

*Prepared by War Department
as proposed substitute
for Committee draft*

In April 1942, the War Department ordered work commenced on the "Canol Project".

Description of the Project.

This project, including later additions, contemplated:

- a. Drilling and exploring for oil at and near Norman Wells in northwestern Canada.
- b. Construction of a four inch crude oil pipeline, with a capacity of 3000 barrels daily, running from Norman Wells oil field 600 miles to Whitehorse, to serve the refinery.
- c. Dismantling a refinery in the United States, transportation of the refinery to Whitehorse, and re-erection of the refinery at Whitehorse, equipped to process 3000 barrels of crude oil per day and to produce aviation and motor gasoline and other products.
- d. Construction of oil products distribution pipelines, running from Skagway, Alaska, at the head of the Inland Passage, to Whitehorse and thence along the Alaska Highway from Whitehorse to Fairbanks and Whitehorse to Watson Lake, together with the requisite oil storage facilities.
- e. Setting up a system of roads and waterways from McMurray, the railroad, to Norman Wells (utilizing Great Slave Lake and the Mackenzie River), with necessary accessory roads, for the transportation of men, equipment and materials required for operations in the oil fields and construction of the eastern portions of the Norman Wells - Whitehorse pipeline.

The completed project, as now planned, will cost 134,000,000.

The project was not conceived as a commercial venture. The War Department made no study of its ostensible commercial value. The War Department deemed it to be solely a military measure to supply petroleum and petroleum products to airfields along the Alaska Highway and to army transport vehicles on the Highway. The Committee recognizes that the project must be viewed solely as one initiated for strategic and logistic reasons and that it cannot properly be criticised unless the decision to inaugurate it, and the steps taken to complete it, evidenced faulty military judgment.

Further, the Committee recognizes that any conclusions with respect to the determination to undertake the project, and the decisions from time to time, to continue construction, must be made in the light of conditions as they existed at the time without taking advantage of hindsight.

Products Distribution Lines.

The products distribution portions of the project are conceded to be of advantage to military operations. No criticism has been made with respect to these portions. They will cost about 34,000,000. The products distribution lines and the appurtenant storage facilities are now substantially, and within a few months will be entirely, completed, thus affording means for transportation of petroleum products from Skagway to Whitehorse, and vice versa, according to whether they are shipped in by sea or produced at the Whitehorse refinery, as well as a means of distributing aviation and motor gasoline down the Alaska Highway from Whitehorse to Watson Lake and up the Highway to Fairbanks. The line from Skagway has been in successful operation since the winter of 1943.

Cost and Present Status of Remaining Portions of the Projects.

The cost of the remainder of the project, as now being carried to completion, will be about 100,000,000. Of this amount totals of approximately (i) 17,000,000 will be expended in exploration and drilling for oil at or near Norman Wells, including, if continued, exploration outside the original Norman field, (ii) 31,000,000 for the construction of the crude oil pipeline from the oil fields to the refinery, (iii) 20,000,000 for the refinery, and (iv) 26,000,000 for the construction of the transportation system and facilities from McMurray to Norman Wells.

Drilling and exploration have now been carried to a point where a total field production of more than 3,000 barrels of oil per day is assured, with a reserve pool of between 50 and 100 million barrels in the Norman field. Likewise, exploration in the vicinity of that field, gives geological and geophysical indications of oil reserves in adjacent territory as large or larger than that in the Norman field.

The crude oil pipeline from the field to the refinery has been substantially completed and the eastern end of the line is now being filled. It is estimated that the entire line will be completed and filled and oil can be flowing from the field into Whitehorse by March.

The refinery will be ready for operation, as to the first stage for motor fuel by February, and as to the second stage for aviation gasoline by May of 1944.

The waterways transportation system has been completed and in operation for use as required.

Committee's Investigation.

The Canol project, exclusive of the products distribution system, has been criticised by certain governmental agencies. It has cost about \$77,000,000 to December ~~1~~. Some time ago the Committee determined to investigate Canol. It has made a thorough study of the project and has had made available to it information in the possession of the War Department, other governmental agencies and other persons having knowledge of the project. Hearings were held at Whitehorse in September 1943, and thereafter in Washington. The Committee determined to make no report until it had had an opportunity to hear General Somervell, who returned to the United States toward the middle of December, 1943, and appeared before the Committee on December 20.

The Committee's investigation discloses that there are three main questions which must be answered:

- a. Was the decision to initiate the Canol Project a proper one?
- b. Should the project, to the extent of developing, producing, transporting and refining 3,000 barrels of crude oil a day (the present planned capacity of the pipeline and refinery), be completed?
- c. Should the exploration and development be continued and the crude oil pipeline and the refinery be expanded to the extent required to transport and process 20,000 barrels of oil per day?

The Committee is satisfied that the portions of the project comprising the products distribution lines and appurtenant storage facilities should be completed as now planned. The remainder of this report is accordingly limited to consideration of the other parts of the project.

Military Situation in April, 1942.

The initiation of the Canol Project was ordered by General Somervell on April 30, 1942. Any intelligent study of whether this decision should have been made must take account of conditions facing the country at that time. The Committee realizes that the Canol project, as well as many other operations, are subject to criticism after the fact and in the light of events which occurred after the decision was made. The Committee has, however, examined the questions involved in the War Department's decision solely in the light of the facts as they were then known.

