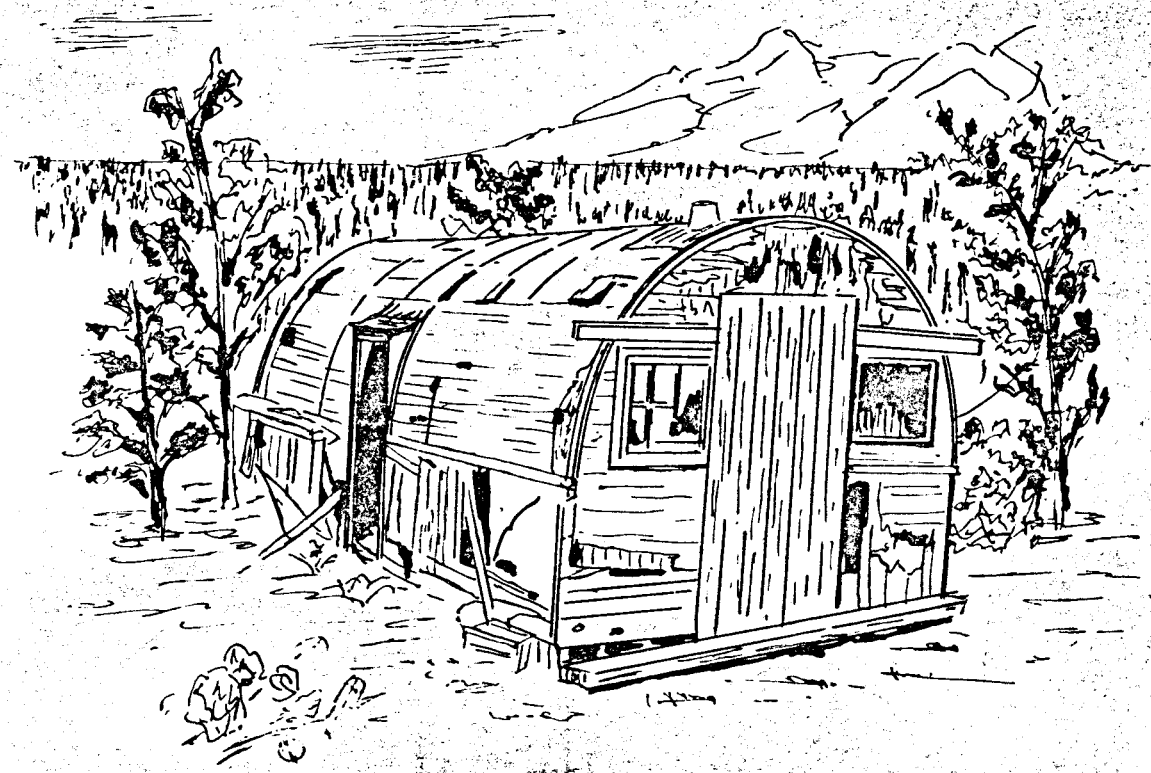
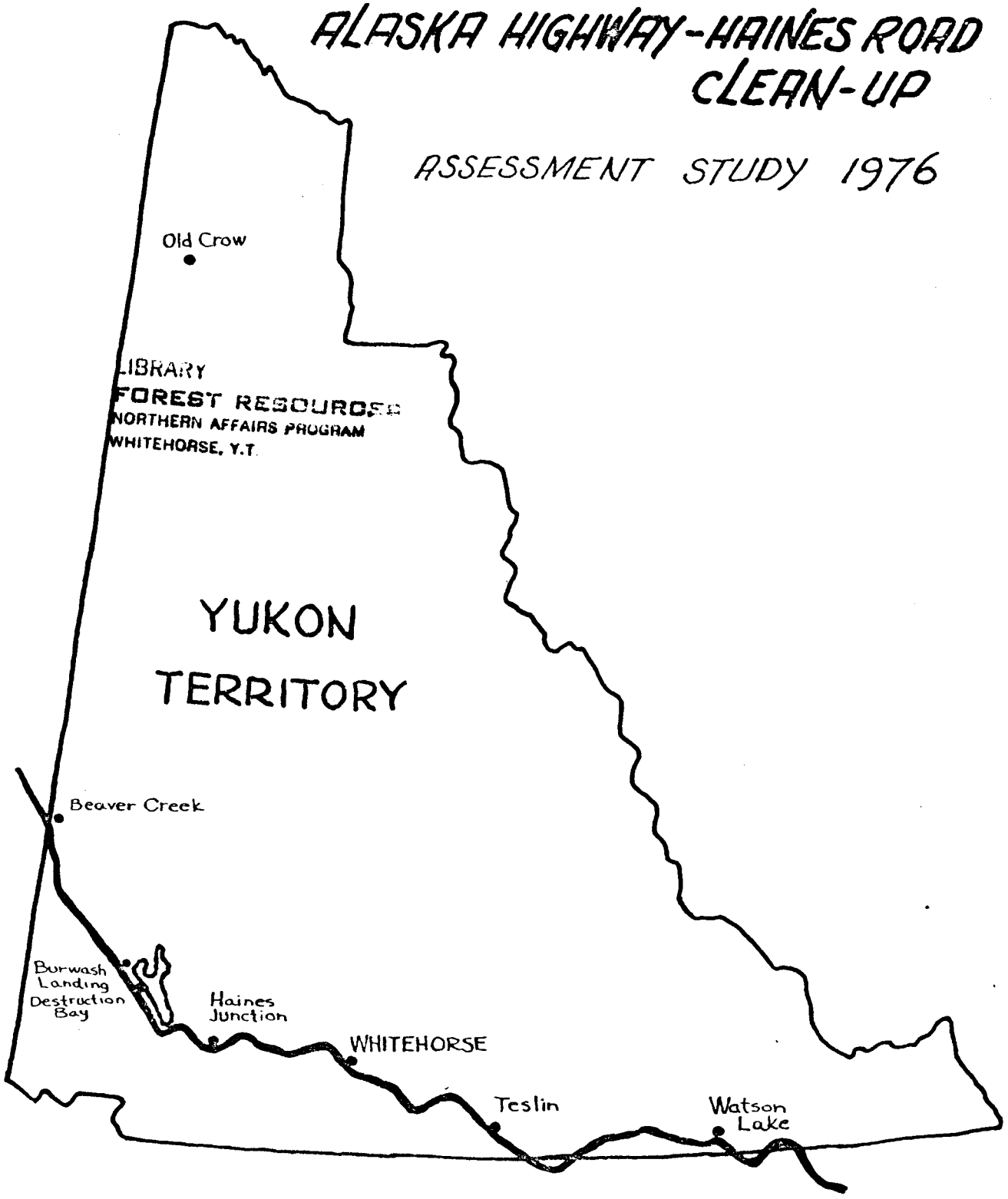


ALASKA HIGHWAY-HAINES ROAD CLEAN-UP

ASSESSMENT STUDY 1976

ALASKA HIGHWAY-HAINES ROAD CLEAN-UP

ASSESSMENT STUDY 1976



328 Lee Ridge Road
Edmonton, Alberta
November 1976

Dept. of Indian and Northern Affairs
200 Range Road
Whitehorse, Yukon Territory

Attention: Mr. W. N. Sanregret, Head Land Use

Re: Alaska Highway Clean-Up Assessment Study
Contract Y6-LA-2

In accordance with the terms of reference and verbal consultations I am pleased to present the attached report dealing with the location and feasibility of effecting restoration to the abandoned Army campsites along the Yukon portions of the Alaska and Haines Highways.

Cost estimates have been based upon 1976 industrial figures. Both cost estimates and work schedules are based upon the authors related experience in the supervision of similar clean-up projects conducted during 1975 and 1976 on the Canol Road, Yukon Territory. Cost figures as presented must be considered as relative and that a true estimate may only be established by tender.

I trust that the information presented is adequate to allow full consideration of related aspects of restoration to enter into the final decision to effect the clean-up of abandoned Alaska Highway Army campsites.

I would like to extend my sincere thanks to W. N. Sanregret for his assistance and guidance and to the Land Use and Land Office staff of the Department of Indian and Northern Affairs for their cooperation.

Sincerely,

C. E. Edey
Project Consultant,
Northern Land Use

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Introduction:

The Land Use Section of the Department of Indian and Northern Development retained the author to conduct a study and provide a comprehensive inventory of abandoned Army campsites located along the Alaska Highway and the Haines Road. Through consultation it was agreed that attempts should be made to identify, as far as possible, the location of refuse dumps associated with the abandoned Army campsites. The extent of the study was to cover only those portions of the Alaska Highway and Haines Road which is a part of the Yukon Territory highway maintenance program.

Specifically, the terms of reference were:

- recommendations on the methods considered for the disposal of debris located on the sites indicated
- recommendations on the location of debris and material disposal
- cost estimates based on 1976 cost of clean-up on each site identified
- recommendations on the salvage potential of any materials to be disposed of and the location, if required, of storage or disposal of these materials
- the equipment necessary for clean-up and restoration
- the manpower necessary for clean-up and restoration
- the most feasible time period required to complete clean-up, taking into account manpower and equipment constraints and the shortness of the operating season
- a master plan for the clean-up project including land reclamation aspects

During the early stages of site identification it became obvious that a large number of the abandoned Army campsites had been partially or wholly disposed of as either titled lands or leases. In addition to the terms of reference the author has indicated any associated lands which have been alienated from Crown control.

The following inventory and methodology has been based upon field work conducted during the months of July and August, 1976. Location of all Army facilities was determined by inventory lists of military camps compiled during 1944 and 1945. Additional information was obtained from compiled records and assistance from the Resource Management personnel of the Yukon Lands and Forest Service, Department of Indian and Northern Development. Site description and sketch maps are based upon aerial identification of campsites indicated as military in 1945. Site inventories are based upon ground reconnaissance. Aerial inspection of the Alaska Highway was made possible by project funding of the Land Use Section.

The recommendations of this report are based on the environmental goals and land use considerations currently practiced in the Yukon Territory. The practible application of a total clean-up is economically unfeasible and thus a certain degree of discretion must be maintained by the governmental supervisor of the clean-up project.

In making a comparison with the quantities of debris cleaned up along the Canol Road, the quantity of debris associated with the Alaska Highway and Haines Road is considerably less. Due to differing accessability, the Alaska Highway has at all times been open to settlement and transportation following the abandonment of sites whereas the Canol Road was for some time closed to public travel. The large inventories of vehicle hulks and heavy metal found at campsites along the Canol Road do not exist at abandoned campsites along the Alaska Highway (Takhini, Mile 946.4 excepted). A larger number of refuse dumps have been identified as military originated along the Alaska Highway than along the Canol Road.

In summary, I have identified 83 military campsites of which 41 sites

are considered to be abandoned, partially or wholly on Crown Lands. Due to continued salvage and removal of materials by private and public interests there remains very little debris in comparison to the Canol Road prior to its clean up in 1975. All sites on the Alaska Highway contain wood debris in various quantities. Only twelve sites represent the majority of debris to be cleaned up.

A general summary of debris remaining includes wood debris on all sites and approximately:

28 refuse dumps

400 vehicle tires

100 vehicle hulks (many of which are not of Army origin)

200 45-gallon drums

Background:

As early as 1929 serious consideration was given for the construction of the Alaska Highway with the formation of two International Highway Associations, one at Fairbanks, Alaska and the second at Dawson City, Yukon Territory. The purpose was to stimulate public interest in the highway project. That same year a bill was presented to the United States Senate to conduct joint investigations with Canada regarding the construction of the highway. Consent for the investigation was received May 15, 1930. Data was collected and the resulting discussions revealed that the highway was feasible from a construction and engineering standpoint. Due to the uncertainties of the Depression, the construction of the highway was shelved.

In May 1938, the Alaska International Highway Commission was empowered

by the President of the United States to renew the highway study. This commission worked in conjunction with a 5-man commission appointed by the Government of Canada in December, 1938. The objective was to determine possible routes by both aerial and ground reconnaissance during the 1939 season. The results of these investigations revealed three routes to be considered.

In August, 1940, a Permanent Joint Board on Defence was established between Canada and the United States. On November, 1940, the Board as a result of the tripartite alliance signed by Germany, Italy and Japan in September, adopted a resolution to construct a series of flight strips across Canada to Alaska. Construction commenced during the winter of 1940-41.

On December 7, 1941, the Japanese attacked Pearl Harbor, seriously impairing the United States Pacific Fleet. On December 10, 1941, the Japanese encounter with the British Far Eastern Fleet off Singapore resulted in Japan's second major naval victory. The losses incurred eliminated both the British and United States Fleets as offensive weapons for many months to follow. The Japanese occupied Guam on December 9, 1941, Wake on December 23 and Manila on January 2, 1942. These events of December 1941 gave the Japanese temporary supremacy of the Pacific Ocean.

On February 2, 1942, a United States Cabinet committee, appointed two weeks earlier, found in favour of a highway linking Alaska to the United States. Further its findings recommended that it should satisfy two vital requirements (U.S. 79th Congress 1946, pp 9-10):

1. Furnish a supply route to link up the established airfields and thus permit their expansion and continued maintenance,

2. Provide an auxiliary overland supply route to Alaska, remote from possible attack by the enemy, to supplement sea and air routes and thus provide a certain measure of safety for the armed forces in Alaska as well as for personnel engaged in ferrying aircraft from the United States to Alaska.

Presidential approval was provided Feburary 11, 1942, for construction of the highway by the United States Army engineer troops, to be followed by contractors provided by the Public Roads Administration to upgrade the pioneer road surface to authorized standards. Three days later, February 14, 1942, approval to proceed with the project was given by the War Department. By exchange of notes between the Honorable W. L. MacKenzie King, Canadian Secretary of State for External Affairs and the United States Minister Pierrepont Moffat on March 18, 1942, formal agreement for the construction of the highway was reached. In effect the notes provided (U.S. 79th Congress 1946, p 11):

(1) The United States Army would make the necessary surveys and construct a pioneer road by use of Engineer troops.

(2) The highway would be completed under contracts made by the United States Public Roads Administration, with a view to finishing the project with all possible speed.

(3) The United States would maintain the highway for the duration of the war and for 6 months thereafter, unless the Government of Canada preferred to assume earlier responsibility for maintenance of the Canadian section.

(4) At the conclusion of the war, the Canadian part of the highway would pass to Canadian control, with the stipulation that citizens of the United States should not be discriminated against in its subsequent use.

(5) In consideration of these understandings, the Canadian Government agreed (a) to provide the right-of-way for the highway; (b) to waive all import duties, sales taxes, and license fees on equipment and supplies required for its construction; (c) to remit income tax on the income of the United States citizens employed in its construction or maintenance, and facilitate their admission to Canada; and (d) to permit the use of timber, gravel, and rock along the route of the highway as required in its construction.

On November 1942, nine months and six days following the issuance of the directive, fourteen years following the first serious proposal presented in the Alaska Legislature, the Alaska Highway pioneer grade was opened at Mile 1061, Soldier's Summit, Yukon Territory. Surfacing and grading continued with a total of 77 private Canadian and American contractors and 4 management contractors employed on a cost-plus-a-fixed-fee basis. By October 31, 1943, the Alaska Highway construction was 96 percent completed and construction activity ceased with the exception of bridge replacements. Completion cost of the project was $139,794,567.

The construction of the Haines Lateral Road was assigned to the contractors of the Public Roads Administration during the winter of 1942-43. This route was necessary as the transportation load of vital construction supplies on the White Pass and Yukon Railroad was too great, resulting in costly time delays of the Alaska Highway. Completion cost, including pioneer trail, grading and bridge construction totalled $12,216,000. Maintenance of the Haines Lateral Road by the United States Army terminated in February, 1944.

Camp facilities during 1942 were predominantly prefabricated frame buildings salvaged from the United States. Later a number of prefabricated metal huts (Butler buildings) were erected. As local contractor operated sawmills were put into operation more than 15 million board feet of milled lumber was utilized in camp construction.

Camps were of two types; large headquarter camps at Fort St. John, Fort Nelson, Whitehorse and Tok Junction, housed Public Roads Administration and their management contractors. These camps were primarily technical support staff, housing over 1000 people. The second or smaller camps were

construction or "line" camps, housing construction crews of 100-200 personnel. These line camps were usually at 10-15 mile intervals and at every major bridge job and sawmill site. At 100 mile intervals, telephone relay stations were manned by personnel of the Signal Corps enlisted men.

In addition to the camp facilities related to the Alaska Highway and Haines Road, construction of pumping stations at intervals of approximately 45 miles was undertaken to facilitate the transportation of fuels from the Whitehorse based refinery. The southern pipeline was 2 inches in diameter and extended to Watson Lake. This line, referred to as Canol No. 3 had five pumping stations along its highway length. The northern extension, referred to as Canol No. 4, consisted of a 3 inch diameter line northward to Fairbanks. Within the Yukon Territories there were seven pumping stations.

Following the termination of the war the responsibility for control and maintenance of the Canadian sector of the Alaska Highway was assumed by Canada, effective April 1, 1946. Maintenance and road improvements were carried out by under Canadian military supervision until April 1, 1964, at which time the Federal Department of Public Works took over the responsibility.

As of April 1, 1971, the responsibility of maintenance of the Alaska Highway and Haines Road have been the responsibility of the Yukon Territorial Government, Department of Highways and Public Works. At the transition time of Federal to Territorial maintenance jurisdiction the Department of Public Works of Canada produced an extensive report titled Northwest Highway System Handover, listing the locations of operational maintenance camps and land reserves for gravel quarries, rock quarries and bridge lots.

Methodology:

All sites that were identified as military during the 1944-45 period and presumed abandoned on Crown lands have been inspected by aerial and ground reconnaissance. The object was to evaluate the site as to:

1. Size of site utilized including refuse dumps where possible
2. Quantity and type of debris remaining
3. Vegetation associations, particularly advanced growth following the abandonment of the site
4. Possible means of disposal
5. Sensitive environmental conditions

Location Reference:

During the 1976 maintenance season the Yukon Territorial Government exchanged the mileage posts along the Alaska Highway for kilometer posts resulting in altered reference as to site location along the Alaska Highway. As bridge mileages have not been changed, I have identified the locations of sites based upon miles. These locations are a combination of referenced mileage to bridge locations and/or indicated locations by miles as presented on inventories in 1944 and 1945. In all cases the identification by mileage is self-evident when experienced on a map scale of 1:50,000. The attached sketches provide reference to local topographic features and should be unquestionable as to location identification.

Survey Limitation:

The information presented in this report comprises all information amassed relative to abandoned Army campsites on Crown land. Due to the fact that the Alaska Highway and Haines Road has been accessable to the public in terms of settlement and salvage it is difficult to determine the former status of some sites. In particular there is a site on the south side of the Alaska Highway at Mile 1095.1, Burwash Landing. The quantity of debris scattered about is extensive. However the site has not been included in this report as earlier inventories do not indicate this as military.

Many of the former Army campsites have been privately developed as tourist facilities. Places such as Iron Creek and Rancheria represent former construction camps. These sites exist as titled or leased lands and occupy for the most part the original construction site however it must be recognized that there will be a certain amount of debris associated with the perimeter of these properties. The inventory of such locations has not been attempted as a legal survey would be required to establish property boundaries. For the purpose of this report I have investigated group sheets and Alaska Highway strip maps available at the Federal Lands Office as well as requesting title searches of lands that may be associated with a former Army campsite and are now possibly privately occupied. The sketch maps (Appendix D) reflect the relative position and lot and group numbers of existing lots. The actual locations of private lots will require surveys to establish private property boundaries and prevent any infringement on private lands during actual clean-up. Where lands have been turned over to the Government of the Yukon Territory for jurisdiction,

such as Local Improvement Districts, abandoned Army sites have not been included. In general these former Army sites remain active as highway maintenance camps operated by the Yukon Territorial Government, Department of Highways.

As has been the experience with the Canol Road clean-up, many of the abandoned gravel pits contain small quantities of metal debris usually from the servicing of construction equipment. The Alaska Highway and Haines Road are no different in this respect. A large number of gravel pits have been abandoned following the construction of the highways. Advanced growth has concealed the entrances to these pits. Investigations of a number of these abandoned pits indicates only a small quantity of debris usually located toward the back of the pit. In view of the large number of abandoned gravel pits, the degree of advanced growth, and the small quantity of debris associated with each, the abandoned gravel pits have not been included in the survey. It would not be practical or desirable from an economical or environmental view to remove this minor amount of concealed debris.

Vegetation:

In general the majority of the debris is concealed by the invasion of vegetative advanced growth. In general those sites southward of Whitehorse are dominantly lodgepole pine residuals on well drained coarse textured soils. Where drainage is impaired, white spruce represents the residual vegetation on moist, fine textured soils. Northward from Whitehorse, white spruce is the dominant residual while poorer site conditions are occupied by black spruce. The presence of willow and alder,

increases with northward locations, becoming increasingly common and better established toward the White River area (Mile 1171).

In general the southern areas exhibit advanced growth up to 10 feet in height for lodgepole pine while similar growth of white spruce is in the 3 to 5 foot range. The general trend northward is a change in residual forest species from lodgepole pine to white spruce and a decrease in growth productivity.

Permafrost conditions are sporadic in occurrence along the Alaska Highway and will likely occur on poorly drained soils. The presence of black spruce in conjunction with heavy ground vegetation will maintain soil temperatures at a frozen state later into the thaw season. These conditions are conducive to the presence and stability of permafrost. A likely example of such a site would be Mile 1156. The use of mechanical equipment on possible permafrost areas should be avoided in the interest of maintaining surface stability. If it is necessary to remove debris from areas where there is potential soil thermal degregation, then hand removal of debris should be utilized rather than equipment.

Wildlife:

The existance of the remaining debris is not likely to have an effect upon wildlife. As was noted along the Canol Road, the presence of wire created a hazard to moose and caribou; however similar circumstances of abandoned wire do not exist along the Alaska Highway and Haines Road with the exception of minor amounts of barbed wire. The majority of barbed wire fencing from around the Canol pumping stations has been removed. Relative to small mammals it is likely that the removal of debris accumu-

lation will temporarily disturb their shelter.

Social Effects:

In light of the public interest generated, both pro and con, from the clean-up of the Canol Road it is likely that mixed public opinion could result from such a planned clean-up. It would be in the Department's interest to survey public attitude toward such a clean-up of the Alaska Highway and Haines Road.

With the large number of private land interests associated with abandoned Army campsites, the Department of Indian and Northern Affairs will have to take adequate steps to inform the respective property owners of any clean-up intentions in advance. A legal survey will be required to identify property boundaries sufficiently that all private property remains undisturbed by any prospective contractor engaged in clean-up and restoration.

The tendering for prospective clean-up should realize the potential of local available labor and local based construction companies. Preference should be extended to those companies established in the Yukon Territory with the intent of creating local jobs and the potential economic input benefit to the local community.

With regards to tourist potential there remains at Stony Creek Mile 956 suitable buildings that could be improved as a historical site for the Alaska Highway. The buildings are in reasonable repair and are of restorable quality. Previously these buildings had been privately designated for removal, however the present status is unknown and requires further investigation.

Salvage:

Inventories of remaining debris associated with abandoned Army campsites reveal relatively minor quantities of potentially salvageable metals. Unlike the Canol Road these metals do not exist in quantities at each abandoned site but rather at only a few of the abandoned sites along the Alaska Highway. As these sites are widely separated the concentration of salvageable metals to a central location for future removal would require a separate loading, hauling and stockpiling operation. The additional expense for salvaging metal cannot be offset by the value of the metal considered to be worth one dollar per ton at the stockpiled site. In view of the small and isolated quantities of salvageable metal and the cost of stockpiling it is not considered feasible to salvage. Alternatively all metal and debris should be disposed of by compaction and burial at a suitably chosen location.

Haines-Fairbanks Pipeline:

The Haines, Alaska to Fairbanks, Alaska pipeline consists of 5 pumping stations located within the Yukon Territory with a 7 inch diameter transmitter line. The following is a list of the pumping stations:

	Location	Mile
1.	Blanchard River	95.5 Haines Road
2.	Haines Junction	1025.5 Alaska Highway
3.	Destruction Bay	1081.0 Alaska Highway
4.	Donjek River	1123.8 Alaska Highway
5.	Beaver Creek	1202.8 Alaska Highway

The pipeline has been closed out of production and cleared of all fuels. Pumping stations have been closed, buildings remain locked within a posted chain link fence. The surrounding areas have been restored and seeded to a variety of grasses. The appearance of these sites during reconnaissance in 1976 appeared quite acceptable.

A complete reconnaissance of the pipeline and facilities was presented in a study September 18, 1972, titled Haines-Fairbanks Pipeline Yukon Territory and prepared by the Department of Indian Affairs and Northern Development. For further reference please refer to the above report.

Clean-Up Alternatives:

Alternative I: Total Clean-Up

Assumes that all identified abandoned Army sites situated on Crown lands will be effectively cleaned-up of debris. Those areas affected, as a result of debris collection and disposal, will be restored to a stable, natural, productive landscape by:

1. Identification of all locations to be cleaned-up by the project supervisor.
2. Surveying and clearly identifying associated property boundaries of private interests.
3. Public tendering for clean-up.
4. Collection of debris for burning and/or burial at a suitable local site.
5. Transportation of debris to an alternate site for disposal

on specific sites.

6. Effecting restoration to ground surfaces, including levelling, sloping, stabilizing, scarification and seeding as required.

Alternative II: Clean-Up of Major Debris Sites

Assumes that there is insufficient debris remaining at all sites to economically warrant total clean-up and that clean-up should be implemented on specific sites where larger quantities of debris exist, these sites reflecting either an environmental or an aesthetic value. Clean-up would involve:

1. Identification of the specific sites to be cleaned up by the project supervisor.
2. Surveying and clearly identifying associated property boundaries of private interests.
3. Public tendering for clean-up.
4. Collection of debris for burning and/or burial at a suitable local site.
5. Transportation of debris to an alternate site for disposal on specifically indicated sites.
6. Effecting restoration to ground surfaces including levelling, sloping, stabilizing, scarification and seeding as required.

Timing of Clean-Up Alternatives:

In order that debris can be located and cleaned up it is imperative that the work be conducted during the summer, or snow-free period. This period on the average would be approximately from June first to the middle

of October, a period of approximately 120 days or 20 weeks.

Commencement of clean-up would likely occur around the first week of June varying either way with the actual south to north location along the Alaska Highway reflecting the lag time of spring melt. Termination of clean-up would occur around mid-October with the presence of permanent snow cover. Termination of clean-up may be extended by the advanced collection of debris prior to snowfall, with burning and/or removal to follow.

Snowfall will affect the clean-up of abandoned sites by increasing terrain sensitivity. Vehicle disturbance will be increased on fine textured, poorly drained soils during snow melt when soil moisture is increased. In addition the completion and approval of the clean-up project by the project supervisor will be affected by the presence of snow. In the event that final clean-up inspections are not completed before snowfall it will be necessary to delay final clean-up approval until the following summer season and subsequently the release of all or a portion of any hold back fee.

The major factor which will affect the overall clean-up timing is availability of suitable weather conditions for burning debris. It is anticipated that site clean-up should be progressive, that is, each site completed before moving to the next site. This method of operation, considering the quantities of wood debris requiring burning, may not be possible. In an excessively dry season it will be likely that burning will be delayed until fall when conditions become more suitable.

The time required per site (Appendix B & C) reflects the anticipated time required per site considering progressive site clean-up and burning.

