

Oil drilling, and its impact on indigenous societies, and the environment in the northwest territories of Canada

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Abstract. The history of the search for oil, in Canada's Northwest Territories, began in the 1920s. History has three well-defined and very different phases. The first spans from 1920 to the early 1940s and met government criteria promulgated in the late 19th century; the second from 1942 to 1946 with a large presence of the North American army and with little presence of the Canadian authorities. After 1946, there was a long break until 1960. The third began strongly in 1970 and the drilling, extraction, and refining operations were conducted with federal legislation, action by the territorial parliament, political control, the opinion of the natives, etc. The second phase is the shortest and the one that did the most damage due to the uncontrolled presence of US Army personnel. After 1970, the opinion of the natives and the excellent decisions of Judge Thomas Berger was heard.

Keywords. Canada, northwest territories, indigenous, oil, projects, impacts.

1. Introduction

Before going into the matter, I warn you that this essay is part of a broad investigation with a physical presence in various geographies of Canada, a country in which the author has developed two projects financed by the Ministry of Foreign Affairs of Canada: 1) Foreign Area Fellowships project: Background and Methods to propose a Research Project with Native Populations, 2) Culture and Social Change among Dènè, Inuit, and Métis of Northwest Territories Canada.

The Canadian government began to show interest in oil and its derivatives at the end of the 19th century. In 1898, the Department of the Interior authorized prospecting first and then exploiting everything related to the oil that existed in the subsoil [1-5]. At that time, it was starting from a wealth that was more potential than real, since the drilling in the Mackenzie River basin had many leaks and those responsible understood that there would be no business.

The expectations created many illusions because the investigations conducted in 1888 served to consolidate the belief of a Special Committee of the Senate, which understood that the available reports ensured the existence of excessively large oil reserves. This wealth was hidden in the Mackenzie River basin subsoil; illusions were that this region could become "the most extensive oil field in America and perhaps in the world" [6].

In this context of expectations and hopes, the profitable exploitation of these resources could not begin immediately due to two aspects: 1) the difficulties presented by the territory, which was still unknown and lacked land routes, 2) the absence of local demand for oil derivatives, since the autochthonous populations did not yet need it.

In 1911, James K. Cornwall carried out the first serious surveys of the deposits detected in the subsoil of the vicinity of Norman Wells. At that time, the company he operated was the Northern Trading Company [7]. The discoveries were promising, and even more so the samples analyzed revealed that the extracted crude was "light and of good quality" [2].

Three years later, P. O. Bosworth obtained the exploitation rights of all the minerals that were in the territory of three demarcations close to the present settlement of Norman Wells [8]. Imperial Oil acquired these lands through a subsidiary company, the Northwest Company. In 1919, a drilling rig was consigned to the area [9]. Oil first emerged on August 24, 1920 [10], and at that time, it was the northernmost well in the world; what's more, it was believed then that crude could not be in areas whose landscapes were classified as typical of taiga and tundra [11].

If we compare the volume of production then with the current one, we must recognize that the Discovery Well, as the first well was called, pumped at a rate of 15 m³ per day [12]. The Northwest Company hastily built a refinery to process 50 m³ per day and it was programmed to meet the demands of the communities along the Mackenzie River, who, by the way, could not consume much in those distant dates. However, the Discovery Well facility and well remained active until they were shut down in 1925 because local demand for petroleum products was not commercially significant [12].

The existing oil industry in Norman Wells lacked possibilities, since the local market, with a low population pyramid and absence of industries, could not absorb the low productivity. Curiously and without considering other expectations, a remarkable event occurred: the appearance and exploitation of radium-producing mines this fact affected the entire surface of the Northwest Territories, and this discovery needed diesel to be able to develop this mining. For this reason, the industry dedicated to refining oil was launched in the summer of 1932 [7]. In reality, it was *pitchblende*, which is a variety of *uranite* with the possibility of being processed to obtain radioactive elements.

Six years later, in 1938, two mining centers called "Con" and "Negus" were put into operation in the vicinity of Yellowknife. The first expected consequence was that fuel requests would be higher, so the Norman Wells plant would have to increase its crude production. This fact made it possible to go from 0.14 m³ per day in 1932 to 197.4 in 1944 and to 172.2 in 1981. These data have been obtained from the documentation filed at the *Dominion Bureau of Statistics* (DBS), which is digitized and available to any researcher. I simply want to add that one cubic meter of crude is equivalent to approximately 6.3 barrels in American measures (Brent) and that each one of them can hold 158.98 liters in the United States.

The increase in gross quantity and related refining forced the *Imperial Oil Company* to build a new refinery on the northern side of present-day Norman Wells in 1939. This plant produced gasoline for jets and diesel for riverboats. Likewise, a part of that production was destined for the mining demand [1].

The next phase coincides with the 1940s, which are the years that correspond to the Canol project, which produced many impacts in Alaska, Yukon, and Northwest Territories. The development of this project forced the displacement of about 40 000 North American soldiers to those regions. This human invasion was short but intense, and oil production dropped markedly when the military withdrew.

The presence of these North American soldiers in the Northwest Territories and in Yukon, between 1942 and 1946, was made through agreements signed between the United States and Canada. Today it is known that all those actions were carried out more for propaganda reasons, than for real dangers with respect to the Japanese enemy of that time, which was neutralized in the battle of the Aleutians. The Japanese army never became a threat to either Alaska or California, but that was the talk American citizens heard every day, especially after the attack on Pearl Harbor on December 7, 1941.

The northern part of Canada began to industrialize and modernize after World War II. Imperial Oil increased its annual production during the 1950s and 1960s, from 30 000 m³ to more than 130 000 m³ [13]. The increase or decrease of any product depends on the market and consumption. The Norman Wells productivity zone had a large catchment area, stretching from Hay River town to the Mackenzie River delta [13].

Another danger, which was raised, came from the so-called Cold War, which originated in Ottawa when the cipher clerk, Igor Gouzenko, deserted from the Russian embassy, with compromising documents that exposed an extensive espionage network, which had ramifications in the United States [14].

In this new context, Ottawa's alliance with Washington made it necessary to discover the far north, which had been forgotten years before and which now, understood as from 1945, the alliances of the Second World War, already broken, led us to think that the territories of Canada and the United States could be within range of Russian bombers. For this reason, a wide line of radars was established from the Alaskan coast to Greenland, and control of these devices on Canadian soil would be Ottawa's mission, but if an attack came, all of them would be in the hands of the US military, at the same time least six hours a day.

These decisions would influence the landscape and the subsoil since the search for raw materials and strategic minerals was imposed. In this exploration, oil could not be left out, especially where it was already known to exist. Likewise, where roads never existed, they began to make an appearance and appeared in the landscape with the consequent impact and modification. Industrialization and innovation in subarctic and arctic areas have come and stayed. The reasons were mostly derived from military defense [14].

Oil production was balanced from 1970 and, one year after another, the extraction of the different wells located in the Mackenzie Valley produced about 150,000 m³ per year [15]. Several reasons prompted this directly or indirectly, but mainly two: 1) the expansion of the network of highways and roads that, from the south, were oriented to communicate with the Mackenzie River valley. This reality made it possible to open supply stations (gas stations) that lowered the price and the refineries present in Calgary, for example, comfortably took over the market [15]; 2) the expansion, between 1962 and 1965, of the railway from Rome, in the province of Alberta, to Pine Point, in the Northwest Territories, which allowed the removal of minerals abroad, mainly lead and zinc, which were marketed by the Canadian Consolidated Smelter Corporations. The railroad made it cheaper to transport petroleum products that were sent to Calgary and Edmonton, which were the two important centers where the business was controlled.

