

The Taiya Project*

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Since the purchase of Alaska from Imperial Russia in 1867, and since the Klondike gold rush in Canada's Yukon Territory in 1896, northern residents have experienced resource booms and busts. American federal spending on military projects during World War II in both Alaska and the Yukon created an economic boom and many opportunities for a mobile construction workforce and numerous northern residents to earn high wages. The influx of thousands of construction workers, however, caused tremendous problems as well and transformed the north. In 1941 the Yukon had fewer than 5,000 inhabitants, 30 per cent of whom were natives. The white population lived in a few communities such as Whitehorse, Dawson, and Mayo, with only a few missionaries, police officers, and fur traders in the outlying areas. Almost overnight, 10,000 American military personnel and an equally large number of civilian workers, some Canadians but most Americans, arrived in the northwest. By the end of 1942, the Whitehorse area alone had a population four times that of the prewar Yukon. In short, the American construction activities affected all aspects of Yukon life and created the biggest boom since the Klondike gold rush, but also severely dislocated the traditional lifestyles of Caucasians and natives alike.¹

Alaskans shared similar experiences, albeit on a larger scale. The 1940 census listed 72,524 residents, of whom 500 belonged to the military and 32,458 were natives. In 1942, Alaska's population had risen to 141,000, of whom 60,000 belonged to the military. A year later the population had grown to 233,000, of whom 152,000 were military personnel. Thereafter the numbers decreased. In 1944, the figures were 185,000 and 104,00 respectively, and in 1945 they had further declined to 139,000 and 60,000.

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¹ Ken S. Coates and William R. Morrison, *Land of the Midnight Sun: A History of the Yukon* (Edmonton: Hurtig Publishers, 1988), 234.

In 1950 the population temporarily stabilized at 128,643, of whom 33,863 were natives and 20,407 belonged to the military.²

The population of Whitehorse dropped substantially from a height reached in 1942, but in 1944 the town still had 6,000 residents, many of them temporary. As Americans moved out, growing numbers of federal and territorial officials arrived, bringing a measure of stability. Canada took over the Alaska Highway after the war, and this resulted in the influx of thousands of Canadian Army personnel. Whitehorse remained the centre of highway operations and became headquarters of the Northwest Service Command. Five years after the Americans left, Whitehorse still had a population of 5,000, a far cry from the tiny frontier community it had been before the war.³

Still, Canadian writer Jim Lotz characterized the 1945-54 period as "the doldrum years" in the Yukon Territory. Government spending on the maintenance of the Alaska Highway and a modest road construction program helped to keep Whitehorse a viable community, but led to the decline of Dawson. Not until 1954 did the federal government become serious about the areas north of 60° and try to develop them. "But it was all done in a haphazard way, as a collection of government departments, private agencies and individuals operated in virtual isolation from each other," Lotz observed. Nevertheless, the efforts initiated another boom, "the development decade 1954-1964," as Lotz named these years. The federal government poured money into the Yukon Territory, and "anyone could get a job," and by about 1966-67 "everything that could be built had been built, and the final touches were being put to several structures in Whitehorse — a library, a museum, a city hall, a prison."⁴

In Alaska, the federal government had attempted for years to provide the territory with basic industries offering year-round employment. This objective once again became urgent after 1945 when military spending dropped precipitously and another economic bust seemed imminent. The onset of the "cold war" soon after the end of the Second World War and the military recognition of the north's strategic location in the air age, however, prevented an economic collapse.

² George W. Rogers and Richard A. Cooley, *Alaska's Population and Economy: Regional Growth, Development and Future Outlook*, Vol. II, Statistical Handbook (College: University of Alaska, Institute of Business, Economic and Government Research, 1963), 7-8.

³ Coates and Morrison, *Land of the Midnight Sun*, 256.

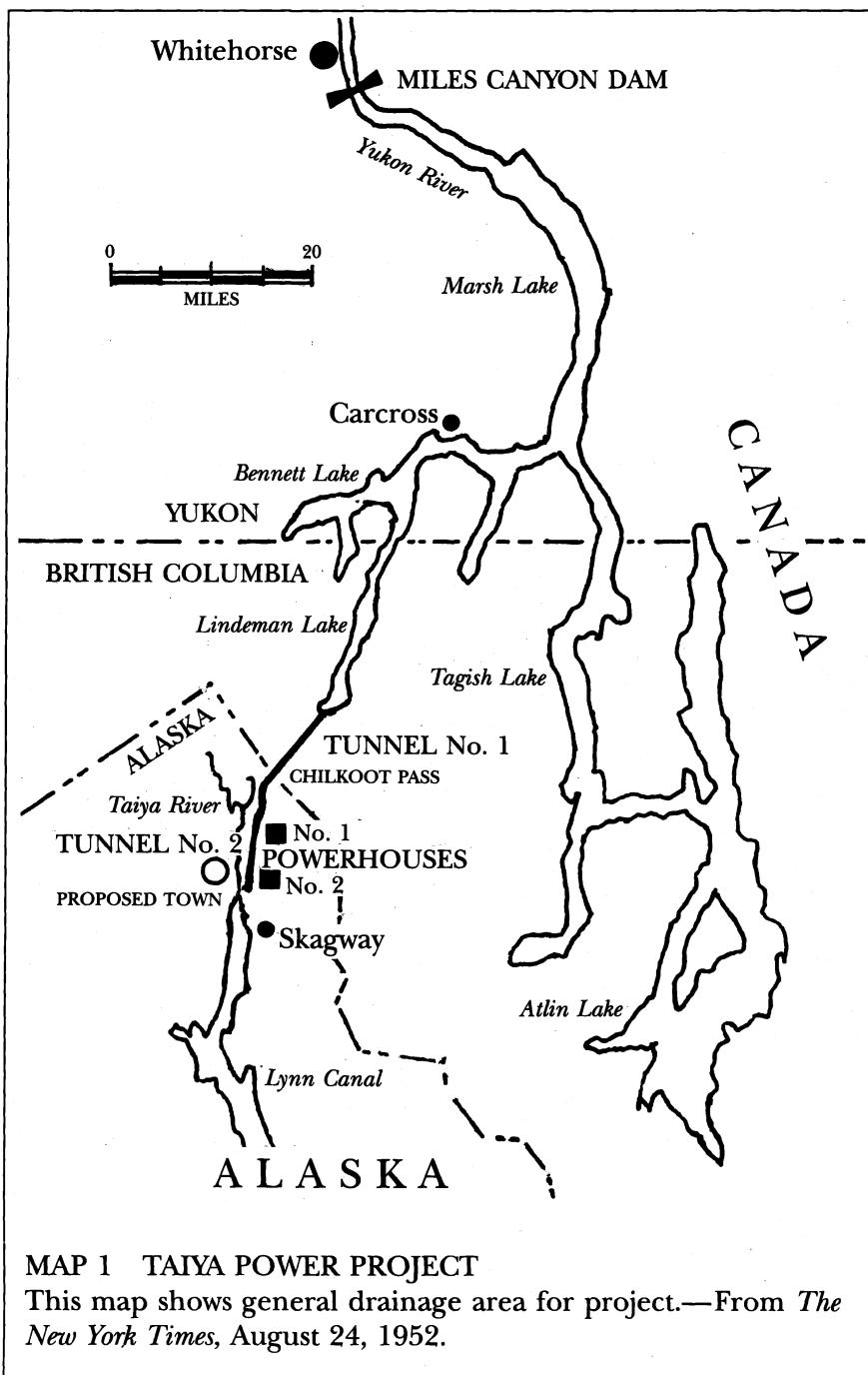
⁴ Jim Lotz, *Northern Realities: The Future of Northern Development in Canada* (Toronto: New Press, 1972), 66-71.

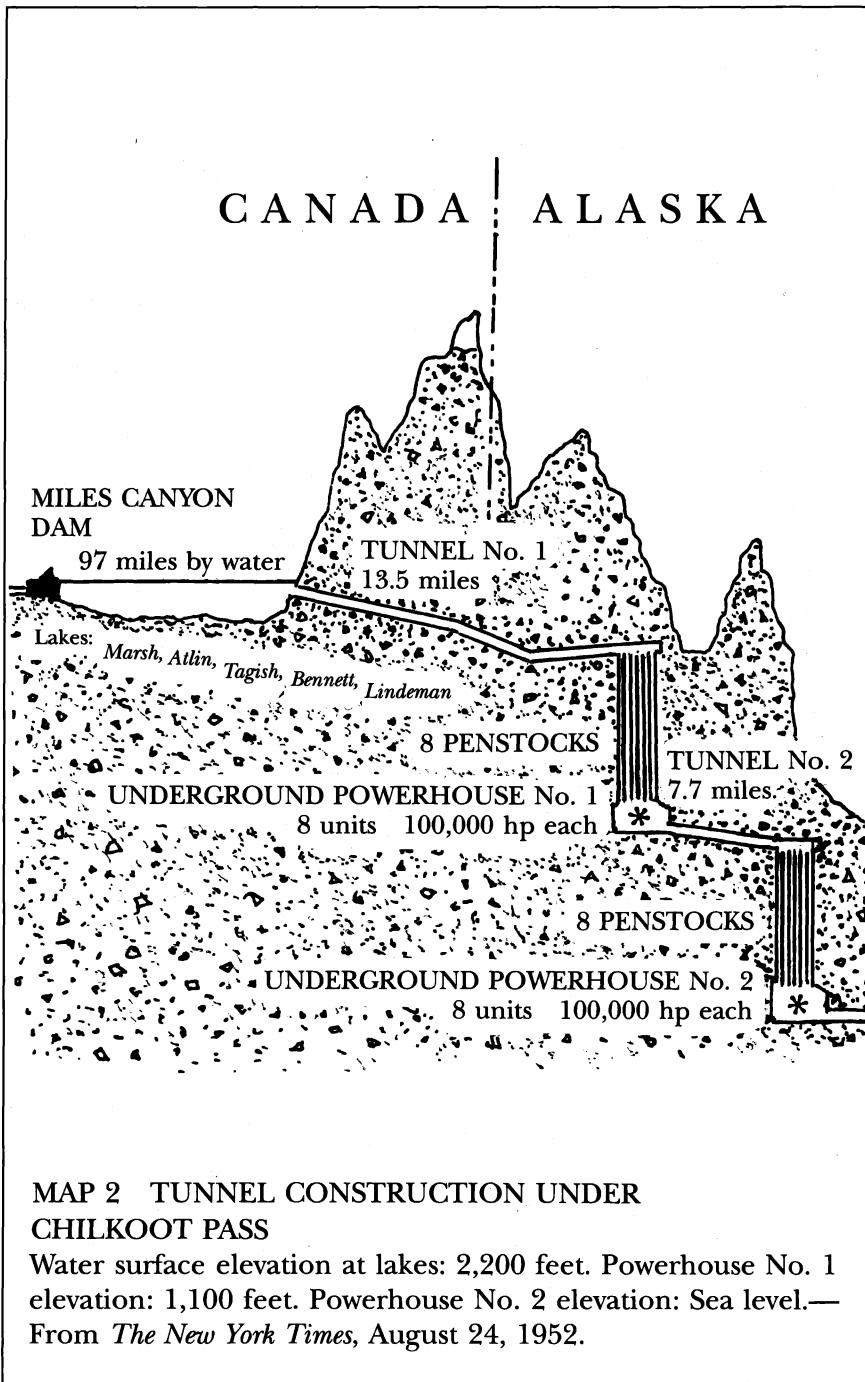
In the postwar years, therefore, the various agencies and bureaus of the Department of the Interior embarked upon a program of identifying and classifying northern resources preparatory to devising a comprehensive development plan for the territory. The Bureau of Reclamation was one of the agencies investigating Alaskan resources.

