The determination of beneficial use of water is exclusively within the prerogative of the State Engineer. W.S. §§ 41 - 3 - 931, 41 - 4 – 502. Wyoming Constitution, Article 8, Section 3. In addition, Section 1104 of the existing DEQ regulations acknowledge that beneficial use determinations governing ground water are within the sole province of the State Engineer.

> "Section 3. Underground Water Protected.
>
> (a) All waters, including ground waters of the State, within the boundaries of the State of Wyoming are the property of the State; and control of the beneficial use of waters of the State resides with the Wyoming State Engineer.
>
> (b) Nothing herein contained shall be construed so as to interfere with the right of any person to use water from any underground water source for any purpose identified in W.S. 35-11-102 and 35-11-103(c)(i); or to limit or interfere with the jurisdiction, duties or authorities of other Wyoming State agencies or officials."

The Wyoming Legislature gave specific recognition to the authority of the State Engineer and the Board of Control when it established the Environmental Quality Act by limiting its applicability. W.S. 35-11-1104 provides, in pertinent part:

> "(a) Nothing in this act:
>
> ****
>
> (iii) **Limits or interferes with the jurisdiction, duties or authority of the state engineer, the state board of control***."** (Emphasis supplied)

The law is crystal clear. The only authority to regulate water quantity lies with the State Engineer and the Board of Control. Any attempt by the Department of Environmental Quality or the Environmental Quality Council to assume power over water quantity or beneficial use is beyond their authority and is unlawful.

The Petition inappropriately seeks a modification of the determination previously made by the State Engineer. The State Engineer has published that "storage of CBNG water is recognized as a beneficial use." See *State Engineer CBNG Surface Water Policy.* The Petition's attempt to limit discharge to the extent "actually used by livestock or wildlife" is directly contrary to the expressed public policy and determination of the State Engineer.

The Petition is also unsupported by the Clean Water Act. Section 5 of the Clean Water Act, provides:

> "Except as expressly provided in this chapter, nothing in this chapter shall... be construed as impairing or in any manner affecting any right or jurisdiction of the States with respect to the waters (including boundary waters) of such States."

33 U.S.C. §1370(2). The attempt of the Petition to claim support in the Clean Water Act is unsupported by the law and cannot impair, abrogate, or supersede the power of the one State Engineer over water quantity.

The DEQ and other State agencies addressed the Petitioner's comments on this subject previously in its Response to Comments submitted in connection with the revisions to Chapter 2, WQRR. In pertinent part, the June 2004 response of DEQ concerning Appendix H rejected the claims now being made by the Petitioner:

> "40 CFR allows for the discharge of produced water if the water is used by wildlife or agriculture during periods of discharge. **This was a provision that was supported by the Wyoming DEQ, Wyoming Game and Fish and many landowners within Wyoming to allow for the continued use of produced water rather than reinjecting the water. It is the DEQ's opinion that there should not be a quantity limitation related to the agricultural and wildlife use determination.** The federal regulations did not contemplate a maximum allowable flow rate but rather the water being discharged was actually used by wildlife or agriculture during periods of discharge. **It was not the intent of the federal regulations that all of the water be consumed."** (Emphasis supplied)

The matters posed by the Petition have been addressed in detail and rejected. There is no reason to revisit these matters again.

In summary, the Petition is a rehash of matters previously raised and rejected. In addition, it is not authorized by law. It is beyond the scope of authority granted to either the DEQ or the EQC. The authority to regulate water quantity and determine beneficial use is vested with the State Engineer and the Board of Control. The Petitioner's requests should therefore be rejected.

THE PETITION IS ILL ADVISED BECAUSE IT HARMS CONVENTIONAL PRODUCTION AT HAMILTON DOME, IS HARMFUL TO AGRICULTURE, THE ENVIRONMENT, AND THE ECONOMY OF HOT SPRINGS COUNTY

The Petition extends its tentacles beyond CBM, and causes extensive damage to conventional oil production and the resulting benefits from that production. Merit Energy produces crude oil at the Hamilton Dome Field located 25 miles northwest of the Thermopolis, WY, in Hot Springs County, Wyoming. Merit holds two (2) NPDES permits (WY0000175 and WY0000680) to discharge produced water from Hamilton Dome Field into unnamed tributaries that eventually flow into Cottonwood Creek. The data below represents a summary of a Use Attainability Analysis filed by Merit with the

Department of Environmental Quality concerning its Hamilton Dome operations and the impact on the economy and environment. The continual water discharge is estimated at 210,000 barrels of water per day, or 13 cfs. Requiring Merit to treat the water in order to meet the standards proposed in the Petition is not economically feasible and the Field would have to be shut in.[1] The resulting loss to agriculture, wildlife, the environment and Hot Springs County would be devastating.

The agricultural community is largely in agreement that ranching operations along Cottonwood Creek would cease altogether with the closure of the Hamilton Dome Field. Produced water provides late season grass and hay irrigation and year-round livestock watering. The beneficial uses would be otherwise limited to scant resources from natural runoff in the early summer season, and would not viably support ranching operations. Attached to this submission as Appendix A are Landowner Questionnaire Responses and an Affidavit which support the agricultural need for the water. Notable are the comments of Frank Rhodes, a rancher at Cottonwood Creek for 45 years. His Affidavit, under oath, includes the following comments:

"The produced water was extremely valuable to my ranching operations.

---

[1] The average cost of reinjection is $200,000 per well, with an initial capital investment of $14 million. In addition, a disposal facility with storage capacity of 250,000 barrels and a sufficient pump capacity would require an additional $5 million investment, for a total capital cost of reinjection at Hamilton Dome of $19 million. Lease operating expense would increase by approximately $150,000 per month due to increased electrical demands and facility maintenance expense. Because wellbores that would have to be converted are currently producing oil wells, there is an estimated loss of oil production of 600 barrels of oil per day.

Treatment of the water on the surface would require a capital investment of approximately $500 per gallon per minute of treatment capacity. At the current discharge rate of 210,000 barrels per day, this would result in a $3 million capital expenditure. More important, the associated increase in operating expenses would be approximately $250,000 per month.

Neither reinjection nor reverse osmosis treatment of Hamilton Dome produced water is acceptably cost-effective. Merit would shut in and abandon the field.

***

> After produced water was discharged, I witnessed a large increase in the number of ducks, geese, pheasants, and mule and white deer on or around Cottonwood Creek.

***

> The produced water from the Hamilton Dome Oilfield has been invaluable to my ranching operations as well as the other ranches and farms that are along Cottonwood Creek below the confluence (sic) the produced water with Cottonwood Creek, and has created a very beneficial environment for the area's wildlife.

***

> Without the produced water, Cottonwood Creek and the surrounding area would return to the dry, arid condition that existed prior to Cottonwood Creek being a year-round stream due to produced water, and ranchers, farmers, and the wildlife would suffer greatly."

In stark contrast to the Petitioner's theories and models, Landowner Assessments clearly demonstrate that, in real life, there are no adverse health effects on livestock or wildlife from Cottonwood Creek due to the produced water from Hamilton Dome. They show positive impacts, no adverse health effects, and vast improvement of wildlife.

The loss of Hamilton Dome discharge into Cottonwood Creek would result in a corresponding loss of:

> 1600 acres of irrigated cropland;
>
> 4000 tons of annual hay production;
>
> 15 to 20% reduction in herd size (about 3200 cows) and eight $2 million reduction in related sales receipts (based on $650 per head); and

20 full-time and seasonal jobs in the ranching industry.

Merit has conducted an extensive economic evaluation of the economic significance of the Hamilton Dome Field. It is attached as Appendix B. A summary of the assessment follows.

The IMPLAN model was used to estimate the total economic losses to Hot Springs County, if the Hamilton Dome Field were shut in. Excluding losses from cessation of Merit's Hamilton Dome production operations, Hot Springs County is estimated to lose $3.3 million in total economic output, a loss of $645,000 in annual labor income, and a net loss of 32 full and part - time jobs.

Fiscal contributions of Hamilton Dome are significant. Annual crude production from the Hamilton Dome Field averages approximately 1.67 million barrels. Hamilton Dome supports an estimated total of 186 jobs in the State of Wyoming, including 136 jobs in Hot Springs County and 50 jobs elsewhere in Wyoming. The associated Hamilton Dome labor income impact in Hot Springs County totals $4.07 million and $2.54 million elsewhere in Wyoming.

Merit Energy is the largest taxpayer in Hot Springs County. Merit Energy is the county's largest source or property tax. The property tax revenue from Hamilton Dome averages 29% of the total property tax revenue of all countywide taxing entities ($1.9 million). Hamilton Dome accounts for the following revenue contributions to major funds and entities in Hot Springs County:

<u>County General Fund</u>: 9% of total General fund revenues.

Library, fair board, hospital: 27% of the library system's total revenues, 15% of the Fair Board's total revenues, and 2% of the Hot Springs County Memorial Hospital District's total revenues.

Hot Springs County Weed and Pest District. 9% of the District's pest eradication budget and 29% of its mosquito control budget.

Hot Springs County Rural Fire Protection District: 29% of the district's budget.

Hot Springs County School District #1: $1.4 million annually for school related funds. This loss would increase the school debt service mill levy for other county taxpayers by 2.8 mills, and based upon a five-year average. Assuming no change in enrollment levels, the Wyoming School Foundation Fund would experience a net cost of $1.235 million from lost revenues and additional entitlement costs.

Hamilton Dome production has provided severance taxes of approximately $1.8 million annually to the State of Wyoming. Federal mineral royalty payments for Hamilton Dome production average $4.4 million. Wyoming's share of those royalties averages approximately $2.2 million annually. Merit pays over $400,000 in sales and use taxes on the purchase of goods and services for the Hamilton Dome Field. Hamilton Dome's crude production represents approximately 33% of the daily feedstock supply needed to sustain Wyoming's refineries at full production. Hamilton Dome supplies more than 20% of the crude necessary to sustain asphalt and road oil production. Loss of this production would have a direct impact on Wyoming's refineries.

Merit has studied the impact on wetlands caused by the loss of Hamilton Dome produced water. The wetlands were inventoried and mapped. Soils were analyzed. The

study, completed in early 2003, demonstrated that a loss of Hamilton Dome discharge would eliminate approximately 600 acres of high quality wetlands. This totally includes nearly 100 acres supported directly by discharge and another approximately 500 acres along Cottonwood Creek that are indirectly supported by the discharge.

Conversion of Cottonwood Creek from a perennial to an ephemeral stream would impact riparian vegetation, and result in a decline of wildlife population and displacement of wildlife species. Francis Petera, the Director of the Wyoming Game and Fish Department, wrote to John Wagner of the Water Quality Division on June 20, 1990 and commented on produced water from Hamilton Dome:

> "Without further evidence that points to harming the wildlife or people in the area, the produced water does provide substantial benefits to the wildlife resource which is using this area."

The water produced from the Hamilton Dome Field would not meet the proposed levels suggested in the Petition for Total Dissolved Solids and Sulfates. Discharges have demonstrated the following ranges:

Total Dissolved Solids	2910 – 3670 mg/L
Sulfates	878 – 1300 mg/L

Because the produced water from the Hamilton Dome Field would not meet the proposed standards requested in the Petition, the loss of that produced water would have a devastating impact on the environment, wildlife, the agricultural community, the labor force, and Hot Springs County, in addition to Wyoming's General Fund. For these reasons, Merit Energy Company respectfully urges the Environmental Quality Council to reject the Petition and not proceed with rulemaking.

RESPECTFULLY SUBMITTED this 14th day of February, 2006.

MERIT ENERGY COMPANY

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CERTIFICATE OF SERVICE

I certify the foregoing pleading was served on this 14th day of February, 2006, and that copies were served as follows:

Kate Fox Davis and Cannon 422 West 26th Street Cheyenne WY 82001	[X] U.S. Mail [ ] Fed Ex [ ] Fax [ ] Hand Delivered
John Corra, Director Department of Environmental Quality Herschler Building, 4W 122 W. 25th Street Cheyenne, WY 82002	[X] U.S. Mail [ ] Fed Ex [ ] Fax [ ] Hand Delivered
Vicci Colgan Mike Barrash Senior Asst. Attorney General 123 Capitol Building Cheyenne, WY 82002	[X] U.S. Mail [ ] Fed Ex [ ] Fax [ ] Hand Delivered

John A. Sundahl

LANDOWNER AFFIDAVIT AND TESTIMONY

APPENDIX A

BEFORE THE WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY, WATER QUALITY DIVISION

RENEWAL OF MERIT ENERGY	)
COMPANY'S PERMITS TO	)
DISCHARGE, PERMIT NUMBERS	)
WY0000175 AND WY0000680	)

AFFIDAVIT OF FRANK RHODES

I, Frank Rhodes, being duly sworn upon his oath, being of lawful age and otherwise competent to testify and having personal knowledge of the matters contained herein do state:

1. I was a rancher on six to eight miles of Cottonwood Creek from 1948 to 1993, just north of Hamilton Dome, Wyoming.

2. During this time, I ranched approximately 13,000 acres of deeded land, and approximately 26,000 acres of land leased from the Bureau of Land Management.

3. I ranched on Cottonwood Creek prior to the time when produced water was discharged from the Hamilton Dome oil field into Cottonwood Creek.

4. Prior to produced water being discharged, Cottonwood Creek would only flow from approximately March to July or August, and would sometimes be dry as early as June. For the rest of the year, Cottonwood Creek was dry with the exception of intermittent flows of rain or snow melt.

