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Sustainable Development of the Shale Gas Industry in Québec

Inquiry and Public Hearing Report

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Opinions and Observations

In its report, the inquiry commission presents a number of opinions and observations based on its analysis. They have been grouped together in the pages that follow, which is referring to the French version report. Readers should refer to the context in which opinions and observations were presented in order to fully understand their significance and scope.

Structure

Environmental controls and supervision

Opinion – For its analysis, the inquiry commission used a range spread of between 150 and 600 horizontal wells drilled per year, over a period of several decades. The rate of 600 wells per year may be exceeded if conditions are conducive to development, as is currently the case in the Barnett shale in Texas and the Marcellus shale in Pennsylvania. → p. 95

Water requirements

Salvaging and reusing water

The inquiry commission observes that the weak concentration of total dissolved solids in flowback water, which is characteristic of the Utica shale, would enable the water to be reused without the need for extensive treatment. → p. 99

Opinion – The inquiry commission is of the opinion that water derived from shale gas exploration and extraction activities should be put to the best possible use, in order to reduce the volumes withdrawn and treated. → p. 99

Availability of water

Opinion – The inquiry commission is of the opinion the industry should work together with drainage basin organizations and the Ministère du Développement durable, de l'Environnement et des Parcs to ensure that the industry's activities and their cumulative impacts are taken into consideration in water master plans. → p. 101

Surface water

The inquiry commission observes that surface water resources may be sufficient to meet the needs of the shale gas industry, provided they are used during periods approved by the Ministère du Développement durable, de l'Environnement et des Parcs. → p. 102

Opinion – The inquiry commission is of the opinion the watercourse flow monitoring network should be adjusted to ensure a form of management that is appropriate in light of the cumulative impacts of industrial activities and ecosystem support capacities. → p. 103

Groundwater

The inquiry commission observes that, based on current data, the water tables in the St. Lawrence Lowlands are generally not productive enough to provide the water required for hydraulic fracturing activities, and that groundwater, as a source of drinking water, needs to be preserved and protected, since it does not usually need prior treatment. → p. 111

Opinion – The inquiry commission is of the opinion that the gas industry should use surface water as its source. However, alternative sources could also be proposed, including groundwater that is unfit to drink. → p. 111

The inquiry commission observes that current knowledge acquisition initiatives on the subject of groundwater, due to be completed in 2013, cover approximately 50% of the target region for shale gas exploration and extraction. These initiatives will provide a basic understanding of the geohydrologic systems required to protect groundwater sources. → p. 111

Opinion – The inquiry commission is of the opinion that, to protect groundwater in areas in which shale gas exploration and extraction activities are likely to take place but which are not covered by the current groundwater knowledge acquisition initiatives launched by the Ministère du Développement durable, de l'Environnement et des Parcs, drilling should not be authorized until a comparable hydrogeological study has been carried out. → p. 111

Opinion – The inquiry commission is of the opinion that an inventory should be made of the major aquifers that are currently being or may potentially be used, and that steps should be taken to protect them. The definition of what constitutes a major aquifer, and the protection measures required, should be drawn up by the Ministère du Développement durable, de l'Environnement et des Parcs. → p. 111

Opinion – The inquiry commission observes that the municipalities are required to identify areas for the protection and supply of drinking water networks, and is of the opinion that they should do this as quickly as possible, to ensure that gas well drilling work does not take place in those areas. → p. 111

Opinion – The inquiry commission is of the opinion that it is important to address deficiencies in the understanding of groundwater flows at depths in excess of 100 metres in St. Lawrence Lowlands rock formations. → p. 113

Opinion – The inquiry commission is of the opinion that the industry should share certain appropriate geological and hydrogeological data for depths of more than 100 metres with researchers and the organizations responsible for managing groundwater. → p. 113

Opinion – The inquiry commission is of the opinion that a limit of 4,000 mg/l for dissolved solid concentrations should be retained to identify usable groundwater, and that the depth at which this limit is attained should be set in the area in which shale gas exploration and extraction activities are likely to take place. → p. 113

Opinion – The inquiry commission is of the opinion that scientific studies are required to establish aquifer vulnerability to potential contamination from the subsoil, caused by shale gas exploration and extraction activities. → p. 113

Water withdrawals

Legislative framework

The inquiry commission observes that the water withdrawal legislative framework to which the shale gas industry would be subjected comprises two different mechanisms, one for surface water and one for groundwater, and that this framework is currently under review. → p. 116

Opinion – The inquiry commission is of the opinion that the new power to authorize water withdrawals which will result from the coming into force of section 19 of the *Act to affirm the collective nature of water resources and provide for increased water resource protection* will structure withdrawals more effectively, and that the section in question should therefore be brought into force. → p. 116

Supplies from municipalities

The inquiry commission observes that shale gas exploration and extraction companies may withdraw the water they need from a municipal source, provided the municipality agrees to supply them. → p. 117

Opinion – The inquiry commission is of the opinion that the development of every gas deposit should be supported by a water withdrawal management plan. → p. 117

Sources of contamination

Boreholes

The inquiry commission observes that a very high percentage of wells drilled recently in Québec by the shale gas industry exhibit problems relating to sealing. → p. 120

Opinion – The inquiry commission is of the opinion that every drilling site should be sufficiently well-equipped to evaluate performance, among other things by means of an observation well, in order to prevent environmental contamination and react quickly if a problem arises. → p. 120

Opinion – The inquiry commission is of the opinion that sealing standards for the design and production of boreholes and formwork should take into account the presence and the geotechnical and physicochemical characteristics of sensitive clays in the St. Lawrence Valley. → p. 121

Opinion – The inquiry commission is of the opinion that all drilling permits should require the use of techniques that can demonstrate the integrity of the well before it is completed. → p. 121

Hydraulic fracturing

The inquiry commission observes that, at the present time, documented cases of drinking water contamination by fluids derived directly from hydraulic fracturing are rare, and that most are related to defective formwork or poor wastewater management. → p. 123

The inquiry commission observes that there do not appear to be any scientific studies in Canada, the United States or elsewhere to assess the impacts of drilling with hydraulic fracturing on groundwater. However, the U.S. Environmental Protection Agency has undertaken a study to assess the impact of the activity on drinking water sources. → p. 123

Opinion – The inquiry commission is of the opinion that there is a need in Québec for scientific studies to assess the risks to the water resource associated with exploration and extraction activities. These studies should be carried out in partnership with the various actors concerned, and with other countries. → p. 123

The inquiry commission observes that knowledge of the chemical composition of hydraulic fracturing water is regarded by the authorities concerned as being essential in order to assess the risks to the environment and to human health. → p. 124

Opinion – The inquiry commission is of the opinion that a statement of inputs used in hydraulic fracturing should be mandatory and public, and that the Ministère du Développement durable, de l'Environnement et des Parcs and the Ministère de la Santé et des Services sociaux should be informed of the concentrations. → p. 125

Opinion – Based on the principle of precaution, the inquiry commission is of the opinion that the Ministère du Développement durable, de l'Environnement et des Parcs should prohibit the use, in the water used for hydraulic fracturing, of chemical additives for which the environmental or health-related risks cannot be assessed, or which may present a risk. → p. 125

The inquiry commission observes that in Québec, in contrast to neighbouring geological regions, there are no maps showing natural fractures in rock formations that may potentially serve as paths to divert the water used in hydraulic fracturing towards aquifers. → p. 127

The inquiry commission observes that it may be several years before groundwater contamination from the fracturing zone is visible on the surface, given the depth of the hydraulic fracturing zone and the characteristics of the geological formations. → p. 127

Opinion – The inquiry commission is of the opinion that the Ministère des Ressources naturelles et de la Faune should map the lineaments in the St. Lawrence Lowlands in order to be able to assess the risks of contamination associated with hydraulic fracturing. → p. 127

Opinion – The inquiry commission is of the opinion that every permit for drilling with hydraulic fracturing should be conditional upon an assessment of the risks of contamination, based on the geological, structural and hydrogeological features of the region to which the application refers. → p. 127

The inquiry commission observes that, in the case of intensive gas extraction, significant volumes of contaminated fracturing water would be deposited definitively in the Utuca shale, and that the shale's hydraulic properties would be altered in the hydraulic fracturing zone. → p. 129

The inquiry commission observes that no studies have been carried out to assess the medium-term and long-term risks of depositing contaminated water from hydraulic fracturing activities in the Utuca shale. → p. 130

Opinion – Based on the principle of prevention, the inquiry commission is of the opinion that it would be appropriate to assess the long-term risk associated with the presence of contaminated water from hydraulic fracturing activities in rock formations. → p. 130

Opinion – The inquiry commission is of the opinion that all information derived from oil and gas exploration and extraction work in the St. Lawrence Valley and considered necessary for the acquisition of hydrogeological and environmental knowledge should be made available for scientific research purposes. → p. 130

Drilling waste and natural on-site contaminants

The inquiry commission observes that there is very little data on the physicochemical characteristics of the Utuca shale that could be used to assess the nature and potential concentrations of natural contaminants. → p. 131

Opinion – The inquiry commission is of the opinion that drilling permits should include the obligation to characterize the physicochemical properties of the geological formations encountered, and to assess them as potential sources of natural contaminants. → p. 131

Opinion – The inquiry commission is of the opinion that there is a need for a complete characterization program for sludge and water from drilling and fracturing, including measurement of the parameters set out in the *Regulation respecting the quality of drinking water*, radioactivity and the prior list of products. The costs associated with such a program should be paid by the industry. → p. 131

Abandoned and orphan wells

Opinion – The inquiry commission is of the opinion that a study of abandoned and orphan wells should be undertaken, to assess the environmental impacts of abandoned wells with respect to shale gas exploration and extraction activities. → p. 132

Opinion – The inquiry commission is of the opinion that it would be appropriate to assess the influence of shale gas exploration and extraction activities on the CO₂ sequestration potential of geological formations in the St. Lawrence Lowlands. → p. 132

