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Original article

# Aboriginal communities, traditional knowledge, and the environmental legacies of extractive development in Canada

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ABSTRACT

Community and regulatory concern over the ongoing impacts of historic extractive developments has spurred efforts to clean up abandoned and contaminated sites across the Circumpolar North. Yet, as the environmental legacies of northern development proliferate, questions remain about how successfully local or Indigenous traditional knowledge (TK) has been included in and applied to issues of remediation, reclamation and restoration at former industrial sites. In northern Canada, Indigenous TK has in the last 40 years been formally incorporated into wildlife management and in some cases approval processes for industrial projects, but has less frequently been applied to remediation issues. This paper will focus on the high profile case of the Canadian government's attempt to remediate arsenic contamination at the former Giant Mine in the Northwest Territories. This abandoned mine contains 237,000 t of arsenic trioxide stored underground adjacent to the city of Yellowknife and the Dene communities of Dettah and Ndilo. While the Giant Mine Remediation Project professed a desire to incorporate TK into the reclamation project, the complex technical nature of the process, and a fundamental misunderstanding of the epistemological basis of Indigenous TK, has prevented anything more than token inclusion of such knowledge. Using transcripts from the recent environmental assessment of the project, we argue that proponents of the remediation project failed to acknowledge that Indigenous TK is not simply a storehouse of scientific data on plants and animals, but is woven together with historical memories of rapid social, economic and environmental changes associated with northern development projects


## 1. Introduction

In spite of at-times hyperbolic contemporary rhetoric around Arctic resources and the "new North" (Smith, 2010; Emmerson, 2010; Anderson, 2009), the globe's northern latitudes have been subject to industrial resource-extractive activities for at least a century (Stuhl, 2013). Particularly after the Second World War, Arctic rim countries promoted intensive industrial development in their remote northern territories, often based around extractive resources such as minerals and hydrocarbons. As Mark Nuttall has noted, "regions and people throughout the circumpolar world have a rich history of experiencing the economic, environmental and social impacts of extractive industries" (Nuttall, 2010, 33). Increasingly, scholars (and others) are drawing on these historical experiences to inform contemporary development impacts and decision-making, particularly surrounding environmental protection and the (beneficial) participation of Northern indigenous peoples in extractive developments (Gibson and Klinck, 2005; Stammler and Wilson, 2006; Angell and Parkins, 2011; Rodon et al., 2013). A considerable body of research has now accumulated on the construction, operational, and even closure phases of extractive developments in Arctic and Northern regions, much of it highlighting the links between resource exploitation, environmental degradation, and the social and economic dislocation of local communities (e.g., Coates, 1991; Josephson, 2014; Morse, 2003; Hacquebord, 2009; Piper, 2009; Sandlos and Keeling, 2012a; Tester et al., 2013).

Amidst this growing attention to the politics of extractive development in the circumpolar North, the long-term environmental legacies of such developments are less well-explored. The cyclical and volatile nature of remote resource economies means that extractive sites may be subject to sudden closure and abandonment, often leaving behind environmental problems (Aschmann, 1970; Keeling, 2010). But whether a particular development is ongoing, completed, or ephemeral, the legacies of historic resource-extractive activities may remain evident in the landscape and environment for long afterwards. This is partly because of the slow recovery rates of many high-latitude

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ecosystems, but also because of the material persistence of the environmental changes themselves. In addition to surface disturbances from extractive activities and infrastructure, mining and hydrocarbon production produce significant polluting wastes, including tailings and wastewaters. Radiological and chemical contaminants also affect the local environment near mineral processing and oil and gas installations, including air pollution, fuel spills, and community wastes (Walker et al., 1987; Poland et al., 2003). These contaminants may move and/or accumulate in the biota, and persist for decades or more after the putative 'end' of extractive activities (Sandlos and Keeling, 2013).

