2002 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 and the impacts of CBM development on ground-water resources during 2002.

Summary of TAC Meetings

TAC met on March 1, 2002 at the US Bureau of Land Management (BLM) offices in Billings and on August 14,2002 conference call.

March 1, 2002 Meeting

TAC met to discuss the locations of wells to be drilled by the Montana Bureau of Mines and Geology (MBMG) for monitoring impacts of coal bed methane development. The subject wells are intended to be the first installation of the regional-scale monitoring program developed by TAC and included in the Statewide Draft Oil and Gas Environmental Impact Statement. The proposed wells will be installed by MBMG using existing funding and, if available, funding through additional grants.

Wayne Van Voast and John Wheaton proposed five monitoring locations selected because of their proximity to coal outcrops and important water resources. TAC reviewed Wayne and John's selections, and identified tracts of public lands that could be accessed for drilling. TAC then identified four additional areas where monitoring is needed if additional funding becomes available.

August 14, 2002 Conference Call

TAC met via conference call to discuss 2000 and 2001 annual ground-water monitoring reports for the CX Field, questions regarding confidentiality of monitoring data contained in the reports, the TAC annual report, and a draft guidance document for monitoring CBM operations. Questions came up during discussions regarding monitoring requirements and access to

monitoring data for Indian Lands, and transfer of CBM wells from companies for regional ground-water monitoring.

Confidentiality of monitoring data contained in monitoring reports submitted to the Montana Board of Oil and Gas Conservation (MBOGC) by CBM operators was the first topic of discussion. The question of confidentiality was raised to clarify how TAC and others can use data CBM operators consider sensitive. DNRC legal staff stated prior to the meeting that data collected from monitoring, testing, and production wells, and springs are public, however a developer can take action to get a protective order from a court to prevent disclosure of "sensitive information". Michael Bergstrom stated that the legal staff at Fidelity views all monitoring data to be public and subject to disclosure. Consequently, at least for Fidelity operations, monitoring data are considered public. Other CBM operators who work in Montana in the future may desire to protect what they consider sensitive data from public disclosure. In those cases, the CBM operator will need to identify sensitive data when it is submitted and take the necessary legal action if a request for disclosure is received.

CBM Development

The CX Field operated by Fidelity Exploration & Production Company (formerly Redstone) in the Squirrel Creek Drainage near Decker Montana was the only CBM field producing in Montana during 2002. The 2002 Annual Groundwater Monitoring report for the CX Field was submitted to the MBOGC March 31, 2003. 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 2002, 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 CBM well #.

Table 1 is a summary of volumes of water produced and Figure 1 is a map showing the estimated extent of drawdowns in the three coal beds being developed at the CX Field. The 10-foot drawdown contours shown in Figure 1 are based on maps presented in Fidelity's 2002 annual report and are intended to illustrate the extent of detectable impacts from CBM development at the CX Field. A number of assumptions were made in preparing Figure 1. First, a northeast trending fault is assumed to limit drawdowns in the northwest corner of the CX Field. Second, because of limited monitoring data, the extent of drawdown in the Carney coal northeast from producing CBM wells was extrapolated based on a logarithmic distance-drawdown relationship derived from maximum drawdowns and distances to the 10-foot drawdown contours for the Dietz and Monarch coals.

Water production from the Dietz coal averaged 6.4 gpm per well in 2002 compared to 17 gpm per well in 2001. Similarly, water production fell from 10.9 gpm per well to 4.3 gpm per well from the Monarch coal, and from 1 1.2 gpm per well to 5.1 gpm per well from the Carney Coal. The spatial extent of drawdown from the CX Field did not change significantly between 2001 and 2002. CBM production has lowered water levels in all three coals beneath the southeastern 213 of the CX Field and extending beneath Fidelity leases in Wyoming. In addition, drawdowns in the Carney coal probably extend northwest from the CX Field, possibly as much as several

miles. The limited number of wells monitored by Fidelity northwest of the northeast trending fault shown in Figure 1 indicates there is limited or no drawdown in h s area.

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
	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
	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
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

The magnitude of drawdown within the CX Field did increase between 2001 and 2002 as Fidelity has begun to achieve their objective of reducing water pressures in the coals to facilitate CBM production. For illustration, Figure 2 shows the expansion of the 100-foot drawdown contour in the Dietz Coal between 2001 and 2002.

Regional Monitoring

MBMG monitors ground-water levels and chemistry in dedicated monitoring wells installed beginning in the 1970s to investigate potential impacts of proposed coal mines (see Figure 3 for distribution of monitoring wells around the CX Field near Decker). Eighteen additional wells were installed at eight locations in 2002 by MBMG under the regional monitoring plan developed by the TAC. These wells are completed in coal zones near their outcrops in prospective areas of CBM development. More wells are planned for coal outcrop areas and the vicinity of the Wyoming border.