Wastewater management

Retention ponds

Opinion – The inquiry commission is of the opinion that authorizations to construct retention ponds for wastewater produced by drilling activities should be conditional upon the creation of an observation well, in order to protect groundwater. → p. 133

Waste management

The inquiry commission observes that the Ministère du Développement durable, de l'Environnement et des Parcs is currently developing tools designed to structure the management of wastewater generated by the shale gas industry. → p. 135

Treatment at municipal facilities

The inquiry commission observes that, according to a preliminary assessment by the Ministère des Affaires municipales, des Régions et de l'Occupation du territoire in the regions concerned, the capacity of municipal treatment plants to receive wastewater from the shale gas industry is limited. → p. 138

The inquiry commission observes that the municipalities do not currently have all the information required to judge the efficiency of their treatment plants if they were to receive wastewater generated by the activities of the shale gas industry. → p. 138

The inquiry commission observes that, to obtain information on the treatment of water used for hydraulic fracturing, the Ministère du Développement durable, de l'Environnement et des Parcs has established a monitoring program for the treatment system set up by the City of Trois-Rivières. → p. 138

Opinion – The inquiry commission is of the opinion that the industry should provide the Ministère du Développement durable, de l'Environnement et des Parcs with all the physicochemical data on wastewater and fluids used for hydraulic fracturing needed to establish the treatment requirements and control parameters. → p. 139

Commercial or industrial treatment and injection

Opinion – The inquiry commission is of the opinion that an assessment of the cumulative impacts of the disposal of wastewater from the shale gas industry should be carried out by the Ministère du Développement durable, de l'Environnement et des Parcs in order to protect watercourses. → p. 139

Opinion – The inquiry commission is of the opinion that underground injections of wastewater should not be envisaged until a special site study has been carried out, based on the geological and hydrogeological conditions, to show that there is no risk of migration and contamination of groundwater supply sources. → p. 139

Water replacement techniques and additives

The inquiry commission observes that techniques have been developed in Canada and elsewhere which would allow the water used for hydraulic fracturing to be replaced by other inert fluids, and that such a replacement may eliminate some of the major environmental impacts associated with the hydraulic fracturing method. → p. 140

Opinion – The inquiry commission is of the opinion that the Québec Government should foster both the development of safe technologies to replace water in the fracturing process, and the use of environmentally acceptable chemical products. → p. 140

Natural gas leaks

The inquiry commission observes that a significant percentage of recently drilled wells in the Utica shale have reported unexpected natural gas emissions that may present a risk of explosion if the gas migrates into enclosed spaces. → p. 145

The inquiry commission observes that several months elapsed before the Ministère des Ressources naturelles et de la Faune inspected the wells drilled in the Utica shale and observed significant emissions of natural gas from several of the wells. → p. 145

Opinion – The inquiry commission feels that all companies should be required to prove that their natural gas well formwork is sealed, both upon completion and at regular intervals thereafter. The gas industry’s credibility depends on its ability to prove to the population that it is capable of avoiding natural gas leaks and quickly correcting abnormal situations. → p. 145

Opinion – The inquiry commission is of the opinion that the Ministère du Développement durable, de l’Environnement et des Parcs should respond to all complaints from residents concerning suspected migrations of natural gas onto their property, and then proceed diligently with the necessary field analyses. The Ministère should institute an information mechanism for that purpose in the regions in which drilling takes place. → p. 145

Air quality and gas industry activities

The inquiry commission observes that, due to the current lack of gas extraction activities in Québec and the absence of shale gas extraction projects, it is not possible to assess the impact of the activity on ambient air quality in Québec. → p. 147

The inquiry commission observes that Québec’s air quality regulations do not specifically cover gas exploration and extraction activities, nor do they exempt them. → p. 150

Opinion – The inquiry commission is of the opinion that the companies concerned should assess the atmospheric dispersion of emissions from gas exploration and extraction activities. The Ministère du Développement durable, de l’Environnement et des Parcs should establish the initial state of air quality in the regions in which exploration and extraction activities are likely to take place. → p. 150

Opinion – In the case of developments involving several gas wells, the inquiry commission is of the opinion that the gas companies should assess the cumulative impacts and should take into account the local and regional emissions of other gas and industrial operations. The companies should monitor the situation, and the data should be forwarded to the Ministère du Développement durable, de l’Environnement et des Parcs in order to be made public. → p. 150

Opinion – The inquiry commission is of the opinion that exploration companies and companies operating natural gas wells should, wherever possible, use electrical devices that do not emit atmospheric contaminants, instead of devices fuelled by diesel or petroleum. → p. 150

Opinion – The inquiry commission is of the opinion that completed wells should be connected to a natural gas collection network as quickly as possible, in order to avoid the need to burn gas in flare towers. Every well operator should therefore plan the development of both its wells and its collection network accordingly. → p. 150

Opinion – The inquiry commission is of the opinion that the Ministère du Développement durable, de l'Environnement et des Parcs should address all complaints from residents concerning odours or ambient air quality in the vicinity of gas exploration or extraction facilities. → p. 150

Greenhouse gases

The inquiry commission observes that the Ministère du Développement durable, de l'Environnement et des Parcs has commissioned a study to assess greenhouse gas emissions from gas exploration and extraction activities in Québec. → p. 154

The inquiry commission observes that the fact of producing natural gas locally, for local consumption, instead of importing it from Alberta, may reduce pan-Canadian greenhouse gas emissions. However, such a reduction would not be attributable to Québec, but Québec would have to account for any emissions from its own natural gas production activities. → p. 154

Opinion – The inquiry commission is of the opinion that the Ministère du Développement durable, de l'Environnement et des Parcs should consider a greenhouse gas emission monitoring program inspired by the United States Environmental Protection Agency's Natural Gas Star Program and the infrared method of monitoring and reducing emissions used in Texas. Monitoring would also include fugitive emissions from natural gas exploration, extraction, transportation and distribution activities in Québec. → p. 154

Natural risks

Earthquakes

The inquiry commission observes that there is insufficient basic information available to assess the presence of active faults in the St. Lawrence Valley and its neighbouring areas. → p. 158

Opinion – The inquiry commission is of the opinion that the design of the various infrastructures used by the shale gas industry should take into account the specific earthquake risk in the area in which the infrastructures will be built. → p. 158

Opinion – The inquiry commission is of the opinion that the companies' emergency plans should include a post-earthquake infrastructure inspection procedure. → p. 158

Opinion – The inquiry commission is of the opinion that the Geological Survey of Canada should study the seismic activity triggered by hydraulic fracturing, and assess the unknown variables that would arise if thousands of wells were to be drilled in the St. Lawrence Valley. The addition of seismographs between Québec City and Montreal should be considered. → p. 159

Landslides

Opinion – The inquiry commission is of the opinion that land-based seismic surveys in Québec should be governed by a good practice guide prepared by the industry in collaboration with the Ministère des Ressources naturelles et de la Faune. → p. 160

Opinion – The inquiry commission is of the opinion that drilling site plans and infrastructure plans should be subject to landslide zoning plans, and that if no such zoning plan exists, the risk of landslides should be assessed by a recognized authority. → p. 160

Opinion – The inquiry commission is of the opinion that every seismic survey application for oil or gas exploration should demonstrate that the risk of land movement has been properly considered when planning the proposed outlines. → p. 160

Technological risks

The inquiry commission shares the observation made by the Direction de santé publique in Mauricie, Centre-du-Québec, Chaudière-Appalaches and Montérégie concerning the lack of information on the risks associated with the shale gas industry. → p. 164

Opinion – The inquiry commission is of the opinion that, in accordance with the principle of prevention, the development of the shale gas industry should be based on prior studies providing all the information required to assess and manage the various risks associated with the industry. → p. 164

Opinion – The inquiry commission is of the opinion that the technological risks associated with the shale gas industry should be managed using proven methods that are documented in French. → p. 164

Opinion – The inquiry commission is of the opinion that, for every project, the company should demonstrate that it has considered the dangers and risks, provided for appropriate monitoring, and included an emergency plan prepared jointly with the community. → p. 164

Opinion – The inquiry commission is of the opinion that an integrated approach to risk management, established jointly with the community, should be used in priority to develop the shale gas industry, in particular with regard to the level of acceptability of the risks associated with each given activity. → p. 164

Land use planning and concurrent use

Land use planning tools and stewardship

The inquiry commission observes that the territorial nature of shale gas industry development requires integrated management of the territory, and that section 246 of the *Act respecting land use planning and development* gives priority to the development of the industry. → p. 167

Opinion – The inquiry commission is of the opinion that, in view of their role in land use planning and the tools at their disposal, the RCMs and municipalities in the regions concerned should be involved in planning the development of the shale gas industry within their respective territories. A coordinated participatory approach should be taken, to ensure that the industry’s development is harmonized with the territorial features of the areas concerned. → p. 167

Development planning

Opinion – The inquiry commission is of the opinion that the companies’ development plans are essential in order to identify and assess the impacts for the environment, and to establish the mitigation measures required. → p. 169

Opinion – The inquiry commission is of the opinion that collection network location plans are essential to assess and mitigate the impacts for the environment, given that the volume of shale gas produced may require connections for 20,000 wells, and that those plans should form part of the companies’ development plans. → p. 170

Compatibility of use

Opinion – The inquiry commission is of the opinion that shale gas industry development is not compatible with protected areas. Moreover, as is the case for ecological reserves, buffer zones should be established around every area entered in the Register of Protected Areas, pursuant to the Natural Heritage Conservation Act. → p. 174

Opinion – The inquiry commission is of the opinion that zoning plans identifying areas suitable for the development of the shale gas industry are vital in order to consider specific regional features such as protected areas and the value ascribed by communities to the elements of interest that must be protected. The plans, prepared by RCMs and municipalities, should be submitted to and approved by the Government authorities. → p. 174