5. Prior to the discharge of produced water, I had to use well water to water my livestock.

6. After produced water was discharged into the Cottonwood Creek, the creek would flow year-round.

7. My ranch, which was sold in 1993, has water rights for water out of Cottonwood Creek and one of the unnamed tributaries into which the produced water is discharged.

8. I used the produced water to water my livestock and irrigate hay. The produced water was extremely valuable to my ranching operations.

9. Additionally, after produced water was discharged, I witnessed a large increase in the number of ducks, geese, pheasants, and mule and white-tail deer on or around Cottonwood Creek.

10. The produced water from the Hamilton Dome oil field has been invaluable to my ranching operations as well as the other ranches and farms that are along Cottonwood Creek below the confluence the produced water with Cottonwood Creek, and has created a very beneficial environment for the area's wildlife.

11. Without the produced water, Cottonwood Creek and the surrounding area would return to the dry, arid condition that existed prior to Cottonwood Creek being a year-round stream due to produced water, and ranchers, farmers, and the wildlife would suffer greatly.

FURTHER AFFIANT SAYETH NAUGHT.

Frank Rhodes

Frank Rhodes

STATE OF WYOMING)
)**SS:**
COUNTY OF HOT SPRINGS)

The foregoing instrument was subscribed and sworn to before me by Frank Rhodes on the 26 day of August, 2002.

James A Mickel Jr.

Notary Public

My Commission Expires: April 24, 2006

NOTARY PUBLIC
JAMES A MICKEL JR.
COUNTY OF WASHAKIE
STATE OF WYOMING
My Commission Expires Apr. 24, 2005

HAMILTON DOME WATER DISCHARGES
TO COTTONWOOD CREEK:

LANDOWNER ASSESSMENTS

GROUNDWATER HYDROLOGY ISSUES

1. Does the current flow of Cottonwood Creek affect the water table level on your property? If yes, do you see increased vegetation in areas of high groundwater table? (i.e. along stream banks) How much? (5 feet, 5 yards, 20 yards, etc.)

2. How many additional livestock can you operate with due to this increased vegetation from the raised groundwater table? (None, 5%, 10%, 20%, etc.)

3. Have you seen any affect of the water table in any water wells in the area? If yes, "What is the depth of the well(s)?"

SURFACE WATER HYDROLOGY ISSUES

States West will assess the current hydrology of Cottonwood Creek and predict the hydrology if the discharges were to cease.

1. Do you have any knowledge of conditions of Cottonwood Creek before 1950? If Yes: How many years out of 10 would it normally be dry at some time during the year? What month would it normally go dry? In the spring, when would water start running in the stream above Hamilton Dome?

2. Do you irrigate with water solely from Hamilton Dome discharges?

3. Do you irrigate with water that is mixed with runoff? If yes: How do you determine if the water quality is adequate for irrigation?

4. How many times a year do you irrigate?

5. Have you seen any impact to your fields from irrigating with Cottonwood Creek water?

6. Have you ever seen any adverse health effects on livestock or wildlife from Cottonwood Creek?

HAMILTON DOME WATER DISCHARGES
TO COTTONWOOD CREEK:

LANDOWNER ASSESSMENTS

GROUNDWATER HYDROLOGY ISSUES

1. Does the current flow of Cottonwood Creek affect the water table level on your property? If yes, do you see increased vegetation in areas of high groundwater table? (i.e. along stream banks) How much? (5 feet, 5 yards, 20 yards, etc.) yes, yes

2. How many additional livestock can you operate with due to this increased vegetation from the raised groundwater table? (None, 5%, 10%, 20%, etc.)

3. Have you seen any affect of the water table in any water wells in the area? If yes, "What is the depth of the well(s)?" no

SURFACE WATER HYDROLOGY ISSUES

States West will assess the current hydrology of Cottonwood Creek and predict the hydrology if the discharges were to cease.

1. Do you have any knowledge of conditions of Cottonwood Creek before 1950? If Yes: How many years out of 10 would it normally be dry at some time during the year? What month would it normally go dry? In the spring, when would water start running in the stream above Hamilton Dome? no

2. Do you irrigate with water solely from Hamilton Dome discharges? yes

3. Do you irrigate with water that is mixed with runoff? If yes: How do you determine if the water quality is adequate for irrigation? yes, historic use of this same water proves it is adequ

4. How many times a year do you irrigate? most fields get 2 per year

5. Have you seen any impact to your fields from irrigating with Cottonwood Creek water? no

6. Have you ever seen any adverse health effects on livestock or wildlife from Cottonwood Creek? no

HAMILTON DOME WATER DISCHARGES
TO COTTONWOOD CREEK:

LANDOWNER ASSESSMENTS

GROUNDWATER HYDROLOGY ISSUES

1. Does the current flow of Cottonwood Creek affect the water table level on your property? If yes, do you see increased vegetation in areas of high groundwater table? (i.e. along stream banks) How much? (5 feet, 5 yards, 20 yards, etc.)

2. How many additional livestock can you operate with due to this increased vegetation from the raised groundwater table? (None, 5%, 10%, 20%, etc.)

3. Have you seen any affect of the water table in any water wells in the area? If yes, "What is the depth of the well(s)?"

I Cant Really Answer These first Three questions Because The Creek has Always Run Since we have owned The Property

SURFACE WATER HYDROLOGY ISSUES

States West will assess the current hydrology of Cottonwood Creek and predict the hydrology if the discharges were to cease.

1. Do you have any knowledge of conditions of Cottonwood Creek before 1950? If Yes: How many years out of 10 would it normally be dry at some time during the year? What month would it normally go dry? In the spring, when would water start running in the stream above Hamilton Dome?

2. Do you irrigate with water solely from Hamilton Dome discharges?

3. Do you irrigate with water that is mixed with runoff? If yes: How do you determine if the water quality is adequate for irrigation?

4. How many times a year do you irrigate?

5. Have you seen any impact to your fields from irrigating with Cottonwood Creek water?

6. Have you ever seen any adverse health effects on livestock or wildlife from Cottonwood Creek? NO

ECONOMIC ISSUES

1. What is your typical season/period of use of water from Cottonwood Creek?

   Begin: _____
   End: _____

2. For what purpose(s) is the water used? (May indicate more than one answer)

   Livestock watering (immediate use): _____
   Livestock watering (stored/impounded for later use): _____
   Irrigate Pastures: _____
   Irrigate Cropland: _____

3. How long has your operation used this water?

4. If you checked livestock watering in Question #2, what kind and how many head of livestock are supported by the water?

   _____/_____/_____
   Cattle / Sheep / Horses
   (cow-calf pairs)

5. Does the livestock watering occur on your own land, leased private land, or federal/state grazing allotments?

6. If you checked irrigation in Question #2, please describe the type and use of the irrigated acreage.

   Acres: _____/_____
   Pasture / cropland

   If cropland, the type of crop grown:_____

   Average productivity/acre over the past 3 seasons: _____

   If the crop is alfalfa or grass hay, is it used as winter feed for your herd or is it sold? _____

7. How many people, including family members, work or are employed by your operation?

   Year-round: _____
   Seasonal: _____

Please review the analysis of the effects of the loss of Hamilton Dome produced water on Cottonwood Creek (i.e., reduced average flow volumes by month). Then address questions 8-12:

8. How would a reduction/loss of the water affect your operation, (e.g., reduce herd size by _____, reduce crop production by _____%, or _____)?

9. Estimate the reduction in your operations annual net income associated with the effects identified in Question #8 above? _____

10. Is there an alternative source of water available to replace this water? If yes, please describe, including the costs associated with obtaining water from the alternative source. _____

11. How would you adjust your operation's labor to deal with the effects associated with the reduction in water? _____

12. Would your operation remain viable with the reduction in volume or the loss of this water?

ECOLOGICAL ISSUES

1. What changes have you noticed with regard to wildlife use of the area since the stream became perennial rather than intermittent?

2. Has the ability to produce alfalfa using discharge water increased use of the area by wildlife, especially big game and game birds?

3. What would become of the irrigated hayfields if you could no longer irrigate?

4. Has there been a change in plants (more willows, cottonwoods, marshes, etc.?)

ECONOMIC ISSUES

1. What is your typical season/period of use of water from Cottonwood Creek?

   Begin: June
   End: October

2. For what purpose(s) is the water used? (May indicate more than one answer)

   Livestock watering (immediate use): X
   Livestock watering (stored/impounded for later use): _____
   Irrigate Pastures: _____
   Irrigate Cropland: _____

3. How long has your operation used this water?
   3 years

4. If you checked livestock watering in Question #2, what kind and how many head of livestock are supported by the water?

   _____ / _____ / 25
   Cattle / Sheep / Horses
   (cow-calf pairs)

5. Does the livestock watering occur on your own land, leased private land, or federal/state grazing allotments? Private Land

6. If you checked irrigation in Question #2, please describe the type and use of the irrigated acreage.

   Acres: 320 / _____
   Pasture / cropland

   If cropland, the type of crop grown: _____

   Average productivity/acre over the past 3 seasons: _____

   If the crop is alfalfa or grass hay, is it used as winter feed for your herd or is it sold? _____

7. How many people, including family members, work or are employed by your operation?

   Year-round: _____
   Seasonal: 4

Please review the analysis of the effects of the loss of Hamilton Dome produced water on Cottonwood Creek (i.e., reduced average flow volumes by month). Then address questions 8-12:

8. How would a reduction/loss of the water affect your operation, (e.g., reduce herd size by 100%, reduce crop production by _____%, or _____)?

9. Estimate the reduction in your operations annual net income associated with the effects identified in Question #8 above? 5000 to 12,000

10. Is there an alternative source of water available to replace this water? If yes, please describe, including the costs associated with obtaining water from the alternative source. Possible well, 8,000

11. How would you adjust your operation's labor to deal with the effects associated with the reduction in water? We would Be OUT of Bussiness

12. Would your operation remain viable with the reduction in volume or the loss of this water? NO

ECOLOGICAL ISSUES

1. What changes have you noticed with regard to wildlife use of the area since the stream became perennial rather than intermittent? WE havent owned The Land Long Enough to Answer This Question

2. Has the ability to produce alfalfa using discharge water increased use of the area by wildlife, especially big game and game birds?

3. What would become of the irrigated hayfields if you could no longer irrigate?

4. Has there been a change in plants (more willows, cottonwoods, marshes, etc.?)
No Change. But we have Lots of willows and trees on our property.

ieby Creek mule Co.
Jeff Van Antwerp
224 S. 9th Street
Theemopolis, WY 82443

Clay Van Antwerp
805 Bushnell
Rock Springs, WY
307-362-4898

ECONOMIC ISSUES

1. What is your typical season/period of use of water from Cottonwood Creek?

   Begin: March
   End: Now

2. For what purpose(s) is the water used? (May indicate more than one answer)

   Livestock watering (immediate use): ✓
   Livestock watering (stored/impounded for later use): ✓
   Irrigate Pastures: ✓
   Irrigate Cropland: ✓

3. How long has your operation used this water? mine for 2 year, but this ranch has used the water since 1905 that I know of and probably longer

4. If you checked livestock watering in Question #2, what kind and how many head of livestock are supported by the water?

   450 / 40 / 25
   Cattle / Sheep / Horses
   (cow-calf pairs)

5. Does the livestock watering occur on your own land, leased private land, or federal/state grazing allotments? My own + state and fedral allot.

6. If you checked irrigation in Question #2, please describe the type and use of the irrigated acreage.

   Acres: 661 acres
   Pasture / cropland

   If cropland, the type of crop grown: _____

   Average productivity/acre over the past 3 seasons: 2 ton per acre hay

   If the crop is alfalfa or grass hay, is it used as winter feed for your herd or is it sold? fed.

7. How many people, including family members, work or are employed by your operation?

   Year-round: 7
   Seasonal: 4

Please review the analysis of the effects of the loss of Hamilton Dome produced water on Cottonwood Creek (i.e., reduced average flow volumes by month). Then address questions 8-12:

8. How would a reduction/loss of the water affect your operation, (e.g., reduce herd size by 50, reduce crop production by 50 %, or more)?

9. Estimate the reduction in your operations annual net income associated with the effects identified in Question #8 above? 100,000.00 or more

10. Is there an alternative source of water available to replace this water? If yes, please describe, including the costs associated with obtaining water from the alternative source. no. not that I'm aware of

11. How would you adjust your operation's labor to deal with the effects associated with the reduction in water? I would have to let the small go.

12. Would your operation remain viable with the reduction in volume or the loss of this water? no

ECOLOGICAL ISSUES

1. What changes have you noticed with regard to wildlife use of the area since the stream became perennial rather than intermittent? N/A

2. Has the ability to produce alfalfa using discharge water increased use of the area by wildlife, especially big game and game birds? lot's of wildlife in this area

3. What would become of the irrigated hayfields if you could no longer irrigate? the would become weed fields

4. Has there been a change in plants (more willows, cottonwoods, marshes, etc.?) N/A

HAMILTON DOME WATER DISCHARGES
TO COTTONWOOD CREEK:

LANDOWNER ASSESSMENTS

GROUNDWATER HYDROLOGY ISSUES

1. Does the current flow of Cottonwood Creek affect the water table level on your property? If yes, do you see increased vegetation in areas of high groundwater table? (i.e. along stream banks) How much? (5 feet, 5 yards, 20 yards, etc.)

   YES – 10 yds

2. How many additional livestock can you operate with due to this increased vegetation from the raised groundwater table? (None, 5%, 10%, 20%, etc.)

