

Claiming the New North: Development and Colonialism at the Pine Point Mine, Northwest Territories, Canada

Abstract

This paper explores the history of economic, social and environmental change associated with the Pine Point lead-zinc mine, a now-abandoned industrial site and town in the Northwest Territories. Recent perspectives in cultural geography and environmental history have sought to rehabilitate mining landscapes from their reputation as places of degradation and exploitation – the so-called “mining imaginary.” We argue that the landscapes of Pine Point epitomize the failures and contradictions of mega-project resource development in the north. While the mine and planned town built to service it flourished for nearly a quarter century, the larger goals of modernization, industrial development, and Aboriginal assimilation were unrealized. Ultimately, the mine’s closure in 1988 resulted in the town’s abandonment and the removal of the rail link, leaving behind legacy of environmental destruction that remains unremediated. At Pine Point, the forces of mega-project development joined with modern mining’s technologies of “mass destruction” to produce a deeply scarred and problematic landscape that failed in its quest to bring modern industrialism to the Canadian sub-Arctic.

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Along a remote stretch of highway on the southern shore of Great Slave Lake in Canada's Northwest Territories, there once was a town named Pine Point (Fig. 1). At its peak, Pine Point's population reached 2,000, and boasted amenities such as a golf course, a shopping centre, and hockey arena. Today, only echoes of the former settlement remain. You can still walk and drive along the orderly streets and sidewalks, but there are no buildings or street signs (Fig. 2). Drive out of town, and a maze of roads constructed out of crushed rock and gravel will lead you to a better understanding of who lived here and why the town existed. At one location, there is row upon row of core samples laid in collapsing wooden racks, a sign of the exploration work that accompanied the area's transformation from remote bush country into a massive lead-zinc mining operation. Huge piles of waste rock and dozens of abandoned open pit mines, many of them filled partially or completely with water, dominate the landscape. The remnants of a 570 ha tailings pond have been covered with gravel, though there are still several small enclosed pools of water that are maintained at the site. An abandoned rail bed, the tracks removed, leads west from the former mill site to the transportation hub of Hay River, where it connected Pine Point to southern processing facilities and global markets that consumed 3,158,168 tons of high grade ore and 9,628,000 tons of ore concentrate produced at the site between 1964 and 1988.¹

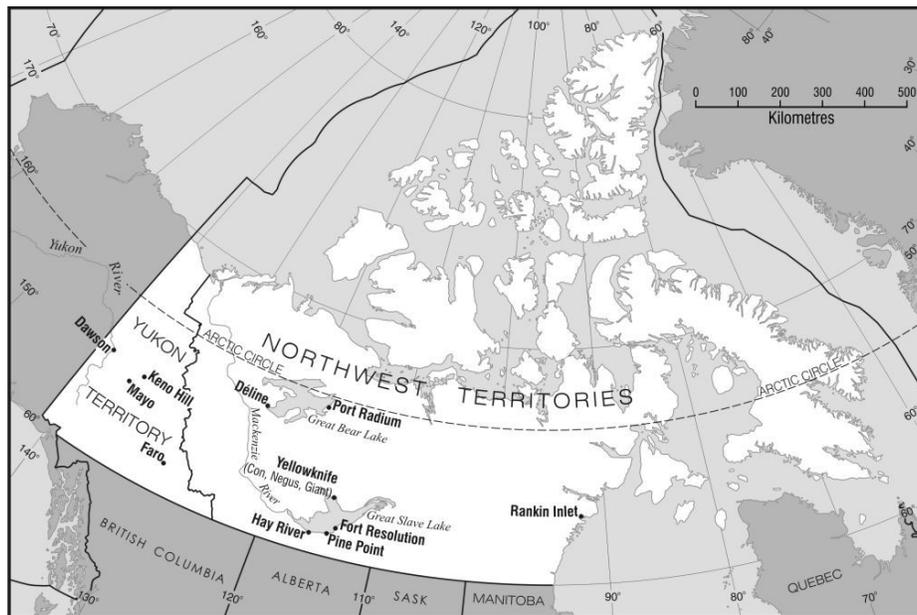


Fig. 1: Pine Point and other historic mining communities around Great Slave Lake, Northwest Territories, Canada. Map by Charlie Conway.



Fig 2: Abandoned Townsite, Pine Point (Photo, J. Sandlos)

Geographer Richard Francaviglia has described such dramatically transformed landscapes as mining's "hard places," sites that exhibit the uniquely hardscrabble, but also tenacious relationship to place emblematic of mining communities.² Drawing on Francaviglia's work, a number of recent mining histories have dismissed what their authors deem the "mining imaginary," the common historical narrative suggesting that mining communities and their local environments will inevitably be destroyed and degraded in the wake of a mine closure. This emerging school of thought argues that many mining communities have displayed a surprising economic and cultural resilience in relation to the notorious price cycles that cause sudden downturns and closure in large-scale mining ventures. The end of a mine and subsequent withdrawal of large-scale capital enterprises from a community have in some cases offered opportunities for communities to develop alternative economic activities such as mine museums, cooperative business ventures, and ecological restoration initiatives that are locally controlled, community driven, and oriented toward social and environmental goals. Where outsiders may focus on mining's ecological impacts, the individuals living in mining towns often maintain positive associations with the local landscape as a place of creative work that allowed for intimate contact with nature.³

The abandoned mining landscape and town at Pine Point reminds us, however, that stories of environmental degradation and community collapse still have a place in the mining history literature.⁴ Indeed, the history of mining in Canada's provincial and territorial northlands suggests that the critics of the so-called mining imaginary underestimate the extent to which their model of community resilience applies in all regional contexts. Certainly the narrative of boom, bust and community decline has held up quite well over time in northern Canada. Canada's territorial north in particular is, in contrast to the lower forty-eight United States or United Kingdom, an isolated and sparsely populated region with a majority Aboriginal population in many areas. It has much in common with other remote circumpolar or Third World hinterlands where poor agricultural prospects, low population densities, and relative isolation from large markets

restricted industrial economic activity to the narrow exploitation of raw resources, particularly valuable minerals and hydrocarbons. A very few northern mining communities have managed to reinvent themselves and cope with closure: Dawson City, Yukon has become a cultural heritage and mining tourism centre, while Yellowknife, NWT thrives as a mining supply centre and the territorial capital. Nevertheless, the dozens of ghost towns and abandoned mines that dot the landscape across the north represent a stark reminder of the dominant development pattern in the region.⁵

Aside from regional considerations, the intensely local focus of the community resilience literature often fails to recognize how social, economic and ecological change in mining communities is mediated by forces both proximate *and* distant. The historian William Cronon suggests (with reference to Kennecott, Alaska) that the localized nature of mining communities should not distract us from considering “the paths out of town” that shaped them: not only the rail and road links that drew some remote mining regions into more direct contact with the outside world, but also the influence of people, goods, markets, and the state that all worked in concert to produce mining landscapes. While local people play a critical role shaping and reshaping mining places, mining histories must also account for the power of the state and private capital to transform and control social and ecological relations in remote mining operations.⁶ As important as it is to consider community agency and resilience, the broader political economy of industrial mining matters, a powerful mediating force that both enables and constrains the survival of mining communities in resource hinterland regions.

The Pine Point lead-zinc mine offers a particularly significant historical example of the state and private capital imposing and shaping an industrial modernization agenda in a largely underdeveloped hinterland region. As the primary architect of post-war social and economic development policy in the territorial north, the Canadian government placed the Pine Point mine at the core of its broader northern development agenda, promoting the mine and its attendant rail link as a means to spark an unprecedented northward extension of southern Canadian capital and industrial activity to northern Canada. By the early twentieth century large corporate interests increasingly controlled base and precious metal mining activity; thus the lead and zinc deposits at Pine Point were unlikely to spark the kind of mass migration, settlement and development associated with the gold rushes of the nineteenth century. Nonetheless, the federal government used the mine as a means to promote internal colonization of its northern regions through planned and controlled industrial resource extraction, extending planning support, infrastructure and generous subsidies so that large private companies could be enticed to invest further in the economic salvation of what was perceived as an underdeveloped region.

Instead of providing the spark for a more diversified and modern northern economy, however, the mine failed to fulfill its promise. In terms of the broader political economy of northern development, the closure of the mine served, for many critics, as an emblematic fulfillment of Canadian economic historian Harold Innis’ warnings about the economic dependency and volatility associated with staple resource exploitation in hinterland regions. On a local scale, Aboriginal communities close to the mine, particularly Fort Resolution to the east, derived marginal economic and employment benefits from the mine and experienced severe disruption of their local economies and environments, part of a broader post-war pattern whereby southern development schemes

produced very few benefits for native northerners.⁷ The case of Pine Point illustrates the convergence of industrial primary commodity production mega-projects and the neocolonial imposition of a modernization agenda on the supposedly backward native hunting and trapping economy of northern Canada.⁸ The Pine Point Mine was at the leading edge of a policy regime devoted to the re-territorialization of the northern Canada as the fountainhead of a primary resource supply chain leading south toward global commodity markets.

Our analysis of the environmental and social impacts of the Pine Point mine on local Native communities and northern Canadian landscapes suggest that its history resonates as a First World example of the unjust distribution of harms and benefits associated with the Third World political ecology literature.⁹ Indeed, on a global scale, we suggest that the Pine Point story resembles other instances of indigenous conflicts with mining development, a process that Richard Howitt has described in the Australian context as “dispossession, displacement, marginalisation and alienation in the period of rapid change precipitated by minerals-based industrialisation.” Whether in Australia, Papua New Guinea, Latin America, or northern Canada, these processes have been underwritten by ideologies of development and modernization, and the material-discursive construction of remote regions as “primary-commodity supply zones.”¹⁰ The Pine Point mine was a catalyst for dislocation and dispossession, and its abandoned landscape remains a symbol of the political and economic power of outsiders to shape local environments in ways that serve the needs of national ambitions and global capital rather than those of local people.