In November 1946, R. C. Johnson, an engineer with the bureau, concluded that an unusually large hydro-electric power potential could be developed by diverting the headwaters of the Yukon River in Canada to the Alaska coast at Lynn Canal. Initially, it was called the Tagish-Lynn project, after many-armed Tagish Lake which straddles the Yukon River; and Lynn Canal, a sixty-mile long water passage which trends south from Chilkat Island to Chatham Strait, twenty-two miles west of Juneau. Later, it was called the Taiya project after Taiya Inlet, a thirteen-mile-long estuary which trends south from the mouth of the Taiya River to Chilkoot Inlet, twelve miles south of Skagway, which was to receive the diverted waters of the headwaters of the Yukon River. Without any studies, Johnson estimated that the project, once constructed, could produce in excess of three billion kwh annually. It would involve the construction of a dam on the Yukon River at Miles Canyon, located a few miles upstream from Whitehorse, Yukon Territory, Canada. This dam would be designed to impound the waters from Atlin and Bennett Lakes and their tributary rivers and smaller lakes discharging into Tagish Lake and then flowing via Marsh Lake into the Yukon River. The Miles Canyon dam was to create a large lake for storage and reverse the flow. The proposed point of diversion was to be at Lake Lindeman, ninety-seven miles from Miles Canyon by the twisting course of the rivers and lakes. Two tunnels were to be constructed, the first 13.5 miles long from Lake Lindeman to Chilkoot Pass; the second, 7.7 miles long, would drop the water about 2,200 feet from Chilkoot Pass to Taiya Inlet at the head of Lynn Canal, an arm of the Pacific Ocean.⁵

In the summer of 1947, the Aluminum Company of America (ALCOA) became interested in Taiya. ALCOA's predecessor, the Pittsburgh Reduction Company, was founded in 1888 to make use of the Hall process for separating aluminum from its oxide. Until World War I, ALCOA was the sole producer of primary aluminum in North America. World War II

⁵ Confidential Memorandum from the Acting Chief, Bureau of Reclamation, to the Commissioner, 23 July 1949, Ernest Gruening Papers, Governor's Alaska File, 1948-53, Box 1, University of Alaska Fairbanks Archives; George Sundborg, General Manager, The Alaska Development Board, "Information Memorandum" no date, Ernest Gruening Papers, Governor's Alaska File, 1948-53, Box 1, University of Alaska Fairbanks Archives.





substantially increased demand for this metal and resulted in a major expansion of the company's capacity. In the postwar period, ALCOA expanded into foreign markets, mainly in primary smelting and refining. It also continued its process of vertical integration, both backward into energy supplies and forward into finished aluminum products, and became the world's largest aluminum producer.⁶ In any event, this interest prompted the Bureau of Reclamation to send its chief engineer, L. N. McClellan and engineer L. G. Puls, both from the Denver office, to Alaska in November of that year to survey the project. The two men summarized the results of their investigation in *Report on the Potential Hydroelectric Power of Southeastern Alaska and the Yukon Territory* (1948). They determined that a Yukon River dam such as Johnson envisioned and tunnels of eleven and four miles, respectively, would carry the water across the international boundary into Alaska to a power site on the Taiya River. They estimated the operating head at 2,000 feet, being the distance from the top of the dam to the water outlet at the bottom where the turbines were located, and furnished two operational plans. One would utilize only a portion of the available water to produce about four billion kwh annually — up one billion kwh from Johnson's rough estimate — whereas full diversion, necessitating the construction of a second dam below Whitehorse, would produce ten billion kwh annually. On 23 April 1948, the U.S. Geological Survey withdrew the Taiya area after classifying it as a power site.⁷

On 22 October 1947, I. W. Wilson, the senior vice-president of ALCOA, and the company's chief hydraulic engineer, James P. Growdon, visited J. M. Wardle, the director of the Surveys and Engineering Branch, Department of Mines and Resources in Ottawa, and outlined to him the proposed major power development utilizing the Atlin-Tagish Lake-Lewes River Drainage Basin. ALCOA's plans differed slightly from Johnson's proposal. The company would construct a dam a short distance above the Whitehorse Rapids on the Lewes River (upper Yukon) in Miles Canyon, raising the waters in the upper reaches of the river, namely Marsh, Tagish, Bennett, and Atlin Lakes to an elevation of about 2,210 feet. The water stored was to be routed into Taiya Inlet through an eleven-mile-long northerly tunnel and an eight-mile-long southerly tunnel. Power House No. 1 was to be built at the end of the northerly tunnel, and Power House

⁶ D. C. Stafford and R. H. A. Purkis, *Directory of Multinationals*, Vol. 1, A-J (New York: Stockton Press, 1989), 47.

⁷ Confidential Memorandum from the Acting Chief, Bureau of Reclamation, to the Commissioner, 23 July 1949, Ernest Gruening Papers, Governor's Alaska File, 1948-53, Box 1, University of Alaska Fairbanks Archives.

No. 2 on the Taiya River at the lower end of the southerly tunnel. Growdon estimated that the natural flow would furnish 11,000 cubic feet per second plus storage at a total head of between 2,000 to 2,200 feet, resulting in a total power output of one million hp. The project also necessitated the construction of an aluminum plant in the Taiya Valley above Skagway together with a new town to house the workers. Apparently, to make the project attractive to the Yukon Territory, ALCOA also proposed the construction of a small power plant at Miles Canyon producing about 1,800 hp for the needs of Whitehorse.⁸

Wardle alerted the two men that ALCOA would have to consider a number of matters of concern to the Dominion government. These included the requirement that the company negotiate separately with representatives of the Yukon Territory, British Columbia, and the territory of Alaska, and since the project involved exporting Canadian waters to the United States, Canada's Department of External Affairs would also be involved. Furthermore, enough water needed to be left in the Lewes River for mining and navigational needs, as well as possible future hydro-electric power developments below Lake LaBerge. Wardle also suggested that ALCOA involve the appropriate ministers as well as the head of the Water Rights Branch of British Columbia in the proposal; and he concluded by telling Wilson and Growdon that water charges at the power sites would most likely be based on the horsepower developed by the Canadian water.⁹

Wilson and Growdon agreed that ALCOA would submit a formal proposal to the Dominion Minister of Mines and Resources as well as the appropriate British Columbian authorities. If tentative approval was obtained, then the former would issue survey permits enabling the company to gain the information needed for its application for an interim licence. It seemed likely, however, that the application would have to be referred to the International Joint Commission because it involved the diversion of Canadian waters to the United States.¹⁰

A few days later, Wardle sent a copy of the Dominion Water Power Regulations to ALCOA's Growdon, stating that the use of Yukon River waters for power development would eventually be covered by an agreement between the Dominion and British Columbia governments, U.S. authorities and the company, including water charges and storage rates.

⁸ J. M. Wardle, Memorandum for File, 27 October 1947, int-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

⁹ Ibid.

¹⁰ Ibid.

He also forwarded copies of the Whitehorse-Teslin and Juneau-Atlin map sheets as well as water level data of the various lakes involved in order to facilitate the company's planning process.¹¹

Wardle, however, was concerned about Growdon's estimate that building a dam at Miles Canyon and raising the waters to a maximum level of 2,210 feet would supply the Taiya project with an annual mean flow of 11,300 cubic feet per second (cfs). He asked Norman Marr, the assistant controller of the Mines, Forests and Scientific Services Branch of the Dominion Water and Power Bureau, to check out the numbers. It turned out that Growdon had based his estimate on the records of only one year, namely 1943-44. By adding data from three subsequent years, Marr discovered that the average flow for the four years averaged 10,315 cfs. Thus, the average for the four years was about 700 cfs less than Growdon's estimate, and about 1,400 cfs less in the lowest year. To achieve a dependable flow of 10,100 cfs there would have to be carry-over storage on the lake areas of the upper basin, and one would have to assume that years of higher yield than 11,000 cfs would occur sufficient to fill the storage. To provide for the deficiency below that flow experienced in the three years 1944-47, "carry-over storage of 2,200,960 acre feet would be required representing a depth of approximately 455 square miles. An additional storage depth of about 2 feet would be required to regulate the seasonal flow in any one year, and evaporation losses would also need to be taken into account in any extended storage cycle." In short, a flow of 10,000 cfs appeared to be a realistic figure.¹²

Canadian bureaucrats also laid out a variety of power possibilities on the Lewes and Yukon Rivers. For example, a dam built at the foot of Miles Canyon at an elevation of 2,094 feet and backing the water up to Tagish Lake at an elevation of 2,148 feet would develop a fifty-four-foot head producing 54,000 hp. Backing the water from Miles Canyon back to Atlin Lake at an elevation of 2,210 feet would develop a head of 116 feet at the dam, and assuming a flow of 10,000 cfs would develop some 110,000 hp above Whitehorse. However, there existed no market for this power at the time. ALCOA, with the same flow and storage and a 2,000 feet head would be able to develop approximately two million hp on Taiya Inlet. Once completed, however, none of the potential power sites below Whitehorse

¹¹ J. M. Wardle to James P. Growdon, 30 October 1947, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

¹² Norman Marr to J. M. Wardle, 17 November 1947, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

on the Yukon River would be available for development since the Taiya project had preempted the necessary water.¹³

In March 1948, ALCOA told Wardle that the company had "been endeavoring to fit together in Washington and Victoria [B.C.] the numerous pieces of the 'Jig-saw Puzzle' comprising the power and aluminum project in Canada and Alaska," and although there had been real progress it had been "much slower than we would like." In any event, ALCOA officials were to meet with the deputy minister of the Department of Mines and Resources and his staff in Ottawa on 12 March 1948 to discuss the proposed project.¹⁴ During the meeting, ALCOA suggested diverting a steady flow of 5,000 cfs to the power tunnels for generating electricity for the aluminum plant. Each of the two power houses was to develop 540,000 kw. Another 100,000 hp for the needs of the Yukon Territory required water in addition to that for feeding the two power plants. ALCOA offered to develop the power requirements of the territory. Reimbursement to the company would equal the generating cost, including special installations, or the expense of developing a similar block of power at Miles Canyon, whichever alternative proved to be the cheaper one. Still a third possibility consisted of building a transmission line over the White or Chilkoot Passes to connect the tidewater plants with the Whitehorse area.¹⁵

Company officials told the Canadians that the U.S. Congress had to pass legislation before the construction of an aluminum plant in Alaska could begin. Therefore, ALCOA had decided to wait before submitting a formal request to reserve the lands bordering the lakes and rivers in the Yukon Territory affected by the proposed development from entry until Congress had acted. Once the necessary legislation had passed, the company would make an effort to have the Dominion, provincial, and American authorities simultaneously announce the project. The Canadians promised to announce then that the Dominion government had received an application from ALCOA to investigate a large power project, involving the storage of water in the Yukon Territory and British Columbia, which seemed advantageous from the Canadian viewpoint. The Dominion government promised to promptly consider such a request and issue a survey permit "if and when the Cabinet considered the project justified further action."¹⁶

¹³ J. M. Wardle, Memorandum for file, 2 March 1948, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

¹⁴ J. P. Growdon to J. M. Wardle, 5 March 1948, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

¹⁵ J. M. Wardle to Deputy Minister, Department of Mines and Resources, 16 March 1948, "Yukon Power Diversion — Aluminum Company of America," int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

¹⁶ Ibid.

The deputy minister of the Department of Mines and Resources pointed out that unofficial reports had reached him from British Columbia which asserted that since all the diverted water had to cross the International Boundary through Lake Bennett, and one of the power tunnels was also located in the province, it should receive the greater share of any power rental charges. The deputy minister remarked that the provincial sections of the waters of Atlin and Bennett Lakes and Taku Arm, however, provided very limited power possibilities without the chain of lakes and the dam site at Miles Canyon located in the Yukon Territory. Obviously, direct negotiations with B.C. officials were called for to reach an agreement on the share of rentals. Perhaps an even more important question had to be settled quickly, and that was the price the Dominion government was to charge ALCOA for the water diverted to its power plants. Normally, if the project was entirely on Canadian soil, the developing company would pay for the amount of power proposed. In this case, however, a substantial proportion of the development and the power plants were to be located in the United States. In any event, the deputy minister was certain that ALCOA would not wish to proceed very far until it knew the sum it would have to pay in annual rentals.¹⁷

On 8 April 1948, J. M. Wardle conducted an informal discussion in Ottawa with I. W. Wilson and J. P. Growdon of ALCOA, and the company's Canadian solicitor, Bethune Smith, about the Yukon diversion project. Wilson related that the U.S. Department of Justice had refused to approve the project based on a technical point. Although he did not divulge the difficulties, Wilson acknowledged that the matter could not "be straightened out in a short time." He assured Wardle, however, that ALCOA had not abandoned its plans. The Canadian agreed that his department would continue negotiations with British Columbia about allocations of water and revenues, and until such an agreement was reached, the Dominion government could not determine the rental charges ALCOA would have to pay. Thereupon, ALCOA's men asserted that the company "could not proceed too far without an understanding in this regard."¹⁸

The men also discussed the Whitehorse district requirements, and ALCOA opined that for some years to come these needs could satisfactorily be met by installations at the Miles Canyon Dam. Increasing power demands in future years required that more water flow through the dam.

¹⁷ Ibid.

¹⁸ J. M. Wardle, Memorandum for file, 8 April 1948, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

The flow in the river below Whitehorse could easily be supplemented by the construction of storage dams on tributary rivers flowing into the Yukon below the city. ALCOA agreed to provide 100,000 hp for Canadian use from its Taiya Inlet plant, providing it could be used in the near future, and Canada agreed to release approximately 600 cfs of water at Miles Canyon dam for that purpose. If, however, the power could not be used immediately, ALCOA preferred to meet the demands as they developed "on their merits," a viewpoint the Canadians considered reasonable.¹⁹

In early December 1948, ALCOA's chief hydraulic engineer Growdon and solicitor Smith again met the Canadians to update them on recent developments. Growdon assured the latter that the company had not changed the general design of the project, but that legal difficulties, namely the inability of Alaska's territorial government to convey to any private company or person any land except for mining or homestead purposes, still held up the project. Obviously, Congress would need to pass appropriate legislation to remedy the problem. Growdon concluded by stating "emphatically that the Aluminum Company was more interested than ever in the development, and that he would be in Ottawa just as soon as legal obstacles in the United States had been overcome."²⁰

A month later J. M. Wardle, the director of the Surveys and Engineering Branch, Department of Mines and Resources in Ottawa, informed Dr. H. L. Keenleyside, the Dominion Deputy Minister of Mines and Resources, that the department needed to consider the direct benefits to the Yukon Territory and the power rental to be charged ALCOA before taking any definite action on a formal ALCOA application for the Taiya project. If ALCOA paid in cash for all power rentals, the Yukon would not benefit at all because the money would be deposited to the credit of the Receiver General. Wardle suggested, however, that in lieu of rental payments in whole or in part, ALCOA undertake certain specific projects benefiting the Yukon directly. What he had in mind was the construction of a good highway between Whitehorse and Dawson City, together with the completion of the connection then being built to the Mayo District. The Miles Canyon dam above Whitehorse could economically furnish 10,000 hp to satisfy the needs of the district. Both transportation and electric power projects, he argued, would permit the Yukon Territory to reap the fullest benefits from the development of its own resources. Wardle had some

¹⁹ Ibid.

