RESEARCH OF FORMER

MILITARY SITES & ACTIVITIES

IN THE YUKON

Action on Waste Program
Arctic Environmental Strategy (AES)
Indian and Northern Affairs Canada

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ACKNOWLEDGEMENTS

The project team would like to thank all the people who provided their time and talked to us about their personal stories and activities throughout the Yukon. The information gathered was greatly improved by your assistance.

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EXECUTIVE SUMMARY

This project was initiated in February 1995 and completed in April 1995, for the Arctic Environmental Strategy (AES), Indian and Northern Affairs. The objective was to complete a review of former military sites and activities in the Yukon, during World War II and afterwards, through to the 1970s. This period was an unknown factor, in terms of the introduction of contaminants into the Yukon.

The military activities of World War II, which affected the northwest were reviewed in detail from 1939 to 1971; the Northwest Staging Route airports, the construction of the Alaska Highway, Canol pipelines, and later the Haines-Fairbanks pipeline project. The activities of the U.S. and Canadian Army have had an impact on the landscape and have been a source of contaminants present in the Yukon today.

Location of construction camps for the Alaska Highway, Haines Road and pump stations for the Canol and Haines-Fairbanks pipelines were acquired from a variety of archival sources. Interviews were conducted in each of the communities along the project corridors. Persons who were either involved or had knowledge of the military activities were approached for information.

Sites of military activities and associated dump sites were compiled and presented acccording to Resource Management District in a District Review section; Watson Lake, Teslin, Tagish, Laberge, Haines Junction, Beaver Creek and Ross River. In each District Review section, each area of development and associated dumpsites are discussed and illustrated. Interviews are recorded in the district and community in which they were completed. Each camp, pump station, relay station, radio range station, sawmill and associated dumps were plotted on 1:250,000 scale maps for each Resource Management District involved in this study.

A site containing another 40 canisters of DDT, like that found in Rainy Hollow, B.C. in 1994 was not found. Sites were determined which were definite dumps or burial sites from military activities, and later clean up activities. Some interviewees felt that there was a very good chance that sites that were in fact "cleaned up" could contain buried contaminants. Others felt that there was nothing more serious than household refuse in these dumps. The procedure of the day was to bury "waste" to simply get it out of sight. Environmental concerns were minimal during this period, oil spills occurred, tranformers with PCBs were utilized, DDT was used for insect contol, and herbicides were used for brush control that are no longer registered due to their persistence in the environment.

There are numerous sites determined through this study which could be environmentally sensitive and should be investigated for contaminants as soon as possible. This would help to alleviate the concerns that many Yukoners have; regarding the quality of their "country foods".

RESEARCH OF FORMER MILITARY SITES & ACTIVITIES IN THE YUKON

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1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

This project was initiated by the Action on Waste Program, Department of Indian and Northern Affairs (DIAND), managers of the Arctic Environmental Strategy (AES), in Whitehorse, Yukon.

Ensuring elimination of unsafe and hazardous waste is a main objective of the AES Action on Waste Program. Waste management sites have been identified throughout the Yukon for each Resource Management District. About half of the 800 sites initially identified have been cleaned up. Many of these have been the visible dump sites, where household garbage, old barrels or vehicles have been removed.

The first Contaminant Workshop sponsored by the Arctic Environmental Strategy (AES) in February 1994, revealed levels of certain contaminants in fish, ie. DDT and PCBs in Lake Laberge and DDT in Watson Lake, which may be directly due to military activities. In the summer of 1994, Royal Roads Military College of Victoria, B.C. was hired by AES to assess selected sites within the Yukon, including the Aishihik and Snag airports built as part of the Northwest Staging Route. PCBs were found in specific locations at these abandoned airports.

The discovery in September 1994 of buried canisters of DDT at Rainy Hollow, British Columbia, near the Border pump station of the Haines-Fairbanks pipeline, raised serious concerns for the potential of further buried contaminants in the Yukon. Special procedures were utilized when removing the DDT canisters, as shown in Photo# 1.

Previous studies had also revealed that further research was necessary to determine potential contaminants left behind after the military defense projects of World War II and later military activities.

1.2 PROJECT OBJECTIVES

The military activities in the Yukon, during and after World War II, could be the biggest source of contaminants in the Yukon. In those days, as legend will have it, everything was buried from new equipment to old worn out parts. The main objective of this project was to obtain relevant information from oral interviews and an archival records review to provide the location of military sites and the type of activity at each site. Specifically, the objective was to find the location of sites, which could contain hazardous waste such as DDT or PCBs, requiring immediate clean up.

This review of activities would begin with the development of airports as part of the Northwest Staging Route, include the construction of the Alaska Highway, Haines Road, and Canol pipelines (1942-1945), and later, the Haines-Fairbanks pipeline (1954-1971). Additional military activities, if relevant, would also be addressed.

The study area would include the Northwest Staging Route and associated emergency airports, the Alaska Highway corridor from Watson Lake to Beaver Creek, the Haines Road and Haines-Fairbanks pipeline, and the Canol pipelines, consisting of four separate pipelines referred to as Canol No.1, 2, 3, & 4. along the Alaska Highway, South and North Canol Roads, and Whitepass Railroad right of way. These projects extended from Alaska and the Northwest Territories through British Columbia and the Yukon.

1. Removal of DDT from Rainy Hollow, British Columbia, September 1994

2.0 METHODOLOGY

2.1 FAMILIARIZATION

Initiation of this project, began on January 25, 1995 with a familiarization meeting with Mark Palmer and Brett Hartshorne, with the AES Action on Waste Program, in Whitehorse. It was determined that travel funds would be provided to complete interviews in the communities.

The project team attended the 1995 Contaminant Workshop on January 28th and 29th, sponsored by AES. This project was explained and we were introduced to people in the workshop. We made some initial contact with representatives of the First Nations as well as learned which contaminants are of immediate concern in the Yukon.

Studies, sponsored by the Arctic Environmental Strategy (AES), revealed levels of contaminants, namely organoclorines (toxaphene, DDT and PCBs) in several lakes in the Yukon. Sediment testing has been completed on some of the lakes in 1994, to determine chronological history of contaminant pollution, pinpointing the exact year of deposition. "Country foods" traditionally consumed in the Yukon have been tested for potential contaminants. The units of measurement used to describe contaminants are parts per million (ppm) and parts per trillion (ppt). These are very small units and have caused some confusion and perhaps more "fear" than neccessary.

A pamphlet on contaminants, prepared by the Council for Yukon Indians, (AES supported) addresses some of the concerns for the environment:
"Some of the questions that Elders are asking the scientists?
- What is in the Army dumps on the Canol Road?
- Are chemicals leaking out of the dump sites at McCrae into the Yukon River?
- Years ago a Whitepass train went into Lake Bennett. What became of that? Are the contents leaking into the lake?" (1)

Background information was collected from AES, including Contaminant Factsheets, (2,3,4,5) and previous reports (6,7,) and a report done for AES in 1993, entitled *Use, Disposal and Transportation of Selected Contaminants in the Yukon*. (8) As part of this study, people were interviewed for their knowledge of potential contaminants and dump sites in the Yukon. It was decided at the beginning of this project not to re-interview people already contacted during this 1993 study.

Portions of an Environmental Workshop for Yukon First Nations, was attended by the project team to make further contact with representatives from the First Nations within

the study area.

2.2 INTERVIEWS

Travel was arranged in order to conduct interviews in person in each community. Each of the First Nations within the study area were contacted via fax and telephone to arrange meeting dates. Other people were also contacted within each community.

First Nation	District
Liard River	Watson Lake
Kaska Tribal Council	Watson Lake
Teslin Tlingit Council	Teslin
Kwanlin Dun	Tagish
Ta'an Kwach'an Council	Laberge
Carcross/Tagish	Tagish
Champagne/Aishihik	Haines Junction
Kluane	Haines Junction
White River	Beaver Creek
Ross River Dena Council	Ross River

A questionnaire was developed to provide framework for our interviews but also allow for flexibility. This helped to keep the interviews informative, accurate as possible and also allowed for tangential discussion. The list of questions is presented in Appendix A.

Group meetings were held with Elders at Haines Junction and Teslin. Individual interviews were completed at the Kluane First Nation office. Otherwise people were interviewed in their homes or place of work. Within each community all available people were interviewed who would have been active on these projects, either as an employee, or later, as clean up personnel.

Most of the interviews were completed during February and March, 1995. Interviews in the western portion of the study area were conducted, from Champagne to Beaver Creek and in the eastern area from Teslin to Watson Lake. Interviews were also done in Ross River, Carcross and Whitehorse. Telephone calls were made to out of territory residents and to people not available for interviews in person.

A list of people interviewed is presented in Appendix B. Interviews are presented in the district in which they were completed. In many cases there were sites mentioned which were in other districts. Many residents within the Haines Junction District mentioned sites in the Beaver Creek District. Interviews with people in the private sector or government were conducted to gather additional information and are

presented where relevant. The Resource Management Officers in the Watson Lake, Teslin, Haines Junction, Beaver Creek and Ross River Districts were interviewed and information on waste management sites related to military activities were acquired. People who were contacted but did not reveal any useful information have not been included in the interview list.

Copies of Contaminant Factsheets and relevant reports, provided by AES, were handed out to First Nation offices and other interviewees that were interested.

2.3 ARCHIVAL RECORDS REVIEW

The database reference listing was reviewed at the Whitehorse Library and Yukon Archives for references regarding World War II projects. Historical volumes were acquired from the Northern Collection, Whitehorse Library. Records and historical maps were reviewed at Yukon Archives, Environmental Protection Service and Action on Waste Program, in Whitehorse. Copies were made of all relevant documents which have been provided in additional files to AES, noted in the text. For further illustration, portions of these records, photographs and maps appear throughout the report.

Public Road Administration Maps - 1943

Archival maps of the Public Roads Administration (PRA) were acquired from YTG Department of Highways, Engineering Branch (Community and Transportation Services, Government of Yukon, 200 Range Road, Whitehorse).

For the Alaska Highway, there are 10 sections from Dawson Creek to the Alaskan Border. In each section are 40-50 sheets illustrating each mile. These maps are dated 1943, with mileages updated later. (9)

Sections:
1) Mile 0-49
2) Mile 49-162
3) Mile 159-300
4) Mile 300-393
5) Mile 391-496
6) Mile 494-642 Liard River ,B.C. to Upper Liard, YT.
7) Mile 639-803 Upper Liard to Teslin
8) Mile 803-928 Teslin to MP928-North of Whitehorse
9) Mile 929-1093 MP928 to Burwash Landing
10) Mile 1092-1221.4 MP1093 to Alaska Border

These were the most valuable source for showing the location of the pioneer road and the first realignment of the Alaska Highway, as well as the location of construction

camps, relay stations, pipelines and pump stations, and some U.S. Army dump sites. These maps start at Section 6: MP 620 at Lower Post, (Sheet 6/41). These maps indicate the pioneer road and the improved road, as well as the Canol pipeline routes (Canol 1,2,3,4). In some places there is a great variance of the highway from the original pioneer road. A copy of these PRA Maps, with each camp, pump station etc. highlighted in red has been provided to AES of the Yukon portion of the Alaska Highway (Sections 6-10 - File # 1).

Other PRA maps were acquired for the Haines Road done by Foley Brothers Inc. and Rohl-Connolly Co., Haines, Alaska for the U.S. Corp of Engineers, in 1943. (10). These maps show relay stations and construction camps along the Haines Road, constructed in 1943-44. A copy has been provided to AES. (File # 2).

A map also available at YTG Engineering, indicated the mileages of the Canol Road and was the best source for the location of the camps and pump stations along the Canol No. 1. (11). A copy of this map with adjusted mileages from Johnson's Crossing (MP0) to the NWT border (MP 283) has been provided to AES. (File # 3).

2.4 REPORT FORMAT

A large volume of information was compiled covering a period of 55 years from the initial conception of the Alaska Highway and related military projects, starting in September 1939 when Canada entered World War II, and ending with the location of DDT canisters at Rainy Hollow, B.C. in September, 1994. Information is divided into sections, to provide for a more comprehensive discussion and illustration.

A summary of potential contaminants associated with military activities has been presented in Section 3.0, according to four categories: organochlorines, petroleum spills, herbicides, and "other". Additional contaminant information is presented in Appendix C.

Each military activity of relevance to this project is summarized in Section 4.0. A historical overview is given for each project with information indicated in chronological order. Additional information is presented in Appendices, including lists of camps, relay stations, pump stations, sawmills, and summary of reports related to a specific military project. Photos and figures are used to illustrate an activity where relevant. Clean up information is discussed, specific to each project. Portions of clean up reports are presented in Appendices.

In Section 5.0, military activities and their corridors or areas of activity were divided into the appropriate Resource Management Districts, utilized by DIAND, as shown in

Figure 1. This included seven districts: Watson Lake, Teslin, Tagish, Laberge, Haines Junction, Beaver Creek, and Ross River, out of a total of 10 in the Yukon. The boundaries of each district are defined on the maps prepared in this report. A summary of the district boundaries and map coverage for each district is presented.. Sites within British Columbia, along the Alaska Highway and Haines Roads have been included in the nearest Yukon district to provide a more complete review.

A few of the Appendices of Section 4.0 have been divided according to the particular Districts. A listing of all the construction camps and pump stations along the Alaska Highway (9) in Appendix D is provided in each District Review, except Ross River. The listing of sawmill sites (12), Appendix E, has also been separated into the different district reviews. Information from the Edey Clean Up Assessment Study in 1976 (13), in Appendix L., including figures illustrating dump sites are presented in the district reviews. Relevant information on Clean Up from Government files at Yukon Archives (14) have also been presented. A listing of Army waste sites, completed by Enivironmental Protection Service (EPS) in 1983 (15), is indicated in each district review. The information was summarized as is and location co-ordinates were not checked. The sites determined at the RMO offices are also listed in each district review. Sites determined in the Laberge report (8) that were military in origin or are a duplication of sites found in this project are identified within the District Review sections. Comments regarding heritage resources of particular sites have also been included. (16)

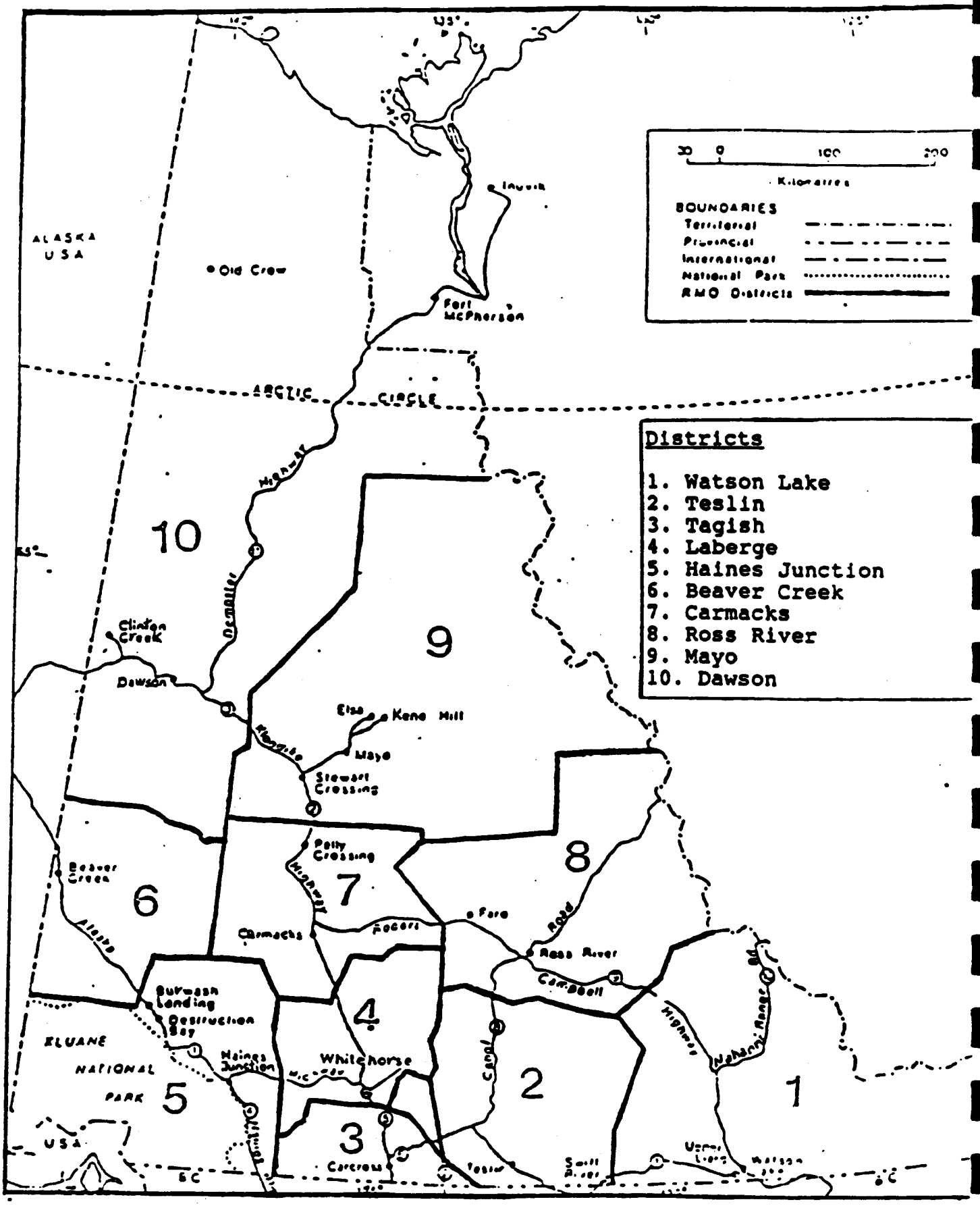
Information and interviews are presented by community or settlement, along the Alaska Highway starting from the district boundary on the east and working west. For roads which branch off the Alaska Highway, including the Haines and Canol Roads, communities are discussed south to north.

As mileposts were used to determine locations in this time period correlation to kilometres has not been done in this report. Each time the road was altered or realigned the mileposts changed. Mileposts are different according to the particular reference source and year of the source. For consistency sake the mileposts from the PRA maps (9) have been used for the Alaska Highway. Mileages from various government records are presented in Appendices in Section 4.0.

Pipeline Mileage posts although noted as Milepost MP in documents are noted as Pipeline Post (PP), to differentiate between milepost of the road and pipeline where possible.

Particular references have been noted throughout this report and they are shown by a number in parenthesis ( ). These are in the order that they are mentioned and are listed as footnotes in Appendix R.

FIGURE 1: DISTRICT BOUNDARIES



2.5 MAPPING

Fourteen maps at 1:250,000 scale have been prepared to illustrate the military sites; construction camps (private and US Army), relay and radio range stations, airports, pipeline pump stations, sawmill and dump locations. Areas with military activities, i.e practice bombing are noted. Oil spills along the Haines-Fairbanks pipeline are also shown. Symbols illustrate the different uses for each site location. The location of dumps from archival sources or historical maps were noted by the letter A. Where interviews have determined the dump site, this is shown by a B. Many of the sites were confirmed by both A & B.

Maps in B.C. have been included to fully illustrate the sites along the Alaska Highway and the Haines Road. Borders of the original NTS map bases have been removed to facilitate joining up the maps for review purposes.

LIST OF MAPS

Map No.	District	NTS Map No.
Map 1	Watson Lake	105A/104P
Map 2	Watson Lake/Teslin	105B/1040
Map 3	Teslin	105C/104N
Map 4	Tagish/Laberge	105D
Map 5	Laberge	105E
Map 6	Laberge/Haines Junction	115H
Map 7	Haines Junction/Laberge/Tagish	115A
Map 8	Tatshenshini River, B.C.	114P
Map 9	Haines Junction/Beaver Creek	115F&G/115B&C
Map 10	Beaver Creek	115J&K
Map 11	Ross River/Teslin	105F
Map 12	Ross River	105K
Map 13	Ross River	105J
Map 14	Ross River	105O/105P

MAP LEGEND :

Northwest Staging Route Airports
U.S. Army Relay Stations
Radio Range Stations
Highway Maintenance Camps
U.S. Army Construction Camps
Private Contractor Construction Camps
Sawmills
Pump Station - Haines-Fairbanks Pipeline
Pump Station - Canol Pipeline
RMO Waste Management Sites
Dump Sites - (A) Archives (B) Anecdotal
Military Activity (Practice Bombing)
Known Oil Spills

APPENDIX A: QUESTIONNAIRE

We described the AES program and the objectives of our contract to each interviewee.

How long have you lived in the Yukon?
If you weren't born here, when did you come and why (ie to work on the highway etc.)?

How were you involved in the construction of the Northwest Staging Route Airports, the Alaska Highway, Canol Pipeline or Haines-Fairbanks pipeline ?

In what year(s) were you involved ?

Do you know where possible dump sites were located associated with these activities?

Do you know what materials were dumped at these locations?

Did you ever use or see transported/buried; DDT, PCBs, equipment/vehicles during this period?

What kind of containers were used?

Did you ever see any oil spills or evidence of oil slicks on rivers or lakes?

Have you have found garbage or military debris or barrels (empty or full) while out in the bush?

How did the Army operate and what were standard operating procedures?

Do you know of anyone else that we should talk to?

