

**2005 Annual Report
Powder River Basin Controlled Groundwater Area
Technical Advisory Committee**

Introduction

The Powder River Basin Controlled Groundwater Area (PRBCGA) was established to protect existing water users from impacts resulting from coal bed methane (CBM) development. The Montana Board of Oil and Gas Conservation (MBOGC) implement the PRBCGA through regulations that require characterization, monitoring, and evaluation of ground water conditions, and mitigation of impacts to existing water users.

A technical advisory committee (TAC) was established to oversee the ground-water characterization, monitoring, and evaluation requirements of the PRBCGA. TAC consists of five members selected by DNRC for their expertise in the Powder River Basin coal region, ground-water hydrology, and/or the CBM industry. In addition to overseeing monitoring and reporting requirements for individual fields, TAC is assigned to review ground-water data and scientific evidence related to the PRBCGA and make recommendations to the MBOGC regarding mitigation of impacts.

The purpose of this report is to describe the activities of TAC during 2005 and the impacts of CBM development on ground-water resources during 2004.

Summary of TAC Meetings

The TAC met on December 7, 2005 to discuss current and prospective CBM activity, progress of regional monitoring, the 2004 Ground-Water Monitoring report for CX Field, and ground-water monitoring plans for projects by Pinnacle. Attending the meeting were TAC members Michael Bergstrom, Peter Bierbach, John Wheaton, John Kilpatrick, and Russell Levens. Tom Richmond of the Montana Board of Oil and Gas Conservation and Andy Bobst of the U.S. Bureau of Land Management also attended. TAC member Angela McDannel was unable to attend.

Tom Richmond began the meeting with a description of current and prospective CBM activity in the Montana portion of the Powder River Basin. Besides Fidelity Exploration and Production Company, Pinnacle Gas Resources Inc., Powder River Gas, LLC., and Nance Petroleum obtained permits from the Montana Board of Oil and Gas Conservation for CBM development. Powder River Gas has plans for 238 wells in their Castle Rock project. Pinnacle plans to drill 132 wells in their Dietz project and 48 wells in their Coal Creek project. Nance Petroleum plans to drill one well for drainage protection near the Wyoming border. Permits for the Powder River Gas and Pinnacle projects are conditioned on the companies submitting monitoring plans for review and comment by the TAC.

John Wheaton described progress of the regional monitoring well network and discussed regional monitoring data. Data and interpretations from monitoring data through 2004 are presented in MBMG Open-File Report 528: Coalbed Methane Regional Ground-Water Monitoring Report: Montana Portion of the Powder River Basin. Andy Bobst also

participated in the discussion of regional-scale monitoring. Andy described a possible cooperative approach to monitoring involving industry and government agencies. Currently, each coalbed methane operator is required to submit a monitoring plan and conduct monitoring according to requirements of MBOGC that include shutting in wells to collect water pressure data. The idea behind the possible cooperative approach is to have coalbed methane operators fund well installation, monitoring, and reporting that would be conducted by an independent agency. A single consistent regional monitoring network would be built from the network being set up and monitored by MBMG. The potential benefit of a unified approach is more comprehensive regional monitoring and consistent reporting. The potential benefit of this approach to industry would be reduced monitoring and reporting costs, and reduce disruption resulting from annual shut-in requirements. Michael Bergstrom agreed to present the idea to his colleagues in the coalbed methane industry, but cautioned that he has heard concerns over similar proposals discussed previously. In addition, the TAC discussed the possible need to modify MBOGC order 99-99 to accommodate different monitoring requirements. Tom Richmond did not believe that would be necessary.

Michael Bergstrom described activities on Fidelity leases near Decker. New drilling has been limited to private and state-owned land because of an injunction against the BLM preventing them from issuing permits to drill on federal land. Discussion of Fidelity's CX Field 2004 Annual Groundwater Monitoring Report covered adequacy of monitoring in new developments east of the Tongue River and the overall objectives of monitoring. The general consensus of the TAC is that a more comprehensive regional scale monitoring network would allow the effects of development in new areas to be detected.

Unfinished Business

Representatives of Pinnacle Gas Resources Inc. were scheduled to present the TAC with monitoring proposals for their Dietz and Coal Creek projects, but were unable to attend the December meeting. The TAC expects to review monitoring proposals for these projects at their next meeting, tentatively scheduled for May 2006.

2005 CBM Development

The CX Field operated by Fidelity Exploration & Production Company near Decker Montana was the only CBM field producing in Montana during 2004. The 2004 Annual Groundwater Monitoring report for the CX Field was submitted to the MBOGC in April 2005. Fidelity's report contains information on development and monitoring activities, coal bed hydrogeology, ground-water conditions, and proposed changes to their monitoring plan. The report includes a list of wells and springs included in Fidelity's inventory at the end of 2004, structural contour maps for the Dietz, Carney, and Monarch coals based on the latest drilling information, potentiometric surface and drawdown maps, and lists of cumulative water production by well. Table 1 is a summary of volumes of produced water reported for the three coal beds developed at the CX Field and Figure 1 shows the limit of drawdowns observed in the Dietz and Monarch coals (based on maps provided by Fidelity). Monitoring data are insufficient to estimate the extent of drawdowns in the Dietz or Monarch coals east of the Tongue River or in the Carney coal in general.

