

# 8. *Recent & Anticipated Developments*



Traditionally, state of the environment reports look back in time to assess the condition of the environment and whether it has changed.

However, there is also value in looking forward to anticipate what some of the major environmental challenges will be in the coming years and to assess whether public and private sector programs will be adequate to deal with those challenges. In this section of the report, the Mackenzie River Basin Board examines some of the major industrial developments, environmental issues and initiatives that could affect the Mackenzie River Basin over the course of the next few years. Specifically, it considers industrial developments that may occur in the basin and public and private sector environmental initiatives.

## Industrial Developments

### The Oil and Gas Industry

The oil and gas industry will continue to expand in most jurisdictions in the Mackenzie River Basin. Exploration, seismic activity, the development of new wells and pipeline expansions will continue in the southern part of the basin. Exploration and seismic activity have increased in the Northwest Territories but have not yet reached the levels of the early 1970s. Land disturbance and the removal of vegetation are usually associated with these activities.

The proposed Mackenzie Gas Project (MGP) may stimulate further petroleum exploration and lead to development of gas reserves in the Mackenzie Delta and other parts of the western NWT. A major component of the MGP is a proposed pipeline that would move gas to southern markets

through the Mackenzie River Valley. In June 2003, the MGP submitted a Preliminary Information Package to regulatory authorities as a first step in initiating the environmental assessment of this project.<sup>203</sup> The petroleum industry has already increased activity in the Mackenzie Delta and Beaufort Sea areas. The Beaufort Sea Exploratory Drilling Program has been proposed as the first step towards obtaining authorization for a drilling program slated to start in 2004–2005. This is the first such application in the Beaufort Sea in many years. In the western NWT, outside of the Mackenzie Delta, there could be as many as 255 seismic programs, 167 exploration wells and 49 new producing wells in the next fifteen years.<sup>225</sup>

The petroleum industry in northeastern BC will likely continue to expand, especially since new pipelines, such as the Alliance Pipeline Project, are being constructed in the area. The recent discovery of the vast Ladyfern gas field will further fuel exploration and drilling activity. Northeastern BC has rich reserves of petroleum, which the industry is only now beginning to develop. This boom will likely continue for several years to come.

In Alberta, much of the oil and gas activity in the next few years will focus on the continued development of the Athabasca Oil Sands near Fort McMurray. Major expansions are planned by companies that are currently mining oil sands and there is potential for new companies to begin

operations. It is expected that \$23 to \$56 billion will be invested in oil sands development by 2011. Total production of oil and bitumen is expected to double between 2002 and 2008.<sup>110</sup> In 2003 Alberta Economic Development listed twenty-five new oil sands projects that have been announced or approved or were under regulatory review in the Athabasca oil sands.<sup>226</sup> Expansions will include both open-pit mining operations and *in-situ* recovery. *In-situ* recovery refers to the recovery of oil by means of horizontal wells. It leaves a much smaller footprint on the land than open-pit mining and reduces the need for extensive reclamation after the operation ends. However, it requires large quantities of water, some of which is injected into deep wells, thus removing it from the water cycle. The expansion of oil sands developments will result in a corresponding increase in Fort McMurray's population, which is expected to be between 50,000 and 70,000 by 2010.<sup>110</sup> Forty-one thousand people currently live in Fort McMurray.

Interest has been expressed in conducting exploratory work for oil and gas reserves and in developing coal and coalbed methane deposits in the headwaters of the Peel sub-basin in Yukon. The ecological and wilderness tourism values of this area will have to be considered when assessing development proposals related to these activities.

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## Forestry

Forestry will continue to be an important industry in Alberta and northeastern BC. The harvest of timber has more than tripled since the 1970s in northern Alberta alone.<sup>227</sup> National forest accords and forest management agreements between forestry companies and provincial and territorial regulators are in place and provide for the sustainable use of forest resources on Crown land. Forestry companies also harvest trees on private land and are promoting the development of private woodlots with the co-operation of landowners.