Opinion – The inquiry commission is of the opinion that the impacts of facilities on landscapes would be reduced by considering the characteristics of landscape units, including topography and vegetation, and by identifying general principles for the geographical disposition of drilling sites and the mitigation measures required, in collaboration with the community. → p. 177

Opinion – The inquiry commission is of the opinion that protective measures should be applied to heritage sites and landscapes valued by the community. The companies, at the beginning of the extraction process, should also implement visual screens for sites located close to inhabited zones. These measures should be established in collaboration with the community. → p. 177

Nuisances

Noise

The inquiry commission observes that companies must comply with the noise levels set out in memorandum of instruction no. 98-01, on noise, issued by the Ministère du Développement durable, de l'Environnement et des Parcs. These levels are established, for fixed sources, according to the zone in question and the period of the day. → p. 180

Opinion – The inquiry commission is of the opinion that the Ministère du Développement durable, de l'Environnement et des Parcs should require the companies to implement mitigation measures, a monitoring program to be applied during operations, and any necessary remedial measures, for every exploration and extraction site. → p. 181

Light

Opinion – The inquiry commission is of the opinion that, although the burning of gas in flare towers is a temporary operation during exploration, the companies should eliminate it due to its visual impact on inhabited sectors. → p. 182

Opinion – The inquiry commission underscores the need to implement a proper lighting system in order to ensure the safety of workers on exploration sites. However, it is of the opinion that the lighting should be designed so as to limit the impacts on residents living close to the sites. → p. 183

Trucking

Opinion – The inquiry commission is of the opinion that the construction of a pipe to supply the water needed for hydraulic fracturing would significantly reduce the volume of trucking. → p. 184

Opinion – The inquiry commission, given that several multi-well sites may be located in the same sector, is of the opinion that the cumulative impacts of trucking should be assessed before authorizing the development of a gas deposit. The companies' development plans and the routes taken by the trucks would be required for such an assessment. → p. 185

The inquiry commission observes that the Québec Oil and Gas Association has undertaken to implement measures, in conjunction with the municipalities concerned, to minimize and compensate for the impacts of trucking, including joint preparation of trucking plans and an agreement concerning damage to municipal road infrastructures. → p. 186

Opinion – The inquiry commission is of the opinion that the Ministère des Transports, in collaboration with the community, should establish the road safety measures and trucking impact mitigation measures to be implemented by the companies. These measures should also be included in the conditions set out in the certificate of authorization. → p. 186

Opinion – The inquiry commission is of the opinion that every measure designed to reduce heavy vehicle traffic, such as transporting water through pipes, should be given priority in order to limit the impacts of trucking and the risk of road accidents. → p. 186

Separator distances

Opinion – The inquiry commission is of the opinion that separator distances, designed among other things to ensure the safety and tranquility of nearby residents, should be established on the basis of scientific studies, in conjunction with the Ministère du Développement durable, de l'Environnement et des Parcs, the Ministère de la Santé et des Services sociaux and the Ministère de la Sécurité publique. → p. 187

Opinion – The inquiry commission is of the opinion that the municipalities should consider the application of a principle of reciprocity in connection with the distance standards imposed on gas wells, to ensure that the introduction of new, incompatible uses within the required distance standard is prohibited by by-law. → p. 187

Complaint management

Opinion – The inquiry commission is of the opinion that a centralized mechanism to manage complaints concerning shale gas exploration and extraction should be implemented to ensure follow-up. → p. 188

Opinion – The inquiry commission is of the opinion that the burden of proof in respect of problems relating to shale gas exploration and extraction should lie with the companies, rather than with individual citizens. → p. 188

Right of access

The inquiry commission observes that a company can only use land with prior consent from the owner, or if not, following a decision to expropriate. → p. 190

Opinion – The inquiry commission is of the opinion that a framework agreement, including a standard lease, would serve as a guideline for negotiations between individual citizens and companies, to ensure that the rights of landowners affected by shale gas exploration and extraction are upheld. → p. 190

Home insurance and civil liability insurance

Opinion – The inquiry commission is of the opinion that the Ministère des Ressources naturelles et de la Faune should require the holders of prospecting permits and extraction rights for oil, natural gas and underground reservoirs to take out sufficient civil liability insurance to cover technological accidents caused by themselves or by their subcontractors which result in damage to neighbouring residential, commercial or agricultural properties. → p. 191

Opinion – The inquiry commission is of the opinion that the Ministère des Finances, which is responsible for administering the *Act respecting insurance* (R.S.Q., c A-32), should require insurers to cover damage caused by a third party to a residential or commercial property as a result of a technological accident, as is the case elsewhere in Canada. → p. 191

Economic forecasts

The inquiry commission observes that the National Energy Board and the United States Department of Energy, which monitor changes in energy prices, do not agree on the future value of natural gas prices, and that current developments appear to indicate that the price will remain fairly low in the short term, thereby potentially reducing gas deposit prospection. → p. 199

The inquiry commission observes that the scope of the economic spinoffs varies significantly, depending on the extraction scenario. The future price of natural gas will also have a key impact. → p. 199

Revenues generated by the resource

The current situation in Québec and elsewhere

The inquiry commission observes that virtually all oil and gas exploration rights in the St. Lawrence Lowlands have been sold for an average price of 10 ¢ per hectare, and that the holders of rights relating to underground reservoirs obtained the same rights in January 2010, at no additional cost. → p. 201

With regard to the methods used to allocate oil, gas and underground reservoir prospecting permits, the inquiry commission observes that the provinces and states using auction-based processes derive considerable revenues from the allocation of titles. → p. 202

Opinion – The inquiry commission is of the opinion that the Ministère des Finances, for the sake of “economic efficiency”, should carry out an economic analysis in order to propose a method of recovering, as quickly as possible, the shortfall incurred as a result of the low fees originally charged when granting exploration rights in the St. Lawrence Lowlands. Moreover, the new Act respecting hydrocarbons should include the requirement to proceed by means of calls for bids when granting the available exploration rights. → p. 202

The inquiry commission observes that, although there are some significant variations in the North American royalty systems examined, the general guidelines for the systems are based on two principles, namely to profit from the market and from any future increases in gas prices, and to stimulate the operation of less productive wells through competitive measures. → p. 204

The reform of Québec’s system of royalties

The inquiry commission observes that the Ministère des Finances intends to adjust Québec’s system of royalties, which would be based on systems existing elsewhere in North America. → p. 205

Opinion – The inquiry commission is of the opinion that the proposed framework should be designed to preserve the resource in the long term, so as to derive maximum collective benefit from it while maximizing the revenues from royalties. A new, balanced system should stimulate exploration and discourage hasty extraction. → p. 206

Opinion – The inquiry commission is of the opinion that it would be appropriate to increase the amounts for mandatory work in areas covered by prospecting permits, and that transfers of permits should not be authorized, to ensure that companies, in future, can only obtain permits through bidding. → p. 207

Taxation

Taxation in Québec

Opinion – The inquiry commission is of the opinion that, when an operating lease for a gas deposit is issued by the Ministère des Ressources naturelles et de la Faune, subsequent drilling of wells in the deposit should be treated as an extraction activity, not an exploration activity. → p. 209

Municipal taxation

The inquiry commission observes that local municipalities with natural gas extraction facilities within their territories would be able to collect income from property taxes provided the natural gas collection equipment is entered on the assessment roll. → p. 210

The Generations Fund

Opinion – Based on the principle of “social fairness and solidarity”, the inquiry commission is of the opinion that the Ministère des Finances should take advantage of the opportunity provided by the development and extraction of shale gas, which is a non-renewable resource, to increase the financing of the Generations Fund by including the payment of amounts taken from royalties paid for gas extraction, in order to benefit future generations. → p. 211

Job creation

Employment forecasts

The inquiry commission observes that the job creation scenarios produced by the Québec Oil and Gas Association and the Ministère des Finances are prudent, compared to the evaluations made in British Columbia and Pennsylvania. → p. 212

The need for specialized personnel and businesses

Opinion – The inquiry commission is of the opinion that, if gas development is significant in the coming years, it would be appropriate for the Québec Oil and Gas Association and the Ministère du Développement économique, de l’Innovation et de l’Exportation to work together, first to identify and encourage firms in Québec that are able to develop expertise, and second to offer their services to help them do this. → p. 214

Opinion – The inquiry commission is of the opinion that it would also be appropriate to encourage companies from outside Québec to contribute specialized gas exploration and extraction expertise. The Ministère de l’Éducation, du Loisir et du Sport should also be involved in the process, to maximize the development of specialized technical and university-level training in order to foster local employment. → p. 214

Opinion – The inquiry commission is of the opinion that it would be appropriate for the Ministère du Développement économique, de l’Innovation et de l’Exportation and the Ministère des Ressources naturelles et de la Faune to publish an annual review of the economic spinoffs and jobs generated by the industry, and to indicate the steps taken to maximize the spinoffs in Québec. → p. 214

Site restoration

The inquiry commission observes that the environmental responsibility of holders of prospecting permits for oil, natural gas and underground reservoirs does not extend beyond the date on which the well is officially closed. → p. 215

Opinion – While subscribing to the principle that a company should remain responsible in perpetuity for any contamination of the soil or the water table, the inquiry commission is nevertheless of the opinion that a fund financed by the industry would be appropriate, based on the principles of “polluter pays” and social fairness and solidarity. The fund would pay for the cost of restoring well sites that are abandoned or closed down by owners who are insolvent or no longer active, and that face long-term air, land or water contamination problems. → p. 215

The inquiry commission observes that the Auditor General of Québec has noted deficiencies in connection with the value of the financial security required and the monitoring of payments to ensure that proposed mining site redevelopment and restoration work is actually carried out. → p. 216