The Pine Point Mine

Pine Point was not the first large-scale mining project in the Canadian north. The history of mining in northern Canada properly begins with the Yukon gold rush in 1898, but the first large-scale industrial mines—what we would today call mega-projects—did not appear until the early twentieth century. Prior to World War II, the number of developments remained small, limited to high-value precious metals or strategic minerals in high demand on global markets. Key developments included the Keno Hill silver mine (1913), the Port Radium radium and uranium mine (1932), and three closely related gold mines on the northern shore of Great Slave Lake: Con (1938), and Negus (1939), and Giant (1948, though first staked in 1935).¹¹ In the 1950s and 1960s, at the height of the post-war economic boom, mining companies proceeded with significant exploration and development activities at such sites as the lead-zinc deposits at Pine Point, lead deposits at Faro in the Yukon (the Cyprus-Anvil Mine), and nickel at Rankin Inlet, NWT. Pine Point was particularly significant, however, because of its emergence as a cornerstone of the federal government’s northern modernization agenda.

Although the Pine Point mine commenced production in the mid-1960s, interest in the site stretches back to 1898. In that year, Ed Nagle, an independent fur trader based at Fort Resolution, staked the first eight claims in the area with the assistance of prospectors stranded while passing through the Great Slave Lake region on their way to the Klondike gold fields in the Yukon. The mineralization of the area was known to Nagle through interactions with local Aboriginal people, who used the galena deposits for making lead shot. Nagle’s claims attracted the attention of Geological Survey of Canada

geologists Robert Bell and J. Macintosh Bell, who surveyed the area in 1899 and reported on its lead, zinc and silver deposits. Without valuable gold, however, the Pine Point claims were allowed to lapse, and it was not until the mid-1920s that sustained corporate interest in the site materialized.¹²

The Oblate missionary and historian Rene Fumoleau has documented how these early mineral exploration activities directly stimulated federal government efforts to secure treaties with local indigenous people (referred to today in Canada as First Nations). The Aboriginal population of the southern Great Slave Lake area is Denesuline (Chipewyan) and Slavey, subgroups of the larger Athapaskan-speaking Dene Nation, which is distributed throughout the vast Mackenzie Basin region. In spite of centuries of contact and interaction with European fur traders, missionaries and civil authorities, before the 1890s, there were no agreements ceding land or resources to non-Native people in the north, as the land itself was considered useless for non-Native settlement. The Canadian government originally initiated negotiations for Treaty 8 in 1898 to secure land for settlers and miners in the Athabasca Region to the south, but extended negotiations to Great Slave Lake in 1899 at the insistence of Minister of Interior Clifford Sifton, who instructed NWT Indian Commissioner David Laird: “In view of the reported mining development in the Great Slave Lake Region it is important that a treaty should be extended to embrace that country if at all possible.”¹³ Signed at Lesser Slave Lake and Fort Resolution in 1899, the treaty aimed (from the government’s perspective) to extinguish Native land title and reserve resource rights, including mineral rights, to the Crown, in exchange for guaranteed access to traditional game resources for hunting, fishing and trapping, as well as annuity payments. By contrast, Aboriginal signatories believed they had agreed not to the wholesale transfer of ownership, but rather to shared access to land and resources, with basic protections for Aboriginal lifeways and benefits such as health care and education.¹⁴

Treaty-making and early mineral exploration laid the groundwork for the large-scale landscape changes to follow. In the 1920s, Ed Nagle’s son, Ted, travelled to the region on behalf of the Consolidated Mining and Smelting Company with a six-member exploration team.¹⁵ As the major corporate actor in the Pine Point development, CM&S, a subsidiary of the Canadian Pacific Railway (CPR) and one of Canada’s emerging mining giants, played a central yet at times contradictory role in the project. CM&S, later known as Cominco, was founded in 1906, an amalgamation of several mines, mills and companies in the Kootenay mining district of British Columbia, centered around the rich Sullivan Mine and Trail lead-zinc smelter. The company was dominated by the CPR and its central Canadian directorship, which sought to provide traffic for the transcontinental railway’s Crow’s Nest Pass line. As Jeremy Mouat has shown, CM&S’s rise to prominence in the B.C. mining sector mirrored international industry trends towards metropolitan capital, heavy investments in technology for the refining of low-grade ore deposits (and the resultant changing labour arrangements), and the development of integrated mining, mineral processing, and transportation systems.¹⁶ Highly capitalized mining corporations—whether American giants like Kaiser Steel, the American Smelting and Refining Company (ASARCO), and the Kennecott/Utah copper company; British firms such as Rio Tinto; or the emerging Canadian conglomerate Noranda Inc.—created large-scale operations that integrated several separate, even far-flung ore deposits and milling operations with central smelters, while diversifying into different minerals or

other subsidiary concerns. CM&S branched out from its main base in lead-zinc to include gold, coal, copper and other mineral properties, and developed sidelines in gypsum and fertilizer production at the Trail smelter. As Tim LeCain argues, the domination of mining by large, integrated corporations emerged in tandem with a mining system of “mass destruction” involving the increasingly mechanized exploitation of low-grade ore deposits in open pits, often with devastating environment consequences at mine, mill and smelter sites.¹⁷ The history of environmental damage and international conflict over sulphur emissions at CM&S’s Trail lead-zinc smelting complex exemplified the often-dismissive attitude of powerful North American mining corporations to local interests.¹⁸

After the initial scramble to establish and consolidate its Pine Point claims in the 1920s, CM&S used its considerable influence with the federal government to limit competition for lead-zinc deposits, allowing the company (through a joint-venture subsidiary, the Northern Lead-Zinc Company) to develop the site at its preferred pace. In 1931, a federal Cabinet order withdrew from staking a 98.5 square mile area around the original CM&S claims; subsequent Mines and Resources Department documents noted that “these reservations were not in favour of anyone, although it was pretty generally known departmentally at whose insistence they were made.”¹⁹ These reserved areas were cancelled in 1934, when the onset of the Depression and the attention drawn to radium and gold developments further north in the NWT (including CM&S’s own Con and Negus gold properties at Yellowknife Bay) halted virtually all development work at Pine Point. After the Second World War, the company resumed efforts to delineate and prove up the extensive ore body, as it became concerned over the potential exhaustion of its B.C. mines. To secure its position, in 1948 Cominco lobbied the federal government for the creation of a 500 square-mile concession granting the company exclusive rights to prospect for and stake lead and zinc deposits for a period of three years. A concession of such unprecedented size was justified by the company and federal mines officials by the nature of the ore body (consisting of extensive, low-grade deposits) and the early recognition of the potential for a mega-project scale enterprise requiring capital-intensive transportation, power and other infrastructure developments. CM&S and its partner Ventures Ltd. convinced federal officials that granting more or less exclusive corporate control over the region furthered the goals of “orderly development,” an increase in national revenues, and “the provision of employment for local inhabitants and the general increase of employment opportunities in the country.”²⁰ Neither government officials nor CM&S made any attempt to consult with First Nations in Fort Resolution or Hay River to the west despite the fact the concession essentially alienated of a large body of land within traditional use areas and within the boundaries of the Treaty 8 territory.

In the 1950s, corporate interests, national development priorities and the international Cold War political economy converged at Pine Point. The CM&S desire to ensure a steady, long-term supply of feedstock for the Trail smelter was reinforced by the general optimism about base-metal markets. Post-war economic recovery and expansion, the lifting of wartime price ceilings, and the emergence of strategic Cold War demands for industrial minerals heralded a bright future for the Canadian mining industry. In particular, growing American domestic consumption was augmented by national security concerns, articulated in the 1952 *Resources for Freedom*, or Paley Report, to secure adequate long-term supplies and stockpiles of “strategic” industrial minerals. Canadian politicians and bureaucrats, eager to promote an agenda of hinterland economic

expansion, explicitly linked mineral policy and related developments to American resource demands.²¹ CM&S, for its part, bolstered its case for government infrastructure support with reference to these positive long-term market conditions, as well as forecasts of ore production from Pine Point lasting up to 50 years.²² This confidence in mineral-led development was reflected in federal reports that directly linked the mines at Pine Point and Yellowknife to “the long-range development of the whole of Canada’s new North,” and pledged assistance for the construction of hydroelectric dams, transmission lines, roads, harbours, airstrips and rail links to support large-scale mine and mill projects.²³ This northern development strategy promoted an increasingly interventionist role for the Canadian government in northern society and economy. In 1953, the federal government established a new Department of Northern Affairs and National Resources with an explicit mandate to further economic and political development in the Yukon and Northwest Territories. Mark Dickerson and Shelagh Grant have described this extension of federal government activities and interest in the north as the effective beginning of colonialism in the region.²⁴

In the case of Pine Point, Deputy Minister of Northern Affairs and Commissioner of the Northwest Territories, R. Gordon Robertson, began in the mid-1950s to promote the idea among senior government and CM&S officials that a railroad to the lead-zinc deposits on Great Slave Lake might serve as a catalyst for further economic development in the Mackenzie Region.²⁵ In his 1955 brief on northern development to the Royal Commission on Canada’s Economic Prospects, Robertson extended this argument, suggesting that a railway to the Pine Point area was critical to the national economy, concluding with the suggestion that the mine and the railroad would provide a gateway for the greater national purpose of northward industrial expansion:

A railway to Great Slave Lake will not be just another railway. It is not a railway to a lake, or to open a mine or to serve a community. A railway to Great Slave Lake will be one of the great development railroads of the country. It will not bring population to the Northwest Territories to the same extent that the western railroads brought it to the prairies, but it may well bring in the years ahead a comparable increase in the wealth of Canada. This railway is quite different from most of the branch lines constructed in recent years which were destined to serve one mine, or a group of mines; its purpose is to open up a whole new region. The fact that there happens to be a potential mine of great value at its northern terminus is a piece of great good fortune, for it will enable this railroad to be built without the long wait for reasonable returns which so often has been the lot of a pioneer railroad.²⁶

The proposed Great Slave Lake Railroad was to be a catalyst for modernization in the north, according to Robertson, a spur not just to a chain of mines but also to the federal government’s colonial ambitions in the region.