²⁰ J. M. Wardle, Memorandum for file, 2-3 December 1948, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

doubts, however, if government approval for such an agreement with ALCOA could be obtained.²¹

The governments of Canada, British Columbia, the Yukon Territory and Alaska expected to receive power rental revenues from ALCOA, and that complicated the establishment of a fair and reasonable rate. The company was coming north to obtain low-cost power. Rentals set at too high a rate, he maintained, would "prejudice the whole project." Wardle assumed an annual rental of \$866,500 for the installation of 1,158,000 hp based on the Dominion Water and Power Act and dependent on the head developed in each country. Canada's share would be \$476,575, to be divided between the Yukon Territory and British Columbia. The simplest way to assess each share, he maintained, was on the basis of power lost by the diversion of water. The only head available for development in British Columbia consisted of fifty-seven feet between Lake Atlin and Taku Arm. Based on an estimate of the water flow from the Atlin Lake drainage, British Columbia's share of the rental should be three percent of \$476,575 or \$14,300 annually. The Yukon Territory's share, based on power lost through 5,000 cfs diversion, would amount to \$462,275. Wardle admitted that these revenue figures probably were the most favourable Canada and particularly the Yukon Territory could expect because American authorities might not agree to the method used to apportion rentals between the two countries, and also might propose a different computation method. British Columbia could be expected to object to the rental apportionment based on power lost, and instead claim substantially more money for storage of water on its territory. And finally, ALCOA probably would point out that rentals based on potential power losses in the Yukon drainage basin through the diversion of 5,000 cfs were fallacious because of the assumption that all that power could be developed economically by Canada, which was not so. Furthermore, it was unlikely that there ever would be a market for much of the potential power on the Lewes and Yukon Rivers.²²

In the meantime, the U.S. Senate had asked Assistant Secretary of the Interior William E. Warne whether a Yukon-Alaska power project was planned and if he knew anything about it. Warne replied affirmatively and outlined ALCOA's plans. The news was out, and within a short time two press associations asked the company's Pittsburgh office about the matter, only to be told that ALCOA actively pursued the investigation. At the same

²¹ J. M. Wardle to H. L. Keenleyside, "Re: Aluminum Company of America (ALCOA) Project, Yukon Territory," 7 January 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

²² *Ibid.*

time, ALCOA had drafted a measure permitting it to acquire land in Alaska for power development which sponsors were to introduce in Congress after appropriate review by experts.²³

On 22 February the Dominion withdrew from disposal lands in the Whitehorse area that would be covered with water if the levels of the Lewes River south of the proposed dam at Miles Canyon, Marsh, Tagish, Bennett and Atlin Lakes and Taku Arm and other tributary and connecting waterways were raised to an elevation of 2,215 feet above sea level.²⁴

Up to this point, British Columbia's Premier, Byron Johnson, and his cabinet had been unclear about the difference between the Aluminum Company of America (ALCOA) and the Aluminum Company of Canada (ALCAN), and this led to the belief that, if the ALCOA project in Alaska proceeded, ALCAN would not undertake a huge development planned for the province. Perhaps the confusion was understandable. Established in 1902 as the Canadian subsidiary of ALCOA, ALCAN became independent in 1928 and in the years immediately following it completely separated from ALCOA. At that time, ALCAN's North American activities consisted primarily in the smelting of aluminum ingots in Canada for sale to fabricators in the United States. As a result of the 1928 separation, ALCAN also took over former ALCOA bauxite mines in British Guiana and Yugoslavia, as well as equity in smelters in Italy and Norway and fabricating plants in the United Kingdom and Germany. It also expanded its operations in Germany and opened fabricating facilities in Switzerland and India. World War II increased demand for aluminum, and ALCAN built the world's largest aluminum smelter at Arvida (Jonquiere) in Quebec, constructed additional hydro-electric plants there and expanded fabricating operations elsewhere in Canada and Brazil, founded new subsidiaries in Australia and Brazil, and developed bauxite deposits in Jamaica. Like ALCOA, ALCAN was a vertically integrated company. This included power generation, because large amounts of electricity were required in the aluminum production process. ALCAN also ran bauxite mines, besides aluminum refining, smelting, and fabricating facilities.²⁵

McNeely DuBose of the same company visited Victoria, B.C. and explained that the two companies were entirely independent of one another

²³ J. M. Wardle, Memorandum for file, 3 February 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

²⁴ Privy Council 855, 22 February 1949. Section 12 of the Dominion Water Power Act, Revised Statutes of Canada, 1927, chapter 210, granted the Privy Council the right to withdraw lands; J. M. Wardle to Growdon, 9 March 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

²⁵ Stafford and Purkis, *Directory of Multinationals*, Vol., A-J, 28-29.

and were competitors to boot. He also emphasized that the proposed ALCAN development "was in no way connected with or dependent upon that of ALCOA" and that the latter's plans had no bearing whatsoever on that of the Canadian company. Additionally, ALCOA's Canadian counsel, Bethune L. Smith, spent a week in Victoria, B.C., where Premier Johnson asked Smith "to assure him that the Alaska-Yukon Project would not interfere in any way with that of the Aluminum Company of Canada and this I did." In fact, he remarked, the B.C. government was ready to discuss water charges with the Dominion government and how these should be divided between the governments involved.²⁶

On 4 May, the law firm representing ALCOA in Canada applied for a survey permit to conduct geological investigations not requiring diamond drilling at Miles Canyon and similar activities in British Columbia. It was possible that before the end of the summer more extensive surveys and investigations would be needed, the firm advised. It also told Norman Marr, the assistant chief engineer of the Dominion Water and Power Bureau of the Department of Mines and Resources, that ALCOA would not undertake the project itself but rather would have a subsidiary company, incorporated in Canada, do the work. The name of such a company had not been determined yet, and it therefore requested that the permit be issued in the name of solicitor Smith.²⁷

By early 1949, in fact, two other aluminum companies were interested in developing British Columbia's great water power potential to run separate plants on the West Coast. Reynolds Metals Ltd. of Virginia planned to undertake surveys on the 1.5 million horsepower potential in the Eutsuk, Whitesail, and Tahtsa Lakes area on the central coast and the one million horsepower potential in the Taseko-Chilco system near Bute Inlet. ALCAN already had conducted preliminary work along the coast. E. T. Kenney, the British Columbia minister of lands, had announced that the government had reserved the lands which included the two major hydro sources on the coast, namely the Taseko-Chilco-Homathko system and the site that Reynolds Metals Ltd. had selected. But since ALCAN had entered the field first, it would be given priority consideration. Kenney further stated that these plans would necessitate the construction of two cities housing a population of 50,000 each. Among suggested townsites were Kitimat on Douglas Channel and Kimsquit on Dean Channel.²⁸

²⁶ Bethune L. Smith to J. M. Wardle, 5 April 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

²⁷ Stuart Thom to Norman Marr, 4 May 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

²⁸ "Aluminum Firms Seek B.C. Power," *Construction World*, February 1949, 34.

By 11 May 1949, Norman Marr, the Acting Controller of the Dominion, expressed the opinion that the ALCOA project was of such magnitude that it involved matters of national and international importance of the highest order. Canada was vitally interested in administering the Yukon Territory's resources, and British Columbia had a significant stake as well. Nothing, he warned, "should be given in the form of a concession until exhaustive study" had been made of every aspect of the proposal and how it affected Canadian interests. Fortunately, a survey permit granted under the Dominion Water Power Act and Regulations merely allowed the applicant to enter Crown and other lands, and protected the Crown and others from any damage. Therefore, Marr had no objection to issuing this permit.²⁹ There the matter stood when, on 13 May 1949, ALCOA's Wilson and Growdon went to Washington, D.C., to discuss plans for the construction of an aluminum reduction plant near Skagway, Alaska with the territory's Governor, Ernest Gruening, and Under Secretary of the Interior, Oscar Chapman. The ALCOA men told the two bureaucrats that Growdon had led a reconnaissance party to Alaska in 1947 for the purpose of reconnoitring large power sites. His party had determined that the Taiya Project perfectly fit company plans. Initial development called for the generation of 400,000 kwh, sufficient to manufacture 400 million pounds of aluminum annually, employing 4,000 workers and supporting a town of 20,000 inhabitants. Wilson and Growdon told the government officials that ALCOA was about to begin intensive field surveys, supported by several consulting engineers on the dam and reservoir sites, in order to be certain that no earth faults or other conditions would make tunnel construction difficult.³⁰

The ALCOA people told Gruening and Chapman that they had already contacted Canadian Dominion officials about the Taiya Project and had become convinced the company would not encounter any serious difficulties in getting permission to divert the headwaters of the Yukon River. ALCOA also was of the opinion that the U.S.-Canadian International Joint Commission, established to consider all hydro projects affecting waters across the border, had no jurisdiction in the matter since no boundary waters were involved. ALCOA, however, was uncertain whether the

²⁹ Norman Marr to Timm, Memorandum, "Re: Proposed Yukon-British Columbia-Alaska Power Project," 11 May 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

³⁰ George Sundborg, "Memorandum for the Record," 20 May 1949, Conferences in Washington with Officials of the Aluminum Company of America, Ernest Gruening Papers, Governor's Alaska File, 1948-53, Box 1, University of Alaska Fairbanks Archives.

Federal Power Commission had the jurisdiction to grant a power site permit on the Alaska side. The company thought that it could probably argue successfully in the courts that the FPC had no jurisdiction, but that might take years. If it had to deal with the FPC after all, one of the problems would be to agree on a satisfactory rate schedule. ALCOA assumed that it would use nearly all of the electricity produced, although the Canadian government desired to reserve enough low-cost energy for such industrial uses as might develop in the future. ALCOA was agreeable to such an arrangement, and anticipated financing the project entirely on its own without any federal investment. There was, however, the possibility that the government of British Columbia, on whose territory some of the construction would take place, might object. ALCOA, however, felt permission would be granted.³¹

Problems remained, however. The Department of the Interior needed to devise a method enabling the company to acquire the necessary land for the plant and related works; and there was a long-pending Department of Justice anti-trust suit against ALCOA which needed to be disposed of before the Taiya project could get underway. Several problems of an international nature also needed to be resolved. The most immediate one concerned the necessity of a joint U.S.-Canada investigation of the project. From the beginning, the suggestion had been made that such an investigation be undertaken by the International Joint Commission under Article IX of the treaty between the United States and Great Britain of 11 January 1909. As early as July 1949, Secretary of the Interior Julius A. "Cap" Krug had asked Secretary of State Dean Acheson to persuade the Canadian government to participate in such a joint undertaking.³²

Another problem involved the participation of the two countries in the project. Rumour in Alaska had it that ALCOA had approached the Canadian government for permission to investigate the hydroelectric potential of the upper Yukon River only to be told that the project was of minor importance since the Canadians knew of no potential power developments on the upper Yukon, nor downstream to the international boundary, and that it was only interested in potential damages which might be done to the White Pass and Yukon Railway and to downriver navigation. The Canadians, however, had asked ALCOA to reserve sufficient power to meet future industrial requirements in the Yukon Territory if the project

³¹ Ibid.

³² Confidential Memorandum from the Acting Chief, Bureau of Reclamation, to the Commissioner, 23 July 1949, Ernest Gruening Papers, Governor's Alaska File, 1948-53, Box 1, University of Alaska Fairbanks Archives.

was built. In case the rumour of an agreement between the Canadian government and ALCOA was indeed true, the Bureau of Reclamation speculated, then the situation was indeed confused and could only lead to future international ill-feeling. The bureau thought that since the Canadian government had not investigated the hydro-power potential of the upper Yukon River and knew so little about the natural resources of the Yukon Territory that it was unable to foresee a market for any considerable portion of Taiya's power, this was "insufficient justification for either the Aluminum Company of America or the United States to take advantage of the situation by sharp dealing." Rather, the future interests of the citizens of Alaska and the Yukon needed to be protected. Diverting the water from Canada to Alaska had to be "approached very cautiously," the bureau warned. It pointed out, however, that in any development the United States would be entitled to 41 percent of the power and Canada to 59 percent.³³

The bureau maintained that the Canadian government should realize that a private treaty with ALCOA for the development of the Taiya Project was not possible because of the resulting reduction in flow of the Yukon River at the international boundary. This, of course, would adversely affect the development of potential hydro-power sites by the U.S. government on the Yukon River in Alaska. There also existed the possibility that stream depletion would adversely affect the navigation period throughout the length of the river by delaying the spring break-up and causing freeze-up earlier in the fall.³⁴

The project would create a power market so large as to be hardly comprehensible. The combination of large power capacity, low-cost and availability at tidewater allowed bauxite, the raw material, to be shipped to the project area from almost halfway around the world. In fact, the Bureau maintained, the Taiya project was of economic importance to many nations. For example, ALCOA considered buying bauxite for the proposed aluminum plant from the island of Palau, some 5,000 miles distant in the Pacific. There were other resource possibilities a little closer. An extensive iron-titanium ore deposit was located at the settlement of Klukwan, Alaska, twenty-three miles from tidewater and harbour facilities at Haines, and a mere fifty-five miles from the Taiya project. Several U.S. steel producers

³³ Ibid.; the Acting Chief of the Bureau of Reclamation arrived at the percentages based on the elevation of the natural bed of the Yukon River at the International boundary near Eagle, Alaska of 879 feet above sea level and the average water surface elevation of the potential power project storage reservoir in Canada of 2,145 feet above sea level, 879/2,145, or 41%/59%.