Opinion – The inquiry commission is of the opinion that a financial security for the restoration of gas exploration and extraction sites should be paid by the companies, based on a schedule that would allow for the payment, at any time, of all related costs, to ensure that the State runs no financial or environmental risk. → p. 216

User pays

Opinion – The inquiry commission is of the opinion that the Québec Government should introduce a system of royalties that will provide it with substantial revenues from gas resource operations while compensating the communities for any inconvenience caused by the presence of the industry in their vicinity. Such a mechanism, which would be separate from the royalties collected by the Québec Government, would reflect actual costs under the “user pays” concept. → p. 218

The value of homes located close to gas sites

Opinion – The inquiry commission feels the Ministère des Affaires municipales, des Régions et de l’Occupation du territoire should carry out long-term monitoring of the market value of homes located close to potential shale gas sites in Québec. → p. 218

Social acceptability

Opinion – The inquiry commission is of the opinion that an approach to planning based on transparency and respect, using a participatory approach, would help achieve greater social acceptability for the development of the shale gas industry in Québec. This should also be done within an integrated process that includes territorial management. → p. 229

The industry’s social commitment

Opinion – The inquiry commission is of the opinion that information and joint action are vital to create a more harmonious relationship with the communities in which shale gas exploration and extraction activities are planned. → p. 231

Information and involvement

Opinion – The inquiry commission notes that, under the provisions of the future Act respecting hydrocarbons, firms will be required to consult the general public. However, because exploration sites will be preselected and negotiations will already have taken place with the landowners, the consultation process will serve simply to inform citizens of the work that will take place in their area. In other words, it will not be a true consultation. → p. 232

Opinion – The public inquiry commission is of the opinion that public involvement and consideration of local community concerns, both of which are necessary for social acceptability, should take place from the early phases of exploration. → p. 232

Opinion – The inquiry commission is of the opinion that gas exploration and extraction projects should be assessed using information that is as complete as possible. Companies should be involved in the production of good practice guides, and in the knowledge acquisition process. → p. 233

A consultative committee

Opinion – The inquiry commission is of the opinion that a shale gas industry development zoning plan showing the sites on which projects could be carried out would be more likely to rally the community. → p. 235

Opinion – The inquiry commission is of the opinion that a consultative committee for shale gas industry activities is essential in order to ensure harmonious development of the shale gas industry within the territory. → p. 235

Opinion – The inquiry commission is of the opinion that the Minister of Natural Resources and Wildlife and the Minister of Sustainable Development, Environment and Parks should consider the possibility of entrusting the regional land and natural resource commissions, under the authority of the regional conferences of elected officers, with responsibility for coordinating opinions on the shale gas industry's activities in the region in question. → p. 235

Prior consultation

Opinion – The inquiry commission is of the opinion that the gas companies should obtain a prior notice of admissibility for their projects from the Ministère du Développement durable, de l'Environnement et des Parcs, before submitting them to the regional shale gas industry consultative committee. → p. 236

Opinion – The inquiry commission is of the opinion that the gas companies should always submit their projects for prior consultation by the consultative committee, which would then forward its opinion of the project to the Minister of Sustainable Development, Environment and Parks. → p. 236

Municipal involvement

Opinion – The inquiry commission is of the opinion that, based on the principle of subsidiarity, the Government should provide land use planning powers and orientations so that the municipalities are able to structure the development of the shale gas industry in the same way as they structure other types of industries, with due respect for the Government’s responsibility to develop the collective gas resource in a harmonious way. → p. 237

Opinion – The inquiry commission is of the opinion that the Ministère du Développement durable, de l’Environnement et des Parcs, should work with the Ministère des Affaires municipales, des Régions et de l’Occupation du territoire in order to ensure that RCMs and local municipalities give due consideration to the sixteen principles of sustainable development, as stipulated in section 4 of the Sustainable Development Act. → p. 237

Authorizations

Opinion – The inquiry commission is of the opinion that the current structure of the shale gas industry is compartmentalized between two separate Government departments, as a result of the legislation for which those departments are responsible, and that this is not conducive to integrated supervision and control. → p. 240

Opinion – The inquiry commission is of the opinion that exploration and extraction activities should be authorized by the Ministère du Développement durable, de l’Environnement et des Parcs, so that all environmental issues can be addressed in a single certificate of authorization. The responsibilities incumbent upon the Commission de protection du territoire agricole du Québec would remain unchanged. → p. 240

Opinion – The inquiry commission is of the opinion that the Mining Act and the Regulation respecting petroleum, natural gas and underground reservoirs should be amended to make the Ministère du Développement durable, de l’Environnement et des Parcs responsible for enforcing environmental protection provisions pursuant to the Environment Quality Act. → p. 241

The organizational model and funding

The inquiry commission observes that the system of fees currently used by Québec for drilling permit applications is based on the “user pays” concept and reflects common practice elsewhere in North America. However, it also observes that the fee system in British Columbia comes much closer than Québec’s system to covering the costs. → p. 243

Opinion – The inquiry commission is of the opinion that the fee structure for applications by the natural gas industry should be reviewed by the Ministère des Finances and the Ministère du Développement durable, de l'Environnement et des Parcs, to ensure that it covers, as nearly as possible, the actual cost of examining the applications and of conducting inspections and technical and environmental monitoring and control, in line with the principle of internalization of costs. → p. 243

Opinion – The inquiry commission is of the opinion that it would be premature to set up an independent agency to oversee the gas industry, and that it will be up to the Ministère du Développement durable, de l'Environnement et des Parcs to identify the most appropriate organizational model, based on the anticipated volume of activity in the medium term. → p. 243

PART 3

Orientations

The first part of the report described the current situation of Québec's shale gas industry and summarized the concerns and opinions expressed by participants at the public hearings. As for the second part, it presented the inquiry commission's analysis of various biophysical, human and economic issues. This third part sets out the proposed guidelines for exploration, extraction and collection of natural gas, so that the industry can be developed safely and in compliance with the requirements of sustainable development. The purpose of all these proposals is to ensure that the industry's activities are able to coexist with local populations, the environment and other activity sectors.

Some aspects of the mandate given to the BAPE by the Minister of Sustainable Development, Environment and Parks were not addressed, and the inquiry commission therefore did not adopt a position on them. However, the topic on which public hearing participants had the most to say, and with which they often disagreed, was the role of natural gas in Québec – in other words, the place it should have in Québec's energy balance. Generally speaking, natural gas was perceived as being used mainly to heat buildings (domestic, commercial and industrial) and water, and to produce electricity through cogeneration. In reality, however, it is also used both here and elsewhere in North America to produce plastics, and in some metallurgical processes such as steel production.

Many people pointed out that intensive shale gas development in North America has increased the natural gas supply and reduced prices. Some felt it would therefore provide an opportunity to cut back on the use of coal and oil in heating and electricity production, while others mentioned the possibility of using it to replace gasoline and diesel in some cars. On the other hand, some participants thought the current low price, which is expected to persist in the future, may generate undue competition for some renewable energy sources, with the result that they would be more difficult to develop since they would not be economically viable due to the low price of gas. However, these two opposing positions nevertheless shared a common goal, that of reducing carbon emissions into the atmosphere.

This latter issue appears to be of particular importance, since it may alter the way we use natural gas. The future role of natural gas in Québec needs to be clarified by the ministère des Ressources naturelles et de la Faune¹, as do the impacts of increased shale gas availability in North America for the development of renewable energy in Québec.

1. [Free translation] Ministry of Natural Resources and Wildlife.

The development of the shale gas industry offers considerable economic potential and may help reduce our imports of natural gas. However, not only would this new industrial sector be deployed in a large inhabited area of southern Québec, but it may also have repercussions on the quality of life of citizens, and on the quality of the environment. The lack of current knowledge and experience was raised on numerous occasions by citizens, and was also noted by the inquiry commission.

The commission has based its views on the *2008-2013 Government Sustainable Development Strategy*, the aim of which is to incorporate sustainable development consistently into government policies, programs and actions. The Strategy focuses in particular on three issues: “Develop knowledge”, “Foster commitment” and “Promote responsible action”. To “develop knowledge”, the commission has proposed a strategic environmental assessment. To “foster commitment”, it has suggested setting up a consultative mechanism, and to “promote responsible action” it has proposed a draft framework.

The *Sustainable Development Act* stipulates that citizens are entitled to a good quality, safe living environment. The proposed framework should reflect their concerns, and those of their local and regional representatives. To achieve social acceptability, the gas companies must become good neighbours to their host communities. There is also the question of community involvement in the planning and decision-making process. Human activities must be respectful of the support capacity of ecosystems and ensure their sustainability, and a balance must be maintained between development needs on the one hand and preservation of water and air quality, soils and biodiversity on the other. It is extremely important not to exceed the threshold beyond which the functions and balance of the environment are damaged beyond repair.

Shale gas extraction should strengthen energy supply security, make the resource available at a fair price, and serve as a lever for economic development. The proposed framework should allow the industry to be effective, and should set royalties at a level that would provide a substantial inflow of funds to the State while remaining within the industry’s ability to pay. The measures proposed by the commission are designed to make the shale gas industry accountable and foster best practices. Accordingly, the companies must be responsible for, monitor and report on their actions.

Chapter 12 **The Strategic Environmental Assessment**

This chapter addresses the need for a strategic environmental assessment that would attempt to answer the main questions concerning the development potential for gas extraction operations in Québec – a process the inquiry commission believes is essential and should be implemented by the Québec Government.

A strategic environmental assessment is an impact analysis and assessment process applied to government policies, plans and programs, and to any other initiative situated upstream of projects (Pierre André et al., 2003). Its purpose is to provide an overview of the potential impacts that several similar projects would have, and it is carried out early in the process of planning new activities or the reconsidering future of existing activities, in order to address environmental, health-related, social and economic considerations. The first step is to establish the scope of the study, in order to guide research and analysis needs.