At the end of the 1960s, the sale of refined products from Norman Wells reached only the existing population centers along the Mackenzie River, those located near Fort Simpson, which was then the northernmost limit that could be reached by road. At best, this declining market supplied the basin to the river delta, from the Canadian western arctic coast to Alaska. The same business reached as far as Gjoa Haven on the eastern side and as far as King William Island. I add that the Norwegian explorer Roald Amundsen founded this distant nucleus in his efforts to discover the Northwest Passage, which he achieved in 1906 [14]. The village because that is what it is, was named in the Norwegian language as Gjøa and owes its name to the ship that managed to navigate for the first time from the Atlantic to the Pacific along that route so sought after for centuries mainly by the English. The fuel supply had to be done by barge during the summer months, so appropriate tanks were required to have supplied during the long boreal winter [16].

In 1960 a world, oil cartel, better known as OPEC (Organization of Petroleum Exporting Countries), was created, with headquarters in Vienna (Austria). The objectives of this group were to set reasonable prices and ensure supply to consumers. With the ability to influence world prices by establishing supply and export controls, this group caused drastic price inflation, even generating world crises. Norman Wells's crude prices were hurt by OPEC policies. According to available data, between 1961 and 1972, Mackenzie oil reached a value of US\$7 per cubic meter. After the formation of OPEC, the price skyrocketed, from \$14 in 1973 to over \$77 in 1981 [17]. The vertiginous evolution of prices allowed the execution of projects previously considered as non-economic, but which later became so [3].

The price per cubic meter of daily domestic production was similar to that produced by foreign agents. Esso Resources Canada Ltd. (formerly Imperial Oil) had been conducting tests for secondary hydrocarbon recovery at Norman Wells since 1968, and in 1980, Esso and IPL produced a joint development proposal. Esso would expand its facilities in the Norman Wells oil field through a secondary salvage project, while IPL proposed building a 12-inch (324 mm) diameter pipeline to transport Norman Wells petroleum products to a terminal near Zama, Alberta, about 868 km. further south [18].

2. First historical stage: the canol project

In August 1940, William Mackenzie King, Prime Minister of Canada, and Franklin Delano Roosevelt, President of the United States, met in Ogdensburg, New York. The result of these conversations materialized in a document signed by the two presidents and in it, the bases were established to jointly establish collaborations in the field of military defense. In the event that one attacked one or both countries the powers that were already immersed in World War II, the other would come to their aid. One of the clauses stipulated that the United States could, if necessary, use Canadian territory to defend itself against third parties [14].

One of the first consequences, to implement the provisions of this alliance, came from three concrete facts: 1) the Japanese air-naval attack against Pearl Harbor on December 7, 1941, whose surprise immediately turned into thinking that Alaska was the North American “Achilles heel” and its oil, the booty coveted by the attackers [19, 20]; 2) supply of North American aircraft to the then Soviet Union, under a “lend-lease” regime, which would reach Siberian territories flying from Alaska, to be used against Germany [21]; 3) Japanese invasion of two Aleutian islands, thus beginning the well-known battle of the Aleutians, which ranks as one of the most complex of World War II, and one of the least important, despite the punctual propaganda to make believe the opposite of their own and strangers [14, 21-23].

As an anecdote, since it is not the subject of this essay, I will say that the head of this operation was Admiral Yamamoto and that all the Japanese war programs were programmed by the strategist Minoru Genda, who had also been the head of the attack on Pearl Harbor, forcing the United States to enter the fray [24]. On May 30, 1942, Japanese troops invaded the islands of Attu and Kiska. This action unfolded in a confrontation that lasted between June 6 of that year and August 15, 1943 [25].

The objective was to create a scenario that would make it easier to distract the Americans so that they could focus on the main objective, which was to seize Midway Island. The occupation of these two islands produced a great psychological effect both on the population and on American public opinion, which believed that the danger was real [26]. The North American authorities, and especially their military, knew that Japan lacked long-range bombers, so it was impossible for them to attack the coasts of California from the Aleutians, as the citizens were led to believe [22].

2.1. Origin and development of the canol project

The next step was to run the Canol Project in the 1940s since the war ended and the project had not been completed. The state of war and the Ogdensburg agreements fostered three main projects: 1) the opening of a series of airfields in Canada's Northwest Territories, which would link Edmonton to Whitehorse and facilitate aircraft traffic between Alaska and Siberia; 2) the layout and development of a land highway exclusively for the traffic of military vehicles since the purpose was to secure and support the different military camps that would be established along it. The itinerary was renamed by Fairbanks residents as “the Negro Road”, based on the high number of black workers dedicated to its construction [23, 20]; 3) development of the Canol Project, whose most notable activities were to be deployed in the vicinity of the then village of Norman Wells [27].

The city of Edmonton became the regional headquarters for the three main schemes, which would be interconnected and supervised by the US military authority. Executing all the work required a lot of workforces and some 33,000 soldiers, mostly black, were deployed to carry it out [28]. The original decisions to advance the Canol Project were promulgated by the United States Department of War on April 29–30, 1942.

The military engineers were empowered to carry out the following operations: 1) arrange with the Standard Oil Company of New Jersey (parent of Imperial Oil Limited) to drill at least nine new wells in the vicinity of Norman Wells and to expand the facilities existing production and refining facilities, which were already in operation; 2) build and inspect a pipeline for the transfer of crude oil, with its relevant pumping stations, and to be operational by September 15, 1942. The route would go from the Mackenzie River, in Norman Wells, to Whitehorse, in Yukon, where an airfield was located near the highway that was also under construction; 3) supply with the necessary material to increase the work in the oil fields and settle the oil pipelines through the Athabasca-Mackenzie waterway; that is to say, between the head of the railroad and Fort McMurray and from here carry out the transfer by the river to the oil camp, in Norman Wells; 4) build before October 1, 1942, a refinery in Whitehorse to process 3,000 barrels of crude oil per day [28].

The company started out with much confusion and planning flaws, as US Army engineers began laying a different pipeline along the railroad from Skagway, Alaska, to Whitehorse, Yukon Territory. This pipeline was to transport gasoline shipped from California by Standard Oil, a subsidiary of Standard Oil of New Jersey. The transport had to be done in tanker trucks from the facilities of its refineries in Los Angeles, so the distance to be covered was considerable [29].

Before the end of 1942, Canol Section 2, the first of three additional lines, was pumping ready-to-use fuel at Whitehorse before a pipeline was laid west of Camp Canol, across the Mackenzie River, from Norman Wells. This data represented a hard blow for the California Standard, thanks to the intervention of Harold Ickes, Secretary of the Interior of the United States [30].

The loading and transport operations of the most diverse goods and materials were carried out at a good pace. During the summer of 1942, supplies, skilled personnel, and unskilled personnel arrived. Each person and each thing was distributed to the place that they had previously assigned. At that time, the Mackenzie River was the only means of communication to reach Norman Wells, and the most diverse supplies arrived by rail as far as Peace River, since a temporarily operational road to the north started from this point.