³⁴ Ibid.

had expressed an interest in this deposit, including Bethlehem and U.S. Steel. Bureau reconnaissance power market studies indicated that as much as 3.5 billion kwh of electricity per annum might be needed in order to produce 70,000 tons of the strategically important titanium per year; while pig iron production, a companion industry of titanium, would require another 0.8 billion kwh annually for the production of two million tons per year.³⁵

There were other possibilities, such as copper deposits within the project area whose extent had never been thoroughly investigated; there was a major lead-silver ore body near Dawson, and probably other minerals not yet discovered. Already ores produced in the Yukon Territory were being shipped to Trail, B.C., where the nearest smelter was located. They might instead be shipped to Taiya. The U.S. Bureau of Mines also had told the bureau that the possibility of establishing ferro-silicon, antimony, and ferro-alloy plants in the project area should be studied. In any event, the bureau thought that future studies might reveal a power demand for between fifteen and twenty billion kwh annually for Taiya electricity.³⁶

To plan for gigantic projects such as Taiya required bold and creative imagination. Considerable local opinion probably opposed flooding of the White Pass & Yukon Railway and possible damage to downriver navigation. The bureau thought that this represented narrow thinking considering that annual power revenues would amount to between \$20 million and \$40 million. In the bureau's opinion, such figures would even justify the abandonment and inundation of the town of Whitehorse, if required. It was natural that "local residents in the area would resist such a move" but that "should not influence the planning of the project for the national good of both Canada and the United States." In fact, ALCOA had recognized local resistance and restricted the project to only 400,000 kwh of plant capacity. The acting chief of the bureau was convinced that the drainage of the Teslin River Basin should be added to the project's water supply. Other drainage areas west of Whitehorse could also be used to augment the water supply for the project. Future studies, he was convinced, would double the previous power production figures to between fifteen and twenty billion kwh annually.³⁷

There were further studies, and then northerners learned that the Aluminum Company of Canada planned to construct a huge power and aluminum plant at Kitimat, British Columbia. The project, in a wilderness

³⁵ Ibid.

³⁶ Ibid.

³⁷ Ibid.

setting, necessitated the creation of a new town, and the whole project was to take three years for completion. Alaska's Governor Ernest Gruening quickly protested "this gross tragic and grave discrimination against an Alaska project [Taiya] which has been in preparation for four years." He argued that British Columbia depended on Alaska defences for its protection and no spot in British Columbia is either more or less defensible than the Dyea Valley at the upper end of the Inside Passage...." Gruening was appalled because the Kitimat project, according to news reports, was to be built with American aid. He charged that Kitimat would be very difficult to defend in case of armed conflict in the north, whereas Taiya was easily defensible. He listed the various disadvantages of Kitimat, such as the necessity to build a fifty-five-mile-long transmission line "over a rugged unexplored mountain range many of whose peaks are more than 6,000 feet high." Deep snows, icing conditions, and snow and rock slides would constantly menace the line, he predicted. The Taiya power house, in contrast, would be within five miles of the proposed plant site. In addition, Taiya possessed much greater power producing capabilities than Kitimat and the unit cost of development would, therefore, be cheaper. Most importantly, however, was the fact that American "encouragement of an industrial development of this magnitude at Dyea would be of tremendous lasting benefit to the economy of Alaska which is a part of the United States."³⁸ ALCAN, however, neither cared about Gruening's self-serving arguments nor paid any heed to these projects and proceeded with its plans.

In the meantime, British Columbia government officials had taken a closer look at the ALCOA scheme and decided not to grant the company any special concessions because the province would "not benefit economically in any way from the contemplated development" and the only revenue "we shall derive will be through rentals," which should be no less than those "called for in our regulations"; once the right had been granted and the water diverted from B.C., any possible Canadian use would be alienated as long as the company kept its licence in good standing; ALCOA "would compete directly within the protection of the American tariff on aluminum" with ALCAN which had made a preliminary decision to build an aluminum plant in British Columbia; and while there was at present no demand for a large block of power in that area of northern B.C., the water could probably be channelled south to the Taku Valley at probably no greater cost than the proposed Skagway diversion. Nevertheless, it was a good idea to convene a conference at the technical level on all

³⁸ Ernest Gruening to Oscar L. Chapman, 29 December 1951, 5 January 1951, Central Files, OT-CCF, Alaska, Commerce and Industry-6, Aluminum Plant, RG 126, NA.

aspects of the project from the provincial and Dominion points of view. In short, the B.C. government, contrary to the impressions solicitor Smith had gained while in Victoria, was not anxious to discuss the ALCOA project until the ALCAN development had been settled.³⁹

Dominion Controller, Norman Marr, had few comments on the B.C. government viewpoints on the ALCOA project, except that the feasibility of diverting the Yukon waters southward to the Taku Valley would have to be demonstrated. Furthermore, since this all-Canadian scheme diverted Yukon River waters, this would result in reduced flow in Alaska and thereby raise an international issue.⁴⁰

On 9 June, the Dominion government issued the survey permit "in favour of Mr. Bethune L. Smith" for the area along the Lewes River and tributary waters in the Yukon Territory, noting that it did not commit the government to grant water power concessions and only applied to the Yukon Territory. The British Columbia minister of lands administered the project area in his province and would have to grant the necessary permit. Soon thereafter, Dr. Warren J. Mead, the head of the Geology Department at the Massachusetts Institute of Technology and two of his associates together with a party of men travelled to the Yukon to determine if any large faults or sheared zones existed in the project area which would prevent building a dam at Miles Canyon or drilling a tunnel through the Coast Range. Mead's findings were favourable to the project. Armed with this data, ALCOA's chief hydraulic engineer Growdon visited administrators of the White Pass & Yukon Railway Co. Ltd. in Whitehorse. The railroad connected Skagway at tidewater on the Pacific Ocean with Whitehorse at the head of the Yukon River transportation route, and would be affected by the ALCOA project. White Pass officials listened and scrutinized the plans and then listed the impacts on the railroad. There were no changes from Skagway to Mile 39, but from there to Carcross the railway and the oil pipeline parallelling it needed to be relocated and reconstructed for a twenty-nine-mile stretch at a level of fifty to seventy-five feet above the present location. The Carcross townsite would be inundated, including the railroad station, airfield, and the U.S. Army fuel tank farm. New locations also needed to be found for the Lake Bennett station, which included a road, section and engine house, coal bunker, water tank, passing tracks,

³⁹ R. C. Farrow to George P. Melrose, Memorandum, "Re: Aluminum Company of America-Yukon-Atlin Project," 27 May 1949; George P. Melrose to H. L. Keenleyside, 28 May 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

⁴⁰ Norman Marr to Wardle, 3 June 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

and various other installations. The same relocation would be necessary at the Pennington station, and passing tracks at Pavey and Watson or thereabouts would have to be reinstalled. A stretch of the Alaska Highway from Mile 897, near the Marsh Lake Dam, east to about Mile 886 would need to be relocated, but that would be the responsibility of the Canadian Army. The Carcross-Tagish road, which met the Alaska Highway at Jake's Corner, also had to be relocated to higher ground.⁴¹

Growdon had told the White Pass people that the entire scheme was still in its preliminary stages, and ALCOA needed time before deciding once and for all on the economic feasibility of the project. Growdon, however, assured the White Pass executives that if the project proceeded, his company would pay for the relocation and reconstruction of railroad facilities impacted by the flooding.⁴²

A couple of weeks after the Victoria meeting, the B.C. government told Dominion officials that it was not enthusiastic about ALCOA's project because it would compete directly with ALCAN which considered the construction of an aluminum production facility in the province. Worse yet, U.S. tariffs on aluminum would give ALCOA a distinct advantage over ALCAN. If B.C. granted a licence at all, it would compute fees and rentals on a basis yielding the largest returns. As for a division of these monies between the province and the Dominion, it would have to insist on a 57 to 43 per cent split because that percentage of the drainage area contributing to the waters to be diverted to the United States was located in British Columbia.⁴³

By the end of December 1949, ALCOA officials informed the Dominion Department of Mines and Resources that the company had undertaken eight specific surveys essential for developing the Taiya project. These ranged from a topographic survey of the southern end of Lake Lindeman to locate the intake works and tunnel portal to a survey of the Alaska Highway where it crossed the Lewes River and along the east shore of Marsh Lake in order to make possible the relocation of that stretch of highway above elevation 2,200; and additional topographic and hydrographic surveys at Miles Canyon to a topographic survey to determine the surface area of the reservoir to be created by the Miles Canyon dam.⁴⁴

⁴¹ Norman Marr to Stuart D. Thom, 9 June 1949; C. J. Rogers to C. A. Gillam and R. A. Gibson, 4 July 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, vol. 45, RG 89, NAC.

⁴² Ibid.

⁴³ Geo. P. Melrose to J. M. Wardle, 24 November 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

⁴⁴ J. P. Growdon to J. M. Wardle, 29 December 1949, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

In March 1950, Deputy Minister Hugh L. Keenleyside of the Department of Resources and Development noted that in all discussions with ALCOA since October 1947, when the company had first proposed Taiya, Canadian officials had always stressed that maximum benefits had to accrue to Canada from any diversion of Yukon waters to the United States. Furthermore, no agreement could ever be reached without the prior consent of the British Columbian government, which would not approve the Taiya proposal until ALCAN had firmly committed itself to build a large aluminum project in the province. Nevertheless, both governments had withdrawn from entry all lands likely to be inundated from raising water levels in the lakes in the Yukon Territory and British Columbia, and had allowed ALCOA to conduct exploratory surveys in the region. Furthermore, in 1949 the U.S. government had officially approached Ottawa and requested that the proposal be referred to the International Joint Commission. Canada had denied the request and had instead agreed to arrange informal discussions at the official level. These took place in November 1949. There, the U.S. representative again urged that the matter be referred to the International Joint Commission and was refused once again. The Dominion government suggested instead that exploratory field and economic surveys be undertaken at the departmental level in Ottawa and Washington, and this the Americans accepted. In fact, the U.S. federal government appointed Assistant Secretary of the Interior W. E. Warne and the Deputy Chief of the U.S. Army Corps of Engineers, Brigadier-General J. S. Bragdon, to represent Washington in these departmental discussions. Ottawa hesitated in appointing its representatives, despite repeated requests from the U.S. Embassy to do so without delay. Not until 5 April 1950, however, did the Canadian cabinet authorize its officials to participate in the proposed preliminary field and economic surveys for the diversion of Yukon River waters. It did so with the clear understanding that such an agreement involved no commitment for future action. The Department of Resources and Development thereupon appointed J. M. Wardle, the director of the Special Projects Branch, and Deputy Minister H. L. Keenleyside to represent Canada. The two sides met in New York on 20 April 1950 and discussed co-operative arrangements in carrying out the investigation relating to the Taiya proposal.⁴⁵

⁴⁵ Hugh L. Keenleyside, Memorandum for the Minister, "Proposed Yukon Water Diversion," 29 March 1950, R. A. Gibson to J. E. Gibben, 12 April 1950, NAC. Robertson to R. H. Winters, 6 April 1950, H. L. Keenleyside to Acting Under-Secretary of State for External Affairs, 7 April 1950, int.-117, file 332-1, pt. 3, Vol. 1302, RG 85, NAC.