Alternative I:

It is anticipated that the total clean-up will require approximately 105 days (Appendix B) to effect. This includes a 15% allowance for unfavourable weather and mechanical problems. Considering the length of time required it is essential that commencement of the clean-up start within the first week of June, completing, as per estimate, by the first week of November. In addition to the 105 days required, will be approximately one month of planning and identification by the Government project supervisor and surveyor team and completion reporting time of one month following the termination of clean-up.

Alternative II:

It is anticipated that clean-up of major debris sites will require 50 days (Appendix C) including a 15% allowance for unfavourable weather and mechanical repairs. Considering the shorter time period required for Alternative II, commencement of clean-up could be as late as the end of June, finishing by the second week of September. In addition to the clean-up schedule a Government project supervisor would be required for a period of one month before and after the project, as in Alternative I, to effect site identification and completion reports. The surveying of sites before clean-up will require approximately 15 days.

Cost Analysis:

The cost analysis is based upon the minimum amount of equipment and manpower expected to be required to effect the clean-up. It is recognised that due to the variability of the sites involved, all pieces of

equipment may not be required on each specific site, but they all should be retained for the overall project. It is further assumed that when equipment is not in operation, the operator will be productive from a labour standpoint. With this consideration the stand down and labour costs will be considered to be approximately equivalent to the operation of the equipment. It would not be economical, for example, to hire a highboy tractor trailer unit to move the caterpillar every other day while releasing the unit when not required, the road costs would be excessive as well as project timing would become dependent upon daily equipment availability. In addition, the cost analysis reflects the additional time required by the government supervisor and survey crew in identifying and marking sites and the additional time required following clean-up completion. This additional time is expected to be utilized in preparing a final report covering the progress of the clean-up operation.

A summary of the projected cost of clean-up based on 1976 cost figures is presented for both Alternatives I and II. A breakdown of cost analysis is included in Appendix B & C.

Summary Cost Analysis:

Alternative	Number of Sites	Number of Days	B.C. Cost	Yukon Cost	Sub Total	Gov't Supervision	Total
I	41	107	$13,900	$236,600	$250,000	$27,250	$277,750
II	12	50	-	$116,800	$116,800	$17,300	$134,100

As is apparent, Alternative II represents approximately one-third of the overall sites. The quantity of debris concentrated at these sites, in the form of kitchen refuse, wood materials, partial building frames,

and vehicle hulks and components indicate that Alternative II will require approximately half the overall projected time and at approximately half the cost of Alternative I.

Restoration:

The invasion of natural vegetation over the last thirty years has been very successful. In some cases access roads are barely identifiable due to advanced growth, while on other sites the central portions of the previous campsites remain relatively free of vegetation. In all cases the perimeters of the formerly disturbed sites exhibit invasion of the natural vegetation. Factors such as soil compaction, exposure, and soil moisture deficits influence the reestablishment of vegetation.

During the clean-up operations should be conducted in such a manner as to preserve as much as possible the residual as well as the advanced growth from invading natural vegetation species. This objective can best be accomplished by utilizing existing access for vehicle movements and natural or artificially existing clearings for burning and burial sites.

The purpose of establishing a vegetation cover is to:

1. To reduce the possibility of potential for soil erosion from surface water movement by establishing a vegetation root mass, to bind soil particles.
2. To minimize the surface disturbance caused by the clean-up operation.

Of these factors, the first is of immediate importance. It is advantageous to promote slope stability by the application both native and

exotic grass species coupled with proper construction of drainage diversions to prevent direct water run off on steep slopes. As slope angle increases the relative effectiveness of direct seeding decreases as seeds are redistributed by gravity, wind and water. In the case of steep slopes, a seed mulch applied by hydroseeding should be utilized to assist the establishment and germination of seeds.

The second objective is considered a cosmetic approach to site rehabilitation. It has been noted (Van Eyk, P. 23) that application and subsequent fertilization of exotic grass will produce a rapid, dense growth resulting in heavy accumulation of grasses, which may represent a significant fire hazard. In addition the growth of exotic grasses will hinder the natural invasion of native vegetation which could be encouraged through application of fertilizers only.

Relative to the clean-up of the abandoned army campsites, the following criteria should be considered:

1. All disturbed areas should be levelled or regraded to conform to existing topography.
2. Burial sites require a minimum of 3 feet of overburden covering debris with the maximum height above the surrounding landscape not to exceed two feet.
3. Natural invasion of vegetation should be allowed on areas where water erosion is of low potential. Application of fertilizer would likely increase the rate of vegetation invasion.
4. Artificial revegetation should be considered on slopes that are subject to water or thermal erosion. Restoration should be affected by:

a) grading of the disturbed slope to reduce the slope angle.

b) diversion of concentrated flows of water through properly constructed cross ditches or breakers traversing the face of the slope.

c) manual or hydroseeding of deep rooting grass species on slopes followed by early spring planting of willow or alder cuttings.

d) application of fertilizer of 26-18-9 composition at the rate of 300 lbs per acre at the time of seeding. A follow-up application of 19-19-19 fertilizer has been found to be beneficial (Van Eyk, P. 18) in promoting growth.

It should be noted that the establishment of a grass cover has little or no effect in stabilizing soil conditions subject to gullying by water. Plant growth is usually not fast enough to restore the organic mat within the first year (Bliss, P. 131). The importance of drainage diversion coupled with seeding programs cannot be over-emphasized.

The seed mix considered for use with demonstrated use in northern areas (Bliss, P. 134) would include:

	Weight of Seed (Lb/Ac)
Arctared creeping red fescue	13
Nugget Kentucky bluegrass	13
Tall arctic grass	8
Bluejoint	8
Slender wheatgrass	4
Frontier reed canary grass	4

Application of seed should be either during early spring while snow still persists or during the late fall as moisture is critical for seed germination and establishment. In addition the establishment of willow and alder cuttings is dependent upon ample moisture conditions. The ideal time for planting of cuttings would be in the spring following the initial spring run off.

Summary:

During 1942 and 1943 the Alaska Highway and the Haines Lateral Road were constructed by the United States Military and the Public Roads Administration for the purpose of transporting men and supplies to Alaska. Within the Yukon Territory a total of 83 major sites consisting of maintenance camps, communication repeater sites and Service Command Centres were constructed, as well as pumping stations to move Norman Wells refined crude products from Whitehorse to Watson Lake, Yukon and Fairbanks, Alaska in support of the northern airfields operations. Following the termination of the war and through the following years, many of the campsites were phased out and eventually abandoned.

During the summer season of 1976 the identification of former army campsites was undertaken with the object being to identify those abandoned army campsites on Crown lands, establishing an inventory of remaining debris and making recommendations towards their clean-up and restoration respecting environmental objectives. The inventory identified 41 sites of the total 83 as being partly or wholly abandoned on Crown lands.

The general debris conditions of the sites vary greatly from scattered wood debris requiring burning to sites where concentrations of metal debris and wood remain. In no case are there sites where remains are similar in quantities and types to those associated with the abandonment of the Canol Road.

In addition to location of abandoned campsites, attempts were made to identify refuse dumps formerly utilized by these camps, however it is felt that this phase is extremely difficult and the degree of success in identification is low. Of those refuse dumps identified as of military

origin, at least four remain active. The restoration of these sites have been included from an environmental and aesthetic point of view. Clean-up may be considered from an aesthetic value in light of local tourism promotion as a viable economic base for the Yukon Territory.

The assessment report does not view the remaining debris as potentially salvageable for the following reasons:

1. Relatively low quantity of salvageable metal associated at a minority of the identified sites.
2. Based upon tendering of stockpiled salvaged from the Canol Road in 1976 a bid value of $1.00 per ton of scrap metal is not economical to warrant the salvage and stockpiling of debris from the Alaska Highway.

Clean-up and restoration of abandoned sites is based on the disposal of debris by burning and/or burial. Two alternatives have been presented:

1. Total clean-up of all sites requiring 107 days of working at a total cost of $227,750.00.
2. Clean-up of 12 major environmental or aesthetically valued sites requiring 50 days working time at a total cost of $134,100.00.

Specific recommendations per site, including site inventory and photographs are included in Appendix D.

Other abandoned army campsites include a 7 inch pipeline from Haines, Alaska, via the Haines Road and Alaska Highway to Fairbanks, Alaska. This pipeline, including 5 pumping stations, is inoperable and considerations for its disposal were commenced in 1972. For the purpose of this assessment, the pumping stations have been mentioned in Appendix D, however clean-up and restoration is not presented. For further infor-

mation refer to a report on the "Haines-Fairbanks Pipeline Yukon Territory" by the Department of Indian Affairs and Northern Development, September 18, 1972.

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Appendix A. Inventory of Former Army Facilities

Mile	Location	1945 Military	1976 Status
595	Iron Creek	6 buildings	Private: Iron Creek Lodge Title 75Y829, Lot 3, Group 758
606.3	Hyland River, British Columbia	16 buildings	Provincial campground
619.7	Lower Post, British Columbia	3 buildings	Community of Lower Post
631.9	Watson Lake	16 buildings	*Y.T.G. campsite
634.6	Watson Lake	Standard Oil pumping station	Y.T.G. Reserve, Intersection of Alaska & Campbell Highways
635	Watson Lake	14 buildings	Y.T.G. highway maintenance camp
642.6	Liard River	11 buildings	Y.T.G. Reserve
642.7	Liard River	26 buildings	Y.T.G. Reserve
652.7	Roger Lake (DoDo Lakes)	26 buildings	Crown lands, private lease #2691
670.2	Lower Rancheria River	17 buildings	Y.T.G. Reserve, bridge lot
687	Rancheria River	13 buildings	Crown Reserve, Dept. of Northern Affairs & National Resources
692.7		Standard Oil pumping station Z	Crown land
710	Rancheria	28 buildings	Private: Lots 2 & 5, Group 756 William Howard Simpson (Title)
721.6	Rancheria River	1 building	Y.T.G. Reserve bridge lot
722.5	Pine Lake, Airfield Junction	≈9 buildings	Y.T.G. Reserve flight strip Crown
727.3		3 buildings	Crown, removed
733	Swift River	14 buildings, army repeater station, highway maintenance	Y.T.G. highway maintenance camp
741.6	Screw Creek, British Columbia	28 buildings	British Columbia

* Yukon Territorial Government, under control of the Commissioner of the Yukon Territory

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B.C.

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Appendix A (Continued)

Mile	Location	1945 Military	1976 Status
911.0	MacRae	24 buildings, headquarters Alaska highway maintenance division & maintenance camp	Y.T.G. D.C.Z.
917.0	Whitehorse	2 buildings	Y.T.G. D.C.Z.
919.0		Army checking station North gate (1944)	Y.T.G. D.C.Z. Unidentified
936	Takhini	12 buildings, Old camp 1W	Private lease, Lot 299, Group 804, M.G. Yakielashek, 1/3/75
946.4	Takhini River	11 buildings	Crown
956	Stony Creek	9 buildings, maintenance camp (old 47)	Crown
956.8	Stony Creek	Standard Oil pump station B	Crown
968.1	Mendenhall River	10 buildings	Unidentified; Y.T.G. campground, private service station (closed)
974.7	Champagne	2 buildings	Reserve application, Dept. of Indian & Northern Affairs
987.5	Cracker Creek	19 buildings	Crown; Private titled C. J. Boland, Lot 18, Group 803
996.3	Aishihik River	Buildings removed, army repeater station	Building sites, private land, refuse on Crown & private lands
1000	Canyon	Standard Oil pump station C	Crown
1006	Marshall Creek	9 buildings	Location unidentified
1016	Haines Junction	18 buildings, maintenance camp (old 108)	Y.T.G. local improvement district. Community of Haines.
1036.2	Haines Junction	Standard Oil pump station D	Crown
1038	Sulphur Lake	2 buildings	Y.T.G. campground
1054	Kluane	5 buildings	Private: Martin & Frances Victor, Fairbanks Alaska, Title #64HH

Appendix A (Continued)

Mile	Location	1945 Military	1976 Status
1056	Kluane	26 buildings, maintenance camp (old 180)	Y.T.G., primarily disposed of during highway realignment
1064.1	Horse Shoe Bay	2 buildings	Unidentified
1080.8	Destruction Bay	Standard Oil pump station E	Lot 287, Group 852, Diplomatic Note, Haines Fairbanks pipeline pump station
1082.9	Destruction Bay	3 buildings	Y.T.G. Reserve
1083	Destruction Bay	26 buildings, army relay & repeater station & hospital	Y.T.G. Reserve
1083.8	Destruction Bay	8 buildings, old camp	Y.T.G. Reserve
1092.3	Burwash Camp	2 buildings	Y.T.G. Gravel pit
1098	Duke River	26 buildings, maintenance camp (old 200)	Crown
1126.4		Standard Oil pump station F	Lease #3391-2 C. M. Bradley Crown
1130	Donjek River	16 buildings (old camp)	Private lease
1130.1	Donjek River	12 buildings	Private lease, Crown
1137	Donjek River	7 buildings	Crown buildings removed
1146.5	Edith Creek	7 buildings	Unidentified
1150		1 building	Unidentified
1156	Koidern	21 buildings, maintenance camp (old 259)	Crown
1164	Koidern River	12 buildings, Koidern repeater station	Private J.W. Cook, Agreement of sale
1166	Koidern	Standard oil pump station G	Crown
1167.5	White River	13 buildings, army checking & relay station (Camp O'Hara)	Crown, private lands adjacent
1171	White River	14 buildings	Crown

Appendix A (Continued)

Mile	Location	1945 Military	1976 Status
1176		1 building	Unidentified
1184	Dry Creek	18 buildings	Crown
1191.5	Enger Lakes	2 buildings	Crown, abandoned gravel pit
1200		12 buildings, old camp (Lundeen's)	Y.T.G. highway right-of-way, undeveloped highway rest stop
1200.7	Beaver Creek	22 buildings, old camp	Private, Lot 10, Group 951, V.O. Livesay, Land Sale 2455, 15/2/57; Crown
1205.5	Beaver Creek	Standard Oil pump Station H	Crown
1206.2		16 buildings, maintenance camp	Crown
1213		10 buildings	Crown
1213.1		1 building	Private, Lot 14, Group 951, Hoffman
1220		3 buildings	Private
103.2	Takhanne River (Haines Road)		Crown

Appendix B. Alternative I: Total Clean-Up

Site		Required Time (Days)	Clean-Up Description
652.7	DoDo Lakes	2	Hand, Burn
670.2	Little Rancheria River	2	Mechanical, Burn, Bury
687.0		2	Mechanical, Burn, Bury
692.7	Canol pumping station Z	3	Burn, Hand, Mechanical, Bury Stabilize
722.5	Pine Lake Airfield	1	Mechanical, Burn
741.6	Screw Creek (B.C.)	1	Mechanical, Burn
747.6	Canol pumping station Y (B.C.)	½	Mechanical, Burn, Bury
770.0	Helen Lake (B.C.)	3	Mechanical, Hand, Burn, Bury
775.8	B.C./Y.T. Border (B.C.)	½	Mechanical, Burn, Remove
780.2	Garbage Dump	1	Burn, Bury
793.9	Canol pumping station X	2	Hand, Mechanical, Burn, Bury
796.6	Morley Bay	2	Mechanical, Hand, Burn
829.7	Brook's Brook	4	Mechanical, Hand, Burn, Bury
843.9	Squanga Lake flight strip	3	Mechanical, Burn, Bury
854.8	(i & ii) Canol pump station W	3*	Mechanical, Burn, Bury
883	Marsh Lake	2	Mechanical, Hand, Burn
946.4	Takhini River	3	Mechanical, Burn, Remove
956	Stony Creek	4	Preserve, Mechanical, Burn, Remove
956.8	Canol pump station B	1½	Mechanical, Burn
987.5	Cracker Creek	4	Mechanical, Remove
996.3	Aishihik River	7	Hand, Mechanical, Burn, Remove
1000	Canol pump station C		
1036.2	Canol pump station D	1	Burn
1056	Kluane	1	Hand, Burn, Bury
1080.8	Canol pump station E	1	Mechanical, Burn, Bury
1092.3	Burwash Landing	2	Hand, Mechanical, Burn, Remove

* Requires seasonal timing

Appendix B (Continued)

Site		Required Time (Days)	Clean-Up Description
1098	Duke River	2*	Mechanical, Burn
1126.4	Canol pump station F	2	Mechanical, Hand, Burn, Bury
1130.1	Donjek River	5*	Mechanical, Hand, Burn, Bury
1156	Koidern	2	Mechanical, Burn, Remove
1166	Canol pump station G	2	Mechanical, Hand, Burn, Bury
1167.5	Koidern	2	Hand, Mechanical, Remove
1171	White River	2	Mechanical, Burn, Remove
1184	Dry Creek	1	Mechanical, Hand, Burn, Remove
1191.5	Enger Lakes	½	Mechanical, Remove
1200		1*	Hand, Remove
1200.7	Beaver Creek	1	Mechanical, Remove
1205.5	Canol pump station H	2	Mechanical, Hand, Burn, Remove
1206.2		2	Mechanical, Hand, Burn, Remove
1213		2	Mechanical, Hand, Burn, Bury
103.2	Million Dollar Camp (Haines Road)	10	Burn, Mechanical, Hand

Total 93 days
plus 15% allowance = 107 days

* Requires seasonal timing

Appendix B. Alternative I: Cost Estimate

Equipment:	British Columbia	Yukon	Total
D6 Caterpillar c/w operator @ $35/hr; 107 days @ 8 hrs	1700	28,300	30,000
Highboy Tractor Trailer c/w operator @ $35/hr; 107 days @ 8 hrs	1700	28,300	30,000
Tandom Axle Dump Truck c/w operator @ $30/hr; 107 days @ 8 hrs	1400	24,300	25,700
Jinpole Winch Truck c/w operator @ $22/hr; 107 days @ 8 hrs	1000	17,800	18,800
3/4 Ton 4 x 4 Pickup Truck @ $900/mon; 5.25 months	300	4,400	4,700
3/4 Ton Crew Cab Truck @ $950/mon; 5.25 months	300	4,700	5,000
Manpower:			
Foreman @ 9.00/hr 130 days @ 8 hrs	500	8,900	9,400
Labour (4) @ 8.25/hr 107 days @ 8 hrs	1600	26,700	28,300
Cook @ 8.25/hr 130 days @ 8 hrs	500	8,100	8,600
Accomodations:			
$30/man/day, 159 days, 10 men	2600	45,100	47,700
Reclaimation Cost Allowance:	800	14,200	15,000
Contractors Overhead:	1500	25,800	27,300
Total Labour and Equipment:	13,900	236,600	250,500

Appendix B. Alternative I: Cost Estimate Government Supervision

Equipment:	British Columbia	Yukon	Total
3/4 Ton 4 x 4 Pickup Truck @ $900/mon; 7.25 months	350	6,150	6,500
3/4 Ton Crew Cab Truck @ $950/mon; 1 month	-	950	950
Manpower:			
Project Supervisor @ $1600/mon; 7.25 months	600	11,000	11,600
Surveyor @ $1500/mon; 1 month	-	1,500	1,500
Surveyor's Assistant @ $1000/mon; 1 month	-	1,000	1,000
Accomodation:			
$30/man/day 190 days	300	5,400	5,700
Total	1,250	26,000	27,250

Total Cost of Clean-Up With Government Supervision $277,750

Appendix C. Alternative II: Clean-Up of Major Debris Sites

Site		Required Time (Days)	Key Word Work Description
670.2	Little Rancheria River	2	Mechanical
687		2	Mechanical, Hand, Burn
780.2	Garbage dump	1	Burn, Bury
829.7	Brook's Brook	4	Mechanical, Hand, Burn, Bury
843.9	Squanga Lake flight strip	3	Mechanical, Burn, Bury
883	Marsh Lake	2	Mechanical, Hand, Burn
946.4	Takhini River	3	Mechanical, Remove
987.5	Cracker Creek	4	Mechanical, Remove
996.3	Aishihik River	7	Mechanical, Hand, Burn, Bury
1000	Canol pump station C		
1130.1	Donjek River	5	Mechanical, Hand, Burn
103.2	Million Dollar camp (Haines Road)	10	Burn, Mechanical, Hand, Bury

Total 43 days
plus 15% allowance = 50 days

Appendix C. Alternative II: Cost Estimate

Equipment:	Total
D6 Caterpillar c/w operator @ $35/hr; 50 days @ 8 hrs	14,000
Highboy Tractor Trailer c/w operator @ $35/hr; 50 days @ 8 hrs	14,000
Tandom Axle Dump Truck c/w operator @ $30/hr; 50 days @ 8 hrs	12,000
Jinpole Winch Truck c/w operator @ $22/hr; 50 days @ 8 hrs	8,800
3/4 Ton 4 x 4 Pickup Truck @ $900/mon; 2.5 months	2,300
3/4 Ton Crew Cab @ $950/mon; 2.5 months	2,400
Manpower:	
Foreman @ 9.00/hr 60 days @ 8 hrs	4,300
Labour (4) @ 8.25/hr 50 days @ 8 hrs	13,200
Cook @ 8.25/hr 60 days @ 8 hrs	4,000
Accomodations:	
$30/man/day 10 men 72 days	21,600
Reclaimation Cost Allowance:	7,500
Contractors Overhead:	
25% on Overhead and Labour	12,700
Total Labour and Equipment	116,800

Appendix C. Alternative II: Cost Estimate Government Supervision

Equipment:	Total
3/4 Ton 4 x 4 Pickup Truck @ $900/mon; 4.5 months	4,100
3/4 Ton Crew Cab Truck @ $950/mon; 1 month	950
Manpower:	
Project Supervisor @ $1600/mon; 4.5 months	7,200
Surveyor @ $1500/mon; .75 months	1,100
Surveyor's Assistant @ $1000/mon; .75 months	750
Accomodation:	
$30/man/day 105 days	3,200
Total	17,300
Total Cost of Clean-Up With Government Supervision	$134,100

Appendix D. Inventory

Mile 652.7: Crown Lands; Private Lease 2691

Condition:

- 4 partial log slab buildings
- 2 wharfs
- 1 concrete foundation
- 2 log building foundations
- 1 Butler quonset hut frame
- 1 walkway of wood and sawdust

Vegetation:

Black spruce along lower ridge and Roger Lake
Main site aspen, willow and alder

Restoration:

1. Remove and burn remains of log slab buildings, wharfs and wood foundations and scattered wood debris.
2. Retain walkway as is.
3. Remove Butler building frames to Mile 670.2 for burial.
4. Retain concrete on site.

Mile 670.2: Commissioner's Lands; Reserved Bridge Lot 22.95 acres

Condition:

- building remains bulldozed into windrow
- scattered tin cans
- dump
- 3 barrels
- scrapper blades
- freezer box
- wood debris scattered about site

Vegetation:

- Lodgepole pine predominant with aspen along clearing

Restoration:

1. Collect wood debris and burn
2. Collect metal and bury on site as indicated

Mile 687.0: Crown Lands: Lot 2, Group 806, Citizenship and Immigration Reservation, 40 acres; Lot 3, Group 806, Dept. Northern Affairs and Natural Resources Reservation, 5.77 acres

Condition:

- 7 collapsed buildings
- 16 ft by 20 ft log building (standing)
- dump (686.7 mile) former military dump currently used by Transport Cafe, comprised of 3 adjoining sites

Vegetation:

Predominantly aspen.

Restoration:

1. Collect wood building debris, burn and bury
2. Collect, burn and bury garbage dump on major site, restore site for continued use.

Mile 692.7: Crown Lands

Conditions:

- buildings bulldozed over embankment
- approximately 1/3 of the barb wire fence remains

Vegetation:

Lodgepole pine residual associated with aspen and willow

Restoration:

1. Fall aspen at lower edge of building debris and burn site.
2. Remove metal following burn and bury
3. Effect slope restoration and stabilization

Mile 722.5: Crown Lands

Site 1 - 2 log buildings
- 1 wood frame building

Site 2 - portions of 3 buildings
- 1 truck camper shell
- small amount of scattered garbage

Site 3 - airfield locator tower
- 2 collapsed buildings
- scattered wood debris

Site 4 - tent frames
- 5 grease kegs

Vegetation:

Lodgepole pine residual and lodgepole advanced growth.

Restoration:

1. Remove wood frame building in Site 1, collect wood debris to indicated burn location, Site 3, for burning.
2. Pile tent frames to one side for future use.
3. Retain the 2 log buildings at Site 1.
4. Retain tower.

Mile 741.6: Province of British Columbia

Conditions:

- 1 car body
- 1 utility trailer
- scattered wood debris and logs from buildings
- collection of garbage (mostly metal) in gravel pit

Vegetation:

Aspen and lodgepole pine advance growth.
Alder and willow along Screw Creek.

Restoration:

1. Collect and burn wood and log debris.
2. Collect, crush and bury metal.

Mile 747.8: Province of British Columbia

Condition:

- 1, 8 x 16 ft building shelter
- 1 vehicle service ramp (log)
- 2 drums
- 2 tires
- 1 trailer frame, burned

Vegetation:

Lodgepole pine with 3-7 foot advanced growth along trails

Restoration:

1. Collect and burn wood debris
2. Crush and bury metal

Mile 770: Province of British Columbia

Condition:

- wood debris of 12 buildings
- sawdust pile
- water supply route
- approximately 12 grease kegs
- 2, 45-gallon drums

Vegetation:

Advanced growth of lodgepole pine, white spruce and aspen. Willow along Hazel Creek.

Restoration:

1. Wooden debris to be burned
2. Collect and bury metal

Mile 775.8: Province of British Columbia

Condition:

- 1 collapsed building
- 1 crushed car body

Vegetation:

Lodgepole pine

Restoration:

1. Burn collapsed building on site
2. Remove car body for burial at Mile 780.2

Mile 780.2: Crown Land

Condition:

- dump formerly used by military for operation of camp at Mile 777.7. More recently used by Morley River Lodge and Yukon Territorial Government campground.
- approximately 6 vehicle hulks
- numerous tires

- numerous barrels
- numerous refuse

Vegetation:

Aspen and white spruce

Restoration:

1. Fall aspen at base of garbage dump
2. Pile and burn site
3. Bury site with gravel from adjacent pit (approximately 300 feet away)
4. Abandon site

Comment:

Existing dump at 780.2 is visable from the Alaska Highway and receives addition of refuse from the Morley River campground. This site is not adequate for the quantity of refuse it receives and is not located such that it can be periodically reduced by fire.

Mile 793.9: Crown Land

Condition:

- 2 concrete pads
- remains of quonset hut
- garbage dump
- scattered wood and tins
- ≈ 300 feet of 2 inch pipe

Vegetation:

Aspen, lodgepole pine and white spruce. Central camp area remains open and relatively free of vegetation.

Restoration:

1. Collect all wood debris and burn
2. Collect metal to old garbage dump, crush and bury
3. Remove pipe and bolts from concrete
4. Leave concrete intact

Mile 796.6: Crown Land

Condition:

- 3 log buildings partially standing
- 2 single barrel stoves

Vegetation:

Site is heavily vegetated with residual and advanced growth white spruce. Ground cover of heavy sphagnum moss. Access trails support heavy alder and willow growth.

Restoration:

Centrally pile remains of log buildings for burning.

Comment:

Building remains are not visable from the Alaska Highway (approximately 300 feet)

Mile 829.7: Commissioner's Lands; Crown

Conditions:

- approximately 25 drums, primarily along beach and in Teslin Lake
- 2 vehicle hulks
- 3 concrete foundations
- wood debris from approximately 6 buildings
- boat
- loading ramp
- two garbage dumps:
    1. Wood and metal
    2. Main dump/land fill site (Mile 827.9)

Vegetation:

Aspen and willow dominantly. White spruce around dump #1.

