Behind the Oil Curtain – Athabasca River Monitoring and Tar Sands Development

By Kevin Timoney

Current production of oil from the Athabasca tar sands is estimated at 1.1 million barrels/day (bpd) and is anticipated to reach 3 million bpd by 2020, and perhaps 5 million by 2030 ("Alberta's Oil Sands," Alberta Energy website 2008). As a result of tar sands development, 65,040 ha of boreal ecosystems alongside the Athabasca River now lie under a tar sands industrial footprint; the only well-studied tailings pond leaks 5.7 million litres/day; current production of tailings from all facilities is 1.8 billion litres/day; and the nation's top four emitters of volatile organic compounds (VOCs) are tar sands facilities north of Fort McMurray (unpublished data).

Against this background, I discuss the inadequacy of ecosystem monitoring in the Athabasca tar sands region.

Decline in Alberta Government River Monitoring

In the 1970s, the Alberta government had a world-class water monitoring system. Government cutbacks swept through the system in the 1980s and 1990s as provincial politicians slashed monitoring budgets, closed laboratories, and fired technical staff. After press releases trumpeted the fiscal savings of the new "lean" government, managers were forced to contract private laboratories for most monitoring and analyses. Savings initially realized were consumed in increased per unit costs, which necessitated a steep decline in monitoring effort – a decline exacerbated by decreases in both quality controls and the government's ability to oversee, analyze, and interpret ecological data.

The impact of privatizing a public responsibility is illustrated with eight commonly measured metal analytes from the lower Athabasca River region. (An analyte is a substance or chemical constituent determined through an analytical procedure.) For all eight analytes, monitoring effort was high in the 1970s, declined in the 1980s, crashed to minimal monitoring in the 1990s, and had virtually stopped by the present decade (see Table 1). The sampling effort is slightly better for the sum total of observations for all 365 metal water-quality analytes (Table 1, bottom row), but the decline remains precipitous – an 82 percent decline in observations during the present decade relative to sampling effort in the 1970s. For most analytes, there are too few observations in recent decades for meaningful time series analyses. The decline in provincial monitoring effort for assessment of water quality is pervasive.

Since the mid-1990s, government has devolved most of its water quality monitoring in the lower Athabasca River region to an industrially controlled consortium known as the Regional Aquatics Monitoring Program (RAMP). Industry also does its own monitoring. In the former case, the data are unavailable to the public. In the latter case, industry releases data to the public at its discretion. The net result is greatly reduced data availability for the public and the scientific community at a time of unprecedented tar sands development. The collapse of public water quality monitoring means that trend analyses for changes in concentration of analytes has become difficult or impossible.

The Failure of RAMP

Most environmental data in the region are gathered by RAMP. Raw data are available only to members of the consortium while the public is allowed

Table 1. Number of Alberta government observations by decade of metal water quality analytes for stations in the lower Athabasca River region.[1]

Analyte	Decade (N Observations)			
	1970	1980	1990	2000[2]
Aluminum	925	418	0	0
Arsenic	816	544	51	16
Copper	859	591	18	0
Iron	969	662	31	0
Mercury	998	672	39	0
Manganese	987	575	1	4
Lead	968	716	85	0
Zinc	821	579	18	0
Total N	7343	4757	243	20
Mean N	917.9	594.6	30.4	2.5
All Metals N[3]	16772	9131	6342	3096
All Metals Mean N[3]	45.9	25.0	17.4	8.5

[1]Alberta government data, current to December 2007
[2]Number of observations adjusted to decade for 2000-2007 data by multiplying N by 1.25
[3]All Metals N is the sum of observations for 365 metal water quality analytes

access only to vetted reports. A small amount of data is available to the public, gathered by a provincial government agency whose responsibility for monitoring has been largely supplanted by RAMP. A small amount of data is gathered by researchers independent of government or industry. The result is that tar sands industrial developments are proceeding without adequate scientific scrutiny.

A recent scientific review of RAMP raised concerns about the integrity of the RAMP program. The review concludes that "RAMP is not in a position to measure and assess development-related change locally or in a cumulative way." There were "serious problems related to scientific leadership and a lack of integration and consistency across components with respect to approach, design, implementation, and analysis" (G. B. Ayles, M. Dubé, and D. Rosenberg, '*Scientific Peer Review of the Five Year Report [1997-2001]*,' 2004, RAMP).

