Groundwater Monitoring and Reporting Guidelines

Prepared for CBM Producers Operating in Montana

By the CBM Technical Advisory Committee (TAC)

On Behalf of the Montana Board of Oil and Gas Conservation

(June, 2009)

The following Guidelines were adopted by the Montana Board of Oil and Gas Conservation (BOGC) in accordance with Board Order 151-2008 (2008), and Montana Department of Natural Resources and Conservation (DNRC) Final Order for the Powder River Basin Controlled Groundwater Area (1999). Prior to the BOGC's public hearing regarding an Applicant's proposed Coal Bed Methane (CBM) POD, the Applicant will submit a monitoring and evaluation plan for water resources in the project area (herein called the "Groundwater Monitoring and Reporting Plan") to the TAC for its review and input. The TAC has 60 days following receipt of a Groundwater Monitoring and Reporting Plan to review and provide written recommendations to the Board and notification to the applicant.

Groundwater Monitoring and Reporting Plans must include the following components:

1. Introduction and Scope of Work: For each proposed Plan of Development (POD) area, the Applicant will describe their process to collect pre-production and post-production hydrostatic pressures and water quality data. The Applicant will also describe their process to measure or estimate hydrostatic pressure during production of each monitored zone, as determined below. These data are to be collected on a regular annual basis in a consistent manner throughout the period of CBM production.

2. Identify Areas to be Monitored: Based on site-specific hydrogeologic analysis, the Applicant will identify the geographic area to be monitored. This area will include the POD area and a peripheral zone over which the operator reasonably believes may be affected by de-pressurization/drawdown from the proposed POD. At a minimum, the peripheral zone must extend one mile beyond the exterior boundary of the proposed POD area. The geographic area to be monitored will be displayed on the map(s).

3. Private Well and Spring Inventory: The Applicant will provide a list of all wells and springs within the geographic area to be monitored which are identifiable with public records. At a minimum, public records for the purpose of these Guidelines include the database of Ground Water Information Center (GWIC) (http://mbmggwic.mtech.edu/) and DNRC's Water Right database (http://nris.state.mt.us/dnrc/waterrights/default.aspx). These wells and springs will be categorized as "Potentially Affected", or "No Potential for Effects" within the meaning of the DNRC Final Order designating the Powder River Basin Controlled Groundwater Area which states that CBM groundwater withdrawals, "are monitored and the water withdrawals be controlled where existing beneficial uses of

water are adversely affected". The coal seam from which potentially affected wells or springs may be obtaining water will be identified. Available supporting hydrogeologic data such as static water levels and water quality data, along with well construction information will be provided. The Applicant will also provide a map or maps showing the proposed POD area, location of proposed CBM wells, hydrologic features, area geology and structure, and the potentially affected wells and springs.

4. Groundwater Monitoring Network and Evaluations: Based on the site-specific hydrogeologic analysis and the well and spring inventory above, the Applicant will identify the coal beds to be produced which are also water sources for potentially affected wells and springs. The Applicant will propose a network for annual monitoring of each coal bed which provides for monitoring of hydrostatic pressure (head) within the producing field, and monitoring of hydrostatic pressure (head) at all potentially affected wells and monitoring of flow at all potentially affected springs in the peripheral zone of the POD area for which landowner permission can be obtained. The Applicant may propose to monitor a representative subset of potentially affected wells and springs best suited to characterize effects from the proposed POD. The applicant also may propose to use monitoring wells constructed and situated to measure the hydrostatic head in the coal bed of interest. There must be sufficient monitoring to establish a distance-drawdown relationship for each coal bed to be produced which is also a water source for potentially affected wells and springs. The applicant may propose a different density of monitoring in coal beds with the greatest potential for adverse effects on existing wells or springs as a result of CBM production and may propose alternate methods for developing distance-drawdown relationships for coal beds with limited potential for adverse effects.