Canol was conceived as a military necessity. It was ordered for the purpose of supplying oil and oil products to the Alaska Highway from points as near as possible to the places they were required to be used. The War Department considered Canol on the same basis as it would consider building an airfield or any other essential war installation, with the additional fact in mind that oil, being the life blood of mechanized warfare, is of the very highest order of importance.

In December, 1941, our fleet, as an offensive weapon, virtually disappeared and was not to reappear for many months. Between Pearl Harbor and the end of April, 1942, we lost Guam, Wake and Manila. Singapore fell and Rangoon and Java were lost, along with all the oil fields of the East Indies. Bataan surrendered, primarily because we did not have the means to supply our troops there. The Japanese had won the battle of the Java Sea.

In the spring of 1942, the Germans intensified their submarine onslaught against shipping off the East Coast and in the Gulf and the Caribbean. Refineries at Aruba were shelled. Month by month sinkings of tankers in-

creased -- month by month they exceeded by large tonnages replacements from new construction. The losses became so heavy that tanker movements along the East Coast were stopped. All plans with respect to Caribbean shipping had to be recast, not only on account of the volume of sinkings in that area but also because of the shortage of warships required to protect convoys there.

Escort vessels to protect convoys sailing to supply the various fronts were utterly inadequate. The capacity of the ship-building industry was limited, and there was need for far more ships -- Naval vessels, landing craft, tankers, dry cargo ships, barges and tugs -- than could be produced. It appeared that a long period would elapse before we could make good our losses, much less build the constantly increasing tonnages required for the supply of our troops and those of our allies.

General Somervell conferred, during this period, with Admirals Land and Vickary of the Maritime Commission, and ultimately a shipbuilding program was outlined and discussed with the President. It was evident, however, that it would be impossible to produce the shipping the Army required, and that if sinkings continued at the then rate, we would have a continued net attrition.

At the same time, the Army was trying to find new sources of supply. General Somervell, until the beginning of March, Assistant Chief of Staff, G-4 (in charge of supply) and, after March 9, Commanding General of the Services of Supply, was the officer most familiar with the problems involved and was required to make the decisions designed to solve supply problems.

At the time, out of all major world petroleum reserves, it appeared that we could count only upon those in the United States and, assuming the submarine problem were solved, those of the Caribbean area. We were losing the Dutch East Indies. Rommel was in front of Tobruk and, if the Suez fell, Iraq and Iranian oil fields could no longer be relied upon.

Against this background of possible defeat for want of the wherewithal to transport supplies to battlefronts all over the world, the War Department concluded to embark on the Canol project. In any examination of the project this background - the possibility of losing the war before we had really begun to fight - must be kept in mind.

Determination to Build the Alaskan Highway

If the United States is to be defended against attack from the Pacific, Alaska must be defended also. The Army planned to defend Alaska primarily by use of air power. This required the ferrying of a constant stream of combat planes and bombers, and the air transportation of supplies, to our Alaskan installations. In addition, it was planned to fly airplanes to Fairbanks, to be there turned over to the Russians for use against Germany.

Planes required servicing en route; they needed gasoline, repairs and adjustments. It had become apparent, shortly after Pearl Harbor, that we would require intermediate airfields for this purpose. The airfields would have to be supplied with gasoline, spare parts and the like. These could be carried in to the fields by air only by allocating a large number of cargo

planes to make the deliveries. Four different routes for a highway were studied, and ultimately the route of the present Alaska Highway, running from Dawson Creek, northwest of Edmonton, Canada, to Fairbanks, Alaska, was determined upon. A chain of airfields already existed between these points and could be improved and enlarged. Further, flying conditions were more favorable along this route than other available ones. The decision to construct the Alaska Highway was made early in February, 1942, and that Highway, with accessory roads, has been completed and is in use.

The Highway is approximately 1600 miles long. Gasoline and other supplies cannot be furnished to the airfields along the route by motor trucks alone, except by use of more trucks than are available. The gasoline required to operate the supply trucks would use up so great a percentage of their carrying capacity as to make such a method of supply, along the entire length of the Highway, impractical.

Alaskan Oil Prospects.

It became obvious that it would be a great advantage to be able to supply the airfields along the Highway from nearby sources of oil. General Somervell had long been familiar with the possibilities of oil in Alaska. Although it has been known for many years that Alaska has oil possibilities, there has, up to the present time, been no development sufficient to prove those possibilities. A small production had been developed at one time, near Katalla, but was abandoned in 1933.

The chances of successful oil production near Point Barrow or on the coast of southern Alaska, territories considered to have the greatest

possibilities, were too conjectural, and achieving actual production would require too much time to merit favorable consideration in the light of the then existing emergency. Further, if production could be developed in any of those localities, the fields would be located on or near the coast and would be vulnerable to attack.

Army Investigation of Canol.

The oil industry, as well as the War Department, knew that oil in commercial quantities existed at Norman Wells. In 1920, oil had been discovered there. A few producing wells had been drilled there and, for upwards of 15 years, had produced about 400 barrels per day during the summer. The only demand had been local, by mines in the vicinity and boats on the Mackenzie River system. The field was operated by Imperial Oil, Ltd., a Canadian subsidiary of the Standard Oil Company of New Jersey. Near the wells, that company had erected a skimming plant sufficient to handle 800 barrels of crude oil per day. The Norman Wells field was the only source of supply near the Alaska Highway with any proved production.