3. Have you seen any affect of the water table in any water wells in the area? If yes, "What is the depth of the well(s)?" YES 80'

SURFACE WATER HYDROLOGY ISSUES

States West will assess the current hydrology of Cottonwood Creek and predict the hydrology if the discharges were to cease.

1. Do you have any knowledge of conditions of Cottonwood Creek before 1950? NO If Yes: How many years out of 10 would it normally be dry at some time during the year? What month would it normally go dry? In the spring, when would water start running in the stream above Hamilton Dome?

2. Do you irrigate with water solely from Hamilton Dome discharges? NO – BUT solely from Cottonwood creek.

3. Do you irrigate with water that is mixed with runoff? If yes: How do you determine if the water quality is adequate for irrigation? YES – Clarity & water testing

4. How many times a year do you irrigate? 8-9 months

5. Have you seen any impact to your fields from irrigating with Cottonwood Creek water? Positive impact only

6. Have you ever seen any adverse health effects on livestock or wildlife from Cottonwood Creek? NO

ECONOMIC ISSUES

1. What is your typical season/period of use of water from Cottonwood Creek?

   Begin: MARCH
   End: November

2. For what purpose(s) is the water used? (May indicate more than one answer)

   Livestock watering (immediate use): YES
   Livestock watering (stored/impounded for later use): Well
   Irrigate Pastures: YES
   Irrigate Cropland: YES

3. How long has your operation used this water?

   This property has used Cottonwood Creek water Since 1904

4. If you checked livestock watering in Question #2, what kind and how many head of livestock are supported by the water?

   200 / 0 / 2
   Cattle / Sheep / Horses
   (cow-calf pairs)

5. Does the livestock watering occur on your own land, leased private land, or federal/state grazing allotments? OWN LAND

6. If you checked irrigation in Question #2, please describe the type and use of the irrigated acreage.

   Acres: 340 / 300
   Pasture / cropland

   If cropland, the type of crop grown: HAY

   Average productivity/acre over the past 3 seasons: 4 Tons/ACRE

   If the crop is alfalfa or grass hay, is it used as winter feed for your herd or is it sold? Both

7. How many people, including family members, work or are employed by your operation?

   Year-round: 5
   Seasonal: 6

Please review the analysis of the effects of the loss of Hamilton Dome produced water on Cottonwood Creek (i.e., reduced average flow volumes by month). Then address questions 8-12:

8. How would a reduction/loss of the water affect your operation, (e.g., reduce herd size by 50 %, reduce crop production by 80 %, or _____)?

9. Estimate the reduction in your operations annual net income associated with the effects identified in Question #8 above? Cause for Liquidation

10. Is there an alternative source of water available to replace this water? If yes, please describe, including the costs associated with obtaining water from the alternative source. None

11. How would you adjust your operation's labor to deal with the effects associated with the reduction in water? Property would be Liquidated ALL Associated Jobs would be Lost.

12. Would your operation remain viable with the reduction in volume or the loss of this water? NO — ALL operations would cease.

ECOLOGICAL ISSUES

1. What changes have you noticed with regard to wildlife use of the area since the stream became perennial rather than intermittent?

   MORE WildLiFe OF every Kind

2. Has the ability to produce alfalfa using discharge water increased use of the area by wildlife, especially big game and game birds? YES TO BOTH

3. What would become of the irrigated hayfields if you could no longer irrigate?

   DRY LAND pasture — WASTE LAND

4. Has there been a change in plants (more willows, cottonwoods, marshes, etc.?)

   Profoundly Yes

HAMILTON DOME WATER DISCHARGES
TO COTTONWOOD CREEK:

LANDOWNER ASSESSMENTS

GROUNDWATER HYDROLOGY ISSUES

1. Does the current flow of Cottonwood Creek affect the water table level on your property? If yes, do you see increased vegetation in areas of high groundwater table? (i.e. along stream banks) How much? (5 feet, 5 yards, 20 yards, etc.)
   Doesn't Run by my Land.
2. How many additional livestock can you operate with due to this increased vegetation from the raised groundwater table? (None, 5%, 10%, 20%, etc.)
3. Have you seen any affect of the water table in any water wells in the area? If yes, "What is the depth of the well(s)?" I have two wells over 300' deep. Since the drought, they haven't been Good water - full of heavy minerals or metals, Sulphur & Sodium

SURFACE WATER HYDROLOGY ISSUES

States West will assess the current hydrology of Cottonwood Creek and predict the hydrology if the discharges were to cease.

1. Do you have any knowledge of conditions of Cottonwood Creek before 1950? If Yes: How many years out of 10 would it normally be dry at some time during the year? What month would it normally go dry? In the spring, when would water start running in the stream above Hamilton Dome? Only been using since about 1974 or 75 - We start as soon as there's water in spring & thru fall, if there's water - This is Second Bad Drought We Have
2. Do you irrigate with water solely from Hamilton Dome discharges?
   Solely From whats in Cottonwood Creek -
3. Do you irrigate with water that is mixed with runoff? If yes: How do you determine if the water quality is adequate for irrigation?
4. How many times a year do you irrigate? From April thru Oct. or Nov. As Long as we can before Freezes up.
5. Have you seen any impact to your fields from irrigating with Cottonwood Creek water? No.
6. Have you ever seen any adverse health effects on livestock or wildlife from Cottonwood Creek? No.

ECONOMIC ISSUES

1. What is your typical season/period of use of water from Cottonwood Creek?

   Begin: early Spring
   End: late June

2. For what purpose(s) is the water used? (May indicate more than one answer)

   Livestock watering (immediate use): Not Allowed
   Livestock watering (stored/impounded for later use): Not Allowed
   Irrigate Pastures: _____
   Irrigate Cropland: X

3. How long has your operation used this water?
   Since about 74 or 75, when there was water

4. If you checked livestock watering in Question #2, what kind and how many head of livestock are supported by the water?

   _____ / _____ / _____ N/A
   Cattle / Sheep / Horses
   (cow-calf pairs)

5. Does the livestock watering occur on your own land, leased private land, or federal/state grazing allotments? N/A

6. If you checked irrigation in Question #2, please describe the type and use of the irrigated acreage.

   Acres: _____ / 311 Not Adjudicated for Rest of Property.
   Pasture / cropland

   If cropland, the type of crop grown: Alfalfa Hay - Grain

   Average productivity/acre over the past 3 seasons: Depends on water - 2001 - no crops at all - Had no water at all -

   If the crop is alfalfa or grass hay, is it used as winter feed for your herd or is it sold? Used for Livestock

7. How many people, including family members, work or are employed by your operation?

   Year-round: 1 + wife
   Seasonal: 1

Please review the analysis of the effects of the loss of Hamilton Dome produced water on Cottonwood Creek (i.e., reduced average flow volumes by month). Then address questions 8-12:

8. How would a reduction/loss of the water affect your operation, (e.g., reduce herd size by _____, reduce crop production by _____%, or _____)?
   I have No idea - MY cattle drink well water - But I Need the creek 100% for crop production.
9. Estimate the reduction in your operations annual net income associated with the effects identified in Question #8 above? _____

10. Is there an alternative source of water available to replace this water? If yes, please describe, including the costs associated with obtaining water from the alternative source. None.

11. How would you adjust your operation's labor to deal with the effects associated with the reduction in water? MY partner Would probably have To seek employment AWAY FROM Ranch IN winter Time -
12. Would your operation remain viable with the reduction in volume or the loss of this water? No -

ECOLOGICAL ISSUES

1. What changes have you noticed with regard to wildlife use of the area since the stream became perennial rather than intermittent? Before the Drought we have lots of wildlife & Wild fowl -
2. Has the ability to produce alfalfa using discharge water increased use of the area by wildlife, especially big game and game birds? Yes, when available
3. What would become of the irrigated hayfields if you could no longer irrigate?
   Have to lay fallow -
4. Has there been a change in plants (more willows, cottonwoods, marshes, etc.?)
   We don't have a tree on our 520 acres -

HAMILTON DOME WATER DISCHARGES
TO COTTONWOOD CREEK:

LANDOWNER ASSESSMENTS

GROUNDWATER HYDROLOGY ISSUES

1. Does the current flow of Cottonwood Creek affect the water table level on your property? If yes, do you see increased vegetation in areas of high groundwater table? (i.e. along stream banks) How much? (5 feet, 5 yards, 20 yards, etc.) Varies from 15-25 yds.

2. How many additional livestock can you operate with due to this increased vegetation from the raised groundwater table? (None, 5%, 10%, 20%, etc.) 15%

3. Have you seen any affect of the water table in any water wells in the area? If yes, "What is the depth of the well(s)?" Well @ house is 95' and produces in excess of 40 gpm.

SURFACE WATER HYDROLOGY ISSUES

States West will assess the current hydrology of Cottonwood Creek and predict the hydrology if the discharges were to cease.

1. Do you have any knowledge of conditions of Cottonwood Creek before 1950? No If Yes: How many years out of 10 would it normally be dry at some time during the year? What month would it normally go dry? In the spring, when would water start running in the stream above Hamilton Dome?

2. Do you irrigate with water solely from Hamilton Dome discharges? – NO

3. Do you irrigate with water that is mixed with runoff? Yes If yes: How do you determine if the water quality is adequate for irrigation? - When there is enough water you utilize it - have had no problems.

4. How many times a year do you irrigate? 2 - 6 depending on water

5. Have you seen any impact to your fields from irrigating with Cottonwood Creek water? Without it they will die.

6. Have you ever seen any adverse health effects on livestock or wildlife from Cottonwood Creek? Absolutely none

ECONOMIC ISSUES

1. What is your typical season/period of use of water from Cottonwood Creek? - Non-drought yrs.

   Begin: April 1-20 - - - - - - - Sept. 1-30
   End: May 20 - June 30 - - - - - - Oct. 1-30

2. For what purpose(s) is the water used? (May indicate more than one answer)

   Livestock watering (immediate use): Year round
   Livestock watering (stored/impounded for later use): _____
   Irrigate Pastures: Spring & fall
   Irrigate Cropland: Spring & fall

3. How long has your operation used this water? - We have owned and used this property for 5 years.

4. If you checked livestock watering in Question #2, what kind and how many head of livestock are supported by the water?

   20 - 40 / 0 / 2-4
   Cattle / Sheep / Horses
   (cow-calf pairs)

5. Does the livestock watering occur on your own land, leased private land, or federal/state grazing allotments? Own land

6. If you checked irrigation in Question #2, please describe the type and use of the irrigated acreage.

   Acres: 25 / 30-35
   Pasture / cropland

   If cropland, the type of crop grown: HAY

   Average productivity/acre over the past 3 seasons: 1-1½ T (drought years)

   If the crop is alfalfa or grass hay, is it used as winter feed for your herd or is it sold? Winter feed

7. How many people, including family members, work or are employed by your operation?

   Year-round: 2 [Wife & myself]
   Seasonal: 0

Please review the analysis of the effects of the loss of Hamilton Dome produced water on Cottonwood Creek (i.e., reduced average flow volumes by month). Then address questions 8-12:

8. How would a reduction/loss of the water affect your operation, (e.g., reduce herd size by 50-100%, reduce crop production by 50 %, or _____)?

9. Estimate the reduction in your operations annual net income associated with the effects identified in Question #8 above? $13,500

10. Is there an alternative source of water available to replace this water? If yes, please describe, including the costs associated with obtaining water from the alternative source. No

11. How would you adjust your operation's labor to deal with the effects associated with the reduction in water? Economically unfeasable to operate

12. Would your operation remain viable with the reduction in volume or the loss of this water? No - cease operations.

ECOLOGICAL ISSUES

1. What changes have you noticed with regard to wildlife use of the area since the stream became perennial rather than intermittent? Much more wildlife using stream as a water source & the riparian areas.

2. Has the ability to produce alfalfa using discharge water increased use of the area by wildlife, especially big game and game birds? Absolutely - lots of deer, chuka and pheasants.

3. What would become of the irrigated hayfields if you could no longer irrigate? They would a

4. Has there been a change in plants (more willows, cottonwoods, marshes, etc.?) Yes, without the water the cottonwood community and surrounding riparian areas would cease to existi

THE ECONOMIC SIGNIFICANCE OF THE HAMILTON DOME OILFIELD

APPENDIX B

The Economic Significance
of the
Hamilton Dome Oilfield

November 6, 2002

Prepared for

Merit Energy Company

Blankenship Consulting LLC

Hammer Siler George Associates

in association with

States West Water Resources Corporation

EXECUTIVE SUMMARY

Ongoing production of petroleum crude from Merit Energy Company's Hamilton Dome field is a significant source of economic stimulus for Hot Springs County and the State of Wyoming. This report provides an assessment of the contributions of Merit's Hamilton Dome oilfield to the economy of Hot Springs County and the State of Wyoming. In fact, these contributions are proxy measures of the adverse impacts that would result from the premature closure of the Hamilton Dome field. The report focuses on the following aspects of the economy:

- the economic stimulus associated with Hamilton Dome employment, purchases of goods and services, payment of taxes and the associated multiplier effect,
- the effect of Hamilton Dome tax payments on the Hot Springs County tax base and the taxing entities who rely on these payments to help fund services provided to residents, including students enrolled in local public schools,
- hay and livestock production along Cottonwood Creek supported by the discharge of produced water from the Hamilton Dome; and,
- the significance of Hamilton Dome crude oil to the Wyoming refining industry and the production of asphalt and road oil.