Restoration:

1. Gather and burn wood debris.
2. Collect drums, vehicle hulks and metal debris, crush and bury at dump #2.
3. Salvage boat for historic purpose
4. Remove debris from dump #1 for disposal at dump site #2
5. Restore dump #2 (Mile 827.9) to suitable condition for continued use

Mile 843.9: Crown Lands with central titled lot: Wann, Helen, Lot 15, Group 805

Condition:

- approximately 8 buildings
- underground storage cellar (root cellar)

- approximately 40, 45-gallon fuel drums
- 5 vehicle hulks
- 1 bulldozer frame
- 1 grader frame
- 1 snow plough
- 1 diesel generator
- approximately 50 tires
- approximately 100 ft of pipe
- approximately 6 small garbage dumps

Vegetation:

Lodgepole pine and aspen

Restoration:

1. All metal and tires remove to restored Canol camp number one, Mile 0.5 on the Canol Highway and place adjacent to Canol salvage, 1975 (approximately Mile 836.5 Alaska Highway)
2. Collect and burn all wood debris
3. Collect centrally and bury garbage on site
4. Collapse storage cellar

Comment:

Debris are scattered at various locations along one main east-west trail paralleling and south of the Alaska Highway. Considerable additional trails exist, likely due to area logging.

Extensive searching of the area by ground and twice by helicopter failed to locate any major dump site.

Mile 854.8: Crown Land

Conditions:

All buildings and facilities have been removed
- 2 dumps
  1. Rusted tins, wood and one vehicle hulk located approximately ½ mile west of the site along a trail
  2. Small amount of currently deposited debris located on the site
- approximately 5, 45-gallon drums
- portion of 7 strand barb wire fence

Vegetation:

White spruce, willow

Restoration:

1. Remove debris, drums and barb wire to dump #1
2. Pile, burn, crush and bury on site

Comments:

Associated with Canol pump station W, at Mile 854.5 is the remains of a sawmill likely utilized by the army. This site would be approximately ½ mile north of the Alaska Highway.

Conditions:

- wood frame structure
- extensive slab piles

Vegetation:

White spruce and willow

Restoration:

Pile and burn during the late fall (access trail is impassable to wheel traffic due to muskeg sections)

Mile 883: Commissioner's Lands, Lot 326, Group 804; Private, 1218, Group 804

Conditions:

- portions of collapsed metal Butler building
- 8' x 8' x 8' wood cribbing
- asphalt roofing material
- wood debris
- portion of wood boat

Vegetation:

Spruce and willow

Restoration:

1. Collapse and fill cribbing
2. Pile and burn wood debris
3. Remove metal to Whitehorse dump

Comment:

Restoration to the former military dump, Mile 882.3 was affected by burning and burial during June 1976. Abandoned Lease #2230-C (Leshart) should be restored.

Conditions:

- remains of two military buildings
- one car body
- 2, 45-gallon drums
- grease keg

Restoration:

1. Remove wood to main site for burning
2. Remove vehicle hulk and drums to Whitehorse for disposal

Mile 946.4: Crown Lands

Condition:

- one complete building
- one partially removed building
- concrete building foundation
- dump located south of mile 945 approximately 0.5 miles; extensive debris, approximately 26 vehicle hulks, 2 buildings, large accumulation of metal debris

Vegetation:

Aspen

Restoration:

1. Remove all metal, vehicle hulks and scrap iron to Whitehorse dump
2. Collect and burn remaining wood debris from buildings

Comments:

It appears that the buildings at Mile 946.4 have been privately disposed of and dismantling has been underway through the 1976 summer.

The actual status of buildings and vehicle hulks located south of Mile 945 is not confirmed. Group sheet information indicates Crown Lands.

Mile 956: Title #375KK, Lot 225, Group 5, Susan Van Bibber, 16/9/59; Outfitter Russ Stevens possible titled lands (unconfirmed); Crown

Conditions:

- 6 standing buildings (possibly private owned)
- scattered wood debris
- 4 vehicle hulks

Vegetation:

Grass, willow; open exposed site

Restoration:

1. Remove vehicle hulks and metal to disposal site at Mile 956.8
2. Collect and burn wood debris
3. Buildings on Crown Land to be reserved for historic site

Comments:

While cleaning up area remove the remains of a recently abandoned tent camp

Mile 956.8: Crown

Conditions:

- concrete foundations
- wood debris
- approximately 400 feet of pipe
- dump in abandoned gravel pit

Vegetation:

Aspen advanced growth along disturbed areas

Restoration:

1. Remove wood debris to abandoned gravel pit for burning
2. Remove pipe and bolts from concrete to be disposed of as in 1
3. Utilize abandoned gravel pit for disposal of refuse

Mile 987.5: Titled C. J. Boland, Lot 18, Group 803 (10 acres), Crown

Conditions:

- 9 vehicle hulks
- 2 refuse dumps

Vegetation:

Aspen, white spruce

Restoration:

1. Identify property boundaries of titled lands
2. Remove vehicle hulks to Mile 956.8 for disposal
3. Remove refuse for disposal to Mile 996.3

Mile 996.3 and 1000: Lot 3, Group 803, Crown title 2056G
Lot 15, Group 803, unpatented
Lot 2775, Group 803, M. Mathews, Deep Creek, Lake Laberge, Y.T.
Lots 19, 20 & 21, Group 803, Title 74Y194, Oliver and Mary Barney, Mile 996, Alaska Highway, Y.T.
Lot 95, Group 803
Lot 89, Group title 76Y76 Raymond and Jennifer Jackson, Whitehorse, Y.T.

Conditions:

Crown Lands

A. Extensive refuse sites along abandoned Alaska Highway right-of-way and trails consisting of:
   - tins
   - 45-gallon drums and grease barrels
   - tires
   - wood debris from buildings

B. Canol pump station C consisting of:
   - 2 concrete foundations
   - wood debris
   - collapsed building

C. Active refuse dump consisting of:
   - extensive accumulated refuse along access road
   - former military dump over embankment
   - recently excavated disposal pit for refuse

Private Property (not necessarily of military origin)

A. Three concrete foundations of former maintenance buildings

B. One standing building possibly military origin

C. Two locations of abandoned vehicle hulks
   i) 12 vehicle hulks and one bus hulk located in gravel pit
   ii) 4 vehicle hulks plus engine blocks and other vehicle components

Vegetation:

White spruce on undisturbed lands. Willow and aspen on disturbed lands.

Restoration:

1. Remove all refuse and metal to a suitable excavated disposal pit prepared at the active dump location
2. Remove and burn all wood debris from Crown Lands
3. Establish ownership of debris and vehicle hulks associated with private lands
4. Remove for disposal those debris in #3 to Mile 956.8 for disposal

Comment:

Actual debris attributable to army operations are:
- Canol pump station C
- site directly south of pumping station C; indicated isolated metal, wood and building locations
- military dump associated with active dump

All other refuse can be attributed to developments since the military establishment of the Alaska Highway.

It would not be in the best public interest to effect restoration to only those sites in this area that are directly attributable to military. Other debris are extensive and require restoration.

Mile 1036.2:

Condition:

- 2 concrete foundations
- 2 concentrations of wood debris

Vegetation:

Spruce and willow

Restoration:

1. Collect and burn wood debris on site

Mile 1056: Yukon Territorial Government

Condition:

- one concrete foundation
- remains of two buildings
- scattered wood and concrete debris
- approximately 10, 45-gallon drums

Vegetation:

Willow

Restoration:

1. Collect and burn wood debris
2. Collect and bury metal and drums
3. Collect broken concrete for burial
4. Retain concrete foundation

Mile 1080.8: Lot 287, Group 852, Haines Fairbanks Pipeline pump station, Diplomatic note. Two unidentified parcels of land. Crown

Conditions: (Crown)

- one garage building
- quonset hut (occupied and locked)
- portion of quonset hut
- vehicle service ramp
- wood and plastic debris
- corral fence
- small amount of refuse around service ramp
- approximately 200 feet of 2 inch pipe

Vegetation:

Open areas with willow and aspen. Spruce residual.

Restoration:

1. Confirm ownership of quonset hut and garage, dispose of by tender for removal
2. Collect and burn all wood debris
3. Collect and bury all metal

Comment:

The Canol pumping station E occupied the same site as that of the present Haines-Fairbanks pipeline pump station. Site restoration has been completed on that portion of the site to the southwest of the Alaska Highway in conjunction with the army abandonment of the Haines-Fairbanks pipeline.

Mile 1092.3: Y.T.G. gravel pit; Crown

Condition:

Heavy accumulation of refuse
- tin cans
- barrels
- culvert sections

Wood debris

Vegetation:

Spruce

Restoration:

1. Collect and burn wood debris in gravel pit
2. Collect and dispose of metal refuse at dump site, Destruction Bay

Mile 1098: Crown

Condition:

- three partial buildings
- one vehicle hulk
- dump
- one stove
- slab pile approximately 200 feet in length

Vegetation:

Black spruce, aspen advanced growth

Restoration:

1. Collect and burn wood and slab pile
2. Bury metal, vehicle hulk and stove
3. Remove and bury dump during suitable dry or frozen period

Mile 1126.4: Private Lease 3391-2, C. M. Bradley; Crown

Condition:

Private
- water pumphouse

Crown
- portion of barb wire fence
- wood debris
- concrete foundations
- wood debris from quonset hut
- approximately 100 feet of pipe

Vegetation:

Willow, aspen

Restoration:

1. Establish lease boundaries
2. Collect and burn all wood debris
3. Coil and bury barb wire

Mile 1130.1: Private Lease; Crown

Condition:

- approximately 10 vehicle hulks
- approximately 6 vehicle axles
- approximately 200 tires
- approximately 5 buildings
- current active refuse dump
- 3 refuse dumps on Donjek River flat
- approximately 30, 45-gallon drums
- wood debris

Vegetation:

Willow and aspen

Restoration:

1. Determine property limits of private land
2. Collect and burn all wood debris
3. Collect and dispose of by burial vehicle hulks and metal at site indicated
4. Collect and bury tires without burning
5. Remove, burn and bury current refuse dump at indicated site
6. Restoration to include adequate site preparation for continued use of refuse disposal at indicated burial site

Mile 1156: Crown

Conditions:

- approximately 4 vehicle hulks
- asphalt roofing material
- fuel storage tank
- wood debris
- 1 partial building
- debris of quonset hut
- accumulation of vehicle parts

Vegetation:

Willow, alder, aspen, black spruce

Restoration:

1. Collect and burn wood debris
2. Remove metal and vehicle hulks to Mile 1130.1
3. Retain fuel tank
4. Leave area indicated as vehicle parts as is

Comments:

1. This site is frequently used by Y.T.G. maintenance for road equipment storage
2. Site indicated in 4 above is located in heavy muskeg with advanced growth black spruce, willow and heavy moss cover. It is likely that this area will maintain permafrost conditions. Removal of debris in this area will cause excessive disturbance.

Mile 1166: Crown

Conditions:

- 2 concrete foundations
- scattered wood debris
- wood and metal from quonset hut
- portion of 6 strand barb wire fence

Vegetation:

Black spruce on residual areas. Willow advanced growth.

Restoration:

1. Collect and burn wood
2. Collect and bury metal on site

3. Remove barb wire fence
4. Remove and bury metal from concrete

Mile 1167.5: Private: Lot 26, Group 901; Title #72VV, R. A. Dickson, P.O. Box 581, Whitehorse
Crown: Lot 35, Group 901, Reservation Yukon Forest Service, 18/5/55

Condition:

- approximately 5 partial buildings
- 1 standing building, in use
- quantities of metal and wood scattered
- 25, 45-gallon drums
- 2 hulks

Vegetation:

Willow and aspen

Restoration:

1. Establish boundaries of private lands
2. Collect and burn wood debris
3. Collect and remove metal to Mile 1166 for burial

Comment:

Site formerly under lease, and cancelled, reverting back to Crown. Inventory of debris inadequate and complicated by associated private land holders use of lands.

Mile 1171: Crown

Conditions:

- portions of approximately 5 buildings
- 1 useable shelter
- 12, 45-gallon barrels
- scattered wood and metal

Vegetation:

Heavy alder growth around building floor

Restoration:

1. Collect and burn building debris
2. Collect and remove metal to Mile 1161 for burial

Comment:

Partial buildings are located within heavy alder advance growth and in the water body behind the site.

Mile 1184:

Conditions:

- two building foundations
- scattered wood debris
- 25 drums
- stove
- 3 hulks
- 3 refuse dump sites

Vegetation:

Heavy aspen advance growth. Muskeg, wet low depressional areas along Dry Creek

Restoration:

1. Collect and burn wood debris
2. Remove metal to Mile 1161 for disposal
3. Retain dump as is

Comment:

Access via trail to the two refuse dumps approximately ½ mile from the Alaska Highway would create unnecessary further disturbance to the stabilized trail.

Mile 1191.5: Crown

Condition:

- culvert sections
- scattered wood (light)
- 3 drums

Vegetation:

Aspen

Restoration:

1. Burn wood debris
2. Remove culvert sections and drums to Beaver Creek dump for disposal

Mile 1200: Yukon Territorial Government; Crown

Condition:

- 8, 45-gallon drums
- dump

Vegetation:

Black spruce, muskeg

Restoration:

Remove drums and tins by hand for disposal at Beaver Creek dump.

Mile 1200.7: Crown

Condition:

- four hulks
- refuse dump
- wood

Vegetation:

Alder, aspen, willow

Restoration:

1. Collect and burn wood
2. Remove refuse and hulks to dump at Beaver Creek for disposal

Mile 1205.5: Crown

Condition:

- wood debris
- approximately 300 feet of pipe
- 1 stove

Vegetation:

White spruce and aspen

Restoration:

1. Collect and burn wood
2. Remove metal to Beaver Creek dump site for disposal

Mile 1206.2: Crown

Condition:

- wood debris from quonset hut
- 1 vehicle hulk
- scattered metal and tins in windrows from dozing clearing

Vegetation:

Aspen, spruce

Restoration:

1. Collect and burn wood debris
2. Collect and remove metal to Beaver Creek dump for disposal

Mile 1213: Crown

Condition:

- 4 collapsed buildings
- refuse accumulation

Vegetation:

Aspen, black spruce

Restoration:

Burn and bury debris on site

Mile 103.5: Haines Road, Takhanne River; Crown

Condition:

- Extensive debris scattered into canyon (near vertical descent to Takhanne River)
- remains of 10 buildings
- one car hulk
- one pump house stilling well
- approximately 25 acres in total
- one small refuse dump south of campsite, approximately ½ mile along pipeline

Vegetation:

Residual white spruce. Advanced growth willow, alder, aspen

Appendix D (Continued)

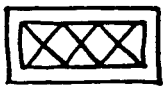
Restoration:

1. Collect, burn and bury all wood and metal debris scattered over site.
2. Burn and remove canyon debris by removal to top of embankment and dispose with debris as in one
3. Effect slope stabilization by drainage diversion and reseeding