APPENDIX B: LIST OF INTERVIEWS

WATSON LAKE DISTRICT

Watson Lake
Eilene Vanbibber
Bob Watson
Clara Donnessey
Jim Close
Gordon Toole
Ann Morgan - Recreation Director - Town of Watson Lake
Willa Reams
Harry Holmquist - Watson Lake Diving Club
Mike Sparks - Assistant Resource Management Officer (ARMO)

Upper Liard
Dick Morris
Fred Hasselburg

TESLIN DISTRICT

Teslin
Doug Smarch
Florence Smarch
Watson Smarch
John Martychuck
Harry Morris
Robert Lee
Blanche Boseley
Len Usher
Orville Smith
George Mahoney
Bill Boseley

Johnson's Crossing
Pansy Allen

Squanga Lake
Ted Hall

APPENDIX B: LIST OF INTERVIEWS (Cont.)

TAGISH DISTRICT -

Tagish
Art Johns

Carcross
Chief Patrick James - Carcross/Tagish First Nation
Larry Whelan
Norman James
Ron Edwards
Hershel Smith
Larry Barret

Whitehorse
Murray Biggin
Hector Lang
Jack Saunders
John Suit
Gordon Yardley

Kwanlin Dun First Nation:
Geraldine Pope - Kwanlin Dun Resource Officer
Jason Shorty
Jessie Scarff

LABERGE DISTRICT

Ta'an Kwach'an First Nation:
Doreen Grady - Ta'an Kwach'an Resource Officer

Champagne
Alex VanBibber

HAINES JUNCTION DISTRICT

Cracker Creek
Chris Bolan - Cracker Creek Lodge

Aishihik Airport
Jim Macmanus

APPENDIX B: LIST OF INTERVIEWS (Cont.)

HAINES JUNCTION DISTRICT (Cont.)

Canyon
Alice Stick
Hayden Woodruff

Haines Junction
Champagne/Aishihik Elders Tea - Co-ordinated by Barbara Eikland:
Oliver Jim
Frank Joe
Sam Williams
Hayden Woodruff
Alice Stick
Polly Fraser
Oliver Jim
Mary Long
Kathy Kurshinruk
Annie Nicholas
Stella Boss
Bessie Crow
Jack Allen
Bessie Allen
Jennie Moose

Rod Tait
Mike Crawshay
Ernest Kelly
George Washington
Ed Karmen
John Trotter - Assistant RMO
Smokey Gutman
Al Tomlin
Lynne Sofiak

Klukshu
Marge Jackson
Francis Joe

APPENDIX B: LIST OF INTERVIEWS (Cont.)

HAINES JUNCTION DISTRICT (Cont.)

Silver City
Jessie & Frank Sias

Destruction Bay
Marsha & Jim Flumerfelt

Burwash Landing
Kluane First Nation:
Mary Jane Johnson
Chief Joseph Johnson
Agnes Johnson
Jessie Joe

Grace Chambers
Darrell Duensing
Dave Cook

BEAVER CREEK DISTRICT

Kluane Wilderness Village
John Trout
"Scully"

Beaver Creek
White River First Nation:
Margaret Nieman
Glen Stephan
Bessie Johns
Eddie Albert
Billy Blair
William Peters

Beat Ledergerber
Jack Stalberg

APPENDIX B: LIST OF INTERVIEWS (Cont.)

ROSS RIVER DISTRICT

Ross River
Ross River Dena Council:
Roger Ellis, Sandra Bob, Johnny Ladue - Resource Officers
George Smith
Hazel Peters
Amos Dick

Father Veyrat
Dick Craft
Jack Woods
Jerry Wolchuk - RMO Carmacks

GOVERNMENT CONTACTS

Ken Kavanagh - Consultant-Department of National Defense-Environment - Ottawa
Marielle Botts - Director of History -Department of National Defense - Ottawa
US.Air Force Base, Langely,Virginia
Dr. Stephen Grundy, Royal Roads College, Victoria, B.C.
Pesticide Information Line- Ottawa
Environment Canada - Ottawa
Canadian Centre for Occupational Health & Safety - Ottawa
George Balmer, Doug Davidge - Environmental Protection Service - Whitehorse,YT.
Environmental Protection and Assessment, Renewable Resources, Govt.of Yukon
Lorne Gay - Field Operations, DIAND, Whitehorse, Yukon
Transport Canada - Whitehorse Airport & Edmonton
YTG Aviation and Marine Branch - Haines Junction
Dave Roderick - DIAND, Whitehorse
Walter Rohlinger - YTG Highways

OTHER CONTACTS

Ken Steele - Whitepass Corporation, Whitehorse, Yukon
Dr. Peter Kershaw - University of Alberta, Edmonton, Alberta.
Bud Kofoed - J.R. Paine & Associates, Whitehorse
Murray Biggin - Historian (NWSR), Whitehorse
Kim Hudson - Researcher for Champagne/Aishihik First Nation

3.0 POTENTIAL CONTAMINANTS

The potential contaminants associated with military activities can be divided into four categories: Organochlorines, including DDT and PCBs; petroleum spills from the Canol and Haines-Fairbanks pipelines, and waste pit areas; herbicides used for brush control, and "other" materials used in military activities.

LIST : POTENTIAL CONTAMINANTS
Organochlorines:
DDT - Mosquito control
PCBs - Transformer oils & Lubricants
Petroleum Spills:
Pipelines (Canol 1,2,3,4),(Haines-Fairbanks)
Waste oil pits, maintenance garages/grease areas
Herbicides:
Haines-Fairbanks pipeline
2,4-D;2,4,5-T (Agent Orange/Esteron)
Tordon 101 (2,4-D,picloram), Fenuron
"Other":
Bombs, Ammunition, Equipment

The contaminants which we have been able to determine from our research include DDT (insect control), PCBs (transformers, lubricants), petroleum spills; from the four Canol pipelines and Haines-Fairbanks pipeline, and garage/grease pit areas; and herbicide use on the Haines-Fairbanks pipeline. "Other" is a catch-all category to include aspects of military activities which have left materials behind, such as practice bombs, ammunition and equipment which may be minor in terms of their contribution of potential contaminants, but they have had an affect on the cleanliness of our environment and have generated concerns for safety and water quality. Heavy metals (lead,mercury,copper,cadmium,arsenic) were not considered to be relevant to military activities and no documentation indicated their use.

Military activities have left behind contaminants both on land (buried or on the surface) and in the water. Much of the surface debris has been removed through clean-up procedures, including burning old buildings, winding up telegraph lines and removing the on-surface section of pipelines. Every camp and pump station along these development corridors had a dumpsite for garbage disposal and other odds and ends. It was when the camps were dismantled in 1943-44 along the Alaska Highway, and later after the bridging contractors left that discarded equipment, scrap metal, tires,

etc. were buried. The method of the day was to bury what was left, to get it out of sight. Many of these could potentially contaminate water sources.

There are few clear maps and descriptions of these buried sites available in archival sources. Government files at Yukon Archives (14) and the 1976 Edey Clean-Up Assessment (13), were the best sources for site descriptions, with some locations of buried dump sites identified along the Alaska Highway.

The results of military activities in the Yukon can be grouped accordingly:
On Land/In Water:
Pipelines (Oil spills, waste oil pits)
Relay/Radio Range Stations (Transformers)
Practice bombs, ammunition
Airplanes (Wrecks)
Equipment (Vehicle hulks)
Residues of Herbicides/Insecticides

3.1 ORGANOCHLORINES

Organochlorines of concern from military activities in the Yukon is DDT and PCBs. Some sources say that toxaphene was sometimes used as another active ingredient of DDT. (8). However, there was no documentation through archival research or interviews that toxaphene was used by the military in the Yukon.

Fish samples were tested for levels of toxaphene and other organochlorines in lakes and rivers from 1990-1994. Samples of burbot livers, lake trout flesh and whitefish flesh were taken from Yukon lakes. Research has shown that it is highly unlikely that toxaphene was deposited into our environment by the military. "The high levels of toxaphene found in fish in Lake Laberge and Atlin Lake likely enters the Yukon from the atmosphere through rain and snow and directly from the air. Local use of toxaphene was always limited and no local sources of toxaphene to these lakes have been identified." (17). This has been emphasized by sediment testing using highly sensitive sampling equipment on Yukon lakes. "Low levels of toxaphene (10-30 pg/L) (1 trillionth of a gram/L) were found in lake water from all lakes. This suggests that the presence of toxaphene in Laberge fish is almost certainly the result of atmospheric input. In the case of PCBs and DDT, however, their consistently higher levels compared to other locations suggests a local influence as well as atmospheric sources." (17).

DDT
DDT was used by the military for insect control, primarily for mosquitos. During the

construction of the Alaska Highway this was used to fumigate barracks, and for personal use for mosquito control.
"All camps were supplied with insecticide and fly paper to use in mess halls. The areas around pit latrines were oiled regularly and all garbage dumps were located outside the camps. Barracks were fumigated with hydrocyanic gas and DDT to exterminate bedbugs, while various insecticides and DDT were sprayed to eliminate roaches. " (18)

As Bob Watson indicated in an interview, (See Watson Lake District Review), he would take DDT and splash it on his face. It was the "ingredient" to keep away mosquitos.

In 1949 and 1950 the RCAF completed aerial spraying of DDT in Whitehorse and Watson Lake RCAF stations. In 1949, DDT and domestic fuel oil solution were sprayed by Douglas Dakota aircraft; in Whitehorse, 3125 acres were sprayed with an average dosage of .22 lbs per acre. In Watson Lake, 6400 acres were sprayed with an average dosage of .25 lbs of DDT per acre. In 1950, two applications were made in Whitehorse, treating an area of 11 square miles directly over the city and the Yukon River. In Watson Lake, the RCAF station at the airport was sprayed once treating an area of 12 square miles, with Watson Lake (the lake) in the centre of the area sprayed. The RCAF continued this mosquito program from 1951-1963 providing two aerial applications of DDT each season to areas around Watson Lake and Whitehorse. (8)

Research conducted under the 1993-1994 Northern Contaminants Program (6) has indicated that there is a far higher level of DDT in the fish sampled in Lake Laberge (burbot liver 4.25 ppm, lake trout flesh 0.9ppm) and Watson Lake (lake trout flesh 3.5ppm, whitefish flesh 0.4ppm) in comparison to all fish at all lakes sampled which contained very low (<0.3ppm) total DDT. In Lake Laberge, sediment testing has been carried out and show the highest concentrations of DDT from the period 1940 to 1946. Higher DDT in fish in these lakes is probably a legacy of DDT spraying for mosquito control from the 1940s to the early 1960s in the Whitehorse and Watson Lake areas. (17).

Refer to Appendix C for further DDT information and explanation of Organochlorines in Yukon fish.

PCBs - Polychlorinated Biphenyls
Previous research has shown that before the military arrived, use of PCBs in the Yukon was very limited. The military primarily used PCBs in electrical transformers and capacitors, radio transmitters and equipment, hydraulic oil and heat exchange fluid. PCB transformer oil was also mixed with trichlorobenzene and used as a machine parts

cleaning solvent. PCB oils were sometimes used to control dust on Yukon roads. The highest concentration of PCB transformers was probably in Whitehorse in connection with the large power demands of the Canol refinery and maybe at Teslin and Watson Lake. (8)

Relay and Radio Range Stations used some PCBs in their transmitters to prevent fire hazards. An environmental assessment by Royal Roads College in Victoria, B.C. (for AES) has shown that PCBs were found inside buildings at Aishihik airport and surrounding Snag Airport. (pers.comm. S.Grundy).

Research conducted under the 1993-1994 Northern Contaminants Program (6) has indicated that Lake Laberge fish had higher levels of PCBs than any other Yukon lake sampled. In Lake Laberge (burbot liver 1.4ppm, lake trout flesh 0.6ppm) in comparison to all fish at all lakes sampled which contained very low (<0.2ppm) total PCBs.

The PCB sediment testing results suggest that there were inputs of Aroclor oils (hexachlorobiphenyls) upstream from Lake Laberge during the period 1945-1955 when PCBs were in common use in the Whitehorse area. The composition of PCBs changes dramatically down the core. At the surface the PCBs consist mainly of di-, tri-, and tetrachlorobiphenyls which suggests that this dumping has now ceased because the recent slices are now dominated by a PCB pattern resembling atmospheric sources. (17).

In the late 1960s, PCBs were suspected of contaminating the environment. However, the manufacture and use of PCBs was not banned in the United States until 1977 and in Canada in 1979. (pers.comm.K.Kavanagh). Uncontrolled disposal of PCB's in Yukon prior to 1979 would have occurred through general garbage disposal practices, by spillage of PCB oil during salvage or filling of transformers and through waste oil handling.

For further information refer to Appendix C.

3.2 PETROLEUM SPILLS

Spills of petroleum products were associated with each of the Canol pipelines (No.1,2,3,4) as well as the Haines-Fairbanks pipeline.

Canol No.1:
Spills for the Canol No.1 Line are best described by P.Kershaw in a 1983 report. (19)

This pipeline operated for only 16 months December 1943 to April 1, 1945. Oil first entered the pipe at Camp Canol, NWT on December 19, 1943 (the first oil spill was that day) and after four months with construction delays etc. reached Whitehorse April 16, 1944. An estimated 27 days were necessary to fill the pipe to Whitehorse. Water could not be used for testing and oil losses occurred. Records have not been found on construction phase spills. Incomplete records of spills reported during the filling of the pipe and before the line had been completed indicate that 44 line breaks occurred during that period. The average daily capacity was 4,200 barrels, though the line was designed to carry 3,000 barrels of crude oil per day, and was operating at a higher pressure than manufacturer's specifications. Total oil that was potentially spilled was calculated at 169,132 barrels or 14.6% of the oil pumped into the pipeline. This includes 5.2% that was left in the line and in storage tanks at the time of abandonment. Much of this was presumably dumped on the ground during salvage operations. Only 42% of the unaccounted crude oil losses have been assigned a cause. The most common being from pipe failure (47%), damaged by tractor tread lugs as they passed over the pipe, 22% were from failure of lapwelds when pumping pressures burst the pipe along the longitudinal joint and another 12% were caused by tension and pressure caused breaks. (19) Approximately 16% of the 1.2 million gallons that were pumped into the pipe at Norman Wells was unaccounted for at Whitehorse. (20) Oil spills for Canol No. 1 are summarized in the Ross River District, in Appendix Q.

Canol No.2:
Earlier records of oil spills on the Canol No. 2 pipeline from Skagway to Whitehorse were not located in archival sources or from Whitepass Corporation who purchased the pipeline in 1959 (pers.comm.K.Steele). The best information on oils spills for this pipeline were completed by the Environmental Protection Service (EPS) in Whitehorse. Environmentally sensitive areas and oil spills from 1966-1976 are mentioned. In this period 38 breaks were recorded with the largest product loss at PP51.2 by Bennett Lake on January 19, 1969 of 1046 barrels. In most cases the reason for spills were pipeline ruptures or failures, with some cases of valves being faulty, due to ice, or being left open. Quantities of fuel spilled are best estimates. (21) EPS has also prepared a list of oil spills from 1975-1995 on the Whitepass pipeline. (22). These are presented in the Tagish District Review as Appendix O.

Canol No.3 & 4:
No records of oils spills were acquired for the Canol pipelines from Carcross to Watson Lake (No.3) and for the line from Whitehorse to Fairbanks (No.4). A further investigation of U.S. Army records is required outside of the Whitehorse area.

Haines-Fairbanks Pipeline:
Investigations of petroleum spillage are presented in two reports, in 1972 (23) and in 1975 (24). In 1971, 20 spills were investigated, 11 of these were within the Yukon, near PP114.5, 119.1, 197.1, 207.6. 217.1, 244.7, 256.8, 257.1, 268, 273.2, 290.8. (PP337.5 is at the Yukon/Alaska Border). The largest spill was at Dezadeash Lake (PP119.1), May 23, 1968 due to corroded pipe. These spills are listed in detail in the Haines Junction and Beaver Creek Districts.

Inhibitors were used in the fuel in the Haines- Fairbanks line. In 1953 were the following: a) 2,6-ditertiary butyl-4 methyl phenol, b) N,N' disecondary butyl -para-phenylenediamine, c) 2,4 dimethyl-6-tertiary-butyl phenol. As of October 1970, the list of antioxidants in JP-4 had increased to nine. It was applied at a rate of 1 pound inhibitor per 5000 U.S. gallons of fuel for the prevention of gum formation. It was thought that these concentrations of inhibitors could be responsible for the lack of vegetation growing in the spill areas when investigated in 1971. (23)

Waste Oil
Oil spills also include intentional dumping into waste pits or around maintenance garages. Clean up reports along the Canol No.1 project list oil stains around maintenance areas. The heavy oil residues from the Canol refinery in the Marwell area in Whitehorse were dumped into pits near the banks of the Yukon River (1944-1945), and the same site was used for waste oil until the early 1960s.

The potential effects of petroleum products are mentioned in Appendix C.

3.3 HERBICIDES

There were a number of herbicides used for brush control along the Haines-Fairbanks pipeline. This included 2,4-D, 2,4,5-T, which was made by the U.S.Army and was called 1Agent Orange. This was used in very high concentrations in Vietnam, but on the Haines-Fairbanks line, at weaker application rates. (See D. Duensing, E.Kelly Interviews-Haines Junction District). In the late 1960s, commercial herbicides contained 2,4-D and 2,4,5,-T, as single ingredients and as mixtures. Esteron was also applied containing 2,4-D and 2,4,5-T, which was commercially available in Canada. Tordon 101 (2,4-D,picloram) and was also applied and Fenuron, a soil sterilant, may have been applied. (See Review of Haines-Fairbanks Pipeline Records in Appendix N in Section 4.0.)

The Pesticide Information Line and Canadian Centre for Occupational Health & Safety were contacted in Ottawa and the Environmental Protection & Assesment Branch, Yukon Renewable Resources were contacted for information regarding these

herbicides. Product information and dates of registration and de-registration were acquired. Additional information is to be forwarded on concentrations of Agent Orange used by the U.S. Army, from the Pesticide Information Line-Ottawa. Information on Fenuron was limited, date of de-registration was 1962 in Canada. There were several types of Esteron available in the Canada. In 1985, any product containing 2,4,5-T was discontinued due to its residual effects in the environment (dioxins). The manufacturers of these herbicides were able to purify 2,4-D but not 2,4,5-T. Esteron available today has 2,4-D, as the sole active ingredient. A list of herbicide products available in the 1960s which could have been used on the Haines-Fairbanks pipeline includes:

Herbicides Records Review: (25) (26) (27)
Esteron 99 - Emulsifiable Concentrate - Ingredient: 2,4-D as low volatile esters, first registered in 1957, and is still registered. Concentration:500g/L
2,4-D 2,4,5,-T Liquid Brush Killer LV 96 - Emulsifiable concentrate
First registration in 1962, last registration December 31, 1985
Concentration: 300 g/L both 2,4-D and 2,4,5-T
Esteron LV-600 emulsifiable concentrate: 2,4-D,
First registered in 1966, and is still registered. Concentration: 564 g/L
Esteron T-6E emulsifiable concentrate: 2,4,5-T
First registered in 1966, date of last registration was December 31,1985.
Concentration: 600 g/L
Tordon 101 Mixture Brush Killer - 2,4-D, picloram: 2,4-D as amine salts (dimethylamine salt, diethanolamine salt, or other amine salts), Concentration 240 g/L
Picloram, present as amine salts (alkanolamine), diethanolamine salt or triisopropanolamine salt. Concentration: 65g/L
First registration in 1964, and is still registered.

Persistence of these herbicides in the soil is as follows: 2,4-D, a few months, 2,4,5-T - 6 to 9 months, and picloram is the longest at 3-5 years. Under dry and cold conditions, such as in the Yukon, persistence in the soil can be increased. "The persistence of picloram in the soil is evidenced by the fact that certain species of plants have been injured under certain conditions, as long as five years after an application." (25).

For spraying on the Haines-Fairbanks pipeline in 1969 the following was recommended: The chemical to be used shall be Tordon 101, picloram and 2,4- D, chemical analysis:(4-amino-3,5,6-trichloropicolinic acid (10.2%) (2,4,-D dichlorophenoxyacetic acid (39.6%) Inert Ingredients (50.2%). This mixed with water and particulating agent (Norbak) shall give a total application rate of 15 gallons per surface area. This shall be applied at the rate of 72.75 gallons per mile. (See Herbicides - October 1969 -Memo - Appendix N).

3.4 "OTHER"

In this category fall the other materials used in miliary activities, which may have contained contaminants. This includes the practice bombs and ammunition which are still on the ground and in the water near the practice target areas. These are not supposed to have contained toxic compounds but could still be hazardous, if they did not explode and are found on land. (See interview-U.S. Air Force-Other Military Activities, Section 4.0.). Military exercises conducted in the Yukon, also brought other ammunition and materials. Truck convoys containing unknown equipment on their way to Alaska, supposedly locked and not open in Canada, could have contained materials with contaminants. Accidents did occur as shown in Photo#11 in Section 4.0.