The linkage of a railroad and the mine to a much broader program of northward economic expansion became, in fact, an article of faith in the public realm and throughout the highest levels of government by the 1950s. In 1957, Prime Minister St. Laurent reiterated his government’s support for a rail link to Great Slave Lake in a speech delivered in the northern gateway city of Edmonton, declaring that “young Canada, in

search of new frontiers, is looking eagerly to the North. And while there are still all sorts of new worlds to conquer within the four corners of Canada, the North is beckoning us.”²⁷ Such boosterism transcended party politics. In 1955 Robertson claimed that the grand task of northern development enjoyed the support of every political party in the country.²⁸ Indeed, the election of 1957 that brought the Progressive Conservatives to power only added further impetus to the Liberals’ development policy, as the new Prime Minister John Diefenbaker sought to fulfill what he termed a “northern vision” of economic development that had featured prominently in the party’s platform.²⁹

Newspaper reports on the proposed railroad and mine echoed the unrestrained political enthusiasm for a northward turn in Canada’s development policies, a measure of the overwhelming consensus that the construction of a railway and the Pine Point mine was the key to unlocking the resources of northern Canada.³⁰

Despite such broad consensus, the Canadian government did go to great lengths to assess whether the railway and mine would be economically viable. Senior bureaucrats produced data suggesting, for the most part, that shipping ore via railway would be cheaper than via an extended and upgraded Mackenzie Highway, as long as roughly 250,000 tons of outbound freight were shipped out each year.³¹ They also insisted that, even if the federal government bore all of the estimated \$50,000,000 capital expenditure on the railway as a means to make such a remote line feasible, over time it would cost the Canadian taxpayer nothing. Robertson emphasized this point in his brief to the Gordon Commission in 1955, where he invoked the relatively new concept of Gross National Product (GNP) to argue that the overall mine project would contribute \$25 million in total economic growth in Canada, while taxes and royalties projected at \$3.5 million annually would far exceed the \$2,138,000 annual cost of amortizing the proposed federal railway subsidy.³² Government officials also studied intensively the relative merits of two proposed routes through northern Alberta, generally favouring the eastern route because the existing timber operations in Wood Buffalo National Park and the proximity to potential (though as yet unidentified) mineral deposits in the region presented greater opportunities for stimulating a broader program of northern development than agricultural operations in the Peace River region. A Royal Commission appointed in 1959 nevertheless narrowly selected a western route originating at Grimshaw, Alberta.³³ Even if this was not the preferred plan amongst Northern Affairs officials, the Canadian government provided \$99,547,345.20 in subsidies to the railroad, the highway to Pine Point and the construction of a hydroelectric dam on the Taltson River to provide power for the project.³⁴

Direct government support for the Pine Point project extended to the planning and development of a mining community near the mine. The new town of Pine Point was not to become a chaotic Wild West boomtown; nor would it be narrowly conceived as a company town. Instead, the government promoted the creation of a modern and carefully planned community to service the mine. Federal officials devoted considerable attention to site planning and questions of administration, since Pine Point was to serve as a model of orderly development and contemporary resource-town planning principles in the north.³⁵ In early 1952, the Department of Natural Resources struck a planning committee that included senior resources and development officials, a planner from the Central Mortgage and Housing Corporation, Mines and Technical Surveys staff, and other government department (and occasionally company) representatives. Initial uncertainty

around the scope of the mine development led to caution among some, including the company itself, about the requirements for what would be “a mining town at best.” Early surveys and plans for a townsite, created in consultation with CM&S, sought to accommodate 1200 to 2500 residents in a fairly simple townsite located near the proposed mine and mill, although some estimates of the town’s ultimate population ran much higher.³⁶ Yet town planning had stalled by 1953, as the company began to explore the use of open-pit mining methods at the site, which would entail a much smaller projected labour force producing a much smaller overall tonnage than previously forecast. This change in plans, in combination with declining lead and zinc prices and uncertainty about the construction of a railway, meant town planning virtually halted, and did not resume until early 1958.

When CM&S relaunched plans to open the mine by the early 1960s, both the government and the company maintained their determination that Pine Point should not be a company town, but acknowledged that CM&S would play a large role in its design, construction and, at least initially, administration. With the Northern Administration Branch taking the lead, the 1953 plan was reviewed and revised to bring it in line with contemporary trends in resource-town planning, including new approaches to site preparation, street layout and zoning that aimed to replicate modern, “new town” planning principles. Notably, implementation and oversight of the town plan was turned over to the territorial government (GNWT), a creation of the federal government whose autonomy and role in local administration had nevertheless increased rapidly since the early 1950s. Although some Northern Affairs officials expressed concern about the GNWT’s capacity to undertake the development, the Territorial Government’s administration of Pine Point and the oversight of construction (largely undertaken by CM&S on contract) was supported by a \$500,000 loan from the federal government, to be repaid from sales of town lots and assessments for services.³⁷

In spite of such large public subsidies and capital outlays, officials within the Department of Northern Affairs largely failed to construct airtight economic arguments for the extension of town, transportation and hydroelectric infrastructure to Pine Point. Roy Crump, President of the Canadian Pacific Railroad and one of the government’s key potential partners on the project, was openly critical of the business case the government had constructed to support the railroad. He mused publicly to the Yellowknife Board of Trade in September 1955 that a railroad to Pine Point was unlikely to be a paying proposition.³⁸ One month later, Crump met with Robertson’s and Lesage in Ottawa, where he suggested that the projections of a revenue neutral railroad in the Gordon Commission brief was simply unrealistic.³⁹ Crump may have been positioning his company for a large subsidy on the Pine Point project (certainly government officials thought this was the case), but Robertson’s notion that the railroad would cost the Canadian public nothing over its lifespan rested on several questionable assumptions: that the Pine Point mine or another successive mining operation would ship ore for fifty years (a projection that was very much a product of bureaucratic enthusiasm rather than a production guarantee from Cominco), that interest rates would remain at 3.5 percent or lower, and that southbound traffic would amount to a minimum of 450 tons of ore concentrate per day.⁴⁰ While it is all too easy to criticize such numbers with the benefit of hindsight, it is difficult to believe that federal bureaucrats were unaware that the business

case for the mine and the railroad rested on inherently variable and unpredictable production figures and market conditions.

Nor did the government's crystal ball projections of future mine developments rest upon firm evidence that the railroad would generate significant mineral development beyond the Pine Point ore body. John McMynn, the Manager at Con Mine, suggested in 1954 there were simply not enough proven high quality mineral deposits to produce an immediate mineral rush in the wake of the railroad extension.⁴¹ In 1960 Justice M.E. Manning, Chair of the Royal Commission on the railway route, claimed that geologists were more enthusiastic about mineral prospects further to the north of Great Slave Lake rather than along the south shore.⁴² Even within the federal bureaucracy, P.A. Koller of the Northern Affairs' Economic Division, argued that there was "no chance" of lithium production proceeding on Great Slave Lake because there was no market for the metal.⁴³ The government's stubborn insistence on investing in the railroad and mine project despite considerable doubt about market conditions and mineral prospects on a regional scale suggests that the Pine Point line and its attendant mine were both literal *and* figurative extensions into unknown territory.

Faced with criticism, the government's Pine Point boosters tended to fall back on the more abstract elements of the northern development agenda. Robertson responded to Crump's skepticism, for example, by reminding him that there was "good ground for optimism" about the mineral potential of the region, and that rising demand for these metals in the coming years required planning for exploitation now. Robertson further emphasized the national importance of the project, casting it as an extension of nation-building efforts in the past: "it would have been equally difficult in 1880 to have shown where all the freight would come from to justify the C.P.R."⁴⁴ C.H. Herbert, Chief of the Economic Division within the Department of Northern Affairs, countered the lingering doubts about freight potential and the mineral prospects of the region in similarly boosterish terms: "we would be completely lacking in faith in the future of the Mackenzie District if we did not feel that a sufficient number of mines would come into production to make the railway useful for at least fifty years."⁴⁵ He suggested "it would be most unwise to fail to develop the potential resources of the Mackenzie Basin and of the Northwest Territories in general," because "these resources will be needed *sometime*."⁴⁶ For the promoters of the mine and railroad within the federal bureaucracy, the government had an obligation to subsidize private industry so long as the attendant development activity would open up new regions of the north, the fruits of which would, in part, flow south to benefit a national economy that had drifted into recession by 1957.

Despite the government's heavy emphasis on the themes of national and northern development, federal bureaucrats also took great pains to demonstrate the benefits of mine and railroad development for Native people in the Mackenzie region. Indeed, federal bureaucrats and politicians sold the railroad and the mine as a two-pronged antidote to what they perceived as a dire economic crisis facing northern Native communities. As with previous arguments, it was Robertson's brief to the Gordon Commission that laid out the basis for promoting the mine as a boon for local people. According to the Deputy Minister, the hunting and trapping economy on which most Natives depended had largely collapsed due to game shortages (particularly a decline in the barren-ground caribou herds) and sharp decreases in fur prices. The solution, he argued, was to develop alternative employment opportunities so that Dene might remain

self-sufficient as they exploited the untapped resource riches of the Mackenzie Valley. The old economy that had dominated the north for three centuries was coming to an end, according to Robertson, and a rapid industrial revolution was the only possible solution to the problem.⁴⁷

Given the general push toward northern development, it is perhaps no surprise that the federal government began to promote the Pine Point railway and mine as the economic salvation for the Dene of the Mackenzie Valley. At a February 1956 meeting of the interdepartmental Advisory Committee on Northern Development (ACND), Robertson stated that the Northern Affairs Minister preferred to reject a Northwest Territories Council request for fur price supports, and instead recommended the rapid construction of the railroad to Great Slave Lake because the “main hope for increased economic activity lay in the development of mineral resources.”⁴⁸ To shore up the government’s position, Robertson further warned in a departmental memorandum that increased relief payments would make it difficult to entice Natives into any kind of wage employment.⁴⁹ Ultimately, the federal government had chosen to reject subsidies for the anachronistic fur trade in favour of very similar forms of government support for a mineral industry that signaled the dawn of a new north.