By the middle of April 1950, newspapers in British Columbia and Alaska had picked up the aluminum and hydropower stories, reporting that the provincial government might favour the diversion of water to Alaska for the Taiya project if the U.S. government dropped the two cents a pound tariff on imported aluminum ingots. This would allow ALCAN to construct a reduction plant at Kitimat, some 400 miles up the coast from Vancouver, to compete in the American aluminum market on an even basis.⁴⁶

Representatives of the two nations met on 20 April in New York and agreed to undertake a series of investigations which included hydro-electric power features involving all of the drainage area that contributed to the flow at Miles Canyon, navigational studies of the Yukon River below Miles Canyon, hydrology, geology, power market, and economic studies throughout the project area; and a careful surface geology, including possibly some seismic tests of the Miles Canyon site, the area around the tunnel including penstock, substructure of power plant and the interconnecting lake region. The cost of these surveys was not to exceed \$300,000 and was to be split equally between Canada and the United States. At the end of the reconnaissance field studies, the investigators were to prepare an interim report. On 1 May 1950, ALCOA applied for a one-year extension of its survey permit of 10 June 1949, but was denied on the grounds that since the governments involved now were to carry out the surveys in the same area, this would merely duplicate the efforts.⁴⁷

The joint economic committee toured the Yukon territory in August 1950. It consisted of three representatives from Ottawa, one from the B.C. government, and four from the U.S. federal government. The party flew to Juneau and Haines from Seattle, drove seventy miles up the Haines cut-off, inspected possible industrial sites in the vicinity and also looked at the large magnetite deposits at Klukwan which, if utilized, would use electric power. Back in Skagway, the men drove to Dyea and looked at possible industrial sites. From Skagway, the party took the White Pass & Yukon Railway to Whitehorse, inspected the Dominion Agricultural Experimental Substation at Pine Creek on the Alaska Highway, and then drove sixty miles down the Haines cut-off. Next the party looked at the Whitehorse Rapids and the proposed dam site at Miles Canyon. Dawson, the centre

⁴⁶ Unidentified newspaper clippings, April 1950, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

⁴⁷ Confidential Memo, "Economic Study of the Yukon River Diversion," 30 May 1950; R. A. Gibson to Norman Marr, 7 July 1950; Stuart Thom to Norman Marr, 1 May 1950, Norman Marr to Stuart Thom, 15 May 1950, int.-117, file 332-1, pt. 3, vol. 1302, RG 85, NAC.

of the famous 1896 gold discovery in the Klondike, was next on the itinerary. The plane carried the party low over Five Finger and Rink Rapids, two potential power sites on the Yukon River. In Dawson the Yukon Consolidated Gold Corporation conducted a tour of its properties including its largest gold dredge. The party also visited the United Keno Hill Mines, producing large amounts of silver and lead. The last stop was Atlin in British Columbia. Throughout the tour, which began on 8 August in Seattle and ended in Atlin, B.C. on 20 August, members of the party talked with the leading citizens, entrepreneurs and government officials of the localities visited in order to gain an understanding of the economic problems and prospects and determine how the Taiya project might impact the region. The field investigations ended in the fall of 1950, but no report was issued because in April 1951 the Canadian government cancelled the agreement, stating that it wished to explore the possibility of using the waters entirely within its country. An interior official recalled that the Canadian government "had never been enthusiastic about the Taiya Project and had agreed with some reluctance to the joint survey," and that the Americans had failed to present a convincing case demonstrating the advantages of the development to Canada.⁴⁸ Prospects for Taiya did not look bright.

In the meantime, the Alaska Development Board, a territorial agency created to help find ways to diversify the territory's economy, had become peripherally involved in the Taiya project as early as 1949 through its occasional work with the small staff of the U.S. Bureau of Reclamation located in Juneau. George Sundborg, the general manager of the ADB, became aware of the ALCOA proposal one day in the summer of 1951 when territorial Governor Ernest Gruening called him to his office in the capitol building. There the governor introduced him to "a patrician looking gentleman in the uniform of a general of the Pennsylvania National Guard." It was Richard King Mellon, who, Sundborg assumed, probably was a "poor relation of the family to which Andrew Mellon, Secretary of the Treasury in the Harding, Coolidge and Hoover administrations, belonged." Sundborg was only half right as he discovered a few weeks later when he saw Mellon's picture on the cover of *Time* magazine. The cover story revealed that Richard K. Mellon not only was the head of the family and the Mellon Bank, but he also had a substantial stake in a half a dozen

⁴⁸ Memorandum for Mr. J. M. Wardle, "Yukon River Power Diversion," 22 September 1950, int.-117, file 332-1, pt. 3, Vol. 1302, RG 85, NAC; Lawrence N. Stevens to Alfred C. Wolf, 9 September 1952, Records of the Field Committee, Taiya Project, RG 48, NA.

of the largest manufacturing and refining companies in the country. *Time* also credited him for spirited public leadership in the successful effort to clean up Pittsburgh and rid it of smog and grime.⁴⁹

Mellon had stopped in Juneau on his way to Skagway and the headwaters of the Yukon River where ALCOA proposed to develop the Taiya project. Mellon told the two men that he wore his uniform in order to impress the Canadians and gain their co-operation in the proposal. The Pennsylvania National Guard had helped by assigning him to make a reconnaissance of the area for a two-week period, which satisfied his obligation for active duty. Gruening told Sundborg to accompany Mellon to Skagway, where a Territorial Patrol officer met them. The officer drove the two men over a recently completed rough road to the ghost town of Dyea in the Taiya Valley. Here the aluminum plant would be built, Mellon informed Sundborg. The next day the men went to Haines and drove to Haines Junction and eastward to Whitehorse, Y.T. on the Alaska Highway. They looked over the Miles Canyon dam site a few miles above town, and the next day went to Atlin in British Columbia and spent the day looking at the river and lakes which would contribute water to the proposed diversion for the Taiya project. For Mellon it was not only a business trip but a return to a part of the world where he had gone on a big-game hunting expedition many years earlier. Doubling back, Mellon and Sundborg drove to Burwash landing and visited the very old widow of Jean Jacquot, the fabled pioneer guide who had led Mellon's party of hunters.⁵⁰

Sundborg and Mellon became friends, and the latter invited him to attend a high-level conference of ALCOA officials and financiers on 8 April 1952 to help bring about the project. The corporate officers and financiers told him that the company had decided, after much preparatory planning, to develop Taiya. Several obstacles needed to be overcome, but financing was not one of them since Mellon had lined up the Kennecott Copper Corporation and Olin Metals as participants. ALCOA senior vice-president I. W. Wilson told Sundborg that he was convinced that the aluminum market would increase significantly in the near future and that he was not worried about ALCAN's Kitimat plant or Canada's desire to sell 300 million pounds of aluminum to the United States because that country normally enjoyed about 10 per cent of U.S. sales anyway. He predicted that total U.S. capacity, including current expansion plans, plus Taiya, would result in a production of about three billion pounds annually. ALCAN, however, should not be handed the U.S. market through a long-

⁴⁹ George Sundborg to author, 4 December 1989.

⁵⁰ Ibid.

term, large purchase agreement such as the U.S. Secretary of Commerce advocated. Instead, it should be made to scramble for customers just as domestic producers were forced to do. It also became clear to Sundborg that ALCOA and ALCAN, "no matter how closely allied they may have been in the past, are now no-holds barred competitors and enemies." If Taiya could be developed, ALCOA would once again provide 50 per cent of the U.S. aluminum consumption, a position it held when the federal courts tentatively gave it a "clean bill of health at the end of the long monopoly prosecution."⁵¹

Conferees told Sundborg in strictest confidence that the Taiya project could be increased threefold in the future at relatively low cost. This would be accomplished by building a dam at Hootalinqua, an ancient Indian fishing site at the junction of the Teslin and Yukon Rivers, thereby adding the Teslin drainage to the lakes system. Such a plan would flood the present site of Whitehorse and require moving it to the plateau occupied by the airport. ALCOA officials considered "this . . . a small matter in comparison with the benefits which would result." If this plan became known, however, company officials warned, "it would alarm everybody, including particularly the Canadians and all of ALCOA's competitors and their friends in Washington. . . ." The company, therefore, merely proposed a two-stage development producing 500 million pounds of aluminum annually. All phases of the development, however, were to be constructed "as to leave room for the terrific 1.5 billion pound development of the future. If and when that was completed, Alaska would be producing three-eighths of all aluminum in the U.S. . . ."⁵²

A number of political problems remained, and with these ALCOA needed Alaskan help, and it wanted the ADB to "carry the ball." The first of these was the necessity of selling the development generally to official Washington as an Alaskan project. This had to be accomplished without emphasis on ALCOA, for the company was "a target for too many people." ALCOA wanted to get the Secretaries of Interior and Defence, if possible the President, friendly Congressmen and Senators and Samuel W. Anderson, the deputy administrator for aluminum for the Defense Production Administration, "to look with favor on Taiya, in principle, without any talk about what companies might put up the money." ALCOA urged that the project be presented "as a large and economically sound

⁵¹ George Sundborg to Delegate E. L. Bartlett, 9 April 1952, Ernest Gruening Papers, Governor's Alaska File, 1948-53, Box 1, Folder ALCOA, University of Alaska Fairbanks Archives.

⁵² Ibid.

hydroelectric development in . . . Alaska which everybody wants to develop. . . ."⁵³

Secondly, the U.S. State Department had to be convinced that "we trade the Canadians out of a water right to Taiya." It would be useless to just ask the Canadians to let the U.S. divert their water to Alaska to supply power for industries operating wholly on American territory. Canada would not do that, particularly now that it wanted to protect Kitimat's competitive position. "So we should get the State Department to insist, as a quid pro quo [for] some of the many favors Canada is continually asking of us, to guarantee to permit use of the water necessary for Taiya on terms no less favorable than those under which ALCAN uses water for Kitimat." Such an agreement also needed to be binding on the Province of British Columbia since part of the needed water was there as well as in the Yukon Territory. In short, it was urgent to get the State Department working on this problem, particularly since ALCAN was certain "to exert all the influence it can on Canadian officials to drag their feet on this." Under no circumstances, however, should a promise to reduce aluminum tariffs be traded for the water rights. For if that was done, "the reason for building big production facilities in Alaska would disappear."⁵⁴

The third problem was to transfer to ALCOA land needed for power plants, aluminum manufacturing facilities, a townsite, and docks. At the request of Governor Gruening, the U.S. Geological Survey had withdrawn the area under a power site classification in April 1948 in order to prevent homesteading by speculators. The fourth and final problem involved licensing from the Federal Power Commission. That agency required that at the end of the fifty-year maximum permit period the government be allowed to take over the plant and sell the power thereafter to users at the market rate. There would be no yardstick for determining this rate since Taiya energy would not have been sold since there had been only one customer. This, of course, would place ALCOA completely at the mercy of the FPC in fifty years, a period too short, the company believed, to wholly amortize the enormous development costs.⁵⁵

The Alaska Development Board's George Sundborg then proposed a possible grand solution to problems three and four. He suggested that the Alaska statehood bill, then under consideration, provided a perfect means for conveying the needed land to ALCOA. Alaska could choose, as a part of its land entitlement "the few thousand critical acres in the Taiya Valley"

⁵³ Ibid.

⁵⁴ Ibid.

⁵⁵ Ibid.

and then sell the land to ALCOA. This solution would also take care of the FPC problem since the whole project would be on state land using Canadian water exclusively. Sundborg anticipated a couple of minor difficulties. First, the needed land had been withdrawn and therefore presumably could not be chosen by the state as a part of its entitlement. To overcome this, the Department of the Interior should restore the parcel to the public domain "one minute before its selection by the State." This course of action required Interior's co-operation. The other problem involved language in the Senate statehood measure preventing Alaska from selecting its land entitlement until five years after admission. It needed to be changed to allow the state to immediately select about five million acres. There was still another way to overcome the difficulties, Sundborg observed. The territory "already has available an unutilized right to select quite a chunk of land granted for support of the University. The land should be grabbed." The question remaining was whether land selected under the university grant could be sold or made available to a private company. If so, would it cease to be federal land "for purposes of clearing the FPC hurdle"? Sundborg worried that Interior might not want to release the power withdrawal if it meant eliminating FPC control. In any event, Sundborg's ALCOA hosts were enchanted with the proposed solution, and became sudden converts in supporting Alaska's quest for statehood. In fact, Sundborg reported, "they now believe statehood to be a prime corporation objective and say they can surely bring a few Senators into line." The "ALCOAns," as he called them, recognized "that it would be dynamite for them or anyone to explain their motives, so they will work unofficially and discreetly." Nevertheless, the company intended "to proceed in its manifold subtle ways at once to get statehood votes." Company officials also had discussed local and territorial taxation with Sundborg and expressed the hope that fairness would prevail. The general manager shared the hope, and privately stated that he was "a little dismayed to contemplate . . . the certain difficulties of getting the people of Alaska, the Legislature and even such excellent folks as the members of my Board to show the necessary understanding and forbearance to make it possible for all this to happen."⁵⁶

After the conference, Sundborg went to the nation's capital, and together with Alaska's delegate to Congress, E. L. "Bob" Bartlett, visited a number of government officials. Secretary Chapman appeared "cordial to the whole development." The secretary indicated that he would try to persuade the state department to seek water rights from the Canadians in future economic negotiations, making Taiya possible. Chapman thought

⁵⁶ Ibid.

that the Taiya Valley land acquisition posed no problem, since Congress could pass legislation authorizing him to dispose of this land for an industrial development, or else he would remove the power site withdrawal at the appropriate moment.⁵⁷

The two men also saw Anderson, the deputy administrator for aluminum of the DPA, and he also seemed to be favourably disposed toward the proposed development. He predicted that within fifty years none of the contiguous forty-eight states would produce any aluminum, but instead all of it would come from large, low-cost projects like Kitimat and Taiya. He estimated that by 1957 additional capacity or imports from Canada or both would be needed to satisfy U.S. demand. In fact, Anderson had suggested that the U.S. admit 300,000 tons of Canadian aluminum annually, with the federal government guaranteeing to purchase 60 per cent of this amount, or 180,000 tons. The deputy administrator had solicited American industry proposals for the expansion of aluminum production, and stated that ALCOA had responded immediately with the proposal to build Taiya. Anderson anticipated proposals for expanded production from other companies, and opined that unless these were forthcoming, ALCOA would probably face troubles from the Justice Department over Taiya because of the dominance it would give the company in the industry. He also warned that Canadian officials had pointed out that the government of British Columbia would oppose any diversion of the headwaters of the Yukon River.⁵⁸

A week later, on 16 April, Sundborg was back in Pittsburgh reporting to ALCOA on his Washington visit. The company's senior Vice President, I. W. Wilson, wondered aloud whether or not the time had come to propose Taiya directly to Anderson since ALCOA did not want to miss out when decisions for increasing production capacities were made. He hesitated to do this, however, because he knew Anderson to be a "rammer" who, when he gets hold of an idea, attempts to push it right through" and perhaps now was not a good time to do so until after statehood had been achieved and the land acquisition matter settled. Also, perhaps some further work on water rights with Canadian officials both in Ottawa and Victoria, B.C., needed to be done. Other uncertainties remained. ALCOA opposed any U.S.-Canada aluminum purchase agreement. Wilson was par-

⁵⁷ Sundborg to Governor Ernest Gruening, 17 April 1952, Ernest Gruening Papers, Governor's Alaska File, 1948-53, Box 1, Folder ALCOA, University of Alaska Fairbanks Archives.