Early in 1941, the attention of the War Department had been called to the oil production at Norman Wells. Subsequently, during the consideration of various routes for a highway, Steffanson, the Arctic explorer, had proposed a route from McMurray in Alberta, at the railhead from Edmonton, using Great Slave Lake and the Mackenzie River, as part of the highway project. This route would have passed through Norman Wells, and one of its advantages, claimed by Steffanson, was the fact that oil to be used in connection with the highway could be obtained at a point on the highway.

In January, 1942, the Army was considering the possibilities of producing oil in Australia and New Zealand -- and did, in fact, engage in unsuccessful exploration in New Zealand, -- with a view to obtaining oil as near as possible to active theaters in order to conserve shipping and to insure supply. At or about that time General Somervell directed James H. Graham to investigate the advisability and feasibility of oil production and operations at Norman Wells. Mr. Graham was then serving as a consultant to General Somervell on transportation matters. He had had a broad experience during the last war in military transport problems. Mr. Graham had also had a broad business experience, including oil operations. He was at the time Dean of Engineering at the University of Kentucky. Mr. Graham associated Brigadier General Walter B. Pyron with him to make the required study. General Pyron had been on active duty since 1940 and was the War Department's principal consultant on oil matters since 1941. At the time he entered on active duty, he was Vice-President of Gulf Oil Corporation, in charge of production and transportation.

These two men obtained the data available at the Bureau of Mines and the United States Geological Survey. They consulted almost daily with General Somervell on the progress of their investigation. General Somervell himself discussed the plans, as they developed, with General Marshall, Chief of Staff, General Gerow, then head of the War Plans Division of the General Staff, General Eisenhower, who was succeeding him, and General Crawford, in charge of supply problems of the War Plans Division.

General Pyron was familiar with the Norman Wells field and its history. Prior to entry on active duty, he had been given some details with respect to the geology and potentiality of that field by a petroleum engineer who had visited the field in 1939.

The question of whether oil would flow at the low winter temperatures in the terrain through which a pipeline would run was a disturbing one. Investigation, however, disclosed that the Norman oil had characteristics which permitted it to flow at temperatures as low as minus 70° Fahrenheit.

By the end of April, 1942, General Somervell and his staff had exhausted the available sources of information in connection with Canol, other than such information as could be obtained from representatives of Imperial Oil Ltd., who, it was recognized, would, as the result of their more than 20 years of experience in the field, be able to furnish the most reliable data. Accordingly, executives and experts of Imperial Oil, Ltd. were asked to confer with War Department representatives in Washington. They did meet with Mr. Graham, General Pyron, General Streett, an Army Air Forces representative on the General Staff, and other Army officers in Washington on April 29, 1942. They brought with them geological surveys and reports and geologists familiar with the field. The contemplated project was fully discussed. The representatives of the oil company spoke of an oil reservoir of two million barrels. They were pessimistic about the chances of obtaining a production of 3,000 barrels per day, and, immediately, after the conference, Imperial wrote a letter to the War Department even more pessimistic in tenor. They described the difficulties of pipeline construction and

operations under the conditions which existed. They were satisfied, however, that, if more oil was found, similar to that being produced, it would flow even at the lowest temperatures which might be expected along the proposed route of the pipeline.

General Pyron was convinced, as a result of his investigation prior to the meeting with the Imperial representatives and of the information and data given him at the meeting, that 3,000 barrels a day could be produced from the field with a reserve pool of between two and one-half and three million barrels, and so stated. As a matter of fact, the Committee is advised that a 3,000 barrel per day production is assured and that there is little doubt that production can be increased to 20,000 per day. As to the reservoir of oil, it is now believed that the pool is from fifty to one hundred million barrels in the Norman Field alone, not to mention indications of one or more other large fields in the vicinity.

The Decision to Construct Canol

On the day the meeting was held, Mr. Graham submitted a one page memorandum to General Somervell containing no facts but merely the following recommendations:

- a. Additional wells be drilled for added production by September, 1942.
- b. Route for a pipeline between Norman Wells and Whitehorse be surveyed and a four-inch pipeline constructed and placed in operation by September 15, 1942.
- c. Suitable refining equipment be found in the United States, dismantled, transported and set up ready for operation by October 1, 1942.

d. Additional action be taken to provide for transportation of materials for the above project.

The Graham memorandum was submitted to General Pyron and the other officers, who had been present at the meeting with Imperial Oil, Ltd., and they approved it. On the same day General Somervell himself approved the Graham memorandum and on the next day, April 30, he ordered the project to be constructed.

General Somervell testified before the Committee that at the time he did not believe that the dates specified for the completion of the various parts of the project could be met and that they were adopted by him merely as a target. He, however, did believe that the entire project could be completed by the summer of 1943, and he states frankly that, if he had known that completion would be delayed until the spring of 1944, he might not have ordered the construction. It is possible that the project might have been completed by the summer of 1943 if top priority had been continuously assigned. However, improved war conditions made it advisable to lower the priority of the Canol project as compared with other war programs, and it is impossible to estimate accurately how long completion was delayed by this subordination of the project.