APPENDIX C: CONTAMINANT INFORMATION

DDT - 1,1,1-tricholor-2,2-bis(p-chlorophenyl) ethane is a chlorinated hydrocarbon. DDT is the best known, the cheapest, and most effective synthetic insecticide. It was first produced in 1874 by Zeidler, but its insecticidedal effectiveness was not discovered until 1939 by Paul Mueller of the Geigy Co. in Switzerland. It was extensively used by the Armed Forces in World War II. Shortly afterwards it became prominent as an agricultural and household insecticide. For 20 years, DDT was used extensively in the belief that it was remarkably harmless even though as early as 1950 its persistence in soil was recognized. There were hints that it might be harmful to certain non-target species. In 1962, it was realized that DDT was a serious ecological hazard and was reviled as the "elixir of death" by Rachael Carson (Silent Spring,1962). The environmental half life of DDT, possibly measured in decades; coupled with the findings of body stores of the substance in the population; led to severe restrictions of agricultural and household application in the advanced countries. The effects of low residues of DDT upon the fertility of animals and birds became a concern.

DDT is almost insoluble in water, has low vapour pressure, and is relatively unaffected by light and air. Thus, it is one of the most persistent insecticides known. Its extreme persistence in plants and animals has led to its widespread contamination of the environment. It is soluble in most organic solvents and petroleum oils. DDT persists longer in soils in drier and cooler climates, similar to the Yukon's conditions.

A bill to ban DDT was introduced in the U.S. Senate in 1966. The use of DDT was restricted in Canada in 1974 and banned in 1985.

PCBs- Polychlorinated Biphenyls

PCBs are oil substances of which there can be up to 209 possible compounds, with about 20 of these considered the most hazardous. The less chlorinated PCBs are clear and oily. With more chlorine, the thicker and darker the oil becomes and there is more toxicity. Concentrated PCB products are usually yellowish brown resins with a distinctive garlic smell.

PCBs were first commercially produced in the 1930's and were primarily used for radio transmitters, transformers, and components. PCBs were used for safe cooling and insulating of electrical transformers and capacitors (75% of all PCBs were put to this use). Approximately 25% or 110,000 tonnes of the PCBs manufactured in North America were used in electrical transformers. PCBs were generally used in indoor applications and areas where fire or sparks were a concern.

PCBs were used in wonder chemicals from around 1950 to the late 1960s as hydraulic oil, heat exchange fluid, adhesive tape, plasticizer and carbonless copy paper.

PCB's dissolve easily in oil and fat which allows them to accumulate in plants and animals. They do not dissolve easily in water and stick to surfaces of tiny particles in air and water. From these surfaces they move into plants and animals and lodge into fatty tissue. PCB's also biomagnify, and therefore humans, the highest in the food web, can have greater accumulations of PCBs than those animals and plants lower in the food web. Due to the low levels of PCBs found in Yukon fish, it is not considered to be a health risk to consumers at this time.

PETROLEUM PRODUCTS

The use of petroleum products ranges from gases (propane,butane), to liquids such as gasoline and diesel, to semisolids such as asphalt, grease and tar. The lighter components such as benzene, toluene and xylene evaporate more readily, they are slightly more soluble in water and are very toxic to fish and other aquatic wildlife. The heavier components remain in the soil or undissolved in water. Waste petroleum products such as used motor and crankcase oil present an additional problem. They often contain hazardous additives such as phenols and heavy metals which have toxic effects on a wide range of organisms.

TESTING FOR CONTAMINANTS

Parameters which are tested to complete an assessment of contaminants include hydrocarbons, organochlorines and dioxin/furans. Thorough assessment of hydrocarbons requires analysis of both the volatile and non-volatile component.

Hydrocarbons:

BTEX - Benzene, Toluene, Ethylbenzene, Xylene
TEH - Total Extractable Hydrocarbons
PAH - Polyaromatic Hydrocarbons
VOC - Volatile Organic Compounds- Solvents
Chlorinated Hydrocarbons - Solvents
ICP Metals (Total & Dissolved) - Inductively Coupled Plasma

Organochlorines:

DDT,and metabolites DDE,DDD
PCBs - Polychlorinated Biphenyls

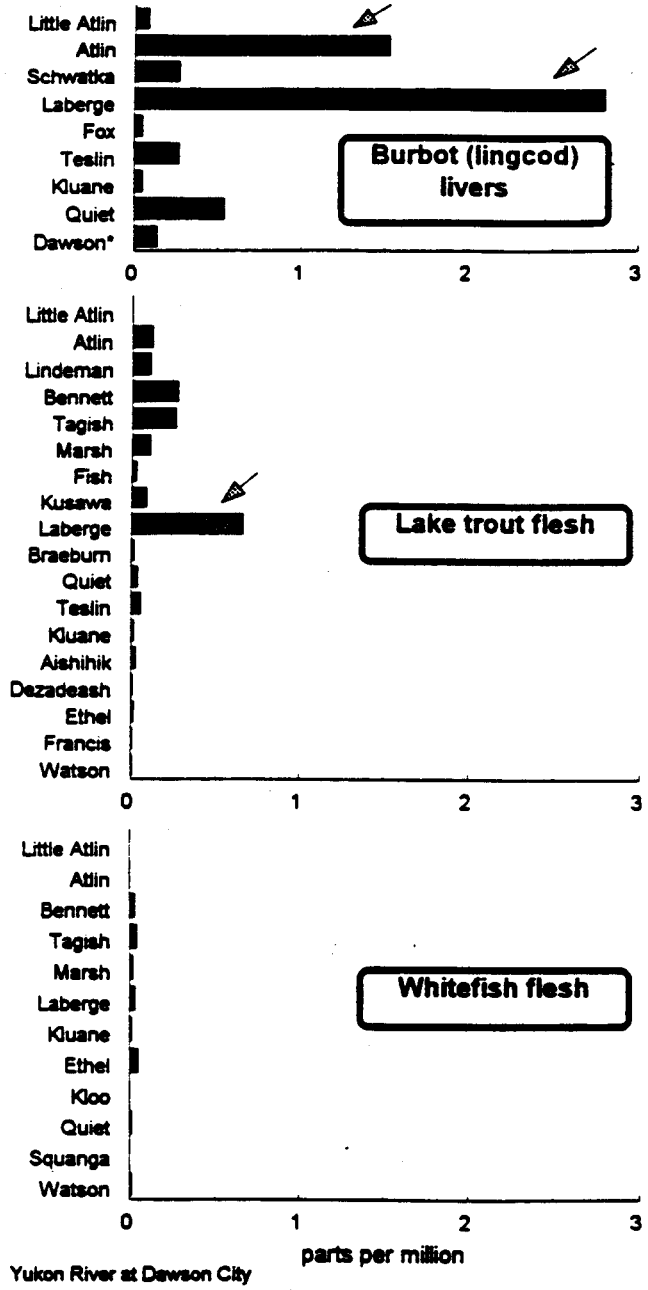
Herbicides: Dioxin, Furans

- Samples are taken of surface and ground water, surface and subsurface soil and swabs are taken for PCBs. Areas with oil and grease stains are tested for hydrocarbons.

Organochlorines in Yukon Fish

All bars represent averages of concentrations of contaminants in wet tissue samples.

Fig. 1
Toxaphene levels in Yukon fish

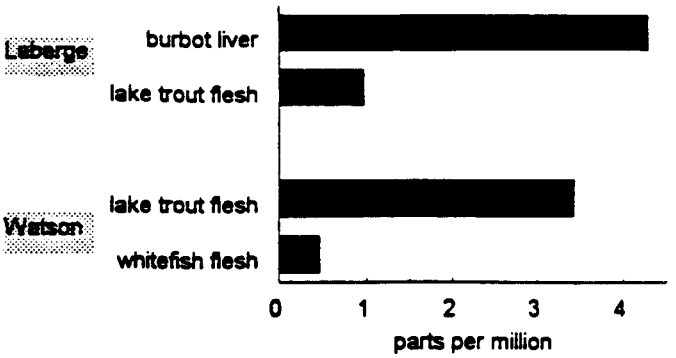


* Yukon River at Dawson City

Toxaphene levels were high enough in the three samples marked with arrows to be considered a possible health concern for people who eat these fish regularly and over a long period. Whitefish samples were all relatively low in toxaphene, as were northern pike samples (not shown). The toxaphene in fish shown in this graph likely enters the Yukon from the atmosphere through rain and snow and directly from the air. Local use of toxaphene was always limited, and no local sources of toxaphene to these lakes have been identified.

Fig. 2
DDT levels in Yukon fish

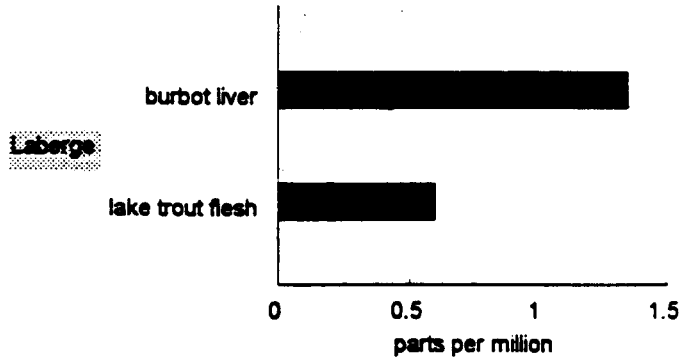
All other fish at all lakes sampled contained very low (< 0.3 ppm) total DDT.



Watson Lake and Lake Laberge had by far the highest levels of DDT in Yukon lakes sampled. DDT at these levels in fish is not considered to be a risk to human health. Higher DDT in fish in these lakes is probably a legacy of DDT spraying for mosquito control from the 1940s to the early 1960s in the Whitehorse and Watson Lake areas. Some DDT still enters Yukon lakes from the atmosphere.

Fig. 3
Total PCB levels in Yukon fish

All other fish at all lakes sampled contained very low (< 0.2 ppm) total PCBs.



Lake Laberge fish had higher levels of PCBs than other Yukon lakes. These levels of PCBs in fish are not considered to be a risk to human health. Sampling of sediment cores from Lake Laberge indicates that a spill of PCB oil may have occurred in the 1950s. PCBs were in common use in the Whitehorse area during that time. Low levels of PCBs continue to enter Yukon lakes from the atmosphere.

4.0 *MILITARY ACTIVITIES AND ASSOCIATED CLEAN UP*

The military activities in the Yukon cover a period from 1939, when Canada first became involved with World War II and military defense projects in the north to 1971 with the shutdown of the Haines-Fairbanks pipeline. This includes the Northwest Staging Route (NWSR) and associated airports (initiated in 1941), the construction and maintenance of the Alaska Highway (1942-1964), the Canol No.1,2,3,4 pipelines (1942-1948) and the Haines Fairbanks Pipeline (1954-1971). The routes of these projects are illustrated on an Overview Map, presented as Figure 2 and includes:

NSR Airports - Watson Lake, Whitehorse, Teslin, Aishihik, Snag
Alaska Highway - Watson Lake to Beaver Creek
Haines Road - B.C./Alaska Border to Haines Junction
Canol No.1 - Whitehorse - Johnson's Crossing to NWT Border
Canol No.2 - Skagway - Whitehorse
Canol No.3 - Whitehorse - Watson Lake
Canol No.4 - Whitehorse - Fairbanks
Haines-Fairbanks Pipeline - B.C./Alaska Border - Alaska Border (Beaver Creek)

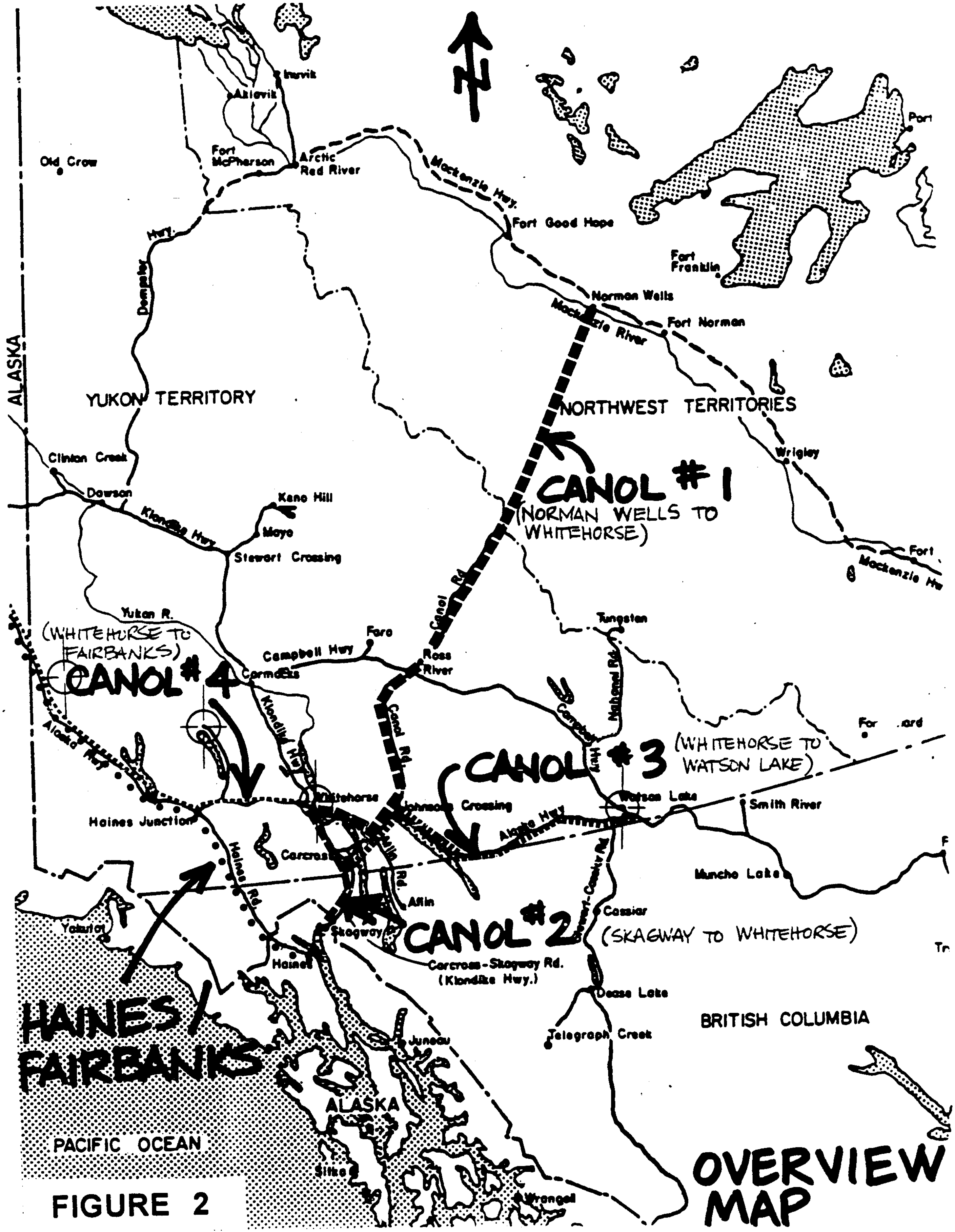
Military activities have been described, in chronological order, in the following categories:

1. Northwest Staging Route
2. Alaska Highway
3. Haines Road
4. Communication Systems
5. Canol Pipeline
6. Haines-Fairbanks Pipeline
7. Other Military Activities
8. Clean Up Activities

Clean up activities, by the military and government, have been described according to project and are also discussed in section 4.8.

4.1 NORTHWEST STAGING ROUTE

In 1939, while debate was continuing over a road to Alaska, there was government and commercial interest in developing a Great Circle Air Route connecting the Canadian Northwest with Alaska, Siberia and China. Canada entered World War II in September, 1939. Planning began under the Canadian-American Permanent Joint Board on Defense (PJBD), created in August 1940, to construct a number of airfields that would stretch from Grand Prairie in northern Alberta to Whitehorse, Yukon and on to Alaska. Construction of airports began in 1941, at Grande Prairie, Alberta; Fort St.John, Fort Nelson, British Columbia; Watson Lake and Whitehorse, Yukon.



N
Inuvik
Aklavik
Fort McPherson
Arctic Red River
Old Crow
Mackenzie Hwy.
Fort Good Hope
Fort Franklin
Norman Wells
Fort Norman
Mackenzie River
Dempster Hwy.
ALASKA
YUKON TERRITORY
NORTHWEST TERRITORIES
CANOL #1
(NORMAN WELLS TO WHITEHORSE)
Wrigley
Clinton Creek
Dawson
Klondike Hwy
Keno Hill
Mayo
Stewart Crossing
Fort
Mackenzie Hwy
Yukon R.
(WHITEHORSE TO FAIRBANKS)
CANOL #4
Campbell Hwy
Faro
Canol Rd.
Ross River
Carmacks
Tungsten
Nahanni Rd.
Campbell Hwy
CANOL #3
(WHITEHORSE TO WATSON LAKE)
Alaska Hwy
Whitehorse
Johnsons Crossing
Watson Lake
Smith River
Haines Junction
Haines Rd.
Carcross
Alaska Hwy
Atlin
Muncho Lake
Yakutat
Skagway
CANOL #2
(SKAGWAY TO WHITEHORSE)
Cassiar
Stewart-Cassiar Rd.
Haines
Carcross-Skagway Rd.
(Klondike Hwy.)
Dease Lake
HAINES/ FAIRBANKS
BRITISH COLUMBIA
Telegraph Creek
Juneau
ALASKA
PACIFIC OCEAN
Sitka
Wrangell
OVERVIEW MAP

FIGURE 2

Supplies for Watson Lake were taken up the Stikine River from Wrangell, Alaska via Telegraph Creek, Dease Lake, Dease River to Lower Post, just south of Watson Lake. Supplies for Whitehorse were brought in over the Whitepass and Yukon Railroad, from Skagway.

"By September 1941, the route was considered useable in daylight, and radio stations were operational along its Canadian length by the end of the year. During this construction, but unrelated to it, a new move was launched in the U.S. House of Representatives to build a highway north". (28)

As the route of the Alaska Highway was being constructed, eight intermediate flight strips were built including Aishihik, Teslin and Snag in the Yukon. By the summer of 1942, the airports at Whitehorse and Watson Lake were in operation. Late in the summer, four emergency airfields were recommended including Pine Lake, (87 miles west of Watson Lake), Squanga Lake, Pine Creek (Haines Junction) and Burwash Landing. (29)

Edmonton became the focal point for shipments of planes, men and material to the north. Ladd Field in Fairbanks became the northern terminus and crossroads to the Nome airfield for the Northwest Staging Route (NWSR), also known as the Alaska/Siberian (ALSB) Ferry Route. The airfields were used for supplying Russia under the Lend-Lease Program. More than 8,000 planes were flown up the route from Great Falls, Montana to Fairbanks and Nome, Alaska and from there flown by Russian pilots to the war front against Germany.

"Every plane that was ferried to the Soviet Union was flown by a least 3 pilots: One who picked it up from a factory somewhere in the United States and delivered it to the ALSIB staging base at Great Falls, Montana; another who flew it 2,500 miles from there to Ladd Field; and a third, who took it another 7000 miles across Russia to the Eastern Front. " (30)

ALSIB TOTALS, BY YEAR

Year	Number of Planes Delivered
1942 (4 months)	129
1943	2,497
1944	3,156
1945 (8 months)	2,144
Total	7,926 *

Of these totals the type of aircraft included:

Fighters			Bombers		Cargo	Other
P-39	P-40	P-63	A-20	B-25	C-47	
2,618	48	2,397	1,363	732	710	58

* An additional 6,092 Lend lease aircraft were delivered to the Soviet Union via all the other routes. (29)

Initial work on the airfields was under taken by Canadian workers, under the direction of the Department of Transport and the RCAF. In 1943, construction was turned over to American civilian contractors and Canadians were moved from the main airports (Whitehorse, Watson Lake) to the intermediate at Teslin, Aishihik and Snag to build buildings etc. At Whitehorse, the field had 75 RCAF, 287 U.S.Army Air Force USAAF, 168 Canadian Army, 146 American Army, 270 Canadian civilians and an estimated 650 American civilians (taking over from the Canadian workers.) At Watson Lake there were 40 RCAF, 10 USAAF, 61 U.S. Army, 175 Canadian civilians and 30 American civilians. At the smaller fields, Teslin, Aishihik and Snag there were slightly more than 100 workers, with temporary construction crews.

As of 1943, Ottawa had spent only about $25 million on its own program for the Staging Route. By 1944, most of the construction work being done on the Northwest Staging Route was proceeding under American Control. In the end, Canada ultimately picked up most of the near $120 million tab for building the Staging Route and its auxiliary landing strips. (30) In late 1943, the airports were taken over by the R.C.A.F and Canada paid for construction and improvements, a total of $58 million. (31)

Interview: Murray Biggin
Mr. Biggin has been working on a historical research project concerning the Northwest Staging Route. He indicated that about 7980 planes reached Russia and they included, the P-39 (Aircobras), P-63 (Kingcobras), B-26, A-20, B-25, AT6, C-47 (Skytrains), C-49, DC-3. Of these about 67 crashed along the route from Great Falls, Montana to Nome, Alaska. Murray provided a list of planes crashes from archival records. (Provided to AES - File # 4) He also provided an historical background for the P-51 Mustang bomber thought to be in Nisutlin Bay near Teslin. (See Teslin District Review).