The Local Realities of National Development

The government’s prediction of major employment opportunities at Pine Point for local Aboriginal people from Fort Resolution or Hay River proved to be more rhetoric than reality. Very few Native and Métis (mixed ancestry) people found employment during the intensive construction phase of the mine in the mid-1960s, though the company hired 27 men from Fort Resolution in January 1964 to clear right of ways for roads and transmission lines.⁵⁰ During the operational period of the mine, Native employment peaked at 17.1 per cent of the total mine workforce in 1970, but declined to between seven and nine per cent in the late 1970s (see Table 1). Cominco Vice-President R.P. Douglas claimed in 1975 the company tended to err on the side caution when compiling Native employment data, placing, for instance, Métis of uncertain ancestry under the general northern category.⁵¹ In contrast, Janet Macpherson’s research from the mid 1970s noted local resentment in Fort Resolution toward Cominco’s practice of including non-local Native labour in employment statistics, or double counting individuals hired multiple times in the same year, when trumpeting the local employment benefits associated with the mine.⁵² Certainly from 1973-76 Native people from outside the region did claim 24 jobs at the mine compared to 78 northern Natives, while in 1978 nearly half the Native labour force (25 of 52 workers) was from south of the sixtieth parallel. Thus, the participation of local Dene from nearby communities such as Hay River and Fort Resolution may have been quite small at any given time. Testimony at the Mackenzie Valley Pipeline inquiry in 1975 suggested most Native workers were from the prairie provinces; only five or six Fort Resolution Natives had obtained steady work at the mines despite promises of extensive employment opportunities made at a community meeting held in 1960.⁵³ For most local Native people, jobs tended to be short term due to high dismissal rates or employees leaving of their own accord. Between 1963 and 1977, the company authorized 125 hires of 92 Fort Resolution residents, but only ten of these workers lasted more than one year. In 1976 alone, Cominco hired 30 Fort Resolution

Natives to work at the mine, but only nine remained on the payroll by Christmas.⁵⁴ This pattern was repeated across the Yukon and Northwest Territories: Native employment rates hovered at close to five per cent across the territorial north through the late 1970s and federal and territorial bureaucrats began to admit in several reports that a mining-led development strategy had largely failed to provide significant local economic benefits for Native northerners.⁵⁵

Table 1: Native Employment at Pine Point Mine, 1967-78⁵⁶

Year	Native Labour Force	Total Labour Force	Native Labour Force (%)
1967	10	220	4.6
1968	34	276	12.4
1969	57	398	14.7
1970	70	410	17.1
1971	21	NA	NA
1973	39	535	7.3
1975	46	637	7.2
1976	NA	NA	NA
1977	45	630	7.1
1978	52	552	9.4

Cominco and the territorial governments did make some attempts to encourage Native participation in the labour force. In March 1969 the territorial government hired a Native from Fort Resolution as resident Employment Liaison Officer, a position meant to ensure job openings at the mine were communicated locally and to recommend suitable candidates to the company. Eight months later, Cominco signed an agreement with the two levels of government and the United Steelworkers to create training positions for six local people per year, with government picking up half the wages and successful participants being granted preferential hiring as relevant positions became available. The program was not as successful as hoped: seven of 21 trainees were fired for absenteeism and another four had quit by 1971. Company officials suggested that those who successfully completed the program likely would have been hired on the open market regardless of the training. The resident Employment Liaison Officer position also failed to recruit many Fort Resolution residents to the mine. According to economist Paul Deprez's 1973 report on the local impacts of the mine, the liaison officer did not have a clear mandate from the company or from either government, and the company largely favoured the advice of one of their existing employees with roots in the community.⁵⁷ The company continued with local recruiting efforts through the 1970s, however, maintaining the local liaison officer, organizing familiarization tours of the mine for Native communities, offering contract work for line cutting and brush clearing to the First Nations government at Fort Resolution, and proposing the creation of a local labour pool where any six Fort Resolution residents could commute to the mine on a company operated bus. Cominco officials took a dim view of the results of these initiatives, however, with Vice-President R.P. Douglas complaining publicly and to government officials that the Band Council turned down the bus offer due to the time involved commuting, and Natives from Fort Resolution abandoned a line cutting contract after the first payday.⁵⁸

Government and company officials blamed the general failure of these employment programs on local Native people. Comments ranged from sympathetic

(though essentialist) appraisals of Native workers' inability to adjust culturally to industrial labour, to more outright racist sentiments that emphasized chronic welfare dependency and a poorly developed work ethic in communities such as Fort Resolution.⁵⁹ While there may indeed have been problems with cultural adjustment to mine work, issues surrounding reliability and transiency persisted in the entire workforce. Turnover rates for non-Native mine employees were in fact *higher* than for Natives in the early years of the mine.⁶⁰

Structural and systemic issues offer a more plausible explanation for low Native employment rates at the mine. Deprez highlighted the failure to extend the highway to Fort Resolution until 1972 as a practical problem, forcing prospective employees to separate from family during the work week due to the lack housing beyond bunkhouses at Pine Point, but also as a symbolic affirmation of Fort Resolution's initial exclusion from the economic opportunities associated with the mine. Transcripts of community meetings in Fort Resolution from this period suggest that many residents had staked much of the town's economic future on the road extension, not only for highway construction and mining jobs, but also to provide transportation corridors to support the local lumber and fishing industries. The eight-year lag between the opening of the mine and the highway extension was thus a bitter pill for the community to swallow.⁶¹ The federal and later territorial governments also failed to provide anything more than a scattershot approach to training Native employees for mine work; hence most skilled labour was imported and Native labourers were confined to unskilled or semi-skilled occupations.⁶² The unskilled nature of Native workers placed them in a double bind in terms of government and company policies; the company tended to offer the limited number of subsidized family unit houses to skilled employees as a retention device, placing local unskilled workers in bunkhouses or trailers. The territorial government did implement a housing program for northern residents in 1969, but established rents higher than Cominco housing because they did not want to establish subsidized housing as a standard policy in northern mining communities.⁶³ At the Mackenzie Valley Pipeline Inquiry hearings, Fort Resolution resident John Morin criticized the northern housing program because it classified people as northern residents who had only lived in the territories for three years, a policy that favoured outsiders, particularly skilled apprentices transitioning to steady jobs at the mine, rather than local labourers.⁶⁴

In more general terms, the fact that the company and the territorial governments began to establish northern housing, employment, and training programs roughly four years after the mine had opened—and then only in an ad hoc and sometimes token fashion—affirms that the colonial objective of northward economic expansion took precedence over local development initiatives. The federal government, in particular, was willing to devote nearly \$100 million in direct subsidies to the extraction and transport of non-renewable resources, but almost nothing toward ensuring that the benefits of this new mining economy would flow through the surrounding local communities. By the mid-1970s, Fort Resolution derived very little economic benefit from the mine despite the vast amount of mineral wealth that was being exported from the South Slave region: over \$400 million in net profit between 1964 and 1989.⁶⁵

If the mine failed to generate significant and lasting economic benefits for local Native communities, it did leave a legacy of large-scale landscape and environmental changes, many of which persist to the present. Mining at Pine Point employed the large-

scale, open-pit methods developed in the early twentieth century in conjunction with selective flotation ore recovery technologies, a new approach to mineral extraction that resulted in often devastating environmental consequences. CITE TIM From the 1950s and throughout the life of the mine, exploration crews conducted drilling activities and cut hundreds of geophysical lines across the landscape (Fig. 3). The mining operations at Pine Point exploited 50 separate Mississippi Valley-type deposits consisting of a swathe of widely dispersed, near-surface orebodies extending over 1600 square kilometers.⁶⁶ Most of the ore was extracted using open-pit (or open-cast) methods (Fig. 4), although two underground shafts were also sunk to extract deeper deposits. In addition to the removal of overburden, miners extracted more than 69 million tons of ore over the life of the mine, at average grades of seven per cent zinc and three per cent lead. Large Euclid haul trucks transported ore along a network of hard-surfaced haul roads to the company's concentrator, which opened in 1965 with a capacity of 5,000 tons per day, later expanded to 8,000 then 11,000 tpd through the installation of additional crushing and selective flotation circuits to separate the concentrate from the waste rock. During the life of the mine, the concentrator generated 82 million tons of tailings that were carried in slurry and deposited in a low-lying containment area north of the concentrator site.⁶⁷

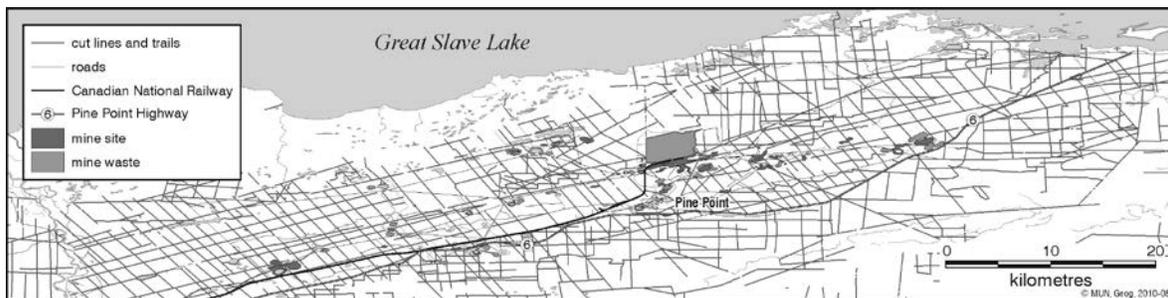


Fig. 3: The Pine Point mining district, showing roads, cutlines, and mine activities. Map by Charlie Conway.