After drilling operations had progressed, it became apparent that the Norman Wells field had potentialities greatly in excess of 3,000 barrels per day and, at that time, it was ordered that the field and nearby structures be drilled until a total production of 20,000 barrels was assured. As stated above, it is evident that this larger production is now assured.

While work on the project was commenced immediately, construction, in connection with the crude oil pipeline and the refinery, was kept at a minimum until a 3,000 barrel production was assured. However, pipeline materials, required at the eastern or Norman Wells end of the line, had to be shipped and the system of transportation between McMurray and the field had to be substantially completed during the ensuing summer season if a full year were not to be lost.

The Petroleum Coordinator for War was not consulted in advance of the decision to embark on the Canol Project. While it is true that under the instructions creating his office he had no jurisdiction over oil operations outside Continental United States, it appears to the Committee that, in the interests of coordinating war plans and of the smooth, consistent operation of governmental agencies interested in the conduct of the war, the War Department should have consulted the Petroleum Coordinator in advance and should have obtained his advice and recommendations. The Committee recommends that, in the future, the War Department take up similar problems with the Petroleum Administrator for War and receive the benefit of his information and advice.

Likewise, the Army did not consult the War Production Board with respect to Canol. That Board had no jurisdiction over the determination to construct the project. It was, however, the agency charged with the duty of allocating materials to various projects needed in the war effort. While strategic determinations are not made by the War Production Board, it is entitled to information, so far as considerations of security permit, as to critical materials which the Army requires. It would have shown better

cooperation between the War Department and the War Production Board if it had been afforded earlier information in the present case.

Contracts with Imperial Oil, Ltd.

A contract was entered into with Imperial Oil, Ltd., which provides for the necessary drilling and construction of storage and other required facilities at the field. The provisions of this contract likewise apply to the subsequent supplemental arrangement whereunder Imperial Oil, Ltd. will participate in the drilling required to produce 20,000 barrels per day. The Company will receive its costs plus a fixed fee of \$2.00 under all existing agreements. Title to all wells drilled and to the casings remain in Imperial Oil, Ltd., subject to any arrangements it may have with Canada.

Our Government has the right to purchase, without specified time limit, all oil produced in the Norman Field, including oil produced from the Imperial wells which existed prior to the inception of the Canol project. Imperial, however, has the right to take sufficient oil from its pre-existing wells to supply the demands of its commercial customers. In the past, these demands have been small, (averaging about 12,000 barrels per year.) From March 1 through October 31, 1943, Imperial processed less than 15,000 barrels of crude oil for its own and its commercial customers' use.

The United States agrees to pay \$1.75 per barrel for all oil purchased from Imperial's pre-existing wells, and \$1.25 per barrel for

other oil produced by Imperial in the field, until a total of 1,500,000 barrels has been delivered to the Government. Thereafter, the United States will pay to Imperial 50¢ per barrel for oil delivered until the Government has been reimbursed for its payments to Imperial under the contract, such reimbursement to be computed at the rate of 75¢ per barrel of oil delivered to the Government. Thereafter, Imperial will again receive \$1.25 per barrel purchased by the United States. The contract provides for a processing charge of 65¢ per barrel of oil refined at the Imperial refinery in the field. All payments are to be made in Canadian funds which are now at a discount of approximately 10%.

The contract makes provision for renegotiation of its terms at the time work thereunder has been completed, which was estimated to be about one year from the date of the contract; the Committee is advised that the right to renegotiate the contract is still intact. However, if the parties do not agree to revise the contract, then the contract as originally drawn will stand. The United States has the right to terminate the agreement with Imperial Oil, Ltd. at any time with or without cause.

The Committee believes that the Government is, under the circumstances, required to pay Imperial Oil, Ltd. too high a price for the oil. It is recognized that the price for the first one million and a half barrels produced may be fair in view of the considerable investment which Imperial had made in the field prior to 1942. However, the 50¢ per barrel and the \$1.25 per barrel, respectively, required to be paid under the contract after the first one million and a half barrels have been delivered, strikes the Committee as similar to a royalty and a royalty at too high a rate. While

Imperial does most of the drilling, all costs of production are being paid by our Government. The wells and casings, under the terms of the contract, will continue to be the property of Imperial. Its situation is, however, somewhat different from that of a mere owner of properties who permits them to be operated by an oil producer under lease and who has done nothing himself to discover and develop the oil production. Imperial did discover the field and did start its development. But it is being too generously treated with respect to oil outside its own development and, especially, oil in any newly discovered field. The Committee recommends that efforts be made to renegotiate the price provisions of the contract with Imperial Oil, Ltd., as well as the provisions applicable to the post-war period.

Agreements with Canada

Arrangements were made by the State Department with the Canadian Government, at the request of the War Department, whereby the project could be carried to completion. Among other things, Canada agreed to furnish rights of way and sites for the pipeline and the refinery. At the end of the war, the pipeline and refinery may be purchased by Canada at its then commercial value or, if it does not see fit to buy, by other persons at not less than that value. If the pipeline and refinery are not sold under the provisions of the agreement, their disposition is subject to the direction of the Permanent Joint Board on Defense, Canada-United States. The installations may not be dismantled without the approval of the Permanent Joint Board.