At the same time, the Americans were setting up seven airfields along the Mackenzie's waterway. Subsequently, the number of aerodromes had to be increased to fifteen, because the flight range was not great in boreal forest areas. Airstrips were increased because it was understood that they were necessary to comply with the operations entrusted to them and to be able to settle in the distant landscapes of Norman Wells and to facilitate the entrance to the Yukon Territories and the Mackenzie Delta [31, 32].

Crude began to be pumped through the pipeline that ran from Norman Wells to Whitehorse. When all the materials arrived at Whitehorse, the construction of a refinery to provide gasoline was also begun. Interestingly, it was detected, at the same time that in all this wide development of activities, covert commercial rivalries, political infighting, and growing ambitions surfaced that were influencing the work necessary to develop the Canol Project. Undoubtedly, these problems were soon to affect the progress that was scheduled, but not achieved, and to upset the initial objectives [29].

The behavior of the Americans affected local Canadian citizens, who filed complaints. The Ottawa government took action in May 1943, ousting General W.W. Foster to the city of Edmonton with orders to collect information and deliver it directly to the Privy Council, a body of colonial origin but with powers. The main objective was to have first-hand reports that reported the activities of Americans in their contacts with resident citizens. The documents presented by General Foster detailed the development of the Canol project and how it was at the time of the investigation, as well as the situation of the Norman Wells oil field [28]. Curiously, the complaints and denunciations presented by his compatriots were ignored, since the important thing then was the war [23].

In 1941, Imperial Oil was still a Canadian company and had a tract of land of about 3,305 acres around Norman Wells. In May 1942, an order from the Privy Council, labeled P.C. 4140, established an additional reserve for the Canol Project that allowed the IOL Company to carry out extractions anywhere within the 80 km destined for the so-called Discovery Well Number 1 [33].

Imperial Oil, as a subsidiary of the US government, but without forgetting that due to its origins, it had to operate in Canada, was commissioned to prospect and drill on an area equivalent to about five million acres. Within eight months, in January 1943, the Canadian and US governments signed an international treaty providing for an even larger reserve to develop the Canol Project [28]. The bounded terrain was bounded on the north by the Beaufort Sea, on the east by the 112th meridian, on the south by the 60th parallel, and on the west by the Yukon Territory-Alaska border [28].

In March 1943, another document, the P.C. 2447 established the same area but slightly reduced its size by setting the eastern limit at 110 km east of the Mackenzie River. Canol now had a potential oil deposit that could be covering approximately 500 million acres and Imperial Oil would be the only extractor and responsible party. The US Army was in charge of patrolling and guarding this huge piece of Canadian territory [34].

At the same time, the Canadian authorities were preparing appropriate reports and measures to control the far north. Regulation P. C. 742 appeared on January 28, 1943, and its text clearly proposed higher rates, strict surveillance, and obtaining reliable reports [22]. The document clearly stated that the Canadian government had the right to seize with compensation and strengthened the British Crown's claim to half of the oil holdings. One of the clauses stated that authorizations could be restricted to Imperial Oil as a counterpart to the United States Department of War [22].

Two weeks later, the Canadian government released another regulation to be applied to the Canol project, the P.C. 1138, dated February 12, 1943. This document established a larger territory with two substantial sectors to which the new and more onerous regulations did not expressly apply [22]. One of these inland areas, centered around Peel and Wind River along with Hungry Lake, covered two and a half million acres of Yukon Territory. The other, which was much larger, amounted to ten and a half million acres, covered the entire lower basin of the Mackenzie River, and was specified to run from the mouth of the Carcajou to the mouth of the Thunder River and almost to the settlement of the Red River that drains into the Arctic.

Curiously, these two districts had resources in their subsoil that was understood as very necessary for the army to dispose of them urgently and to provide them to the United States Department of War. Consequently, the P.C. 1138 was annulled, and although no reason was notified, the Ottawa government resorted to the War Measures Act, which facilitated the use of any asset and even its appropriation if the country needed it. Consequently, no permits or reports were required for prospecting and drilling in these two areas [22].

The comparison of the documentation revealed the existence of many contradictions, especially in the number of drilled wells. Richard LeSeuer, then vice president of Imperial Oil, in a communication to the United States Senate Committee in the fall of 1943, stated that "thirty wells - approximately" were operating [35]. This appreciation coincided with the reports that were handled and that came from the dependencies of the Canol project.

The problem arose because a geologist, Ted Link, who controlled the areas and personnel near Norman Wells, told an Edmonton newspaper that 50 wells were operating on that same date, and all were producing at full capacity. Consequently, the figures did not match; what's more, they represented double what the official Canadian documentation handled, as indicated by an internal report dated December 1, 1943, which recorded only 23 wells, and of those only produced 21. The discrepancy shocked General Foster [36].

But this government report, which had been prepared for the Privy Council by the Interdepartmental Panel on Joint Defense Projects, called attention to one specific fact: until now, all production had come from wells that were identified in the original lease agreement of the company and it was subject only to the easy terms of the old legislation dating back to 1914 [36].

In 1921, new rules were enacted that were accompanied by a more rigid regulatory agenda with higher rates. These measures applied to only one of the company's wells, the so-called Bear Island Number 1, which was abandoned in 1923

after all oil was extracted from it [37]. This example is useless for what happened two decades later and already with the presence of the Canol project in the landscape.

Once the initial objectives, that is, 3,000 barrels per day, were achieved, the army reviewed its urgent needs and production had to be increased until reaching 20,000 barrels per day. Achieving this objective required increasing oil exploitation and reaching the mouth of the Mackenzie and its delta. It was necessary to wait until 1943 and in this year all the ingredients of the Canol project were applied [31, 32].

Now, it is one thing to want and another to be able to get what you want. Preparations to get the expansion started quickly. In April 1942, just days before Canol's orders were issued and a month before the House of Commons learned that such a project was underway, the United States Army Air Force sent seven bombers equipped with trimetric cameras to photograph a 320 km wide area across the Mackenzie Basin, beginning about 80 km north of Edmonton and ending in the Arctic Ocean.

The parallel flights were 48 linear km apart, with diagonal flights between the parallels every 160 km. Additional flights meandered all the major rivers. In one month, some 34,000 photographs were obtained, representing 414,000 km² of potentially oil-producing terrain to be explored. In the opinion of John Carroll [38], the fact that most aerial photos were of a landscape covered in ice and snow was typical of American photogrammetric standards of the time. These photographs were later made into maps and used in polyconic projects, as they were available at the time of negotiations during the winter of 1942-43 to expand the reserve areas requested by the Canol project [38, 31, 32, 27].

In 1942, some surface exploration near Norman Wells came into service. In April 1943, the geologist Link organized twelve teams, at the rate of three people in each one of them, until reaching the entire available workforce, which amounted to thirty-six employees. His assigned mission was to search for upwelling from the lower reaches of the Liard and northern Nahanni rivers and northward to the Red River in the Arctic and the Peel River. One party explored the Nelson and Liard Rivers from Fort Nelson to Fort Simpson [28].

By the time they finished their work, they had completed what was in thirty-five separate areas covering nearly all major streambeds and river basins as far as the vicinity of Aklavik, already in the Mackenzie River delta. Meanwhile, another team turned to seismic research and focused their attention on the other side of the river, just opposite Norman Wells. The reports from these teams were very useful to the company and Ted Link's strategy was later found to have served the company's interests well, despite ecological disasters, being detected shortly thereafter [39].

Curiously, the policy changed significantly in the spring of 1944. The US government forced its army to withdraw and authorized only the possibility of becoming a client. After the Ottawa negotiations, a document known as the P.C. 2904, dated April of that year, indicated the completion of United States exploration activities in the Northwest and Yukon Territories.