The substantial negative economic impacts in Hot Springs County that would accrue to residents, businesses and local governmental entities with premature closure should be taken into account in the overall assessment of the benefits and costs associated with compliance with Class 2C water quality standards.

Economic Contributions of Hamilton Dome

Annual crude production from the Hamilton Dome field averaged 1.67 million barrels over the past five years.

- Employment and Labor Income: Based on annual operating expenses averaged over the past five years, Hamilton Dome supports an estimated 186 jobs in the State of Wyoming including 136 jobs in Hot Springs County (about 4 percent of total employment in the county in 2000) and 50 jobs elsewhere in Wyoming. The associated Hamilton Dome labor income impact in Hot Springs County totals $4.07 million (about 7 percent of total labor income in the county in 2000) and $2.54 million elsewhere in Wyoming.

- Overall Economic Output: The economic contribution of the Hamilton Dome oilfield is conservatively estimated at nearly $28.7 million annually, most of which occurs in Hot Springs County.

Fiscal Contributions of Hamilton Dome

Merit Energy Company is the largest taxpayer in Hot Springs County and the Hamilton Dome field is the county's largest source of property tax.

Property Tax

Over the past 5 years, Hamilton Dome property tax revenue has averaged 29 percent of total property tax revenue for all countywide taxing entities ($1.9 million out of a total $6.6 million). Property taxes are the largest source of locally-derived funding for local governmental entities and represent a major source of non-earmarked revenue subject to discretionary spending control. Counties are statutorily limited to a 12-mill cap for basic county operating purposes (general fund, hospital, library and fair board), limiting their capacity to increase property taxes to offset reductions in revenues. Hot Springs County's property tax rates are at the 12-mill limit. Consequently, a major reduction in revenues associated with the premature shutdown of the Hamilton Dome field would likely trigger reductions in basic service levels.

Over the past five years, property taxes from Hamilton Dome have accounted for the following revenue contributions to major funds and entities:

- County General Fund: 9 percent of total general fund revenues.

- Library, Fair Board, Hospital: 27 percent of the library system's total revenues, 15 percent of the Fair Board's total revenues and 2 percent of Hot Springs County Memorial Hospital's total revenues.

- Hot Springs County Weed and Pest District: Two separate levies fund operations of the Weed and Pest District. Hamilton Dome property tax revenues provide 9 percent of the district's pest eradication budget and 29 percent of its mosquito control budget.

- Hot Springs County Rural Fire Protection District: Hamilton Dome property tax revenues fund 29 percent of the district's budget. Because the district is staffed by volunteers, a loss of that revenue would not reduce services, but would delay the purchase of needed equipment, supplies and training.

- Hot Springs County School District # 1: Over the past five years, Hamilton Dome property taxes for school-related funds averaged $1.4 million annually. Of that amount, $910,000 was for operational purposes and $188,000 for debt service. The Wyoming School Foundation Fund received an average of $325,000. The entitlement provisions of the state foundation program would offset any loss in Hamilton Dome property tax revenue on the operating budget. Based on the five-year average, the Wyoming School Foundation Fund would experience a net cost of $1.235 million from lost revenues and additional entitlement costs, assuming no change in enrollment levels. Reductions in the number of Hamilton Dome-related students would reduce School District #1's entitlement and revenue with little reduction in educational costs. Loss of the Hamilton Dome property tax revenues would increase the school debt service mill levy for other county taxpayers by 2.8 mills, based on the five-year average.

Severance Tax

Over the last two years, severance taxes on Hamilton Dome production have averaged $1.8 million annually,

Federal Mineral Royalties

Over the past two years, federal mineral royalty payments for Hamilton Dome production averaged $4.4 million. Wyoming's share of these royalties averaged an estimated $2.2.million annually.

Sales and Use Tax

In 2001, MEC estimates that it paid over $400,000 in sales and use taxes on purchase of goods and services for the Hamilton Dome field.

The Role of Hamilton Dome Produced Water in the Cottonwood Creek Ranching Economy

Approximately 35 Cottonwood Creek-area landowners benefit directly or indirectly from water discharged from the Hamilton Dome field into the creek. These landowners use the water for irrigation and stock watering purposes. Based on a survey of several of these landowners, the loss of Hamilton Dome discharges into Cottonwood Creek would result in a corresponding loss of:

- 1,600 acres of irrigated cropland,
- 4,000 tons of annual hay production,
- 15 to 20% reduction in herd size (about 3,200 cows) and a $2 million reduction in related sales receipts (based on $650 head) and,
- 20 full time and seasonal jobs in the ranching industry.

Additional losses would be likely for ranches not included in the survey. Several ranchers contacted for the survey expressed concern for the economic viability of their operations without the Hamilton Dome water.

The IMPLAN model was used to estimate the total economic losses in Hot Springs County, including the indirect and induced impacts on other sectors, associated with the direct reduction in annual livestock receipts. Those losses, which include a net reduction of $3.3 million (1.7%) in the county's total annual economic output, a loss of $645,000 in annual labor income, and a net loss of 32 full and part-time jobs, would be in addition to those impacts directly attributable to the cessation of Merit's Hamilton Dome production operations.

The Role of Hamilton Dome in the Wyoming Refining Industry

Hamilton Dome crude production represents about 3.3 percent of the of the daily feedstock supply needed to sustain Wyoming's five refineries at full production. However, Hamilton Dome supplies more than 20 percent of the crude necessary to sustain asphalt and road

oil production. The loss of this production coupled with the absence of an alternate supply could threaten the economic viability of one or more Wyoming refineries.

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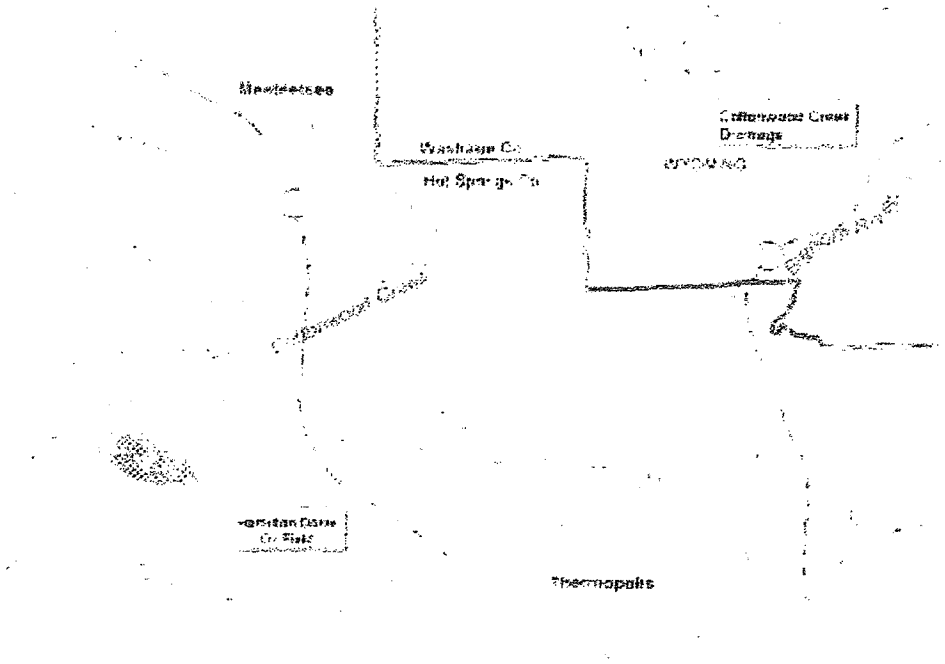
INTRODUCTION

The Hamilton Dome oil field, discovered in 1918, is located 25 miles northwest of the Town of Thermopolis in Hot Springs County, Wyoming. Through 2001, Hamilton Dome had produced 256 million barrels of oil and 1.59 billion cubic feet of natural gas (WOGCC 2001). Merit Energy Company (MEC), the operator of the field, anticipates 2002 production to total 4,250 barrels of oil per day (BOPD), primarily from the Tensleep and Phosphoria reservoirs; the field no longer produces marketable quantities of natural gas. Over the last five years, the Hamilton Dome Field has been on average the eighth most productive oil field in the State of Wyoming, averaging 42 percent of total Hot Springs County oil production and 2.7 percent of total statewide oil production. Oil produced from the field is sold and transported by pipeline to refineries in Wyoming and adjacent states.

Vicinity Map: Hamilton Dome Oilfield and Cottonwood Creek



Source: States West Water Resources Corporation

Also during 2002, Hamilton Dome is anticipated to produce 285,000 barrels of water per day (BWPD). An average of 85,000 BWPD is re-injected to enhance oil recovery. The remaining 200,000 BWPD is discharged from two separate points into unnamed tributaries that eventually flow into Cottonwood Creek (MEC 2002). Discharges of water produced from

Hamilton Dome into the Cottonwood Creek drainage have occurred since the early 1970's. Two NPDES permits, WY0000175 and WY0000680, authorize these discharges.

Cottonwood Creek flows generally eastward from its source in the Owl Creek Mountains at Cottonwood Peak in Township 45 North, Range102 West. It flows eastward 47 river miles into the Bighorn Basin to its confluence with the Bighorn River in Township 45 North, Range 94 West. Hamilton Dome discharges enter Cottonwood Creek at approximately river miles 12 and 19, measured from the upstream end (Jessen 2002).

Until recently, Cottonwood Creek and the tributaries receiving the Hamilton Dome discharge were classified by the Wyoming Department of Environmental Quality, Water Quality Division (WQD) as Class 4 streams. The water discharged from Hamilton Dome meets standards for Class 4 waters. The WQD recently updated Chapter 1 of the *Wyoming Water Quality Rules and Regulations* to comply with the federal Clean Water Act. As a result of this reclassification, Cottonwood Creek is now classified as 2C and the tributaries that receive Hamilton Dome discharges are classified as 3B. The Hamilton Dome discharges exceed Class 2C standards for several constituents including chloride and selenium.

In order to renew its discharge permits, MEC could be required to treat the Hamilton Dome discharge water to meet Class 2C standards. The company believes the financial impact of treating the discharge to meet Class 2C standards would result in closure of the field (Diem 2002). MEC is working with the Wyoming DEQ/WQD to either reclassify the stream or establish site-specific criteria allowing discharge of the produced water to continue without additional treatment. The company also believes that closure of the field prior to the full recovery of the available crude oil resources would trigger significant economic distress on the local economy. The following regional economic analysis has been prepared to examine those economic implications.

The objectives of this economic analysis are to describe the contributions of the Hamilton Dome oil field to the economies of Hot Springs County and the State of Wyoming, to the tax base of Hot Springs County and its relevant taxing entities, to the ranching economy along Cottonwood Creek, and to the Wyoming petroleum refining industry. The contributions described below are proxy measures of the adverse economic impacts that would result from the premature closure of the Hamilton Dome field. In other words, although the narrative typically discusses the economic contributions in positive or beneficial terms, these contributions are measures of what is "at-risk" from requiring compliance with the more stringent water quality standards, the anticipated result of which would be to halt production.

ECONOMIC CONTRIBUTIONS OF MERIT ENERGY COMPANY'S HAMILTON DOME OPERATIONS

On-going production of petroleum crude from the Hamilton Dome field is a source of significant economic stimulus for the Thermopolis and Hot Springs County economies. Moreover, the economic repercussions of that production extend to the broader statewide economy.

With respect to the local economy, the primary economic stimulus encompasses the company's direct payroll and its purchases of goods and services from oil field service companies, utilities and other suppliers and the consumer purchases of its employees. These direct economic infusions indirectly support yet other local businesses and jobs through what is known as the "economic multiplier effect." Finally, production and ad valorem taxes paid by the company, as well as taxes paid by its employees and the businesses and employees whose jobs are supported indirectly by the company's operation help support public education and governmental functions.

A second dimension of the field's economic stimulus derives from its linkages to local farming and ranching located along Cottonwood Creek. Oil production from the Hamilton Dome field yields a substantial quantity of water as a byproduct. Further production is supported by reinjecting a portion of that water into the oil-bearing formations. However, much of that water, about 6,700 acre-feet of water in 2001, discharges into the Cottonwood Creek drainage from where local ranchers subsequently use it for irrigation, stock watering and other agricultural purposes. That water is vital to helping sustain the local agricultural industry because of the region's semi-arid climate. The water also supports wildlife and wildlife habitat in the area.

Yet a third dimension of the field's economic significance is its role in supplying crucial feedstock for the Wyoming refining industry. More specifically, crude from the Hamilton Dome field is transported via pipelines to refineries in Casper and Sinclair, supplying a portion of the total feedstock for those facilities. That supply not only helps sustain the operating viability of those refineries and the economies of the respective communities, but the refined products supply fuel and asphalt to help support the state's economy and highway infrastructure.

Finally, the economic benefits associated with the Hamilton Dome field extend beyond the local communities. Economic linkages between local service firms and suppliers and wholesale and service firms located elsewhere in the state and the flows of consumer purchases to larger regional economies, result in a portion of the indirect and induced "multiplier" effects being captured elsewhere, such as in Cody, Riverton or Casper.