There have been clean ups completed at the different NWSR airports which are presented in the separate District Reviews. Aishihik and Snag were abandoned in 1967 and in the summer 1994, an environmental assessment for contaminants was completed by AES. Watson Lake and Whitehorse airports have been managed by Transport Canada since 1950. All other airports, built by the military are now managed by the Yukon Territorial Government.

4.2 ALASKA HIGHWAY

In 1938, President Roosevelt appointed a five member commission to look into connecting the continental U.S. with B.C., Yukon and Alaska. In Canada, Prime Minister King also appointed a five member commission to study the situation. This commission first met in Victoria in April, 1939. The attack on Pearl Harbour in 1941

initiated studies on the construction of a road through Canada to Alaska. Three routes were proposed, the one which was selected would connect up the Northwest Staging Route airports, through the interior from Alberta, northern British Columbia, the Yukon into Alaska. This route was considered to be less of a military target than if it was built by the coast, supplies for the airports could be transported up the highway and it could be used as a landmark to aid flyers on the NWSR on their way to Alaska. The U.S. would pay for the construction of the highway and would turn it over to the Canadian government six months after the war ended. In return, Canada permitted the taking of timber, gravel and rock along the route, and waived taxes and immigration regulations.

In the spring of 1942, about 11,000 troops were gathered to start the construction of a pioneer road, twelve hundred miles through Canada and 200 miles to Fairbanks, Alaska. Troops were sent to Dawson Creek to build the road north, and to Whitehorse, to build the road south to Watson Lake and northwest to Alaska. In Alaska, troops constructed a road from Valdez southeast to the Yukon border.

Whitepass & Yukon Route Railroad
The Whitepass and Yukon Route Railroad, a 111 mile track from Skagway to Whitehorse constructed in 1899, was the one way of getting supplies to Whitehorse.

2. Flatcars Full of Equipment Leaving Skagway, Alaska for Whitehorse on the Whitepass Railroad.

Before the war, the railroad brought an average of 25,000 tons of freight per year into the Yukon. In 1942, much of the railroad's equipment was over 40 years old, consisting of 10 locomotives, 18 passenger cars, and 173 freight cars. (30) As the tons of American material and equipment began arriving in Skagway in May and June 1942, the Army had 12 steam locomotives into service around the clock, but it still couldn't meet the demands for transportation. In October 1942, the U.S. military service took over the management and operation of the railroad with a lease arrangement with Whitepass. The arrangement was formalized by a diplomatic agreement between Canada and the U.S. in 1943. The U.S. added new locomotives and re-built some 20 miles of new track. In 1943 alone, the railroad packed 22,000 passengers and 284,532 tons of freight, averaging 40,000 tons of freight/month. (33) In November 1944, the railway was put under joint military-civilian operation (330,military,120 civilian employees), although it remained under the Army's command. By the summer of 1945 the army had turned it over completely to civilian control. (29)

Pioneer Road - 1942

All of the seven regiments (18th,35th,93rd,95th,97th,340th,341st) assigned to the construction of the pioneer road were similarly equipped with: 20 D-8 diesel tractors and bulldozer; 24 D-4 and R-4 tractors with bulldozers and trailers for their transportation; three motor patrols; from 50-90 dump trucks, two 1/2 yard gas shovels; one truck crane; six 12 yard carryalls; 6 tractor drawn graders; one portable sawmill and two pile drivers. Two light pontoon companies, each equipped with 675 ft of floating bridge material, were parcelled out to the regiments. Pile or trestle bridges were constructed as soon as possible to release the pontoon equipage. (34) Over the entire stretch of the highway 133 bridges and 8,000 culverts were built. The original Nisutlin Bay Bridge at Teslin Lake was the longest trestle bridge, stretching more than 2,300 feet. The glacial rivers of the Slims, Donjek and White proved to be difficult for bridge construction. (32) As a consequence the construction camps built at the bridges were in place for the longest period of time. Many interviewees have indicated dumps near or associated with these locations.

During 1942, Public Roads Administration (PRA) and their contractors worked on the pioneer road along side the military. All labour and supplies were paid by the PRA and the contractors' equipment was rented. Through the summer of 1942 camps were constructed, with large depots built at Skagway, Whitehorse and Carcross. The PRA contractors also built headquarter facilities in Whitehorse and a number of winter camps for the army at Haines, Champagne, Kluane Lake, Beaver Creek, Lewes River, Judith Creek, Squanga Lake, Carcross and between Nisutlin and Watson Lake.(29)

Camp facilities during 1942 were predominantly prefabricated frame buildings salvaged from the United States. The southern portion of the pioneer road was

connected at Contact Creek, B.C. (MP588) on September 24, 1942 and the northwest portion on October 20 at Beaver Creek (MP1202). An opening ceremony was conducted at Soldiers Summit on Kluane Lake, November 20, 1942.

In November 1942, the Northwest Division of the Northwest Service Command was created for administration of the highway. During the winter of 1942/43, the pioneer road was maintained and specification drawings were prepared for improvement of the road in the 1943 season. The U.S. Army Corps of Engineers, the Northwest Service Command (NSC) and the Public Roads Administration (PRA) were in charge of improvements. Many private contractors were hired to complete the job. A list of contractors working on the Alcan highway in January 1943 included: (35)

BUILDING THE ALCAN HIGHWAY

The Alcan Highway is being built under the direction of the U. S. Army Corps of Engineers and the recently organized Northwest Service Command. Maj. Gen. Eugene Reybold is chief of engineers; Brig. Gen. C. L. Sturdevant is assistant chief in charge of engineer troops; Brig. Gen. James A. O'Connor, formerly in charge of the south sector is head of the Northwest Service Command. Brig. Gen. William M. Hoge was in charge of the road until June 6, and thereafter was in charge of the north sector until he was assigned to other duties. At present the direction in the field is under the following: Col. John W. Wheeler, in charge; Col. E. G. Paules, in command of the north sector; Col. R. D. Ingalls, in command of the south sector; and Col. H. L. Twichell, in command of the Dawson Creek railhead. Regimental commanders have been changed from time to time, but now include Col. A. L. Lane, Col. F. R. Lyons, Lt. Col. L. E. Robinson, Col. F. M. S. Johnson, Lt. Col. Owain J. Hughes, and Maj. J. A. McCarty.

For the Public Roads Administration, Thomas H. MacDonald is commissioner, J. S. Bright is engineer in charge of the road. Engineers in charge in the field include: Fred Capes at Ft. St. John; Frank E. Andrews and H. L. Steddart at Whitehorse, and L. M. Huggins and C. G. Polk in the Alaska section.

CONTRACTORS ON THE PROJECT

GENERAL CONTRACTOR

E. W. Elliott Co., Seattle, Wash., R. B. Johnson, project manager

C. F. Lytle Co., Green Construction Co., Sioux City and Des Moines, Iowa. O. W. Crowley, project manager; C. C. Coykendall, field manager

Associated Firms

E. M. Dusenberg, Inc., Clear Lake, Ia.
Eblen & Eblen, Cumberalnd, Ia.
Eblen & Etdahl, Cumberland, Ia.
Wm. Horrabin Contr. Co., Iowa City, Ia.
V. L. Lundeen, Inc., Montezuma, Ia.
Gus Ostermann, Ocheyeden, Ia.
J. W. Scothorn Construction Co., Cherokee, Ia.
Sears Construction Co., Clear Lake, Ia.
J. Leo Hoak, Des Moines, Ia.
L. Peterson, Cedar Rapids, Ia.
Welden Bros., Iowa Falls, Ia.
Western Engineering Co., Harlan, Ia.
Duvall & McKinney, Logan, Ia.
Ira VanBuskirk, Hawarden, Ia.

GENERAL CONTRACTOR

Okes Construction Co., St. Paul, Minn., Day Okes and Wm. Bates, project managers

Associated Firms

Adolphson, Huseth, Layser & Welch, Thief River Falls, Minn.
Astleford Co., Inc., Minneapolis, Minn.
Art Bolier, Minneapolis, Minn.
Brown & Laguil, Mankato and Adrian, Minn.
Coglan Construction Co., Rollo, No. Dak.
Pederson Bros., Inc., Montevideo, Minn.
Standard Salt & Cement Co., Duluth, Minn.
Thomas Bros., Foley, Minn.
Vulck Construction Co., Rice Lake, Wisc.
Sorensen & Volden, Albert Lea, Minn.
Roverud Bros., Spring Valley, Minn.
Southern Minnesota Construction Co., Caledonia, Minn.
Reese & Olson, Greenbush, Minn.

GENERAL CONTRACTOR

Dowell Construction Co., Seattle, Wash., L. J. Dowell and Ross Woodward, project managers

Associated Firms

Angeles Gravel Supply Co., Port Angeles, Wash.
L. L. and R. W. Byers, San Francisco, Cal.
J. C. Dawson Co., Seattle, Wash.
Hugh Govan and Adler Construction Co., Seattle, Wash.
Haas-Royce-Johnson, San Francisco, Cal.
Joe A. Jussel, Seattle, Wash.
C. E. O'Neal, Ellensberg, Wash.
J. S. Ramstad, Seattle, Wash.
W. C. Thompson, San Francisco, Cal.

GENERAL CONTRACTOR

R. Melville Smith Co., Ltd., Toronto, Ont., T. F. Francis, project manager

Associated Firms (All Canadian)

Emil Anderson Construction Co.
Bond Construction Company, Ltd.
Campbell Construction Company, Ltd.
Curran & Briggs, Ltd.
Don Construction, Ltd.
Dufferin Paving Company, Ltd.
W. H. Harvey & Son
A. E. Jupp Construction Company, Ltd.
Wallace A. Mackey, Ltd.
Storms Contr. Company, Ltd.
Tomlinson Construction Company
Caswell Sand & Gravel Company

Five management contractors were employed. In the Yukon, E.W.Elliot of Seattle was responsible for transportation and the construction of highway camps and Dowell Construction of Seattle was to build the 627 miles between Watson Lake and the Yukon-Alaska border. Okes Construction and R.Melville Smith Co. were to build 506 miles of road from Dawson Creek to Watson Lake and C.F. Lytle Co./Green Construction Co. would complete the 306 miles of road in Alaska. These five main contractors hired an additional seventy-nine companies, including 16 Canadian and 63 American firms to do the actual work. E.W. Elliot Co, also completed two sections of highway, on either side of Burwash Landing and Utah Construction was also hired to complete several pieces of road between Kluane Lake and Beaver Creek. (29)

Highway Camps

In 1943, the PRA sent crews to Montana, Minnesota, Washington and Oregon where they dismantled buildings, emptied warehouses and collected road building equipment. (29) Metal huts (Butler buildings/Quonset) were built. There were two types of camps: the large headquarter camps with 1000 personnel, which housed the Public Roads Administration, their management contractors and technical support staff, housing over 100 people. These were located at Fort St. John, Fort Nelson, Whitehorse and Tok Junction. The other camps or "line" camps were usually at 10-15 mile intervals and at every major bridge job and sawmill site. These usually had 6 to 12 engineers and 100 to 200 construction workers. At 100 mile intervals telephone relay stations were manned by personnel of the Signal Corps enlisted men. (36)

Construction Camps/Pump Stations/Relay Stations - 1943

A full listing of all the construction camps, pump stations (Canol 3,4), relay/radio range stations along the Alaska Highway in 1943, as noted on the PRA Maps is presented in Appendix D. (9) A listing has also been presented in the separate District Reviews.

Sawmill Sites - 1943

Contractor run sawmills were put into operation for milled lumber for the highway camps and bridge construction. Sawmills along the highway numbered 21 in 1943, and are listed in Appendix E. These are noted on the District maps and in the District Reviews. In 1943, timber cut under free permits for joint defense construction projects included 14,500,463 FBM of sawn lumber, 49,356 cords of fuelwood and 618,123 linear ft. of timber for bridge piling, building logs and telephone poles. By 1944, the majority of cutting operations had ceased. (12)

Historic Mileposts

An Historic Mile Post guide was prepared for the 50 year Alaska Highway celebrations in 1992.(37) Many of the sites, marked with an historic milepost along the highway, are military in origin, from the 1943-44 period. These are listed in Appendix F.

PRA Leaves the Yukon

At the peak of construction in 1943 there was a total labour force of 15,900 of which 10,400 were U.S. contractor employees, 1800 were PRA employees and 3700 were Canadian contractor employees. By 1943 the war was focusing in the South Pacific, rather than in the North and commitments and troops were shifted accordingly. In October 1943, the Public Roads Adminstration terminated its general activity on the highway. The contractors had to go on a crash program to get out by the October 31, 1943 deadline and by then all of the contractors working on the road itself had ceased operations and released their men to return home. Of the 133 permanent bridge structures, designed by the PRA, contractors had completed 99 and 34 were incomplete or had not been started.

Of the 1420 miles of completed highway between Dawson Creek, British Columbia and Big Delta, more than two thirds, a total of 970 miles was composed of the original army pioneer road, all of which had been substantially improved and upgraded by the PRA. The other 450 miles of road was strictly PRA built. The U.S. Army Corps of Engineers gets the overall credit for the Alaska Highway but credit for the fact that the highway is still here goes to the Public Roads Administration. (36)

PRA supervisory engineers were transferred from the project with the exception of a small group of bridge engineers under the direction of R. Archibald who remained to direct the bridge work. In November 1943, the PRA's Edmonton office packed up and moved to Chicago. The field offices along the highway only retained skeleton staffs to supervise the evacuation of equipment and remnants of the contractors' forces. Contracts were taken over by the Army United States Engineering Department (USED) and additional work such as painting bridges and placing native timber decks was assigned to Army contractors. Bates & Rogers Co. were given a contract by the Army for the entire bridge work in all three districts. Maintenance of the completed highway was to be an Army responsibility for the duration of the war, using mostly Canadian civilians recruited from the ranks of the departing construction workers. In the wake of PRA withdrawal, Ottawa sent thousands of soldiers to the Yukon. A small number of Americans were left to maintain the highway and the airfields, but all American personnel were removed from the Yukon in 1944.

Two Alaska Highway inspection reports in June and July 1944, describe the bridge and maintenance work in progress. The July 1944 report covers the eastern section of the Alaska Highway from Lower Post Mile (MP619.8) to Whitehorse (MP917.3.) A listing of mileages in the form of a road log is presented in Appendix G. (38)

Since April 1944, when the camps were taken over, road maintenance has been of a haphazard nature. The changeover was effected very quickly and the contractor neither left the road in good shape nor cleaned up the camps.... Maintenance foremen took over the camps with everything against them...the camps were dirty, the crews were inadequate and included married men with their families for whom quarters had to be prepared; the equipment was in poor condition and parts were not available; a general re-organization was in progress involving several changes in camp locations.(38)

Maintenance camps were moved from MP632 to 635 in Watson Lake and from MP652(Dodo Lake) to Little Rancheria River MP670. Maintenance camps had a force of eleven and were located at: MP635 (Watson Lake), MP670 (Little Rancheria), MP710(Rancheria), MP770(Morley Lake), MP804(Teslin), MP843(Squanga Lake), MP883 (Marsh Lake), MP911(MacRae- Maintenance Headquarters).
The camp at Mile 837 (Johnson's Crossing) is occupied by a contractor who will be working on the Norman Wells Road until this fall. The road is maintained in this section, from east of Watson Lake (MP614) to MP938, west of Whitehorse. 3 Flight Strips are also maintained, along with a total road mileage of 498.1 miles. Costs included overhauling construction equipment, guarding abandoned camps, moving and storing goods from camps as well as the cost of operating hotel camps and gas dispensing stations. (38)

A maintenance report in June 1944 covered inspections and maintenance of the western portion of the Alaska Highway from Whitehorse (Mile 917.3) to the Alaska/Yukon Border (MP1221.4). (39) In Appendix H, mileposts are listed from this source.

- Bates & Rogers, Bridge Contractors have started preparation for repairs of piles to the Donjek trestle bridge.
- The Utah Construction Co. vacated all maintenance camps in the Western Area by June 17th and the camps are now staffed by Canadian employees of the U.S.E.D. (U.S. Engineering Dept.)
- The Utah Construction Co. moved from maintenance work to do surfacing on the Flight Strips and took with them a fair proportion of the equipment then in good condition. The remaining equipment has been through construction and is in poor condition.

Maintenance camps are now located at the following mileages:
MP956 (Stoney Creek), MP1015 (Haines Junction), MP1056 (Kluane), MP1098 (Burwash),1156 (Koidern), 1206 (Beaver Creek).
The maintenance organization is to take over the mess, housing and fuel dispensing facilities now operated by the U.S. Army at the Canyon, Destruction Bay and Koidern Relay Stations. This will mean moving one or more of the existing maintenance camps. (39)

An inspection report in July 1944 indicated maintenance on the Carcross Road; described as the west and east legs. (40)
West Leg - Mile 0-32 Jct with Alaska Hwy south to Carcross)
East Leg - Mile 33-0 (Carcross to Jakes Corner - Jct with Alaska Hwy)

The west leg is graded once a month to the Explosive Storage area at Mile 1 Carcross Road (south of Golden Horn). No other maintenance is being done or is proposed for this leg.
The east leg is maintained to make it passable and give access to the Standard Oil pumping station at Mile 31.7, just north of Carcross (west leg). Maintenance of the east leg is the responsibility of the maintenance crew at mile 843 (Squanga Lake Camp-5E) on the Alaska Highway. No maintenance camps are being operated on either leg of the road. (40)

In August, 1944, the headquarters of the Northwest Service Command, located in Edmonton, was moved and re-established in Whitehorse.

Materials and Equipment Disposal

By the time the PRA contractors left Canada in 1943, the Americans had assembled mountains of equipment. The problem of disposal of all this surplus materials and machinery became very complicated as it would require considerable man power and money to pack it out. Canadian merchants did not want the market flooded with surplus stocks which they would be selling at the end of the war.

Strung out along the 1420 miles of the Alaska Highway was the greatest array of road-building machinery ever assembled on a single project in the history of American road building. At the peak of operations in September, 1943, there were 11,107 units on the project, representing a total value of over 27 million dollars. Of this grand total, 3983 units were owned by the contractors and were on a rental basis specified in contracts with the Public Roads Administration. The remaining 7,124 units were government owned. The major portion of this equipment was transferred to Public Roads. (41)

Vehicles used by the U.S. military, were best illustrated in *Truck Tracks,* as shown in Photo# 3.

Officials responsible drew up a plan for handling this equipment.

1. Property belonging to private contractors was to be returned to the owners or cash settlements were to be made with them.
2. U.S. property was to be placed in four categories based on condition:
   Class 1 - Equipment so badly worn out it had no value.
   Class 2 - Items had some salvage or second hand value.
   Class 3 - Material or parts in critically short supply
   Class 4 - Equipment that was new or lightly used and in very good condition.

Items in Class 1 were to be dumped and those in the third and fourth categories were to be used elsewhere. Machines, supplies and parts in category 2 caused the most trouble. These did not warrant the cost of transportation back to the States.

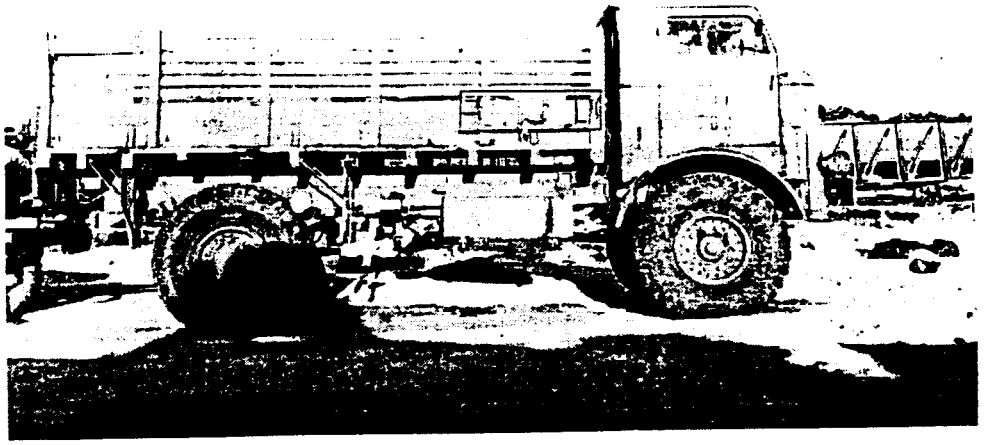
In September 1944, the Permanent Joint Board of Defense (PJBD) addressed this issue of equipment disposal and adopted as their thirty-third recommendation:

a) U.S. government should remove from Canada all items it considered of value,
b) that the Canadian government should arrange with the U.S. to purchase whatever other items it wanted.
c) all remaining movables should be transferred to an agency of the Canadian government for sale. Proceeds from the sale were to be paid to the American Government. (33)

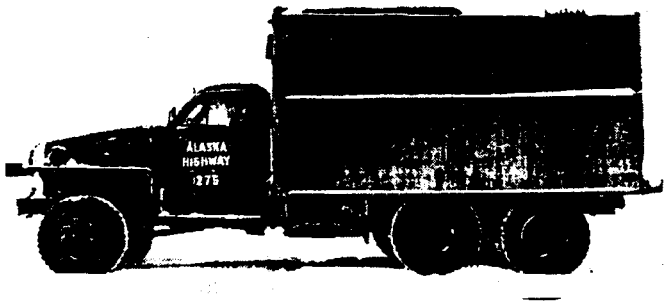
There was a gap of approximately ten months between October 31, 1943, when most of the Americans left the highway construction project and Canada, and the Thirty-third recommendation. This was a troublesome period and reportedly men destroyed large amounts of material along the highway at this time.