An interim agreement was reached in July 2002, between the Kaska First Nation and the federal and territorial governments to begin timber harvesting in the southeastern part of the Yukon Territory. The guidelines for harvesting timber in the Yukon are among the most stringent in the world and are designed to protect water quality. Small-scale timber harvesting will continue in the southwestern Northwest Territories. Industrial activity such as oil and gas exploration, the drilling of oil and gas wells and pipeline and road construction involve the cutting of timber and removal of vegetation. Government, First Nations and industrial partners are working together to develop practices that will minimize the incidental removal of vegetation and ensure stable soil conditions and optimal use of forest resources.

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## Mining and Mineral Exploration

Mining of base and precious metals and coal will continue in some areas of the Mackenzie River Basin. The two existing diamond mines located just outside of the Great Slave sub-basin have increased the traffic on the winter road northeast of Yellowknife. Opening the Snap Lake diamond mine, located within the Great Slave sub-basin, will further increase traffic. The proposed underground Snap Lake mine is currently in the approvals and regulatory phase. A coal mine located near Grande Cache, Alberta in the Peace sub-basin has been granted regulatory approval to re-open and it may do so in the near future. Uranium will continue to be mined at several Saskatchewan mines that border the Athabasca sub-basin. Some further development at existing uranium mines is likely to occur in the coming years. Interest has been expressed in resuming hard rock mineral exploration in the Yukon portion of the Liard sub-basin.

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## Transportation

Transportation corridors in the Northwest Territories will continue to increase in size and number in order to keep pace with the area's rapid industrial expansion. Access roads will be built to service pipeline development, petroleum exploration and drilling projects. A proposal has recently been developed to build a bridge across the Mackenzie River

at Fort Providence. This bridge would provide an all-season road link to Fort Providence, Rae-Edzo and Yellowknife. It would replace the ferry and ice bridge that currently operate at that location. The Mackenzie River may see more barge traffic to supply drilling operations in the Mackenzie Delta and pipeline construction in the Mackenzie Valley. Further development of winter roads in the Saskatchewan portion of the Athabasca sub-basin may also occur. One road will link Wollaston Lake and Black Lake and another will link Stony Rapids and Fond-du-Lac. These projects are in the planning stage. Development plans will address environmental concerns.

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## Hydroelectricity

There are no immediate plans for further development of hydropower facilities in the Mackenzie River Basin. However, BC Hydro retains lands adjacent to the Peace River between Hudson's Hope and Fort St. John, for the site C hydroelectric project. BC Hydro has recently included the Site C proposal in its Integrated Energy Plan, which outlines the company's vision for managing the province's electricity system over the next twenty years.

The territorial and Aboriginal governments in the NWT have agreed to investigate hydropower development opportunities on rivers where minimal environmental impacts are projected and where significant economic benefits can be achieved. The Northwest Territories Power Corporation, together

with its Aboriginal partners is investigating the feasibility of enhancing hydro production from the Taltson Generating Facility to meet growing industrial demand for electricity at the diamond mines north of Great Slave Lake. Another initiative is examining the potential for hydropower development on the Great Bear River. This development would serve the anticipated demand for electricity created by the proposed gas pipeline that may be built in the Mackenzie Valley. Finally, efforts are in progress to assess the feasibility of developing small hydro facilities to serve individual communities such as Lutselk'e and Wha Ti.

In Alberta, a proposal to build a low-head hydro project on the Peace River near Dunvegan was rejected by the Joint Review Panel of the Alberta Energy and Utilities Board and Natural Resources Conservation Board in March 2003.

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## Agriculture

Agricultural development will likely proceed at a slow pace in the Mackenzie River Basin. Recent developments that merit attention include new, large-scale hog barn operations in parts of the Peace sub-basin and the potential for growth in the number of tree plantations. The latter will depend, in part, on whether the Canadian government, in partnership with the provinces and industry, decides to pursue large-scale afforestation (planting forests on previously non-forested land) as a means of removing

carbon from the atmosphere and storing it for long periods of time in growing trees. If done on a large enough scale, such efforts may help to slow the rate of accumulation of greenhouse gases in the atmosphere. Presently, the Canadian Forestry Service is exploring opportunities for large-scale afforestation projects on private land.<sup>228</sup>