In this new context and with the aim of establishing a "strategic oil reserve", the Canadian government took over the financing of the extraction and kept the same label: Canol. The British Crown was now Imperial Oil's most important partner in the development of all oil fields. This situation remained until the end of the war in 1945. Under the order of the previous council, the then monarch, George VI, acquired a third of the company's holdings, while giving up his interest in Bear Island Number 1. [40].

Two months later a new regulation appeared, the P.C. 5059, dated June 30, 1944. This document canceled all outstanding 1943 regulations, reservations, and restrictions. Postwar exploration in the Northwest Territories would be open to all comers under entirely new regulations, henceforth claiming shares for the British Crown [40]. From this moment on, a confusing situation ensued, since not all the partnerships that Imperial Oil had established were well known. Until the end of World War II, and even during the months after June 1944, confusion reigned as to what Project Canol was and what it was not [31, 32].

From June 1942 to January 1946, when drilling in the region stopped, Imperial Oil had started 83 wells in the Mackenzie Basin, 18 of which were on Bear Island [28]. Nearby Goose Island was also riddled with holes. An important innovation at that time occurred in the directional well drilled under the Mackenzie River, which was producing oil. This was Imperial Oil and Canol's number 3 on Bear Island, started on August 15, 1943, and completed in October of that year [20].

We must be clear that it is one thing to drill and another to produce. Canol was in force during the time that the war lasted and in those four years 59 wells produced crude, and all were considered as development wells, except Imperial Canol Goose Island Number 1, [20]. It is located on that small island in the bed of the Mackenzie River and at the height of the city of Norman Wells. Apparently, all of them produced and contributed their part to supply the total, which amounted to 1.6 million barrels of crude (about 250,000 tons). All of this production was sold to the United States Army [20].

The so-called rotary rigs first appeared in the Norman Wells area while Canol still had responsibility. Its mission was to take samples to analyze the crude and detect what kind of refining it should be used for. Likewise, these structures were used to discover where the oil could be stored and it was reported, after a work commissioned to O. D. Boggs, that the producing area could be specified in about 5000 surface acres. In the same report, the discovery of shales in Fort Creek was added, and with this, it was demonstrated that many years ago there were coral reefs in the Mackenzie basin. The finding served to inspire geologists who focused on some studies to unearth these findings [31, 32].

The natives never participated in any formal or informal conversation, since no one invited them to participate. The Canadian legislation, for the years of World War II, already had regulations that indicated that the natives should be consulted [5]. Curiously, as the plaque found near the Norman Wells Historical Center shows, and written in English,

French, and Dènè, those responsible for the Canol project used hunters of this ethnic group to act as companions, guides, hunters, etc. The war made it necessary to ignore many legal aspects [41].

2.2. Impacts of the canol project

The impacts of the first phase, which corresponds to the Canol project and the years of the Second World War, were multiple and of a very diverse nature. I am going to cite some of the most important, both at the time the project was developed and those that have survived.

2.2.1. Impact of the presence of the us army

Displacing 33,000 North American soldiers and more than 8,000 civil servants and auxiliaries for administrative tasks represented a social imbalance in many aspects. Most of the northern Canadian landscape consists of taiga, tundra, and mountains. These environments were going to be temporarily transited by foreigners who were unaware of practically everything about the vast regions of the Mackenzie River.

The northern boreal forest near Norman Wells is made up of low-lying conifers, as all flora is supported by permafrost. In the months in which the North American army was present, these forests were felled without any consideration since the intense cold was neutralized by the presence of large bonfires and the supply of the same came from these groves.

The presence of the military, most of them black brought a lot of discomfort to the aborigines, who had never before seen a human storm with the characteristics of the one above them at that time. The protests were made known to the Ottawa authorities, who carried out an investigation that did not go beyond paper because the moment was typical of military pacts, and nobody wanted internal confrontations.

The importance given to the Canol project, officially to safeguard Alaskan oil from falling into Japanese hands, forced the displacement of a huge fleet of trucks and other transport vehicles to the Northwest and Yukon Territories. When all the tasks were completed, these materials were abandoned; anywhere and those remains are still there, although they have been removed for years to open the roads of Canol to current tourism, promoting land routes. Barracks were planted to house the soldiers and some of them were planned as places of entertainment, where alcohol was served, cards played, and prostitution practiced.

2.2.2. Impact of exploitation on the environment

At the time the Canol project began and during its development, neither the North American nor the Canadian authorities took into account the previous and signed provisions and, therefore, in force in Canada at that time. Already in 1921, negotiations had taken place in Fort Rae, and at that time, Chief Monfwi, leader of the Dogrib Indians, had a prominent role in them; Likewise, James Wah-Shee, who was president of the Brotherhood of Indians of the Northwest Territories, also manifested certain notoriety. Once those negotiations were concluded, the clauses were agreed on, which were then understood to be concrete facts in order to respect the identities of each group, the aspirations they wished to reach, and the good treatment that all the agreed provisions should receive and that should be respected and be fulfilled by the types of government: federal, provincial and autochthonous [41, 42, 5].

In 1942, the North Americans only wanted to safeguard the oil wealth and did not value what had been signed two decades before. The few protests presented by the Indian collectives reached Ottawa but never received a response. The moment was war and that was the only objective.

2.2.3. Traces of the effects of the first phase of exploitation

The legacy of this short but intense phase is still being cleaned up; that is to say, what was abandoned became scrap metal and there are still many remains that can be seen on all the routes that have been opened to tourism during the summer. Even around the Norman Wells Historical Center, you can see trucks, mechanical sleds, hoses, etc., which had their usefulness between 1942 and 1944 and were forgotten as soon as the US Army withdrew. Today they serve to decorate an open-air museum, since the building, small on the other hand, lacks the possibility to house such a quantity of materials.

While the US soldiers remained on Canadian soil, there were citizens who expressed their opinions freely and stated that the federal government in Ottawa had ceded a part of national sovereignty to the benefit of Washington's criteria. This situation was not pleasant, and it manifested itself on several occasions; furthermore, the withdrawal of the military was detected as a relief in all the places where it had been present [23].

3. Phase two: oil exploitation after the second world war in the northwest territories

The second phase has little to do with the first. The Americans are still present but as investors, since all activities are under the control of the company Esso Resources Canada Ltd., which is one of the many subsidiaries of Exxon Mobile. At this stage, the city of Norman Wells was predestined to become an exporter of crude oil to the southern part of Canada. The transfer required two actions: 1) an increase in production, and 2) an oil pipeline linking Norman Wells with Zama, in the province of Alberta, the execution of which was entrusted to the interprovincial company Pipeline (NW) Ltd. whose objective was to transport the raw. These works require time to execute and strong investments. The first notable

difference between the first and the second phase is that the natives had a voice and a vote since Judge Berger [41, 5] advised them.

In the 1980s, Norman Wells, due to its industrial, mining, and hydrocarbon exploitation possibilities, had the means to become the most important regional center of the middle course of the Mackenzie River. However, growth expectations were more potential than real. It is true that citizens came from Toronto and other distant towns with the promise of good salaries and waiting that, as an industrial center, Fort Good Hope would prevail and influence, a settlement located further down the same riverbed and that it would surpass Fort Franklin, which was located upriver.