The Committee does not believe that the present agreements with Canada sufficiently protect the interests of the United States. When the war is over, and if Canada does not exercise its option, Imperial Oil, Ltd. may be the only person likely to be interested in purchasing the pipeline and the refinery, since, under the present contracts, it will control the only supply of crude oil which may be transported through the line and refined at the refinery. Any other purchaser would be required to enter into an agreement with Imperial covering supply of the pipeline and the refinery with crude oil; this, the Committee believes, will place Imperial Oil in the driver's seat and will reduce the commercial value of the pipeline and the refinery to an amount which is only a fraction of the cost of those facilities. There is, of course, the possibility, even probability, that Imperial Oil, Ltd. will not desire to make the investment required to purchase the pipeline and refinery and, accordingly, will be willing to make a fair and reasonable agreement with any prospective purchaser as to sale of crude oil. It is even possible that a purchaser of the pipeline could force a low oil price on Imperial since the owner of the line would control the only outlet for substantial quantities of oil. Granting this, however, it is doubtful whether any purchaser will purchase at a price which is a substantial part of the cost of the facilities, in view of the limited local civilian demand for refinery products for a long time after the end of hostilities.

Stirred into action by the Committee's investigation of Canol, the War Department, in conjunction with the State Department, has now undertaken

negotiations with the Canadian Government and Imperial Oil, Ltd. with a view to entering into new agreements which will give recognition to the advantages which will inure to Canada and Imperial by reason of our expenditures, operations and exploration. The Committee recommends that these negotiations be vigorously carried on, and has no doubt that, in view of the friendly relations between the two countries and the sense of fairness of the Imperial Oil, Ltd., equitable arrangements can be made and this country receive the benefits to which it is fairly entitled.

While more satisfactory arrangements should have been sought in the first instance, nevertheless, if military necessity required the project, it was proper to proceed immediately, whether or not desirable agreements for post-war use could be made.

Reviews of Canol After April, 1942.

After General Somervell ordered the Canol construction, he advised a meeting of the War Council, consisting of the Secretary and Under Secretary of War, General Marshall, General Arnold, General McNair and himself, of what he had done. This meeting was held on May 11, less than two weeks after construction had been ordered.

At the end of May, 1942, the Petroleum Coordinator for War wrote to the President calling his attention to Canol. At the same time he wrote to the Secretary of War. He complained that he had first heard of the project through third parties and that he should have been advised before it was determined upon; he also offered certain criticisms. The President, in June, 1942, advised the Petroleum Coordinator that the project had his

approval and, thereafter, the latter continued to make suggestions in connection with the project and for supplementing it. One of his suggestions involved the distribution products lines which have, in fact, been constructed. He remained doubtful of the potentialities of the Norman field to produce 3,000 barrels of oil per day for any prolonged period.

The Petroleum Coordinator was kept fully advised by the War Department of its plans for obtaining a refinery in the United States. The War Department contemplated purchase of a refinery in Texas, belonging to the Bareco Company. After first approving this purchase, the Petroleum Coordinator later objected to the purchase for fear of its interference with the 100-octane gasoline program in the United States. There were fourteen other refineries which could be purchased without such interference but, subsequently, the Petroleum Coordinator again consented to the purchase of the Bareco refinery and its use in connection with Canol.

Subsequently, the Petroleum Coordinator advised the War Department that the parts and materials, which were required for installation of the Houdry process in the Canol refinery, were urgently needed in connection with domestic installations. The War Department for this reason has deleted the Houdry process from the project.

The Bureau of the Budget, in May, 1943, made a thorough investigation of Canol, and, in June, advised the War Department that, as a result of this investigation, it believed the War Department should review the project to determine (i) whether construction on the Norman-Whitehorse pipeline and

refinery should be stopped, (ii) whether the pipeline should be completed and the scope of the refinery reduced, and (iii) whether search for oil in the Norman and adjacent fields should be stopped or limited. The War Department then reconsidered the project.

In July, 1943, Lieutenant General McNarney, Deputy Chief of Staff, decided that the project should be carried to completion as then planned (which plans included attaining a production of 20,000 barrels daily), because worldwide oil and tanker shortages dictated that Alaskan territory be self-sufficient in so far as possible, because military necessity existed for the provision of aviation gas to support a possible major air offensive from Alaskan bases against Japan, and because, after considering the relative amounts it would cost to complete the project and the recovery which might be had were the project stopped, both economic and military policy dictated completion.

In September, 1943, the Joint Production Survey Committee, an agency recently created under the Joint Chiefs of Staff, was directed to make a thorough investigation of the Canol Project. That Committee held hearings, at which appeared not only representatives of the Army and the Navy but also representatives of the Petroleum Administrator for War. On October 26 of this year, the Joint Chiefs of Staff, acting on a report of the Joint Production Survey Committee, determined that the completion and operation of the Canol Project were necessary to the war effort, that the project should be completed and operated as soon as possible, and that consideration should be given to exploration and development leading to a full recovery

of the predicted reserves. This Committee has no information with respect to the information furnished to or considered by the Joint Production Survey Committee or the Joint Chiefs of Staff.

The Committee feels that the Canol project, since its inception, has been given consideration by the highest military authorities and that, regardless of whether such authorities would have approved the project at the outset, they have confirmed its military value and approved its completion and operation.