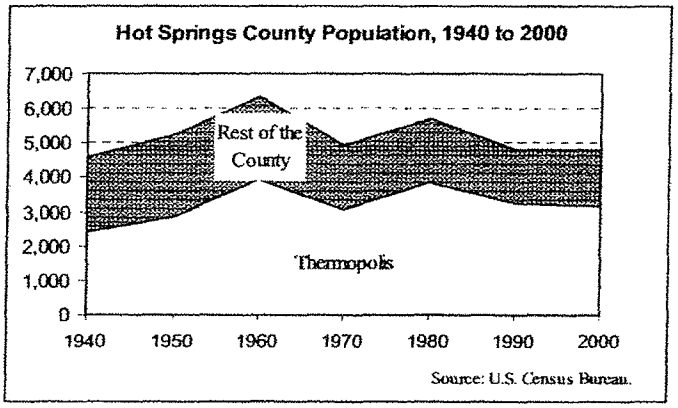
This section of the report examines each of those key economic linkages, quantifying their significance in terms of the numbers of jobs, labor income and annual economic output supported.

Local Setting

The Hamilton Dome field is located in Hot Springs County, Wyoming and is part of a broader region known as the Big Horn Basin. The field is 25 miles northwest of Thermopolis, the county seat and its largest community.

Hot Springs County covers an area of more than 2,000 square miles (1,294,080 acres). Approximately 30 percent of the land in the county is in private ownership. Various federal or state agencies manage the remaining lands or hold them in trust for the Eastern Shoshone and Northern Arapaho tribes as part of the Wind River Indian Reservation.

Hot Springs County is rural. Its population has fluctuated over time, primarily in response to energy and mineral exploration and development. Population peaked at 6,365 residents in 1960. By 1990, the county's population had declined to 4,809 with little population growth in the ensuing decade as the county registered a population of 4,882 residents in the 2000 census. Consequently, Hot Springs County ranked 22nd among Wyoming's 23 counties in terms of population in 2000.



Throughout its contemporary history, most of the county's residents have lived in Thermopolis. In 2000, Thermopolis had 3,172 residents compared to 1,710 residents in the outlying areas of the county.

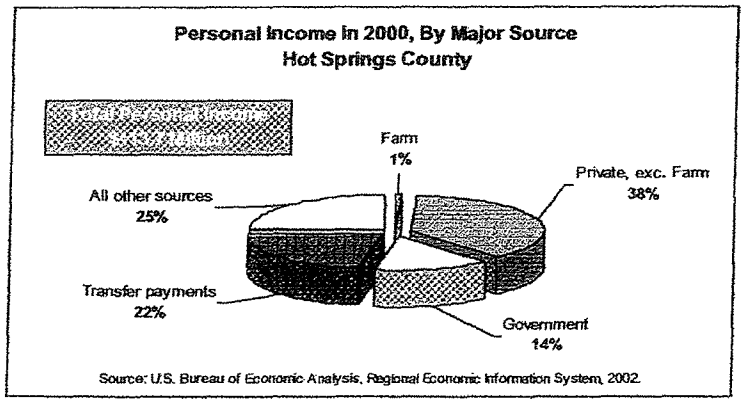
The economic mainstays of the county's economy include agriculture, energy and mineral production, and tourism/outdoor recreation. These "basic" industries generate much of the inflow of wealth into the economy through their sales of goods and services. In turn, the respending of business and employee incomes and local taxes support local retail trade, services and the local public sector. There is little manufacturing or regional wholesale trade activity based in Hot Springs County. Unlike the stagnation characterizing the county's recent population growth, total employment in Hot Springs County increased 334 jobs, nearly 12 percent, between 1990 and 2000 – see Table 1 below. Most of the increase was in the retail trade and services sectors.

TABLE 1
HOT SPRINGS COUNTY EMPLOYMENT, BY MAJOR CATEGORY

Category	1990	1995	2000
Farm	206	198	205
Oil, Gas & Mining	230	150	200
Other Private Sector	1,763	2,075	2,155
Government	614	557	587
Total	**2,813**	**2,980**	**3,147**

Source: U.S. Bureau of Economic Analysis, 2002.

Local retail trade and service businesses, as well as local government, gain additional support from consumer expenditures by the relatively large number of retirees living in the county. According to the 2000 census, more than one of every four local households depend on retirement, social security or some other form of government payments for their income. Income from such transfer payments accounted for 22 percent of the total personal income of $113.7 million in 2000. While such income serves an important function in supporting the local economy, it tends to be relatively fixed over time. When combined with the limited number of higher-paying jobs in the basic industries, this fact translates into comparatively low per capita income in Hot Springs County. In 2000, Hot Springs County ranked 15th among Wyoming counties with a per capita personal income of $23,393, nearly 15 percent below the statewide average of $27,372 per person.



Other major sources of income in Hot Springs County include labor earnings, income derived from dividends, interest and rent, and miscellaneous other income. Private sector earnings, excluding local farming and ranching operations but, including education, is the largest contributor to total income, paying more than $43.4 million to employees and owners in 2000 (38% of the total). That amount was nearly triple the aggregate government payroll of $15.7 million. Local farmers and ranchers had a combined income of $874,000 in 2000, less than 0.8 percent of the total. Dividends, rent and other non-earnings sources of revenue accounted for the remaining $28.2 million in personal income of local residents.

Merit Energy's Hamilton Dome Operations

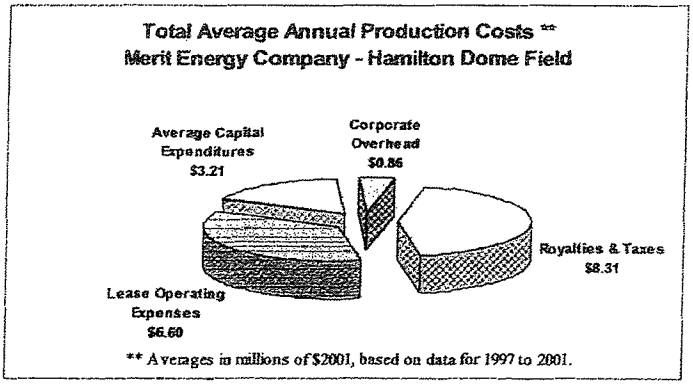
As described above, Merit Energy's primary economic stimulus arises from its production-related expenditures, including the consumer-related purchases of its employees, and its support of public education and government through the taxes it pays. Merit Energy's Hamilton Dome office is the operational base for eight oil fields in Wyoming's Big Horn Basin.

Presently, fifteen (15) of the employees in that office are directly associated with the Hamilton Dome field. Suspending production from the field prior to full recovery of the crude reserves would result in a premature loss of these jobs, their associated incomes and the business volume, jobs, incomes and state and local taxes supported indirectly by the company's operations. Those impacts would be significant.

An analysis of the company's operations, completed using a regional economic model, demonstrates the economic significance of Merit Energy's Hamilton Dome operation. The model uses actual production and operating data for the company for the five-year period, 1997 through 2001. The use of a multi-year data set to summarize the company's economic contributions compensates for much of the market induced year-to-year variability in operating and capital expenditures frequently associated with oil and gas production.

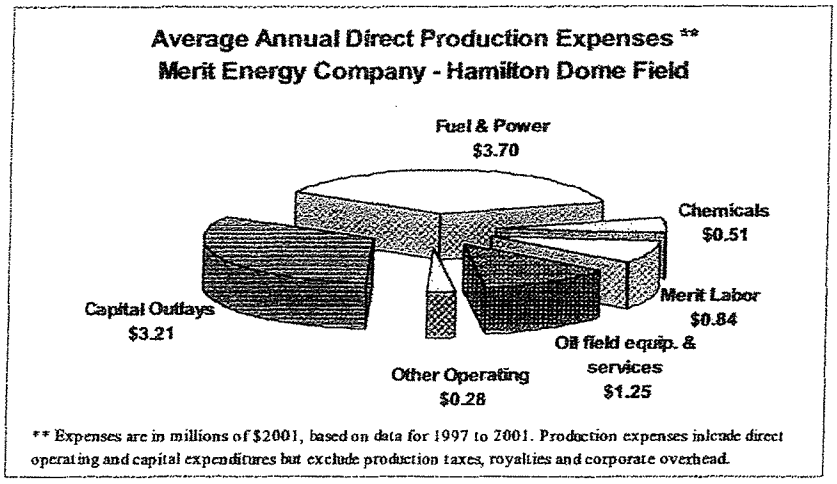
The economic analysis completed for this study, used cost of production data supplied by Merit Energy and the IMPLAN economic modeling software. IMPLAN (**IM**pact Analysis for **PLAN**ning) is an input-output based model originally developed to assist the U.S. Forest Service in land resource management planning. Subsequently, the model and related software were transferred into the private sector, where it is the subject of ongoing refinement and enhancements to provide the analytical capacity to address a broader range of economic and impact planning issues. IMPLAN is widely recognized and accepted in regional economic and economic impact assessment circles. Results of the analysis include direct and total jobs, income and output associated with the operation.

Merit's annual crude production from the Hamilton Dome field averaged 1.67 million barrels of over the past five years. Average annual total costs of production over that same period were $18.98 million ($2001). Royalties and taxes account for the single largest category of production costs, $8.31 million or 44 percent of the total. By comparison, the actual lease operating expenses, which include labor, chemical, equipment, etc., averaged $6.60 million annually – the distribution of costs, by major category, are shown in the accompanying figure.



Of primary relevance to this analysis are the $9.81 million in lease operating and capital expenses made by Merit Energy in a typical year. These expenditures represent the day-to-day purchases of goods and services and payroll outlays to staff that cycle into and through the local and statewide economies, supporting other businesses, jobs for Wyoming residents, and taxes to support government. Fuel and power are the company's single largest production expense category, about $3.70 million annually. Other major categories include labor, replacement

equipment, chemicals, and capital outlays – see the figure below for the direct production expenses by major category.



In addition to the annual volume of purchases, another key determinant of Merit's economic contribution is the extent to which local suppliers provide goods and services. In that regard, Merit Energy actively strives to support local business. It estimates that almost 99 percent of all its annual purchases are from Wyoming businesses and the bulk of those, totaling more than $5.54 million annually, are from contractors and suppliers with an operational presence in Hot Springs County. Table 2 below presents the estimated distribution of Merit's annual operating and capital outlay expenses, by major industrial sector.

TABLE 2
AVERAGE ANNUAL DIRECT PRODUCTION EXPENSES
MERIT ENERGY COMPANY'S HAMILTON DOME FIELD ($2001)

Major Industrial Sector	Hot Springs County	Elsewhere In Wyoming	Total in Wyoming
Oil-field Services, incl. capital outlays	$ 3,365,100	$ 558,300	$ 3,923,400
Electrical Power	$ 167,100	$ 3,342,600	$ 3,509,700
Wholesale Trade	$ 1,125,700	$ 47,300	$ 1,173,000
Retail Trade	$ 6,900	$ 59,200	$ 66,100
Other Services	$ 117,200	$ 55,000	$ 172,200
Merit Energy Payroll	$ 760,100	$ 84,500	$ 844,600
TOTAL	**$ 5,542,100**	**$ 4,146,900**	**$ 9,689,000**

Source: Merit Energy Company, 2002.

Oil field services is the largest category of expenditures, and most of the company's annual outlays for such services are to local contractors. With no major electrical generating facilities in Hot Springs County, electrical power is the single largest production expense from outside the local economy.

Merit Energy currently has 15 employees assigned to the Hamilton Dome operations. However, the significant volume of oil field services and repairs the company contracts to others and its other purchases combine with the jobs supported by employee spending to generate a much higher overall employment impact. Based on the average annual operating expenses, the IMPLAN model estimates a total employment impact from Merit's Hamilton Dome field of 186 jobs statewide; 136 jobs in Hot Springs County and an additional 50 jobs elsewhere in Wyoming – see Table 3. The statewide estimate is exclusive of jobs supported by the expenditures of royalty payments and severance and sales taxes budgeted through the state. The total local jobs supported represents about 4% of total employment in Hot Springs County in 2000.

TABLE 3
PRIVATE SECTOR JOBS SUPPORTED IN WYOMING BY MERIT ENERGY COMPANY'S HAMILTON DOME FIELD

	In Hot Springs County	Elsewhere In Wyoming	Total Wyoming Jobs
Merit Energy	15	0	15
Oil-field services & suppliers	36	25	61
Other private sector	24	23	47
Government and Education	61	2	63
TOTAL	**136**	**50**	**186**

Note: The numbers of jobs supported were derived using IMPLAN, based on Merit Energy Company's average annual expenditures for 1997 through 2001.

The largest number of jobs supported is in local government and education (63 jobs). The strong support for these jobs stems from the company's substantial annual tax payments (these payments are discussed further in a later section.) [1]Another 61 jobs in the oil field service and supply industries followed by 47 jobs in wholesale and retail trade, services, construction and other private sector industries.

A corollary dimension of Merit's positive employment impacts is the beneficial impact on personal income. Over the past five years, Merit Energy Company's direct payroll has averaged about $844,000 annually, though it presently is at about $740,000 on an annual basis. The incomes supported by Merit's operations in government, education, oil field services and other industries magnify that direct impact. When summed across all industries, the estimated labor income impact in Hot Springs County totals $4.07 million annually, with another $2.54 million elsewhere in the state –see Table 4 on the following page. The total local labor income represents nearly 7% of the corresponding total labor income in Hot Springs County in 2000.

[1] The IMPLAN estimates of the number of jobs in education reflect the proportion of the district's total locally derived property taxes paid by Merit. In reality, increases in state school foundation funds would offset much of the loss of Merit's taxes, resulting in a more limited reduction in staffing. Consequently, though the IMPLAN estimates likely overstate Merit's actual employment impacts, they are representative of the company's fiscal support for education.