3. U.S. Military Vehicles Used on the Alaska Highway

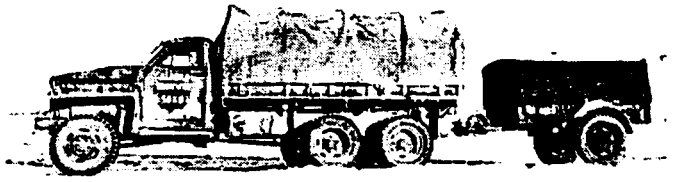
FAMILIAR AND FAITHFUL FRIENDS



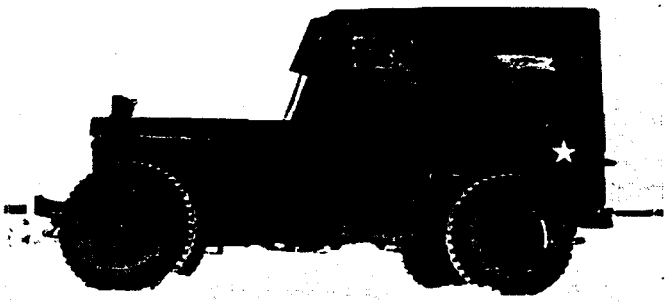
FWD, 4x4, 6-ton cargo truck, built by British specifications for African deserts, even having a right-hand drive. It hauled many thousand tons of freight on the Alaska Highway.



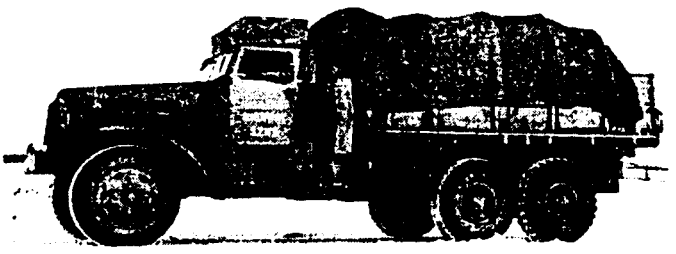
PERISHABLE rations and other goods were hauled in these Studebaker 6x6 2½-ton insulated vans, refrigerated and heated, commonly called "reefers."



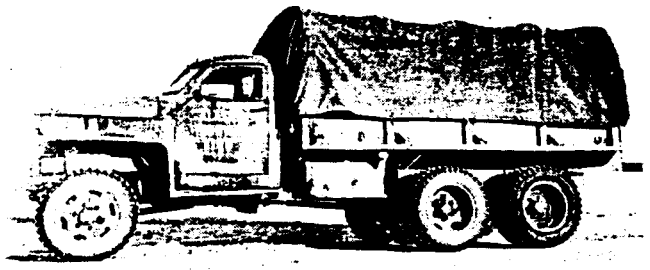
HERE'S THE OLD familiar Studebaker 6x6 2½-ton cargo with a "papoose" on its back, a 1-ton trailer. It took an expert driver to handle these hookups on icy roads.



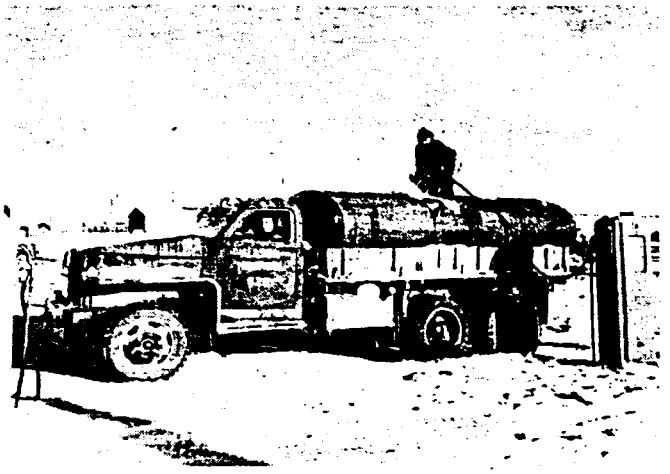
LITTLE JEEPS were the babies of the bunch. Winterized to keep out the Arctic frost, the Willys 4x4 ¼-ton trucks found hundreds of uses on the Highway.



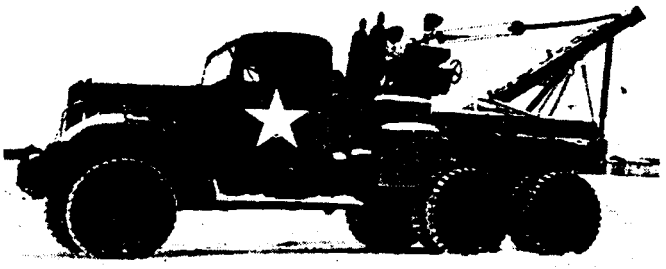
ANOTHER TRUCK built for the desert, but which pounded the icy Arctic trail was the 10-ton White truck, a 6x4 diesel cargo. It taxed skill of driver.



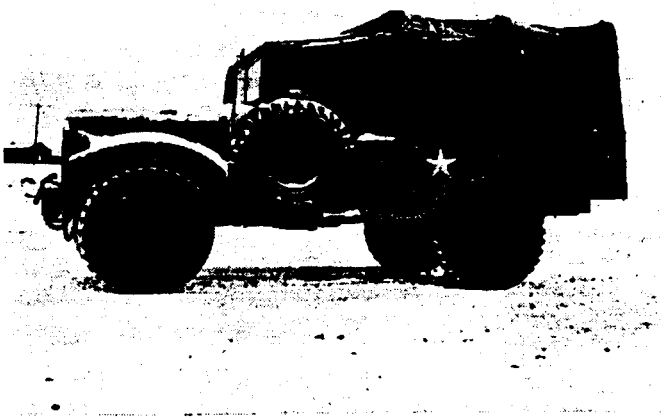
OLD STANDBY of the Alaska Highway—the Studebaker 6x6 2½-ton cargo. After a rough winter and a rough spring thaw, the boys swore by (or at) their "Studies."



MANY THOUSANDS of gallons of petroleum products were hauled by the Studebaker 6x6 1500-gallon tankers, to supplement the pipeline deliveries.

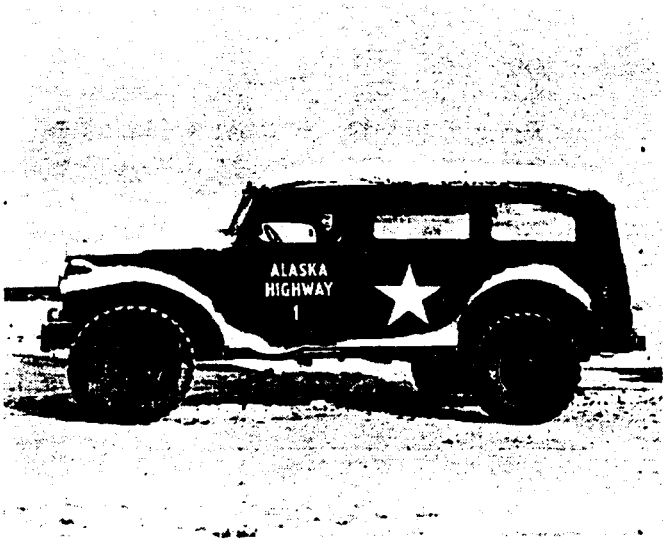


A TRUE FRIEND in need was the Kenworth 6x6 10-ton wrecker. There was no more welcome sight when the Arctic caught up with a driver than this vehicle.



USED MAINLY by the Highway Patrol, the winterized weapons carrier, Dodge 4x4 ¾-ton, was a joyful sight to the driver in need, but a "boogey" to the reckless.

WITH HIGHWAY improvements, staff officers sometimes found Chevrolet 4x2 passenger sedans expedient for negotiating long stretches for inspection and supervision trips.



CARRYALLS, as the name implies, carried all. Rough riding but well respected for its serviceability, the Dodge 4x4 ¾-ton saw much hard service.

People who lived along the highway in late 1943 and in 1944 still tell of dumping, burying and burning of goods from sleeping bags to trucks and Caterpillar parts. During this time the Americans were attempting to haul the suitable equipment out of Canada.

"In the Vancouver Daily Province newspaper (July 6, 1944) B.A. McKelvie reported: I've seen forty-three carloads of American freight myself. About thirty to forty carloads of heavy equipment were rolling each day through central British Columbia on their way back to the United States." (33)

"The amount of waste got much worse, when the Americans began to pull out. They did make a conscientious effort to round up and ship home the thousands of pieces of heavy equipment that were still running or economically repairable, but anything that cost more than its 'book value' to send back was simply abandoned or destroyed." (30)

"When the road, built and paid for by the U.S. was turned over to Canada, the question of equipment became a serious problem. There was a tremendous amount of valuable machinery which would have been most useful in maintaining the road. There were pieces of road equipment which had never been used, some crates which had not yet been opened, hundreds of boxes of new replacement parts, tools and electric light plants (some slightly used and some never used). Many store houses along the highway were packed full. The U.S. government said it would not pay to transport all that stuff back down into the States. The Canadian government said it could not be left there as it would hurt the business of Canadian manufacturers. The U.S. would not take it out. Canada would not buy it or accept it as a gift. So the Canadian government had their people dig huge ditches. They smashed what they could before burying it. Then the Canadian army guarded those ditches and no one dared be caught trying to salvage anything." (42).

The puzzle remains today as to how much new or usable materials and equipment the Americans and Canadians actually dumped and destroyed following October 1943. This period of dumping has become a legend of the north and the stories of waste and destruction are still told. Many Canadians saw these things happen and were shocked with the waste. The reality of the matter must lie between the fabulous stories and the official denials. (33)

In the fall 1945, an American Army captain, Captain Carpenter, went on a search of the Alaska Highway to possibly locate lost equipment supposed to be strewn along the highway. He flew at 500 ft marking out suspicious looking areas and later ground parties went to investigate these. Carpenter located no more than thirty to thirty five pieces which had all been cannibalized, that is stripped and had no value whatsoever. (33)

The House of Roads Committee in the United States investigated charges of corruption and waste along the highway, and after a four month study concluded in March 1946:
- Rumours of abandoned equipment, wild extravagances, fraud and corruption were

not borne out by the committees' detailed studies.
- There was no evidence of graft or corruption on the part of any official, but much larger quantities of materials were brought into the area than were needed for the construction of the project.
- This highway was built during a period of great stress, that it was an urgent priority job, and none knew when the bulldozers were pushing their way through wilderness whether they or the Japanese would get to Alaska first. (33)

The House of Roads Committee had concluded that under the circumstances the highway had been built as economically as could be expected. The committee estimated the PRA and Army expenses for building the pioneer road at $19,744,585 and for the improvement of the highway at $94,079,635 (U.S. Dollars). (33)

The committee found that 30,586 pieces of equipment were used on the Alaska Highway/Canol Project and 635 pieces could not be accounted for. Surplus returned to the U.S. included over 6,000 tons of petroleum products, and 47 tons of chemical warfare supplies. How much of these items contained contaminants was not found in the available documentation. (8)

Alaska Highway Handed Over to Canada

At a formal ceremony in Whitehorse, on April 1, 1946, the Canadian Army took over Alaska Highway and the Northwest Highway System (NWHS) from the United States Army. At a separate ceremony the RCAF took over the airfields and the land line of communications of the north. (43)

On April 1, 1946 , the Works Coy RCE was formed and was known as No.17 Engineer Services. (44) They set up in the site originally used as the Canol oil refinery (in the Marwell area). Upon handover, they became responsible for the Alaska Highway from Dawson Creek, B.C. (MP0) to the Yukon Alaska Border (MP1221.4), including:

1. Dawson Creek Railhead camp
2. Eighteen maintenance camps consisting of a garage, utility buildings (electrical generators, water pumping systems, 5 to 7 married quarters and single men's quarters.
3. Thirty one construction camps totalling approximately 300 buildings, in an abandoned condition.
4. Thirteen airstrips
5. Headquarters NWHS: Lower Whitehorse (HQ offices, Whitehorse Military hospital)
6. The Dowell Area: Lower Whitehorse (REME workshop, HQ 17 Works offices etc.)
7. Powerhouse: (located on 4th Avenue adjacent to west side of the Dowell Area.)
8. Refinery Area: (Canol)
9. Upper Whitehorse - Camp Takhini: (married quarters for NWHS personnel)

The amount of buildings and property available were excessive and disposal action commenced fairly quickly. Early projects included: the Headquarters NWHS relocated to Camp Takhini in new buildings and the service units moved from the Dowell area to the Refinery Area (Services area). This moved nearly all functions of the Canadian Army from the City proper. 219 workshop REME (Royal Electrical Mechanical Engineers) was created from the old US Army workshop in the Refinery Area in 1949. Between 1950-1952, 174 building units were completed in Camp Takhini. A new diesel electric power plant was completed in the Services area, Whitehorse in 1951. It operated for a number of years and was later converted into a Heavy Equipment garage in 1962. Married quarters and utility systems were erected at MP635 (Watson Lake), MP1016 (Haines Junction)and MP1083 (Destruction Bay) by 1960. Modified trailer units for married quarters were completed in 1963 at MP733 (Swift River). Maintenance camp garages were constructed at Watson Lake and Haines Junction. There are fourteen maintenance camps normally containing forty to fifty persons each. These camps derived their water supply from wells. Most of these wells in use to date were originally drilled by the U.S. Army. (44).

In 1942, the U.S. Army installed the MacIntyre Creek water system for personnel and the city of Whitehorse, a population of about 5300 people. It was later reduced to cover Camp Takhini, the Services Area, DOT, RCAF Station Whitehorse, a total of 2400 people. Water was stored in steel water tanks, each with a capacity of 250,000 gallons located in Camp Takhini and the RCAF station. Chlorination was done for sterilization of the water. In 1946, the electrical distribution system and the water and sewer lines for all the camps along the highway and the City of Whitehorse were also transferred with the highway. In 1959, the electrical generating and distribution system was sold to Yukon Electrical Company. (44)

The initial survey of abandoned camps turned up more than 125 sites of buildings along the Highway, some with as few as one or two buildings and some with many buildings. It was found that many of these sites had been pilfered. At some sites only the foundations were left. (44)

Between 1946-1956, most of these buildings were taken on charge so that they could be disposed of as they were creating a hazard to curious tourists travelling the highway. In the early days when these building were sold many purchasers took only that part of the building which was of use to them, leaving the rest to rot on the site. It was found that as the buildings were no longer Department of National Defense (DND) and in most cases on public land, so DND could do nothing to correct this. In many cases the buildings were impossible to sell and the Army had to destroy them and clear the site. This was done by controlled burning during the winter months. The boundaries of most permanent camp sites were fixed and given permanent reservations in the Yukon Territory in 1955. (44)

At the time of the handover in 1946, large quantities of stores were received from the Army in bulk form. This included stores for the maintenance of buildings, grounds and utilities along the highway. The bulk of these stores were at Whitehorse but minor quantities were scattered at various camps along the highway, from Dawson Creek to the Alaska Border. In Whitehorse, they were stored at the Dowell area, Upper Whitehorse and at MacRae. These engineer stores were not completely brought to charge until about 1954 due to lack of storage space and trained personnel. The stores, for which there was no foreseeable use, were sold through the crown Assets Disposal Corporation. Stores in excess of requirements were shipped to the Engineers Stores Depot in Wainright, Alberta. Remaining stores were used by 17 Works. "The financial records from 1946-1959 are very few and no accurate records can be found, except that in the fiscal year 1949/50 the Works Coy spent 2.5 million." (44)

In 1962, 17 Works Coy RCE was reduced from 259 to 208 men. The transport section was completely deleted with 19 Coy RCASC controlling all vehicles and HME controlling all heavy equipment. (44)

Maintenance of Alaska Highway 1943-1964

There are a number of reports regarding the maintenance and construction of the Alaska Highway, Haines Road and Canol Road, covering a period between 1943-1964. (45) (46) (47)

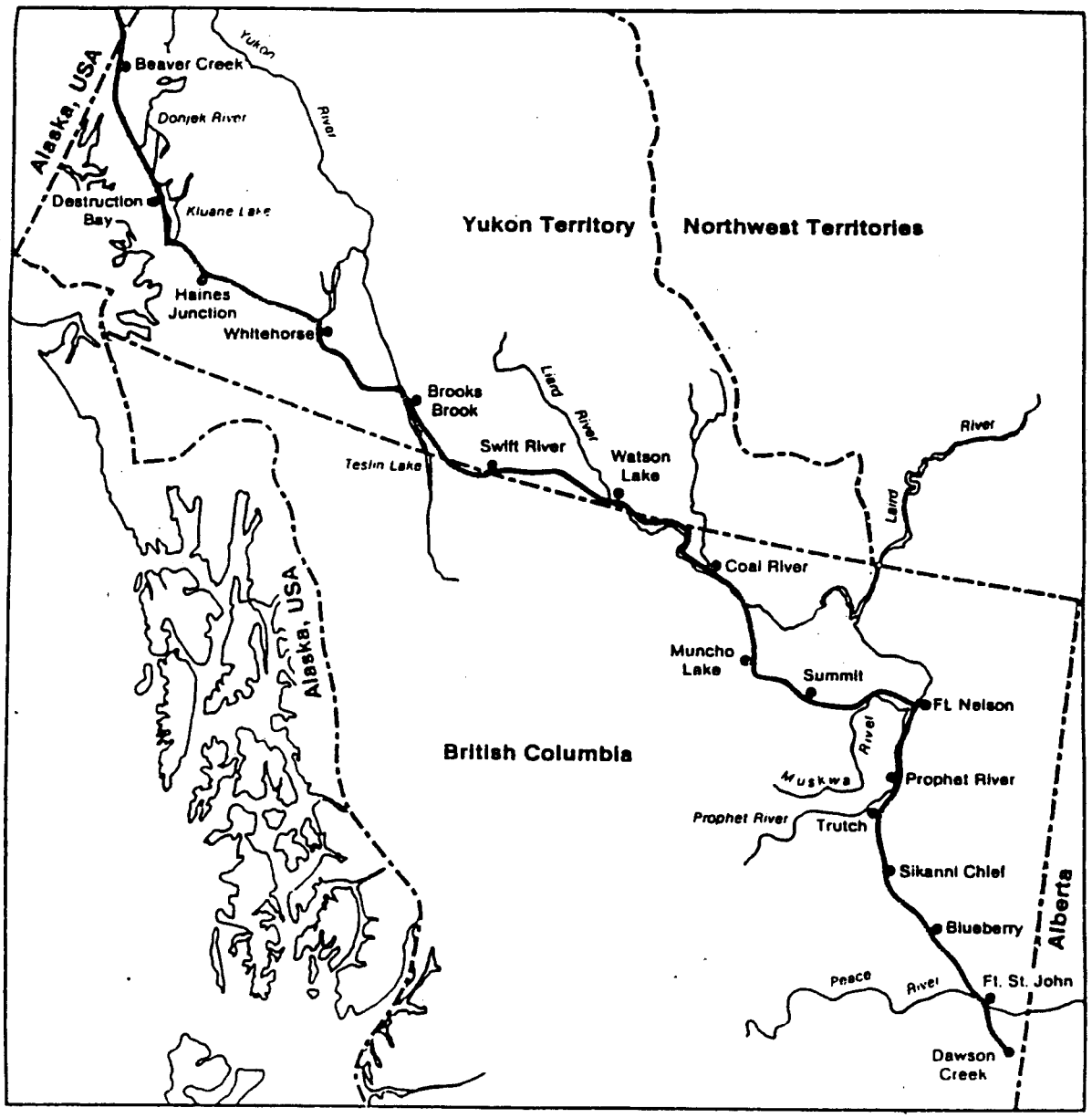
Maintenance on the Alaska Highway was divided into 3 areas:
In 1953:
Southern Area: Mile 0-496 (Dawson Creek - Liard River) British Columbia
3 Access Roads, 2 Flight Strips, 8 Maintenance Camps
Central Area: Mile 496-917 (Liard River - Whitehorse) British Columbia - Yukon
3 Access Roads, 3 Flight Strips, 5 Maintenance Camps
Northern Area: Mile 917-1221.4 (Whitehorse- Yukon/Alaska Border) Yukon
Haines Road, 2 Access Roads, 2 Flight Strips, 4 Maintenance Camps

In 1964:
Southern Area: Mile 83.6-496 (North of Fort St. John - Liard River) British Columbia
1 Access Road, 8 Microwave Station Roads, 2 Flight Strips, 7 Maintenance Camps
Central Area: Mile 496-872 (Liard River - Judas Creek) British Columbia - Yukon
3 Access Roads, 14 Microwave Station Roads, 3 Flight Strips, 4 Maintenance Camps
Northern Area: Mile 872-1221.4 (Judas Creek - Yukon/Alaska Border) Yukon
Haines Road, 2 Access Roads, 6 Microwave Station Roads, 2 Flight Stips,
4 Maintenance Camps

Maintenance Camps in Yukon - 1964:
Central Area - Watson Lake (MP635), Swift River (MP733) Brooks Brook (MP830)
Northern Area - Whitehorse (MP917) Haines Junction (MP1016)
Destruction Bay (MP1083) Beaver Creek (MP1202) (45) (46)

Figure 3 shows the location of highway maintenance camps up the highway from Dawson Creek, B.C.(MP0) to the Yukon/Alaska Border (MP1221.4.) (47)

FIGURE 3: Maintenance Camps - Alaska Highway



Maintenance and road improvements were carried out under Canadian military supervision by the Department of National Defense (DND), until April 1, 1964 when the federal Department of Public Works became responsible. In 1972, the Yukon Territorial Government took over maintenance of the Highway and Public Works continued with administration. On April 1, 1992, the maintenance and administration of the Alaska Highway and other Yukon highways was officially transferred to YTG.

