Council of Canadian Academies
Conseil des académies canadiennes

News Release

Expert Panel finds monitoring, management, and oversight critical for responsible shale gas development in Canada

Ottawa (May 1st, 2014) – A new expert panel report, ***Environmental Impacts of Shale Gas Extraction in Canada***, concludes that shale gas development must be supported by well-targeted science and management strategies to understand and mitigate potential impacts. The report, released today by the Council of Canadian Academies, addresses environmental and associated health impacts and offers insights regarding public engagement and trust.

Shale gas is leading an energy boom which is having profound economic, environmental, and social impacts across much of North America. Shale gas has been characterized as an energy "game changer" because it is abundant, often close to major markets, and relatively inexpensive to produce. As the world's third-largest natural gas producer, fourth-largest exporter, and possessing vast shale gas resources of its own, Canada has a major stake in this new source of energy.

"For Canada, regional context matters. A one-size-fits-all approach will not work to address the various potential environmental impacts that may exist across Canada's diverse regions," said Elizabeth Dowdeswell, President of the Council of Canadian Academies. "As such, communities and decision-makers will need to consider potential environmental impacts within their own contexts and decision-making processes."

The Panel's report sheds light on a variety of potential environmental impacts associated with well integrity; groundwater and surface water; greenhouse gas emissions; land impacts and seismic events; and human health. The report also addresses the importance baseline and ongoing monitoring, and the need for research and data-gathering.

The Expert Panel was not asked to conduct a safety assessment, determine the economic feasibility of shale gas development, or compare energy sources. The report provides a comprehensive examination of potential impacts and insights on how best to mitigate them. Environment Canada's foresight in requesting this examination provides governments, industry, and other stakeholders with an in-depth resource for considering future Canadian development.

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For more background information click here, or visit the Council of Canadian Academies' website, www.scienceadvice.ca, to download a copy of the Panel's report.

About the Council of Canadian Academies
The Council of Canadian Academies is an independent, not-for-profit organization that began operation in 2005. The Council supports independent, authoritative, and evidence-based expert assessments that inform public policy development in Canada. Assessments are conducted by multidisciplinary panels of experts from across Canada and abroad. Members of the Council's blue-ribbon panels serve free of charge. The Council's vision is to be a trusted voice for science in the public interest.

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Media Backgrounder
Environmental Impacts of Shale Gas Extraction in Canada

The Council of Canadian Academies was asked by Environment Canada to conduct an evidence-based assessment to determine the state of knowledge on potential environmental impacts from the exploration, extraction, and development of Canada's shale gas resources. The Council was not asked, however, to determine the safety, nor the economic benefits, of development.

To conduct the assessment, the Council assembled a multidisciplinary expert panel to consider all available evidence relating to shale gas development in Canada. The Expert Panel on Harnessing Science and Technology to Understand the Environmental Impacts of Shale Gas Extraction met five times over a 24-month period during the assessment process. The Panel relied on peer-reviewed literature and reports from government, industry, international bodies, and non-governmental organizations, in addition to workshops and conference attendance, and the Panel's own expertise. The Panel was challenged by a lack of available literature when it first began work, although sources of evidence grew rapidly over the course of the assessment.

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

Well Integrity

Natural gas and fluid leakage from wells due to inadequate cement seals is a long-recognized yet unresolved problem that continues to challenge engineers. Leakages could lead to impacts for both water and GHG emissions. As shale gas development requires a high density of wells to sustain a stable production rate, the need for well integrity is paramount, especially in areas that depend on groundwater for potable water supply. Improved technologies as well as long-term monitoring are required to manage impacts.

Water

The Panel placed significant focus on both groundwater and surface water during its review. Most experts agree that impacts on water raise the greatest environmental concern from shale gas development.

Risks exist for both potable groundwater and surface water. The greatest threat to groundwater is gas leakage from wells for which the impacts are not being systematically monitored and predictions remain unreliable. Potable groundwater can also be at risk from underground pathways for gases, fracturing chemicals, and saline fluids that migrate upwards.

Other water-related concerns include accidental surface releases of chemicals, the amount of water needed for development, and disposal of wastewater. Proper management and continued monitoring can help mitigate some of these risks.

Greenhouse Gas (GHG) Emissions

The impact of GHG emissions from shale gas will depend on the control of methane leakage, how shale gas is used, and broader energy policy.

Land Impacts and Seismic Events

Large-scale shale gas development may represent the start of decades-long industrial activity. As such, cumulative and regional effects on land resources and use will need to be assessed. Potential effects can include such things as the development of infrastructure near well sites. It should be noted that practices currently exist to reduce the land footprint of shale gas development.

Most experts judge the risk of seismic events triggered by hydraulic fracturing or by wastewater injection to be low. Both risks can be diminished through careful site selection, monitoring, and management.

Human Health

Human health and well-being may be affected by various environmental effects (e.g. air and water quality) resulting from shale gas development. However, health impacts are not well understood and additional research is required.

Many within the public are skeptical of shale gas development. Lack of transparency can lead to a perception that industry or regulating authorities are not forthcoming. Therefore, attention must be paid to ensuring open and transparent communication regarding shale gas development.

Monitoring and Research

In many instances to date, shale gas development has proceeded without sufficient baseline data. The report underscores that reliable and timely information is essential to manage potential environmental effects. The Panel also found that possible environmental and health effects of shale gas development may take decades to become apparent, underlining the need for long-term monitoring.

The Panel acknowledges that with a 'go-slow' approach and properly designed management strategies that include sound technologies, safety management by industry, effective government oversight, regional planning, and public engagement, there is an opportunity for Canada to reduce potential environmental and health impacts that may arise from shale gas development.

What this report is meant to do

The report will help to inform federal, provincial, and municipal governments, industry, oil and gas associations and organizations, and the public on impacts related to shale gas development, and aid in the creation of management and mitigation strategies.

To download a copy of *Environmental Impacts of Shale Gas Extraction in Canada* visit: http://www.scienceadvice.ca/en/assessments/completed/shale-gas.aspx