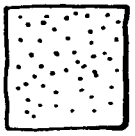
LEGEND

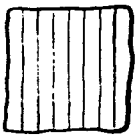
- ALASKA HIGHWAY


- WOODEN DEBRIS


- CONCRETE


- DUMP SITE


- METAL DEBRIS


- VEHICLE HULKS

- GRAVEL PITS


- STANDING BUILDING


- PARTIAL BUILDING

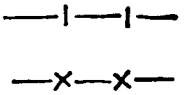

- BUILDING FOUNDATION OTHER THAN CONCRETE


- POSSIBLE BURY SITE

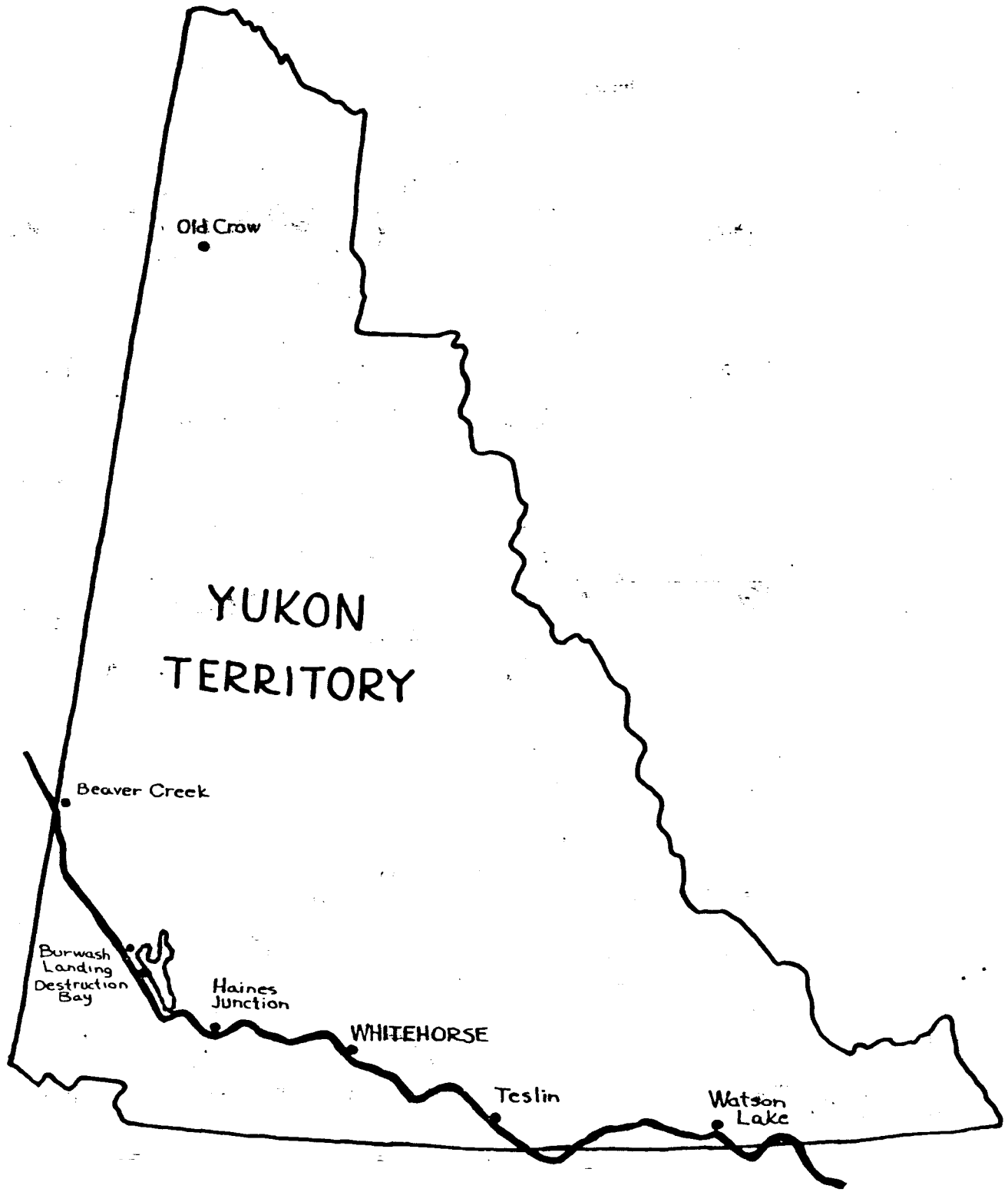

- POSSIBLE BURNING SITI

LEASED or TITLED
- PROPERTY BOUNDARY


- MUSKEG

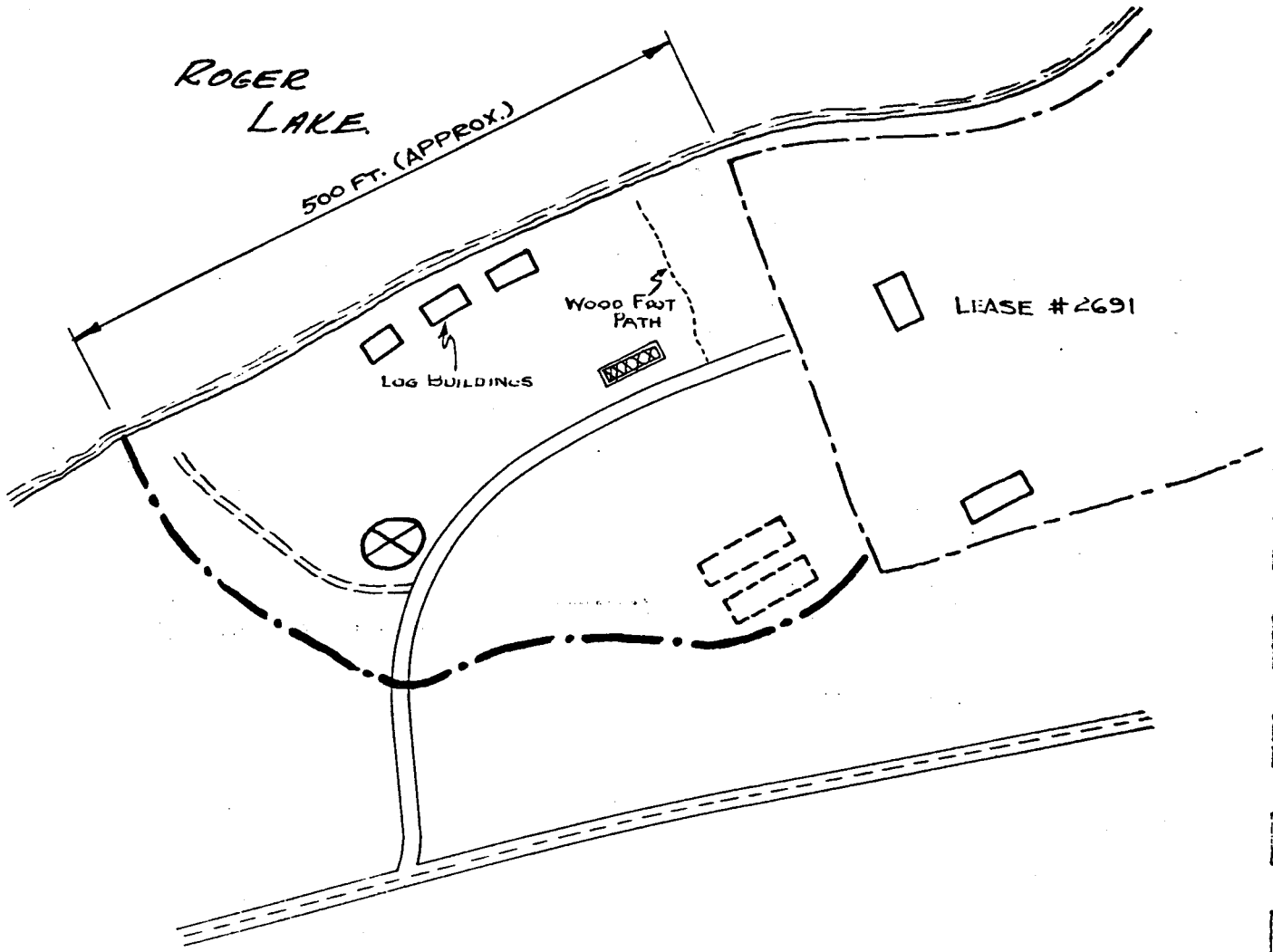

- FENCE

- OVERALL AREA



ALASKA HIGHWAY
REGIONAL SETTING

FIGURE 1



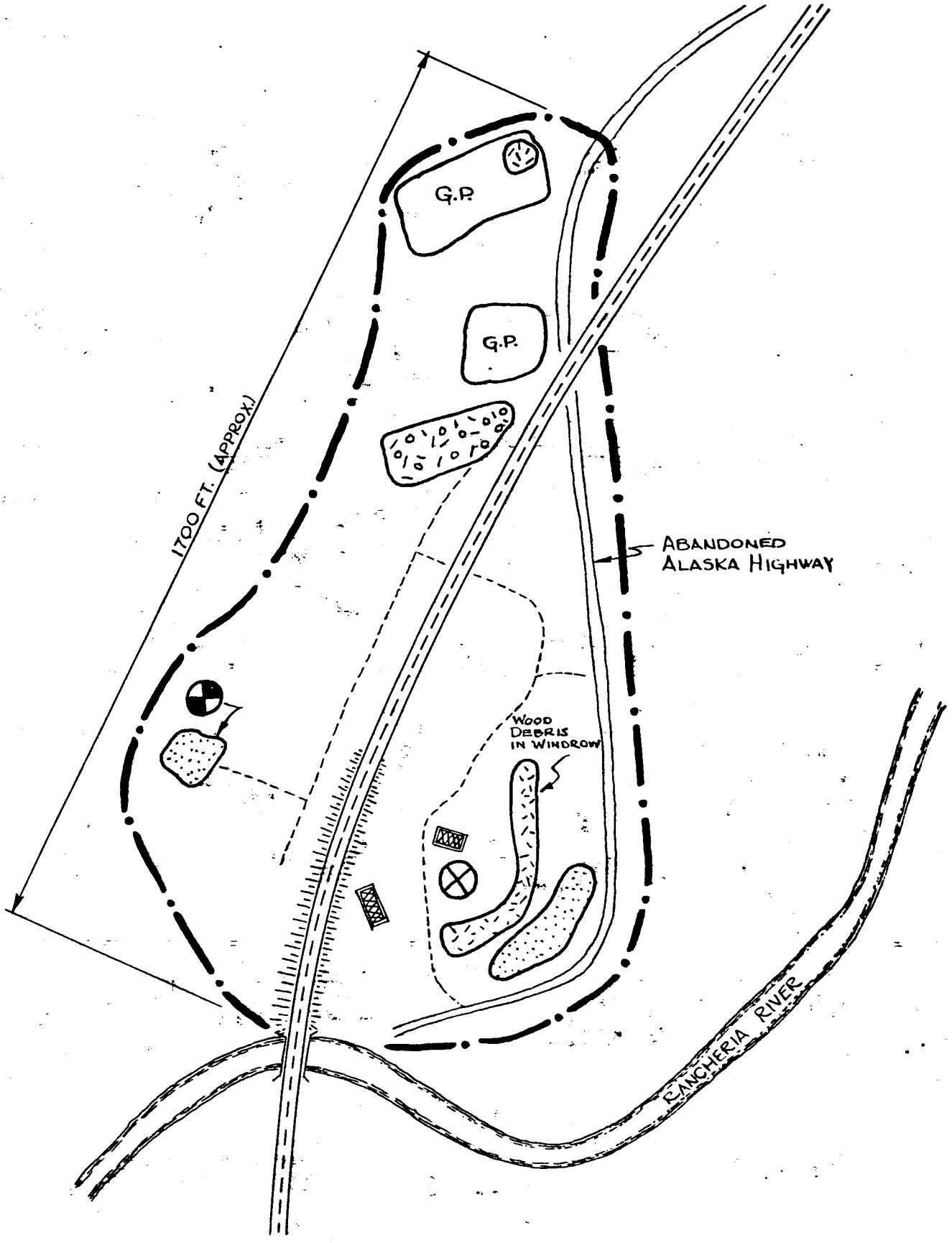
NORTH

ALASKA HIGHWAY

MILE - 652.7

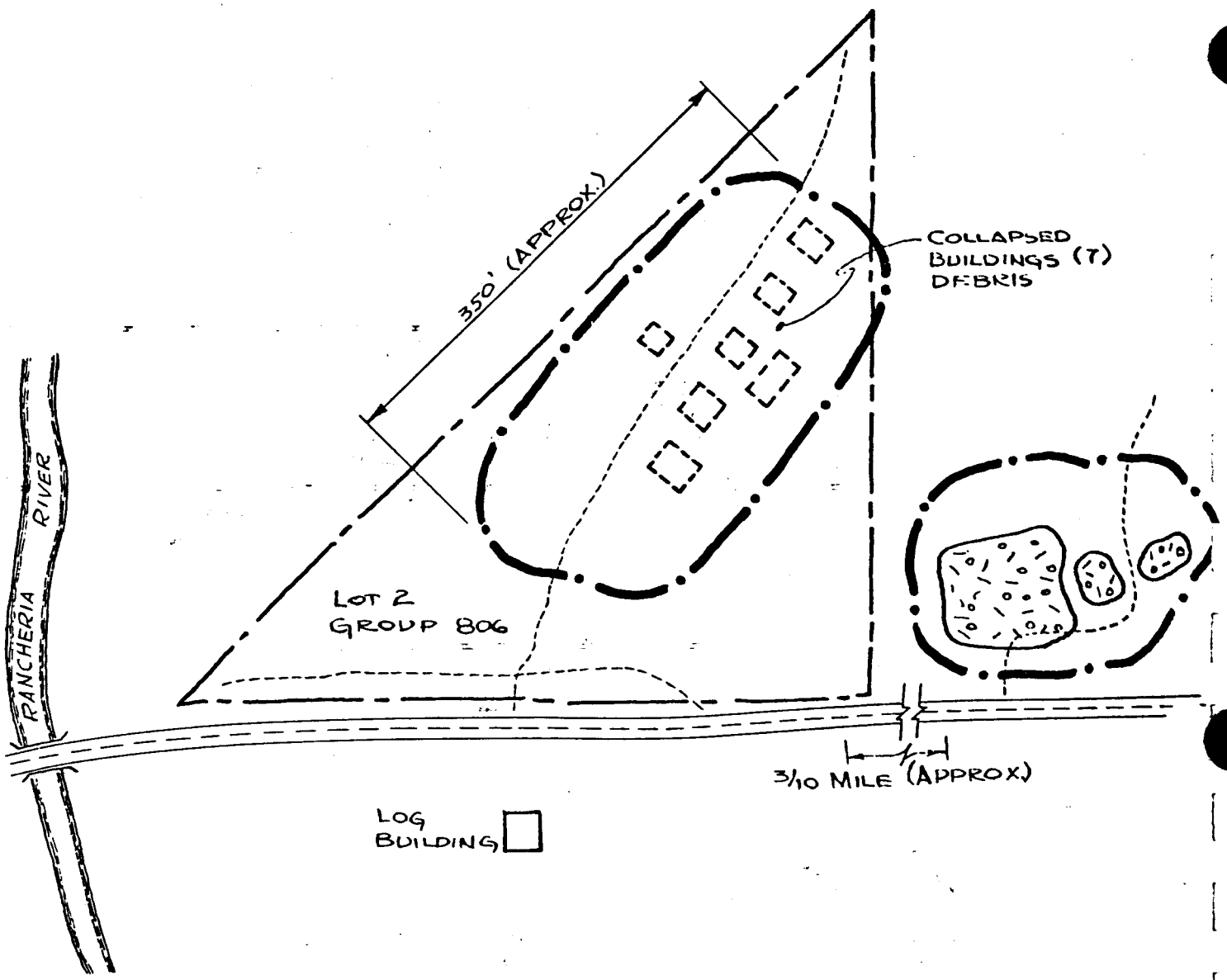
DO DO LAKES

FIGURE 2



NORTH

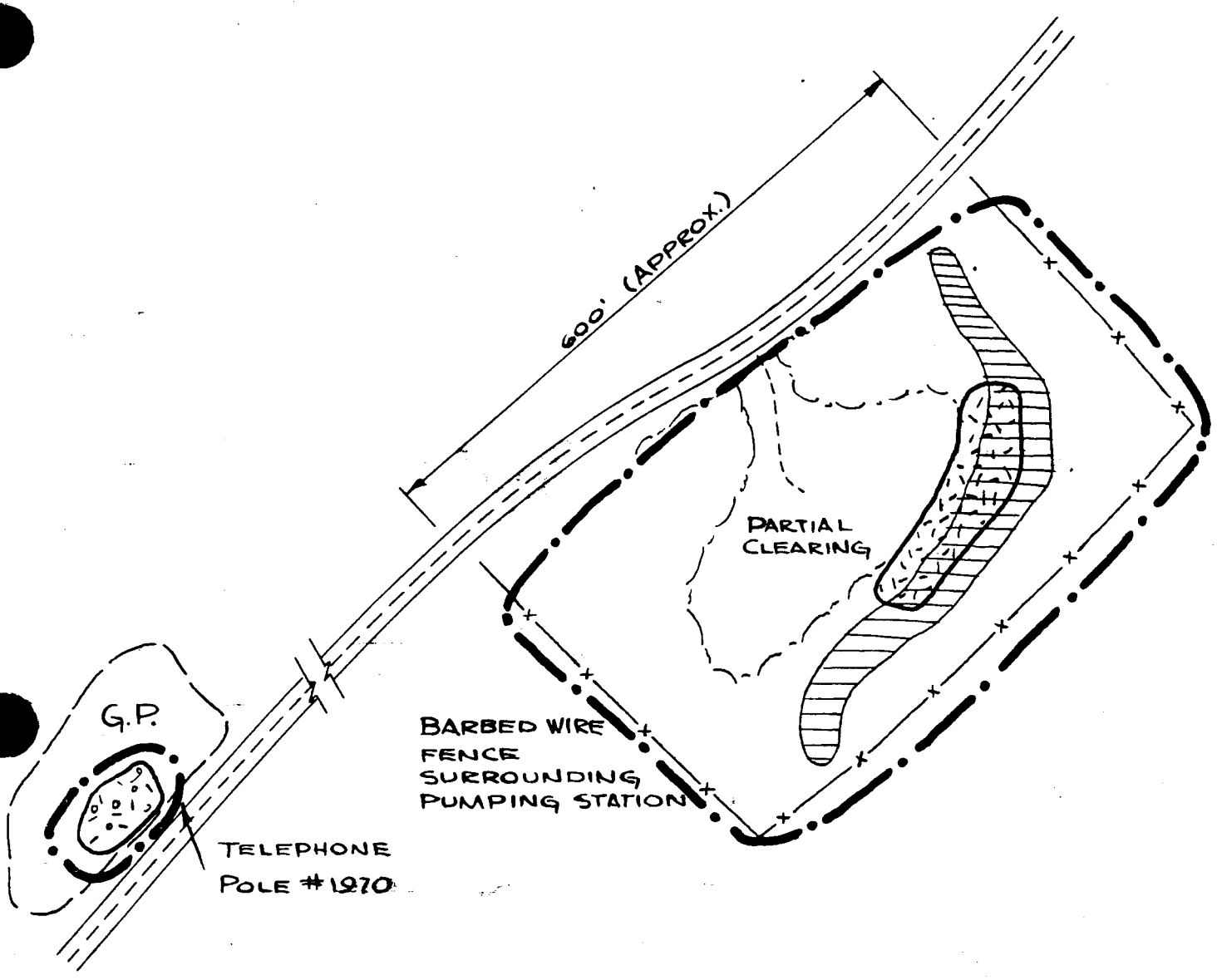
ALASKA HIGHWAY
MILE - 670.2
LITTLE RANCHERIA RIVER
FIGURE 3



NORTH

ALASKA HIGHWAY
MILE - 687.0

FIGURE 4



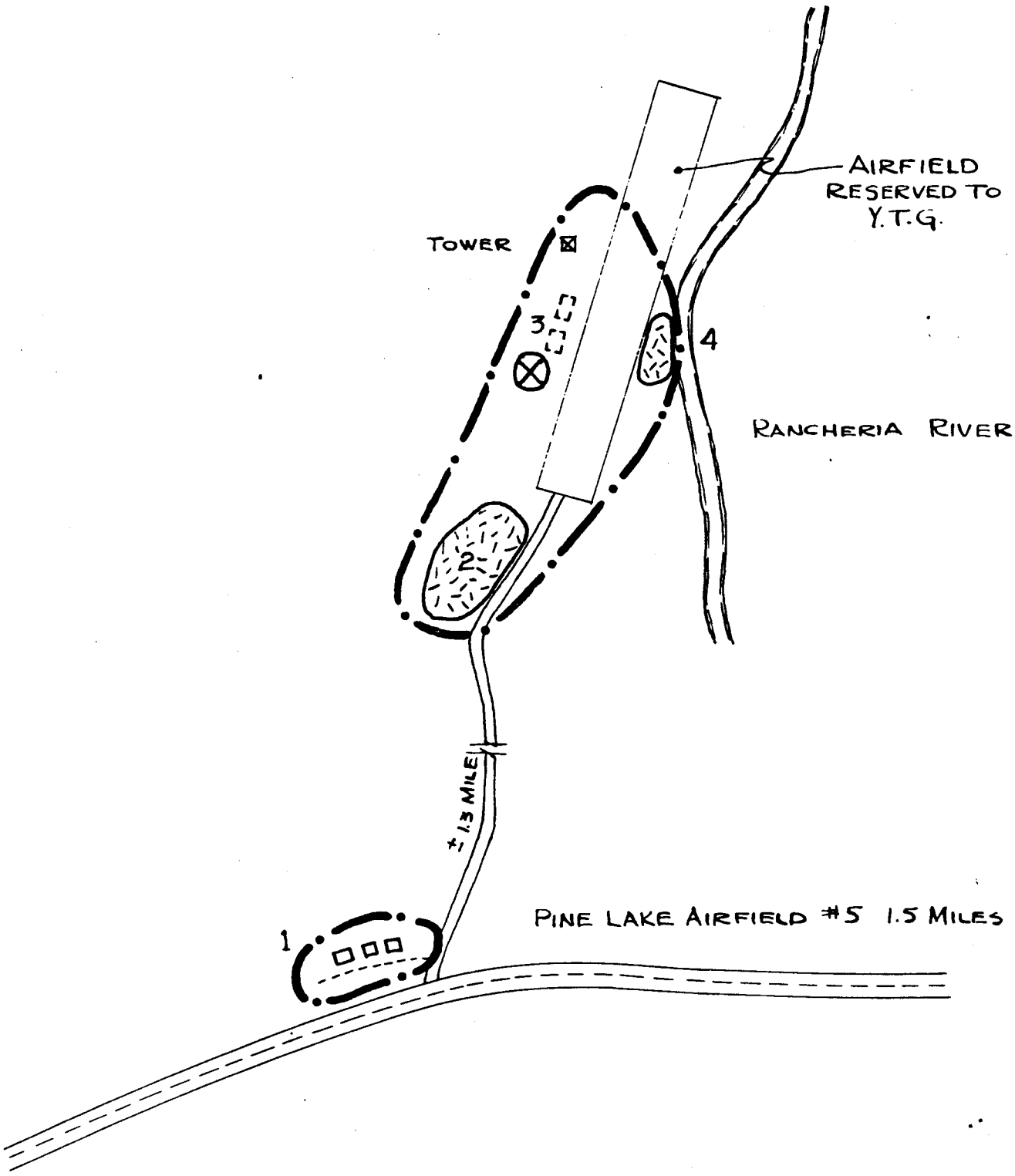
NORTH

ALASKA HIGHWAY

MILE - 692.7

CANOL PUMPING STATION 2

FIGURE 5



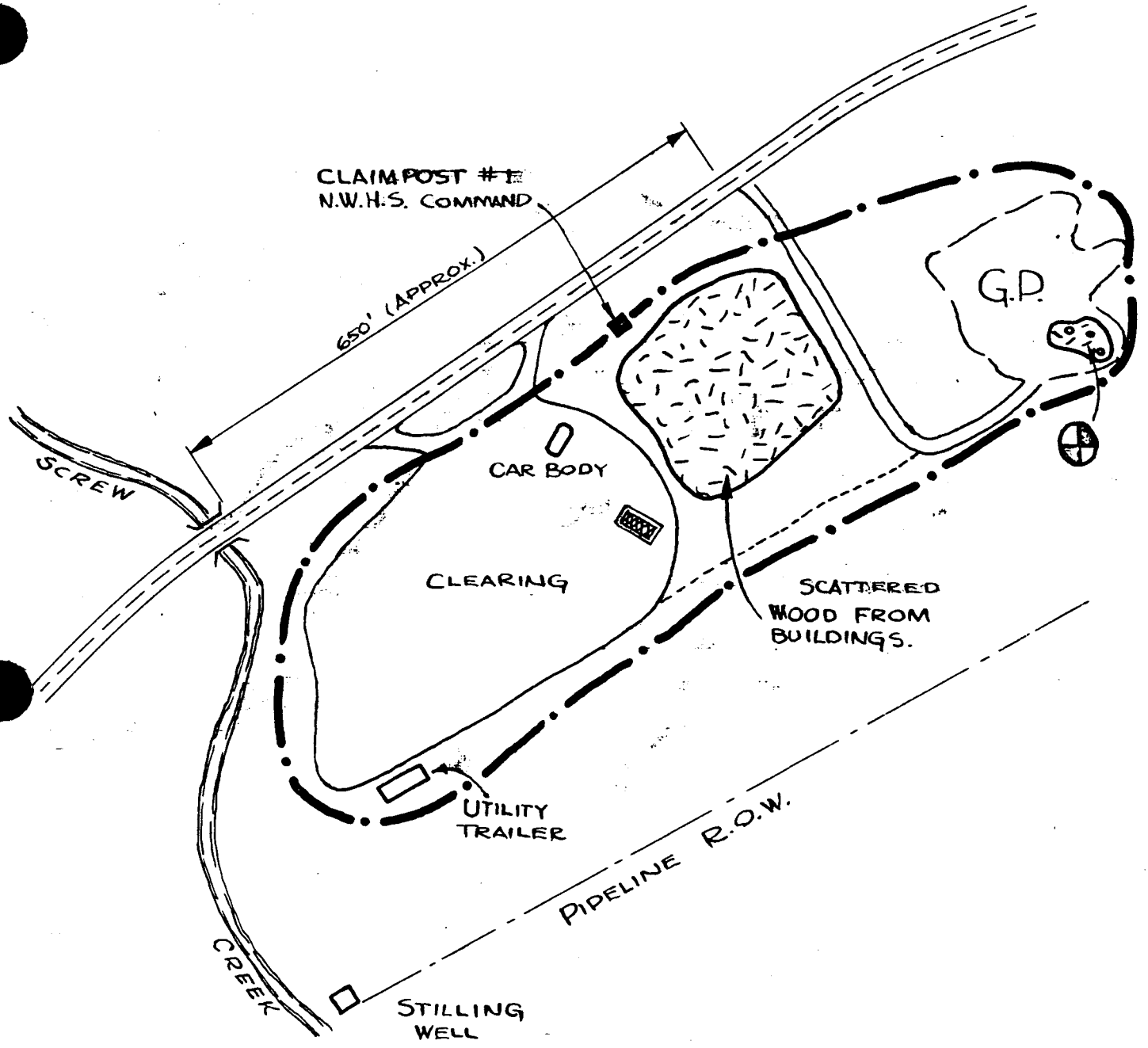
NORTH

ALASKA HIGHWAY

MILE - 722.5

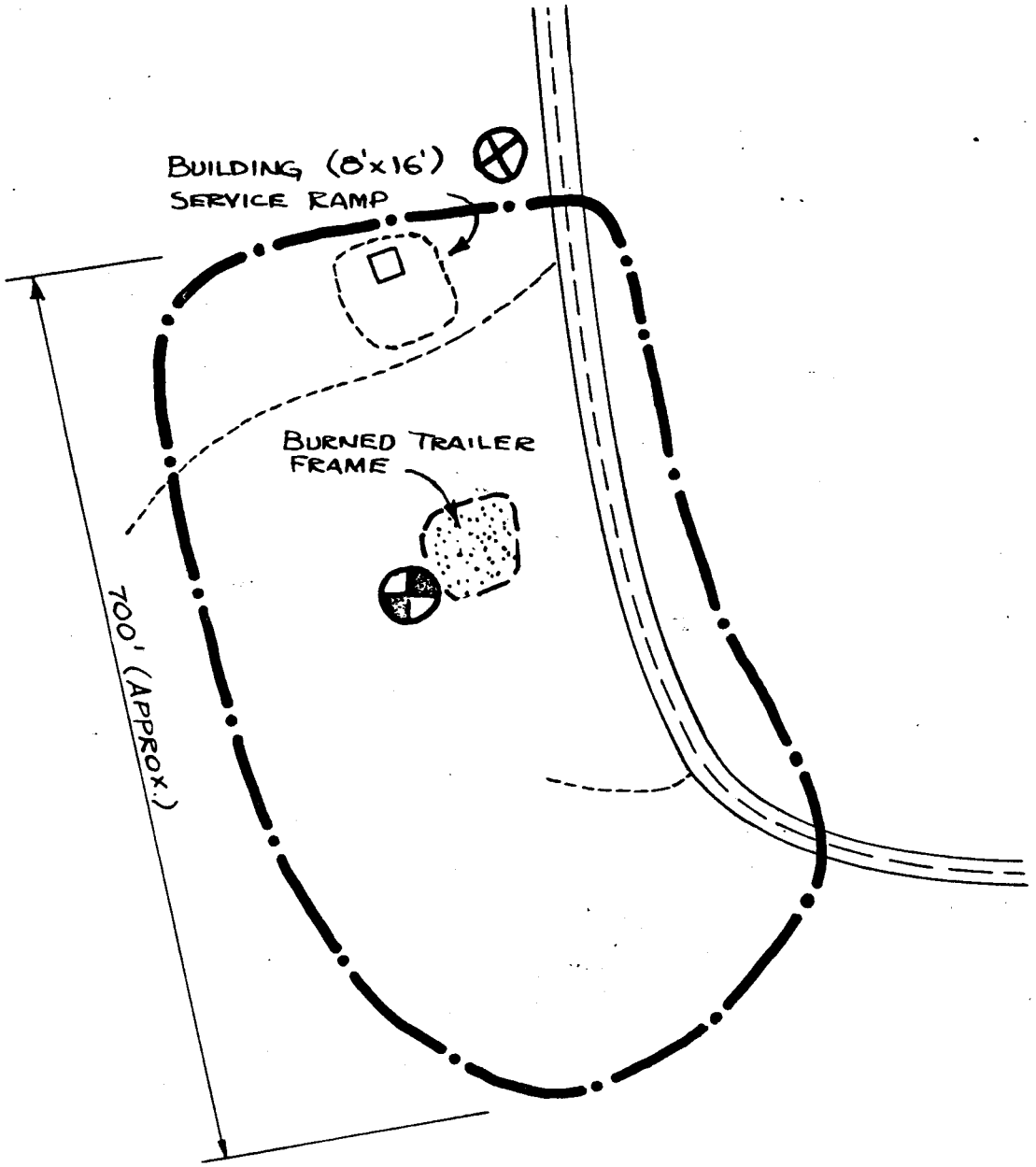
PINE LAKE AIRFIELD

FIGURE 6



NORTH

ALASKA HIGHWAY
MILE - 741.6
SCREW CREEK, B.C.
FIGURE 7



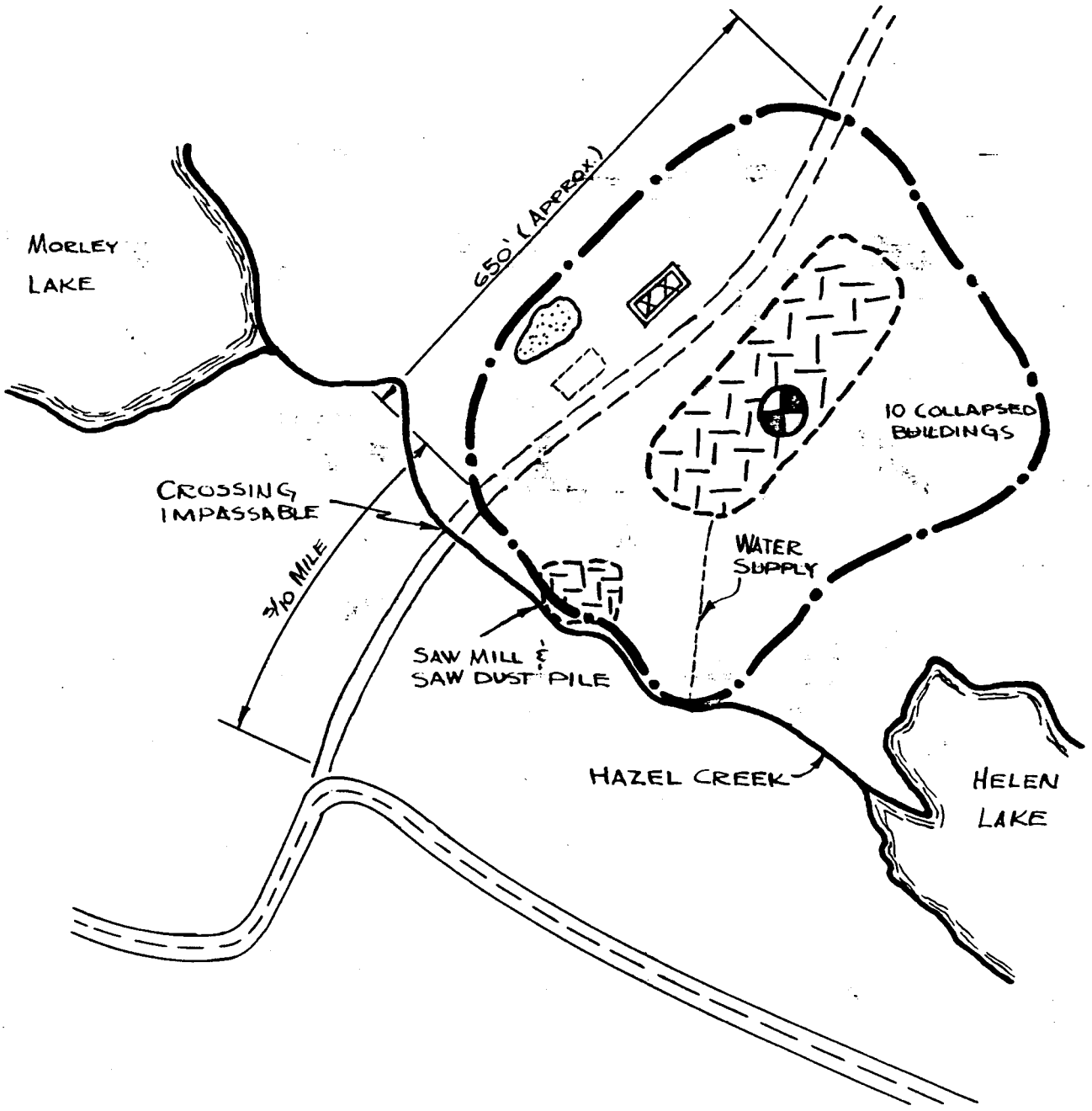
NORTH

ALASKA HIGHWAY

MILE - 747.6 B.C.

CANOL PUMPING STATION Y

FIGURE 8



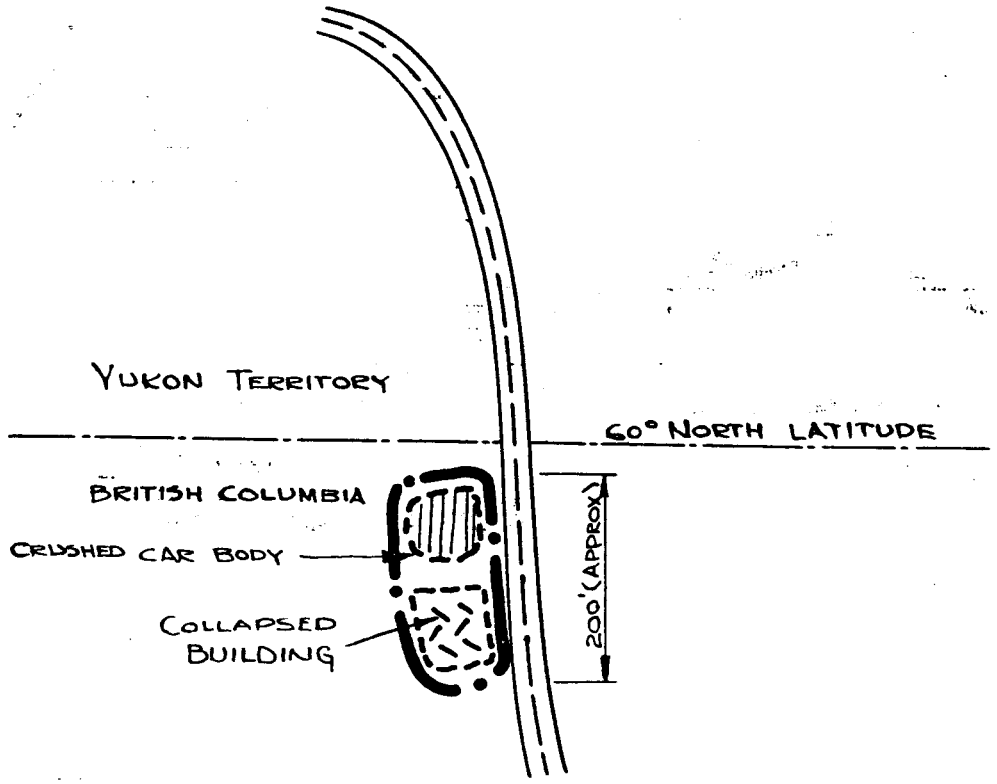
NORTH

ALASKA HIGHWAY

MILE - 770.0 B.C.