Community and regulatory concern over the ongoing impacts of historic extractive developments has (in some cases) spurred efforts to clean up abandoned and contaminated sites across the Circumpolar North. Although there is a thriving technical literature on environmental remediation in the Arctic (Jorgenson et al., 2003; Olsen, 2001; Udd and Bekkers, 2003; Udd and Keen, 1999), the scope of the remediation challenges in the region is not well understood. At the local level, the incorporation of community knowledge and citizen participation in remediation policy and practice, particularly involving Indigenous people, represents a poorly understood aspect of extractive development. (Assembly of First Nations, 2001; McBeath and Shepro, 2007; NOAMI, 2003; Sistili et al., 2006). Because contamination and environmental remediation tend to be framed as technical or scientific issues, the contributions of local and Indigenous people are often limited. Indigenous knowledge and experience, in particular, is typically confined to matters of "traditional" knowledge, such as pre-contact

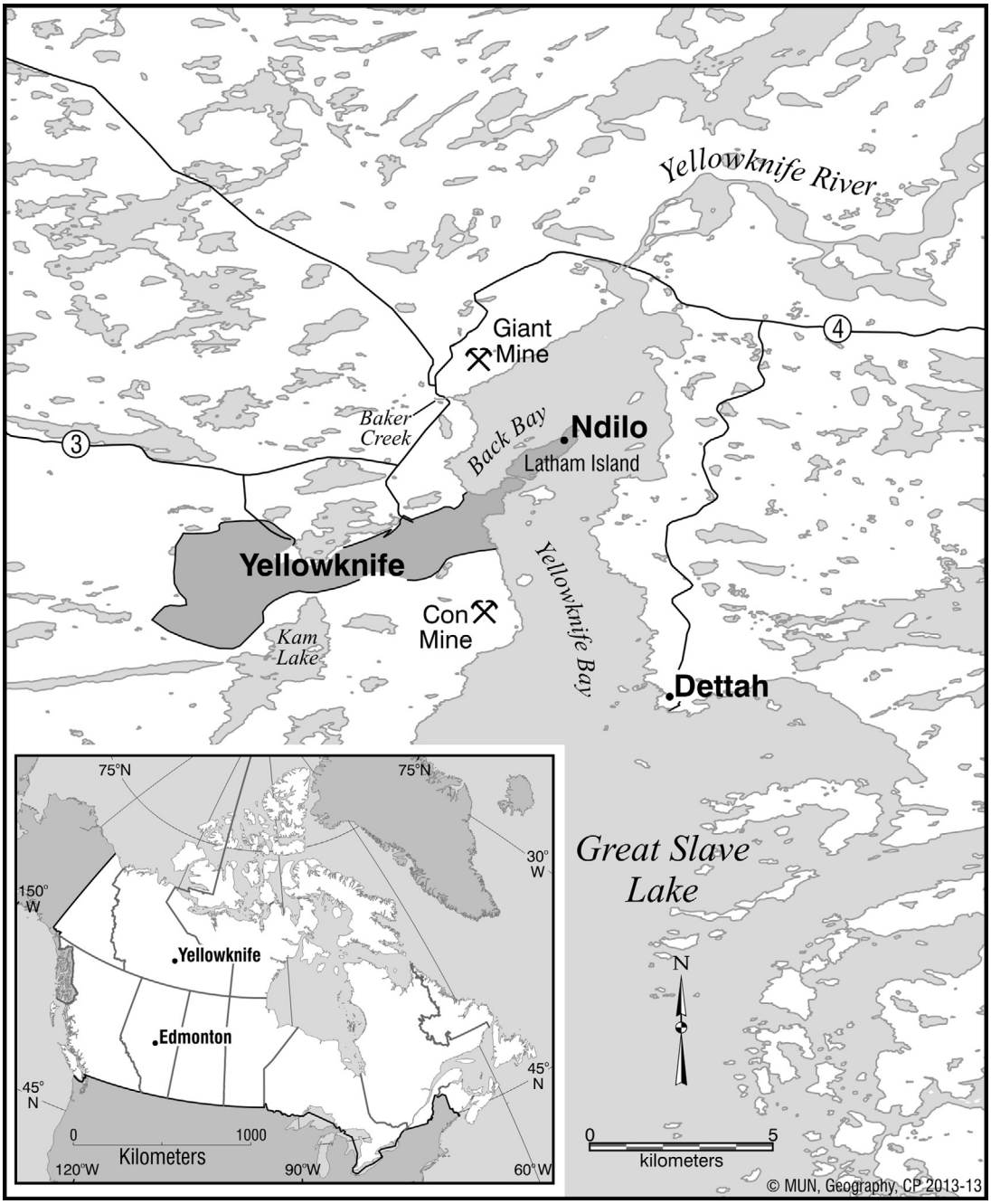


**Fig. 1.** Location of Giant Mine and City of Yellowknife. The Yellowknives Dene communities of Ndilo and Dettah were affected by air and water pollution from the mine before its closure in 2004. Map by Charlie Conway.

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