A strategic environmental assessment should be carried out using the best scientific data, and should be based on verifiable sources of information. It must be transparent, and must comply with the rules of good practice. It will usually include a review of the scientific literature on the subject in question, along with a biophysical, human and economic profile of the regions concerned, plus diagnoses and observations if the activity already exists. In addition, it will include field studies or pilot projects, as well as an analysis of the potential impacts, anticipated cumulative effects and eventual spin-offs from the projects in question. Lastly, it will identify any mitigation or maximization measures that may be required. Public consultations may be organized at different stages of the process.

Although the aim of a strategic environmental assessment is to reconcile the protection of environments and human communities with the principle of “economic efficiency”, it must, if it is to be successful, also take into account two other principles, namely “access to knowledge” and “involvement and commitment”. If public participation is to be effective and efficient, factual information must be made available. The conclusions of a strategic environmental assessment are therefore used to establish the conditions on which activities may be carried out or prohibited. For example, the strategic environmental assessment of the St. Lawrence Estuary led the Government to immediately ban hydrocarbon exploration and extraction, without waiting for the public consultation stage.

Similarly, in Eastern Canada, hydrocarbon exploration at sea led to strategic environmental assessments in Nova Scotia and in Newfoundland-and-Labrador, before public calls for bids to transfer exploration rights. In Québec, the ministère des Ressources naturelles et de la Faune commissioned two similar strategic environmental assessments for the St. Lawrence Marine Estuary sedimentary basins and the three Gulf basins.

In the preceding chapters, it became clear that Québec's shale gas industry is in its early stages, and that a solid foundation of technical and scientific knowledge on the resource, including its geological and hydrogeological aspects, wastewater treatment, land use and coexistence, has yet to be built. The strategic environmental assessment should therefore take place as soon as possible, and as far upstream of the new industry's development as possible, in order to provide the necessary structural tools. Additionally, knowledge acquisition is clearly the first basic step in preparing a regulation written from the standpoint of sustainable development. According to one expert, because the shale gas industry has many different promoters and sites, and presents many risks, in-depth research and a strategic environmental assessment of the cumulative impacts are required upstream of the decision and public consultation process, and may also be conducive to social acceptability (Christiane Gagnon, DT8, p. 13, 41 and 42).

In the present context of the shale gas industry in Québec, a strategic environmental assessment is therefore a necessary element of both an informed decision and improved social acceptability. It should proceed in spite of development pressures arising from any increase in North American gas prices, which are relatively low at the present time.

A committee set up by the Québec Government and composed of representatives from government and municipal authorities, universities and private enterprise, among others, would allow for the pooling of knowledge and expertise on gas systems in order to prepare a specification for the strategic environmental assessment and oversee its application. In addition, information already gathered during gas exploration and extraction work should be made available immediately, and used to prepare the strategic environmental assessment specification. The requirement for confidentiality stipulated in section 215 of the Mining Act should not apply, so as not to delay the assessment process. In addition, the specification should take the form of a research program that would address the main social and health-related concerns and meet the need for additional knowledge. Given the importance of the environmental, social and economic issues at stake, the committee should have sufficient funding to commission any other studies and work it deems necessary.

In addition to the objectives set by the committee when preparing the strategic environmental assessment specification, the following objectives must also be achieved, by acquiring scientific and technical knowledge:

- an economic assessment of the socio-economic relevance of developing the gas resource and the conditions required to maximize revenues for the State;
- an assessment of the environmental impacts and risks, along with a definition of acceptability thresholds and appropriate mitigation methods;
- a regulation to structure environmental assessments of gas exploration and extraction plans and their subsequent application, covering the St. Lawrence Valley and, if possible, other areas of Québec;
- an assessment of the relevance of implementing scientific observatories, to capture knowledge on a continuous basis and ensure that regulations are updated to reflect new developments.

The assessment should pay particular attention to the impacts and risks for groundwater, in order to establish the environmental conditions for the industry's development. Drilling, including hydraulic fracturing, would be required to assess some of the potential environmental impacts and find solutions to any problems identified.

The committee would prepare the assessment specification and propose a timeframe, and the specification would then be submitted for public comment. A number of workshops would be held during the assessment process, and the committee could prepare interim reports for the Government, so that it could review the regulations if necessary.

The document produced by the New York State Department of Environmental Conservation (NYSDEC, 2009) sets out an approach that the committee may be able to use when preparing the specification. The main chapters of the document address geology and seismic activity (*ibid.*, chapter 4), natural gas development activities and high volume hydraulic fracturing (*ibid.*, chapter 5), potential environmental impacts (*ibid.*, chapter 6), mitigation methods (*ibid.*, chapter 7), and the permit issuing and regulatory coordination process (*ibid.*, chapter 8).

As far as water is concerned, the committee may also refer to the EPA's research specification (2011), which directly addresses the impacts of hydraulic fracturing on groundwater.

In addition, the committee may consult the briefs filed with the commission on the environmental, economic and social impacts of the shale gas industry.

Lastly, the committee should also consider the points raised in the commission's analysis.

After completing the strategic environmental assessment, the committee would present two documents: an initial report on the strategic environmental assessment itself, and a second report that could be used to prepare an environmental regulation applicable to the industry. These two reports should be made available for public consultation, following which the committee would draw up its final recommendations for the Government.

The committee would be responsible for deciding whether or not fieldwork and pilot projects were needed. During the assessment process, hydraulic fracturing would be authorized only for work related directly to the assessment. Exploration work could continue in the meantime, but without the use of hydraulic fracturing.

During the inquiry commission's mission to the State of New York in early December 2010, representatives from the Department of Environmental Protection and the EPA expressed an interest in working with Québec on this type of study. It would be appropriate for the committee to explore this opening, in order to maximize the scientific spin-offs and share expertise.

The assessment should provide answers to the various questions and issues addressed by the inquiry commission in its report. It may also look beyond gas exploration, extraction and collection to address the issue of natural gas consumption in Québec.

Even after the assessment is complete, the Government authorities must continue to acquire knowledge and information, so that the departments and agencies concerned have sufficient flexibility to adapt their policies and directives over time, in line with the rules of good practice.

In the opinion of the inquiry commission, a strategic environmental assessment is an essential step in providing Québec with a rigorous evaluation of the advantages and disadvantages of gas extraction.

Chapter 13 **Harmonious Coexistence**

This chapter addresses three elements that the inquiry commission believes must be implemented by the Québec Government, in addition to the strategic environmental assessment. The first is the creation of regional consultative committees to be responsible for supervising the shale gas industry's activities within their respective areas. The second is the requirement to consult government and local authorities prior to any exploration or extraction activities, and the third is the role to be played by the municipalities in their capacity as the Québec Government's partners in land use planning. Before addressing these three elements, however, it is important to examine the question of social acceptability as it relates to the development of the shale gas industry.

Social acceptability

The sustainable land development and wind energy research unit at the Université du Québec à Rimouski identified four constituents of social acceptability for wind energy projects: factors relating to the energy sector, the specific features of the project and its impacts, the decision-making process, and the host social environment¹. These factors, whose relative importance varies according to the individuals concerned, can also apply to the development of the shale gas industry.

With regard to the first factor, namely the sector itself, many participants felt the shale gas industry was being developed too quickly. Some asked for a moratorium on development, to allow for generic or detailed studies. They felt more emphasis should be placed on the development of clean energy sources, and were concerned that the development of the North American gas industry would bring gas prices down and adversely affect hydroelectricity exports. Criticisms were also levelled at the fact that private companies were extracting a collective resource, and the royalties paid to the State were perceived as being too low, given the revenues derived by the companies. However, other participants suggested that shale gas could be considered as a complement to other energy sources, and as a potential substitute for greenhouse gas-emitting energies such as fuel oil. They also felt local gas production should be used to meet Québec's power and energy needs, thereby eliminating imports from

1. C. SAUCIER, *et al. Développement territorial et filière éolienne – Des installations éoliennes socialement acceptables: élaboration d'un modèle d'évaluation de projets dans une perspective de développement territorial durable*. Unité de recherche sur le développement territorial durable et la filière éolienne, Université du Québec à Rimouski, 2007, pp. 31-44.

Western Canada and the associated transportation costs, and improving supply reliability and security. In addition, gas extraction would generate economic spin-offs, create jobs and enhance the collective wealth.

With regard to the second constituent of social acceptability, namely the project and its impacts, participants were concerned about the impacts of gas exploration and extraction activities on soils, water and subsoil. Concerns were also expressed about greenhouse gas emissions, air pollution, and impacts on agricultural activities, land, and plant and wildlife habitats. Technological risks and loss of tranquility were also mentioned, especially in the case of exploration and extraction activities located near inhabited areas.

With regard to the decision-making process, some participants commented on the fact that municipalities and the general public are excluded from the planning and authorization process for drilling projects, and also noted the lack of independent information. They criticized the fact that municipalities are powerless to deal with the industry and asked the Government to acknowledge not only the role played by RCMs and municipalities in land use planning, but also that played by elected representatives in addressing citizens' concerns.

With regard to the last constituent of social acceptability, which encompasses social relationships, the characteristics of the communities affected by the projects, and their influence on social cohesion, there was general agreement on one point: the need to control and structure the development of the shale gas industry in Québec.

Community involvement in the decision-making process is not only a factor in social acceptability¹, but as the wind energy document cited earlier points out, it is also associated with transparency, itself a condition of the population's trust in public and private organizations². The exploration company Gastem, in its contribution, noted that the shale gas industry should be developed in a transparent way, and that companies need to improve their communications with municipalities and local residents (DM168, p. 6 to 8, 12 and 13).

According to the Institut national de santé publique du Québec, the perceived risk associated with shale gas exploration and extraction, along with a lack of public involvement in the decision-making process, may have a psychological effect on the communities concerned, generating stress, anxiety and dissatisfaction among residents, as well as a "loss of trust in the authorities, including the State" (DB93, p. 57, free translation from the French). The Institute added that the social and

1. *Ibid.*, p. 40, 43 et 52.