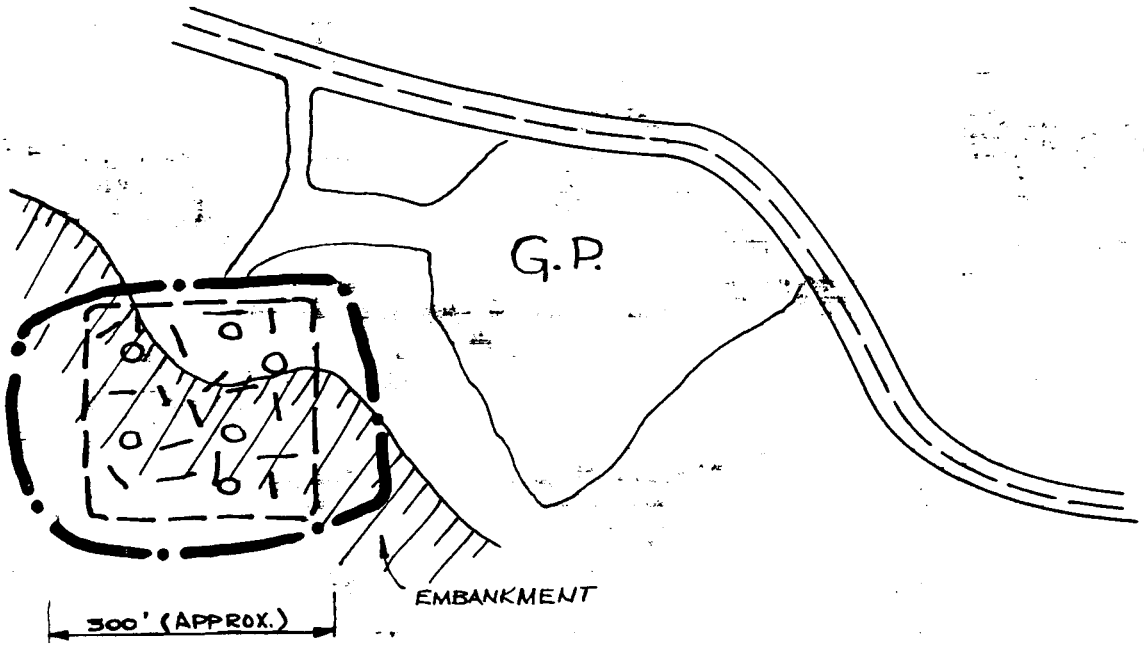
HELEN LAKE MAINTENANCE CAMP

FIGURE 9



NORTH

ALASKA HIGHWAY
MILE - 775.8
B.C./Y.T. BORDER
FIGURE 10



NORTH

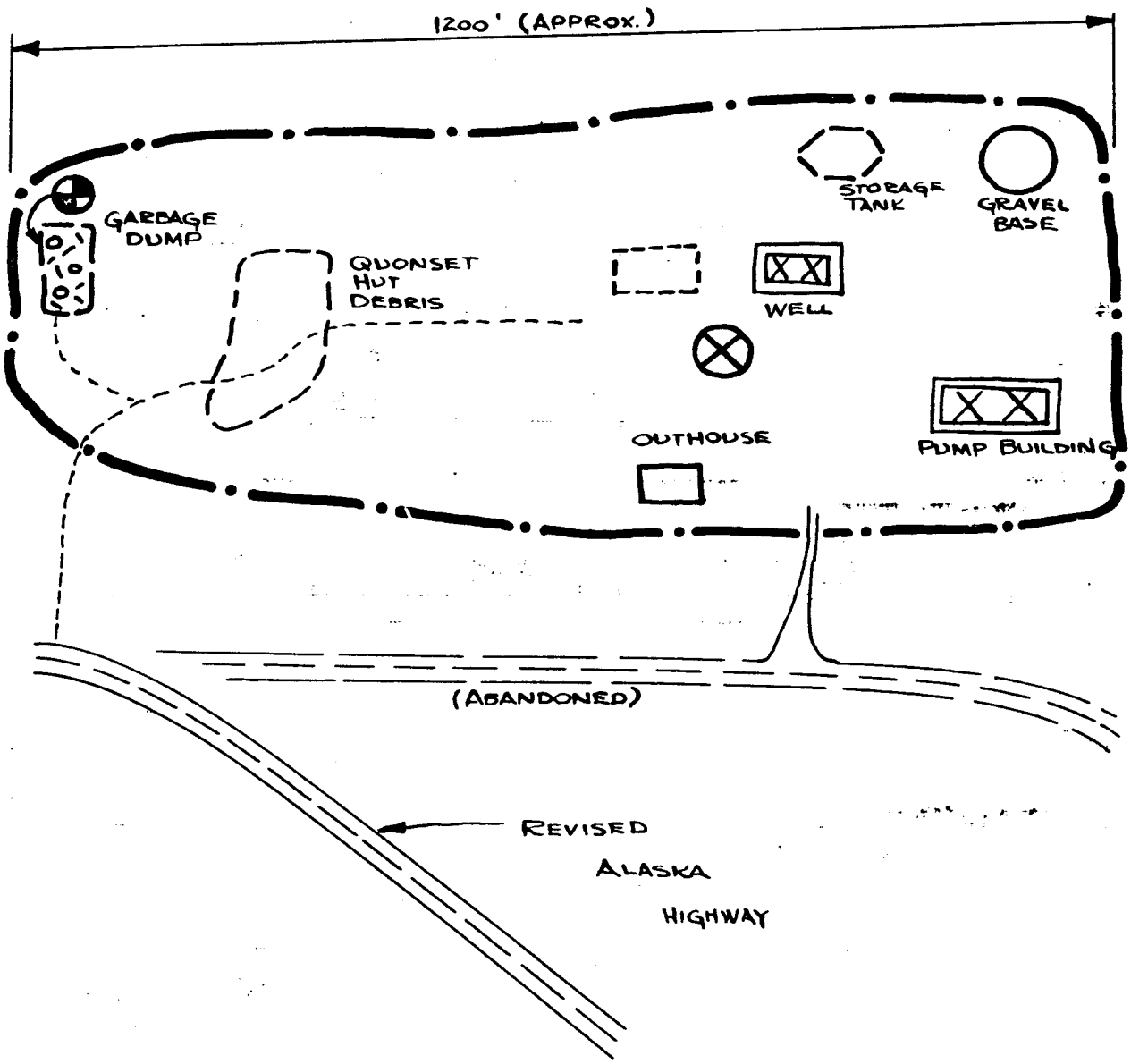
ALASKA HIGHWAY

MILE - 780.2

GARBAGE DUMP

(MORLEY BAY MILITARY SITE & LODGE)