Clean ups which have occurred along the Alaska Highway are recorded in the individual District Reviews. The 1976 Edey report (13), Government files (14), 1983 EPS report (15), RMO waste management sites and interviews have further confirmed sites which have been cleaned up and/or require further assessment.

4.3 HAINES ROAD

The Haines Road was designed by Foley Brother's Inc. and Rohl-Connolly Company. The construction of the Haines Road was assigned to the contractors of the Public Roads Administration during the winter of 1942-43. In March 1943, the 340th Engineers started the task of building the northern half of the Haines Road from a point 108 miles west of Whitehorse (Haines Junction) and they eventually linked up with the PRA Haines-based contractors on August 1, near Chilkat Pass. (30) Construction was finally completed in November 1943. (45)

This route provided another means to transport vital supplies from the ocean port at Haines, Alaska for the Alaska Highway and Canol Projects. The construction supplies were piling up in Skagway as the loads were too great for the Whitepass railroad route to Whitehorse alone, resulting in construction delays. 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. (13)

The complete set of PRA Maps for the Haines Road (10) indicate relay stations and construction camps along the Haines Road in 1943. These are illustrated in the Haines Junction District Review. (Copy of Maps Provided to AES - File#2). In Alaska, there were two relay stations (MP36.4, MP40.5) and in British Columbia, a relay station at MP72 (Glacier Camp) and a construction camp at MP84.5 (Stanley Creek). In the Yukon a relay station was located at MP99 (Million Dollar Falls), a construction camp at MP120.3 (Dezadeash) and maintenance camp at MP138.3. (Kathleen River). The road from Haines, Alaska to Haines Junction was 153.7 miles. New mileage is MP159 at Haines Junction.

Clean up along the Haines Road has consisted of removing some of the surface dumps. A dump is still located in a ravine, near the Million Dollar Falls campground.

4.4 COMMUNICATION SYSTEMS

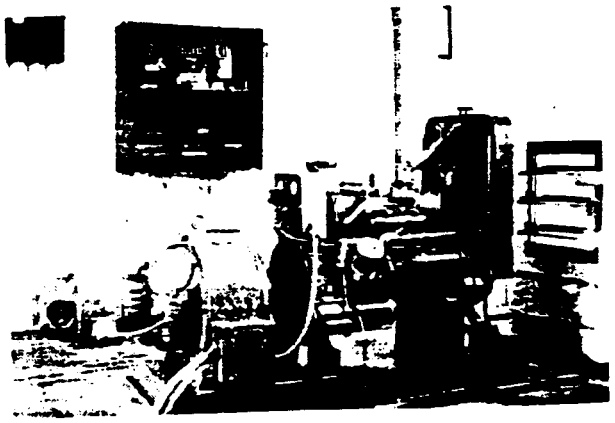
Radio Range Stations
In 1938 the federal government inaugurated Trans Canada Airlines to serve the people of Canada from coast to coast. This required the establishment of an all weather instrument and radio aircraft guidance route across the country. Radio ranges and meteorological weather services for aircraft were established as the airports and landing fields were built. When the war with Japan started in 1941 (Pearl Harbour), the hiring of radio operators was increased to man the Northwest Staging Route (NWSR) from Edmonton to Alaska, in conjunction with the construction of the Alaska Highway.

Heavy radio transmitters, sectional pieces of towers (up to 125 ft or more), as well as power plants and associated equipment were shipped via the various routes to the Yukon; to Whitehorse, via the Whitepass and Yukon Railroad, by barge up the Stikine River to Dease Lake and on to Watson Lake, or for the Canol Project down the Mackenzie River to Norman Wells, Northwest Territories. Early Royal Canadian Corps of Signals (RCCS) operators flew in by bush planes equipped with floats, later by the RCAF and Department of Transport aircraft when landing fields were readied. The placement of facilities were completed in less than a year from December 1941 to November 1942, constructed by Canadian contractors and government officers under the direction of the Department of Transport. (48) When the highway was opened in 1942, the radio ranges were in place to guide the Lend-Lease aircraft for the NWSR. Radio range stations and point to point communications were at Grande Prairie, Fort St.John, Fort Nelson, Watson Lake and Whitehorse and later at the intermediate airstrips at Teslin, Aishihik and Snag. Transmitting equipment used at the radio ranges at Watson Lake, Teslin and Whitehorse in 1942-1944 is illustrated by a series of photographs from *Radio Waves,* shown in Photo# 4. (48)

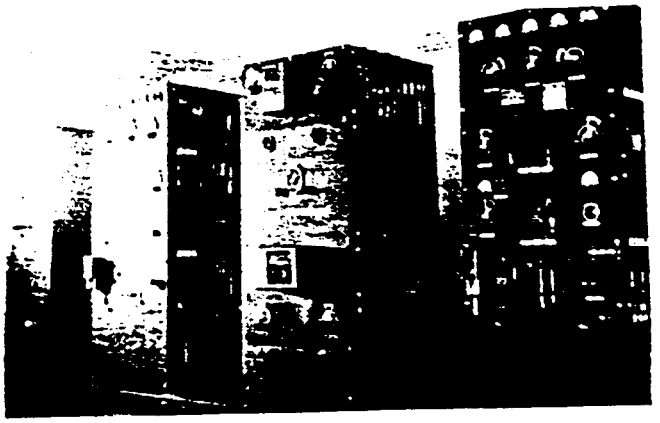
Before the 1950s ended, the Department of Transport (Transport Canada) took over all the operations of the NWT and the Yukon on a gradual basis. (48)

Telephone System
Communication facilities initiated by the Royal Canadian Corps of Signals (RCCS) were extended by the U.S. military and a first class telephone line was built paralleling the full length of the Alaska Highway and along the Canol Road for communication, built at the same time as these projects. "On the Canol project the U.S. military forces installed their own communication facilities to parallel those already long established at many of the points by the RCCS." (48). This connected each relay station, pump station and highway camp, giving direct contact at all times from Washington to Fairbanks. This communication system was also called the Canadian Telephone System or Cantel, a short name for the Northwest Communication System.

4. Radio Range Stations - Yukon



Typical Radio Range Power Unit.
Gasolene powered engine driving a 110 volt generator

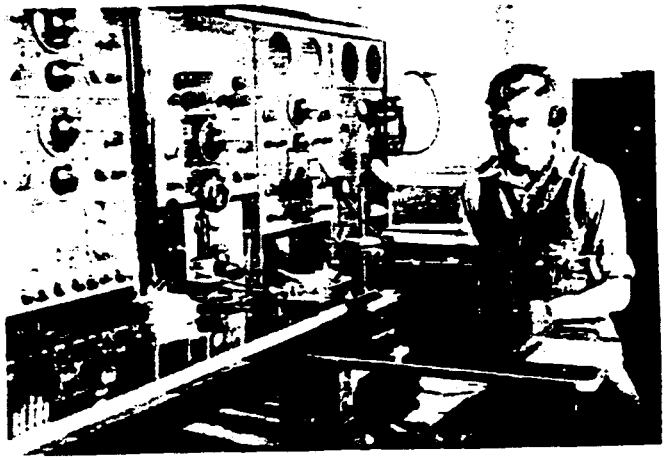


A STANDARD RADIO RANGE TRANSMITTER STATION
L to R: Control Unit, #1 Range Transmitter, Gonio Unit
and #2 Range Transmitter

Operator Jim Semper at work
Watson Lake Radio Range Station - 1944

TYPICAL COMMUNICATION TRANSMITTERS
AT AN INTERMEDIATE STATION
Centre - AG500 4-channel 500 Watt Transmitter and a
2-channel AT3 300 Watt Transmitter

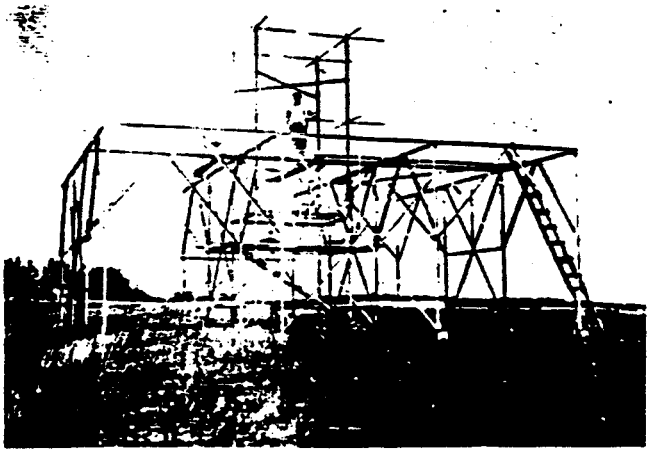
Whitehorse Radio Range Station - 1944
All three "positions" in operation.
Operators: Bob Williamson, Russ Travers
and two other operators busy at the Radio Range monitoring position



Operator Keith Morton busy copying messages
Teslin Radio Range Station - 1944

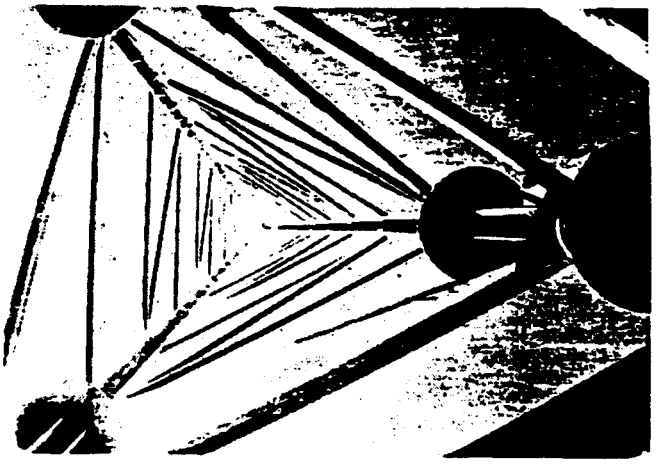
4. Radio Range Stations

Whitehorse Airport Administration Building 1942
Where the Airport, Radio Range and Metrological offices were.



A typical "Cone of Silence" Marker Antenna above counterpoise at all Radio Range Stations

Bank of 7 RCA AT3 - 300 Watt Transmitters and one RCA 260B 2 Kilowatt Transmitter.
Whitehorse communications building - 1942



Triangular radio range tower as viewed from below.
From insulators to top, 125 feet.

At a cost of $4.3 million, the Cantel system provided multi-channel telephone and teletype communication with the outside world for every Army and Air Force installation along these routes. Civilian contractors were hired to construct the Cantel system while depending on nearby military installations for logistical support. Most of the line stringing work was handled by two firms, Oman and Smith Co. and the Miller Construction Co. (30) A total of 65,000 poles, 1226 miles of wire and 16 repeater stations were utilized in this system.

U.S. Relay Stations

Twenty-four hours/day repeater stations operated as part of the U.S. Relay Stations located approximately one hundred miles apart along the highway. U.S. Signal Corps at each station maintained the telephone line. At each relay station there were barracks, baths and latrines, mess halls, officers' quarters, administration buildings,

twenty-five car garages, inspection sheds and gasoline and oil dispensing equipment. Vehicles were maintained and drivers replaced at each relay station. Along the Alaska Highway, in the Yukon, these were located at Watson Lake, Swift River, Brooks Brook, Johnson's Crossing, McRae, Canyon, Destruction Bay and Koidern. In a special souvenir edition of the Alaska Highway in 1944, the relay stations are illustrated and these appear in the different District Reviews. (49)

In Appendix D, the radio range and relay stations located along the Alaska Highway are indicated, as shown on the 1943 PRA maps for the Alaska Highway (9), for the Haines Road (10) and for the Canol Road (11).

In early 1946, the troops were gone, the Canol was abandoned, and Cantel stations, save those on the Alaska Highway, were closed. When Canada assumed the responsibility for the control and maintenance of the Canadian sector of the highway (April 1, 1946), the highway came free to Canada but the Cantel was purchased for $41,000,000, written off by the U.S. at 50% on the dollar. The Canadian Army took charge of the highway and the Royal Canadian Air Force (RCAF) took charge of the communication system. The RCAF withdrew from the assignment shortly afterwards in 1946 and the line was turned over to a newly formed company called the Northwest Communication System (NCS) under the jurisdiction of the Department of Transport. Canadian National Telegraphs (CNT) was then made responsible for the actual operation of the line. (43)

The entire communication system as inherited from the U.S. military was in an advanced state of deterioration. The entire line of 66,000 poles were rotting at ground level, the buildings were old, rotting on their wooden sills and military vehicles were worn out. Relay stations, no longer used, were dismantled along the Alaska Highway, Haines and Canol Roads. In 1947, NCS crews began the work of recovering the lumber along 1200 miles of the Highway from old disused U.S. construction camps to build married quarters for repeatermen, linemen and equipment maintainers. NCS built 60 married quarters, drilled wells, installed water and sewer systems. (43) In 1968, CNT disposed of buildings at the Swift River relay station. (50)

It was likely that the U.S. Relay stations used some PCBs in their transmitters to prevent fire hazards. PCBs could likely be found inside the buildings which housed this equipment. (EPS, pers.comm.) There was limited information on disposal of equipment at these sites, where transmitting equipment was removed to or whether it was buried near the site. It is thought that much of this equipment could have been sold as crown assets and salvaged. (EPS, pers.comm.) No information was available in discussions with Transport Canada in Edmonton or Department of National Defense (DND) in Ottawa. (pers.comm.) It was recommended to do a formal request for information and to do further research at National Archives.

4.5 CANOL PIPELINE

The Canol (Canadian Oil) project was one of the largest construction projects of the Canadian North in terms of cost, labour, and geographical area affected. It was designed to transport crude oil from the oilfields in Norman Wells on the Mackenzie River, to a refinery in Whitehorse in the Yukon, providing fuel for the Alaska Highway construction and NWSR airports, in the Yukon and into Alaska, for the war effort.

On April 29, 1942, the U.S. Army met with representatives of I.O.L. (Imperial Oil Limited) and Standard Oil of New Jersey. By the next day they had ratified an agreement and Canol was launched. A contract with Bechtel-Price-Callahan was drafted on May 4, and signed on May 20, 1942. On May 15, 1942, the Canadian House of Commons was informed of the project and on May 16 the War Committee of the Cabinet approved the project. The Permanent Joint Board of Defense (PJBD) was never asked for a recommendation on Canol. Ottawa had stated that the goal of producing 3000 barrels a day from Norman Wells was probably unrealistic. (30) This was the extent of pre-planning. In addition to economic, engineering and logistical issues, no environmental concern was expressed and no ecological impacts were considered.(19)

The Canol project entailed the construction of four separate pipelines; a 4" diameter, 458 miles (737 km) crude oil pipeline from Norman Wells to the Alaska Highway at Johnson's Crossing and from there, a 6" diameter 119 mile (192 km) pipeline to Whitehorse (Canol No.1); from Whitehorse a 4" diameter pipeline to Carcross and Skagway (Canol No.2); from Carcross a 2" pipeline to Watson Lake (Canol No.3); and a 3" line from Whitehorse to Fairbanks (Canol No.4). A total of 1600 miles (2,575 km) of pipelines in four separate systems eventually were constructed as well as 514 miles (828km) of gravel surface tote road (Canol Road), 515 miles (829 km) of telephone system, 1500 miles (2,415km) of primarily new winter roads, 10 aircraft landing strips along the Mackenzie River and 58 wells of which 55 produced commercial quantities of oil. 1700 miles (2,736km) of water routes were also upgraded. (19)

The estimated total project cost has been variously placed between $130,000,000-$300,000,000. Thirty thousand people were employed on the project which affected an area of over 2.6 million sq km. (19)

The prime contractor on the job was Bechtel-Price-Callahan, a joint venture of nine U.S organizations. A full listing of contractors and other companies listed on the Canol project was indicated by Richard Finnie. (51) The Canol No.1,2,3,4 pipeline routes, associated pump stations and barrel storage capacities are best indicated by Peter Kershaw, shown in Figure 4. (19)

Bechtel-Price-Callahan—A Joint Venture of Nine Organizations

PARTICIPATING COMPANIES

W. A. Bechtel Co., San Francisco, California H. C. Price Co., Bartlesville, Oklahoma

W. E. Callahan Construction Co., Dallas, Texas

Bechtel Company, San Francisco J. H. Pomeroy & Co., Inc., San Francisco

B M P Company, Los Angeles Gunther and Shirley Company, Los Angeles

R. A. Conyes, San Pablo, California Paul Grafe, Los Angeles

* * *

POLICY COMMITTEE

Paul Grafe, *Chairman*

S. D. Bechtel H. C. Price R. A. Conyes

J. H. Pomeroy J. P. Shirley, Jr.

PROJECT MANAGEMENT

Van W. Rosendahl, *Senior Officer* Clark C. Rankin, *Chief Engineer*

CONSTRUCTION MANAGERS

Everett Seabury J. P. Shirley, Jr. E. W. Davis

ADMINISTRATION MANAGERS

J. S. Connell R. D. Grammater

* * *

CONTRACTORS OF THE CANOL PROJECT

Bechtel-Price-Callahan, Constructor . . . *Design of Refinery and Crude Pipelines, Pump Stations . . . Construction of the Project*

J. Gordon Turnbull and Sverdrup & Parcel, Architect-Engineer . . . *Engineering and Design of Gasoline Pipelines, Pump Stations and Appurtenant Structures*

Standard Oil Company of California, *Consultants on Pipelines and Refinery*

Standard Oil Company of Alaska, *Operation of Pipelines and Refinery*

Imperial Oil Company, *Production of Petroleum*

Noble Drilling Company, *Oil Well Drilling*

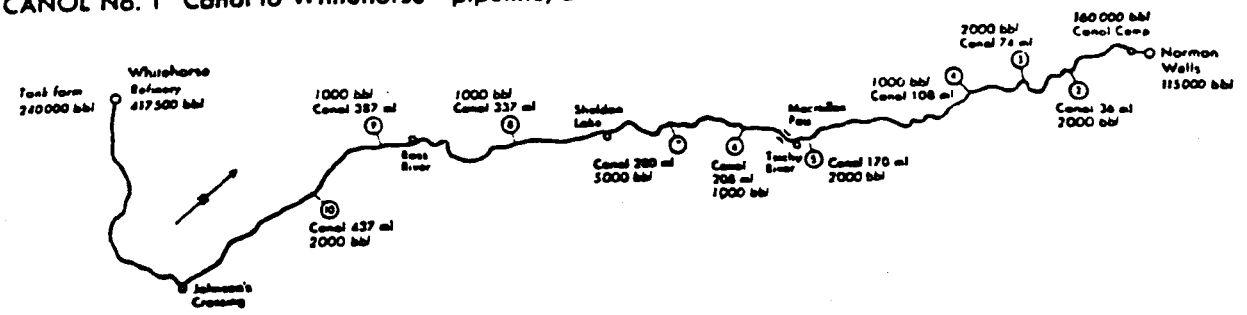
Marine Operators, *Mackenzie River Transportation*

Miller Construction Company, *Telephone Line Construction*

Hatfield Electric Company, *Telephone Line Construction*

FIGURE 4: CANOL PIPELINE NO. 1, 2, 3, 4

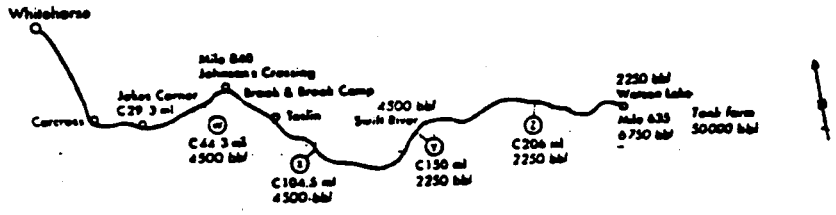
CANOL No. 1 Canol to Whitehorse - pipeline, all weather road, telephone system



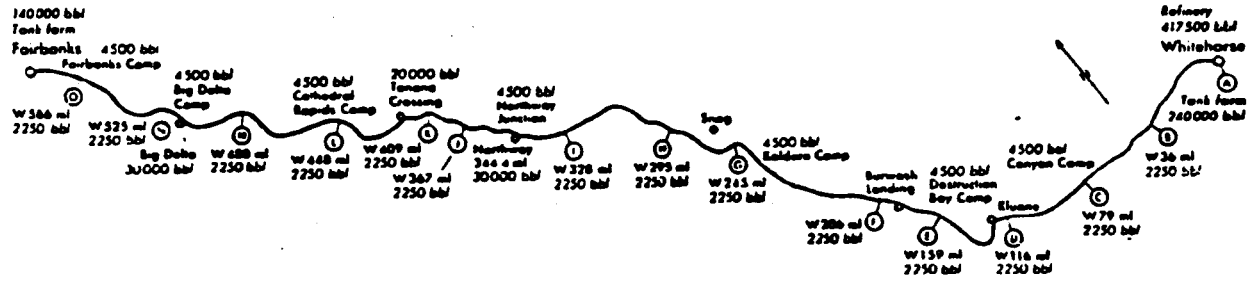
CANOL No. 2 Skagway to Whitehorse - pipeline, railroad, telephone system

○ Pump station
100 bbl Barrels of storage
S100 mi Miles from Skagway
C100 mi Miles from Carcross
W100 mi Miles from Whitehorse

CANOL No. 3 Whitehorse to Watson Lake - pipeline, highway, telephone system



CANOL No. 4 Whitehorse to Fairbanks - pipeline, highway, telephone system



Advertisements for construction employees began in June 15, 1942, by Bechtel-Price-Callahan. " This is No Picnic". (51) Workers would be hauling materials and building the pipelines through the winter of 1942/1943, the summer and part of the winter of 1943/44. Most of the work of the Canol No.1 line was completed during the winter. See Photo 5. (51).