TABLE 4
ANNUAL LABOR INCOME SUPPORTED BY MERIT ENERGY COMPANY'S HAMILTON DOME FIELD (MILLIONS OF $2002)

	In Hot Springs County	Elsewhere In Wyoming	Total
Merit Energy Direct	$ 0.84	$ 0.00	$ 0.84
Oil-field services & suppliers	$ 1.13	$ 1.02	$ 2.15
Other private sector	$ 0.56	$ 1.46	$ 2.02
Government and education	$ 1.54	$ 0.06	$ 1.60
TOTAL	**$ 4.07**	**$ 2.54**	**$ 6.61**

Note: Estimated annual labor incomes were derived using the IMPLAN model and Merit Energy average annual expenditures for 1997 through 2001.

Another measure of the economic contributions of Merit Energy's Hamilton Dome operation is its impact on overall economic output. A conservative estimate of the total statewide impact is nearly $28.7 million annually, most of which occurs in Hot Springs County. The largest portion of the total is represented by Merit's operations, including contracted services – see Table 5 below. By way of comparison, the total estimated 1999 economic output of Hot Springs County was about $195 million. The estimate is conservative as it does not account for the output associated with subsequent rounds of government spending and investments supported by the royalty and production tax payments or that associated with the subsequent refining and consumption of refined petroleum products across Wyoming supported by Merit's Hamilton Dome production.

TABLE 5
ANNUAL STATEWIDE OUTPUT SUPPORTED BY MERIT ENERGY'S HAMILTON DOME FIELD (MILLIONS OF $2002)

Category	Annual Amount
Direct Production Expenses	$ 9.81
Corporate Overhead	$ 0.86
Royalties, Taxes and Gross Net Revenue	$ 13.59
Indirect and Induced Private Sector Output	$ 4.40
Total Annual Statewide Output	**$ 28.66**

Note: The output estimates were derived using IMPLAN and Merit Energy expenditure data for 1997 through 2001

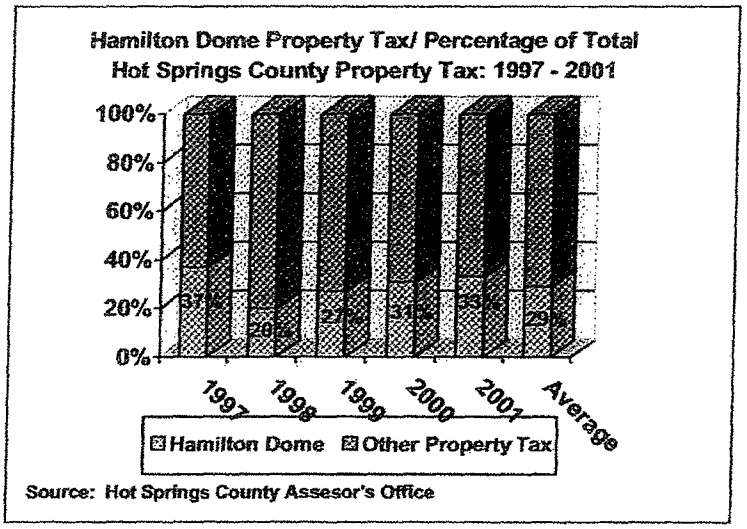
FISCAL CONTRIBUTIONS OF THE HAMILTON DOME OILFIELD

Wyoming oil producers pay ad valorem property taxes on production and on oilfield facilities, severance taxes on production, and sales and use taxes on some purchases of goods and services. Revenues from these taxes accrue to counties, school districts, and certain special districts, to the state general fund, and to a variety of other state funds and accounts. Additionally, the State of Wyoming receives half of the mineral royalties oil producers pay to the federal government and a portion of these revenues is distributed to local governments.

Ad Valorem Property Taxes

Oil producers pay property taxes on the assessed (taxable) value of production and oilfield facilities. Oil production is assessed at 100 percent of the fair market value (wellhead sales price) and facilities are assessed at 11.5 percent of fair market value (depreciated replacement value).

Property tax revenue from production and oil field facilities has accounted for two-thirds to three-quarters of the total property tax revenues received by county-wide taxing entities in Hot Springs County in recent years, (WTA 1997 – 2001). Crude oil production alone accounted for 73 percent of Hot Springs County assessed valuation in 2001 and has averaged 65 percent of total valuation between 1997 and 2001.



MEC is the largest taxpayer in Hot Springs County, and Merit's Hamilton Dome oil field is the county's largest single source of property tax. In 2001, Hamilton Dome accounted for 33 percent of total countywide property taxes paid in Hot Springs County ($2.7 million out of a total $8.3 million). Property tax revenue from Hamilton Dome production averaged 29 percent of total property tax revenue over the last five years ($1.9 million out of an average $6.6 million) (Deromedi 2002).

Property Tax Distribution

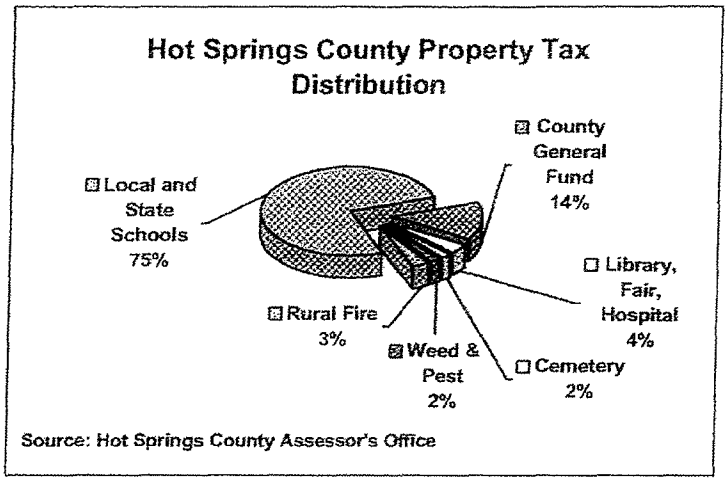
Schools receive the lion's share of property tax revenue in Wyoming. In Hot Springs County, an average of 75 percent of total countywide property tax revenue (including the state school

foundation program and the local school bond issue) has been distributed to schools over the last five years.

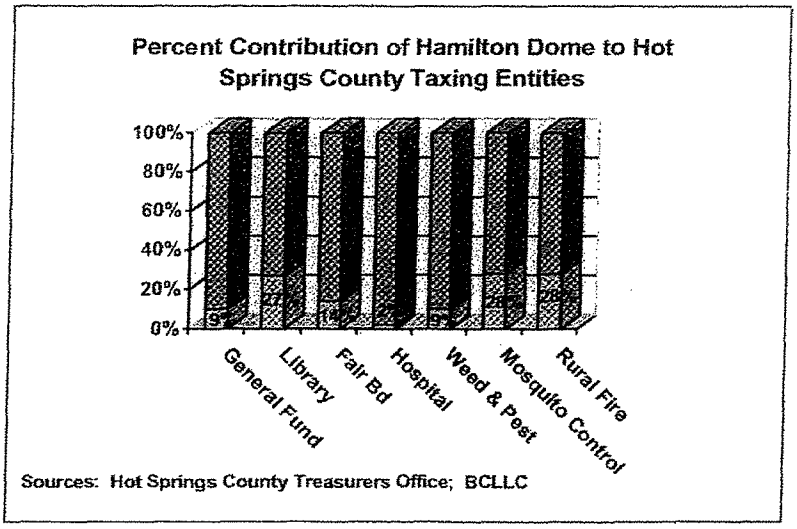
Hot Springs County General Fund

On a countywide basis, property tax revenues accrue to the Hot Springs County General Fund, and to the Library, County Fair and County Hospital funds. These entities are limited to a combined total levy of 12 mills, by state statute.

The county general fund provides revenues for all major county functions. Property tax revenues accounted for 40 percent of Hot Springs County general fund revenues during 2001[2], and averaged 37 percent of general fund revenues over the past four years[3] (Hot Springs County Treasurer's Office).



The relative importance of property tax revenue to the county general fund is greater than its percentage of total revenue however. Much of the county's non-property tax revenue is received from federal or state sources and is earmarked for specific programs or items. In Hot Springs County, property tax is the major source of revenue over which the commissioners exercise discretionary control. Consequently, any substantial reduction in property tax revenue will trigger reductions in basic county services because the commissioners cannot raise the mill levy above the 12-mill limit (Ford 2002).



Hamilton Dome property tax revenue accounted for 12 percent

[2] Total general fund revenues for 2001 were adjusted to account for an early federal PLT payment.
[3] County revenue data for 1997 were not readily available.

of total Hot Springs County General Fund revenue in 2001[4] ($356,000 out of a total $2.986 million), and averaged 9 percent of total revenues over the past four years ($241,000 out of average total $2.576 million).

Hot Springs County Library

The Hot Springs County Library receives property tax revenues from an average one-mill levy. Property tax revenues make up an estimated 95 percent of the library's budget (Bendlin 2002). Based on that estimate, Hamilton Dome property taxes have accounted for an average of 27 percent of the library's budget over the past five years ($27,000 out of an average total of $100,000). Because the library is included within the county 12-mill limit, a 27 percent reduction in revenues would result in a corresponding reduction in library services.

Hot Springs County Fair Board

The Hot Springs County Fair Board receives property tax revenues from a mill levy that has averaged six-tenths of one mill over the last five years. In 2002, property taxes received from a 0.79 mill levy will account for an estimated 52 percent of the fair board's total revenues (Smith 2002). Based on the 1997 through 2001 average property tax contributions, Hamilton Dome Property taxes would account for about 15 percent of the fair board's revenues ($16,000 out of an average total of $108,000).

Hot Springs County Memorial Hospital

The Hot Springs County memorial Hospital receives property tax revenues from a mill levy that has averaged nine-tenths of one mill over the last five years. Property tax accounts for an average of about 6 percent of the hospital's total revenues (Nading 2002) and Hamilton Dome property tax revenue accounts for an average of about 2 percent of the hospital's total revenues.

In addition to the entities identified above, whose property tax levies must fit under the 12-mill cap, other local government entities (districts) also collect property tax revenues. These entities include the Hot Springs County Weed and Pest District, the Hot Springs County Rural Fire Protection District, and Hot Springs County School District # 1.

Hot Springs County Weed and Pest District

The Hot Springs County Weed and Pest District receives property tax revenues from two separate one-mill levies. A statutory one-mill levy funds 30 percent of the district's weed and pest eradication program, the remainder is funded through payment for services. A one-mill special levy funds 100 percent of the district's mosquito control program (Smith 2002). Over the past five years, Hamilton Dome property tax revenues account for about 9 percent of the district's weed and pest eradication budget ($27,000 out of an average total of $312,000) and about 29 percent of the district's mosquito control budget[5] ($27,000 out of an average total of $94,000).

[4] Adjusted revenues as discussed in footnote #3.
[5] Based on 2002 budget

Hot Springs County Rural Fire Protection District

The Hot Springs County Rural Fire District receives property taxes from a mill levy that has averaged 2.2 mills over the past five years. The rural portion of the district relies totally on property taxes for funding its operations[6]. The department is staffed by volunteers. Property tax revenues are used to purchase equipment and supplies and to defray training costs. Hamilton Dome property taxes have funded an average of 29 percent of the rural fire district's budget over the past five years ($60,000 out of an average total $207,000). A reduction of 29 percent in total revenues would not result in a reduction of services, but it would mean that some needed equipment would not be purchased or replaced in a timely manner (Taylor, 2002).

Hot Springs County School District # 1

Hot Springs County School District # 1 receives property tax revenues from three different mill levies: a 26.5 mill special school levy, a 6 mill mandatory school levy, and a school levy to fund debt service on a bond issue. The latter has averaged 7.4 mills over the past five years. Property tax revenues from the special school and mandatory levies fund school district operations, and have comprised between 44 to 55 percent of the district's total operating budget in recent years (Cady 2002). The district also receives entitlement payments from the Wyoming school foundation fund. Revenues from the debt service levy go toward retiring a school bond issued for facilities construction. The bonds are scheduled to be retired in 2010.

Revenues from a 12-mill levy are distributed to the Wyoming School Foundation Fund. The foundation program guarantees a minimum level of funding, known as entitlement, for all public school students in Wyoming. School districts that cannot raise the specified amount from local resources receive payments from the school foundation fund to make up the difference. School districts whose local property tax base yields revenues substantially above the specified amount are subject to recapture, and the excess funds are paid to the state foundation account by the district. In general, reductions in Hot Springs County School District #1 property tax revenues from the special district and mandatory school levies would be made up by payments to the district from the school foundation fund.

If the Hamilton Dome field were to cease production, the Wyoming School Foundation fund would lose the revenue associated with the Hamilton Dome field, which have averaged $325,000 annually over the past five years. Additionally, the state foundation fund would have to increase entitlement payments to makeup for the loss of Hamilton Dome-related revenues from the 26.5 mill special school levy and the 6-mill mandatory school levy. Combined revenue from these levies has averaged $910,000 over the past five years. Therefore, the annual net cost to the Wyoming School foundation fund would total $1.235 million, based on the five-year average.

Because the school district's entitlement is based in large part on attendance, the district would lose revenue if Hamilton Dome employees moved out of Hot Springs County. The reduction in enrollment would likely be spread across a number of grades and schools; therefore,

[6] The district also provides coverage within the municipal areas, which is funded by contract, and on occasion receives grants to purchase equipment.

the loss in revenues would not be accompanied by a corresponding reduction in costs. If District # 1 were to lose enrollment, the net cost to the state foundation program would decrease.