FIGURE 11



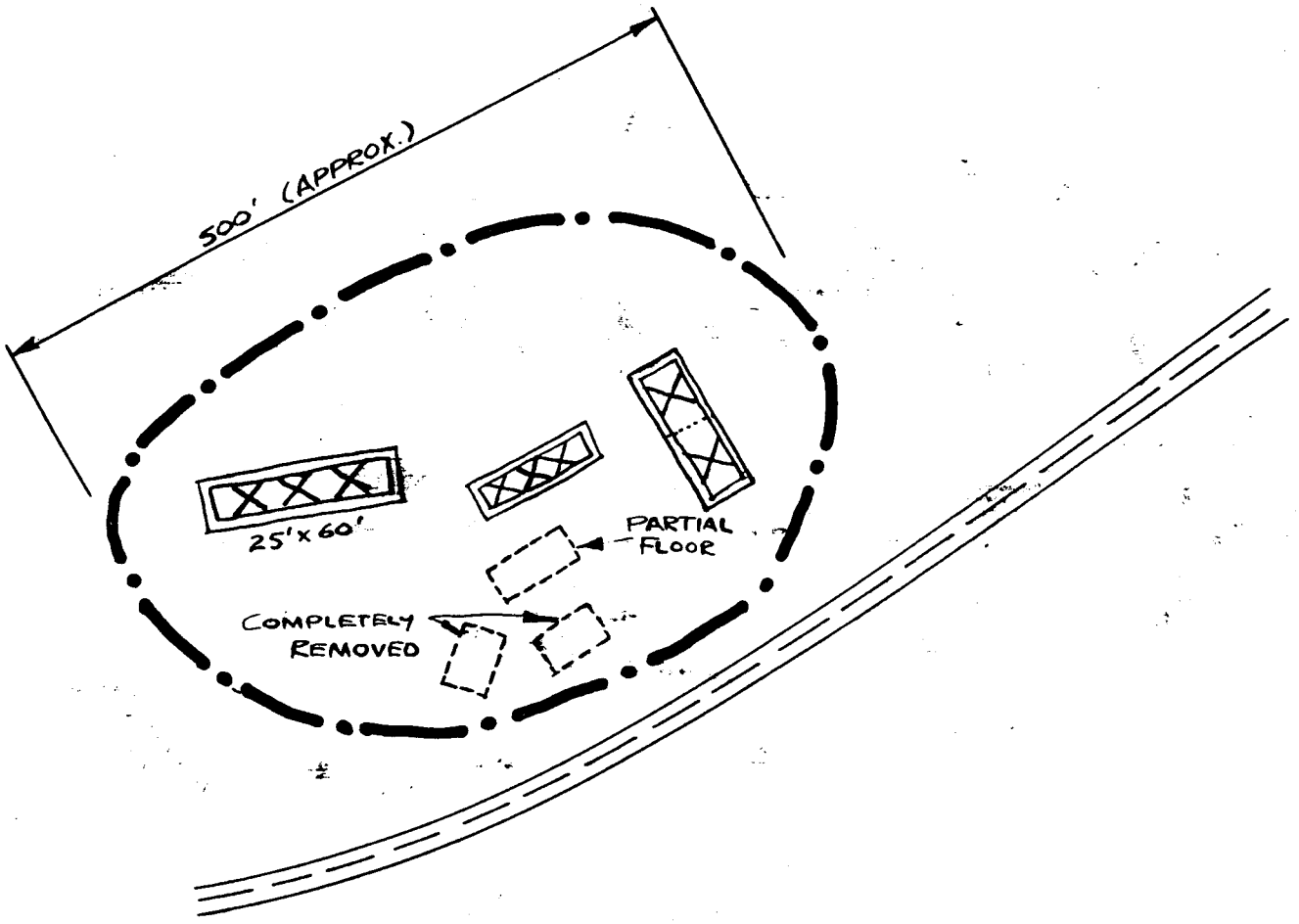
NORTH

ALASKA HIGHWAY

MILE - 793.9

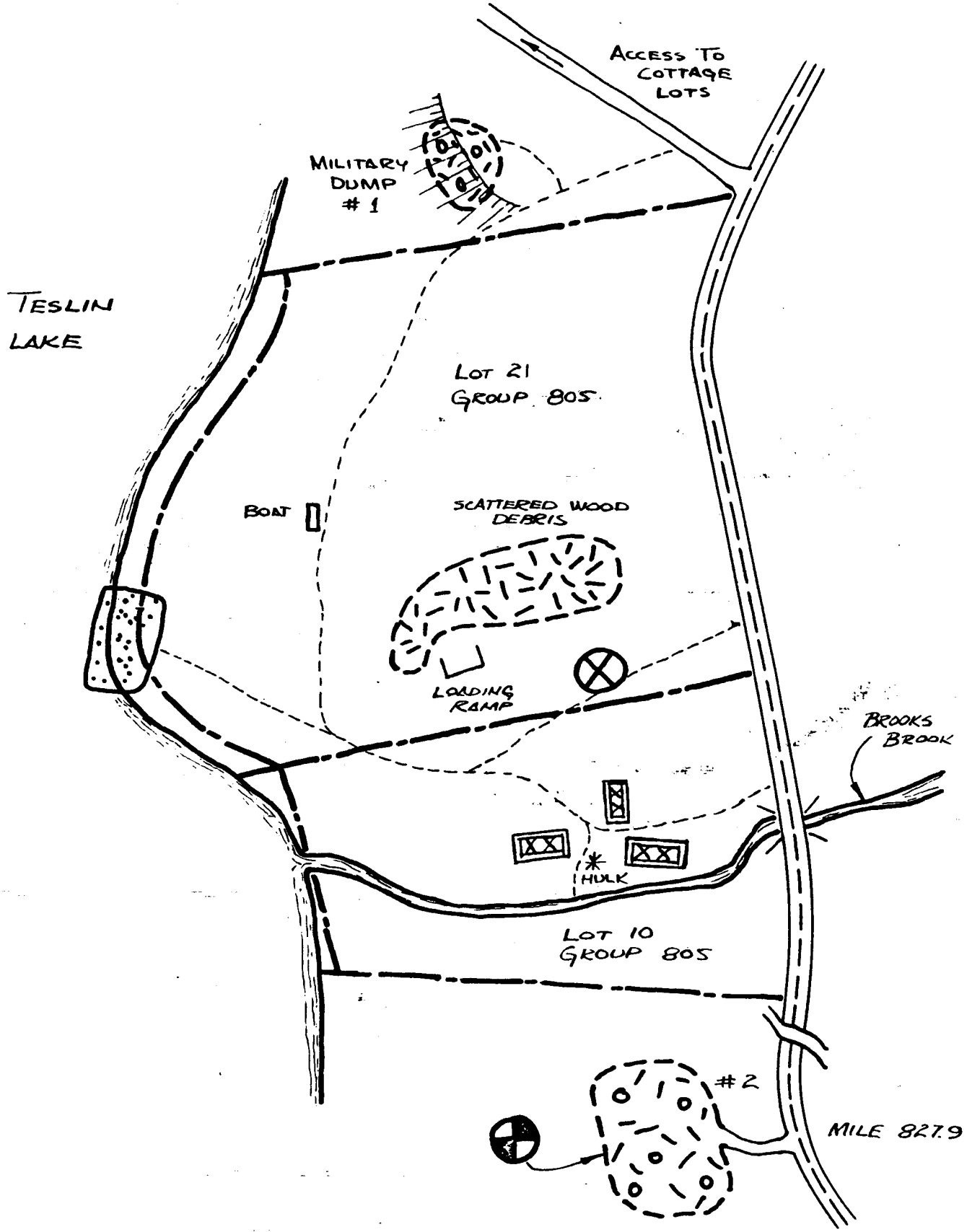
CANOL PUMPING STATION X

FIGURE 12



NORTH

ALASKA HIGHWAY
MILE - 796.6
MORLEY BAY
FIGURE 13



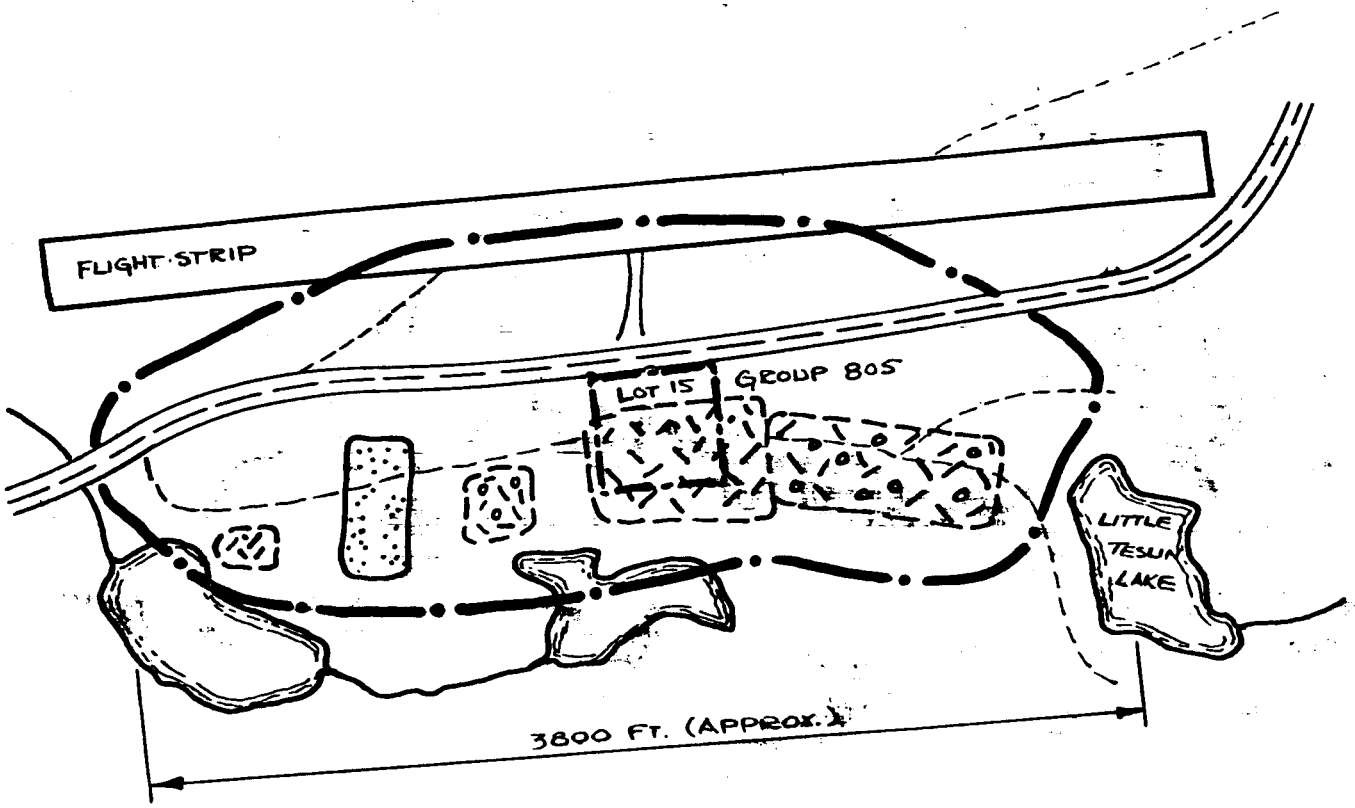
NORTH

ALASKA HIGHWAY

MILE - 829.7

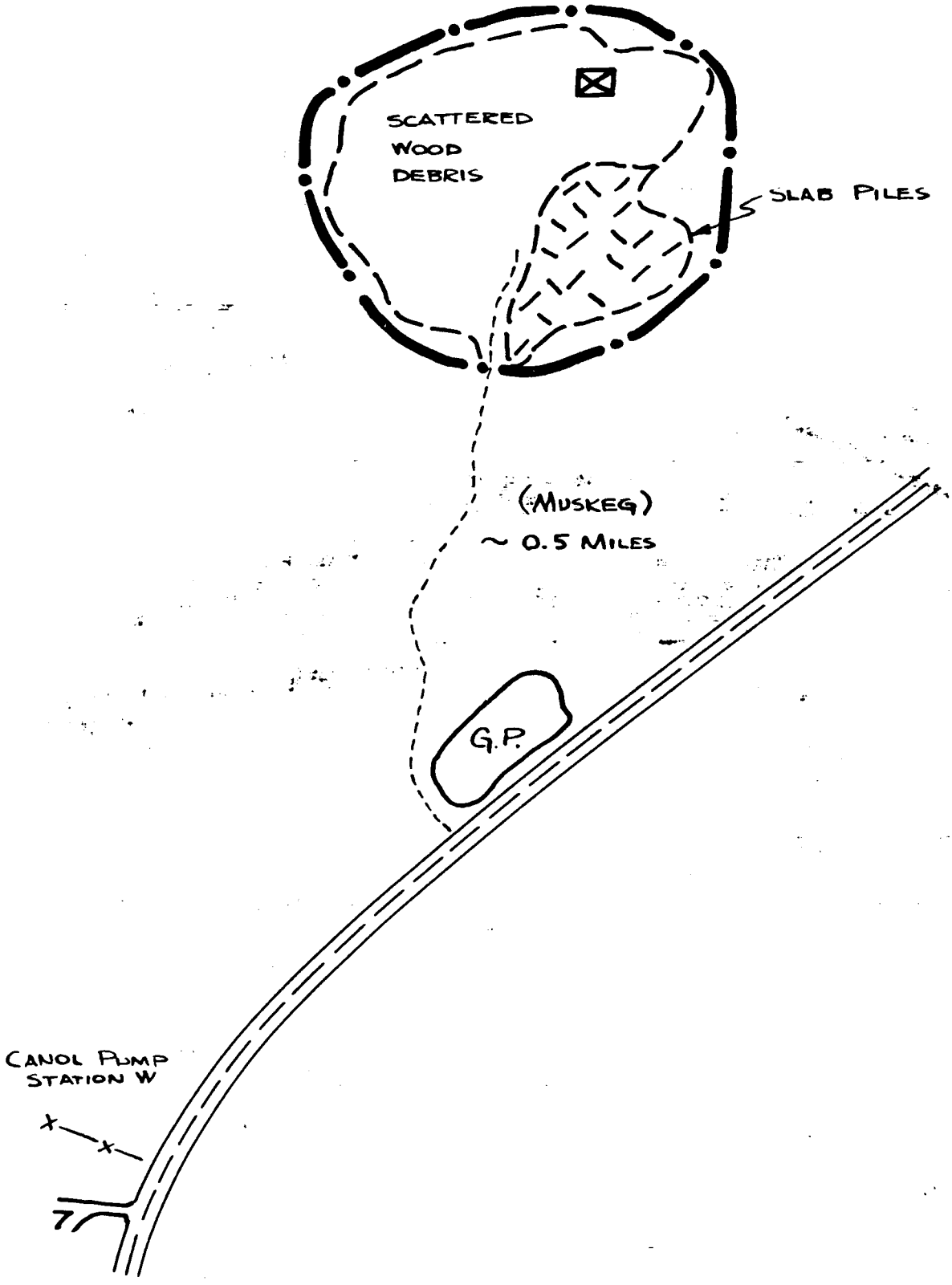
BROOKS BROOK

FIGURE 14

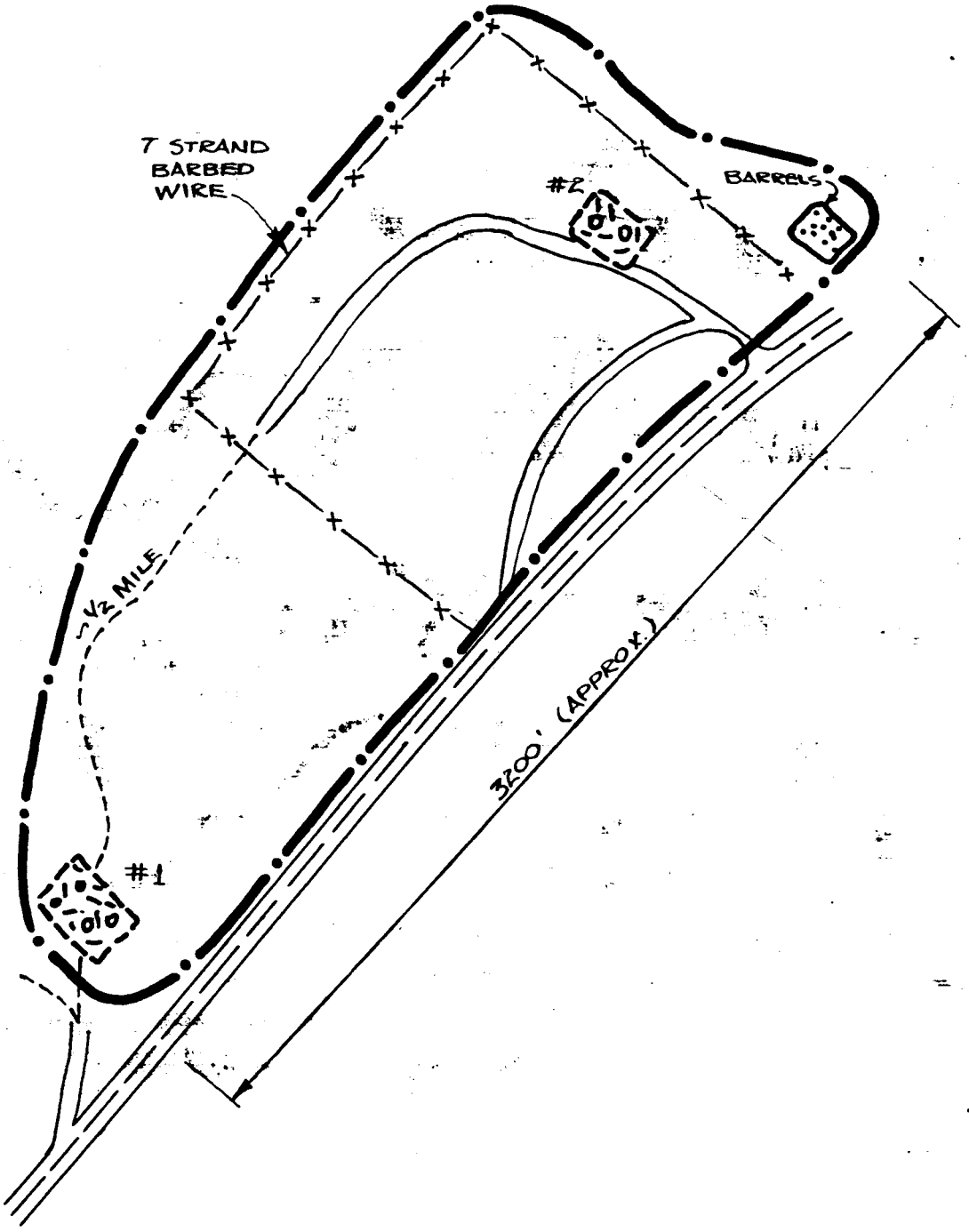


NORTH

ALASKA HIGHWAY
MILE - 843.9
SQUANGA LAKE FLIGHTSTRIP
FIGURE 15



ALASKA HIGHWAY
MILE - 854.5
SAW MILL SITE
FIGURE 16



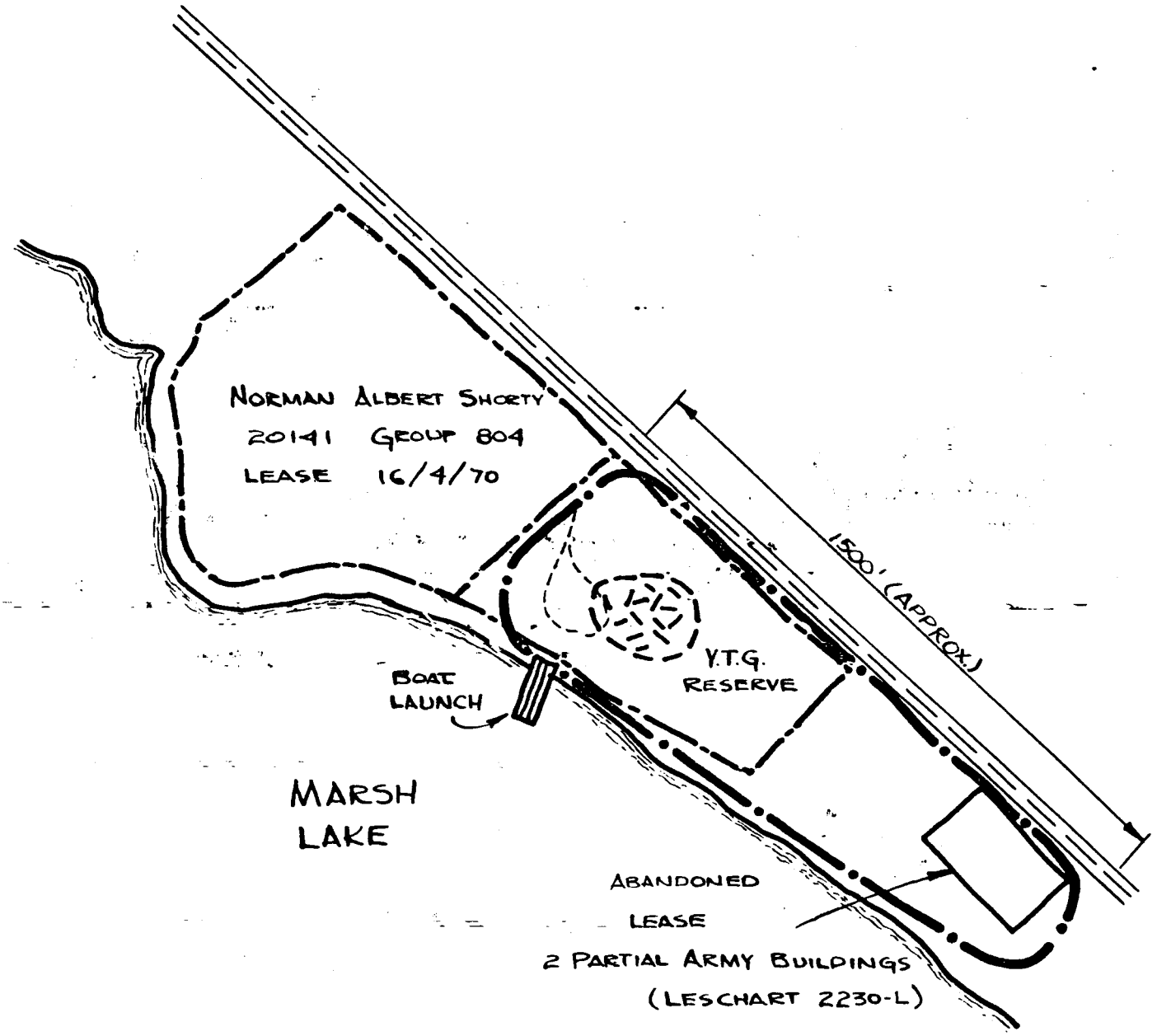
NORTH

ALASKA HIGHWAY

MILE - 854.8

CANOL PUMPING STATION W

FIGURE 17



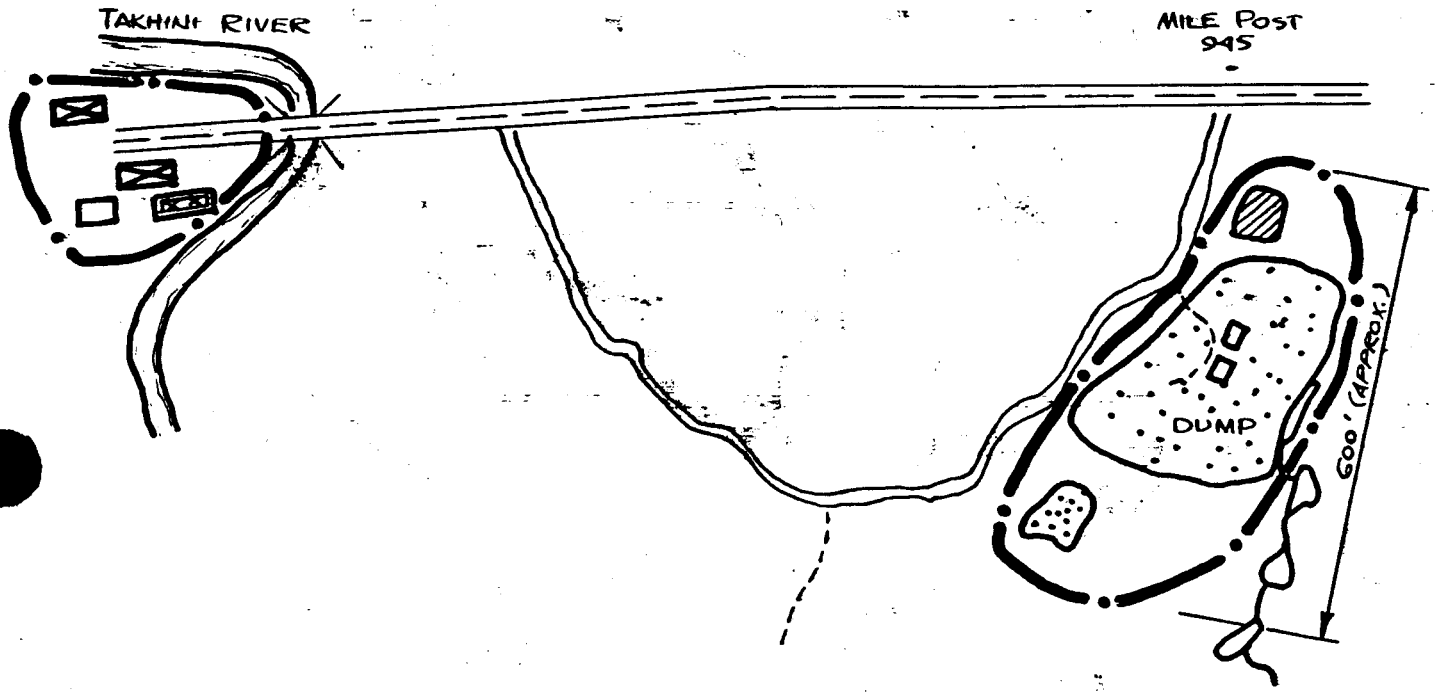
NORTH

ALASKA HIGHWAY

MILE - 883.0

MARSH LAKE

FIGURE 18



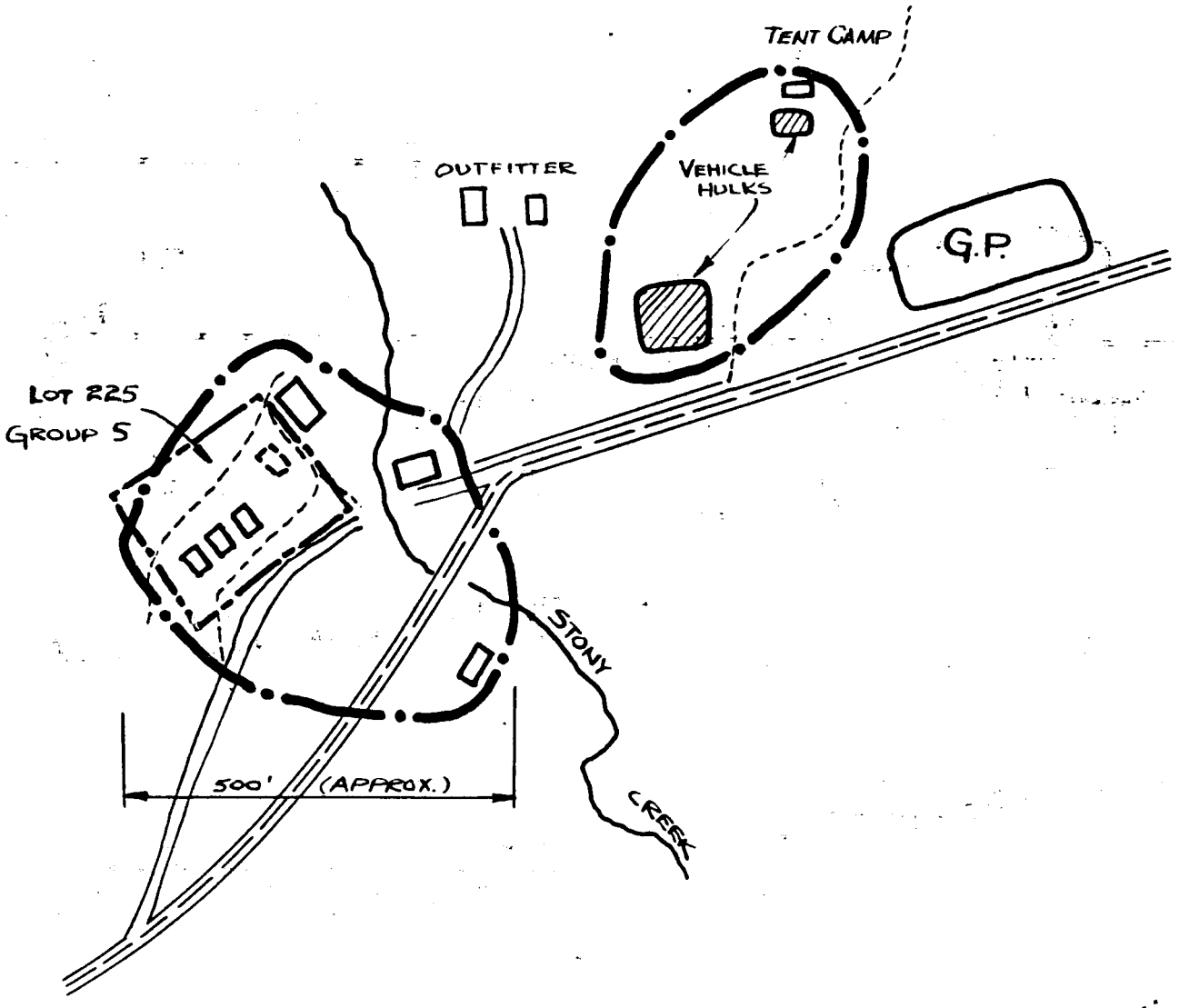
NORTH

ALASKA HIGHWAY

MILE - 946.4

TAKHINI RIVER

FIGURE 19



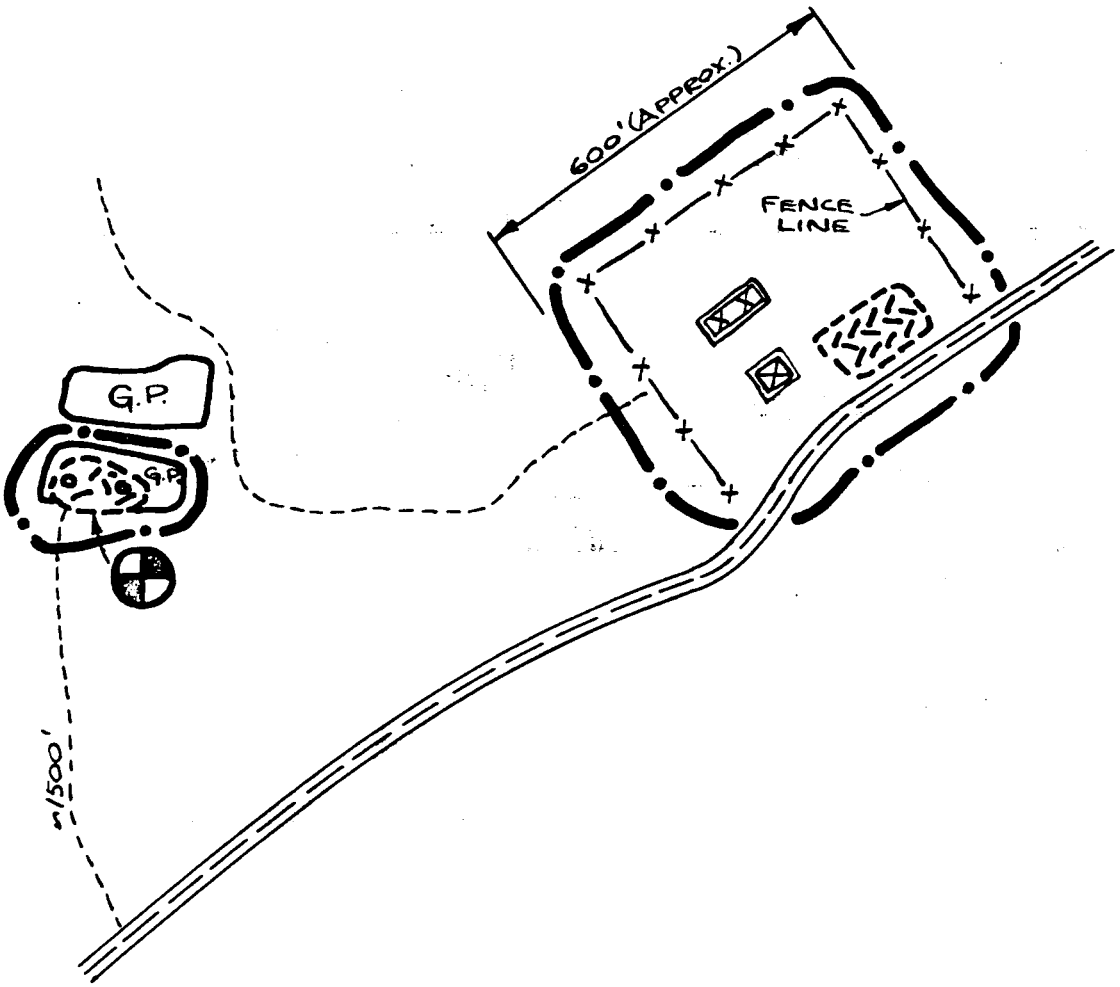
NORTH

ALASKA HIGHWAY

MILE - 956.0

STONY CREEK

FIGURE 20



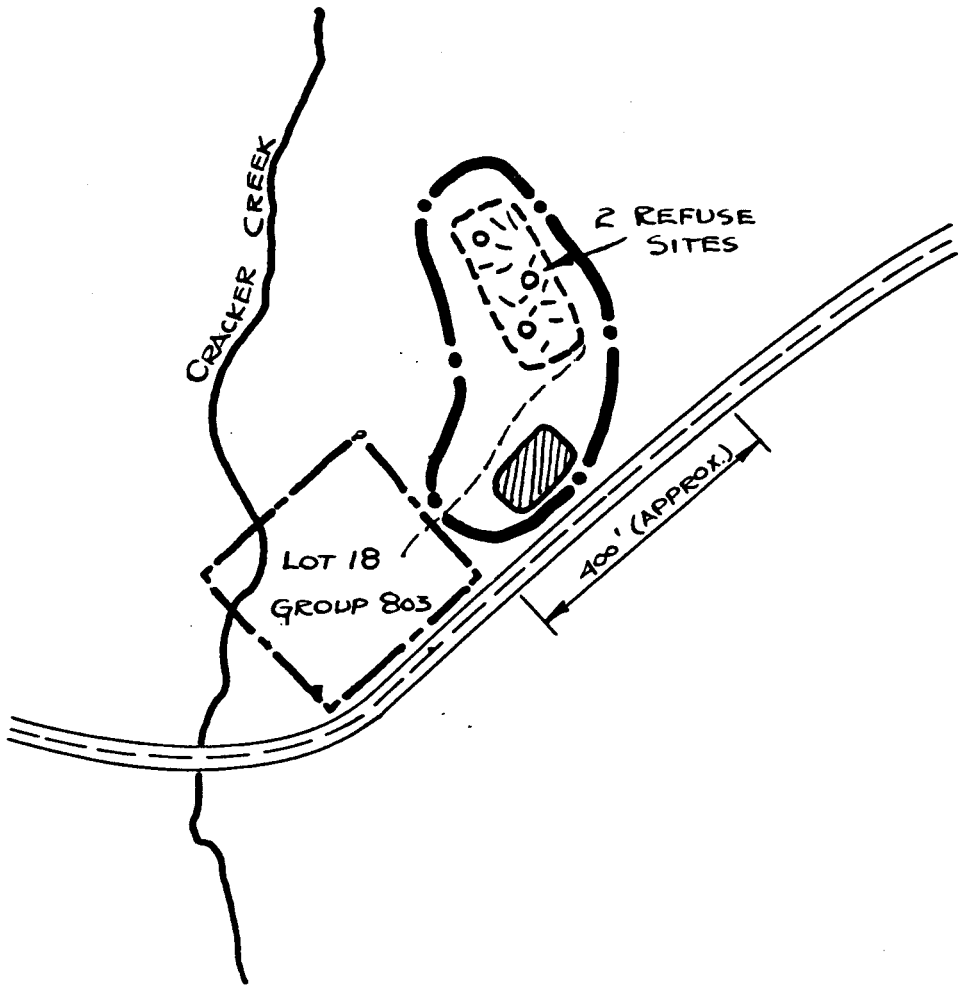
NORTH

ALASKA HIGHWAY

MILE - 956.8

CANOL PUMPING STATION E

FIGURE 21