Based on my study of RAMP and its reports, I conclude the following about RAMP.

1. It is analytically weak.

- The statistical power to detect change is not addressed.
- The temporal baseline proscribed for change detection is too short (5-10 years).
- No effort is made to analyze relevant water quality and biological data.
- No empirical justification is provided for delineation of "reference" sites and "potentially influenced-oil sands sites."
- There is a paucity of comparisons with relevant study sites both within and outside the region.
- References to the scientific literature are sparse; there is little or no context provided for the data.
- The study design is flawed.
- Graphics are often presented in a manner that obscures real patterns.
- Failure to present meaningful analyses of results often leaves the reader guessing as to significance. Often data are presented without context, comparison, or statistical testing.

2. It is biased.

The steering committee, which acts as the funding source, is dominated by the oil industry and provincial government with a vested interest in oil sands development.

Tar sands operations just metres from the Athabasca River north of Fort McMurray
PHOTO: C. WEARMOUTH

3. It is overly conservative.

There is a tendency to dismiss exceedences of wildlife contaminant and water and sediment quality guidelines as anomalous or inconclusive. The tendency to dismiss or downplay the significance of data that show industrial pollution is a consistent theme in RAMP reports.

4. It is subject to errors of fact.

RAMP's 2005 Technical Report, for example, states that water withdrawals for oil sands operations in 2005 were 98.8 million m^3, when the actual withdrawal was more than four times that amount.

5. It is inconsistent.

The composition of the monitoring team varies over time: continuity in monitoring personnel is critical for change studies. Moreover, continual changes in methods and means of presentation render the reports of limited utility. Often there are unacceptable data gaps. In 2006, there was no sampling of sediment quality, benthic (bottom-dwelling) invertebrate community, and fish tissues on the Athabasca River mainstem, and no sampling whatsoever in its delta (see RAMP's 2006 Technical Report).

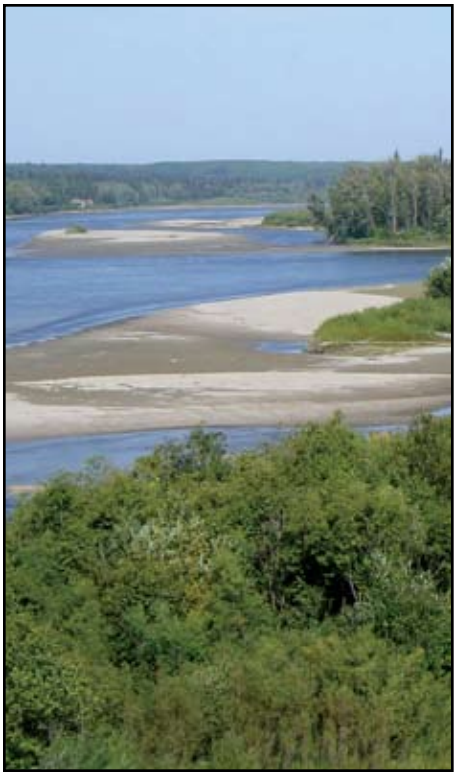
Reports funded and controlled by vested interests such as the Alberta government or industry do not attain the standard of impartiality and peer review required in matters of public and ecosystem health. Similarly, boards charged with overseeing or managing public environmental concerns, such as the Energy Resources Conservation Board and the Cumulative Environmental Management Association, are hampered in their mandates by restrictive terms of reference and bureaucratic structures. The result is the *appearance* of monitoring and management of environmental concerns in the public interest. The *reality* is a lack of timely, publicly available information and the perpetuation of business as usual.

The fact that only vetted reports rather than raw data are available to the public calls into question the failure of RAMP to find statistically significant effects from industry. Rather than a serious scientific endeavour, RAMP acts as a firewall between the public and government-industry in that it shifts attention and responsibility for environmental management away from government. RAMP demonstrates that a fiduciary responsibility cannot be privatized.

The Political and Economic Context

Alignment of government, politicians, and industry to facilitate rapid exploitation and financial gain under the banner of sustainability is common. Wealth or the prospect of wealth generates power that is used to promote exploitation (D. Ludwig, et al., "Uncertainty, resource exploitation, and conservation: lessons from history," *Science* 260: 17, 36, 1993).