2. *Ibid.*, p. 53.

economic characteristics of the populations concerned would have to be studied in order to make an accurate assessment of the psychosocial impacts of shale gas industry development in Québec (*ibid.*, p. 58, 59 and 63).

Lastly, shale gas exploration and extraction could be based on the document entitled *Orientations du gouvernement en matière d'aménagement - Pour un développement durable de l'énergie éolienne*:

Projects should comply with the essential conditions for sustainable development, meaning among other things that they should be socially acceptable to the population concerned, and that they should be harmonized with existing and planned activities in the area.

(Gouvernement du Québec, 2007a, p. 5, free translation from the French)

- ◆ **Opinion** – *The inquiry commission is of the opinion that an approach to planning based on transparency and respect, using a participatory approach, would help achieve greater social acceptability for the development of the shale gas industry in Québec. This should also be done within an integrated process that includes territorial management.*

The industry's social commitment

The Québec Oil and Gas Association has adopted a *Declaration of Social Acceptability* that will allow it to be a good neighbour to its host communities. The Association's members have undertaken to “comply with the principles of social acceptability”, “inform the parties concerned about the impacts of shale gas development”, “minimize the potential impacts of its projects” and “discuss the concerns of stakeholders and communities in order to facilitate the creation of partnerships” (DB81).

A memorandum of agreement between the Québec Government and the industry has also been proposed, to identify the transitional practices that firms will adopt until the new Act respecting hydrocarbons comes into force. According to the ministère des Ressources naturelles et de la Faune (MRNF), this will be “a social pact between the industry, the Government and citizens” (free translation from the French) setting out the terms, practices and commitments required to ensure safe development that is respectful of both populations and the environment (PR3, p. 2). The agreement will also be based on the Québec Oil and Gas Association's *Declaration of Social Acceptability* (Mr. Jean-Yves Laliberté, DT3, p. 47) and will include “measures to ensure that municipalities are truly consulted [...] before drilling work begins” (*ibid.*, p. 13, free translation from the French). Although the MRNF did not indicate a date for signature, it nevertheless noted that “the memorandum of agreement will be submitted to various government departments and agencies for consultation” and that

it “should be ready for signature by the parties in the near future” (DQ28.1, p. 35, free translation from the French). The elements of the agreement were not known at the time this report was written.

In British Columbia, the Minister of Energy, Mines and Petroleum Resources worked with government and municipal authorities, the industry and the Northeast Energy and Mines Advisory Committee (NEEMAC) to identify four principles designed to minimize the impacts of oil and gas activities on local communities. Gas companies adhere on a voluntary basis to these principles, which are: Living Together, Working Together, Respect & Communication, and Accountability¹. In Pennsylvania, a number of companies came together to form the Marcellus Shale Coalition, which organizes information and education activities including public meetings, seminars and site visits, in order to establish good relationships with municipalities and the general public (Mr. Eugene Pine, DT10, p. 34, 41 and 42).

It would be easier to achieve social equity and good stewardship if the companies subscribed to the guidelines set out in ISO 26,000² on social responsibility. Lastly, according to the *Cadre general pour un système de gestion de la sécurité de l'environnement* (General framework for an environmental safety management system):

A firm must continually use stakeholder awareness to secure and renew its political licence to operate in a community. *It must act as though it were a guest of the area's residents.* Effective awareness can help the community to progress from simply tolerating the presence of a facility to appreciating its presence as being worthy of trust and a valuable contributor to community life. (DB41.1, p. 19, free translation from the French)

- ◆ **Opinion** – *The inquiry commission is of the opinion that information and joint action are vital to create a more harmonious relationship with the communities in which shale gas exploration and extraction activities are planned.*

Information and involvement

Before they carry out exploratory drilling, the companies first meet with the landowners concerned to obtain rights of access to their land. However, landowners are not notified by the ministère des Ressources naturelles et de la Faune that subsoil rights have been granted on their properties (Mr. Jean-Yves Laliberté, DT11, p. 67).

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1. British Columbia Ministry of Energy, Mines and Petroleum Resources. *Living together, Working together*, 2009 [online (December 29, 2010): www.empr.gov.bc.ca/OG/oilandgas/LivingTogetherWorkingTogether/Pages/default.aspx].
 2. International Organization for Standardization (ISO) [online (February 3, 2011): www.iso.org/iso/iso_catalogue/management_and_leadership_standards/social_responsibility.htm].

Meetings are also organized with municipalities, to obtain resolutions from the municipal councils in support of dezoning applications to the Commission de protection du territoire agricole du Québec¹ (DB31; Mr. Vincent Perron, DT1, p. 81, 82, 104 and 105 and DT4, p. 55 and 57). The oil and gas geoscientific information system (known by its French acronym SIGPEG) managed by the ministère des Ressources naturelles et de la Faune contains information on exploration activities.

Once the companies have obtained the necessary permissions and rights of access, they normally organize information sessions in collaboration with local municipalities, at which they can present their projects to citizens. In addition to these sessions, information newsletters may be distributed to residents in the affected sectors (DB31; Mr. Vincent Perron, DT1, p. 105 and DT4, p. 55 to 59).

According to the ministère des Ressources naturelles et de la Faune, the municipalities and residents affected by geophysical surveys should also be notified by the companies before operations begin. The MRNF has therefore asked for information documents to be made available to the general public, for example by distributing mini-posters to homes located along roads that will be used by trucks equipped with vibrating plates, and to places where geophones will be installed on private land with the permission of the landowners (DB1, p. 3; DB5, p. 16; Mr. Jean-Yves Laliberté, DT3, p. 8 and DT4, p. 111 to 114).

Since September 2010, the MRNF has also asked the companies to introduce a communications plan to structure their contacts with local authorities and the general public (DQ28.2, p. 4 and 5). In addition, the MRNF has indicated that the draft bill respecting hydrocarbons will introduce “new regulatory requirements for consultation and information, to ensure that exploration and extraction activities are incorporated harmoniously into community life” (Mr. Jean-Yves Laliberté, DT1, p. 14, free translation from the French).

Under the *2006-2015 Québec Energy Strategy – Using Energy to Build the Québec of Tomorrow*, local and regional communities play a major role in Québec’s energy development, and community involvement is an essential part of a sustainable development approach (Government of Québec, 2006, p. 5). According to one expert, upstream consultation, with prior studies on which citizens can express opinions, would help to achieve better social acceptability (Ms. Christiane Gagnon, DT8, p. 41 and 42). In the case of wind energy development, a group of regional conferences of elected officers, including the one from the Chaudière-Appalaches region, worked with the academic community and other organizations to recommend an approach

1. [Free translation] Québec’s Commission of Protection of Agricultural Territory.

based on public consultation as part of a feedback process upstream of the decision, before agreements were negotiated¹.

- ◆ **Opinion** – *The inquiry commission notes that, under the provisions of the future Act respecting hydrocarbons, firms will be required to consult the general public. However, because exploration sites will be preselected and negotiations will already have taken place with the landowners, the consultation process will serve simply to inform citizens of the work that will take place in their area. In other words, it will not be a true consultation.*

- ◆ **Opinion** – *The public inquiry commission is of the opinion that public involvement and consideration of local community concerns, both of which are necessary for social acceptability, should take place from the early phases of exploration.*

The ministère des Ressources naturelles et de la Faune intends to prepare and publish a series of guides to the development of the shale gas industry, including an orientation document setting out the Government's approach, along with generalized information sheets and a Frequently-Asked Questions (FAQ) section on the MRNF website. Information meetings will eventually be organized, and will be attended by the ministère des Ressources naturelles et de la Faune, elected representatives and members of the general public, with contributions from government experts (PR3, p. 2; Mr. Jean-Yves Laliberté, DT1, p. 14). At the time of the public hearings, the orientation document was in the course of being prepared and the information sheets were in the final revision phase (DQ28.1, p. 34). In the case of wind energy, guides were produced by the State and by groups of regional conferences of elected officials, with contributions from the academic community and other organizations. Their purpose was to provide information, structure project implementation and clarify the municipal decision-making process.

- ◆ **Opinion** – *The inquiry commission is of the opinion that gas exploration and extraction projects should be assessed using information that is as complete as possible. Companies should be involved in the production of good practice guides, and in the knowledge acquisition process.*

1. [Online (January 4, 2011): www.eolien.qc.ca/fichiers/eolien/Industrie_eolienne/guide_accept_sociale_uqar.pdf], p. 46.

A consultative committee

According to an expert in the field of social impacts and regional development, committees composed of company representatives, elected representatives, residents and experts should be set up in every region in which shale gas extraction is likely to take place (Ms. Christiane Gagnon, DT8, p. 14 and 38).

State-level coordination and support will be required for the committees, to share expertise and establish a common operating framework and guidelines for negotiations with companies (DQ21.1, p. 9; Ms. Christiane Gagnon, DT8, p. 13, 38 and 49):

The State, as trustee of Québec's natural resources [...], has a duty to structure all methods and operations at every step in the process, and to provide every community, regardless of the means at its disposal, with expertise and a guarantee that its environment will be protected.

(Ms. Christiane Gagnon, DT8, p. 13, free translation from the French)

The legislative frameworks in Alberta and British Columbia provide some interesting examples of coordination. Among other things, they provide for advisory committees composed of representatives from municipal authorities, community organizations (citizens' groups, the business community, and the environmental, agricultural and civil security sectors), the industry and the government agency responsible for overseeing shale gas regulations. The purpose of these committees is to bring the parties closer together and foster collaboration.