Table 1. Summary of water produced from CBM production wells.

Field	Coal Seam	# Wells	Total Water Production	
			Barrels	Gallons
CX	Dietz 2000	62	9,334,416	392,045,472
	Dietz 2001	85	18,089,198	759,746,316
	Dietz 2002	91	7,314,850	307,223,688
	Dietz 2003	133	4,496,207	188,840,693
	Dietz 2004	159	7,038,114	295,600,799
	Monarch 2000	53	5,235,357	219,884,994
	Monarch 2001	75	10,237,672	429,982,224
	Monarch 2002	77	4,152,860	174,420,133
	Monarch 2003	89	2,998,966	125,956,551
	Monarch 2004	90	3,943,355	165,620,897
	Carney 2000	48	5,599,865	235,194,330
	Carney 2001	74	10,371,528	435,604,176
	Carney 2002	75	4,831,076	202,905,178
	Carney 2003	86	3,920,378	164,655,878
	Carney 2004	107	4,408,829	185,170,811
	Other 2004	4	35,782	1,502,825
Totals	2000	165	20,169,638	847,124,796
	2001	236	38,756,615	1,627,777,830
	2002	244	16,299,771	684,590,369
	2003	308	11,415,551	479,453,122
	2004	360	15,426,082	647,895,458

MBMG monitors ground-water levels and chemistry in dedicated monitoring wells installed beginning in the 1970s to investigate potential impacts of proposed coal mines. Monitoring wells installed during 2004 are located according to the regional monitoring plan developed by the TAC. These wells are located in coal zones near their outcrops, in areas where water from coal beds is heavily used, and along the Wyoming border. Locations of regional monitoring wells, and data and interpretations from monitoring conducted through 2004 can be found in Wheaton and others (2005).

References

Wheaton, J, T. Donato, S. Reddish, and L. Hammer, 2004 Annual coalbed methane regional ground-water monitoring report: Montana portion of the Powder River Basin, Montana Bureau of Mines and Geology, Open-File Report 528, 45 pp.

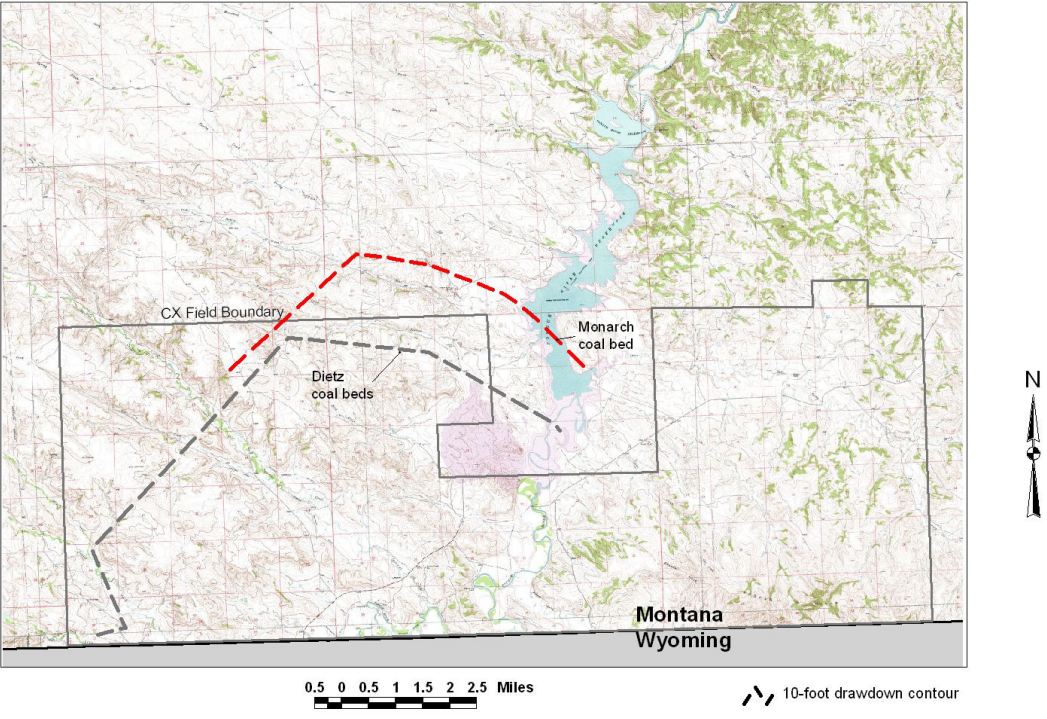


Figure 1. Map of 10-foot water level drawdown contours for Dietz and Monarch coal beds.