⁵⁸ Ibid.

ticularly fearful that if Anderson offered the Canadians such an agreement in exchange for Taiya water rights and then was unable to deliver "as Wilson thinks he will be," then the U.S. would find itself "in an exceedingly poor trading position" for obtaining the water rights. Furthermore, the company had no faith in the abilities of the State Department to obtain the water rights in negotiations.⁵⁹

Getting the President "really interested" in Taiya also was a problem. Although Harry S. Truman had expressed some interest at one time, he needed to be completely won over. Sundborg thought that Truman should be sold on the idea that winning statehood for Alaska and getting Taiya built would "really be a great accomplishment for this administration" and one that would be remembered forever. In any event, Sundborg observed, "we all have it within our hands, if we can work together properly, to strike the greatest single blow ever for Alaska's future."⁶⁰

Sundborg still was bothered by the problems he envisioned in the land acquisition process. ALCOA estimated that it needed 16,000 acres for the project, a strip of land one mile wide and fifteen miles long for the tunnels, and all of the valley below the lower powerhouse, roughly one mile wide and five miles long. The company wanted to protect its ability to triple the project size. Vice President Wilson had stated that ALCOA probably would not build the project unless it was able to acquire the needed land in fee simple title, but left the door open for alternative methods of acquisition.⁶¹

Sundborg thought of still another method of enabling ALCOA to acquire the needed land. In 1929 Congress had passed legislation permitting the University of Alaska to choose 100,000 acres from the public domain. Research had shown that the selection right applied to acreage anywhere in the territory. Presumably, the university could select the land and sell it to ALCOA. There were several stumbling blocks, however, to this solution. A provision of general law stated that on areas released from withdrawals veterans of World War II had a sixty-day preference right in filing. The law was to expire automatically in 1954, but there was every reason to believe that it would be extended to provide the same privileges to veterans of the Korean war. Also, for land to be selected by the university it had to be surveyed, and this was not. Another provision in general law stated that at the completion of each survey, when the plat was placed on file, veterans

⁵⁹ Ibid.

⁶⁰ Ibid.

⁶¹ Ibid.

had a preference right of selection on the surveyed land. The demand for such acreage was so great in Alaska, however, that the university would never be able to exercise its right because veterans, and then settlers, would immediately file on surveyed lands. The only solution to the problem, Sundborg suggested, was to persuade Congress to pass corrective legislation permitting land conveyance to the university after a survey by metes and bounds only, and giving the institution a first right of selection on such lands.⁶²

Lee Muck, the director of the Division of Land Utilization in the Department of the Interior, was surprised that territorial officials and officers of ALCOA thought that there was a problem in acquiring land for the project. He pointed out that seventy-three square miles covering the area from the Canadian border to tidewater were withdrawn by a public land order on 13 January 1948 for purposes of classification, and subsequently designated a power site on 23 April 1948. "With the exception of . . . a few mining claims and a few native allotments, the area is entirely public domain," he pointed out. All ALCOA needed to do was to persuade the federal government to obtain the use of the required land. Acquiring the land, he pointed out, was a minor matter "when compared to the still unresolved question of the Canadian attitude towards the project" since it involved "the storage and use of Canadian waters." Previous negotiations between Interior and the Canadians, Muck concluded, had failed to secure that.⁶³

At the end of June, Governor Gruening asked John R. Steelman, President Truman's assistant, to bring the Taiya project to the chief executive's attention. Gruening considered the decisions to be made to enable the construction of Taiya the most important matter affecting the future of Alaska. "All other Alaskan matters that can be decided by the executive are of secondary importance to this one."⁶⁴ In the meantime, Delegate Bartlett had asked for the President's help on the project, and was perplexed by Truman's response, which was that Taiya should not be turned over to private interests. The President told Bartlett that he would see what could

⁶² Sundborg to Bartlett, 3 May 1952, Sundborg to James Growdon, 26 May 1952, Sundborg to Bartlett, 27 May 1952, Ernest Gruening Papers, Governor's Alaska File, 1948-53, Box 1, Folder ALCOA, University of Alaska Fairbanks Archives.

⁶³ Lee Muck to Joel Wolfsohn, 24 June 1952; Public Land Order No. 436, 13 January 1948; Power Site Classification No. 396, 23 April 1948, Ernest Gruening Papers, Governor's Alaska File, 1948-53, Box 1, Folder ALCOA, University of Alaska Fairbanks Archives.

⁶⁴ Gruening to John R. Steelman, 25 June 1952, Records of the Field Committee, Taiya Project, R.G. 48, N.A.

"be done to keep them [the power projects] in the public interest." Truman had completely misunderstood the delegate's request for help, Bartlett complained, "or perhaps someone from Interior has been giving him a line?"⁶⁵

On 21 August 1952, newspapers in Alaska reported that announcement would be made within days about a proposed huge power and aluminum project in the Skagway area. Repeated Associated Press inquiries to ALCOA brought "no comment" responses. When queried, the Defense Production Administration stated that the proposed ALCOA plant near Skagway was "strictly a paper project; that before any steps could be taken ALCOA would have to ask for and receive a certificate of necessity," and no such request had been made. Above all, the Canadian government would have to approve the project. The next day a newspaper reported that "Land Boom Hits Skagway; Huge Project Rumored. Property Sales Over 50,000; ALCOA Won't Talk." In the meantime, representatives of chambers of commerce from Alaska and the Pacific Northwest met for an All-Alaska Chamber of Commerce conference in Mt. McKinley National Park. Delegates discussed the rumours that representatives of ALCOA would attend the meeting and announce a major development for Skagway. Still, no ALCOA people had arrived at the park by 22 August. In the meantime, Alaskan newspapers reported that property values boomed in Skagway in response to the development rumours. The *Anchorage Daily Times* wrote that property prices had "risen sharply in the last 30 days after mysterious buyers appeared and were interested in purchasing or optioning almost everything in town." ALCOA, which held waterfront rights as well as property in Skagway since 1948, declined to confirm or deny reports that an announcement on the long-discussed project was imminent.⁶⁶

On 23 August, Leon E. Hickman, the vice-president and general counsel of ALCOA, addressed the delegates to the All-Alaska Chamber of Commerce. He told them that his company was "ready, without reservation, to proceed with the construction of a large aluminum-smelting project in Alaska, just as soon as the necessary land can be purchased and the required governmental approvals can be obtained." The project, to be constructed in the Taiya Valley near Skagway, was to cost \$400 million, take four years to complete, create about 4,000 jobs and require the construction

⁶⁵ Harry S. Truman to Bartlett, 27 June 1952, Bartlett to Gruening 1 July 1952, Ernest Gruening Papers, Box 1, Alaska Governor's File, 1948-53, University of Alaska Fairbanks Archives, Fairbanks, Alaska.

⁶⁶ Unidentified newspaper clippings, 21, 22 August 1952, Records of the Field Committee, Taiya Project, R. G. 48, N.A.

of a city for 20,000 inhabitants. The general counsel then outlined his company's plans in detail to his rapt audience.⁶⁷

Alaskan and national newspapers picked up the story, and *The New York Times* even ran a lengthy article together with a map showing the magnitude of the project. While euphoria reigned in Alaska, however, Canadian officials from Ottawa sounded a note of caution. ALCOA first had to obtain an agreement from the Dominion and British Columbia governments to divert the waters of the Yukon River. Secondly, the Dominion government undoubtedly would want assurances that the Yukon Territory's power and navigational interests were well protected before agreeing to the diversion. Thirdly, ALCOA had yet to apply to the Canadian governments in question for the necessary permits to divert the water. Fourthly, the Aluminum Company of Canada was building a \$550 million aluminum plant at Kitimat, B.C., and also was attempting to expand its markets in the United States. Taiya would therefore compete with Kitimat, although Canadian officials believed that this would be no real problem because worldwide aluminum demand promised to be strong for years to come.⁶⁸

Almost a couple of years earlier, on 3 January 1951, *The Ottawa Journal* had reported that "British Columbia started off 1951 with a bang — with an agreement with Aluminum Company of Canada that will lead eventually to a \$500,000,000 development in the northern BC wilderness." Lands Minister E. T. Kenney signed the agreement which the B.C. legislature to begin its session for 1951 in February had yet to approve. It covered water rights in the Tahtsa-Kemano watersheds of Tweedsmuir Park where ALCAN proposed to develop a 500,000 hp power plant on the Memano River as the first stage of a 1.5 million hp project. ALCAN's plans called for building a dam in the grand canyon of the Nechozo River, about 160 miles from the coast, backing up the waters in the Tahtsa-Kemano watersheds, and followed by the construction of a power plant.⁶⁹

In February 1951, Delegate Bartlett reported in his *Washington News Letter* that Charles E. Wilson, the defense mobilization director, had assured Congress that the government had no immediate plans in helping

⁶⁷ "A Collection of Notes and Comments about the Taiya Project," 1952, Records of the Field Committee, Taiya Project, R.G. 48, N.A.; *The Daily Alaska Empire*, 23 August 1952.

⁶⁸ Ibid.; *The New York Times*, 24 August 1952; *The Skagway Alaskan*, 25 August 1952; *The Evening Star* (Washington, D.C.), 25 August 1952; *The Daily Alaska Empire*, 26 August 1952; *The Wall Street Journal*, 1 September 1952; *Time*, 1 September 1952.

⁶⁹ *The Ottawa Journal*, 3 January 1951.

build new aluminum producing facilities in either Alaska or Canada. Wilson had testified before the House Judiciary Committee, chaired by Representative Emanuel Celler (D., N.Y.), which had investigated aluminum shortages. Celler's aim all along had been to block contemplated federal aid for ALCOA's planned Taiya project. Celler and his colleagues believed that any federal efforts to expand aluminum production should be aimed at encouraging new, independent domestic producers. Chairman Celler opposed business concentration and monopolies, and instead favoured competition in the marketplace. Bartlett, however, told his constituents that ALCOA had never asked for federal assistance and in all likelihood would not do so in the future.⁷⁰

On 20 July 1951, U.S. Secretary of the Interior Oscar Chapman had sent Congress a report with detailed suggestions for the development of Alaska's resources and the integration of the territory into the national economy. Long in preparation, the document called for the development of Alaska, the Yukon Territory, and northern British Columbia through a joint American-Canadian effort. Chapman quoted a recent Canadian survey which showed that the Yukon and northern B.C. could support a population of six million people, and the U.S. Bureau of Reclamation claimed that Alaska's rivers and streams could generate about 50 billion kwh of energy for industrial and economic development. Chapman stated that the northern regions of both countries undoubtedly would experience significant economic development in the next century. It was imperative, therefore, that the two nations co-operate fully "in exploring the economic possibilities of this vast region for full utilization of its natural wealth, the defenses of its shores and skies, and the welfare of the millions who will settle it" adding to the greatness of both nations. Chapman had submitted the report with President Truman's approval, but without specific recommendations for legislative or fiscal actions.⁷¹

On 23 July 1951, the Montreal *Daily Star* had reported that Secretary Chapman and W. Stuart Symington, the former secretary of the U.S. Air Force (1947-1950) and director of the Reconstruction Finance Corporation, disagreed sharply over the possibilities of joint Canadian-U.S. planning for the development of Alaska, the Yukon, and northern B.C. Symington opposed such development, claiming that it was strategically unsound because of threat of attack from the Soviet Union. Symington stated that the U.S. should not help develop foreign aluminum production capacity

⁷⁰ Delegate E. L. Bartlett's *Washington News-Letter*, 15 February 1951, E. L. Bartlett Papers, University of Alaska Fairbanks Archives, Fairbanks, Alaska.

⁷¹ *Ottawa Citizen*, 20 July 1951, Stafford *Beacon-Herald*, 21 July 1951.

"against the bitter protest of our own industry. . . ." ⁷² That statement did not make any sense at all, because ALCOA was an American company, not a foreign one.