In British Columbia, the Ministry of Energy, Mines and Petroleum Resources consults local authorities when calls for bids are launched. In Alberta, joint groups known as "synergy groups", composed of representatives from First Nations, local communities, government agencies and the industry, have been set up to discuss the issues and social impacts of oil and gas resource development, and the mitigation and monitoring measures required. The synergy groups, overseen by Synergy Alberta, help to facilitate or strengthen the industry's social acceptability (DB54, p. 1 and 2; Ms. Kim Brenneis, DT8, p. 35).

A consultative forum such as this would also be appropriate for Québec. Activities should be carried out in collaboration with the main regional stakeholders. Québec already has extensive experience with this approach: its regional conferences of elected officers, regional environmental boards, regional cultural boards and regional tourist associations are all involved in regional planning and development, and play an important role as coordinators and catalysts in their respective fields.

The *Act respecting the ministère des Affaires municipales, des Régions et de l'Occupation du territoire* (R.S.Q., c. M-22.1) was amended in 2010 to provide for the creation of a regional land and natural resource commission in every administrative region, under the responsibility of the regional conference of elected officers. The commissions' task is to prepare an integrated regional land and resource development plan for their respective regions, in compliance with Government orientations, the orientations prepared by the ministère des Ressources naturelles et de la Faune¹ and, where applicable, any other orientations put forward by a Government department.

The plan prepared by each commission will set out the region's orientations and objectives for the conservation and development of wildlife, forests and land. It will provide for monitoring mechanisms and reporting to the ministère des Ressources naturelles et de la Faune, and may also address energy, mining or any other element covered by a special agreement with the Ministry. Shale gas extraction would therefore fall within the scope of the regional commissions.

The coordination effort required for integrated management of shale gas exploration and extraction projects could therefore be entrusted to an existing structure – the regional conference of elected officers in each administrative region. This is consistent with Direction 6 of the *2008-2013 Government Sustainable Development Strategy*, which is “to practice integrated, sustainable land use and development”. In the Strategy, the Government recognizes the regional conferences of elected officers as priority interlocutors for regional development issues.

The regional land and natural resource commissions would be responsible for fostering joint action by the partners in respect of gas projects, and for issuing opinions to the ministère du Développement durable, de l'Environnement et des Parcs² on favourable conditions for the development of gas projects in the community. They would also be responsible for preparing an integrated, general vision of the gas sector in the region, and for discussing water management, business development plans and emergency plans. They would have information on monitoring and reporting both during and after exploration and extraction activities, and would be supported not only by a permanent resource at the regional conference of elected officers, but also by experts from the ministère des Ressources naturelles et de la Faune, the ministère du Développement durable, de l'Environnement et des Parcs and other interested Government departments.

1. [Online (February 18, 2011): www.mrnf.gouv.qc.ca/regions/commissions/commissions-mandat.jsp].

2. [Free translation] Ministry of Sustainable Development, Environment and Parks.

- ◆ **Opinion** – *The inquiry commission is of the opinion that a shale gas industry development zoning plan showing the sites on which projects could be carried out would be more likely to rally the community.*
- ◆ **Opinion** – *The inquiry commission is of the opinion that a consultative committee for shale gas industry activities is essential in order to ensure harmonious development of the shale gas industry within the territory.*
- ◆ **Opinion** – *The inquiry commission is of the opinion that the ministère des Ressources naturelles et de la Faune and the ministère du Développement durable, de l'Environnement et des Parcs should consider the possibility of entrusting the regional land and natural resource commissions, under the authority of the regional conferences of elected officers, with responsibility for coordinating opinions on the shale gas industry's activities in the region in question.*

Prior consultation

True consensus-building is possible only if the parties concerned have reliable information upstream of gas projects, so that their concerns can be considered by the companies, and eventually by the Government before it grants authorization. In preparing its project, a company would request a prior notice of admissibility from the ministère du Développement durable, de l'Environnement et des Parcs. It would then be required to submit its project to the shale gas industry consultative committee. The description of the project and the future collection network would include information on the exploration or extraction site, the anticipated growth rate, the volume of water to be withdrawn, the list of chemical products to be used, wastewater management, monitoring measures, mitigation measures, the trucking plan, any compensation payable, the emergency plan, the closure plan and a guarantee that the site would be restored. From an economic standpoint, the company would benefit from presenting its entire development strategy to the consultative committee at the same time, instead of taking a well-by-well approach. The committee could then propose amendments that would make the project acceptable, before submitting its opinion to the Minister.

The company would then apply to the Minister of Sustainable Development, Environment and Parks for authorization. The information and studies required to support the application could be simplified for activities that comply with the conditions established as a result of the strategic environmental assessment.

The Minister of Sustainable Development, Environment and Parks, having considered both the company's application and the committee's opinion, would then have sole

authority to decide whether or not the project should be authorized, with or without conditions.

- ◆ **Opinion** – *The inquiry commission is of the opinion that the gas companies should obtain a prior notice of admissibility for their projects from the ministère du Développement durable, de l'Environnement et des Parcs, before submitting them to the regional shale gas industry consultative committee.*
- ◆ **Opinion** – *The inquiry commission is of the opinion that the gas companies should always submit their projects for prior consultation by the consultative committee, which would then forward its opinion of the project to the Minister of Sustainable Development, Environment and Parks.*

Municipal involvement

Municipal powers are defined in a number of laws, including the Municipal Powers Act, the Act respecting land use planning and development and the Act to affirm the collective nature of water resources and provide for increased water resource protection. As shown in previous chapters, the industry's activities, if carried out in developed, inhabited areas, would have impacts on sectors under municipal jurisdiction, including water supply and treatment, transportation, emergency measures, economic development, coexistence with other land uses and the management of citizens' complaints concerning nuisances and neighbourhood disturbances.

Because natural resources are under collective ownership, the Government must ensure that they are managed properly, so that they can be used and developed in a harmonious way that is profitable to Québec as a whole. Section 246 of the *Act respecting land use planning* gives precedence to the *Mining Act*, thereby considerably limiting the capacity of municipalities to structure the development of the gas industry within their territories.

There is an analogy here with the situation of the agricultural sector, where the Government issued planning guidelines to serve as ground rules for municipalities in order to allow for the development of agricultural businesses and uphold the rules governing coexistence. The RCMs have the power to foster the development of agriculture through the land use plan, and this allows for the creation of zones devoted specifically to agricultural activities in rural areas. This same power is also acknowledged in the *2008-2013 Government Sustainable Development Strategy*, which mentions the leading role played by the RCMs in the area of land use planning.

In the wake of its 2004 sustainable development plan for pig production, the Government gave the municipalities a legislative power¹ to place certain conditions on construction permits for pig production facilities, in order to limit the unpleasant odours associated with the facilities and foster their insertion into the community. In addition, the Government's orientations were amended in 2005² to give municipalities more flexibility to plan agricultural zones, and provide the tools they need to oversee the problem of pig farm development.

- ◆ **Opinion** – *The inquiry commission is of the opinion that, based on the principle of subsidiarity, the Government should provide land use planning powers and orientations so that the municipalities are able to structure the development of the shale gas industry in the same way as they structure other types of industries, with due respect for the Government's responsibility to develop the collective gas resource in a harmonious way.*
- ◆ **Opinion** – *The inquiry commission is of the opinion that the ministère du Développement durable, de l'Environnement et des Parcs should work with the ministère des Affaires municipales, des Régions et de l'Occupation du territoire³ in order to ensure that RCMs and local municipalities give due consideration to the sixteen principles of sustainable development, as stipulated in section 4 of the Sustainable Development Act.*

1. *An Act to amend various legislative provisions concerning municipal affairs*, 2004, c. 20.

2. [Online (December 21, 2010) : www.mamrot.gouv.qc.ca/amenagement-du-territoire/orientations-gouvernementales/production-porcine].

3. [Free translation] Ministry of Municipal Affairs, Regions and Occupancy of Territory.

Chapter 14 **Structure**

This chapter proposes a legal and regulatory framework to govern natural gas exploration, extraction and collection, and examines the authorization process and administrative fee scales.

Authorization

Companies must obtain a number of authorizations from different authorities. For example, the ministère des Ressources naturelles et de la Faune oversees the conditions of compliance for gas wells, while the CPTAQ is responsible for the use of land located in agricultural zones for purposes other than agriculture CPTAQ (DB1, Appendix 1). In October 2010, the ministère du Développement durable, de l'Environnement et des Parcs issued a memorandum of instruction requiring a certificate of authorization for all gas well work, pursuant to section 22 of the Environment Quality Act. The protection of water, soils and air quality falls under the responsibility of the ministère du Développement durable, de l'Environnement et des Parcs.

Companies apply individually to the various authorities for these authorizations. Once they have complied with the obligations, they are not required to inform third parties. This increases the complexity of monitoring the industry's activities and makes them more difficult to control.

Because companies are not required to obtain a certificate of authorization from the ministère du Développement durable, de l'Environnement et des Parcs at the beginning of their geophysical and drilling activities, it is difficult for the Ministère to obtain an overview of the potential impacts of wells. In fact, the Ministère does not become involved until the hydraulic fracturing phase, which requires a large volume of water and chemical products. For all other activities causing environmental disturbances, however, companies must comply with section 20 of the Act, which stipulates that:

20. No person may emit, deposit, issue or discharge or allow the emission, deposit, issuance or discharge into the environment of a contaminant in a greater quantity or concentration than that provided for by regulation of the Government. The same prohibition applies to the emission, deposit, issuance or discharge of any contaminant the present of which in the environment is prohibited by regulation of the Government or is likely to affect the life, health, safety, welfare or comfort of human beings, or to cause damage to or otherwise impair the quality of the soil, vegetation, wildlife or property.

Systematic consideration of environmental issues is essential. It will ensure that all exploration and extraction activities are monitored, and will also allow for tighter controls.