Fig. 4: Aerial view of the O.42 pit area. Pine Point, April 28, 1965. [Credit: Cominco/NWT Archives/N-1987-021-0056](https://www.cominco.com/~/media/Cominco/N-1987-021-0056)

The development of the mine and its attendant infrastructure preceded effective environmental regulation in the Northwest Territories by either the territorial government, which exercised very limited responsibilities regarding land and resources, or the federal government. Environmental protection legislation was virtually absent, beyond the poorly enforced anti-pollution provisions of the federal Fisheries Act. The revised Canada Mining Regulations proclaimed in 1961 outlined prospecting, claim-staking, mineral tenure and development rules, but remained silent on questions of environmental impact, pollution control or mine site remediation.⁶⁸ Federal and territorial officials charged with overseeing the mine's development remained primarily concerned with maximizing the potential economic benefits for the mine. Environmental protection issues raised during the planning and early development phases of the mine were confined to questions of how air pollution policy might affect the potential construction of a smelter at Pine Point.⁶⁹

Concerns about the local environmental impacts of the mine operation emerged from both government scientists and local Native people in the 1970s. Initial concerns focused on the mine's tailings containment and pit dewatering practices. A 1972 study by federal Department of Environment scientists explicitly linked their investigation of heavy metal contamination from Pine Point's tailings area to the broader issue of effective mine pollution control policy in the Northwest Territories. Their study undertook water sampling, sediment and vegetation sampling, and the analysis of tissues and organs from fish taken from the waters of Great Slave Lake near the mine. At this time, the company discharged its mill tailings from a T-shaped trestle, the decanted overflow effluent filtering through the surrounding muskeg and, eventually, reaching Great Slave Lake. The authors concluded that, while the values for heavy metals and other contaminants in nearby lake waters generally remained below safe concentrations, there remained some risk of spikes in contaminant levels during seasonal runoff or due to the inefficient operation of the tailings control system. Sediments and vegetation in the area between the tailings pond and the lake were contaminated with copper, cadmium, lead, and zinc.⁷⁰

The same year, an engineering assessment of the mine's wastewater handling procedures was similarly critical of the tailings disposal system. The Laval University research team echoed the biological report's concerns with seasonal overflows of the tailings pond, especially during spring thaw, when frozen tailings and snow cover combined to send large volumes of effluent water over the dykes of the containment area. This report also highlighted the problem of pit dewatering at Pine Point, whereby millions of gallons per day of water containing sulphides and mineral salts was pumped from the open pits under excavation and discharged directly into local creeks, and thence into Great Slave Lake.⁷¹ Although neither tailings overflow nor pit water appeared to cause severe water quality problems, concerns about water pollution resurfaced at NWT Water Board hearings in the late 1970s, particularly from local land users concerned about groundwater contamination, reduced wildlife populations and potential human health impacts.⁷²

As land users with long-standing economic interests in wildlife harvesting, Aboriginal people (at Fort Resolution in particular) actively protested the habitat impacts, loss of access to traditional resource sites, and damage to traplines associated with the

extensive mining activities. In spite of government efforts to direct Aboriginal people away from trapping, Fort Resolution residents engaged in seasonal hunting and trapping activities across the entire region east of the Slave River (although these activities were reportedly restricted on Cominco property).⁷³ As mineral exploration of the area proceeded, Métis and Dene trappers found their traplines destroyed by bulldozers ploughing the hundreds of kilometers of geophysical lines. The mine came under severe criticism by Fort Resolution residents at hearings held in the community in 1975 as part of the Mackenzie Valley Pipeline Inquiry. Harold Bosley [likely Balsillie] testified,

[W]hen they opened up that Pine Point... there was six of us that was trapping down there. When they opened up the mine there, and when we went back to our traps, they had been cutting lines there right on our trapline and between the six of us we lost about 200 traps and we never got no return for it...⁷⁴

Other testimony highlighted residents' concerns about water quality in creeks, streams, and Great Slave Lake, as well as their resentment of pressures on recreational sites and fish and game populations from non-Natives from Pine Point.⁷⁵

The deterioration of the mixed jack pine/black spruce forest in the Pine Point vicinity may have exacerbated these impacts on wildlife species (and the people depending on them). A critical Canadian Forestry Service report from 1975 suggested that mine exploration activities, pit dewatering and highway construction had altered the area's complex water regime, resulting in tree deaths from flooding or ponding of water, in some cases, and lowering of the water table in others. Echoing the 1972 water study, the author argued that "planning and development within the extraction complex has been poor with respect to social and environmental degradation" and that the extensive denudation of the surface vegetation would have a long-term negative impact due to slow revegetation in the northern climate.⁷⁶ Testimony from Fort Resolution residents corroborated these criticisms of widespread tree mortality, especially near the highway. A later forest study discounted the effects of pit dewatering, but confirmed that highway construction had resulted in large areas of pine mortality due to interrupted water flows.⁷⁷

Even far from the mine, the development of infrastructure produced severe environmental impacts. The construction Twin Gorges Dam in 1963 and the Nonacho Dam in 1968 to power Pine Point caused significant ecological change in the Taltson River watershed several hundred kilometers to the east. A traditional knowledge study produced in collaboration with the Denesuline community of Lutsel k'e (a roadless community on Great Slave Lake east of Fort Resolution situated near the Taltson watershed) suggested major social and cultural impacts due to the changes the dams brought to flooding regimes and water levels in the region. These included: the flooding of commonly used trails, traditional hunting and trapping areas, and grave sites; the destruction of fur-bearing habitat due to the flooding of five distinct lakes, their attendant wetlands, and their connecting waterways; the destruction of bird habitat on submerged islands; changes to caribou crossing routes; and finally, a decline in the quality of fish harvests (with individuals becoming thinner and laden with cysts) due to possible mercury contamination attributed to rotting vegetation in the reservoir. Lutsel k'e residents also reported that ice thicknesses had become unstable within the Talston

watershed; many blame the drowning of two trappers in 1992 on dangerous and unpredictable ice conditions associated with the dams. As with Fort Resolution's relationship to the mine, the community of Lutsel k'e received almost no employment benefits, and no hydro-electricity, from the Talston River dams, but bore the brunt of the environmental costs associated with the ancillary infrastructure that powered the Pine Point development.⁷⁸

The closure of the mine in 1988 brought an end to production at Pine Point, but not to environmental concerns. In response to the Fort Resolution community's longstanding concerns about water quality, in 1995 a series of investigations of contamination from previous operations and from the decommissioned mine and tailings site were undertaken. The authors reviewed previous investigations dating back to the 1970s, and conducted sediment coring, fish sampling and water quality sampling in Great Slave Lake offshore from Pine Point, in Resolution Bay near Fort Resolution, and in the Slave and Little Buffalo rivers. These studies discounted long-term or widespread contamination or human health threats from the operation of the mine, although noting some localized, elevated levels of heavy metals in sediments, and of mercury and arsenic in fish organs.⁷⁹

Federal and territorial officials considered the decommissioning of the mine site as a success. An abandonment and restoration plan called for the covering of large dewatering wells adjacent to the open pits (allowing them to fill with water), securing the two underground adits, installing fences or large berms surrounding the open pits, and blocking access to the network of haul roads criss-crossing the area. Ironically, the effort to restrict access to the Pine Point property proved to be one of the controversial features of the closure, as it blocked access to hunting, camping and trapping sites for local residents. Cominco attempted some selective revegetation of waste rock piles, though with varying degrees of success. The company also capped and graded the tailings area with rough gravel to prevent wind and water erosion of the tailings, secured the dykes at the edges of the tailings area, and constructed a permanent spillway to permit the treatment of runoff from the tailings area to remove soluble zinc before discharge.⁸⁰ Beyond these efforts, no ecological restoration was undertaken, and mining impacts remain the significant defining features of the Pine Point landscape.

Perhaps more poignantly, the removal of nearly all equipment and infrastructure – including mine and mill buildings, the rail line and the entire town itself – signaled the finality of the town's demise. The company sold houses for nominal prices to be hauled away, and Pine Point homes can be found in Fort Resolution, Hay River and communities in Northern Alberta. The town's hockey arena came to rest in Fort Resolution. The company bulldozed rest of the town, including its new school. Within a year of closure, the town of Pine Point—cornerstone of state regional development and modernization plans in the 1960s—was obliterated from the landscape.⁸¹

Conclusion

The example of Pine Point and dozens of other abandoned northern Canadian sites offers a useful corrective to recent perspectives of cultural geographers and landscape historians who have sought to question narratives of environmental degradation and community collapse following mine closures. At its best, this literature

reminds us of the complex and contested meanings of place and community at such sites. Even at Pine Point, we find there are complex and competing views of history and landscape, including for Aboriginal people; as one Métis man who formerly lived in Pine Point noted, the mine was a mix of “the good and the bad.” Former residents maintain a nostalgic website celebrating the friendly community and the region’s mining past. In a broader northern Canadian context, Liza Piper has argued that mines are not necessarily a blight on the landscape but can be understood as integrated in symbolic and material ways with the local biophysical in which they are embedded.⁸² While regarded by “outsiders” as brutal, degraded or even toxic, former mining landscapes may be touchstones of community identity and memory, and provide both material and cultural resources for economic recovery or even political resistance. In Ben Marsh’s terms, place identity in such communities serves as both means (of material continuation or survival) and meaning (drawn from the past as a resource for this persistence).⁸³

The total erasure of the community at Pine Point and the dispersal of its residents suggests, however, that the attempts to critique the so-called mining imaginary often fail to consider the persistence of catastrophic community impacts associated with the mining experience. Nor do they recognize the wider ideological and political contexts shaping the establishment and fate of mining districts. We argue that histories of hinterland development must account for the colonial nature of state and capitalist-driven modernization agendas, even in so-called First World settings. These conclusions resonate with recent suggestions that environmental historians devote more attention to issues of power and injustice in North America. Paul Sutter, for instance, has recently invoked the example of South Asian environmental histories in calling for greater attention to social inequality in histories of North American conservation and environmentalism.⁸⁴ Drawing from the geographical subfield of political ecology (which focuses broadly on conflicts over resource management and environmental degradation in the Global South), we contend that an analysis of colonial patterns of development emerging from Third World studies may be applied in First World contexts such as the Canadian north. Though couched in the rhetoric of regional economic and social development, the expansion of mining (and its attendant infrastructure) into this region was devoted almost exclusively to the extraction of valuable resources, rather than promoting social and economic benefits for local Aboriginal communities. In the end, Pine Point remained an outpost of the southern Canadian resource economy, rather than a secure beachhead for long-term social and economic progress. Pine Point’s legacies of landscape dereliction and social dislocation are ultimately rooted in neocolonial attitudes towards people and territory, and serve as cautionary tales for contemporary pro-development discourses in the Canadian north, however couched in terms of economic sustainability or the rhetoric of local benefits.