While military necessity of the project has thus been recently again determined, it has also become more apparent, as time goes by, that sources of petroleum outside the United States must be obtained in increasing quantities, not only for conduct of the present war but to preserve for the future use of the United States, in peace and in war, our own rapidly decreasing reserves. Here is a reservoir in Canadian territory which augments the supply for the defense of the United States, Canada and Alaska without further depleting our own resources. To be sure, United States funds have been expended in developing and making usable this supply. However, oil represents more than money. It is worth the expenditure of funds to conserve our own oil supply if, by so doing, we can obtain oil elsewhere for our common cause. If more petroleum is discovered on the Mackenzie than will be used for this war, negotiations with Canada should lead to the establishment of a military reserve for the common defense of both countries in the future.

Consideration of Criticisms of the Project.

There have been many criticisms of the project, which have come to

the Committee's attention.

It is only fair to state, however, that there has been little criticism of the manner in which the construction has been carried on. Only a few instances of waste have come to the Committee's notice and those involve relatively small amounts. Colonel Wyman, the engineer officer originally in charge of the work, did not perform his duties satisfactorily and was replaced in March 1943. Since that time, the work has, so far as any evidence presented to the Committee discloses, been carried on efficiently and competently.

The following criticisms of the project have been brought to the attention of the Committee and are the most substantial ones and have been considered in detail:

A. It has been urged that, considering the cost of the Canol project in terms of money, manpower, shipping and other transportation requirements, equipment and material, the decision was arrived at too hastily and without consideration of the difficulties and problems involved.

It is true that relatively brief consideration to the matter was given by men who had many other duties to perform and problems to solve, and that no prudent man would consider embarking on such a project in peacetime and as a commercial venture without a more thorough investigation - one which might consume years not months. Nevertheless, short of actual drilling in the field which would have proved that there was a greater amount of oil in the Norman field than was believed at the time to be there, surveys of routes for the pipeline which would have consumed so much time as to make

the project no longer practicable as a military venture, and estimates of the costs in terms of money, labor, materials and equipment which it was known would be great, little information, not obtained by General Somervell prior to his decision, could have been had. There is no doubt that the representatives of Imperial Oil, Ltd. knew more about the field than any others and they furnished all available geological data. It cannot be said that General Somervell did not thoroughly consider and study all the information which was available to him, or that he went into the project without fully realizing what its difficulties were.

The Committee recognizes that, in the spring of 1942, a decision such as the one made in connection with Canol had to be made quickly or not at all. Sufficient supplies of oil too late would have been of no use. If however, General Somervell had gone into the matter more thoroughly - assuming that there was time to do this, which is doubtful - he might have been better able to estimate the length of time the project would take and might, therefore, have refused to issue orders directing its construction. On the other hand, as above pointed out, during the progress of the work, men, supplies and equipment, required for its construction, were diverted to fill more pressing needs. Thus the Committee feels that it cannot say whether the project would have been completed by the summer of 1943, as planned, if it had continued to carry the high priority originally assigned to it. It is, further, difficult to criticise a decision on the score of haste when it develops that oil, which was the keystone of the determination to go ahead, is available in greater quantities than those thought sufficient to justify the project.

In addition, the War Department General Staff and the Joint Chiefs of Staff have, within the past few months, confirmed the decision by their determination that the project should be continued as a presently needed military measure for use in offensive operations, made possible by the successful expulsion of the Japanese from Alaska. Unless, therefore, the Committee is prepared to say that Canol was unsound at the time it was begun but has since become a sound military operation, General Somervell's decision cannot be seriously criticized. If he had decided not to go ahead with Canol, then we would be lacking a facility which the highest military authorities have determined we now require in the conduct of the war.

The Graham memorandum, with General Somervell's approval endorsed thereon, is the only documentation in the files of the War Department with respect to Canol prior to the directive for its construction. The Committee would have been aided had the various steps and considerations entering into the decision been written up by the persons participating in the investigation. As it is, we have now had to rely on the unaided recollection of the participants. However, the first order issued by the Commanding General of the newly formed Services of Supply in March 1942, had discouraged memoranda and communications where oral conferences were practicable. Speed was required. Many actions had to be taken immediately. Most officers in positions of responsibility might have delayed for a long period while documents were prepared, approvals endorsed, and the responsibility placed on the shoulders of others. The action was hasty

in this case and without abundance of caution. Even if this is true, we are not disposed to criticize prompt decision, willingness to assume responsibility, and bold and vigorous action in time of war. Such qualities are rare and, when they exist, win wars.

General Somervell has accepted full responsibility for the decision. He characterizes it as a justified gamble, made in a desperate situation with the future of this country at stake. So far as finding oil is concerned, the gamble was successful.

The Committee believes, however, that, regardless of whether or not the Petroleum Coordinator for War could have been of assistance at the inception of the project, the relations between war agencies, the necessity of exploring all possible sources of relevant information and essential governmental team-work, required that the Petroleum Coordinator be consulted and now require that he be consulted as to post-war uses of the oil.

B. It is claimed that the project involved quantities of shipping, materials and manpower which could have been better used in the war effort for other purposes.