- ◆ **Opinion** – *The inquiry commission is of the opinion that the current structure of the shale gas industry is compartmentalized between two separate Government departments, as a result of the legislation for which those departments are responsible, and that this is not conducive to integrated supervision and control.*
- ◆ **Opinion** – *The inquiry commission is of the opinion that exploration and extraction activities should be authorized by the ministère du Développement durable, de l'Environnement et des Parcs, so that all environmental issues can be addressed in a single certificate of authorization. The responsibilities incumbent upon the Commission de protection du territoire agricole du Québec would remain unchanged.*

This opinion would require amendments to the *Mining Act* and the *Regulation respecting petroleum, natural gas and underground reservoirs*, to make the ministère du Développement durable, de l'Environnement et des Parcs responsible for enforcing all provisions relating to environmental protection, pursuant to the *Environment Quality Act*. A directive similar to Directive 019 concerning the mining industry could be prepared during the strategic environmental assessment, and the approach proposed by the commission should also be considered when drafting the new Act respecting hydrocarbons. The industry's objectives and activities could be divided in a similar way to agricultural activities; the *Agricultural Operations Regulation* (R.R.Q., c. Q-2, r. 26), adopted under the *Environment Quality Act*, sets out environmental standards for the raising of animals, the facilities used for that purpose, the storage facilities for animal waste, the spreading of that waste, the parcels of land used for crops, and the use of fertilizers.

The ministère des Ressources naturelles et de la Faune, which is responsible for managing the resource and acquiring geological information concerning land in Québec, would continue to be responsible for issuing geophysical survey permits, oil, gas and underground reservoir prospecting licences and extraction leases.

The ministère du Développement durable, de l'Environnement et des Parcs should examine requests for prior notices or certificates of authorization after the company has obtained the necessary rights from the ministère des Ressources naturelles et de la Faune, so that it has all the information it needs to fulfill its mission. It would then be possible to issue a single certificate of authorization covering all the stages of the gas project, while continuing to respect the two departments' fields of jurisdiction.

- ◆ **Opinion** – *The inquiry commission is of the opinion that the Mining Act and the Regulation respecting petroleum, natural gas and underground reservoirs should be amended to make the ministère du Développement durable, de l'Environnement et des Parcs responsible for enforcing environmental protection provisions pursuant to the Environment Quality Act.*

The organizational model and funding

In British Columbia, supervision of the gas industry is centralized under the responsibility of a government agency reporting to the Ministry of Natural Resource Operations. All environmental, gas and petroleum expertise is grouped together within the agency. This type of structure was cited on several occasions at the public hearings; some participants were in favour of it, while others were not.

The British Columbia Oil and Gas Commission, with its 200 or so employees, manages all permit applications for gas exploration and extraction activities. The Commission derives roughly 40% of its financing¹ from the fees associated with permit applications (\$11,100,000 in fees collected, out of a total budget of \$28,000,000 in 2010), and the remaining 60% is obtained mainly from levies (\$17,000,000 out of \$700,000,000 collected by the province in 2009). A portion of the amounts received (\$5,600,000) is paid as compensation to the Aboriginal people.

The two methods used by the Commission to fund its activities are the fees² charged for permit applications, and a percentage of the revenues derived from the sale of natural gas or petroleum, or from pipeline operations. Fees are charged for a variety of activities. For example, a drilling permit application costs \$10,300. A company is also required to pay other fees if it wishes to build a natural gas treatment station or install a connecting pipeline. In the case of annual levies on gas and petroleum production, the regulation sets a rate of \$1.42 per m³ of petroleum and \$0.71 per 1,000 m³ of natural gas.

The Pennsylvania Department of Environmental Protection's Bureau of Oil and Gas Management is also financed out of the fees³ payable for drilling permit applications (Mr. Eugene Pine, DT10, p. 10 and 13). According to the information given at a meeting held in Harrisburg on November 30, 2010, which was attended by members of the inquiry commission and representatives of the Department, the average fee for

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1. British Columbia Oil and Gas Commission (2010). *2009/2010 Annual Service Plan Report*, 56 p.
 2. [Online (December 16, 2010): www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/488752389].
 3. Department of Environmental Protection [online fee calculator (December 17, 2010): www.dep.state.pa.us/dep/deputate/minres/oilgas/2011Permitcalculator.htm].

a drilling permit is US\$2,700, regardless of whether or not drilling actually takes place. There is also a surcharge to cover an orphan well program (US\$200) and a well abandonment program (US\$50). According to the Departmental representatives, there are a large number of applications¹, roughly 6,000 per year, for which drilling does not take place and for which the fees are not refunded. The Bureau has a staff of nearly 200 people who are responsible for monitoring and controlling oil and gas operations, plus many others assigned to environmental supervision divisions also under the Department's authority. Other fees are payable for soil erosion control and water withdrawals.

In Québec, according to an estimate by the Québec Oil and Gas Association, the average fee payable to the ministère du Développement durable, de l'Environnement et des Parcs², the ministère des Ressources naturelles et de la Faune and the RCMs (for the cutting of trees and bushes), is \$3,510 (DB18).

At the public hearings, the ministère des Finances said the Québec Government may review its fee scales to reflect departmental needs at the time the applications are examined, and to cover the cost of the inspections and the technical and environmental monitoring and control measures that would be required if the volume of gas exploration and extraction activities increases significantly. If the level of activity in the industry remains low, however, the Ministère thinks it could meet the shortfall out of royalty payments. It also noted that Government departmental financial and personnel needs are assessed annually, during the program reviews carried out each year by the Secrétariat du Conseil du trésor (Mr. Luc Monty, DT 9, p. 41, 42, 44 and 45).

With current ministerial fee scales, the total revenues derived from an activity level of 150 wells per year would be no more than \$500,000, paid into the province's consolidated fund. For an activity level of 600 wells per year, revenues would be roughly \$2,000,000. Therefore, based on the current scales, the fees charged for permit applications would be insufficient to hire the number of people required to meet the increased need for inspections, monitoring and controls, especially given that it takes 200 or more people to deal with the level of activity in both Pennsylvania and British Columbia.

The structure would require not only technical expertise specific to the shale gas industry, but also environmental expertise in areas such as water, air and soil. This latter expertise is currently centralized at the ministère du Développement durable, de

1. [Online (December 20, 2010): www.dep.state.pa.us/dep/deputate/minres/oilgas/Production%20Statistics%20Estimated.htm].

2. [Online fee scale (December 17, 2010): www.mddep.gouv.qc.ca/ministere/tarification/mddep.htm#ind_autres].

l'Environnement et des Parcs, and is applied to all industrial activity in Québec. British Columbia produces roughly five times as much natural gas as Québec consumes each year, and its service fees are insufficient to fund its agency. A structure such as this in Québec would require a much greater volume of activity than is currently projected in the short and medium term.

- ◆ *The inquiry commission observes that the system of fees currently used by Québec for drilling permit applications is based on the “user pays” concept and reflects common practice elsewhere in North America. However, it also observes that the fee system in British Columbia comes much closer than Québec’s system to covering the costs.*
- ◆ **Opinion** – *The inquiry commission is of the opinion that the fee structure for applications by the natural gas industry should be reviewed by the ministère des Finances and the ministère du Développement durable, de l’Environnement et des Parcs, to ensure that it covers, as nearly as possible, the actual cost of examining the applications and of conducting inspections and technical and environmental monitoring and control, in line with the principle of internalization of costs.*
- ◆ **Opinion** – *The inquiry commission is of the opinion that it would be premature to set up an independent agency to oversee the gas industry, and that it will be up to the ministère du Développement durable, de l’Environnement et des Parcs to identify the most appropriate organizational model, based on the anticipated volume of activity in the medium term.*

Conclusion

The inquiry commission examined and analyzed various avenues and issues connected with the sustainable development of the shale gas industry. To do this, it gathered factual information and contributions from individual citizens, groups, municipalities and the industry, and based its examination on Government and scientific documentation, expert opinions and the experience of people responsible for applying the regulations in Québec, elsewhere in Canada and in the United States. Its missions and site visits also helped it to understand the context in which shale gas exploration and extraction activities will eventually take place in Québec.

In the case of some fundamental issues, however, the answers are partial or even non-existent. Accordingly, to meet the need for more scientific knowledge and in the absence of proven facts that can be used to identify the potential risks associated with shale gas exploration and extraction, the inquiry commission has proposed a strategic environmental assessment. While the assessment is in progress, hydraulic fracturing will be authorized only for work related directly to the assessment. Exploration work would continue in the meantime, but without the use of hydraulic fracturing. An assessment such as this is a necessary element of both an informed decision and improved social acceptability.

A shale gas industry consultative committee should be set up to help ensure that the industry is able to coexist harmoniously with the community. The Minister of Natural Resources and Wildlife and the Minister of Sustainable Development, Environment and Parks should assess the possibility of asking the regional land and natural resource commissions, under the authority of the regional conferences of elected officers, to perform this task. The regional commissions would consider project proposals and then submit their opinions to the Minister of Sustainable Development, Environment and Parks.

Although it is important to respect the State's responsibilities as trustee of the natural resource, the municipal authorities should also be involved in order to achieve integrated management of the shale gas industry's activities within their respective territories. Government orientations should therefore be established, allowing the municipalities to structure the development of the shale gas industry in the same way as they structure other types of industries, including agriculture.

The framework currently applicable to the shale gas industry is compartmentalized between two separate Government departments, as a result of the legislation for which those departments are responsible, and this is not conducive to integrated

supervision and control. Accordingly, it is suggested that exploration and extraction activities should be authorized by the Ministère du Développement durable, de l'Environnement et des Parcs, so that all environmental issues can be addressed in a single certificate of authorization.

The opinions and orientations set out in the report are intended to improve methods, among other things by providing a legal and regulatory framework that would allow the shale gas industry to be developed safely. Some of the measures proposed may need time in order to become effective, while others do not require legislative or regulatory amendments and could be implemented in the short term – for example, the adoption of measures to ensure diligent monitoring, at well sites, of fugitive methane emissions, surface water and groundwater quality, and disturbances.



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