CANOL No.1:

The route of the Canol No.1 pipeline was determined by surveyors, Guy Blanchet and Kent Fuller in the winter of 1942/43. They traveled by dog sled and relied heavily on native guides and bush pilots to determine the best route from Sheldon Lake through the Macmillian Pass area. (52) The plans for Canol No.1 called for more than 55,000 tons of cargo to be shipped to Norman Wells in the Northwest Territories. A fleet of barges and a series of portages were required to travel the rivers and lakes from Waterways, northern Alberta to Norman Wells. This was a massive undertaking in itself moving equipment, building materials and miles of pipe to Camp Canol, NWT. Construction began in the fall 1942, commencing at Norman Wells and crossing the Mackenzie River to Camp Canol, 8 miles to the west. By December 1942, nineteen new wells had been drilled in the Norman Wells area by Imperial Oil for the army, which had tripled output.

On January 24, 1943 military instructions were issued to start the job of building an access road for civilian contractors who would begin work on the 577 mile Canol No 1. pipeline, to bring the crude from Norman Wells to Whitehorse. One crew started from Canol Camp, NWT, called the Canol No. 1 East on June 1943, and another crew started at Johnson's Crossing,YT, Canol No. 1 West. The boundary of the Northwest Territories was the dividing point. Pipes and equipment were shipped via the Whitepass Railroad, and transported to Johnson's Crossing. (See Photo# 6) (51) On February 16, 1944, the eastern and western ends of the pipeline were joined at MP 281.5, near the Yukon/NWT border. A 4" line extended from Camp Canol to Johnson's Crossing (513 miles) and from there a 6" line extended 83 miles along the Alaska Highway, by Marsh Lake to Whitehorse, a total distance of 596 miles. The pipeline followed a more direct route than the road and the two alignments often deviated as much as one km.

The pipe was laid on the ground and followed the local topography. This was possible because the oil from Norman Wells had a temperature pour point of less than -56.7C and had a viscosity of 275 seconds. At small streams the pipe was given anchor collars and laid on the stream bed. At large or rapidly flowing streams the line had special pipe supports, on road bridges or pipeline suspension bridges. After welding the pipe, sections were blocked off by valves and air was pumped in at 700 kPa pressure to test the welds. Testing with water was not possible. (19)

5. Conditions of Work on the Canol Project

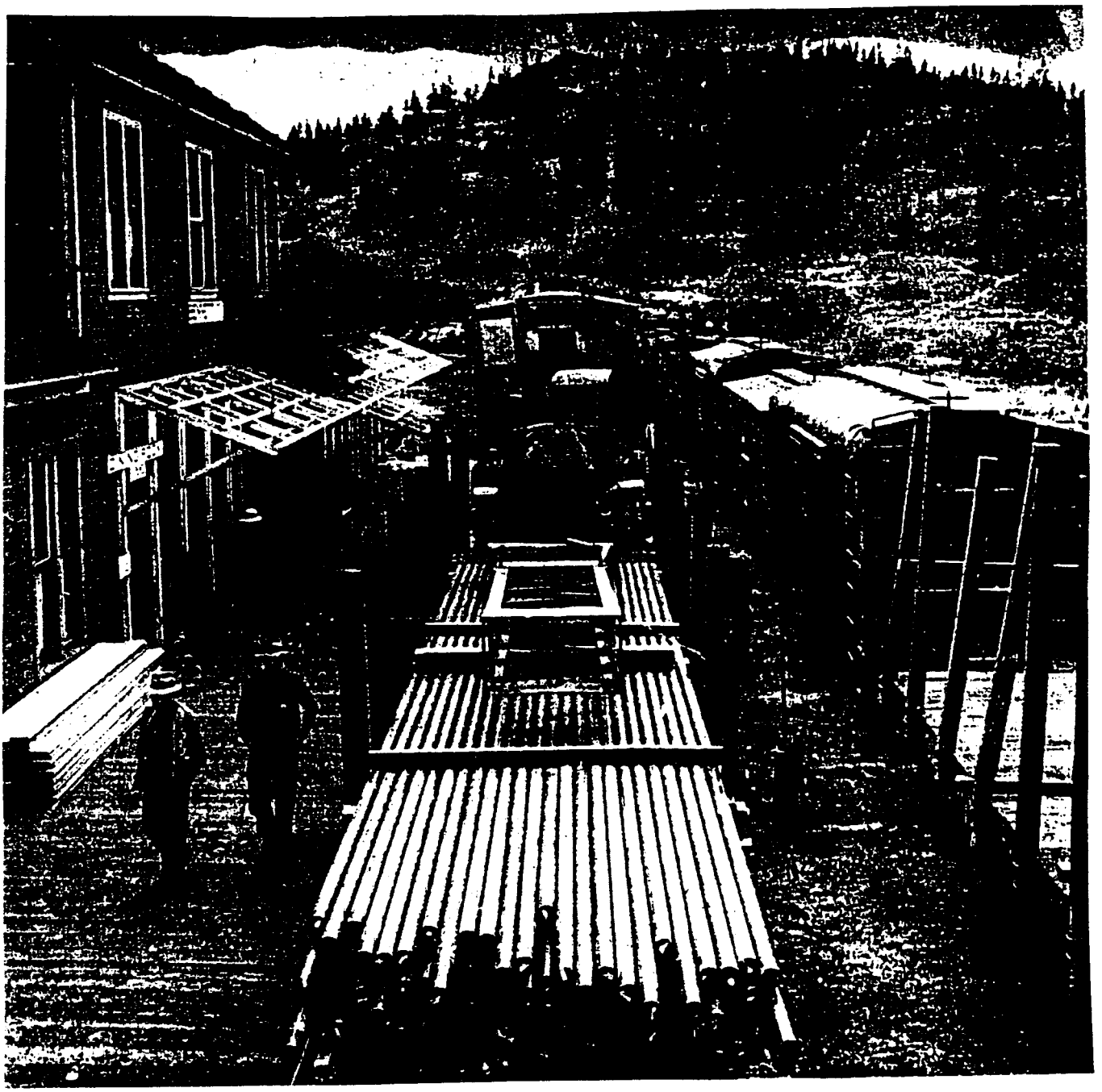
THIS IS NO PICNIC

WORKING AND LIVING CONDITIONS ON THIS JOB ARE AS DIFFICULT AS THOSE ENCOUNTERED ON ANY CONSTRUCTION JOB EVER DONE IN THE UNITED STATES OR FOREIGN TERRITORY. MEN HIRED FOR THIS JOB WILL BE REQUIRED TO WORK AND LIVE UNDER THE MOST EXTREME CONDITIONS IMAGINABLE. TEMPERATURES WILL RANGE FROM 90 DEGREES ABOVE ZERO TO 70 DEGREES BELOW ZERO. MEN WILL HAVE TO FIGHT SWAMPS, RIVERS, ICE AND COLD. MOSQUITOES, FLIES AND GNATS WILL NOT ONLY BE ANNOYING BUT WILL CAUSE BODILY HARM. IF YOU ARE NOT PREPARED TO WORK UNDER THESE AND SIMILAR CONDITIONS

DO NOT APPLY

June 15, 1942 *Bechtel-Price-Callahan*

6. **Typical Load of Pipe for the Canol Project at Lake Bennett Station, on the Whitepass Railroad**



As the road builders and pipeliners forged ahead, telephone crews followed closely behind. The construction of the Canol Road was completed in February 1944. On Canol East, Bechtel-Price-Callahan constructed the telephone line and on the Canol West, Miller Construction Co. completed the work. (51). The construction of the telephone line was initiated at Camp Canol in July 1943 and was first put into operation in May 1944. This was part of the U.S. network which operated between Edmonton to Fairbanks from 1942 to 1944. Of the five flight strips originally proposed, only one was cleared at Sheldon Lake (MP220), used only in the winter months and was abandoned shortly after opening. (53)

Pump Stations/Relay Stations/Construction Camps/Emergency Shelters
The Public Road Admistration map of the Canol Road in 1943 (11) was the best source for location of the pumps stations, relay stations and construction camps, and emergency shelters for the Canol No. 1 project. Topographically the map is in error, but mileages were indicative of distances and were used in this summary. Mileages were calculated from Jonhson's Crossing to the NWT border.

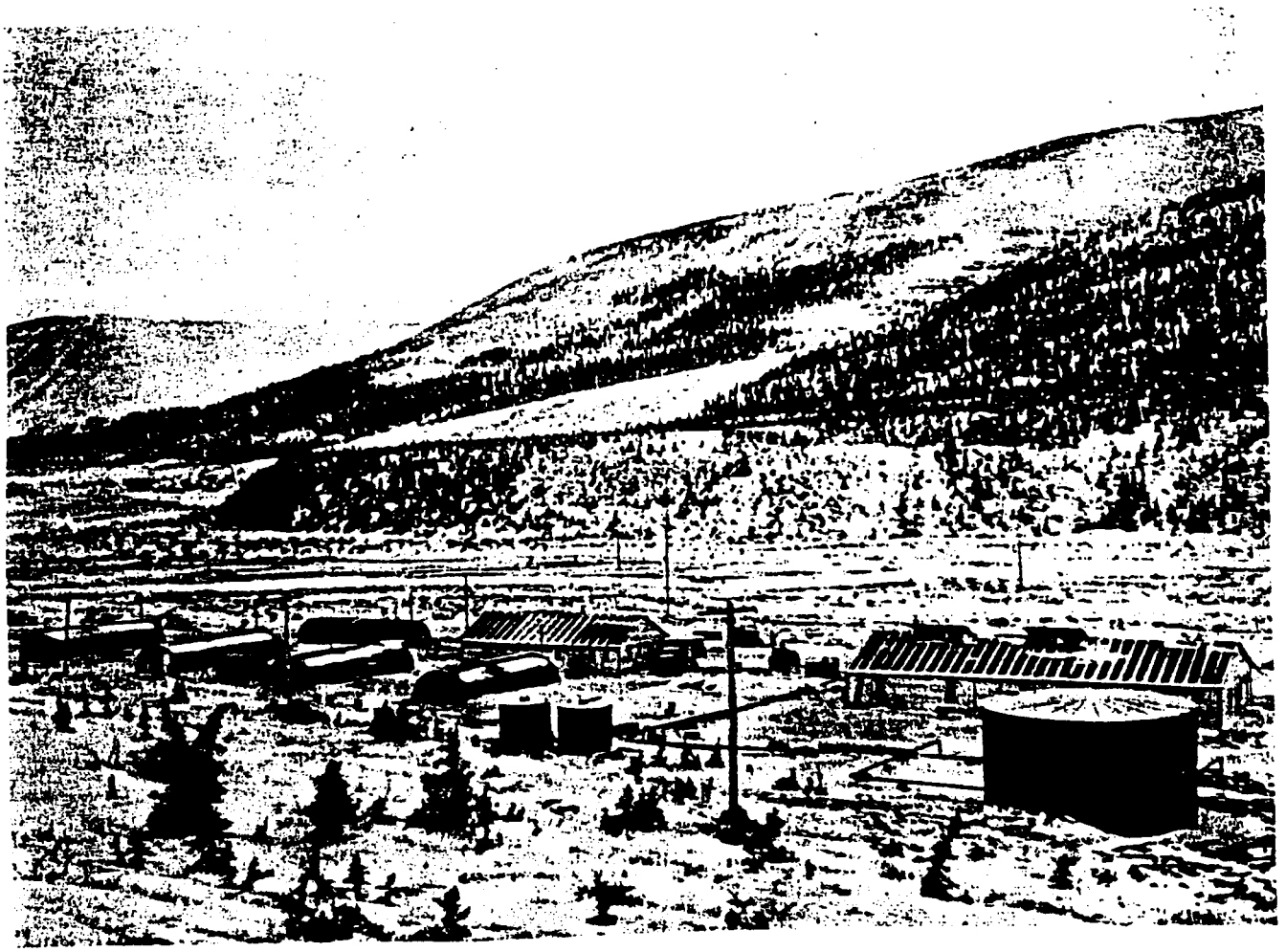
There were a total of 10 pump stations, 6 U.S. Army relay stations, 13 maintenance camps (Elliot Co.) and 32 emergency shelters, located 1-10 miles apart.

Pump Stations/Relay Stations

Station #	MP From NWT	Camp Name		MPfrom JC
Station 1	- MP0	- Camp Canol	NWT	
		- Relay Station No.6	"	
Station 2	- MP36	- Dodo Canyon	"	
Station 3	- MP74	- Plains of Abraham	"	
Station 4	- MP108	- Bolstead Creek	"	
		- Relay Station No.5	"	
Station 5	- MP170	- Egouchie River	"	
Station 6	- MP208	- Intga River	"	
		- Relay Station No.4	"	
Station 7	- MP280	- Macmillan River	YT	MP233
		- Relay Station No.3	"	
Station 8	- MP337	- Orchie Lake	"	MP176
		- Relay Station No.2/Weather Stn		
Station 9	- MP387	- Lapie River	"	MP126
Station 10	- MP437	- Gravel Creek	"	MP67
		- Relay Station No.1	"	
Camp Canol	- MP513	- Johnsons Crossing	"	MP0
Whitehorse	- MP596	- Tank Farm & Refinery	"	
	- MP231.3	- Yukon/NWT Border		MP283

The diesel engines for each pump stations were designed so they could operate on the crude taken from the line. Each pump station had storage tanks, barracks, powerhouse, and equipment buildings. Photo No. 7 illustrates the general lay out.(51)

7. General Layout of Pump Station - Canol No.1 Project



From Canol Camp to Whitehorse ten pumping stations were being erected. At each were three Diesel engines, so designed that they could run on crude oil taken from the line, just as the gasoline engines along the supplementary lines between Whitehorse and Watson Lake and Fairbanks could tap the refined products as they flowed through.

Elliot Maintenance Camps - Canol Road 1943

MP from NWT	Camp Name		MP from Johnson's Crossing
MP0	- Camp Canol	NWT	
MP50	- Little Keele River	"	
MP67.5	- Little Keele River	"	
MP80.5	- Plains of Abraham	"	
MP130.3	- Keele River	"	
MP222	- Tsichy River	"	
MP238.5	- Macmillan River	YT	MP272
MP246	- Macmillan River	"	MP267
MP279	- Macmillan River	"	MP233
MP299	- Sheldon Lake	"	MP212
MP372.4	- Ross River	"	MP142
MP491	- Murphy Creek	"	MP29
MP513	- Johnson's Crossing	"	MP0

Emergency Shelters are listed in the Teslin District Review from Johnson's Crossing MP0 to MP90 and in the Ross River District Review from MP90 to the NWT border MP283.

Canol Refinery at Whitehorse, YT.

The Whitehorse refinery construction commenced on April 1943 and was completed in April 1944. 24 storage tanks with a total capacity of 678,500 barrels were also built. The thermal cracking unit, part of the crude unit and most of the tankage was purchased from Corpus Christi, Texas, the boilers came from an old power plant in Hamilton, Ontario and turbines and generators were from Pinedale, California. The first crude oil was pumped into the line December 19, 1943 at Camp Canol and reached the Whitehorse refinery on April 16, 1944. It took 27 days to fill the pipe. Several months passed before the refinery was in operation, producing only diesel oil. The plant was not ready to make 100-octane aviation fuel until October 1944. Oil deliveries were made to Whitehorse for only 331 days to March 13, 1945. Less than a year later in April 1945, the refinery was shut down. Its total output during the previous nine months had been 23,417 barrels of aviation gasoline, 31,370 barrels of motor gasoline and 256,358 barrels of diesel oil. (30) Between July and November of 1944, the project provided all of the motor gas requirements for military needs between Watson Lake and Fairbanks and also exported between 136,000 and 244,000 barrels from Skagway. (19)

During the 16 months of operation 1,161,394 barrels were pumped through the pipe, and a total of 971,685 barrels were received in Whitehorse. The difference of 189,709 barrels was either in the pipe, at the pump stations or unaccounted for. It is likely that almost all of this quantity was spilled. (20)

A summary of the barrels pumped from December 19, 1943 to March 1945 on Canol No.1 is presented in P.Kershaw's report. (19) 42% (46.108 barrels) were spilled during construction operations. Pumping pressures were at 11,030 kPa, 6.3% higher than those recommended by the manufacturer. (19) (See Appendix Q).

Special credit belongs to the U.S. Army Air Transport Command, which flew men and freight for the Canol Project; to the U.S. Army Medical Corps, whose northern field hospitals cared for soldiers and civilians alike; to the U.S. Army Signal Corps, which established and maintained communication across the wilderness, to the Task Force 2600, comprising the 89th and 90th Heavy Pontoon Battalions and the 388th Engineer Regiment, which took the first freight shipments down the Mackenzie River and delivered them to the job site; and to the 35th Combat Engineer Regiment, which pioneered the western half of the Canol Road. (51)

CANOL No. 2 - Skagway to Whitehorse-

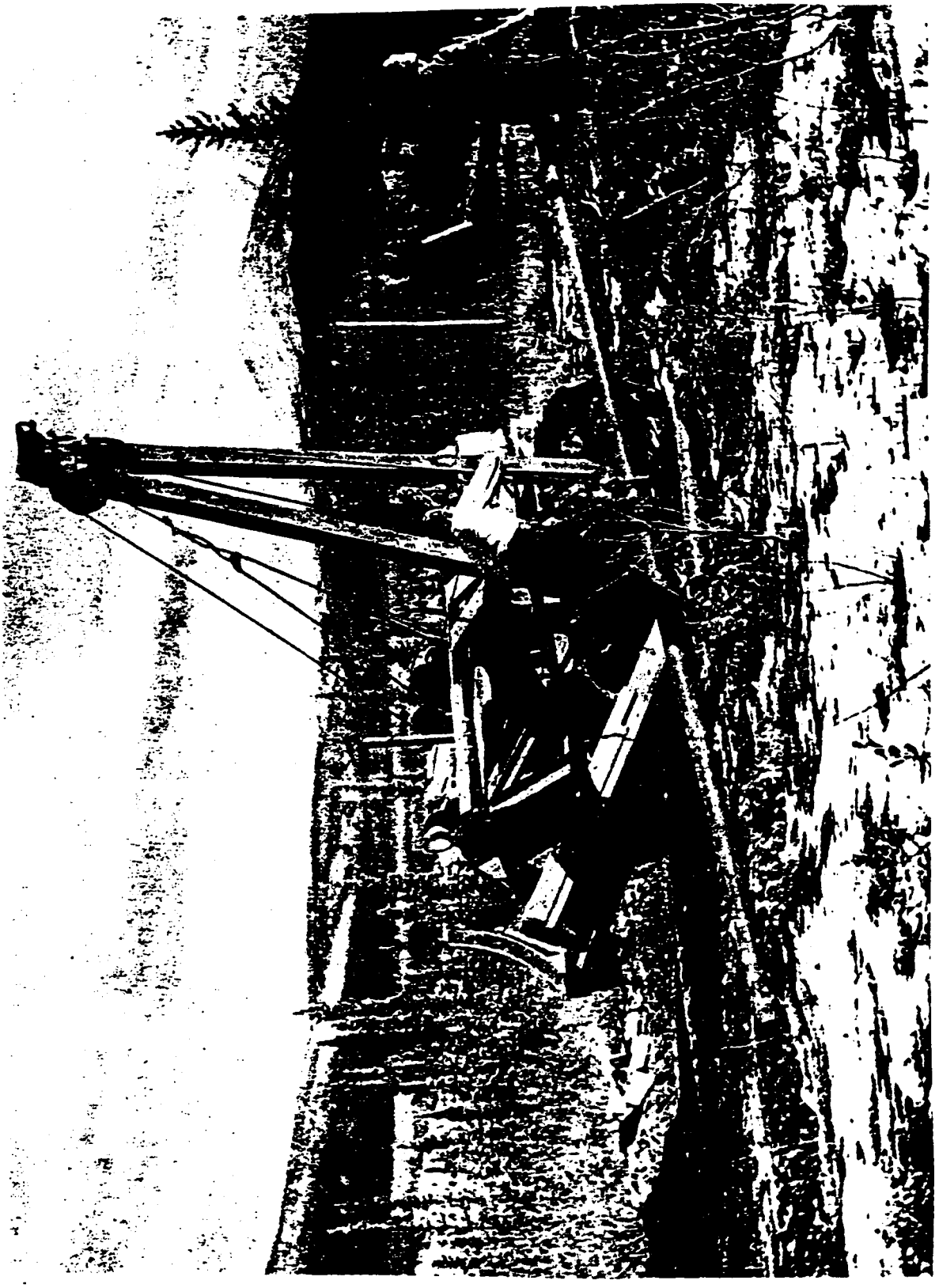
Bechtel-Price-Callahan (BPC) started working on the 4 inch pipeline from Skagway to Whitehorse in October 1942, as shown in Photo# 8. (51) Pumping stations were constructed at the Whitepass Summit and at Carcross. On January 20, 1943, the first tanker load of gasoline was pumped over the 4" pipeline, a distance of 110 miles from Skagway to Whitehorse. This pipeline was primarily constructed in the right of way of the Whitepass Railroad. This was potentially a highly explosive situation with aviation fuel running right next to the tracks with the steam engines, some of which were still fired by wood. The right of way was leased by the United States Army from WPYR for pipeline construction and for railroad operation. (See 4.2.- Whitepass & Yukon Route Railroad). In 1946, the pipeline was shut down, in 1947 it was put into operation again by the U.S. Army, in 1948 it was leased to Whitepass, and in 1949 the U.S. Army again took over operations and continued to operate it until 1958. In 1958, Whitepass purchased the portion of the pipeline in Alaska from the Army and the Canadian portion was transferred to the Canadian Government who in turn leased it to Whitepass. In 1962 the Canadian portion of the pipeline was purchased by WPYR. (21)

Environmental Protection Service reports provided information on oils spills, from 1966 to 1995. (21) (22). These are presented in the Tagish District Review. Records of the U.S. Army were not located, regarding oil spills and maintenance operations for this pipeline. Whitepass Corporation did not have earlier records available. (K.Steele pers. Comm.). A strip map of this pipeline showing pipeline post mileages is provided in File # 6. (21).