It is true that Canol has required 95,000 tons of coast-wise or ocean shipping, including barges, to carry the materials and equipment necessary for its completion to the site of the work, and, at times, the labor of 10,600 civilians and 2500 soldiers were needed for the job, General Somervell has stated to the Committee that the ships, which were used, were few in number and, to a large extent, those which were not useable for trans-oceanic voyages to other fronts. Four inch pipe, the largest pipe used in

any of the pipelines except for 120 miles of six inch pipe, was available in quantities, and its use did not deprive any other needed war project of necessary materials. The refinery was out-moded because of its size and not needed in the 100-octane gasoline program in the United States. The Bareco Refinery, ultimately chosen as the best suited for the purpose, was used with the Petroleum Coordinator's consent. At about the same time, Russia purchased two refineries in this country, likewise with the consent of the Petroleum Coordinator for War. It is evident, therefore, that there were refineries which could be spared.

In any event, the particular use to which transportation facilities, materials, equipment and available manpower should be put in the interests of the war effort is primarily a matter of military strategic judgment and is for military decision. The Committee has consistently refused to investigate or criticize strategic decisions and, despite the opinions of individual members of the Committee that transportation, materials and manpower could have been better used in connection with other military operations, the Committee feels that it must accept the decisions of the General Staff and the Joint Chiefs of Staff, which apparently recognize that this diversion of shipping, materials and men to Canol was justified by military necessity.

C. It has been said that a few tankers could have carried a greater quantity of petroleum products to Alaskan ports between April 1942 and this date than will be produced by the Whitehorse Refinery up to the middle of 1945.

These cargoes could have been stored at advantageous points along the Alaska Highway. Further, if this method of supplying the Highway had been adopted, the costs involved would have been only a small percentage of the costs of Canol even though tankers had been built especially for this purpose.

The War Department has answered this criticism by showing that in April 1942 and for a considerable period thereafter there were no tankers available for this purpose. During that period the shortage of tank ships was so acute as to cause the greatest alarm. Every available tanker had to be used for more pressing missions than supplying a reserve for the Highway. It is, of course, true that a certain number of tankers had to be used to keep the Alaska theater, including the Highway, supplied with oil, but the available stock of tankers was so small as not to permit the addition of even a single one for the purpose suggested. Further, although it appears that the submarine menace, at least for the present, has been reduced, there is still a military need for more tankers than are afloat.

In addition, in view of the demands upon the California oil fields for supplying other theaters and the dwindling California reserves, it is apparent that oil, carried to Alaska under the proposal being discussed, would have had to come from either the Mid-Continent fields, requiring a long rail haul over congested railroads and the use of the short supply of tank cars, or from Caribbean fields, which would have required longer and more dangerous voyages and a greater number of tankers.

It is true that oil supplies to Alaska, and the materials and

equipment required for the Canol project, have arrived safely at destinations, but in April 1942 there were well-grounded fears that the sea route to Alaska could not be safely traveled. Certainly, escort ships were not available adequately to protect convoys. As matters stand, commencing in the spring of 1944, the refinery at Whitehorse will be able to furnish nearly all the aviation gasoline required for ferrying operations along the Highway, all of the motor fuel required by motor vehicles operating between Fort Nelson and Fairbanks, and sufficient fuel to run the refinery. If the pipeline and refinery are enlarged to transport and process 20,000 barrels of crude oil per day, there will be a substantial surplus of aviation gasoline and motor fuel available for other military purposes.

D. Critics of the project have argued that a production of 20,000 barrels per day in the field should not be sought in view of the fact that the crude oil pipeline and the refinery itself can handle only 3,000 barrels per day.

The Committee recognizes that it would have been foolhardy to have built a pipeline, sufficient to transport 20,000 barrels per day, and a refinery equipped to process that quantity of crude oil, before that production had been assured. The Committee also has in mind that it will be comparatively easy to lay an additional pipeline along the route of the four inch line from Norman Wells to Whitehorse, once the access roads for the four inch line have been completed, and that the larger size pipe which will be required, and the additional critical components needed for the expansion of the refinery, should not be taken away from other war uses until they are needed for Canol.

General Somervell stated to the Committee that he might shortly ask for additional appropriations to cover the expense of these expansions. It is, however, the Committee's understanding that the War Department has not yet finally determined upon the enlarged refinery and pipeline projects, and the Committee believes that no further development should be carried on to establish a 20,000 barrel daily production until a decision has been reached to enlarge the pipeline and refinery capacity if that production is attained.

E. Claims have been made that the project is not feasible, that the oil will not flow at low winter temperatures, that in cold weather it will precipitate paraffin which will stop the flow of oil through the line, and that spring thaws, floods, storms, and other climatic disturbances will cause so much interruption to the flow of oil through the line as to make its operation impractical.

Tests made by the United States Bureau of Mines, Universal Oil Products Company, Standard Oil Company of California and Imperial Oil, Ltd., among others, prove that the crude oil will flow at a temperature of minus 70° Fahrenheit. The mean minimum temperature in the country, through which the pipeline passes, over a period of a number of years has been around minus 25° Fahrenheit for the coldest month of the year. In addition, the pipeline is laid above the ground and, for substantially its whole length, will be covered in cold weather by a blanket of snow. With the insulation afforded by the snow and in view of the fact that the oil in the line will be moving, it will be seldom, if ever, that the oil in the pipeline reaches a temperature as low as the surrounding area.