Norman Wells is not a historic community in the Mackenzie Valley. The aborigines knew the place when they passed through it when they came to hunt, fish in the river waters, or because they spent the night in the surroundings; because it did not have, it did not even have a missionary center that could indicate the presence of Anglican or Catholic missionaries [43]. The settlement was born with oil and its antiquity dates back to 1914, since in this year the first drilling platform arrived and, with it, the first English-speaking settlers. If we want to think about earlier times, we can go back to 1911, which was the year that J.K. Cornwall arrived [4].

Alexander Mackenzie reviewed, in 1789, the presence of oil leaks on two occasions when he made his journey from Montreal to the Mackenzie delta, which was then unknown, and he made the return as well. I am going to show the two occasions in which he described crude oil and what the natives used for it. I do so because I firmly believe that many of those who quote him have not read his diaries, including Canadian researchers, whom I do not quote out of respect. The first time he noted the presence of oil responded, by description, to the deposits that began to be exploited much later on the coasts of what is now called the Beaufort Sea, one of the many that appear in the geographies of the ocean Arctic.

The data were observed at the mouth of the Mackenzie, navigating through each of the channels of the delta, citing the Eskimos, because then the Inuit word was unknown and it was believed that they were an Indian variant; that is to say, he did not have ethnographic possibilities to differentiate them, although in his writings he notes ceremonies and commercial exchanges that could have clarified the issue for him even then. I add in his favor that the objective of his travels was exclusively commercial and focused on obtaining furs, since at that time he was an employee of the Northwest Company, which did not necessarily merge with the Hudson's Bay Company until 1821 [44, 5].

Alexander Mackenzie referred to this product for the first time in July 1789, when it was about to reach the Arctic Ocean, and noted it like this: "Friday, 24.-At five we continued our course, but, in a very short time, were under the necessity of applying to the aid of the line, the stream being so strong as to render all our attempts unavailing to stem it with the paddles. We passed a small river, on each side of which the natives and Esquimaux collect flint. The bank is a high, steep, and soft rock variegated with red, green, and yellow hues. From the continual dripping of water, parts of it frequently fall and break into small stony flakes like slate, but not so hard. Among them are found pieces of Petroleum, which bears a resemblance to yellow wax, but is more friable" [45].

The second review was made in his diary almost a month later, in August 1789, and he wrote it down like this: "Wednesday, 19.-The Indians were again sent forward in pursuit of game; and some time being employed in gumming the canoe with Petroleum, we did not embark till half past five, and at nine we landed to wait for the return of the hunters. I here found the variation of the compass to be about twenty degrees east" [45].

3.1. The new project developed between 1982 and 1985

The so-called Norman Wells Oilfield Expansion and Pipeline Project represented at the time the largest and most important industrial development plan in northern Canada. Financed by Esso and IPL, its objective was to increase oil production in the Norman Wells field, from 500 m³ to 4,000 m³ per day. Most of the crude was to be transported to the southern markets of Canada through a fully buried 324mm pipeline. Based on Esso's reports, crude should flow through the new pipeline by mid-1985. By 1986, the Norman Wells oil field had reformed and become Canada's third-largest producer [46].

The expansion of the Norman Wells oil surface immediately meant an increase in the number of wells and especially those that had the capacity to produce. In this context, 150 new excavations were carried out; half of them, seventy-five, were used to improve the recovery rate and the others to obtain crude oil itself [47]. It was hoped that the improved recovery method, which included a complex scheme based on flooding with water, would more than double the amount to be produced since those responsible were convinced of the potential wealth because those riches had been formed during the Devonian period.

This method would allow the recovery of around 42% of the accumulated quantity, much higher than the 17% achieved up to then with conventional methods [46]. As a consequence of the fact that a large part of the oil reef called Kee Scarp, estimated at more than 100 million m³, was located under the waters of the Mackenzie River, the development plan required the construction of six artificial islands and these would house approximately the half of the 150 wells that would be drilled to a depth of about 500 m in the Devonian formation [46].

The plan for the entire complex was designed to service the wells and produce gas for the plant, the refinery, and the surrounding community. Likewise, the project included the supply of crude oil for the Norman Wells refinery, which had to be supplied with 500 m³ per day, and the oil pipeline that had to transport 4,000 m³ per day [46]. The production of refined products such as gasoline, jet fuel, and diesel at the Norman Wells refinery, destined for northern markets, would continue at its usual rate of 335 m³ per day [46].

However, most of the production was destined for the southern markets, and for this reason, the oil pipeline was projected from Norman Wells to Zama. Crude oil has been transported since it was operational through a system called

the Rainbow Pipeline System, which stretched to Edmonton, where it links up with Imperial Oil Ltd.'s extensive trans-Canada system. The route followed by the pipeline was planned as a parallel line to the right bank of the Mackenzie River to a point near Fort Simpson where it crosses the channel and then heads southeast toward Zama. The route followed by the pipeline needed to cross two important rivers: the Big Bear and the Mackenzie. IPL pumping stations were established near Norman Wells, Wrigley, and Fort Simpson, with connections to the Zama terminals.

The benefits of this energy project would have long-term effects for Canada since energy self-sufficiency was envisioned. On the other hand, by reducing the need for imported crude, the country would save some C\$8 billion over the life of the oil field [46]. Federal revenues also grew substantially thanks to taxes on corporations and individuals. These two sources of tax returns together with one-third of the project proceeds were expected to increase the federal treasury by about Can\$172 million/year [48].

The laying of the pipe took time since it was necessary to excavate previously in a terrain dominated by permafrost. While the works lasted, materials and equipment were required, which supplied the industries established in the southern regions and when these could not be requested from other areas or abroad, mainly from the United States. Supply was poor in northern regions [27, 4]. Similarly, there was a demand for skilled labor and employment, and these two requests improved regional employment [49].

It is possible that the biggest beneficiary, at that time, turned out to be the steel industry, since it supplied thousands of tons of the pipeline that was installed from Norman Wells to Zama [50]. Alongside this, many other factories and companies contributed a wide range of equipment, such as pumps, compressors, and storage tanks [50]. Firms based in Edmonton and Regina supplied most of the materials used, especially the Interprovincial Steel and Pipe Corporation (IPSCO), which is the largest specialty steel manufacturing plant in Canada and has a notable subsidiary in Regina [50]. Equipment and materials were transported by truck to the Hay River, and from there by barge to Norman Wells on the Mackenzie [36]. Demand for oil and its derivatives should generate enough earnings to neutralize spending and start making a profit [27].

Regionally, the largest benefits were to be felt in the Northwest Territories and the province of Alberta. Taking into account the logistics of the internal air routes and the effective road network at the time of executing this phase of the project, it was expected that most of the cargo and passenger movements, related to the northern settlements fixed along the river Mackenzie, were to originate in Edmonton, Calgary, Regina, and Winnipeg, and later in Ottawa, Toronto, and Montreal. Keep in mind that the distance between Ottawa and Edmonton is about 3,500 km, and the flight requires almost five hours. Let's not forget that Canada is the second-largest country in the world.

On-site, a significant number of skilled construction employees employed by Esso were habitual residents of Edmonton and Calgary. The contract stipulated that they had to work three weeks in a row and that they would rest the fourth at home, so it was necessary for them to have air transportation from Norman Wells, which is why an airport was built, and anecdotally, it's the only one I know of. in the world where the suitcase conveyor belt has red lights and sirens to announce that it is starting to spin and that its owners will be able to pick them up and the children get up to avoid accidents because while they wait, they use the conveyor belt as leisure zone [47].