At the same time, scientific understanding of the exploitation is hampered by lack of controls and



Athabasca River near Fort McKay
PHOTO: J. HILDEBRAND

replicates in these real-world ecosystem-level experiments, especially in cases such as the tar sands where the majority of data is privately held and collected within a poor study design. Given a scientific consensus that tar sands impacts are serious and require attention, it might be impossible to prevent irreversible harm. Many practices, such as irrigation in arid lands, continue in spite of scientific evidence that they are destructive (Ludwig et al.).

As of 2006, investment in the Alberta tar sands reached about $14 billion. A barrel of oil reached US$140 in June 2008. At a conservative price of $100 per barrel, current production revenue approximates $112 million dollars per day or roughly $41 billion dollars per year. In his former role as federal environment minister, Stéphane Dion stated: "There is no environmental minister on Earth who can stop the oil from coming out of the sand because the money is too big" (C. Krauss, "In Canada's wilderness, measuring the cost of oil profits," *New York Times*, October 9, 2005). Thirty-four years ago, two prescient biologists wrote: "Present political attitudes and energy demands indicate that full-scale development of the Alberta oil sands will proceed at a rapid pace" (C. D. Schick, & K. R. Ambrock, *Waterfowl Investigations in the Athabasca Tar Sands Area*, Canadian Wildlife Service, 1974).

The fact that erosion of tar sands geological deposits is a source of contaminants has been used by the Alberta government to deflect criticism of its environmental management. While the question of tar sands pollution is essentially a scientific one, the question has been politicized and polarized. The position of the Stelmach government on pollution from the tar sands industry has been and continues to be that there is none: "Alberta has been monitoring water quality in the oil sands area since the early 1970s and there have been no detectable changes in water quality in the Athabasca River and regional lakes due to oil sands mining" (K. Capstick, pers. comm., June 12, 2008).

As part of its new $25-million campaign to brand Alberta tar sands oil production as "green," the government has stated: "Industry is prohibited from discharging untreated process water from oil sands projects into the Athabasca River…. Extensive testing has shown no signs of elevated risks for people living downstream from oil sands projects.... [The government] ensures a healthy environment…. Stringent testing has consistently shown there has been no increase in concentrations of contaminants as oil sands development has progressed…. The contaminant sources in the area are natural" (Government of Alberta, "Alberta's Oil Sands: Opportunity, Balance," 2008).

At the federal level, the Government of Canada has conducted little meaningful scientific research, monitoring, and enforcement. On the topic of Athabasca River pollution from tar sands activities, federal Environment Minister Baird has written, "No evidence of an offence has been found" and "No evidence of any deposit by a person of a deleterious substance has been found." In regard to leaching from tailings ponds, he wrote, "No evidence has been found that groundwater contamination from the Tar Sands tailings ponds is leaching into the river" and "Environment Canada has found no evidence that groundwater contamination and leaching from tar sands tailings ponds is occurring in contravention of the Fisheries Act" (Letter and enclosure in response to Environmental Petition No. 238 pursuant to section 22 of the Auditor General Act, Environment Canada. Fax from the Office of the Auditor General of Canada, May 28, 2008).

No monitoring of migratory bird deaths, a federal responsibility, is conducted. The Department of Fisheries and Oceans has limited its involvement to the issuance of permits for the harmful alteration, disruption, or destruction of fish habitat.

Organizations tend to distort information to meet organizational needs (D. M. Bella, "Organizations and systematic distortion of information," *Journal of Professional Issues in Engineering* 113, 1987). The distortion does not require malice but simply an acceptance on the part of each functionary that responsibility involves solely the completion of one's assignments. Based on a study of organizational disasters, such as the crash of the space shuttle Challenger and the Chernobyl explosions, Bella concluded that modern organizations display two troubling systemic properties: (1) they develop complex technological systems of immense power and (2) they sustain widespread self-deception concerning the catastrophic risks of their activities.

Conclusions

Government lacks the capacity to monitor ecosystem change with sufficient rigour to fulfill its mandate of environmental protection. While the Alberta government's view that contamination of the Athabasca River derives solely from natural sources is a distortion of reality, it is predictable given the immense profits at stake.

The Alberta government has promised that nothing will get in the way of tar sands development. Decline in monitoring capacity coincident with unprecedented ecosystem perturbations is, of course, no coincidence. This is the new reality of life behind the Oil Curtain. What better way to maximize profit with a minimum of fuss?

Kevin Timoney is an ecologist who has studied and reported on ecosystems and ecological change in western Canada for the past 25 years.