The Hot Springs School Bond levy is funded 100 percent by property tax. Over the past five years, the school bond levy would have been an average of 2.8 mills higher without Hamilton Dome property tax revenues.

Wyoming Severance Tax

Wyoming oil producers pay a 6 percent severance tax[7] on oil produced in the state. In 2000, the Hamilton Dome field generated about $2.1 million in severance tax revenues. In 2001, severance tax revenues from the field totaled about $1.6 million[8]. These payments represent about 4 and 2 percent of total oil severance taxes for those years, respectively, and 0.08 and 0.04 percent of total severance tax payments.

Severance tax proceeds are distributed to the Mineral Trust Fund, Leaking Underground Storage Tank (LUST) account, the State General Fund, Water Development funds (I and II), Highway Fund, counties, county roads, cities and towns, capital construction, Budget Reserve Account.

Royalty Payments

Oil produced from the Hamilton Dome field generated about $5.1 million in federal mineral royalties in 2000, and about $3.7 million in 2001. The federal government distributes 50 percent of federal mineral royalties to the state where the minerals were produced. Hamilton Dome federal mineral royalty revenues to the State of Wyoming totaled $2.55 million in 2000 and $1.85 million in 2001.

In Wyoming, Federal Mineral Royalties are distributed to many different entities and funds. These include the University of Wyoming, the Wyoming School Foundation Fund, the Highway Fund, the Highway Fund for County Roads, and local municipal entities. Funds are also provided to special district and school districts for capital construction, state aid to county roads, Legislative Impact Royalty Account, community colleges, transportation enterprise account, general fund administrative account and others.

In 2000, federal mineral royalties generated by Hamilton Dome accounted for an estimated 1.7 percent of all federal mineral royalties to the state[9], in 2001, Hamilton Dome's contribution was about 0.8 percent of total.

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[7] Between 1/99 and 11/99 the severance tax rate was 4 percent. Severance tax rates are less for stripper oil, oil recovered from tertiary methods, new wells, incremental oil from workovers and completions and renewed production.

[8] Prior to 2000, Hamilton Dome was partially owned by another company, therefore total severance tax payments are not available for prior years.

[9] Including coal lease bonuses.

Sales and Use Tax

In Wyoming, sales and use taxes are levied on gross receipts from sales of tangible personal property and selected services including receipts from public utilities. The state levies a 4 percent sales and use tax; 28 percent of the revenues from this tax (less administrative costs) is distributed to the county and incorporated municipalities in the county of origin, according to a population-based formula. Hot Springs County also levies a 1- percent general revenue sales and use tax; proceeds from this tax are distributed to the county and its incorporated municipalities in the same manner as the local portion of the state tax.

It is conservatively estimated that MEC paid $400,000 in sales and use taxes on purchases of goods used in the Hamilton Dome field during 2001 (Kobielusz 2002). This is about 12 percent of all sales and use taxes collected in Hot Springs County during fiscal year 2001. However, because some vendors may have reported sales and use tax collections in their home counties, it is likely that not all of the local share of these revenues were distributed to Hot Springs county and its incorporated municipalities.

ECONOMIC LINKAGES BETWEEN THE HAMILTON DOME OILFIELD AND HOT SPRINGS COUNTY AGRICULTURE

As across most of Wyoming, farming and ranching in Hot Springs County is a way of life and a mainstay of the local economy. Though constrained by the limited amount of land in private ownership, an arid climate, and the difficult economic market conditions affecting livestock and commodity producers, the county's agriculture sector supports the economic livelihood of many Hot Springs county households.

Every five years the U.S. Census Bureau conducts a census of the nation's agriculture industry. Conducted at the end of those years ending with the number "2" and "7", the census compiles and reports data on production, size and other operating parameters for all farms and ranchers. According to the 1997 census, results of which were published in 1999, a total of 147 farms and ranches operated in Hot Springs County.

The census provides additional insights into these operations and the individuals and families who operate them. In terms of size, 64 of the 147 local farming and ranching operations are small, less than 180 acres. Another 42 are between 180 and 999 acres in size, with 41 operating on 1,000 or more acres. Farming and ranching is the principal occupation of the operator in 85 of 147 cases, while 62 operators are part-time or hobby operators with a principal occupation other than farming.

In terms of tenure or ownership, most of the farms and ranches are family owned and operated; 99 of the farms and ranches are operated by full owners, with another 44 operated by part owners. Among the operators, 38 reported operating the present farm for less than 5 years, compared t 62 operators who had been on the present farm 10 years or longer.

Most of the local agricultural operations engage in cattle ranching, with 17 raising sheep. In 1997, Hot Springs county farmers and ranchers reported a total inventory of 33,279 head of cattle, with sales of another 15,849 head during the previous year. Nearly a third of the total operations are farms engaged primarily in growing alfalfa, barley and other crops.

Local farmers and ranchers reported an aggregate total of 944,205 acres of land in use as part of their operations. The total includes land nearly 899,000 acres of private land and state and federal lands covered by grazing allotments used as pastureland or grazing range. Only about 38,000 acres of the total is irrigated, half of which is pastureland and the other half is cropland. Hay used for winter feed is the predominant crop raised in Hot Spring County. In 1997, more than 30,000 tons of hay was grown on just over 17,300 acres. Because these irrigated lands provide vital winter and spring range and winter-feed for the cattle and sheep herds, they are vitally important to the economic viability of the local agriculture industry.

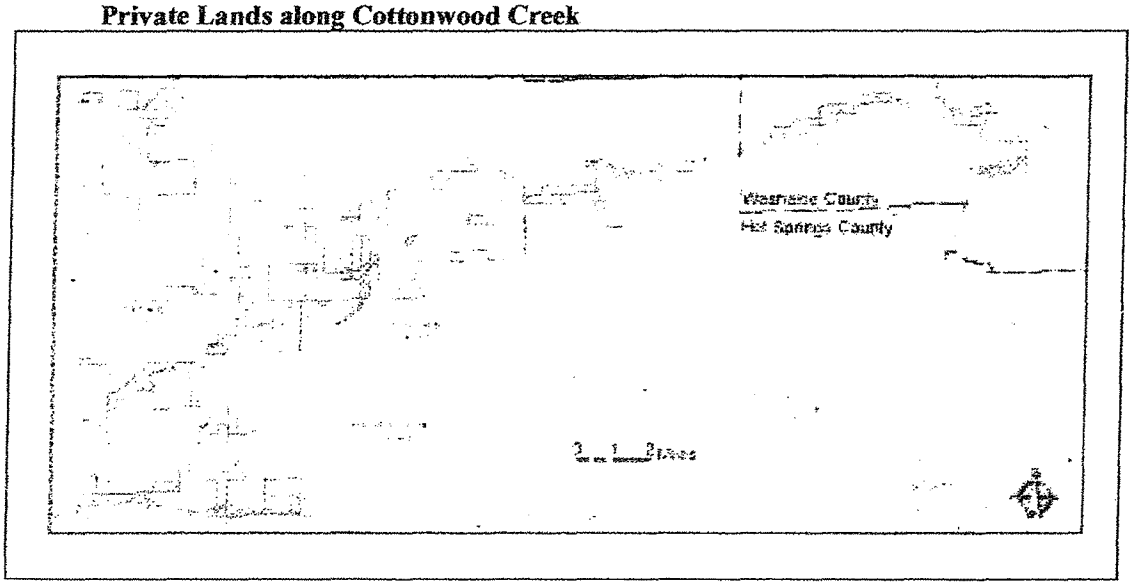
The combined marketing receipts from livestock and commodity sales totaled $9.6 million in 1997, an average of about $65,000 per operation. Of the total, $8.6 million was derived from livestock sales compared to $1.0 million from crop sales. However, operators incurred $7.6 million in production expenses to produce those sales. The major expenses included livestock, feed, fuel, hired labor, interest on loans, rent and property taxes. When these

expenses were combined with other costs, they left a residual net cash return of about $1.5 million, or an average of only about $10,200 per operation.

Cottonwood Creek

Approximately 35 landowners have property on or near Cottonwood creek. Virtually all of these landowners benefit directly or indirectly from the water discharged from the Hamilton Dome field. Three ranches immediately adjacent Hamilton Dome have rights to the discharged water, which is used for irrigation and stock watering. Water unused by these ranches flows down Cottonwood Creek and is used by landowners who have rights to Cottonwood Creek water, again for irrigation and stock watering.

Private Lands along Cottonwood Creek



Source: States West Water Resources Corporation

The indirect benefits of the Hamilton Dome water are substantial. Cottonwood Creek is known to have an intermittent flow above the Hamilton Dome discharge points. Natural flow along the creek is strongest in spring and early summer, diminishing to a trickle in mid-summer and in some years, disappearing altogether during late summer and fall.

Because the Hamilton Dome discharge provides a year-round flow, the water table along Cottonwood Creek is continually saturated and the resultant riparian growth stabilizes the streambed. This means that runoff into Cottonwood Creek from snowmelt and rainfall does not have to recharge the water table; virtually the full flow from these events is available for water users along the creek. Likewise, the stabilized streambed reduces siltation of the stream, resulting in more usable water during spring snowmelt and rainstorms.

Another important benefit of the Hamilton Dome discharge is that the temperature and constant volume minimizes icing of Cottonwood Creek in winter, particularly in the upper reaches. This allows year-round stock watering from the creek, enhancing its value for ranchers.

Although it varies from parcel to parcel, it is likely that more than two thirds of the crop production on irrigated land along Cottonwood Creek is made possible by the availability of water discharged from Hamilton Dome. Most of the irrigated land along the creek is used to irrigate pastures and produce an alfalfa/hay/grass crop, which is used as winter feed for cattle that are grazed on BLM grazing allotments during summer. This ability to graze livestock on leased rangeland during summer, pasture livestock on deeded land along Cottonwood Creek during winter, feed them on hay grown using Hamilton Dome discharge and water them from creek water kept running and open because of Hamilton Dome is key to the continued economic viability of many of the ranches along the creek.

Owners of several of the larger ranching operators along Cottonwood Creek were contacted to discuss the potential impact of curtailed water discharges on their operations. Collectively, these ranchers produce hay on approximately 2,250 acres of irrigated cropland, which in turn supports about 4,650 cows. These estimates reflect "normal" conditions, not the drought conditions that currently exist. In addition, they also create 29 full-time and seasonal jobs for ranch hands. On average, these ranchers estimated that 70% of their annual hay production was dependent on Hamilton Dome water. Prematurely cutting off the water flows would force the ranchers to cut back their herds and reduce the amount of hired labor they use.

For the purposes of this analysis, the loss of Hamilton Dome water is assumed to have a direct, proportional impact on the annual hay and beef production and use of hired labor for these operations. The estimated direct impacts under such a scenario are as follows:

- 1,600 acres converted from irrigated cropland to pasture or non-irrigated cropland
- 4,000 tons less of hay per year (@ net reduction of 2.5 tons per acre)
- A combined herd reduction of 3,200 cows
- An annual reduction of $2,000,000 in livestock sales receipts (@ $650 per head)
- A loss of 20 full-time and seasonal jobs in the ranching industry

Additional losses would be likely for ranches not included in the survey

The IMPLAN model was used to estimate the total economic losses in Hot Springs County, including the indirect and induced impacts on other sectors, associated with the direct reduction in annual livestock receipts. Those losses, which include a net reduction of $3.3 million (1.7%) in the county's total annual economic output, a loss of $645,000 in annual labor income, and a net loss of 32 full and part-time jobs, would be in addition to those impacts directly attributable to the cessation of Merit's Hamilton Dome production operations.

A further economic effect of the loss of produced water from the Hamilton Dome field would be a reduction in value of the agricultural property along Cottonwood Creek; the value of non-irrigated land is substantially less than the value of irrigated land.

THE SIGNIFICANCE OF HAMILTON DOME PRODUCTION TO WYOMING'S REFINING INDUSTRY

Wyoming is home to five operating petroleum refineries. With a combined daily average refining capacity of 140,386 barrels per day, Wyoming's refineries represent approximately 5% of the nation's domestic petroleum refining capacity. The refineries, their respective operators, location and daily distillation capacity are listed in the following table.

TABLE 6
WYOMING PETROLEUM REFINERIES, JANUARY 2001

Refiner	Location	Daily Capacity (barrels per day)
Frontier Refining Inc.	Cheyenne	38,670
Little America Refining Co.	Evansville	24,500
Silver Eagle Refining	Evanston	3,000
Sinclair Oil Corporation	Sinclair	62,000
Wyoming Refining Co.	Newcastle	12,216
STATEWIDE TOTAL		140,386

Source: U.S. Dept. of Energy, Energy Information Administration, 2001.

In 1997, the refining industry produced more than $1.2 billion in output, accounting for about 40 percent of the total statewide manufacturing output. Direct employment at the refineries totaled more than 700 jobs in 1997, those jobs averaging about $50,000 in wages and salaries to yield a combined annual payroll of over $35 million. Many more jobs and additional payrolls were indirectly supported in the pipeline, trucking and other related industries, as well as through consumer expenditures by the households directly and indirectly employed by the industry.

Crude oil from the Hamilton Dome field plays an important role in supporting the state's refining industry. Hamilton Dome crude is transported via pipeline to one of the in-state refineries via pipeline. Production presently averages about 4,600 barrels per day from the Hamilton Dome field. That production represents about 3.3% of the daily feedstock supply needed to sustain the in-state refineries at full production. In reality, Hamilton Dome's production is especially critical because the oil produced from Hamilton Dome is asphaltic crude, the primary source of asphalt and road oil.

