

Environmental Impacts of Shale Gas Extraction in Canada

The North American energy landscape is undergoing dramatic change. Unconventional oil and gas resources are fuelling an energy boom that is having profound economic, environmental, and social impacts across much of the continent, including Canada. At the forefront of this change is shale gas, which has been characterized as a “game changer” because it is abundant, often close to major markets, and relatively inexpensive to produce. Understanding potential impacts is critical for policy makers as they consider how best to manage this resource.

This report comes at the request of Environment Canada, which asked the Council to assemble a multidisciplinary expert panel to consider the state of knowledge of potential environmental impacts from the exploration, extraction, and development of Canada’s shale gas resources. The Council’s report presents a comprehensive examination of shale gas development in Canada. It does not, however, determine the safety, nor the economic benefits, of development. It reviews the use of new and conventional technologies in shale gas extraction, and examines several issues of concern including potential impacts on surface water and groundwater, greenhouse gas emissions, cumulative land disturbance, and human health. The report also outlines approaches for monitoring and research, as well as mitigation and management strategies.

Key findings

Although the technologies and techniques used in extracting shale gas are understood, more research and information is needed on the potential environmental impacts that could result from this process. In Canada, shale gas development has moved forward in British Columbia and Alberta while potential development is still being explored in Quebec, New Brunswick, and Nova Scotia. Unlike the United States, Canadian development has moved at a slower pace. This slower pace of development presents a unique opportunity for Canada to take the time to explore and determine the proper management practices to develop its shale gas resources responsibly.

For Canada, regional context matters. Environments, ecosystems, geographies, and geologies are not uniform across the country. Therefore, consideration of different potential regional impacts need to be closely considered when determining the suitability for shale gas development.

Overall, the Panel found that well-targeted science is required to ensure a better understanding of the environmental impacts of shale gas development. Currently, data about environmental impacts are neither sufficient nor conclusive.

The Panel’s assessment focused on a number of environmental impacts. They include:

- **Well Integrity**
- **Water (groundwater and surface)**
- **Greenhouse Gas Emissions**
- **Land Impacts and Seismic Events**
- **Human Health**
- **Monitoring and Research**

Question

What is the state of knowledge of potential environmental impacts from the exploration, extraction, and development of Canada’s shale gas resources, and what is the state of knowledge of associated mitigation options?

Report and related products:

- **Environmental Impacts of Shale Gas Extraction in Canada**
- **Executive Summary**
- **Report in Focus (abridged version)**
- **News release and backgrounder**

Expert Panel

The Expert Panel on Harnessing Science and Technology to Understand the Environmental Impacts of Shale Gas Extraction is chaired by **John A. Cherry**, Director of the University Consortium for Field-Focused Groundwater Contamination Research, Associate Director of G360 Centre for Applied Groundwater Research, and Adjunct Professor in the School of Engineering at the University of Guelph. For a complete list of panel members visit the **[Expert Panel on Harnessing Science and Technology to Understand the Environmental Impacts of Shale Gas Extraction](#)** page.



Members of the Expert Panel on Harnessing Science and Technology to Understand the Environmental Impacts of Shale Gas Extraction at a site visit near Calgary, AB, as part of their second panel meeting, August 2012.

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