In the 1980s, the Yellowknife-based Government of the Northwest Territories was estimated to have an income equivalent to about Can\$6 million per year [48]. At first, it was thought that this amount was more than enough, but disappointment surfaced as soon as it was learned that these emoluments corresponded to 3% of what the federal government of Ottawa was going to receive [48].

However, companies incorporated in settlements along the pipeline route and near the community of Norman Wells should, by virtue of transportation taxes, have a competitive advantage in supplying certain goods and services over the two main companies involved. Based on the data provided by Esso [47], during the 1981-1982 biennium, more than thirty-seven and a half million dollars were delivered to companies located in the north and non-refundable, and 2,876 jobs were created for resident people in the vicinity, and for this, the infrastructures of the Norman Wells Expansion Project would be used [47].

The projections that were programmed for the town of Norman Wells already seemed excessive at that time, despite the fact that it was believed that most of the benefits would be distributed among local employers and workers. There is no doubt that a project of this magnitude requires an increase in the workforce, an expansion of industrial, educational, and recreational infrastructure, as well as a growth of the neighborhood and the population in general. Esso expected construction workers to exceed 900 from mid-1983 to the same time in 1984, and with them, the census would reach more than 1,200 people in the most important periods of construction [47].

The establishment of detached, manufactured housing for rotating workers would mitigate the pressure on community services and the demand for housing. The primary camps, to house Esso employees and those of its main subcontractors, were expected to hold more than 900 workers [47]. In reality, the total population of Norman Wells has never exceeded 600 inhabitants, so expectations were too optimistic [41, 51, 52, 5]

Table 1. Hopes, but not realities

Place	Capacity to store
Esso Resources-Field 1	200
MacKenzie House	200
Northern-Loram	450
Partec-Levalin	60
Total	910

The Report of the Federal Environment Assessment and Review Office¹¹ [48] recognized that this project would provide "a necessary economic stimulus" for the entire Mackenzie basin. Their recommendations were aimed at ensuring economic benefits, particularly local employment and business opportunities. FEARO believed that the impacts on individuals and populations could be kept "within acceptable limits" and to achieve this desirable situation, it provided several examples: 1) inflationary effects of the project on the local economy, 2) wage differences between workers hired for the project, and those of other sectors of the northern economy, 3) pressure on the housing stock, public services, and recreational facilities, and 4) the welfare provided by the economy.

FEARO emphasized the importance of minimizing peer pressure from foreign construction workers on the communities of Norman Wells, Fort Norman, Wrigley, and Fort Simpson. Esso responded to this request by housing its Norman Wells workers in self-contained labor camps and using an airlift system for rotaries to Edmonton and other northern hubs. The needs of construction workers for housing, services, and entertainment would be met primarily in the camps and in their home communities. The reality was that many temporary houses were built by joining various shipping containers with internal modifications. These types of residences became a real danger, especially due to the fires that occurred at bathing time, since there was a need to put up signs to warn tourists and workers, such as the one below. Norman Wells' Mackenzie Hotel has this sign in every room: "Please keep the bathroom door closed while showering – Due to the sensitive fire alarm system".

3.2. The initial impact of the project

In 1982, the pre-construction phase of the Norman Wells Oilfield Expansion and Pipeline Project began. By the spring of 1982, thousands of tons of cargo, from prefabricated buildings to drilling rigs, had been stored at Hay River, before being transported to Norman Wells. During the summer months, supplies and materials were shipped up the Mackenzie River to the town.

One of Esso's major subcontractors, Northern-Loram (a joint venture of Vancouver-based Northern Construction Company and Calgary-based Loram International), signed a C\$100 million contract to carry out drilling, seismic blasting, and hauling of shale and limestone rocks located in the vicinity of Norman Wells. A considerable amount of these slabs was used to build a road from the quarry to the river and to build a new wharf that remains operational in the period after the thaw and until another similar situation arrives months later; that is, the river is operational for navigation from May to October. Beginning in 1983, trucks began transporting rocks on ice roads, specially built to connect with important open points on four of the six artificial islands, to which I have already alluded.

In 1982, the federal and territorial governments took steps to help Norman Wells's village and prepare it to bear the temporary demographic shock. These measures included the incorporation of new jobs in the public sector, an increase in these, and the initiation of a long-term community plan. The need for new or improved recreational facilities was recognized and the lead agent, Esso, provided the village with a grant to build new recreational structures [47].

In this context, there was notable growth in Norman Wells, especially in the private sector, with the presence of several companies to respond to the demand for goods and services. In the two-year period from 1982 to 1983, the number of local companies increased notably from 37 to 51 [53].

The first wave of construction workers arrived in Norman Wells in the summer of 1982. According to Esso estimates, 225 of them would practice rotation as early as the summer of that year, and 300 would do so by the winter of 1982-1983. [46]. This influx of workers nearly doubled the population of Norman Wells at the time, and local and federal officials expressed concern about the social implications of the foreign population boom [54, 42, 14, 55].

Despite the initial impact of this project, it appears that it was deployed in accordance with the guidelines established by FEARO. According to a report from the RMPC detachment in Norman Wells, presented to Hamlet Council on November 23, 1982, crime rates in the last three years (1980 to 1982) had not changed significantly. This testimony included an analysis of various categories of crimes, such as those generated by excessive alcohol consumption, motor vehicle traffic violations, home invasions, robberies, and muggings.

The main conclusions of this report were: 1) the total number of complaints for 1982 (through October) was only slightly higher than for the previous two years, 2) the number of protests per capita for 1982 was lower than the preceding two years, previous years cited, 3) the total volume of liquor-related crimes, robberies, break-ins, and assaults had actually decreased in 1982, compared to 1980 and 1981, 4) the largest increase in complaints was for violations related to motor vehicles: speeding, traffic accidents, and traffic problems. The number of complaints in this final category had tripled from the 1981 figures. Interestingly, the RCMP (Royal Canadian Mounted Police) estimated that the number of motor vehicles had increased by more than four times (Norman Wells Hamlet Council, minutes of meeting held on 23 November 1982).

The construction boom had many impacts on Norman Wells, the most significant of which were: 1) the physical move of Esso operations employee residences from the original Esso lease site to a new subdivision in the northern part of the village, 2) quarry work and 3) heavy truck traffic.

One consequence of the rapid growth was the pressure for family housing and for having suitable lots to build a house. Of course, the offer was neutralized and balanced by the demand. It is possible, because it is not clear from the documentation that I have handled, that this balance comes from the control established by Esso to develop the project, which was already very far from those years in which there was enormous pressure from the occupied camps by American

soldiers between 1942 and 1944. The main reason prices have been maintained is that the federal and territorial governments provide housing for their employees. In this sense, the demand for more private housing has been relatively low up to now [54].

3.3. Legal issues regarding exploitation and its consequences

The project to install an oil pipeline along the entire length of the Mackenzie River, which is what the second phase consists of, is an exclusively Canadian task, even if it has foreign financial support. The initiative was governmental, but on this occasion, no prior concession was made, as was the case with Canol in 1942. A consortium, made up of various companies dedicated to the exploitation of oil and gas, was established under the name of Arctic Gas.