   Preexisting monitoring wells, private wells and non-producing CBM wells may be utilized to define the hydrostatic pressures (heads) in the peripheral zone where possible so long as the monitoring data obtained are representative of an individual coal bed and not comingled produced coal beds. It should be recognized that since private wells typically do not have an annular seal, they may be of limited use for defining hydrostatic pressures. Where PODs or CBM developments adjoin, monitoring networks should be based on a unified monitoring approach where feasible. The Applicant will present a summary table and map of the proposed monitoring network, which will show the existing and/or proposed wells to be monitored and identify any sources of data expected to be obtained by other entities. The aquifer in which the wells are completed will be indicated. Any alternatives or deviations to the monitoring guidelines described herein will be explained. In developing the monitoring network, Applicants and the TAC will take into consideration limitations and opportunities of land and mineral ownership, accessibility, geology, well construction, and other relevant factors.

5. Data Management: The Applicant will present a proposed schedule for collection and submission of monitoring data and supporting information consistent with guidance provided by the TAC or the Board. The data management process shall be designed to enable the development of a consolidated Annual CBM Regional Groundwater

Monitoring Report for coal bed methane production from the Powder River Basin in Montana which is focused on protection of water supplies.

Submission of Groundwater Monitoring and Reporting Plans: CBM producers are responsible for submitting Groundwater Monitoring and Reporting plans to the TAC and Board. The TAC shall review the Applicant's proposed Groundwater Monitoring and Reporting Plan and may: a) recommend approval of the plan without change, b) recommend approval of the plan with conditions, or, c) recommend rejection of the plan as presented and provide reasons for such recommendation, and in each case notify the Applicant and the Board in writing within 60 days of receipt of the plan. A review of the proposed Groundwater Monitoring and Reporting Plan may be requested by the TAC, the MBOGC Administrator or the Applicant and scheduled prior to the TAC's recommendations to the Board. Revisions to the proposed Groundwater Monitoring and Reporting Plan will be incorporated according to their mutual agreement.

Modification of Groundwater Monitoring and Reporting Plans: Applicants may request modification of previously approved Groundwater Monitoring and Reporting Plans. These proposed modifications will be submitted to the TAC. The TAC will evaluate the modified Groundwater Monitoring and Reporting Plan and provide recommendation for approval or modifications in writing to the Applicant and Board within 60 days following receipt of the modified plan. Modifications to Groundwater Monitoring and Reporting Plans which are within the scope of the existing Monitoring Guidelines and considered to be minor or an improvement by both the TAC and BOGC Administrator may be administratively approved through use of a Sundry Notice (Form 2), letter or memorandum.

Reassessment of Groundwater Monitoring and Reporting Plans: The TAC will reassess each CBM producer's Groundwater Monitoring and Reporting Plan annually, and may recommend to the Board that a CBM producer modify the plan. A monitoring plan review may also be performed at the request of the BOGC Administrator.

Annual Reporting of Monitoring Data, Information and Evaluations: Groundwater monitoring data and information collected or compiled by CBM producers pursuant to approved Groundwater Monitoring and Reporting plans will be submitted to the Board and the TAC and archived in GWIC by MBMG. Monitoring Data, Information and Evaluations will be reported in a consolidated Annual CBM Regional Groundwater Monitoring Report prepared by MBMG. If a consolidated report is not prepared, or does not contain the required monitoring data, information and evaluations, individual field- or POD-specific reports must be prepared by CBM producers.

TAC Review of Monitoring Data, Information and Evaluations: The TAC shall review the consolidated Annual CBM Regional Groundwater Monitoring Report or individual reports and may make recommendations to the Board as provided in DNRC's Final Order designating the Powder River Basin Controlled Ground Water Area. If, upon review of the consolidated or individual reports, the TAC determines that a CBM producer has failed to submit the required monitoring data, information and evaluations; the TAC shall notify the CBM producer of the deficiency and provide the CBM producer with a reasonable period to time, not to exceed 60 days, within which to provide the requested information, or to obtain an extension of time. A failure to provide the requested information may be grounds for a determination by the TAC that

the CBM producer is in non-compliance with the monitoring and reporting requirements and may be reported by the TAC to the Board.