A warming climate could allow further expansion of agriculture in the basin. While this may be viewed as an opportunity by some, concerns have been expressed about the continued conversion of forests to farmland in Alberta's southern boreal forest.<sup>227</sup>

## Environmental Initiatives

### Climate Change Study

The Mackenzie – GEWEX study of climate (see **Chapter 1 – The Mackenzie GEWEX Study (MAGS)**) will continue until 2005. The study has entered its second phase and is now focused on developing a thorough understanding of how climate variability and climate change affect the atmospheric and hydrological system of the Mackenzie River Basin. The goal is to be able to predict how the climate and water resources of the Mackenzie River Basin will respond to climate change that occurs both naturally and as a result of human activity.<sup>2</sup>

### Initiatives in the Northwest Territories

The Northwest Territories is currently experiencing, and will likely continue to experience, an unprecedented pace of industrial development. Many resource management agencies (such as land and water boards and advisory committees) are being created through agreements with Aboriginal peoples to help ensure that broad societal and Aboriginal perspectives are considered in the management of our natural resources. This makes the approach to regulatory issues more complicated than it used to be. People in the north are concerned about water and aquatic resources and are increasingly interested in water management. Inter-jurisdictional boundary issues related to water management are viewed as important, especially given the downstream location of the Northwest Territories. Many partners are involved in water and aquatic resource management. Environment Canada and the Department of Indian Affairs and Northern Development deliver water quantity and quality monitoring programs and conduct applied research in support of water resources management. DIAND is responsible for ensuring that priority abandoned mines are properly cleaned up so that they no longer pose a threat to the environment. DIAND's efforts in this regard will be enhanced by a federal government commitment under the Federal

Contaminated Sites Accelerated Action Plan to clean up contaminated sites on federal lands across the country. The Government of the Northwest Territories is working on a strategy to safeguard the quality of drinking water in the NWT. The strategy is using a multi-faceted approach that includes ensuring that source waters are kept clean.

A committee of government, First Nations and industry members continue to work on the NWT Cumulative Effects Assessment and Management Framework. The framework is intended to facilitate the protection of ecological integrity and the building of sustainable communities, and will foster responsible economic development within a sound environmental management framework.<sup>229</sup> The regional Cumulative Impact Monitoring Programs (CIMP) will serve as independent audits of the health of the environment in the Northwest Territories. Such audits must be done as a condition of the *Mackenzie Valley Resource Management Act*. Aboriginal and government organizations, in partnership with community representatives, are working on developing these programs.

Environment Canada's Northern Ecosystem Initiative is a partnership-based program that supports projects whose objectives are to understand, conserve and protect northern ecosystems and sustain northern communities. The program's priorities are

currently being reviewed in preparation for a renewed, five-year mandate.<sup>230</sup>

The Northern River Ecosystem Initiative, a scientific initiative undertaken jointly by the governments of Canada, Alberta and the Northwest Territories, was completed in 2003. The purpose of the initiative is described below (see **Initiatives in Alberta**).

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### Initiatives in Alberta

A new provincial government policy regarding water management is expected in 2003. *Water for Life: Alberta's Strategy for Sustainability* will address issues of drinking water supply, health of aquatic ecosystems, water for economic growth and knowledge to make effective water management decisions. The Alberta government initiated investigations of drinking water systems and the use of water for oil field injections even before finalizing this policy.

A partnership of governments, industry and other stakeholders has developed a Regional Sustainable Development Strategy (RSDS) for the Athabasca Oil Sands area in northeastern Alberta.<sup>113</sup> The strategy will provide a framework for the sustainable development of the area's vast petroleum resources. Through this strategy, seventy-two important environmental issues were identified and blueprints for action were