The headquarters was established in Calgary. The main objective was to build a pipeline to transport natural gas, which would be extracted in the vicinity of the Arctic Ocean to the southern cities of Canada, as a first objective, and later it would be expanded to reach the areas of Central American countries. Between the years 1960 and 1970, the federal government of Canada raised an investigation to find out what the social, economic, and environmental consequences would be in case of carrying out the pipeline. Likewise, he wanted to know all the implications to advise what terms and conditions should be considered and to avoid any problems.

By this time, the natives were already on alert and, given the problems they had had until their rights were recognized, they again turned to their most notable defender: Judge Thomas Berger [41, 5]; What's more, this lawyer took the case very rigorously and without complexes to confront the federal government, since the provincial government was more oriented towards regional opinions and native opinions. Once you read it, one realizes that he took into consideration what had previously been done, that is, what the Canol was and the legacy he left in the Northwest Territories and the Yukon while the American soldiers were there.

Judge Berger requested all the information to study it and issue his subsequent opinion. In this regard, he stated the following: "A gas pipeline will entail much more than a right of way. It will be a major construction project across our northern territories, across a land that is cold and dark in winter, a land largely inaccessible by rail or road, where it will be necessary to construct wharves, warehouses, storage sites, airstrips--a huge infrastructure--just to build the pipeline. There will have to be a network of hundreds of thousands of roads built over the snow and ice. Take the Arctic Gas project: the capacity of the fleet of tugs and barges on the Mackenzie River will have to be doubled. There will be 6,000 construction workers required north of 60 to build the pipeline and 1,200 more to build the gas plants and gathering systems in the Mackenzie Delta. There will be 130 gravel-mining operations. There will be 600 river and stream crossings. There will be innumerable aircraft, tractors, earthmovers, trucks, and trailers" [56].

The federal government was clear that it wanted to carry out this great work, but that it should not be considered in isolation. Thus, as a responsible executive, he presented a document entitled Expanded Guidelines for Northern Pipelines to the House of Commons on June 28, 1972. In this text, the bases were suggested to take into account what would be the impact if the gas pipeline were built first and followed soon after by an oil pipeline.

Cecil Andrus, United States Secretary of the Interior, consulted for his experience, stated the following on the subject: "The problem is that once you go through a particular area with a pipeline, the next step is a suggestion by industry to explore for more mineral resources in the corridor of the newly installed pipeline. Then you've got a much more complex situation than you had to begin with, and usually, one that wasn't even considered when the original pipeline decision was made" [56].

In this context, Judge Berger needed to assess the impact that a corridor that would take gas and oil from the Arctic to the middle of the continent would generate. On the other hand, voices arose in Ottawa in favor of taking advantage of what was still available from the Canol, which for the environment consisted of two pipelines, one that ran from Alaska through the northern Yukon to the Mackenzie delta, and another that covered the entire valley of the river. The magistrate thought that the environmental impact might not occur at the time of construction; What's more, it was most likely slow, and it accumulated.

In this line of argument, Berger, who had documented himself well, maintained that the entire northern zone of Canada, which corresponds to the Arctic and Subarctic, was fragile, and that the species could be exposed to vulnerability in the medium term. Since no one has a chance to guess the future, becoming weaker than you already are something that may or may not happen.

The judge asked himself a simple question, although very difficult to answer: what impact will be produced, with the implementation of a large-scale border project, on plant and animal species? The jurist was well aware that the history of progress in North America is that of any border area and was fully aware of the theories of Turner, an American who pointed out that modifying international boundaries is how a country became powerful, and that this modification was the cause of incessantly generating progress [57, 52].

The ongoing siege of the North American border is a remarkable event carried out by humans who had the will and the ability to alter the face of the continent. The benefit was enormous, and it is not necessary to repeat how roads were laid that later became great transportation networks. Cities appeared industries rose, and agriculture experienced a previously unimagined boom [14, 5, 55]. The enormous abundance of cultivated land and resources generated the conviction that the riches were inexhaustible.

Thomas Berger was well aware that Canadian progress was based on the economic model and national consciousness among those who were Anglo-Saxon and Francophone, whether they understood each other or not. But, at the same time, a strong identification was also in force, the one that had developed in the 50s and 60s among the aborigines (Indians,

Métis, and Inuit) who wanted their territories to return to the way they were before they were violated by the white man's greed [44]. Is there only one Canada? There are two. Are there more than two or three?

Starting in 1960, there began an awakening of ecological awareness and a progressive concern about the need to have relevant legislation on the environment, natural resources, etc. These concerns arose as a response to the growing power of technology, the use of which increased the consumption of natural resources and thus generated a greater and faster impact. In this context, it was soon concluded that conciliatory situations could not arise.

The mismatch was clear throughout the Canadian upstate. Native Americans living in the Mackenzie Valley claimed that the laying of a pipeline and the establishment of an energy corridor from the Arctic to the southern part of the nation would affect the land they had depended on for many centuries. Environmentalists specified that the north was Canada's last great wilderness area and that it was recovering very slowly from environmental degradation, making its protection vitally important to all Canadians.

The magistrate, in his report, adds the following, so that it is taken into account: Now, the interests of the natives were not identical, far from it, with those who wanted to make the different industries involved in the exploitation a reality; What's more, industrialists make short, medium and long-term calculations to previously determine the profits they can achieve from the asset to be exploited for its pertinent commercialization, and these data are made with precision.

Judge Berger, when he made his proposals and put them forward after analyzing the pros and cons, proposed this suggestion: "Let me be clear about the importance that I accord to the wilderness. No one seeks to turn back the clock, to return in some way to nature, or even to deplore, in a high-minded and sentimental manner, the real achievements of the industrial system. Rather, I suggest that wilderness constitutes an important-perhaps an invaluable part of modern-day life; its preservation is a contribution to, not a repudiation of, the civilization upon which we depend" [56].

The area that corresponds to the Canadian Arctic and Subarctic is enormous, and in its many ecosystems emerge tracts of land and water that are vital for the survival of entire populations of mammal, bird, and fish species at certain times of the year. This concern for the habitat, in a critical situation, was at the center of the considerations of environmental problems studied by Judge Berger.

The magistrate, in his report, adds the following, so that it is taken into account: "Let me outline some of the environmental questions that I had to come to grips with in the Report, and that the Government of Canada, and all Canadians, must now consider. Our national parks legislation, as it now stands, is not adequate to preserve northern wilderness areas, which, if they are to be preserved, must be withdrawn from any form of industrial development. That principle must not be compromised. It is essential to the concept of wilderness itself as an area untrammelled by industrial man. We should include in our National Parks Act a provision for a new statutory creation: the wilderness park. It would consist of land to be preserved in its natural state for future generations. Wilderness legislation has already been in existence in the U.S. since 1964. I have urged that the Northern Yukon, north of the Porcupine River, be designated a national wilderness park" [56].

In the Report prepared by the magistrate, a defense of the northern nature of Canada was embodied and on numerous occasions, he was committed to the beauty of the tundra landscape, the most extensive, along with the northern boreal. Both landscapes occupy an area of some "nine million acres of land in its natural state, inhabited by thriving populations of plants and animals. This wilderness has come down through the ages; it is a heritage that future generations, living in an industrial world even more complex than ours" [56].

In this line of argument, the judge points to the assumption that a pipeline was laid that linked Alaska with the Canadian Arctic Coast and continued along the Mackenzie River to Edmonton and Calgary. If this work were carried out without previous impact studies, what would happen would be to annul the land routes of the caribou herds that, in the springs, move from the vicinity of the Porcupine River, in Yukon, to the pastures that arise in the vicinity. from the Arctic coasts and could not go to those pastures where females give birth to their young as they have been doing for centuries, and these animals make these movements to avoid three dangers: wolves, mosquitoes, and horseflies; while they care for their young [58, 59].