By the fall of 1951, the Taiya proposal had been considerably muddied. Some members of Congress had become convinced that ALCOA should concentrate on the production of aluminum and leave the generation of electricity to others. In fact, Congress had charged both the U.S. Army Corps of Engineers and the Bureau of Reclamation with the task of developing the hydro-electric potential of the United States. As a result, a bitter rivalry had developed between these two agencies. C. K. LeCapelain of the Lands Division of Canada's Department of Resources and Development observed that this had created difficulties for the Canadian government as to whom to deal with, since both agencies felt it their responsibility to develop the Taiya project. LeCapelain referred to the now defunct international committee with its several subcommittees established in 1949 to survey the project, but he claimed that sometime in 1950 the Canadian government "began to get unsympathetic to this project" [Taiya], possibly because of American obstruction of the Kitimat proposal and the St. Lawrence International Waterways development. In fact, the Canadian government had informed the U.S. Ambassador on 31 March 1951 that it "could not take any further steps in a joint investigation of the Yukon River Power Diversion project "until the possibility of using these waters in Canada has been explored."⁷³

A year later, in the fall of 1952, ALCOA, as already stated, announced that it proposed to construct the Taiya project. The Canadian Broadcasting Corporation responded immediately, stating that Canadian opinion on the West Coast was "what about Kitimat?"

ALCAN already was well into the first phase of its \$600 million development and had 6,000 men working at various sites. One of the immediate questions was to what extent ALCOA's Alaska plant would cut into potential Kitimat sales. The company's reply had been that the world market for aluminum was growing fast enough to provide ready markets for both plants. ALCOA needed Canadian power to generate the 1.6 million hp it needed. The water came from the Yukon and British Columbia, "so deals will have to be made" with the federal government and British Columbia, and these "would have to be to the advantage of all concerned — the

⁷² Montreal *Daily Star*, 23 July 1951.

⁷³ C. K. LeCapelain to Sinclair, 14 September 1951, C. H. Herbert, Memorandum for the file, "Yukon River Power Diversion," 10 September 1953, int.-117, File 332-1, pt. 3, Vol. 1302, RG 85, NAC.

American and Canadian Governments, B.C., the Yukon and ALCOA." That was not going to be easy, for in addition Canadian forests, fishery, mining, and water power resources needed to be safeguarded. The CBC commentary concluded that if all of this could be accomplished, "then the north Pacific coast will soon enter a new era of industrialization." Dominion resources experts also added a note of caution, reiterating much of what the CBC already had broadcast. Above all, the company had yet to make a formal application to the Dominion government for permission to divert Yukon River waters. The U.S. federal government, in the meantime, pointed out that ALCOA had not yet officially applied for the approximately 20,000 acres of lands in the Taiya River Valley needed for the project. In fact, under existing laws the largest block of federal land that could be sold for a business site was 160 acres.⁷⁴

A month later Woodbury Willoughby, the economic counsellor in the U.S. Embassy, contacted C. H. Herbert, the chief of the economic division in the Northern Administration and Lands Branch, inquiring whether or not Canada had undertaken any further studies of the Yukon River Power Diversion project after it had cancelled the joint investigation in March 1951. If so, what had been learned about the project? Herbert told Willoughby that the studies had continued and that the results had been encouraging for developing power in Canada by diverting the head waters of the Yukon River into the Taku River, as well as developing industrial sites and a deep water harbour on the Taku. Herbert continued that the Taiya project stood no chance of approval "as long as there is any possibility that the world's aluminum productive capacity might outstrip the eventual demand. . . ." ALCAN, supported by the federal and B.C. governments, would certainly oppose any diversion scheme for U.S. aluminum production because if supply of aluminum outstripped demand, "the industry in the U.S. is likely to seek, and probably . . . achieve, an increase in the protective tariff," thereby severely impacting Canadian production.⁷⁵ Other bad news followed.

On 2 October 1952, *The Northern Miner* of Toronto, Canada, published a piece entitled "The Threat to Kitimat." The writer stated that many Canadians had been irked by ALCOA's assumption "that Canada would readily give up an important water flow to permit an American company" to compete directly with Kitimat, a project that had captured

⁷⁴ Cameron Stockard, CBC News Roundup, "Report on the Aluminum Company of America — or "Alcoa," 26 August 1952, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC; *The Ottawa Citizen*, 26 August 1952.

⁷⁵ C. H. Herbert, Memorandum for the file, "Yukon River Power Diversion," 10 September 1952, int.-117, file 332-1, pt. 3, Vol. 1302, RG 85, NAC.

the imagination of all Canadians. In short, "the more one looks at the American proposition, the less one warms up to it." Nevertheless, the U.S. Department of the Interior withdrew most of the remaining land surrounding Skagway on 22 October 1952. The approximately 7,400 acres together with the 1948 withdrawal meant that all the land west of the Skagway River and about 2.5 miles north of the city was closed to all forms of appropriation under the public land laws. This action, presumably, was to make it easier to give ALCOA access to the needed acreage.⁷⁶

On 4 November, ALCOA's Wilson told Robert H. Winters, the minister of the Dominion Department of Resources and Development, that his company was "anxious to work out with all the interested Canadian departments and agencies, both Dominion and Provincial, a mutually helpful and advantageous program and procedure for the generation of electric power" through the diversion of the headwaters of the Yukon River to Taiya Inlet in Alaska. A couple of weeks later T. Lindsley, the president of Quebec Metallurgical Industries, Ltd., a subsidiary of Ventures Limited, summarized for Winters the Alsek River Power Project — *Yukon and British Columbia* — his company had developed in collaboration with the federal and British Columbia governments some time earlier. Here was a Canadian company proposing to utilize Canadian waters in Canada, dooming ALCOA's plans. Water from a 36,000 square mile watershed, including the Lewes, Teslin, and Kluane Rivers was "to be converted in suitable successive stages to the Alsek River where a head of 1,800 ft. was available." This allowed for the annual production of approximately 5.2 million hp. It also wanted to use a part of the power in its electrometallurgical and electrochemical processes for the production of silicon, steel, and ferro-alloys. Other Canadian companies undoubtedly would also use this low-cost power and process the mineral resources of the Yukon and northern British Columbia, such as lead and zinc concentrates, nickel and copper, and iron. In addition, the timber resources in the region around the power site justified the establishment of a pulp and paper industry. Quebec Metallurgical Industries Ltd. had already launched surveys which were to take twelve months. Thereafter, it planned to submit a formal application to obtain a licence for the power rights. QMI Ltd. planned to use most of the headwaters of the Yukon River, albeit in a different location. As a result of this proposal and ALCAN's protest, Robert Winters informed ALCOA in early December that his department did not recommend that the federal government permit the diversion scheme because it was responsible for making certain that the maximum benefit from any power de-

⁷⁶ *The Northern Miner*, 2 October 1952; *The Daily Alaska Empire*, 31 October 1952.

velopment accrued to Canada. That was not the case under ALCOA's scheme.⁷⁷

ALCOA's president was naturally disappointed. He informed Minister Winters that if "economically feasible to utilize the water needed for the Taiya Project in an all-Canadian development that . . . would take precedence over the Taiya Project." Wilson also asked for a meeting so that the advantages of the Taiya project for Canada could be analyzed. In the meantime, ALCOA intended to obtain the necessary permits from the U.S. government for the project. Winters had no objection if ALCOA engineers made pertinent data available to the appropriate officials in the Water Resource Division, but reiterated that "I must again inform you that I cannot recommend the water diversion you are seeking."⁷⁸

In early January 1953, the *Engineering News-Record* reported that "Canada has slammed the door conclusively in the face of the Aluminum Company of America's plans for development of hydro power in Alaska" by invoking "a 1907 law forbidding diversion of waters for use outside the country without a license." (The Electricity and Fluid Exploration Act of 1907). It was rumoured that ALCOA executives, who had been negotiating privately with Canada, now wanted to enlist the aid of the U.S. State Department. The editor stated that ALCOA expressed optimism about its chances of gaining Canadian permission for the diversion, but observers in Ottawa saw no sign of any change in the government's attitude. In fact, in February, the Canadian federal government announced that Frobisher Ltd., a large Canadian exploration and development company, had been given a contract to survey the hydro-power potentials in certain lake and river basins in the Yukon Territory. The ultimate plan was to build a huge hydro-electric installation on the Yukon-British Columbia border furnishing power for smelting plants for the production of aluminum, magnesium, and various other metals.⁷⁹

By March, ALCOA had not requested State Department aid, but a month later the Kaiser Aluminum & Chemical Corporation of Spokane, Washington notified Interior that it intended to send one of its managers to Alaska "to look over the possibilities for hydroelectric sites adequate to

⁷⁷ I. W. Wilson to Robert H. Winters, 4 November 1952, T. Lindsley to R. H. Winters, 20 November 1952, R. E. Powell to R. H. Winters, 28 November 1952, R. H. Winters to I. W. Wilson, 5 December 1952, int.-40, 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

⁷⁸ I. W. Wilson to Robert H. Winters, 19 December 1952, Robert H. Winters to I. W. Wilson, 26 December 1952, int.-40, file 7031-37/A274, pt. 1, Acc. 84-85-1592, Vol. 45, RG 89, NAC.

⁷⁹ Excerpt from the *Engineering News-Record*, 15 January 1953, Records of the Field Committee, Taiya Project, R.G. 48, N.A.; *The New York Times*, 17 February 1953.

supply an aluminum plant somewhere in the Territory." The company intended to look at sites in the Juneau area, Copper, Susitna, and Yukon River basins, as well as at several other sites.⁸⁰

Many interested Alaskans still wondered why ALCOA had not submitted the necessary applications to the Canadian government. Terris Moore, the president of the University of Alaska and one well connected with the business establishment, remarked that ALCOA "felt it important not to negotiate privately with the Canadians in advance" because it had been criticized by the U.S. Department of Justice for co-operating too closely with the Aluminum Company of Canada (ALCAN) in the past. Any further impressions that this co-operation for increased aluminum production had continued, ALCOA feared, would merely have provided legal evidence against it in the anti-trust suit. In any event, Moore believed that the situation was stalemated, and that it would require active U.S. government intervention to reach some kind of an agreement.⁸¹ That did not happen, however, but government activity and speculation about the competing proposals continued.

In late 1953, federal Resources minister Jean Lesage reaffirmed that Ottawa would not permit the export of Canadian power. If, however, ALCOA built its plant in Canada and formed a Canadian subsidiary, the government would consider the proposal.⁸² In January 1954, ALCOA officials visited British Columbia Premier W. A. C. Bennett and lobbied him on the Taiya proposal, but he was noncommittal and merely observed that "we want to work out the best possible deal but we must see that the interests of British Columbia are protected."⁸³ In fact, Ottawa hydroelectric experts warned that Americans were desperate for Canadian water because thousands of fertile acres of land in the western United States were "threatened by falling water tables." Drill bits went down as much as 1,000 feet and often only found salt water. In short, there was a critical water shortage in the western United States and they predicted the strongest pressure from American power interests to get British Columbia to part with its power reserves along the border. The experts were fearful that water-wealthy British Columbia might learn too late the value of its water

⁸⁰ Lyle E. Graine to George W. Rogers, 6 March 1953, Records of the Field Committee, Taiya Project, R.G. 48, N.A.; Jos. T. Flakne to Joseph Morgan, 27 April 1953, Norman L. Krey to Jos. T. Flakne, 19 June 1953, Central Files, OT-CCF, Alaska, Commerce & Industry-6, Aluminum Plant, R.G. 126, N.A.

⁸¹ Terris Moore to Samuel S. Ericsson, 12 October 1953, Central Files, OT-CCF, Alaska, Commerce & Industry-6, Aluminum Plant, R.G. 126, N.A.

⁸² *The Vancouver Sun*, 16 December 1953.

⁸³ *Ibid.*, 13 January 1954.

resources. They warned that the Americans were the toughest bargainers in the world, and when it came to talk about hydro-power, one could "forget all the after dinner speeches, all that hands across the border and hearts-and-flowers stuff." British Columbians needed to know the value of the hydro potential or else lose big to American interests.⁸⁴

In any event, Premier Bennett indicated that he was willing to seek the co-operation of Ottawa and the United States government in permitting ALCOA to develop the Taiya project — if it appeared more advantageous to British Columbia than Frobisher Ltd.'s proposal. To most observers, however, this seemed unlikely, because undoubtedly the United States would hike its 1.5 cent per pound tariff on imported aluminum, thereby protecting ALCOA's market and killing the export market of ALCAN in the United States.⁸⁵ In March, the *Victoria Daily Times* reported that "Industrial Giants in Water Rights Fight." It went on to say that industrial firms "were engulfed in a mighty tug-of-war for the rights to utilize the massive hydroelectric potential of British Columbia and the Yukon." Premier Bennett reported that this was the issue he had been discussing with ALCOA and Quebec Metallurgical Industries, a subsidiary of Frobisher Ltd. QMI had informed the premier that it planned to spend \$15 million in the initial development of a 100,000 horsepower hydro generating plant which could be expanded to utilize the five million horsepower available. British Columbia controlled more than half of the water rights involved with the federal government having authority over the rest. The paper wrote that QMI held the "inside track" with Ottawa because it planned to establish its metallurgical industry in Canada at Tulsequah at the head of Taku Inlet. While QMI had conducted surveys in the area, it had not yet applied for water rights, while ALCOA had not conducted any investigations to date. The paper speculated that British Columbia would probably accept either company's application with the caveat that it had to favour the development of the province. Rumour also had it that the provincial government would insist that whatever company received the water rights had to develop "the entire resources of the area . . . within a specified time."⁸⁶

A couple of months later, the *Victoria Daily Times* had formulated an editorial policy on the ALCOA-QMI contest to utilize the waters of the upper Yukon River. "No waterpower which can be economically used in Canada should be sold to any foreign nation" it declared. In fact, ALCOA

⁸⁴ Ibid., 22 January 1954.