Indeed, since 2008 mineral development has returned to Pine Point. A junior mining company, Tamarlane Ventures, recently received permission from territorial regulators to develop remaining ore bodies left over from the Cominco operation. For many local people, the prospect of renewed mining at the site has stirred negative memories of their exclusion and lack of control over previous rounds of industrial development. The environmental assessment report on the Tamerlane Project reported that Aboriginal communities in the South Slave region had raised concerns about wildlife and fisheries impacts, lead–zinc contamination, and groundwater impacts associated with

the new project. According to the report, the historical memory of the original Cominco mine is alive and well in the regions: “Aboriginal groups [in the South Slave] have concerns about the lack of closure to outstanding concerns with the historical Pine Point Mine east of the Buffalo river, which shut down in 1987 [sic]. Both the former operator (Cominco Ltd., now Teck Cominco) and INAC [Department of Indian and Northern Affairs Canada] were criticized for the lack of resolution to community concerns about long-term impacts on lands, waters and wildlife.”⁸⁵ While some Aboriginal people welcome the economic opportunities associated with a new mine, for others the empty pits, the ghost town and the decommissioned rail line serve as reminders of the intense social, environmental and economic changes brought by past mine development and abandonment. At Pine Point, the colonial history of mining is ever-present in the negotiations over the impacts and benefits of the industry for the region.

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² Richard V. Francaviglia, *Hard Places: Reading the Landscape of America’s Historic Mining Districts*. (Iowa City: University of Iowa Press, 1991).

³ Gavin Bridge, “Contested Terrain: Mining and the Environment,” *Annual Review of Environment and Resources* (2004) 29: 205-29; Christopher Davies, “Wales: Industrial Fallibility and Spirit of Place.” *Journal of Cultural Geography* 4 (1983): 72-86. Thomas Dublin, *When the Mines Closed: Stories of Struggles in Hard Times* (New York: Cornell University Press, 1998); Peter Goin and C. Elizabeth Raymond, *Changing Mines in America* (Santa Fe, N.M.: Center for American Places, 2004); Peter Goin and Elizabeth Raymond, “Living in Anthracite: Mining landscape and sense of place in Wyoming Valley, Pennsylvania,” *The Public Historian* 23, 2 (2001), 29-45; John Harner, “Place Identity and Copper Mining in Sonora, Mexico,” *Annals of the Association of American Geographers* 91, 4 (2001), 660-680; Ben Marsh, Continuity and Decline in the Anthracite Towns of Pennsylvania. *Annals of the Association of American Geographers* 77 (1987): 337-52; Karen Beschler Metheny, *From the Miners’ Doublehouse: Archaeology and Landscape in a Pennsylvania Coal Company Town* (Knoxville: University of Tennessee Press, 2007); William Wyckoff, “Postindustrial Butte.” *The Geographical Review* 85 (1995): 478-96; David Robertson, *Hard as the Rock Itself: Place and Identity in the American Mining Town* (Boulder, Colo.: University Press of Colorado, 2006). For an application of this school of thought to northern Canada, see Liza Piper, “Subterranean Bodies: Mining the Large Lakes of North-west Canada, 1921-1960,” *Environment and History* 13 (2007): 155-86; Liza Piper, *The Industrial Transformation of Sub-arctic Canada* (Vancouver: UBC Press, 2009).

⁴ For works that adopt this view, see William Cronon, “Kennecott Journey: The Paths out of Town.” In *Under an Open Sky: Rethinking America’s Western Past.*, eds. William Cronon, George Miles and Jay Gitlin (New York: W.W. Norton/Douglas, 1992), 28-51; Douglas A. Baldwin and David F. Duke, ““A Grey Wee Town”: An Environmental History of Early Silver Mining at Cobalt, Ontario.” *Urban History Review* 34 (2005): 71-87; Martin Lynch, *Mining in World History* (London: Reaktion, 2002); Timothy LeCain, *Mass Destruction: The Mine and Giant Mines that Wired America and Scarred the Planet* (Piscataway, NJ: Rutgers UP, 2009); Timothy LeCain, “The Limits of ‘Eco-Efficiency:’ Arsenic Pollution and the Cottrell Electric Precipitator in the U.S. Copper Smelter Industry,” *Environmental History* 5 (2000): 336-51; Chad Montrie, *To Save the Land and People: a History of Opposition to Surface Coal Mining in Appalachia* (Chapel Hill; University of North Carolina Press, 2002); Kathryn Taylor Morse, *The Nature of Gold: An Environmental History of the Klondike Gold Rush* (Seattle: University of Washington Press, 2003); Duane A. Smith, *Mining America: The Industry and the Environment, 1800-1980* (Lawrence: University Press of Kansas, 1987); David Stiller, *Wounding the West: Montana, Mining and the Environment* (Lincoln: University of Nebraska Press, 2000).

⁵ Office of the Auditor General of Canada. *Report of the Commissioner of the Environment and Sustainable Development, 2002* (Ottawa: Minister of Public Works and Services, 2002), chapters 2 and 3; Indian and Northern Affairs Canada. "Northern Contaminated Sites Program." <http://www.ainc-inac.gc.ca/nth/ct/ncsp/index-eng.asp> (accessed June 1, 2010); Cecily Neil, Markku Tykkyläinen, and John Bradbury, eds. *Coping with Closure: an International Comparison of Mine Town Experiences* (New York: Routledge, 1992).

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⁷ For specific criticisms of development policy in northern Canada that reference Pine Point, see Thomas Berger. *Northern Frontier, Northern Homeland: The Report of the Mackenzie Valley Pipeline Inquiry: Volume One*. (Toronto: James Lorimer and Co., 1977); K.J. Rea. *The Political Economy of the Canadian North*. (Toronto: University of Toronto Press: 1968). For more general criticisms that invoke Innis, see Mel Watkins (ed). *Dene Nation: The Colony Within* (Toronto: University of Toronto Press, 1977); Mary Louise McAllister, "Shifting Foundations in a Mature Staples Industry: A Political Economic History of Canadian Mineral Policy," *Canadian Political Science Review* 1 (June 2007): 73-90. For Innis' key writings on mining and staples, see Daniel Drache, ed. *Staples, Markets, and Cultural Change: Selected Essays*. Innis Centenary Series (Montreal: McGill-Queen's University Press, 1995); Harold Adams Innis, *The Fur Trade in Canada: An Introduction to Canadian Economic History*. Revised Edition (Toronto: University of Toronto Press, 1956), Harold Adams Innis, *Settlement and the Mining Frontier* (Toronto: Macmillan, 1936); Harold Adams Innis, *The Problems of Staple Production in Canada* (Toronto: Ryerson Press, 1933).

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⁹ A. Keeling and J. Sandlos, "Environmental Justice Goes Underground? Historical Notes from Canada's Mining Frontier," *Environmental Justice* 2 (2009): 117-125.

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¹¹ Piper, *The Industrialization of Sub-Arctic Canada*.

¹² Ted Nagel and Jordan Zinovich, *The Prospector North of Sixty* (Edmonton: Lone Pine Publishing, 1989), 18-19.

¹³ Cited in René Fumoleau, *As Long As This Land Shall Last: A History of Treaty 8 and Treaty 11, 1870-1939* (Calgary: University of Calgary Press, 2004), 53.

¹⁴ Fumoleau, *As Long as this Land Shall Last*; Kerry Abel, *Drum Songs: Glimpses of Dene History* (Montreal and Kingston: McGill-Queen's University Press, 1993), chapter 8.

¹⁵ Nagle and Zinovich, *The Prospector North of Sixty*, 37-90.

¹⁶ Jeremy Mouat, "Creating a New Staple: Capital, Technology, and Monopoly in British Columbia's Resource Sector, 1901-1925," *Journal of the Canadian Historical Association*, 1 (1990): 215-237; Jeremy Mouat, *Roaring Days: Rossland's Mines and the History of Mining in British Columbia* (Vancouver: University of British Columbia Press, 1995): Chapter 7.

¹⁷ Timothy J. LeCain, *Mass Destruction: The Men and Giant Mines that Wired America and Scarred the Planet* (New Brunswick, N.J.: Rutgers University Press, 2009).

¹⁸ James Robert Allum, "Smoke Across the Border: The Environmental Politics of the Trail Smelter Investigation," (PhD diss., Queen's University, 1995); John D. Wirth, *Smelter Smoke in North America: The Politics of Transborder Pollution* (Lawrence, Kan.: University of Press of Kansas, 2000).

¹⁹ Memo, R.A. Gibson, Department of Mines and Resources, 6 Feb. 1948. RG 22 v. 195 file 40-3-2 pt. 1, Library and Archives Canada [hereafter LAC],

²⁰ W.G. Jewitt and [president, Ventures Mines] to R.A. Gibson, Department of Mines and Resources, 12 Feb. 1948, RG 22 vol. 195 file 40-3-2 pt. 1, LAC. The granting of the concession at Pine Point nevertheless initiated a trend towards government grants of large (even vast, in the case of the Iron Ore Company concessions in New Quebec and Labrador) concessions to large mining corporations to promote the development of remote base metal mines in the north. See Kenneth J. Rea. *The Political Economy of the Canadian North* (Toronto: University of Toronto Press: 1968), 140 note 92.

²¹ Wallace Clement and Glen Williams, "Resources and Manufacturing in Canada's Political Economy," in Wallace Clement, ed., *Understanding Canada: Building on the New Canadian Political Economy* (Montreal: McGill-Queen's University Press, 1997), 49; Melissa Clark-Jones, *A Staple State: Canadian Industrial Resources in Cold War* (Toronto: University of Toronto Press, 1987). For an assessment contemporary to the Paley Report, see I.S. Lloyd, "A Twenty-five-year Plan—Some Reflections on the Paley Report," *The South African Journal of Economics* 21 (March 1953): 16-30

²² W.G. Jewitt to C.J. Herbert, 17 Apr. 1957 and 5 Apr. 1957. RG 22 vol. 197 file 40-3-4 pt. 5, LAC.

²³ Department of Mines and Resources, *Annual Report*, (Ottawa: Queen's Printer, 1948, 1949), 19-20.

²⁴ Mark O. Dickerson, *Whose North?: Political change, political development, and self-government in the Northwest Territories* (Vancouver: UBC Press, 1992), 62. See also Shelagh Grant, *Sovereignty or Security? Government Policy in the Canadian North, 1936-1950* (Vancouver; UBC Press, 1988).

²⁵ For Robertson's views on the Pine Point Mine, see R. Gordon Robertson to E.E. Stavert, President, Cominco, 30 September 1954. RG 22, vol. 196, file 40-3-4, pt. 3, LAC; R. Gordon Robertson, *Memoirs of a Very Civil Servant: Mackenzie King to Pierre Trudeau* (Toronto: University of Toronto Press, 2000). The Commissioner of the Northwest Territories was an unelected administrative position overseeing federal government territorial policy.