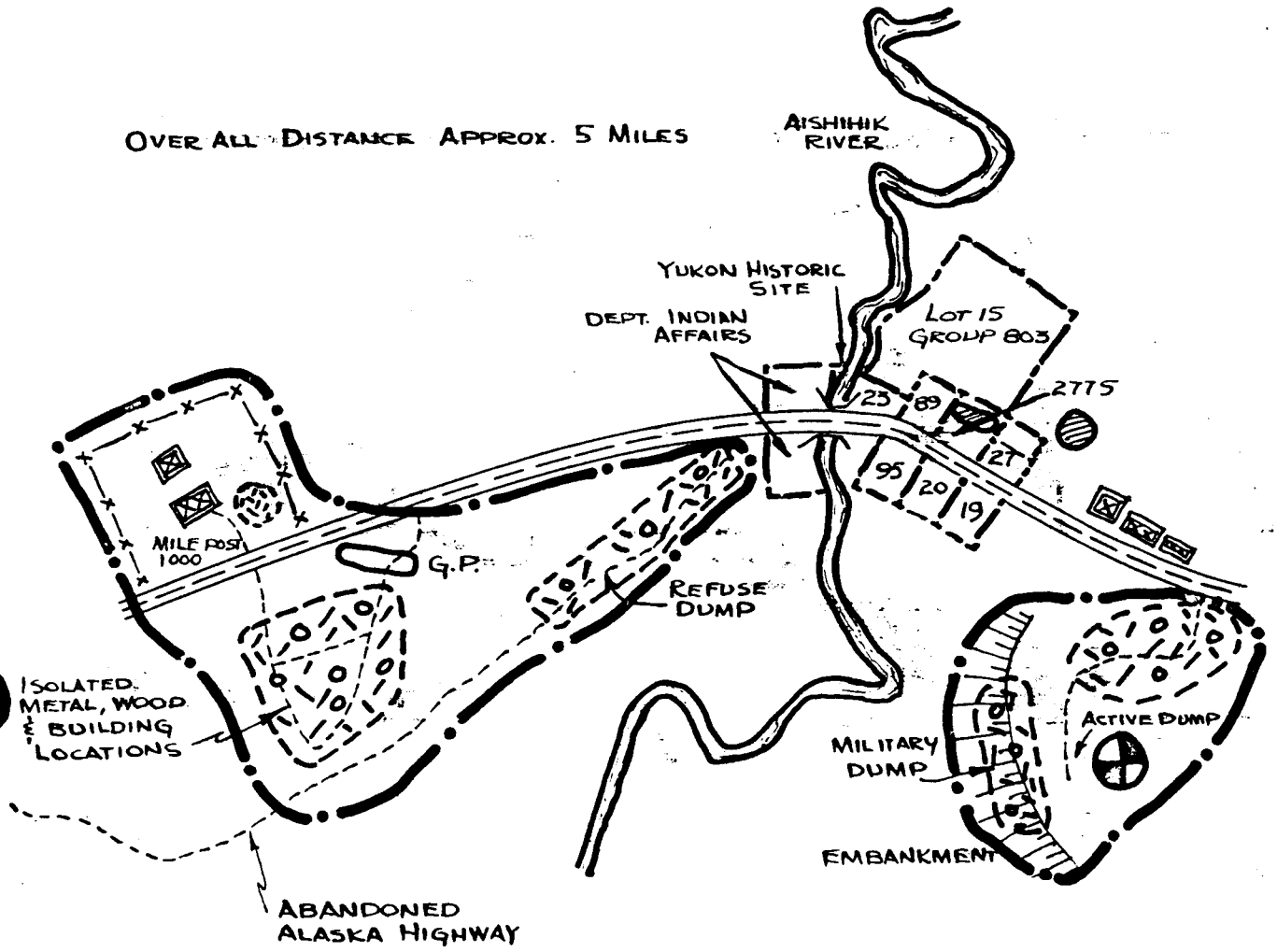
NORTH

ALASKA HIGHWAY

MILE - 987.5

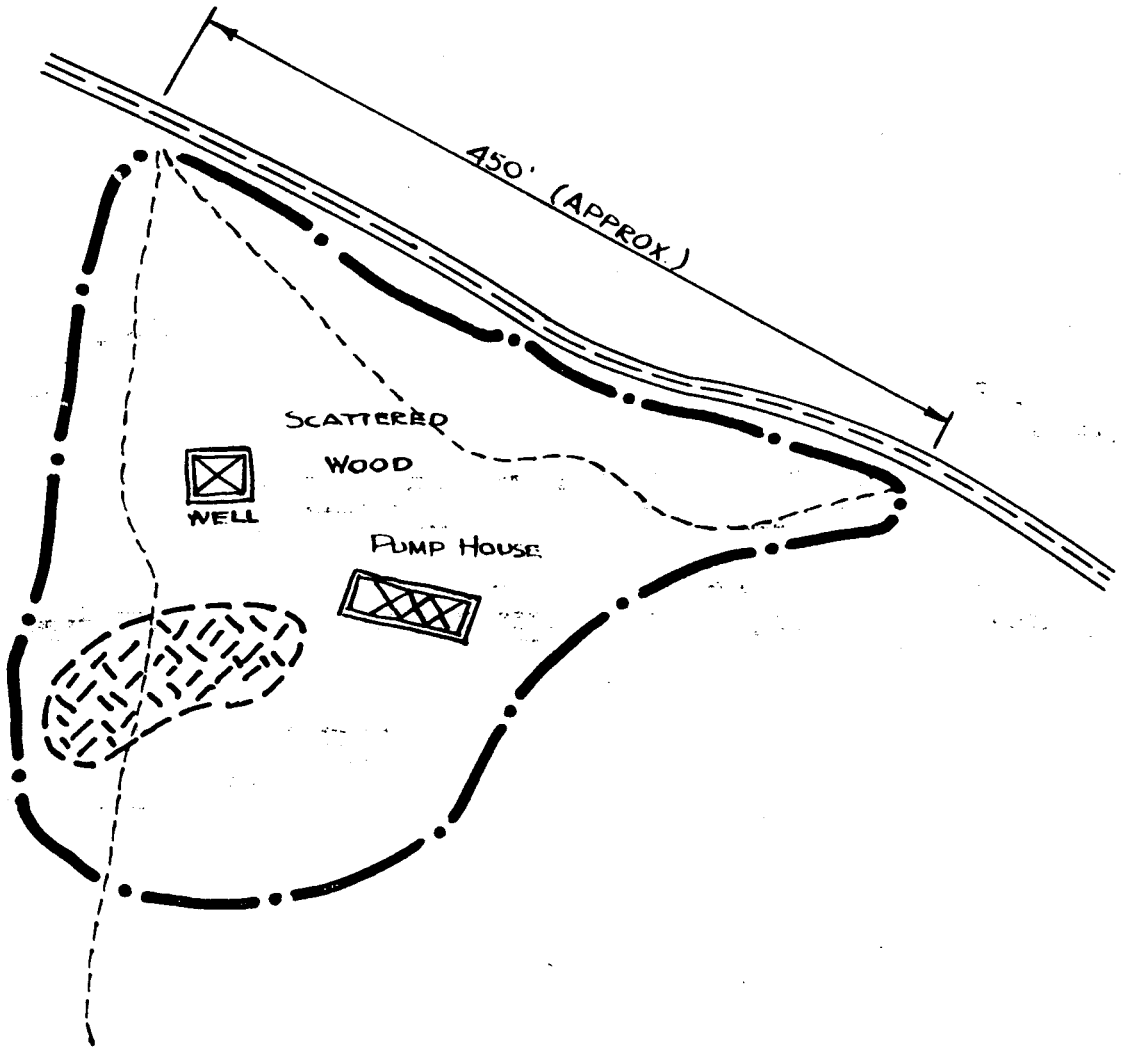
CRACKER CREEK

FIGURE 22



NORTH

ALASKA HIGHWAY
MILE - 996.3
AISHIHIK RIVER (CANYON)
MILE - 1000.0
CANOL PUMPING STATION C
FIGURE 23



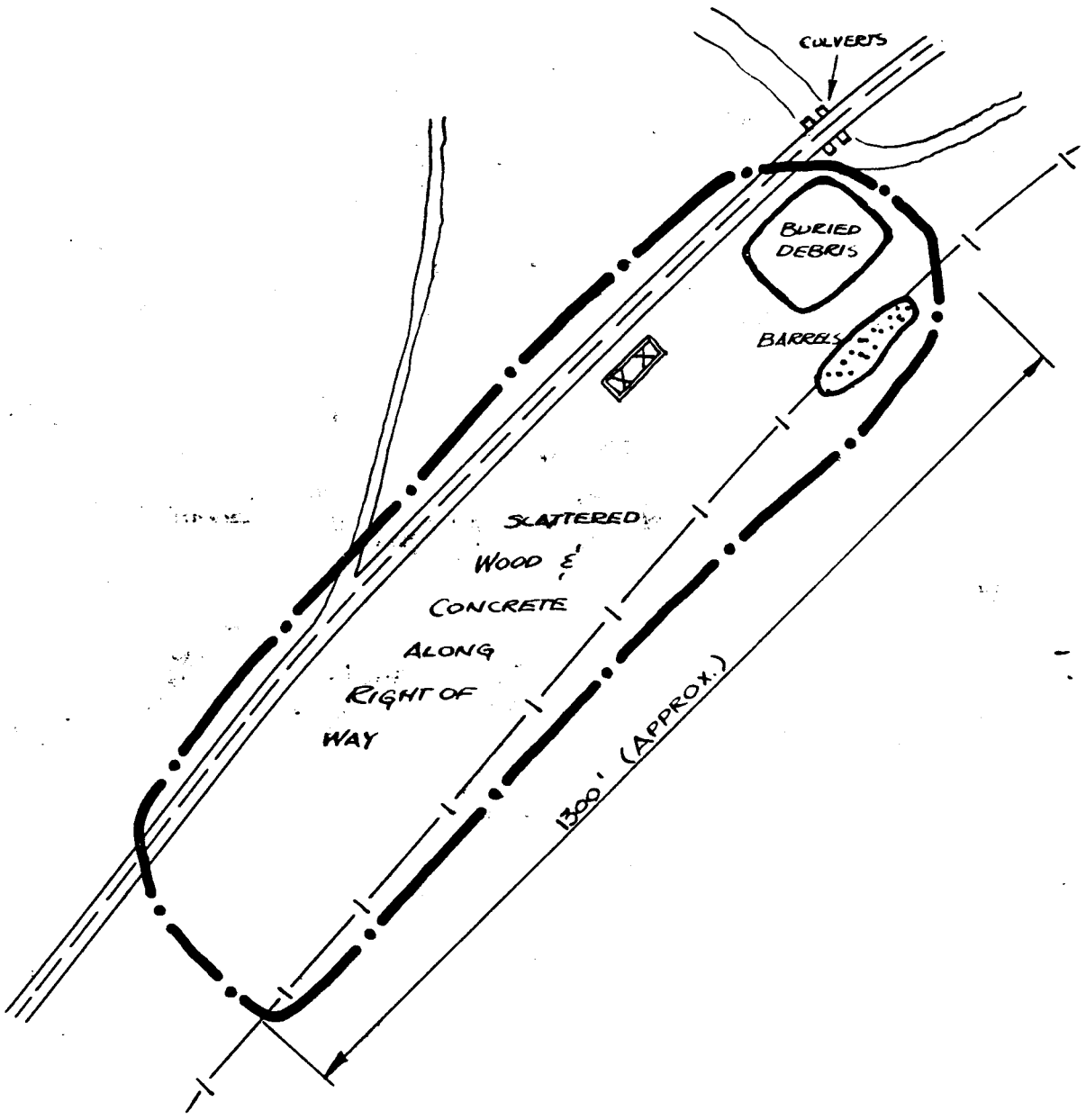
NORTH

ALASKA HIGHWAY

MILE - 1036.2

CANOL PUMPING STATION D

FIGURE 24



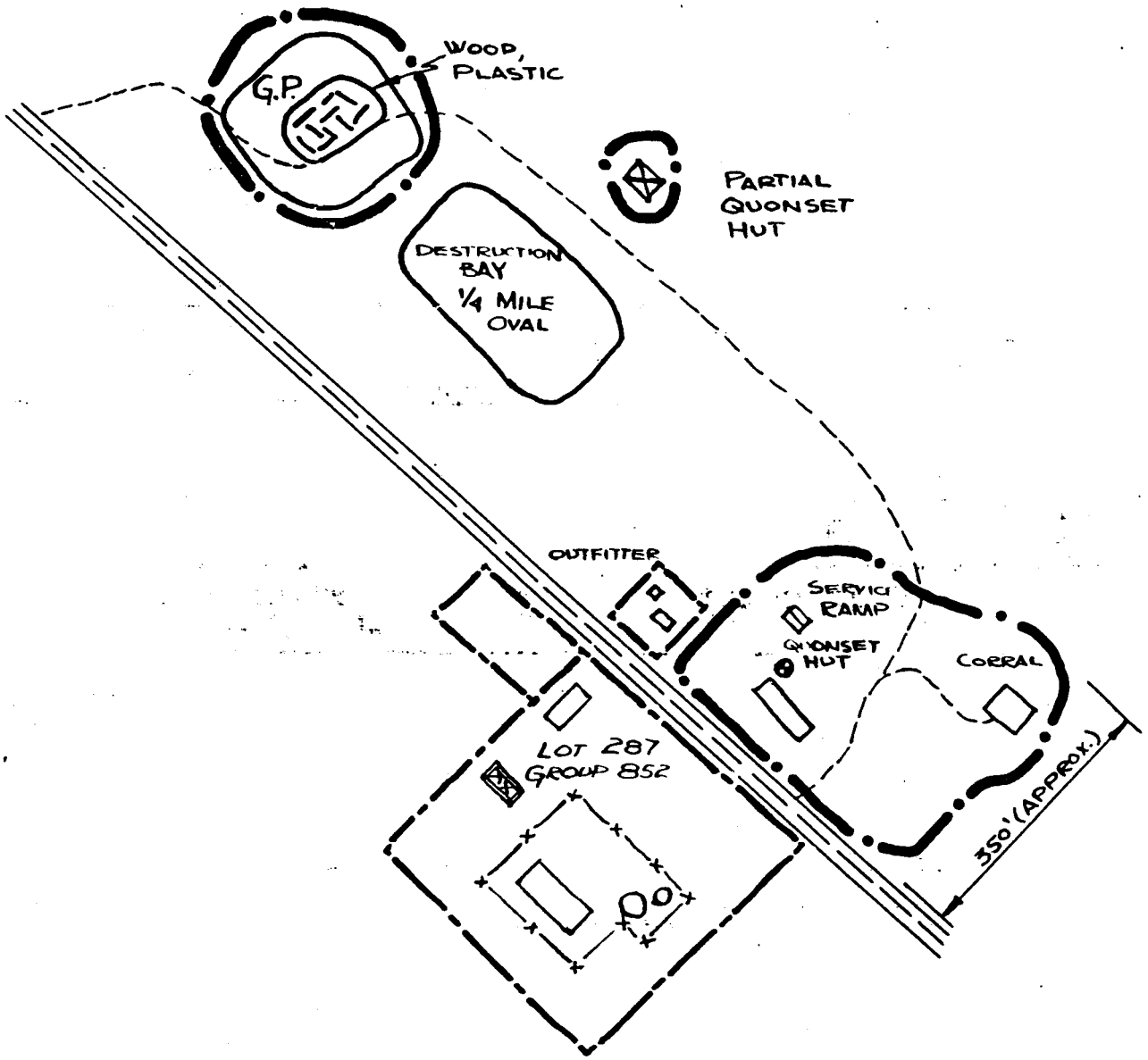
NORTH

ALASKA HIGHWAY

MILE - 1056.0

KLUANE MAINTENANCE CAM

FIGURE 25

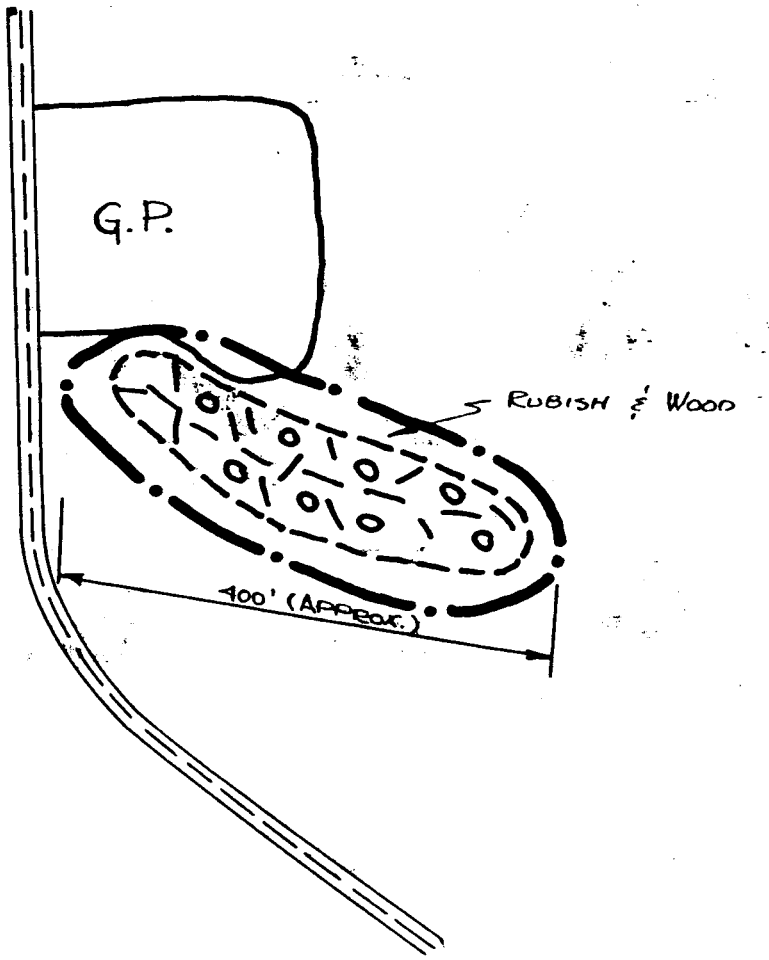


ALASKA HIGHWAY

MILE - 1080.8

CANOL PUMPING STATION E

FIGURE 26



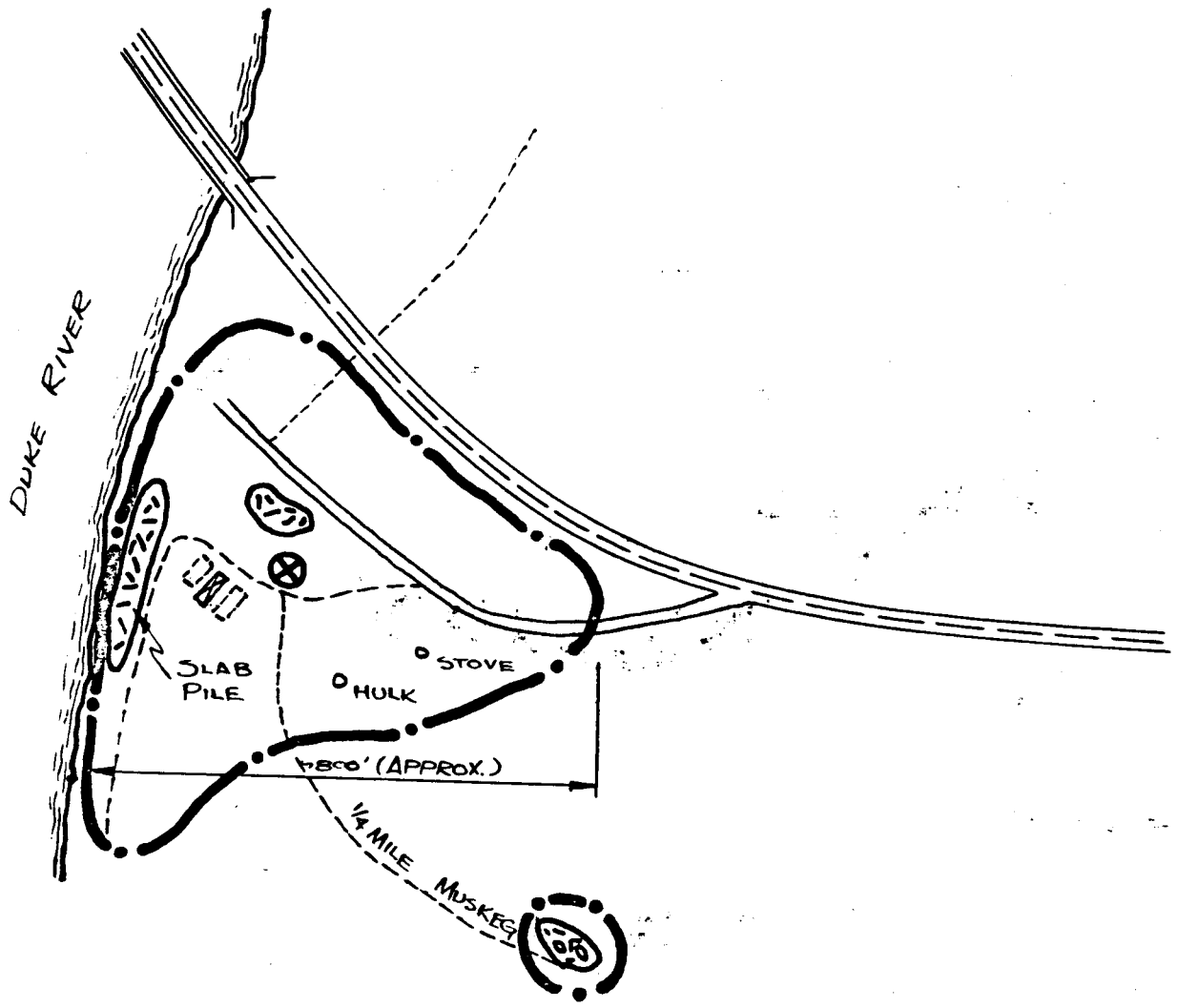
NORTH

ALASKA HIGHWAY

MILE - 1092.3

BURWASH LANDING

FIGURE 27



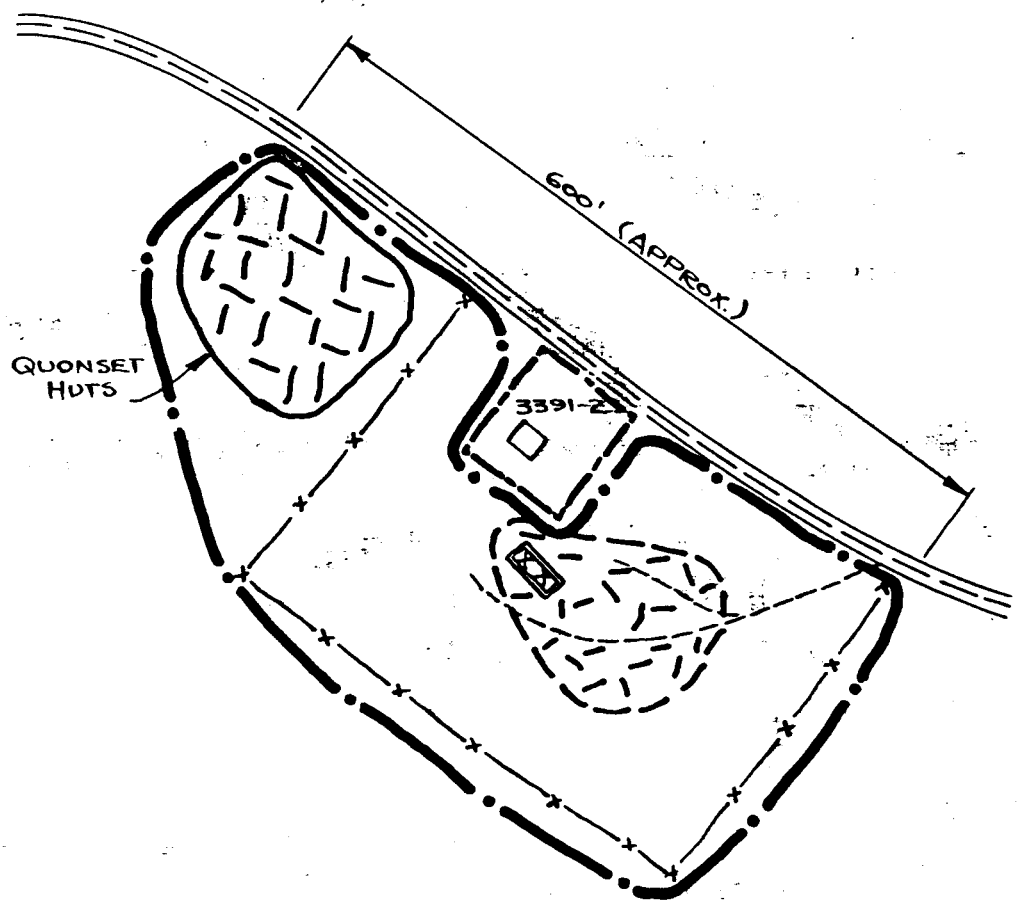
NORTH

ALASKA HIGHWAY

MILE - 1098.0

DUKE RIVER

FIGURE 28



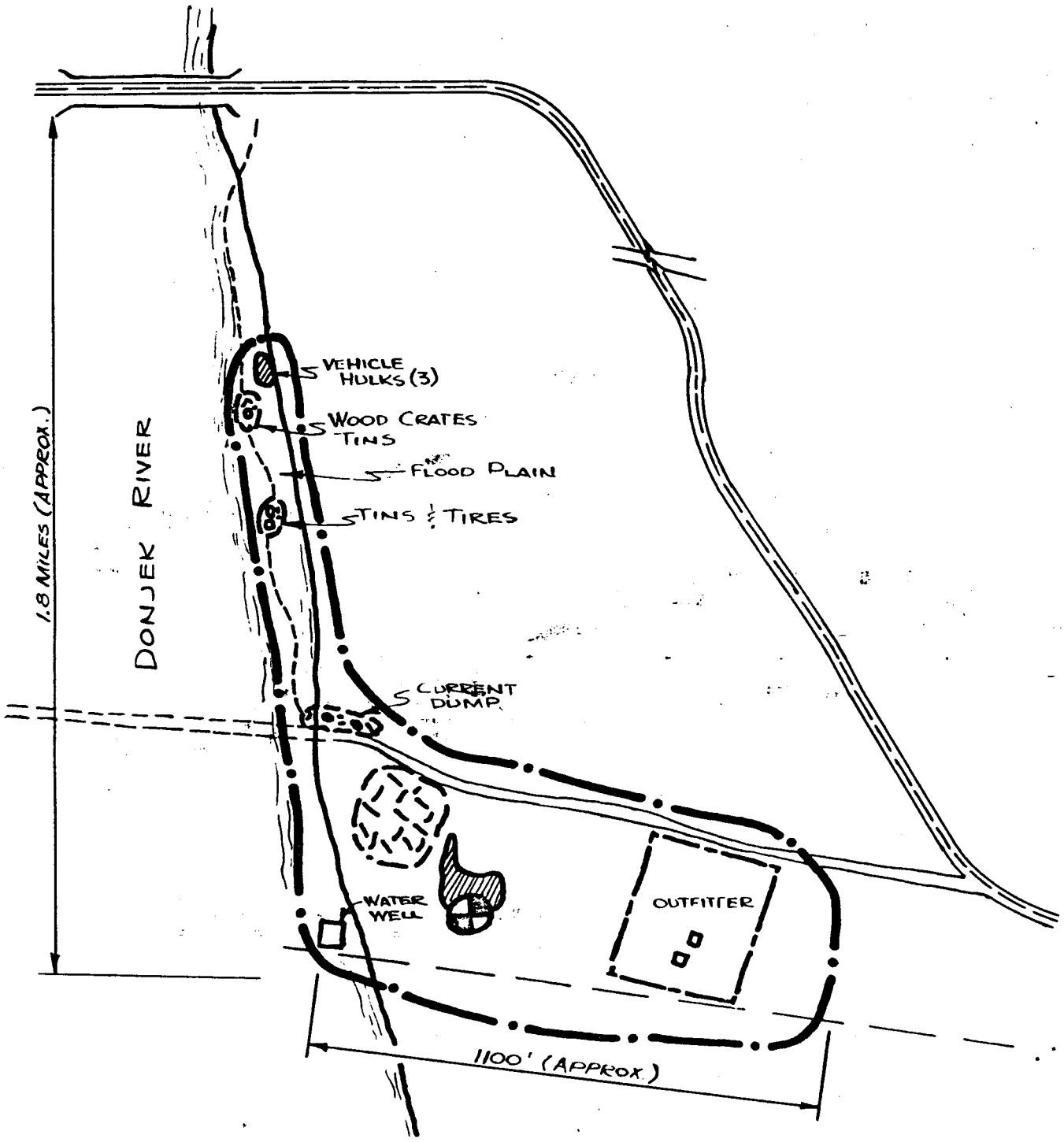
NORTH

ALASKA HIGHWAY

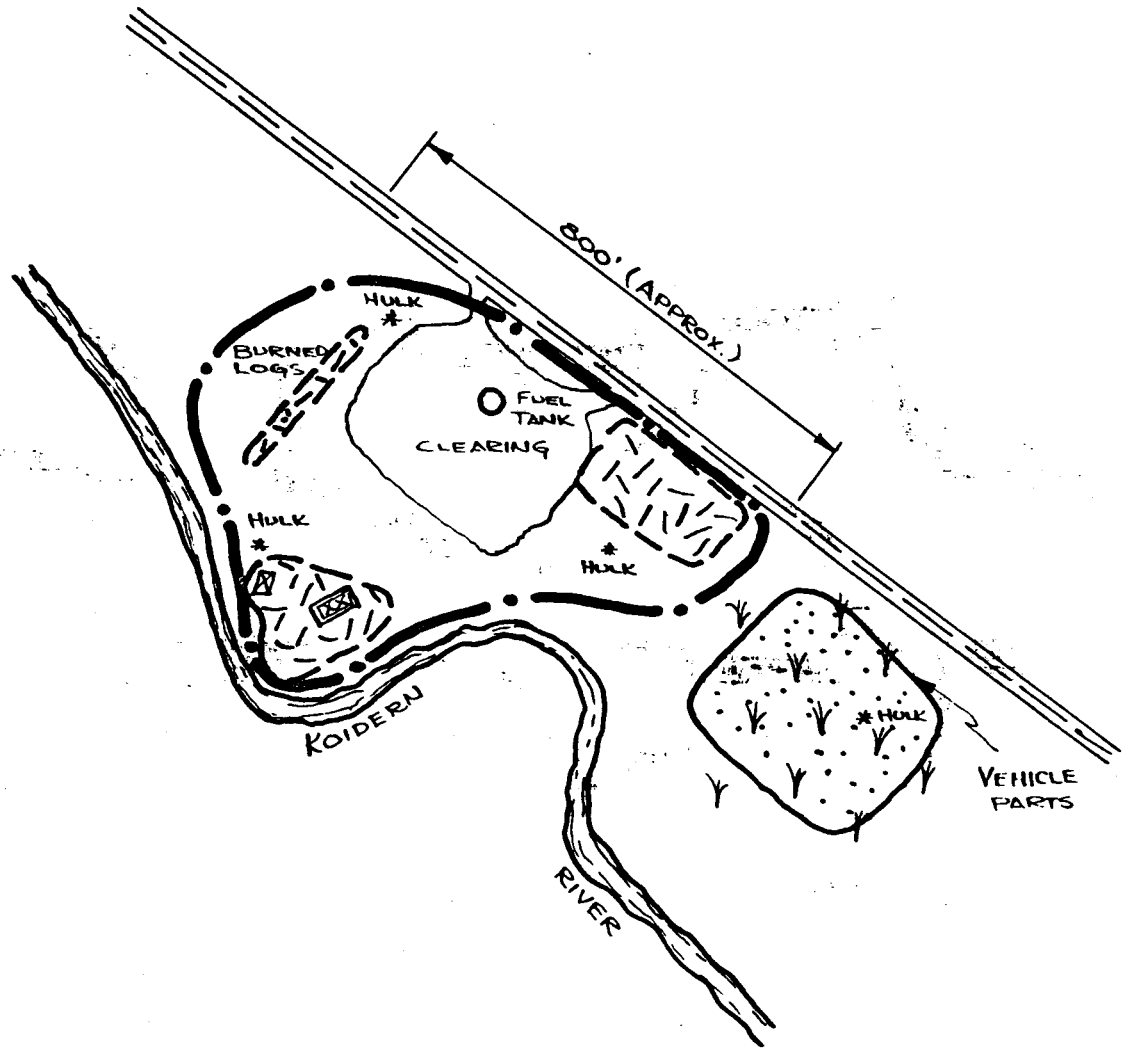
MILE - 1126.4

CANOL PUMPING STATION

FIGURE 29

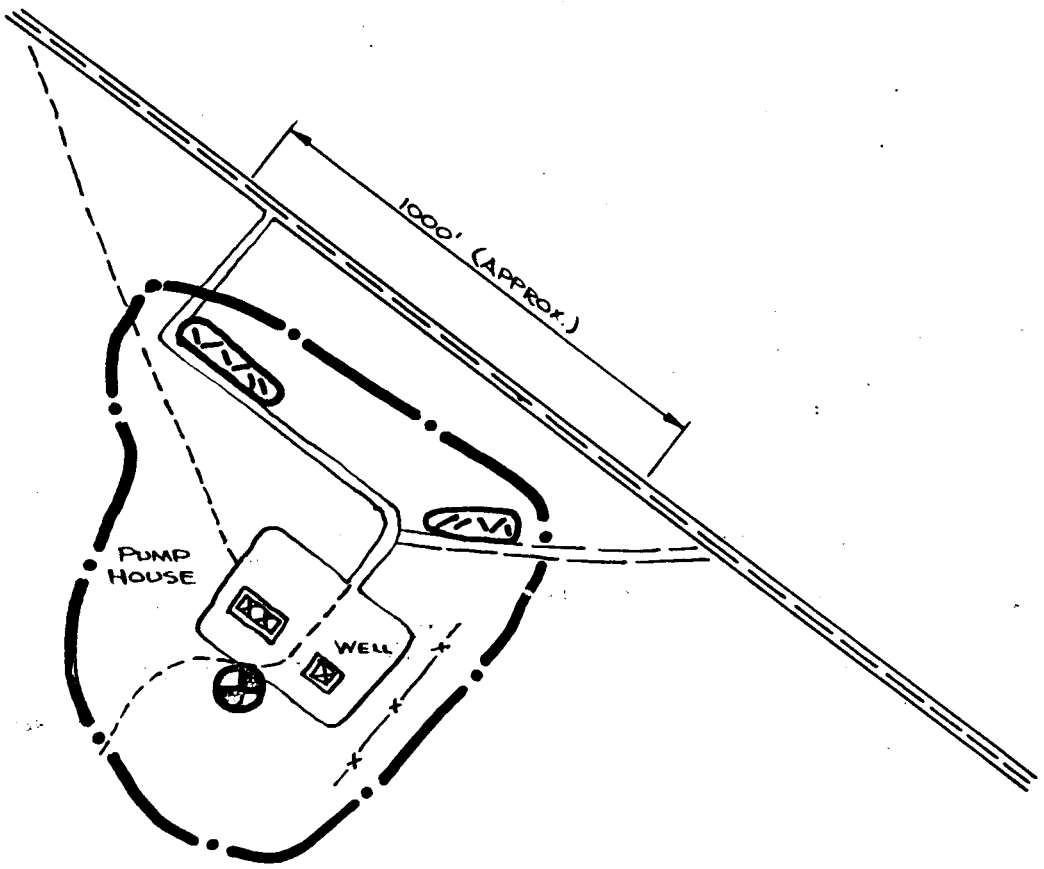


ALASKA HIGHWAY
MILE - 1130.1
DONJEK RIVER
FIGURE 30



NORTH

ALASKA HIGHWAY