Asphalt is a crucial component of highway construction and maintenance, airport runways and aprons and parking lots. As such, it is vital to sustaining Wyoming's economic health and that of surrounding states through its ties to the construction industry and by providing safe, efficient and reliable transportation capacity for residents, commercial traffic and tourists visiting the state. Furthermore, though accounting for only about 2% of the nation's asphalt and road oil refining capacity, asphalt and road oil production in the state has accounted for almost 10% of the nation's production in recent years.

Having a "local" supply of asphaltic crude is, therefore, important to the economic viability of the in-state refining industry. It helps minimize transportation costs and is vital to maintaining the overall operating efficiency and, hence, the cost competitiveness of the existing

refineries. Without the supply from Hamilton Dome crude, the economic viability of one or more of the refineries could be threatened.

Such a situation arises because petroleum refineries are not standardized industrial facilities, each able to process the same types of feedstock or produce the same outputs. Rather, refineries are built to different specifications with respect to inputs and outputs. The differences are manifest in the production capacity of different production streams.

Across the nation, the asphalt and road oil production capacity accounts for approximately 5.2% of the total refining capacity. In Wyoming, such capacity represents more than 13% of the total statewide refining capacity and 15% when adjusted to reflect the capacity of the three refineries that produce asphalt. Hamilton Dome supplies more than 20% of the crude needed to sustain those operations. While the prospect of eliminating the Hamilton Dome production might appear of limited consequence, the loss of that supply, coupled with uncertainty regarding the availability and costs of alternative supplies, could adversely affect the operating economics and profitability sufficiently to curtail asphalt production or even undermine the long-term economic viability of one of more Wyoming refineries. Such an event would trigger substantial job and income losses in the affected community and significant negative fiscal impacts for the affected local governments and school districts. Increased reliance on out-of-state supplies risks higher costs and increased potential for delays or disruption of deliveries, both of which have broad economic implications for the state.

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FILED

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Terri A. Lorenzon, Director
Environmental Quality Council

February 16, 2006

Mr. Mark Gordon
Chairman, Environmental Quality Council
122 West 25th Street
Herschler Bldg., Rm. 1714
Cheyenne, Wyoming 82002

RE: Docket No. 05-3102: Powder River Basin Resource Council Petition for Rulemaking

Dear Mr. Gordon:

Devon Energy Production Company, L.P. ("Devon") appreciates the opportunity to comment on the Powder River Basin Resource Council's ("PRBRC") Petition to Amend Water Quality Rule, Chapter 2, Appendix H ("Petition").

Devon produces oil and natural gas throughout the state of Wyoming, including a significant amount of coal bed natural gas ("CBNG") from the Powder River Basin. We are a member of the Petroleum Association of Wyoming ("PAW"), and join with PAW in requesting the Environmental Quality Council deny the PRBRC's Petition. In addition to consideration of PAW's comments, Devon asks the Council to consider the following comments and requests that they be made a part of the record in this matter.

WHOLESALE CHANGE IN WYOMING WATER LAW

The Council need only read the first two pages of the Petition to realize the intent of the petitioners is to address issues they perceive with CBNG production in the Powder River Basin. All the petitioners represent that they reside on or own land along tributaries to the Powder River. Nearly every person mentions CBNG production on or near their property and three of the ten claim to have damages to their soil, vegetation, or livestock caused by CBNG water.

It is important to note that the proposed rules are not limited to CBNG production, nor to the Powder River Basin. The Petition proposes amendments to Section (c)(i) of Appendix H. The Petition states the provision, which allows "'grandfathering' for some beneficial uses of water" will be changed to add a limit so that the exemption would only apply "to that quantity of water that can be demonstrated to have actually been put to beneficial use." However, Section (c) is actually entitled "Additional Permit Conditions and Limitations Specific to Oil and Natural Gas (*other than coal bed natural gas*) Production Facilities." (Emphasis added). The exemption to which the petitioners referred is an effluent limit exemption which only applies to "existing permits where the original permit application was submitted prior to September 5, 1978." *See*, Petition, Ex. 1.

We believe the primary aim of the Petition is to force DEQ to preserve natural flow regimes in ephemeral stream systems by requiring oil and gas producers to find and prove a *consumptive* use for all water discharged. Notwithstanding the conflict this creates with the State Engineer's constitutionally provided jurisdiction, requiring the DEQ to regulate flow to prevent changes in vegetation patterns or to stop flow so that cattle can graze on the bottom of a stream bed will have far reaching repercussions.

INTERFERENCE WITH THE AUTHORITY OF THE STATE ENGINEER

The DEQ's authority to regulate the discharge of water produced in association with the oil and natural gas extraction industry is derived from its delegated authority to administer the National Pollution Discharge Elimination System permits. Environmental Protection Agency regulations allow areas west of the 98h meridian to discharge this water into "navigable waters" when it has a use in agriculture or wildlife propagation. 33 U.S.C. §1342; 40 C.F.R. §435.50. "Use in agriculture or wildlife propagation" means that the water is "of good enough quality" to allow its use for 1) wildlife, or 2) livestock watering, or 3) other agricultural uses and that the water "is actually put to such use during periods of discharge." 40 C.F.R. §435.51(c).

Current DEQ water quality regulations mimic the federal provision, and only apply to the quality of water discharges. The regulations state:

> The produced water discharged into surface waters of the state shall have ***use in agriculture or wildlife propagation***. The produced water shall be of good enough quality to be used for wildlife or livestock watering or other agricultural uses and ***actually be put to such use during periods of discharge***.

Although its jurisdiction is specifically limited to water *quality*, DEQ takes water *quantity* into account in determining whether the water is "of good enough quality" to be used for wildlife and agriculture, especially when it comes to mixing zones. The DEQ also monitors the quantity of water being discharged by oil and gas producers, and permits in the Powder River Basin specifically require them to work together to prevent overtopping of streambeds, icing, and erosion of the channel.

Petitioners want DEQ to impose a "beneficial use" standard on CBNG by-product water that would require that all water be fully *consumed*, thus preventing any discharge into the streams of the state. However, the term "beneficial use" is not synonymous with the term "agriculture or wildlife propagation" found in the federal law. Under Wyoming's constitution, "beneficial use" standards are within the exclusive jurisdiction of the State Engineer. "[T]he supervision of the waters of the state and of their appropriation, distribution and diversion," lies with the Board of Control and the State Engineer. WYO. CONST. art. 8, §2. The State Engineer has "general supervision of the waters of the state and of the officers connected with its distribution." WYO. CONST. art. 8, §5. "Priority of appropriation for beneficial uses shall give the better right. No appropriation shall be denied except when such denial is demanded by the public interests." WYO. CONST. art. 8 §3. "Beneficial use shall be the basis, the measure and limit of the right to use water at all times[.]" WYO. STAT. ANN. §41-3-101 (Lexis 2005). The legislature specifically limited DEQ's authority to regulate water quality, providing that nothing in the Environmental Quality Act "limits or interferes with the jurisdiction, duties or authority of the state engineer, [or] the state board of control." WYO. STAT. ANN. §35-11-1104(a)(iii) (Lexis 2005). Further,

DEQ acknowledges that it does not have the authority to determine what constitutes a "beneficial use" of the state's waters. The introduction to Chapter 2 of the Water Quality Rules states that nothing in the regulations "supersede or abrogate the authority of the state to appropriate quantities of water for beneficial uses." DEQ Water Quality Rules Ch. 2 §1(a).

To the extent that petitioners advocate allowing DEQ to limit the amount of groundwater that may be withdrawn, that contention too must fail because such actions would again conflict with the State Engineer's jurisdiction. The withdrawal of groundwater for purposes of oil and gas exploration is specifically acknowledged as a beneficial use under Wyoming law:

> Any person who intends to acquire the right to beneficial use of any underground water in the state of Wyoming, shall, before commencing construction of any well or other means of obtaining underground water or performing any work in connection with construction or proposed appropriation of underground water or any manner utilizing the water for beneficial purposes, file with the state engineer an application for a permit to make the appropriation and shall not proceed with any construction or work until a permit is granted by the state engineer, provided, that *whenever a bore hole constructed for mineral exploration, oil and gas exploration, stratigraphic information or any other purpose not related to groundwater development shall be found to be suitable for the withdrawal of underground water, application shall be filed with and approved by the state engineer* <u>*before water from the bore hole is beneficially utilized*</u>.

WYO. STAT. ANN. § 41-3-930 (Lexis 2005).

<u>"BENEFICIAL USE"</u>

The rules proposed by the PRBRC would effectively impose the petitioners' idea of beneficial use on every operator in the state who needs to discharge water in association with oil and gas production and those who wish to use such water. This will necessarily lead to a restriction on the use of water from other groundwater wells, along with the return of water that has been beneficially used to waters of the state (to surface water or through infiltration to groundwater). Petitioners justify their position by painting a picture of the Powder River Basin with a very broad brush. CBNG water is not "salty"; while there may be elevated salinity in some water, there are plenty of areas where this water may be used to improve irrigation. In fact, CBNG water is often cleaner, and does a better job at leaching the soils, than the natural runoff traditionally used in spreader irrigation systems in this area.

The Petition also seems to request that landowners not be allowed to irrigate with CBNG water without the DEQ's approval. Several landowners with which Devon works are very protective of their private property rights and would not welcome such an intrusion into their affairs. Most water management plans in the Powder River Basin are developed through good faith cooperation between landowners and producers. It is unfair to those landowners that want to use the water to allow a few to prevent the use.

Overall, the petitioners present a very limited view of the benefits that can be provided by discharging and storing CBNG water. The presence of water on the surface, especially during the recent prolonged drought, presents bountiful opportunities for wildlife propagation, not just for drinking water, but also

for increased forage, wetlands, nesting areas, and other wildlife habitat. In fact, Devon received Wildlife Stewardship awards from the Wyoming Game and Fish Department in 2002 and 2004 for establishing CBNG water reservoirs that benefit wildlife. These water reservoirs enhanced vegetation and established watering sites for wildlife as well as habitat for water fowl and fish.

Finally, the allegation that water is being "flushed" downstream into Montana is simply false. The Wyoming DEQ has issued a draft policy for "Assimilative Capacity Allocation and Control" for the Powder River that caps the quantity of CBNG produced water that can reach the Powder River and prevents the changes in conductivity and sodium adsorption ratio in the mainstem that addressed in the Petition. Since March 2001, CBNG operators have, on a monthly basis, monitored the flow and water quality of the tributaries to the Powder River that receive CBNG discharge. They have also monitored the water quality on the mainstem of the Powder River upstream and downstream of the tributaries in accordance with NPDES permit monitoring plans. The USGS monitored flow and water quality at several locations on the mainstem of the Powder River and on major tributaries in Wyoming, including Clear Creek and Crazy Woman Creek, with varying locations and frequency. The flow data from both of these programs for the March 2001 through December 2004 monitoring period show that the flow contribution from both natural runoff and CBNG discharges has been less than 2.3% of the total flow in the Powder River measured at the Wyoming-Montana State Line.

EFFLUENT LIMITS

Devon also asks the Council to deny the PRBRC's request to impose more restrictive effluent limits for sulfates, total dissolved solids, and barium. The current effluent limits have been effective in protecting livestock and wildlife and the Petitioners have not demonstrated otherwise. Furthermore, these regulations were just amended in a process that took years to complete. The limits proposed in the Petition are overly restrictive and would result in an unnecessary requirement to treat or end discharges that are suitable and safe for livestock and wildlife, resulting in a waste of resources.

A change in the sulfate limit to 500 mg/l would result in a change in the classification of most of the natural shallow groundwater in the Powder River Basin from Class II to Class IV. Produced water from CBNG operations have extremely low sulfate levels and would generally not be affected by a change in the sulfate standard. The documents presented by petitioners also show higher levels are safe for livestock. Likewise, a TDS level of 5,000 mg/l is safe and suitable for livestock and lowering the limit to 2,000 mg/l would provide little actual benefit compared to the resources that must be expended to implement such standards.

The petitioners' proposal to reduce the effluent limit for barium is also unnecessary. The Extension Service document referenced by the Petitioners references an outdated EPA source for its recommendation. Most references do not even include barium in the livestock water quality criteria, including the Colorado State University Extension Service, which is quoted in the Petition as the source for a 0.3 mg/l barium limit for livestock. (*See,* http://www.ext.colostate.edu/PUBS/LIVESTK/04908.html; *See also*, http://www.agr.gc.ca/pfra/water/livestck_e.htm).

CONCLUSION

In conclusion, Devon urges the Council to summarily dismiss the PRBRC's Petition. The rules proposed in the Petition represent a violation of the constitutional authority of the State Engineer and Board of Control, as well as a violation of the statutory limits on the DEQ's authority. It would also impose unnecessary and imprudent restrictions on the discharge of water associated with oil and gas production facilities, and place the DEQ in the precarious position of impeding on private property rights. Further, it will necessarily lead to a restriction on the use of water from other groundwater wells, along with the elimination of return flows from beneficial uses. It is simply not appropriate for the Council to engage in rulemaking at the request of a handful of residents in the Powder River Basin, when the rules will jeopardize the beneficial use of surface and groundwater by thousands of others in the state.

Thank you for the opportunity to submit our comments. Devon reserves the opportunity to submit additional comments in response to hearing testimony and comments submitted by other parties. Please do not hesitate to contact me should you have questions or require additional information.

Sincerely,

Randall W Maxey

Randall W. Maxey by MTS
Senior Regulatory Specialist