²⁶ R. Gordon Robertson, *The Northwest Territories: its Economic Prospects, a Brief Presented to the Royal Commission on Canada's Economic Prospects* (Ottawa: Queen's Printer, 1955), 29. A copy was found in RG 33, Series 41, vol. 7, LAC.

²⁷ Prime Minister Louis St. Laurent, Northern Development and Railway to Great Slave Lake, Extract from the Address Made by the Prime Minister in Edmonton on April 30th, 1957. RG 30, vol. 13219, file 9735-6, pt. 1, LAC.

²⁸ R.G. Robertson, Memo to the Minister, "Possible Construction of a Railway from Grimshaw to Pine Point." RG22, vol. 196, file 40-3-4, pt. 4, LAC.

²⁹ Alvin Hamilton to Ted Horton, Editor, *News of the North*, 26 May, 1958. RG22, vol. 211, file 40-3-34, pt. 1, LAC.

³⁰ There is a massive collection of articles (too many to list) reporting on the government's pro-northern development stance in one file of the Royal Commission on the Great Slave Lake Railway. See RG 33, Series 41, vol. 12, LAC. See also, Editorial, "Reaching the Last Frontier," *Journal of Commerce Weekly*, 24 October 1959. RG 33, series 41, vol. 12, LAC; Editorial, "A Northern Inventory," *The Globe and Mail*, 23 April 1958. RG 22, vol. 211, file 40-3-34, pt. 1, LAC; Editorial from *The Northern Miner*, 19 May 1955. A typewritten copy was found in RG 22, vol. 196, file 40-3-4, pt. 3, LAC; No Author, "Early Rail Building is Urged," *Edmonton Journal*, 22 February 1960. A clipping of the article was found in RG 22, vol. 322, file 40-3-34, pt. 6, LAC.

³¹ See discussion in Justice M.E. Manning, W.D. Gainer, John Anderson-Thomson, *Report of the Royal Commission on the Great Slave Lake Railway*, vol. 1 (July 1960). See also C.H. Herbert to Deputy Minister, 8 August 1955. RG 22, vol. 196, file 40-3-4, pt. 4, LAC; Herbert to the Deputy Minister, 28 March 1957. RG 85, vol. 1312, file 355-1, pt. 1, LAC; Herbert to W.G. Jewitt, Vice-President in Charge of

Mines, Consolidated Mining and Smelting Company, 29 March 1957. RG 22, vol. 196, file 40-3-4, pt. 5, LAC; Robertson to R.B. Bryce, Secretary to Cabinet in the Privy Council Office, 21 May 1957. RG 22 vol. 197, file 40-3-4, pt. 5, LAC; and Robertson's Memo to the Minister, 19 July 1960. RG 22, vol. 322, file 40-3-34, pt. 6, LAC.

³² R. Gordon Robertson, *The Northwest Territories: its Economic Prospects, a Brief Presented to the Royal Commission on Canada's Economic Prospects*, 27-28. RG 33, Series 41, vol. 7, LAC.

³³ Railway to Great Slave Lake, A Brief to the Royal Commission Appointed by Order-in-Council 1959/705/June 4. Submitted by the Department of Northern Affairs and National Resources, Advocating the Waterways Route to Pine Point, Great Slave Lake. RG 22, vol. 212, file 40-3-34, pt. 4, LAC. Peter Clancy, "Working on the Railway: A Case Study in Capital-State Relations," *Canadian Public Administration* 30 (1987): 450-471.

³⁴ Paul Deprez. *The Pine Point Mine and the Development of the Area South of Great Slave Lake*. (Winnipeg: Center for Settlement Studies, 1973), 29.

³⁵ On resource-town planning in Canada, see Keeling, "'Born in an Atomic Test Tube'"; L.D. McCann, 'The Changing Internal Structure of Canadian Resource Towns' *Plan Canada* 18 (1978): 46-59; O.W. Saarinen, 'Single-Sector Communities in Northern Ontario: The Creation and Planning of Dependent Towns' in *Power and Place: Canadian Urban Development in the North American Context*, eds. G.A. Stelter and A.F.J. Artibise (Vancouver: UBC Press, 1986), 219-264; G.A. Stelter and A.F.J. Artibise, 'Canadian Resource Towns in Historical Perspective' *Plan Canada* 18 (1978): 7-16; N. White, 'Creating Community: Industrial Paternalism and Town Planning in Corner Brook, Newfoundland, 1923-1955' *Urban History Review/Revue d'histoire urbaine* 32 (2004): 45-59.

³⁶ Memo, C.H. Taggart, supervisor and inspector of field surveys, to B.W. Waugh, Surveyor General, Department of Mines the Technical Surveys, 27 June 1952. RG 85 vol. 1268 file 1000-181 vol. 2, LAC; Minutes, Meeting of the Committee on the Development of Pine Point Townsite, 25 March 1952, RG 22 vol. 195 file 40-3-4 pt. 1, LAC and Minutes, Meeting of the Committee on the Development of Pine Point Townsite, 3 October 1952, RG 85 vol. 1268 file 1000-181 vol. 1, LAC.

³⁷ Mark O. Dickerson, *Whose North?* Chapter 5; the GNWT received a further \$250,000 loan to finance subdivision development in 1969, see documents in RG 85 vo. 1419 file 303-181, LAC, RG 22 vol. 1367 file 250-51-36 pt. 1, LAC, and G-1979-003 box 79 file 2 and 3, NWT Archives [hereafter NwTA].

³⁸ Except Re Pine Point, President's Remarks, Yellowknife Board of Trade Dinner Meeting, 15 September 1955. RG 85, vol. 1312, file 355-1, pt. 1, LAC.

³⁹ R. Gordon Robertson, Note for File, Railway to Great Slave Lake; Discussion with the President of the C.P.R. 27 October 1955. RG 85, vol. 355-1, file 355-1, pt. 1, LAC.

⁴⁰ See R. Gordon Robertson, *The Northwest Territories: its Economic Prospects, a Brief Presented to the Royal Commission on Canada's Economic Prospects*, 27-28. RG 33, Series 41, vol. 7, LAC. Herbert to the Deputy Minister, 28 March 1957. RG 85, vol. 1312, file 355-1, pt. 1, LAC. Two years later, Hebert had already adjusted these numbers to a much less favourable breakeven point based on 360,000 tons of ore concentrate being shipped each year (roughly 986 tons per day), and interest costs of 4.5 percent over a 50 year amortization period. Herbert to Jewitt, 29 March 1957. RG 85, vol. 1312, file 355-1, pt. 1, LAC. W.G. Jewitt explicitly rejected the idea that Pine Point would last for fifty years. He was fairly prescient when he suggested that twenty-five years was a more realistic lifespan for the mine. See Herbert, Memorandum for the Deputy Minister, 28 March 1957. RG 85, vol. 1312, file 355-1, pt. 1, LAC.

⁴¹ John McMynn, Manager, Con Mine to C.H. Herbert, 12 November 1954. RG 22, file 40-3-4, pt. 3, LAC.

⁴² See discussion in Justice M.E. Manning, W.D. Gainer, John Anderson-Thomson, *Report of the Royal Commission on the Great Slave Lake Railway*, vol. 1 (July 1960), 19. Riley's testimony is found in the document, Royal Commission on the Great Slave Lake Railway, Analysis of Transcripts of Evidence – Subjectized, Vol. 1. n.d. RG33, series 41, vol. 1, LAC.

⁴³ Koller to Herbert, 16 December 1955. RG 22 vol. 40-3-4, pt. 4, LAC.

⁴⁴ R. Gordon Robertson, Note for File, Railway to Great Slave Lake; Discussion with the President of the C.P.R. 27 October 1955. RG 85, vol. 355-1, file 355-1, pt. 1, LAC.

⁴⁵ C.H. Herbert, Memorandum for the Deputy Minister, 28 March 1957. RG 85, vol. 1312, file 355-1, pt. 1, LAC.

⁴⁶ Herbert, Memorandum for the Deputy Minister, 9 February 1956. RG 85 vol. 1312, file 355-1, pt. 1, LAC. The emphasis is Herbert's.