Along with caribou, tundra landscapes are temporarily home to geese that come to spend the summer and then return to California and Central America. There are also other species such as the peregrine falcon, golden eagle, and other raptors that nest in northern Yukon and have been endangered for years because the food they get harbors toxic elements [60]. Other animals are the polar bear, the brown and the black; moose, goats, foxes, beavers, lynxes, and muskrats [61].

Consequently, Judge Berger disagreed with Arctic Gas's proposal to build a pipeline through northern Yukon, since it was not just about that impact, but about avoiding the next one, which would be to make a similar laying from the Mackenzie delta until connecting with the line already in operation from Norman Wells.

Faced with this possible mischief, the magistrate issued his opinion: "I also recommended that a whale sanctuary be established in Mackenzie Bay. In summer, the white whales of the Beaufort Sea converge on the Mackenzie Delta to calve. Why? Because the Mackenzie River rises in Alberta, B.C., and carries warm water to the Arctic. Therefore, the herd—some 5,000 animals remain in the vicinity of the Delta throughout the summer, then leaves for the open sea. For these animals, the warm waters around the Mackenzie Delta, especially Mackenzie Bay, are critical habitats, for here they have their young. Here in these warm waters, the whales stay until the calves acquire enough blubber to survive in the cold oceanic water. Nowhere else, as far as we know, can they go for this essential part of their life cycle. We must preserve these waters from any disturbance that would drive the whales from them" [56]. This opinion was issued after researching David Sergeant, who was then Canada's most enlightened authority on whales [62].

The extension of Canadian land occupied by the Arctic and Subarctic is considered as the border to be modified so that, in the purest style of Turner, it can be considered as the appropriate one for the country to advance without ceasing,

developing, and becoming powerful. Everything is a matter of extracting the enormous wealth that is deposited in its subsoil in order to control and subdue it.

Faced with this situation, favorable for investors, Judge Berger stated the following: “The question is, are we serious people, willing and able to make up our own minds, or are we simply driven by technology and egregious patterns of consumption, to deplete our energy resources wherever and whenever we find them?” [56]. The problem is not finding resources and taking advantage of them, it is about reconciling industrial, social, and environmental objectives.

Since the 18th century, Humanity began to depend on technological advances, since thinking brains proposed that prosperity and well-being depended on them. Thanks to the application of technology, it has been affirmed that the Industrial Revolution is the most important event that occurred after the Neolithic, because of overcoming a stage based on agriculture and beginning to depend on an industrial and urban one [63].

The application of appropriate technology increases the volume of goods to dispose of; in this sense, what is manufactured can be temporarily stored, but its immediate destination is consumption. This aspect also triggered economic profits and capital accumulation. In this context, executives since the 18th century seek to increase the spending of their fellow citizens and foreigners who are supplied through exports and trade. Close to the end of the first quarter of the 21st century, we must ask ourselves, paraphrasing Judge Berger, should our descendants and we continue to aspire to the idea of unlimited growth? Similarly, should the Third World aspire to the same goal?

The next question is whether unlimited growth can occur for all. Can we humans realistically expect to live by a philosophy of endless growth? Can we keep a goal of endless growth and offer the same goal to everyone else in the world? Does equity require that the same goal be open to people all over the world? If we can't do both, does this mean we need to reconsider the targets each country has set?

It is not a question of questioning the industrial model, but of considering whether it has the capacity at all times and for all people to offer them the best way to improve their standard of living. Ian McTaggart-Cowan points out: “Is the only way to improve a lot of a country's citizens the way of industrialization, whether it be the Western way or the forced march of the USSR? Almost inevitably, diversity is sacrificed to spurious efficiency.

The loss of diversity is not merely a matter of sentimental regret. It is a direct reduction in the number of opportunities open to future generations. As we look towards the end of the 20th century... we see..., this diversity threatened by dominant societies pursuing goals that, though they have produced a rich material culture, are already eroding the sources of their original stimulus” [64].

Until the end of the 19th century, the main source of energy was wood, and until at least World War II coal occupied that place. Now our energy resources are oil and gas. Consumption in rich countries has skyrocketed to the point that in just fifteen years spending can triple, while there are many African countries that continue to collect firewood to feed their kitchens. Moderating consumption requires a reconsideration of traditional wisdom. I do not state that we have to dismantle the industrial model, but that we must improve it and that will only be achieved with education and awareness, and if these are lacking, chaos will increase.

3.4. Future projections

With the oil industry going, it was thought that Norman Wells would have more relevance in the Mackenzie Depression, especially because of the crude oil and because of the geographical situation of the town in that river basin. With a larger population, commercial functions and public services would grow unabated. In addition, it was believed that other nuclei, more or less nearby, such as Fort Franklin, Fort Norman, Colville Lake, and Fort Good Hope, would reinforce that importance. Similarly, all expectations depended on the duration of crude oil reserves, which were then projected to be 20 years [46]. Interestingly they keep going.

The future, as of 1992, was the year in which the depletion of the wells was thought to have already started other industrial developments, and these would provide a strong regional economy for Norman Wells. These improvements could involve finding additional energy resources, or a better means of recovering more oil in place.

The calculation on the completion of the oil business -and its impacts- failed since, to this day, exploration in the Mackenzie Valley continues, and the seismic teams continue to work throughout the area and explore the existence of other hydrocarbon deposits because the region has turned out to be richer than thought.

4. Conclusion

The Canadian Northwest Territories are one of the least populated areas of the American continent. Some 45,000 people currently live in an area of 1,346,000 km² (approximately the same as 150 years ago, around 1871), and of them, only slightly more than a third are from the primitive indigenous ethnic groups.

Although oil production was never important, in the country as a whole, it is a territory with great mining potential, as it is a producer of diamonds, gold, and natural gas. Perhaps in the future oil will once again be the protagonist, since the coastal area of the Arctic, in Alaska, has proven to be a region very rich in hydrocarbons and it is possible that further exploration will discover what they did not find on the coast or on the continental shelf inside.

The experience of the environmental impacts in the Mackenzie River depression, and more specifically in the Norman Wells area, despite its small size, and the time that has elapsed, should alert us to possible future exploitation, whether of fuels, such as gas and oil, and other minerals, because the impacts that can be caused are almost irreversible, although the sparse population of the tundra seems to support the idea of an empty, and useless region.

Moreover, nothing could be further from reality, since any well-preserved natural region is a true treasure of an Earth on which humans exert excessive pressure, on many occasions exhaust, and pollute.

The reality before us is that the problems are more serious than they seem and go beyond the ideological conflicts that have occupied the world for too long. A question that floats in any environment: how much energy is needed to run industrial machinery, where will we get it from, where is the incessant industrialization headed and what happens to the people who live pending these advances?

The problems that we face on a daily basis are not only economic and if they are solved it will be by applying ideological formulas that must be free of viral contamination; that is to say, they must be valued through a moral and ethical dimension, and even if they make reference, they must overcome what is already worn out. Capitalism and communism are two models of materialism that have competed for the loyalty of men until today. Neither of them has come to rethink the need to modify the objectives of the industrial model. Can we change the address? The future of the world we know and in which we live depends on this question, as well as respect or not for the environment in which any society operates.

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