So far as paraffin is concerned, the problem presented by the Canol

pipeline is no greater and no different than that of any other pipeline running through cold country and carrying oil of high paraffin content. There are many such pipelines, and means have been devised, and, the Committee has been advised, will be used in connection with the Norman-Whitehorse pipeline, to prevent any interruption of the flow of oil by paraffin.

The War Department has stated to the Committee that it expects short and intermittent interruptions of flow, due to leaks, breakages and similar difficulties, but that it anticipates no more trouble than is inherent in any other long pipeline. Such interruptions occur in connection with all pipeline operations. General Pyron testified that there is no reason to believe that this problem will be more serious than with many other existing lines, and that it can be met without serious interference.

The Standard Oil Company of California, which has been retained by the War Department to operate the pipeline and refinery, as well as other experts, anticipate no unusual difficulties in these operations arising from the above-mentioned causes.

The Committee has concluded that criticism on the ground of feasibility is not valid.

F. Some persons believe that Fairbanks instead of Whitehorse should have been chosen as the site of the refinery.

The War Department considered Fairbanks as a location but concluded that Whitehorse would best serve the purpose in mind. Fairbanks is in our own territory and, if the refinery had been located there, post-war control of the project would have been in our hands to a greater degree. This would have been the principal advantage of Fairbanks, as the Committee views

however, involved the construction of a long pipeline from the railroad to the Highway, and along the Highway to Watson Lake. The country between the railroad and the Highway is difficult country, and a pipeline along that route would have presented many of the same problems involved in the Norman Wells-Whitehorse line.

More important, however, the gasoline which, under the plan, would have been used to fill the storage, would have had to come from Mid-Continent or Caribbean fields, would have used tank cars which are in short supply, and would have presented the same difficulties as were discussed above in connection with carrying oil to Alaska by tanker. One of the principal advantages of Canol will be that it will draw its oil from sources outside the United States and will not, during the period its production is available to us, reduce our dwindling oil reserves.

While it appears to the Committee that the suggestion of the Standard Oil Company of California was a feasible one, the Committee does not feel that the War Department is subject to criticism for adhering to its Canol plan, which, in the judgment of those in charge of military supplies, presented greater over-all advantages than the Standard Oil Company's suggestion.

Future Plans Respecting Canol.

Regardless of whether or not the decision to build the Canol project was a wise one, consideration must be given to whether the project should now be discontinued, reduced or enlarged in scope. It will require approximately \$27,000,000 to complete the entire project,

or \$24,000,000 exclusive of remaining costs of the products distribution lines to which no objection has been made.

The project, exclusive of the distribution lines, can be discontinued in its entirety, or the crude oil pipeline and the refinery can be abandoned at this point, with or without further exploration for oil. If work on the refinery and pipeline is stopped there will, nevertheless, remain a requirement of \$7,000,000 for evacuation expenses. Men must be paid until they are returned to the United States and their transportation to this country, likewise, must be paid by the Government. If exploration activities continue, an additional cost of \$7,000,000 (included, however, in the remaining costs above stated) will be involved. Thus a saving of \$10,000,000 would result from the abandonment of the refinery and crude oil pipeline taken by themselves. If, in addition, the exploration activities are discontinued, \$17,000,000 will be saved.

Whether or not it is determined to complete the project as now planned, the Committee recommends that no further operations be carried on for the purpose of developing a production of 20,000 barrels per day until it has further been determined whether the capacity of the pipeline and refinery will be expanded to carry and process 20,000 barrels per day if such production is available. If the decision is in the affirmative, requests for appropriations for additional required funds will, as General Somervell has stated, be presented to the Appropriations Committees of the Congress, and we recommend to the Appropriations Committees that, when

such requests are made, they carefully scrutinize and investigate the proposals and be governed to a large degree by the then state of the pending negotiations with Canada and Imperial Oil, Ltd. and by the then determinations of our military chiefs.

The Committee is of the opinion that, even though it is determined to enlarge the project to handle 20,000 barrels per day, no further exploration for oil should be carried on until attempts have been made to negotiate with Canada and, if required, with Imperial Oil, Ltd., to assure to the United States benefits in any oil discoveries to an extent commensurate with the contributions of this country to the discovery of this oil and the development of the Norman Wells and adjacent fields.

The Joint Chiefs of Staff, having determined that the project, with its present planned capacity of 3,000 barrels a day, is a military necessity, a contrary opinion by the Committee would involve its passing upon a purely military decision. This, the Committee has always scrupulously avoided. We accordingly, accept the view that the project should be completed and placed in operation with its 3,000 barrel capacity. To stop now would be reckless in light of the military determination which has been made.

Apart from any consideration of the correctness of the decision to construct Canol and of the conclusion of the Joint Chiefs of Staff that the project is a military necessity, however, approximately \$100,000,000 have already been spent. The United States will derive little or no direct benefit from this expenditure in the post-war period when new and satisfactory

arrangements are made with the Canadian Government and Imperial Oil, Ltd. Accordingly, the Committee again recommends most strongly that the negotiations, started since the beginning of the Committee's investigation and now being carried on, be pushed as vigorously as possible. It is hoped that agreements may be entered into which will preserve to the United States use of the oil discovered and developed by it, and of the pipelines and refinery built by it, to the extent it is equitably entitled by virtue of its contributions of money, manpower, materials, and equipment to this project for the benefit of the joint war effort.