MILE - 1156.0
KOIDERN RIVER
FIGURE 31

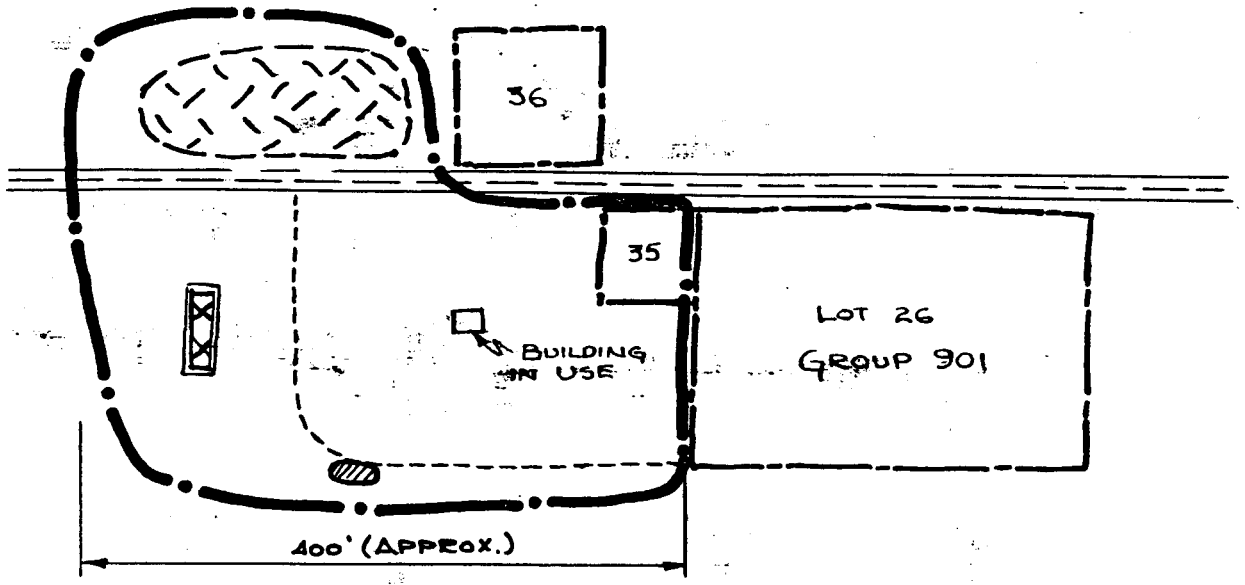


ALASKA HIGHWAY

MILE - 1166.0

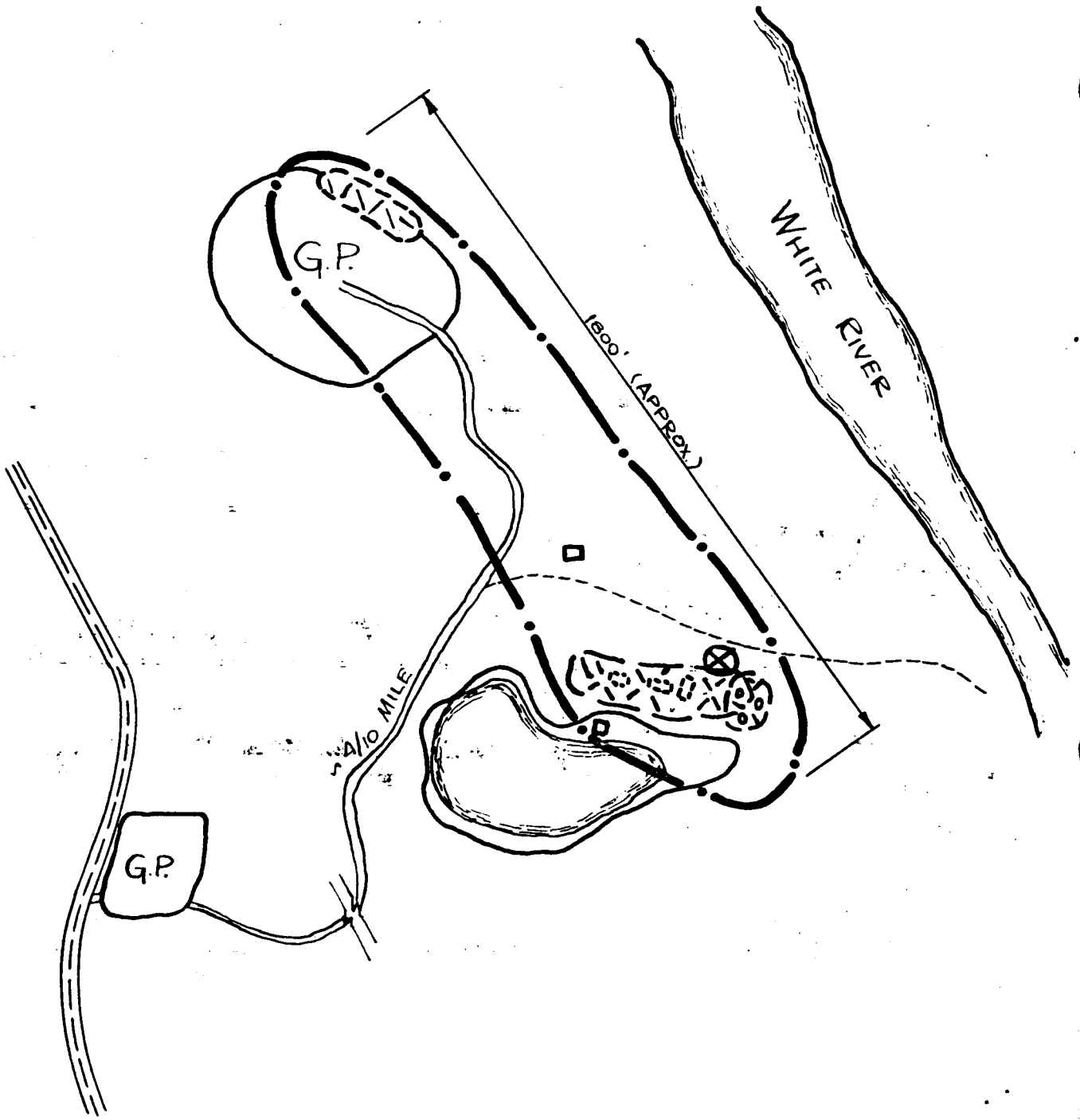
CANOL PUMPING STATION G

FIGURE 32



NORTH

ALASKA HIGHWAY
MILE - 1167.5
KOIDERN
FIGURE 33



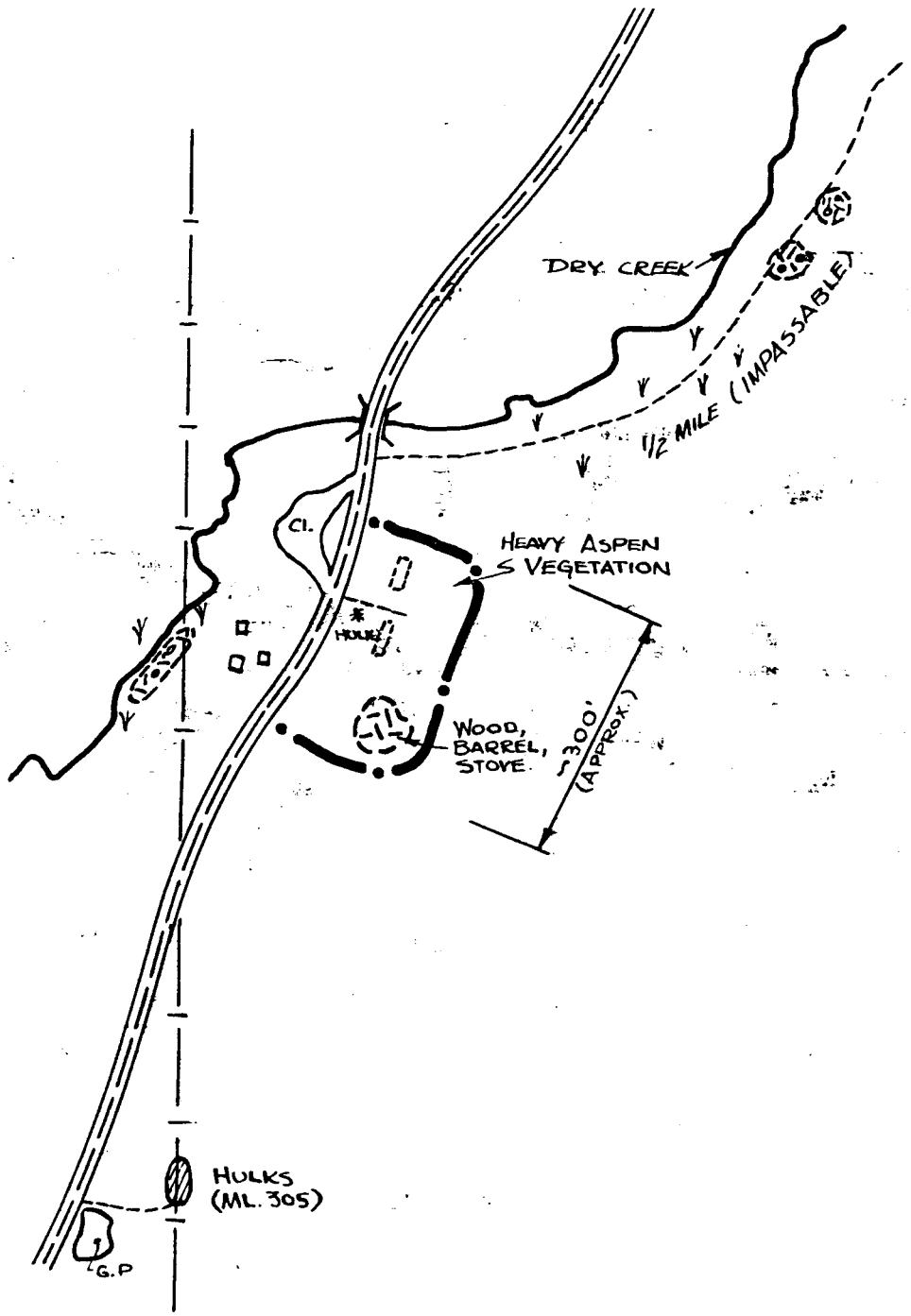
NORTH

ALASKA HIGHWAY

MILE - 1171.0

WHITE RIVER

FIGURE 34



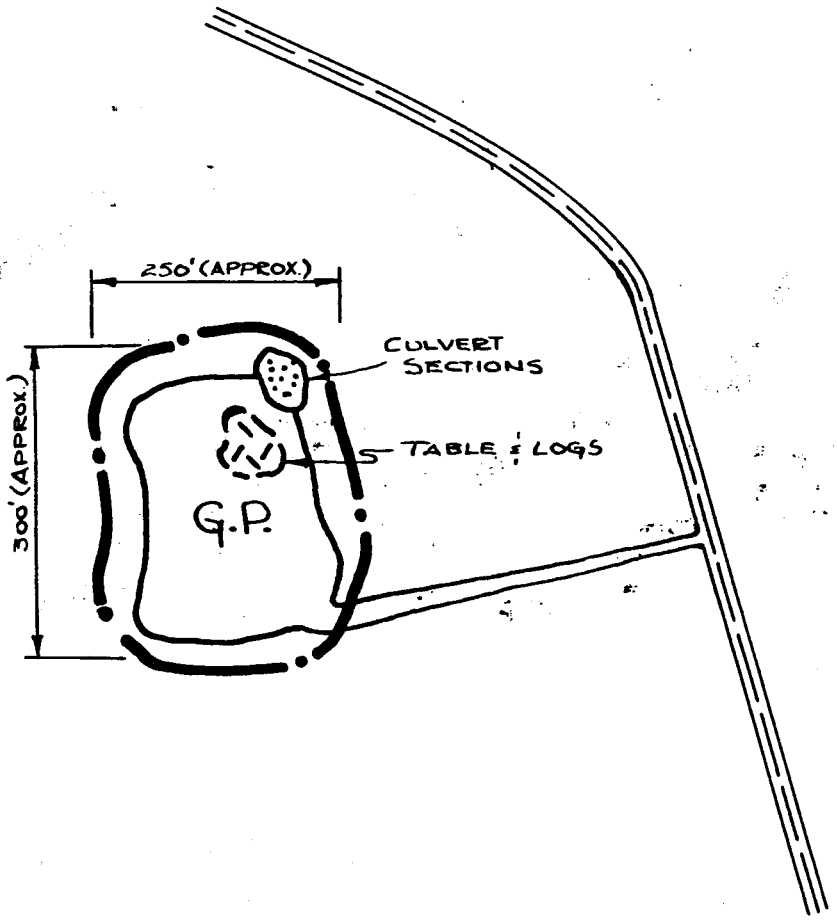
NORTH

ALASKA HIGHWAY

MILE - 1184.0

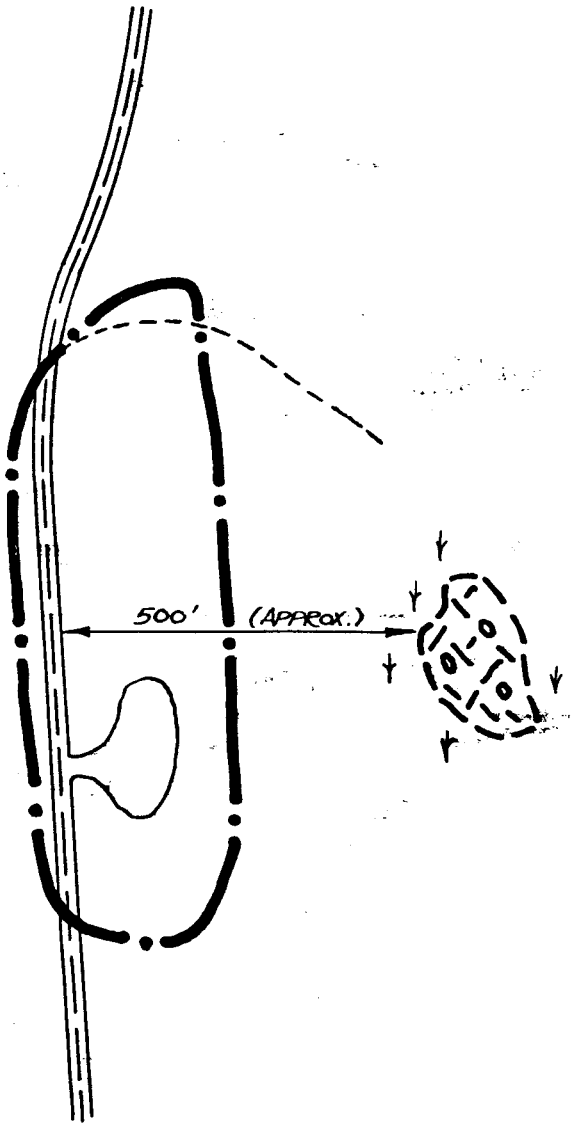
DRY CREEK

FIGURE 35



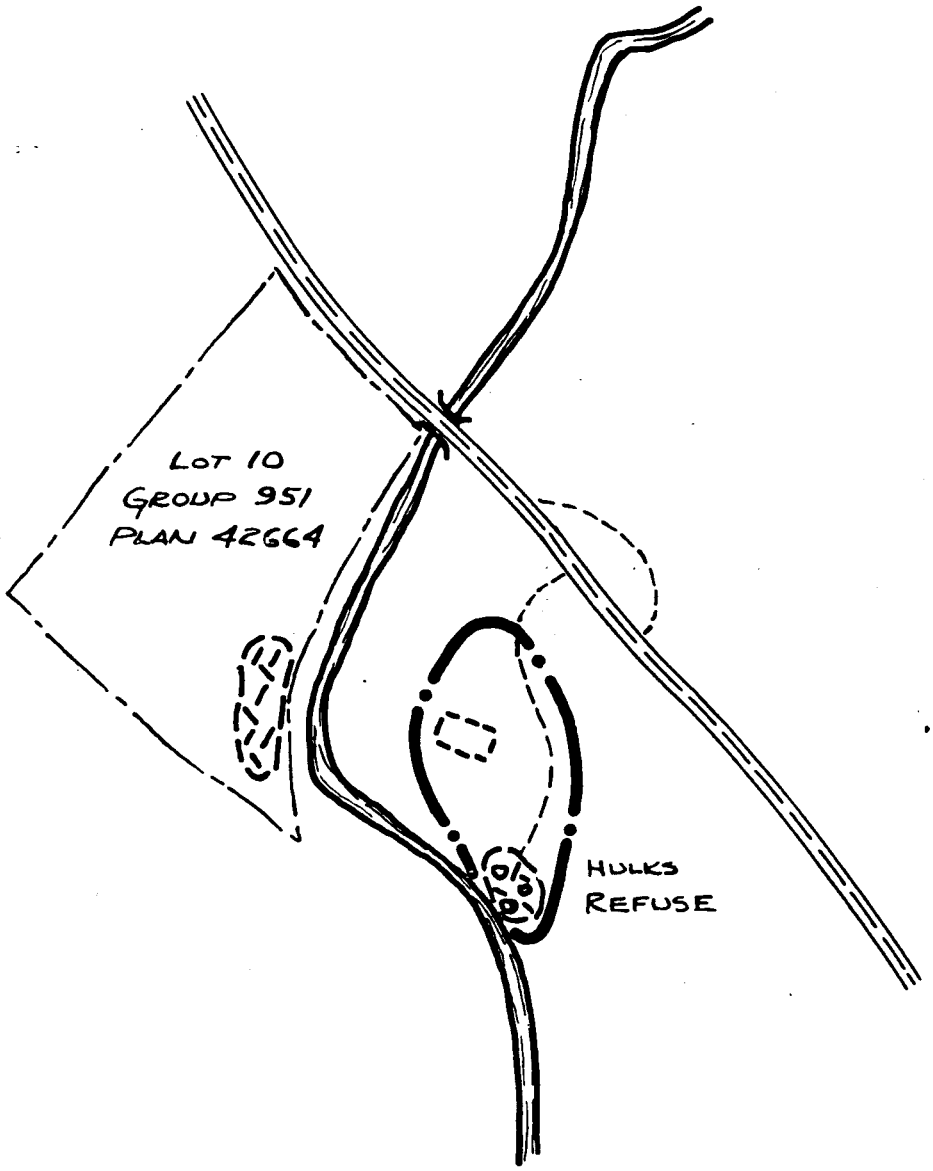
NORTH

ALASKA HIGHWAY
MILE - 1191.5
ENGER LAKES
FIGURE 36



ALASKA HIGHWAY
MILE - 1200.0

FIGURE 37

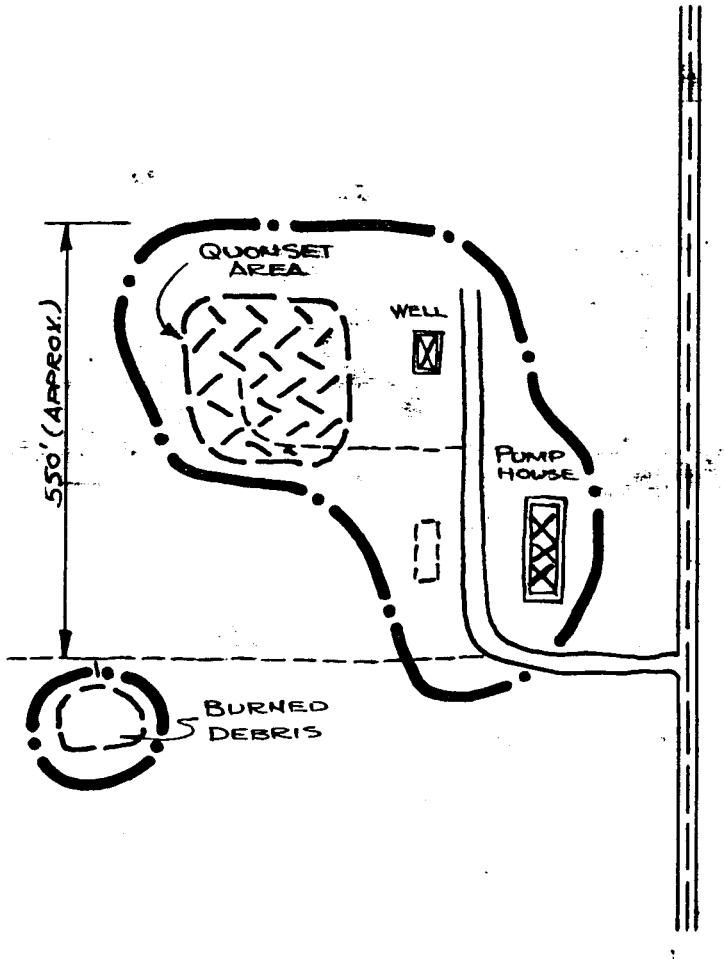


ALASKA HIGHWAY

MILE - 1200.7

BEAVER CREEK

FIGURE 38



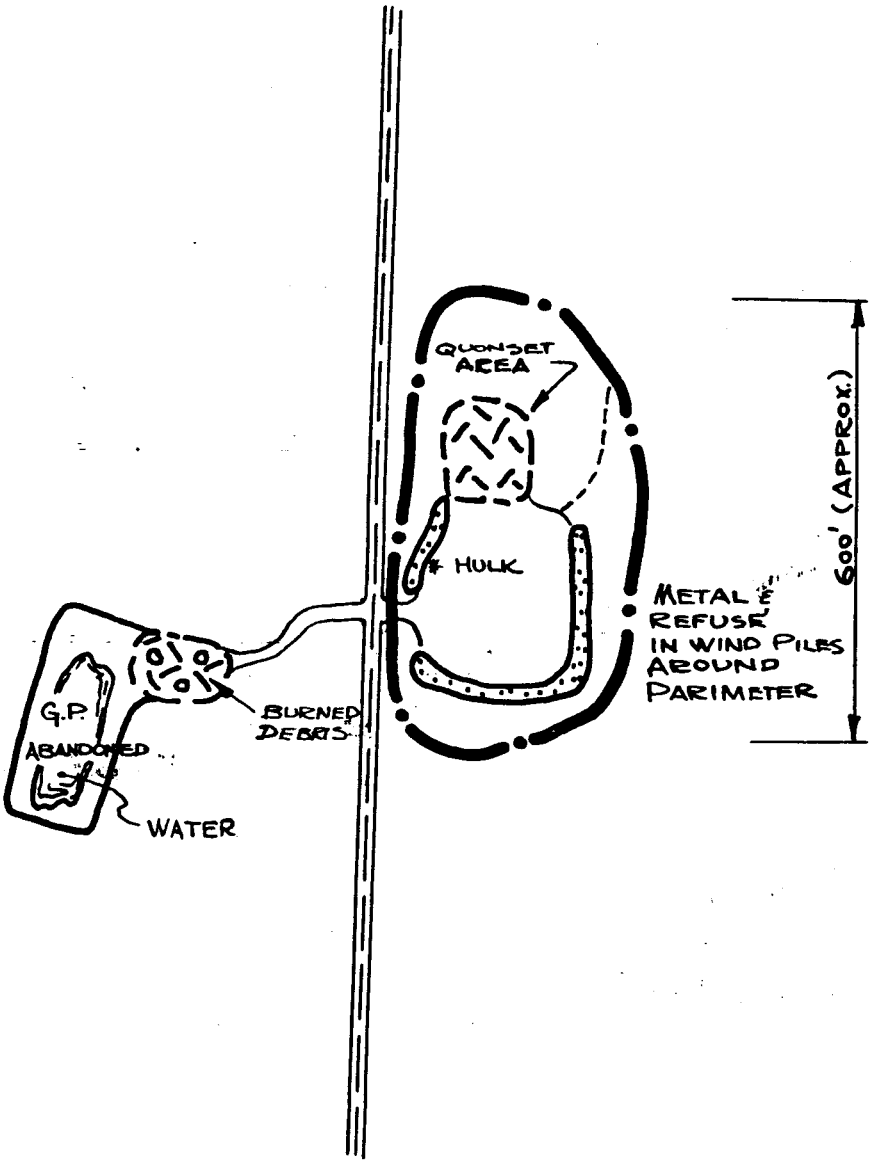
NORTH

ALASKA HIGHWAY

MILE - 1205.5

CANOL PUMPING STATION H

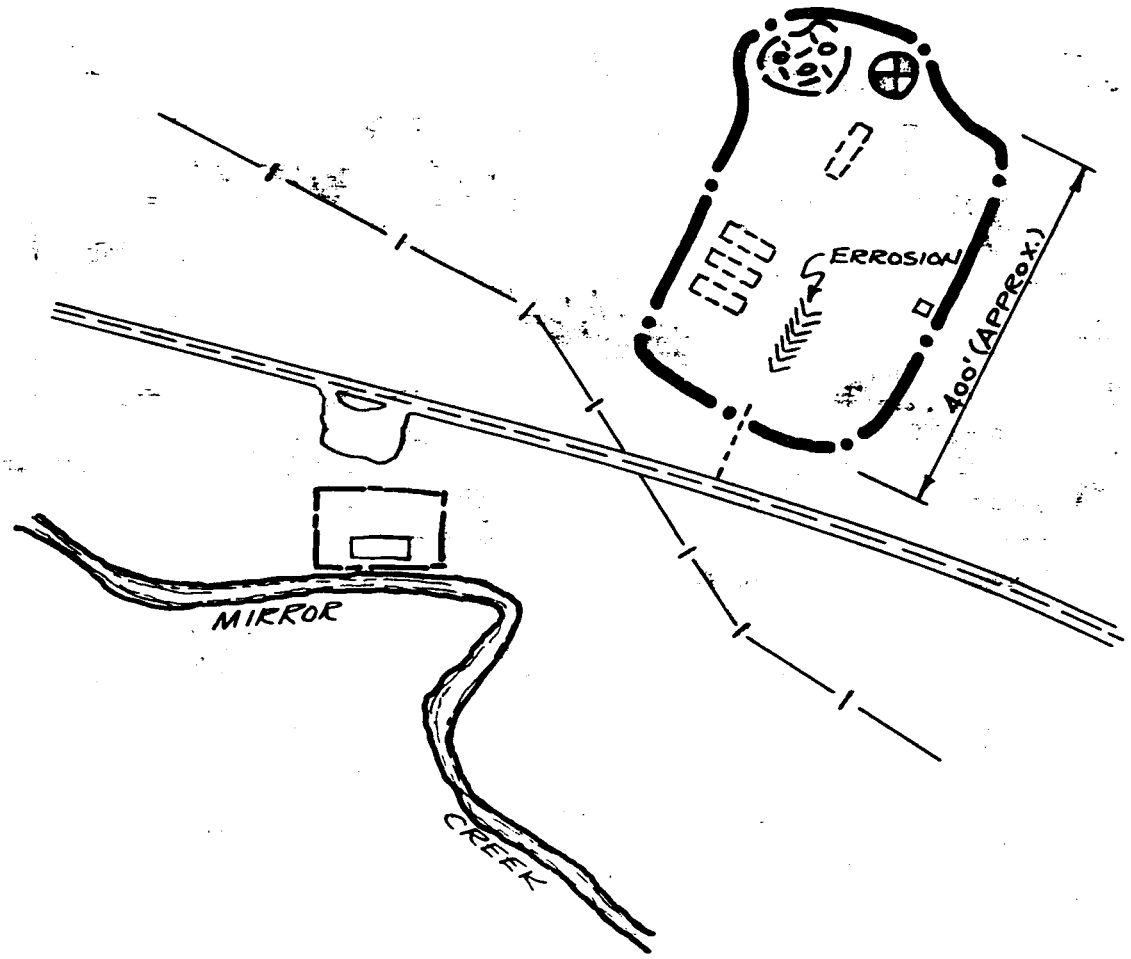
FIGURE 39



NORTH

ALASKA HIGHWAY
MILE - 1206.2

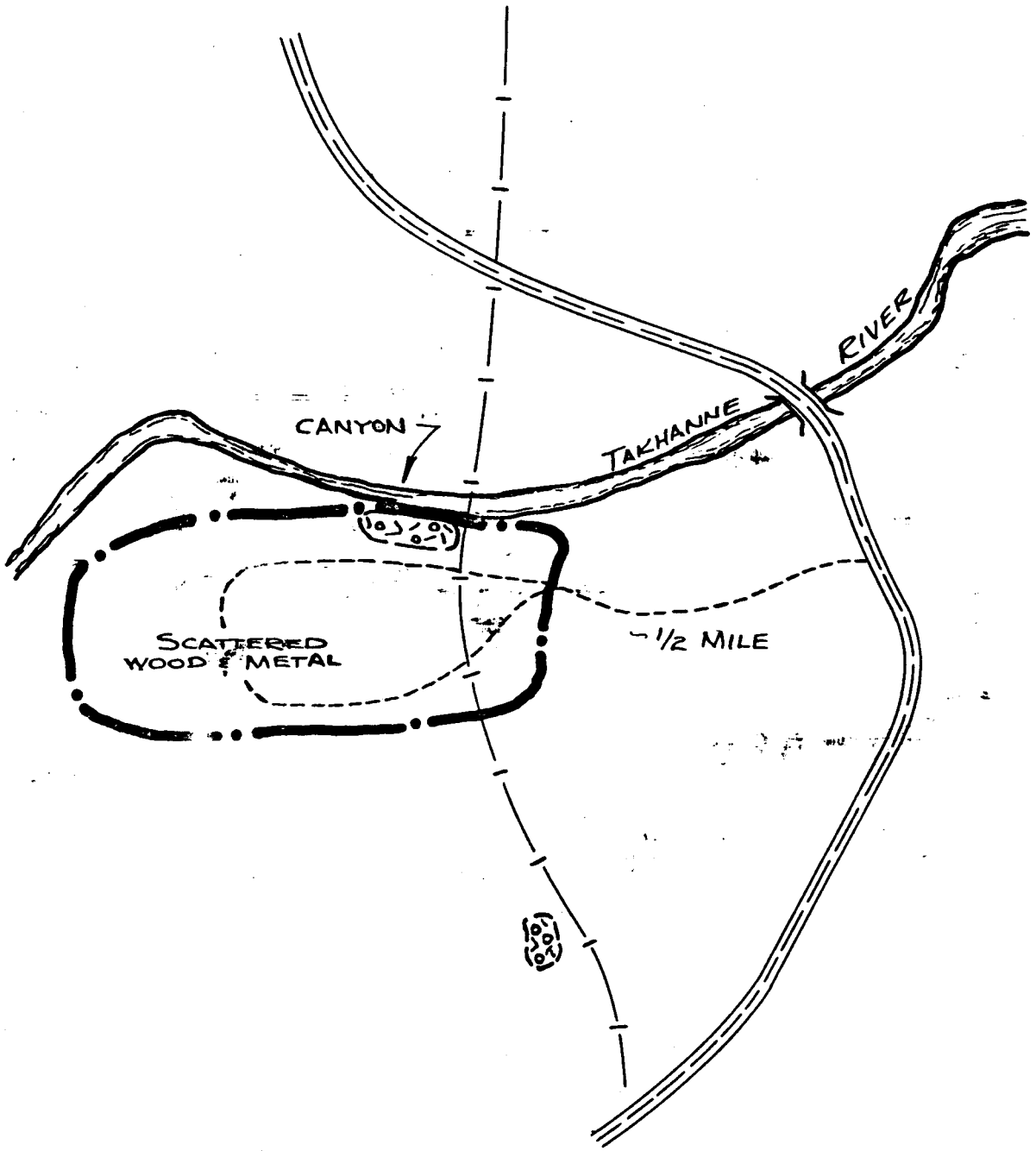
FIGURE 40



NORTH

ALASKA HIGHWAY
MILE - 1213.0

FIGURE 41



HAINES ROAD
MILE - 103.5
TAKHANNE RIVER
FIGURE 42