

Groundwater and Surface Water Regulation and Management in Western Canada's Emerging Shale Gas Regions

Jamie Wills, Waterline Resources Inc

Technological advancements in fracturing and well stimulation have led to the development of the global unconventional gas market. These and related technologies have resulted in coal bed methane development in Alberta, and more recently to shale gas development in the Montney area and the Horn River Basin in British Columbia (BC). In contrast to coalbed methane development, shale gas development involves the use of large volumes of water (e.g., 25,000 to 40,000 m³ of water per fraced well). Based on recent press releases, hundreds of gas wells are planned for the Horn River Basin alone in the next several years. As such, water use for shale gas development is expected to increase significantly. To date, water use for BC's Horn River shale gas drilling and fracturing operations has largely been sourced from surface water, owing to the apparent abundance of surface water resources. In contrast, little to no assessment of the source water potential of area groundwater resources has been undertaken.

The Horn River Basin is remote, sparsely populated, and limited site-specific climatologically data exists with which to construct accurate area-specific water mass balances. For this reason, uncertainty exists with respect to the sustainability of surface water resources in light of the planned shale gas development. Considerable uncertainty also exists with respect to area groundwater resources, as well as to related aspects such as groundwater – surface water interaction. Industry, regulators and stakeholders understand the need to resolve current data gaps to ensure that shale gas development is implemented in a sustainable manner with respect to water use. For this reason, regional assessments are underway to start to address area water resources.

Unlike Alberta, BC has no saline/non-saline water definition, and only surface water use requires a license

under the Water Act (i.e., groundwater use requires no license). There is also no specific requirement to reuse water returned to surface during fracturing operations. In advance of the expected increase in water use by the shale gas industry, BC has initiated an update to the water regulatory framework (e.g., Oil & Gas Commission draft guideline on water permitting). During this period of regulatory transition (and uncertainty), many producers are initiating their own assessments to provide data to better define area water resources from a sustainable perspective.

This presentation will provide an overview of existing and emerging BC water regulations. It will also provide an overview of phased, cost-effective surface water and groundwater assessments that industry can use to better define surface water and groundwater resources at/near their operations.

Jamie Wills, M.Sc., P.Geol.

Mr. Wills is president of Waterline Resources Inc, a Calgary Alberta and Vancouver Island-based hydrogeological consulting firm. He has a M.Sc. in hydrogeology (UofW), and 23 years of related experience focusing mainly on groundwater exploration, development and management. He has extensive national and international experience, and since 2000 he has focused on preparing EIAs for oil sands projects. In addition to providing senior technical oversight, Mr. Wills is increasingly being retained to assist clients in interpreting and navigating the evolving water use approval process in western Canada. He is a former regulator, and a past-President of the Canadian Chapter of the International Association of Hydrogeologists.