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- ⁴⁷ R. Gordon Robertson, *The Northwest Territories: its Economic Prospects, a Brief Presented to the Royal Commission on Canada's Economic Prospects*, 13-17. RG 33, Series 41, vol. 7, LAC.
- ⁴⁸ Extract from the Minutes of the Thirty-first Meeting of the Advisory Committee on Northern Development, 6 February 1956. RG 85, vol. 1512, file 1000-181, pt. 4, LAC.
- ⁴⁹ R. Gordon Robertson, Internal Memo, The Economic Crisis of the Resident Population in the North, 1 February 1956. RG 85, vol. 1512, file 1000-181, pt. 4, LAC.
- ⁵⁰ Deprez, 91-92.
- ⁵¹ R.P. Douglas, Assistant Vice President, Cominco, to A.D. Hunt, Assistant Deputy Minister, Department of Indian Affairs and Northern Development, 11 September 1975. G-2002-004, Box 38, NWT.A.
- ⁵² Macpherson, "The Pine Point Mine," 89.
- ⁵³ Testimony of Chief Edward Sayine, Mackenzie Valley Pipeline Inquiry, Proceedings at a Community Hearing, Volume 6, New Indian Village, Hay River, NWT (30 May 1975), 499-503; testimony of Larry McConnell, Mackenzie Valley Pipeline Inquiry, Volume 32, Fort Resolution, NWT (8 October 1975), 3061-3062. For a statement about most native employees coming from outside the region, see Testimony of Anvid Osing, Mayor, Pine Mackenzie Valley Pipeline Inquiry, Proceedings at a Community Hearing, Volume 30, Pine Point, NWT (6 October 1975), 3000-3001.
- ⁵⁴ Fort Resolution Residents Employed by Pine Point Mines Limited. G-2002-004, Box 38, NWT.A. There is no date on this document but it was sent under cover of a letter from G.D. Tikkanen, General Manager, Cominco to S.M. Hodgson, Commissioner, Government of the Northwest Territories, 9 February 1977. G-2002-004, Box 38, NWT.A.
- ⁵⁵ The employment numbers and criticisms are found in "Northern Mineral Strategy: Discussion Paper," Draft, 5 June 1978. G-2002-004, Box 38, NWT.A; "Native Labour in the Northern Mining Industry," (draft) send under cover of letter from Robin Brice, Resource Economist, Mineral and Petroleum Development Section, Department of Economic Development and Tourism, Government of the Northwest Territories to Chief, Manpower Development Division, Department of Economic Development and Tourism, Government of the Northwest Territories, 3 February 1982. G-2002-004, Box 23, NWT.A.
- ⁵⁶ The data was culled from Deprez, 67-70; "Northern Mineral Strategy: Discussion Paper," Draft, 5 June 1978. G-2002-004, Box 38, NWT.A; R.P. Douglas, Assistant Vice President, Cominco, to A.D. Hunt, Assistant Deputy Minister, Department of Indian Affairs and Northern Development, 11 September 1975. G-2002-004, Box 38, NWT.A; .D. Tikkanen, General Manager, Cominco to S.M. Hodgson, Commissioner, Government of the Northwest Territories, 9 February 1977. G-2002-004, Box 38, NWT.A; R.P. Douglas, Vice-President, Cominco, to Frederick J. Joyce, Northern Operations Branch, 16 March 1977. G-2002-004, Box 38, PWNHC; Pine Point Mines, Ltd. Annual Reports, 1979-1982, G-2002-004, Box 35; R.P. Douglas, "Utilization of Human Resources North of Sixty," *CIM Forum* (April 1978), 13-17.
- ⁵⁷ Deprez, 79-90; Macpherson, 88-90. For archival documents assessing the relative success of the employment agreement, see U. Rank, Employment Liaison Officer to Cliff Reid, Chairman, Trainee Employment Advisory Committee, Pine Point NWT, 19 November 1971, and "Proposal for the Amendment of the Pine Point Training and Employment Agreement," n.d. G-1999-003, Box 6, File 7, NWT.A.
- ⁵⁸ R.P. Douglas to Frederick Joyce, Director, Northern Operations Branch, 16 March 1977. G-2002-004, Box 38, NWT.A; W.H.R. Gibney, Manager, Pine Point Operations to D.P. Mersereau, Regional Director, Government of the Northwest Territories, 8 July 1975. G-2002-004, Box 38, NWT.A; R.P. Douglas, "Utilization of Human Resources North of Sixty," *CIM Forum* (April 1978): 13-17.
- ⁵⁹ For derisive comments about the Native labour force, see Ben Hunter, Head, Special Employment Programs, Employment Division, Department of Economic Development, Government of the Northwest Territories, to Chief, Employment Division, 22 April 1976. G-2002-004, Box 38, NWT.A; R.C. Rankin, Head, Employment Development, Employment and Training, Department of Economic Development and Tourism, Government of the Northwest Territories, to Chief, Employment and Training, 6 October 1977. G-2002-004, Box 38, NWT.A; R.P. Douglas, "Utilization of Human Resources North of Sixty."
- ⁶⁰ For the issue of native turnover versus non-native turnover, see Deprez, 107.
- ⁶¹ On the road issue, see Deprez, 31-33. See also Minutes of the First Meeting of the Fort Resolution Advisory Committee, 24 June 1963; S.A.H. Dodds, Memorandum for the Administrator of the Mackenzie, 26 June 1963; and Alex King, Chief, Fort Resolution to G.L. Merrill, Administrator, Fort Smith, 9 March 1962. RG 85, vol. 1000/181, pt. 2, LAC.

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- ⁶² See Jack Witty, Employment and Training in the Mineral Industry, Unpublished Report, Government of the Northwest Territories, 22 December 1977, p. 3. G-2002-004, Box 38, NWT.A.
- ⁶³ Deprez, 70-71.
- ⁶⁴ Testimony of John Morin, Mackenzie Valley Pipeline Inquiry, Proceedings at a Community Hearing, Volumen 31, Fort Resolution, NWT (7 October 1975), 3000-3001.
- ⁶⁵ Pine Point Mines, Ltd., *Annual Report*, 1964-1989.
- ⁶⁶ Peter Hannigan, "Metallogeny of the Pine Point Mississippi Valley-type Zinc-lead District, Southern Northwest Territories," in Goodfellow, W.D., ed., *Mineral Deposits of Canada: A Synthesis of Major Deposit-Types, District Metallogeny, the Evolution of Geological Provinces, and Exploration Methods* (Ottawa: Geological Association of Canada, 2007), 610.
- ⁶⁷ G.H. Giroux and Ian McCartney, "Report on the Great Slave Reef Lead-Zinc Deposits Pine Point, N.W.T.," report for Tamarlane Ventures, Inc, 2004; Ryan Silke, *The Operational History of Mines in the Northwest Territories, Canada* (Yellowknife: Ryan Silke, 2009), 376-391; Environment Canada, *The State of Canada's Environment 1996* (Ottawa: Ministry of Public Works and Government Services, 1996), Box 8.7.
- ⁶⁸ Ian Marshall, *Mining, Land Use, and the Environment, vol. 2: A Review of Reclamation Activities in Canada* (Ottawa: Environment Canada, 1983), 11; Gary McGee, *Mining and Environmental Law* (Ottawa, Department of Mines and Resources, 1973); Canada. Northern Administration Branch. Resources Division, *Mining in the North* (Department of Northern Affairs and National Resources, 1961), 19.
- ⁶⁹ Smelter pollution policy was the subject of several bouts of correspondence in the files RG 22 vol. 195 40-3-4 pt. 2, pt. 3, and pt. 5, LAC.
- ⁷⁰ J.N. Stein and M.R. Miller, "An Investigation into the Effects of a Lead-Zinc Mine on the Aquatic Environment of Great Slave Lake," Winnipeg: Resource Development Branch, Fisheries Service, Department of Environment, April 1972.
- ⁷¹ Yves Berube et. al., "An Engineering Assessment of Waste Water Handling Procedures at the Cominco Pine Point Mine," Ottawa: Department of Indian Affairs and Northern Development, April 1972.
- ⁷² M.S. Evans, L. Lockhart and J. Klaverkamp, "Metal Studies of Water, Sediments and Fish from the Resolution Bay Area of Great Slave Lake: Studies related to the decommissioned Pine Point Mine," Environment Canada, National Water Research Institute, Burlington and Saskatoon, NWRI Contribution No. 98-87, July 1998.
- ⁷³ In addition to testimony cited below, evidence of seasonal trapping activities is indicated in RG 85 vol. 1000-101 pt. 2, LAC; restrictions on trapping are indicated in NWT Metis Development Corporation and Bruce Ramsay & Associates, "Town of Pine Point: Preliminary economic diversification assessment," Town of Pine Point, 1985, held in the Government of N.W.T. Legislative Library.
- ⁷⁴ Testimony of Harold Bosley [Balsillie], Mackenzie Valley Pipeline Inquiry, Volume 32, Fort Resolution, NWT (7 October 1975), 2990.
- ⁷⁵ See testimony in Mackenzie Valley Pipeline Inquiry transcripts Volumes 30 (Pine Point), 31 and 32 (Fort Resolution), October 1975. In his final report to the inquiry, Justice Thomas Berger highlighted Pine Point as an example of the "social, economic and geographic dislocations" of Native people: Thomas Berger, *Northern Frontier, Northern Frontier; Northern Homeland: The Report of the Mackenzie Valley Pipeline Inquiry*, vol. 1 (Ottawa: Supply and Services Canada, 1977), 123-124.
- ⁷⁶ Drake Hocking, "Forest Deterioration Survey, Pine Point, Mackenzie District, Northwest Territories," Ottawa: Canadian Forestry Service, Environment Canada, August 1975, 11.
- ⁷⁷ See transcripts in note 73; "Report on Pine Deterioration in the Pine Point area, N.W.T.," Environment Canada [?] report, 1984, held in Legislative Library, Government of the Northwest Territories.
- ⁷⁸ Ellen Biellawski (in collaboration with the community of Lutsel k'e), *The Desecration of Nanula Kué: Impact of the Talston Hydroelectric Development on Dene Soline*. Unpublished report for the Royal Commission on Aboriginal Peoples (December 1993).
- ⁷⁹ Evans et. al., "Metal Studies of Water, Sediments and Fish."
- ⁸⁰ Environment Canada, *The State of Canada's Environment 1996* (Ottawa: Government of Canada, 1996), p. 8-31; D.L. Johnston, "Pine Point, NWT: Closing a Mine and Removing the Whole Townsite," *Hazardous Materials Management* 4 (December 1992): 21-22.
- ⁸¹ The closure and removal of the townsite is dramatically documented in an episode of the current affairs show "Focus North," N-1989-013, Ref video 27A and B, NWT.A.

⁸² Liza Piper, "Subterranean Bodies: Mining the Large Lakes of North-west Canada, 1921-1960," *Environment and History* 13 (2007), 155-86.

⁸³ See especially D. Robertson; Harner, "Place Identity and Copper Mining in Sonoma"; and Marsh, "Continuity and Decline in the Anthracite Towns of Pennsylvania"; critical appraisals of heritage landscapes of mining towns include Robert Summerby-Murray, "Interpreting Personalized Industrial Heritage in the Mining Towns of Cumberland County, Nova Scotia: Landscape Examples from Springhill and River Hebert," *Urban History Review* 35, 3 (2007): 51-59, and Don Mitchell, "Heritage, Landscape, and the Production of Community: Consensus history and its alternatives in Johnstown, Pennsylvania," *Pennsylvania History* 59, 3 (1992): 198-226. For the Pine Point website, see "Pine Point Revisited," <http://pinepointrevisited.homestead.com/> (accessed May 30, 2010).

⁸⁴ Paul Sutter, "When Environmental Traditions Collide: Ramachandra Guha's *The Unquiet Woods* And U.S. Environmental History," *Environmental History* 14 (July 2009): 543-50.

⁸⁵ Mackenzie Valley Environmental Impact Review Board. Report of Environmental Assessment and Reasons for Decision on Tamerlane Ventures Inc.'s Pine Point Pilot Project, EA-0607-002, 22 February 2008.