⁸⁵ *The Vancouver News-Herald*, 25 January 1954.

⁸⁶ *Victoria Daily Times*, 31 January 1954.

had accepted this principle and declared that if Canada could find a better use for the Yukon's waters "then its application should properly be refused." Yet the editor did not reject the ALCOA proposal out of hand, but rather suggested that the two companies might be "able to come together in some form of partnership and joint use of the river." Unfortunately, however, neither the provincial nor the federal government had all the facts yet needed to frame a sound policy on the proposals.⁸⁷

The Vancouver Province echoed the sentiments of the Victoria paper, stating that it would be "little short of a crime to commit a vast block of Canadian power to an industry (ALCOA) which will bring little benefit to Canada," but it was equally stupid to "allow any company, Canadian or American, to tie up the power until it is ready to use it," since QMI intended to initially develop only 100,000 horsepower out of the five million horsepower available. In any event, even if the Alaska Panhandle robbed Canada "of practically all water frontage in the north," and thus of a tide-water site for industry, she had the power "that any great industry must have, and that is something to bargain with." The editor suggested that Canada might, through tough and shrewd bargaining, "buy or lease Skagway," or if not it, some other port.⁸⁸

At the end of May in a speech he made at Trail, British Columbia's Lands and Forests minister R. E. Sommers told his listeners that he expected "a large company to start on a northern hydroelectric and smelter development that will stagger the imagination." He apparently referred to QMI's \$700 million proposal to utilize Yukon power at Tulsequah Inlet. Sommers expected to meet with the firm's top officials at the end of June 1954 to complete negotiations, precluding the necessity of reaching an agreement with the United States for an Alaskan port.⁸⁹ In the meantime, Whitehorse boomed as representatives of leading Canadian and American mining and construction companies buzzed around on their surveying tours. Citizens of the town were convinced that there would be room for both Canadian and United States enterprises powered by Yukon water. Thus, part of the water would be diverted to the Alaskan coast near Skagway and the rest to Tulsequah in British Columbia. Many citizens seemed to believe that the political differences could be resolved without much trouble, and that ALCOA and QMI were devising a plan to work together.⁹⁰

⁸⁷ Ibid., 18 March, 1954.

⁸⁸ *The Vancouver Province*, 20 May 1954.

⁸⁹ *Victoria Daily Times*, 31 May 1954.

⁹⁰ *The Daily Colonist* (Victoria), 13 June 1954.

On 27 July 1954, ALCOA executives met with the British Columbia cabinet, one day after Frobisher Ltd., the parent company of QMI, had applied for a water rights licence for the provincial section of the Yukon River. The press speculated that ALCOA and QMI negotiated for "a Deal" that would allow the latter to sell power to the former.⁹¹ By early August, the provincial government had granted the conditional water licence to the parent company of QMI. The licence holders agreed to post a substantial bond for an envisioned eight-year first-stage development. This cleared the way for QMI to make a similar application to Ottawa.⁹² A couple of days later, ALCOA executives in Philadelphia, Pennsylvania announced the company's decision to "fight the British Columbia government's decision to give the water power rights of northwestern British Columbia to Frobisher Ltd." on the grounds that the Canadian company lacked the necessary financing to proceed with its plans. Company officials, however, revealed no action they would take.⁹³

A few years later, in the spring of 1956, Delegate Bartlett told U.S. Secretary of State John Foster Dulles that the Honourable J. A. Simmons, a Member of Parliament for the Yukon Territory, had proposed that there be negotiations with the United States for providing an access corridor to the sea through southeast Alaska for the Yukon Territory and British Columbia. The delegate proposed that the U.S. grant such a corridor leading to a suitable harbour in the northern Panhandle under a long-term lease arrangement in return for a joint development of the hydro-electric potential of the upper Yukon River, namely the Taiya Project. It is unknown how the Secretary responded to Bartlett's proposal. Alaska's Governor B. Frank Heintzleman, asked by the Department of the Interior for his opinion, stated that he did "not favor taking any action which could (and likely would) result in having Canada develop one or more cities within the exterior boundaries of Alaska in the near or distant future."⁹⁴

By 1957, ALCOA had abandoned all plans for the Taiya project. The company's Leon E. Hickman explained to Governor Heintzleman that although ALCOA for several years had been ready to proceed with the Taiya development and build an aluminum smelter "that would have been second to none," that no longer was true. Since 1952, the economic advantages of an aluminum smelter at Taiya had steadily dimin-

⁹¹ *The Vancouver Sun*, 28 July 1954.

⁹² *The Daily Colonist*, 3 August 1954.

⁹³ *The Vancouver Sun*, 5 August 1954.

⁹⁴ E. L. Bartlett to John Foster Dulles, 26 May 1956, B. Frank Heintzleman to Anthony T. Lausi, 27 June 1956, Central Files, OT-CCF, Alaska, Commerce & Industry-6, Aluminum Plant, R.G. 126, N.A.

ished. Now the company could no longer justify the project "even if all parties . . . cooperated fully. . . ." Several factors were responsible for this change. ALCOA already produced more aluminum on the west coast than the western markets could use. Freight rates had gone up steadily, and the increasing efficiency of the smelting process had resulted in lessening energy requirements per pound of aluminum. Therefore, freight costs loomed ever more importantly while electrical power costs had become less important. Furthermore, it now was cheaper to produce electricity from coal in the Ohio Valley. Building a smelter there had the great advantage that the aluminum pig produced would be close to its markets. Adding all these factors, ALCOA could not possibly smelt aluminum at Taiya "and get it to eastern or mid-western markets at a price even closely competitive with metal smelted in the Ohio Valley."⁹⁵ Taiya was dead.

A number of factors contributed to Taiya's demise. Clearly, the major obstacle was the resistance of the Dominion and British Columbia governments to aid an American economic competitor. Furthermore, neither government could agree on what rents should be charged the Americans for the use of Canadian waters or on how these were to be divided. Both governments proposed schemes financially advantageous to one side or another, but did not settle on a particular split. The bulk of the Yukon River headwaters originated in British Columbia, but there were no suitable power heads in that part of the province to use the water efficiently. Above all, the Dominion government soon decided that Canadian waters should be used exclusively to benefit the Canadian economy. Another problem involved ALCOA itself. In 1937, President Franklin D. Roosevelt had appointed the Temporary National Economic Committee to study economic concentration. It had just begun to report its findings when World War II broke out. Concerning aluminum, I noted that ALCOA completely dominated the industry. Thus, in 1940, the federal government found itself totally dependent on the sole private supplier of desperately needed aluminum for aircraft production. This placed the Roosevelt administration in a precarious condition, because on the one hand the country needed vast aluminum supplies; and on the other critics of ALCOA maintained that the war provided an excellent opportunity to break the company's monopoly. The federal government could create competition not only by building its own plants but also by financing new private operators in the industry, which would also contribute to further economic di-

⁹⁵ Leon E. Hickman to B. Frank Heintzleman, 22 February 1957, Central Files, OT-CCF, Alaska, Commerce & Industry-6, Aluminum Plant, R.G. 126, N.A.

versification in the West. Roosevelt largely followed the policy suggested by the critics, but balanced it carefully so as not to antagonize ALCOA. The administration did little to undermine the company's dominant position in the industry, but stimulated an extensive expansion of aluminum production by building a dozen new plants, half of which were located in the west.⁹⁶

In the late 1930s the New Deal inaugurated its anti-trust campaign under Assistant Attorney General Thurman Arnold. In 1937, the Department of Justice charged ALCOA with violation of the Sherman Anti-Trust Act and initiated proceedings to dissolve the company, claiming that it exercised absolute control in the industry, controlled prices, made unreasonable profits, and actually limited the use of aluminum in the United States. ALCOA denied that it held a monopoly because its customers could readily find aluminum substitutes. Court proceedings began in the District Court for the Southern District of New York and argument continued for the next four years. This resulted in a lengthy trial, which ended on 12 March 1941. It produced 58,000 pages of transcripts. Judge Francis Caffey rejected the government's position, and the Department of Justice thereupon filed an appeal to the U.S. Supreme Court on 14 September 1942.⁹⁷

By this time, the United States was involved in war, and the major concern of federal agencies like the War Production Board and the Metals Reserve Corporation was to boost aluminum production rather than to prosecute ALCOA. On 9 June 1944, Congress passed special legislation to confer jurisdiction on a special appeals court to hear the case. In January 1945, the Department of Justice cautiously proceeded with its action, stating that it would not affect maximum war production. The special court announced its decision on 12 March 1945, finding ALCOA a monopoly but declaring that the war's economic changes, particularly the nine new federally financed aluminum plants on the Pacific Coast operated by ALCOA, Reynolds Aluminum, and Henry J. Kaiser, had lessened ALCOA's control.⁹⁸

The court refused to recommend ALCOA's dissolution, noting that it would be a disservice to break up a company which for so long had demonstrated its efficiency. It instructed the District Court for the Southern District of New York to decide in the future whether or not dissolution

⁹⁶ Gerald D. Nash, *World War II & The West: Reshaping The Economy* (Lincoln and London: University of Nebraska Press, 1990), 91-92.

⁹⁷ Ibid., 92-93.

⁹⁸ Ibid., 93; Gerald D. Nash, *The American West Transformed: The Impact of the Second World War* (Lincoln and London: University of Nebraska Press, 1990), 29.

would be necessary. The court's finding, however, did not appease ALCOA critics. They rallied behind Secretary of the Interior Harold L. Ickes, Senators Harry S. Truman and James E. Murray, administrator of the Bonneville Power facilities Paul River, and the congressional delegations from the Pacific Northwest, all of whom fought hard to break ALCOA's hold.

The critics were not wholly successful, although in the postwar disposal of federal aluminum plants, companies such as Reynolds Metals and Kaiser Aluminum captured over one-half of the market, although ALCOA maintained its primary position nationally.⁹⁹ After its experiences in the war and postwar years, and with the tangible possibility that the government might initiate anti-trust proceedings once again, ALCOA naturally was reluctant to recruit the aid of Congress for the purposes of negotiation with the Canadian governments for Taiya.

ALCAN fared very differently with the American federal government. At the urging of the War Department, Jesse Jones of the Reconstruction Finance Corporation began investigating the possibilities of procuring aluminum from ALCAN's huge facility at Shipshaw in the Canadian province of Quebec. In 1941, as the aluminum shortage worsened, Jones instructed the Metals Reserve Corporation, a subsidiary of the RFC, to advance ALCAN \$93 million on future aluminum deliveries. Of this amount, \$68.5 million was an interest-free loan, the rest to be paid off by deducting five cents per pound from the aluminum ALCAN delivered to the United States. In addition, the Metals Reserve Corporation established a \$34,250,000 line of credit for ALCAN to be made available as deliveries came in. ALCAN sold the metal to the United States at slightly above market prices. At the same time, the Canadian government freed ALCAN from most income and excess-profits taxes and also permitted it an accelerated depreciation for the new facilities it built in order to fill American orders. In short, ALCAN received a much more favourable deal than American producers were able to obtain. In fact, through the Shipshaw contracts the American government financed a vast expansion of Canadian production certain to curtail growth of the American aluminum industry on the Pacific coast in the postwar era. Despite vociferous protests from politicians and industrial leaders in the west, the War Production Board, adhering to prior contractual commitments, signed additional agreements with ALCAN's Shipshaw facility in 1943 and 1944 which extended to 1995. In hindsight, however, the Shipshaw contracts were a wartime necessity which im-

⁹⁹ Nash, *World War II & The West*, 93, 121.

mensely strengthened ALCAN but also weakened ALCOA's American competitors.¹⁰⁰

ALCAN clearly operated from a position of strength. It had built the huge Kitimat complex in northern British Columbia in the early 1950s, and it actively, and successfully, lobbied both the Dominion and British Columbia governments to protect its investment from ALCOA competition.

Finally, there was also the Canadian government's intent on reasserting its sovereignty in the north which, it felt, had been lost to the United States. During the war, U.S. armed forces had arrived in great numbers in the Canadian north. The strategic importance of that part of the world had been realized after the Japanese occupied Kiska and Attu in the Aleutian Islands in 1942. The U.S. Army built the Alaska-Canada Military Highway (ALCAN) through British Columbia and the Yukon Territory to Alaska, and also the Canol pipeline and road from Norman Wells on the Mackenzie River in the Northwest Territories to Whitehorse in the Yukon Territory. Many other military installations had been established throughout the Canadian and American north. Ottawa, no doubt, now viewed American efforts in the Canadian north with a jaundiced eye. In any event, ALCOA never built Taiya; nor did Canadian plans to tap the headwaters of the Yukon River ever come to fruition.

¹⁰⁰ Ibid., 103-114.