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developed to address these concerns. The Cumulative Environmental Management Association was formed in 2000, in part as a result of the work of the RSDS.<sup>14</sup> Comprised of forty-six member organizations interested in protecting the environment in the Wood Buffalo Region of northeastern Alberta, the association's mandate is to develop recommendations on how to reduce the long-term impacts on the environment of industrial development in the region. Guided by the RSDS, the association's working groups are presently engaged in a wide range of issues related to water quality, air quality, mine reclamation, trace metal pollution and ecosystem sustainability. The Canadian Oil Sands Network for Research and Development Environmental Research Group is presently researching methods to enhance mine reclamation and to minimize the adverse impacts of oil sands process-related water.<sup>231</sup> The industry itself has been proactive in cleaning up its emissions. It has reduced total sulphur dioxide emissions by about 50% since 1996. Also, for each barrel of oil produced in 2008, the industry will reduce its carbon dioxide emissions by about 45% compared to 1990 emissions.<sup>232</sup> Unfortunately, this gain will likely be offset by increases in production. Outside of the oil sands area, Alberta Environment is initiating a water management plan for Lesser Slave Lake and the Lesser Slave River.

The Northern Rivers Ecosystem Initiative (NREI) was completed in 2003. The governments of Canada,

Alberta and the Northwest Territories undertook this initiative, which spanned the Peace, Athabasca and Slave rivers and Great Slave Lake. Through NREI, science teams have been focusing on priorities such as pollution prevention, endocrine disruption in fish, drinking water and environmental effects monitoring. Studies have examined the incidence of fish abnormalities and the effects of land use, flow regulation and climate change on aquatic ecosystems.

In 2003, the federal Program for Energy Research and Development completed an assessment of the natural and human-made impacts of oil sands contaminants within the Peace and Athabasca rivers. The study will lead to an improved ability to differentiate between chemical contamination from natural sources and from the oil sands industry.

The Western Boreal Conservation Initiative is a new initiative involving many partners. Its goals are to facilitate conservation and protection of western boreal forest ecosystems and biodiversity, to support sustainable development of natural resources, and to provide a foundation for a future national initiative. This initiative will cover large tracts of land in the Mackenzie River Basin.

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### Initiatives in British Columbia

In collaboration with government agencies, First Nations, key stakeholders and the general public, BC Hydro is developing the Peace River Water Use Plan in

response to concerns about fish stocks, flood protection, aquatic habitat, recreational opportunities and their relationship to hydro power generation. The plan will describe a new set of operating rules for hydro facilities. The rules will address several concerns, including the impacts of low reservoir levels on industry; the management of ice to minimize floods and ice jams; the impacts of low flows on community drinking supplies and effluent disposal; the impacts of flows and water level changes on recreation and aquatic habitat in and around the Williston Lake Reservoir; and the effects of changing water levels on dust storms around the reservoir. The Peace River Water Use Plan should be completed in 2004.

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## Initiatives in Saskatchewan

With federal government participation, the Cumulative Effects Monitoring (CEM) program was initiated by Saskatchewan in 1994 to determine the potential impacts of uranium mining on northern terrestrial and aquatic ecosystems. Monitoring stations for the program are located at Beaverlodge and Cluff lakes and another nineteen sites across northern Saskatchewan. Lake Athabasca has one of three background sites. Many of these sites are located within the Athabasca sub-basin.

An increasingly important component of CEM is

communication with northern residents and their involvement in sample collection. The Environmental Quality Committee (EQC) for Athabasca is one of three committees that serve as a bridge between northerners, government and the uranium industry. Representatives from the designated “impact communities” of Camsell Portage, Uranium City, Fond-du-Lac, Black Lake, Stony Rapids and Wollaston Lake sit on the Athabasca EQC.

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## Initiatives in Yukon:

There are signs that natural resource exploration and development are on the upswing after a relatively quiet period. Resource managers will need to work collectively to facilitate and oversee these activities.

First Nations' governments are becoming increasingly interested in managing water resources. In remote areas such as the Peel sub-basin, they may ultimately carry the strongest voice for stewardship.

The roles of different government agencies in managing water resources are changing. On April 1, 2003 the responsibility for water was transferred from the Department of Indian Affairs and Northern Development to the Government of Yukon. Already in the early stages of development, a new Yukon Water Quality Monitoring Network will ultimately see cooperative work agreements between several levels of government, including Environment Canada, municipalities, First Nations and the Government of the Yukon.