CANOL No.3 - Whitehorse to Watson Lake

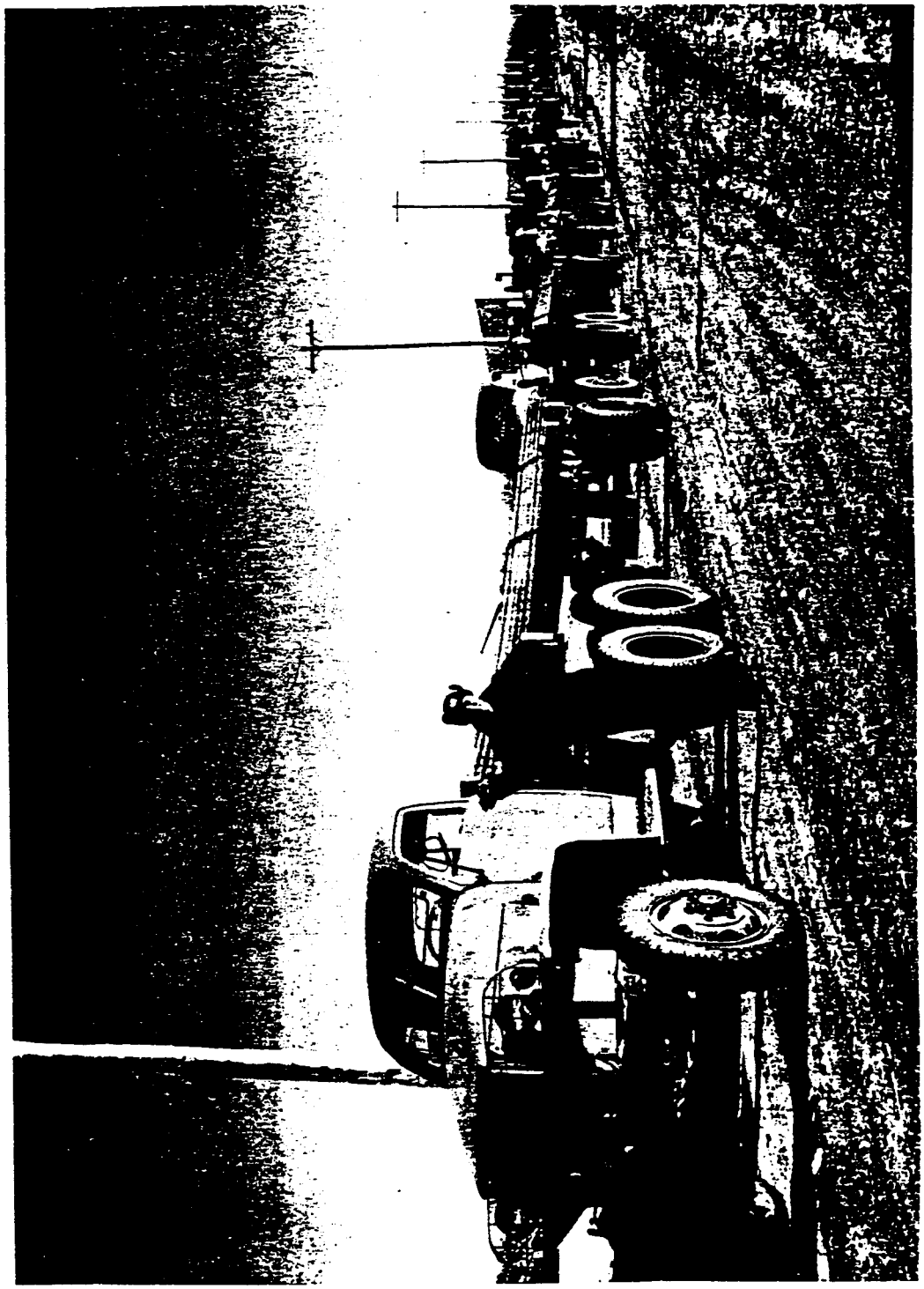
BPC crews started constructing a 2 Inch pipeline from Carcross to Jake's Corner and along side the Alaska Highway to Watson Lake, in January 1943. BPC started transporting the pipe, delivering it from Watson lake north to Carcross, dropping off the pipe in 25-joint lots every 1000 ft. Photo# 9 shows a large convoy of BPC trucks. (51)

8. Construction of Canol No. 2



In October 1942 the Constructor laid a supplementary pipeline between Skagway and Whitehorse.

9. Bechtel-Price-Callahan Transported the Pipe Along the Alaska Highway.



In January 1943 Bechtel-Price-Callahan began freighting over the Alaska Highway from Dawson Creek. There were countless truck loads of foodstuffs and construction supplies, while convoys of dollies rolled northward with pipe. Each dolly load comprised 80 joints thirty-eight to forty-four feet long, weighing six tons.

It was July 1943, before gasoline reached Watson Lake. This line transported mostly aviation gasoline, pumped from Whitehorse as a refined product and from Carcross (from Skagway via Canol No. 2). Including Whitehorse and Carcross, there were 6 pumping stations along the pipeline:

Pumping Stations:
Whitehorse - MP917 Alaska Highway + Tank Farm (also part of Canol No.1,2,4)
Carcross - MP66 Klondike Highway (also part of Canol No. 2)
Station W - MP855 Alaska Highway Big Devil Lake (Summit Lake)
Station X - MP794 Alaska Highway Morley River Pumping Station
Station Y - MP748 Alaska Highway Swan Lake/Woof Lake, B.C.
Station Z - MP693 Alaska Highway Rancheria River -
Watson Lake - MP635 Alaska Highway + Tank Farm

The PRA maps (9) indicate the location of the pipeline and pump stations, which were also assessed for clean up by Edey in 1976. (13) There was virtually no information found regarding the maintenance and operation of this pipeline. No documents were located mentioning oil or gas spills. One interviewee mentioned a spill near Morley Bay. The tank farm in Watson Lake was located on a hill north of the Airport and gasoline was gravity fed to the Watson Lake Airport which had underground storage tanks.

CANOL No.4 : Whitehorse to Fairbanks
BPC crews started building a 3 inch pipeline from Whitehorse to Fairbanks, in the winter 1943. It was completed by mid summer 1943 and first filled in November 23, 1944. (19). This pipeline had 15 pump stations, 8 of which were in the Yukon.

Pump Stations:
Station A - Refinery and Tank Farm (Whitehorse) - MP917 Ak Hwy
Station B - Stoney Creek - MP957 "
Station C - Canyon - MP1000 "
Station D - Jarvis River - MP1036 "
Station E - Destruction Bay - MP1081 "
Station F - Donjek River - MP1126 "
Station G - Koidern - MP1166 "
Station H - Beaver Creek - MP1206 "
Station I,J,K,L,M,N,O - Alaska (extending to Fairbanks)

The location of pump stations are marked on the PRA maps (9). Information on oil spills and maintenance of this pipeline was not found. This continued to operate, in conjunction with Canol No.2, into the mid 1950s. This line could not meet the demands for additional fuel required in Alaska and the 8" Haines-Fairbanks pipeline

was constructed in 1954/55 in the Canol No. 4 right of way, along the Alaska Highway from Haines Junction to Beaver Creek. The Haines-Fairbanks Destruction Bay pump station was constructed at the previous site of pump station E at MP1081.

Construction camps for Canol No. 3 and No.4, were located at intervals all along the Alaska Highway from Watson Lake to Beaver Creek. Photo# 10 shows a typical construction camp. (51)

10. Canol No.3 & 4 Construction Camp - Alaska Highway

At intervals between Watson Lake and Carcross, and at other points along the Alaska Highway and access roads, camp after camp was built. In new and mostly uninhabited country there had to be camps for truck drivers and pipeliners as well as pumping-station builders and operators.

Abandonment of the Canol

Economic consideration forced abandonment of the project as maintenance costs for the pipeline and for the road were each evaluated at $11,000,000. Norman Wells also could not compete with the oil brought by tankers to Skagway, and to the Yukon via Canol No.2, and onto Alaska via Canol No.4. (19) Canada was given the first option to purchase the property at appraised value at the end of the war. It was specified that if Canada failed to exercise the option the property could be sold to any other bidder. Canada declined and the Canol project was abandoned early in 1945. Evacuation directives were given March 8, 1945. The refinery was closed April 1, 1945. On Canol No.1, evacuation occurred from the Mackenzie River westward and was closed by April 30, 1945. Buildings were secured and boarded up, equipment was winterized and left, so that the pipeline could be reactivated if needed. Date of abandonment/cancellation for Canol No.2 was June 6, 1946, for the Canol No.3 line was October 1, 1945, and for Canol No.4, July 14, 1946. (19)

Clean Up Activities - Canol

Canol No.1

In 1947, Canol No.1 and the refinery were sold to private commercial interests. Between 1947-48, the W.M. Barnes Company from Los Angeles dismantled the refinery in Whitehorse and trekked it down the Alaska Highway to Leduc, Alberta, just outside Edmonton, to be used in the Imperial Oil Ltd. oil fields. (43) 17 Coy works supplied a large number of personnel during off duty hours to assist with the dismantling. (44) More than 7,000 tons of equipment had to be torn down, reduced to moveable loads, and carried 1414 miles to Edmonton to be reassembled. Some equipment was shipped via the Whitepass Railroad and boat to Vancouver. (54)

The Canol Road was not maintained after closure in 1945. In 1947, the Highway Maintenance Establishment opened up the first 30 miles of the road which had deteriorated due to floods and normal weathering. At MP4.2 (South Canol), a construction camp was set up and 30 miles of road was reshaped, ditched and graded. (45)

From the late 1940s, through the 1950s and 1960s, private companies and their contractors as well as locals salvaged materials on the Canol Road. In 1948 the U.S. army came back and cleaned up along the Canol Road, burying everything that was left. (See Orville Smith interview-Teslin District Review.) In 1951, Mr. Smith had worked for Ray Hyde, who had bought the pipeline thereby acquiring the salvage rights along the Canol, removing equipment at the pump stations and the pipe. Everything was taken out to Johnson's Crossing and Mr. Hyde apparently did not bury anything. Mr. Bosely, another Teslin resident, worked on the salvage operation on the North Canol in the summer 1951-53, working mostly between MP222 (past Sheldon Lake to the NWT border (MP282). "Cats" were taken out on the south side of Godlin

Lake. He didn't do any burying. (See Bill Bosely interview - Teslin District Review) Between 1945-1955 the North Canol Road was okay and you could drive it. Gradually the bridges started to deteriorate and the road was closed. In 1969, contractors were hired to repair the bridges and travel was improved to the Macmillan Pass area, near to the NWT/Yukon border. (See Hector Lang interview-Tagish District Review).

Canol No.2

In June 1953, a treaty agreement was created between the U.S. and Canada regarding the Haines-Fairbanks Pipeline which included reference to Canol No.2. (See Appendix N - Facilities/Management Procedures).

"In the event that the notice is given by the United States of the termination of the operation of the four inch line between Skagway to Whitehorse, the United States will transfer to Canada without compensation any equity it may have in that part of the pipeline located in Canada... and will undertake such terms and conditions which are mutually agreed upon, to make available for the use of Canada that part of the 4 inch pipeline from the Canadian border to Skagway as well as the terminal and pumping facilities at that port."

In 1958, the American portion of Canol No. 2 was sold to Whitepass & Yukon Corporation and the Canadian portion was transferred to the Canadian government. with the U.S. being granted the right to build and operate a military 8" line across Yukon Territory (Haines-Fairbanks Pipeline) in lieu of cash payment from Canada for these Canol facilities. (53). In June 14, 1960, the Whitepass & Yukon Corporation offered to buy Canol No.2 in Canada and the Whitehorse tank farm. This offer for $125,000 was accepted and the sale concluded in December 1961. The pipeline transported fuel primarily in the winter, when the railroad was not operating to avoid operation hazards. In 1994, Whitepass ceased to operate this pipeline and plans are to remove all the fuel in the line in the summer of 1995. (See Ken Steele interview - Tagish District Review).

Canol No.3

For Canol No.3, the 2" line was sold through Crown Assets Disposal Corporation, since it was found to be unfit to operate and even if it were fit could not be operated economically. The pipe was drained and removed in 1947/48. Up to 1962, almost $100,000 had been realized from its sale on a piece meal basis.

Canol No.4

Canol No. 4 and the other half of the tank farm was sold to Whitepass and Yukon Corporation for $286,500 on July 21, 1962. Canol No. 4 was dismantled by Whitepass from MP1024 (Bear Creek-Haines Junction) to MP1226, Yukon/Alaska boundary immediately upon its acquisition. The portion of the line from Haines Junction to Whitehorse was dismantled in 1963. (53).

Little information was located on the salvage of the Canol No.3 & 4 pump stations

along the Alaska Highway. As no reports were found describing these activtities, it is assumed that these were salvaged by private contractors and local residents after the war. These sites were identified as part of the general clean up operations in the 1970s along the Alaska Highway, as described in section 4.8.

Clean Up Activties Along the Canol Road

Specific reports were completed in the 1970s along on the South and North Canol Road to assess remaining buildings, equipment and areas of pollution associated with the Canol No.1 project. These studies identify what was present before clean up operations in the mid 1970s by DIAND.

An engineering report was prepared on the pollution of the Canol Highway by the Canadian Forces in September 1970. (7) Mile 297 was as far as this study covered due to road conditions.

" Approximately 200 filled or partially filled oil drums were found at designated sites along the Canol Highway, in addition to areas of ground that were staurated with oils and greases. Approximately 6000 empty oil drums, 200 truck hulks, miscellaneous vehicle debris including graders, engines and tires, lengths of 4-inch pipe and building debris were scattered throughout the line inspected. This debris creates a serious litter problem which makes the highway unsightly. Although the Canadian military forces were not responsible for this litter, the markings on much of the discarded equipment is military, which causes considerable unfavorable comment from those who travel the highway which extends 513 miles from Johnson's Crossing to Norman Wells in the N.W.T." (7)

List of Sites - Canol Road - 1970

A brief description of each of the sites from this 1970 report includes:

MP0	-	Johnson's Crossing - MP836 Alaska Hwy
MP19	-	Barrels partially filled with asphalt (Static Ashalt Protective Coating made by Flinkotte meeting CGSP 37-GP-38 and DND TS -2 Specifications.
MP73	-	Foundation of Pumping Station, bunkhouse, pipe, barrels "Area has been contaminated in past, but little remains now."
MP74	-	Empty oil drums scattered in ravine
MP99.5	-	Remains of wooden buildings
MP124.5	-	Pumping Station, remnants of buildings, barrels truck hulks
MP125-172	-	Wrecked vehicles, empty oil drums
MP174	-	Debris scattered both sides of road, collapsed buildings, quonset hut, empty drums, truck hulks, graders, evidence of heavy oil and grease saturated areas, also filled or partially filled oil drums.
MP175-216	-	Empty drums, truck hulks
MP216	-	This area is an real eyesore with a pollution problem, on both sides of the road. East of Canol Road: A 75'x 75' area was found to be black with oil and exhibited a strong oil smell. One area 25' x 25' was saturated with grease and 3 areas (roughly 25' x25') were found saturated with oil, to a depth of about 2 inches; Another area of 600' x 150' is covered with debris, empty drums, truck hulks, grease ramp, and remnants of bldgs.

List of Sites - Canol Road - 1970 (Cont.)

MP216 (cont.) - West of the Canol Road: An area 400' x 150' was covered with six collapsed buildings oil drums and miscellaneous debris. 500 empty drums, 50 partially filled oil drums, 15 truck hulks were found in this area.

MP217-236 - 15 of the 20 drums were found at MP233.5. Several thousand feet of 4 inch pipe were seen lying along the edge of the road.

MP236 - 950 oil drums, 100 partially filled drums, 100 truck tires, 100 bags of concrete, 18 trucks and 15 buildings scattered over two areas, 1000' x 200' and 700' x 100'. Two areas were found contaminated with oil and grease (25'x25' and 50'x50'). This area is a real eyesore and has the greatest potential pollution problem.

MP237 - Large building used as a supply depot

MP237.5 - Buildings and debris are scattered through the bush, about 300 yards east of the Canol Road.

MP237-251 - 35 oil drums, lengths of pipe

MP251 - 450 empty oil drums, 3 partially filled, 7 truck hulks
Area 50' x 50' is saturated with oil down to a depth of 2 inches.

MP252-262 - Empty drums (165), truck hulks (9)

MP263 - Scattered debris, an area of 25' x 25' was found to be partially saturated with oil.

MP264-271 - 23 empty drums

MP 271-272 - 1400 empty oil drums, 38 truck hulks, 12 collapsed buildings, 6 standing buildings, and 2 graders. Debris was scattered over two areas; approximate dimensions 700' x100'. One cache contained 1000 oil drums. MP272 - Truck hulks line up.

MP274-279 - 16 empty drums, 1000 ft of pipe.

MP280 - 1000 empty drums (800 in one cache)

MP286-288 - 76 empty drums, 3 truck hulks

MP289-296 - 4 empty drums, 1 truck hulk

MP297 - 550 empty drums, 15 collapsed buildings, 4 standing buildings

MP298 - end of the line.

Suggested Disposal Points - 1970

<u>South Canol:</u>

MP 0 - Johnson's Crossing

MP 60 - Quiet Lake

<u>North Canol:</u>

MP 142 - Ross River

MP 212 - Sheldon Lake

"A study conducted by the Department of National Defense in 1970 found some 200 filled or partially filled oil and grease drums along the Canol Highway, some 6000 empty oil drums, 200 odd truck hulks, miscellaneous vehicle parts, pipeline material, and building debris etc. The heaviest concentration of these materials were at pumping stations and supply depots, with the majority of the debris on the North Canol Road between Ross River and the Northwest Territories boundary. " (14) (Govt File 2396, Yukon Archives, December 1973)

In 1973, attention was directed towards cleaning up the South Canol Road by the Yukon Lands and Forest Service, Department of Indian and Northern Affairs (DIAND). In 1974, the telephone wire was started to be wound up by the Land Use crews, DIAND. In 1975, Synergy West Ltd was hired to prepare a report inventorying, vehicle hulks, barrels and debris at Canol No.1 sites along the South and North Canol. Sites were identified as to where debris could be buried. (55). (A map from this report has been provided to AES -File # 6.) Mileposts where Canol No.1 debris was identified and where a potential burying site was recommended are noted by an asterisk (*), shown in the following table.

Mileages for Areas of Debris & Potential Burial Sites: Synergy-1975

South Canol:	Burial Site	North Canol:	Burial Site
MP0 Johnson's Crossing	*	MP142-172	
MP4.5		MP174	*
MP19		MP175-217	
MP22	*	MP213.5 Sheldon Lake	*
MP24		MP233	*
MP73	*	MP234-247	
MP99.5	*	MP247	*
MP105.5		MP253	*
MP124.5	*	MP258	*
MP125-142		MP260	*
MP142 Ross River	*	MP268	*
		MP282	*
		MP283 YT/NWT Border	
		MP283-293 NWT	*

The Snergy West mile by mile inventory was reviewed by Lorne Gay, Project Manager for the Canol Road clean up project, DIAND in September, 1975. In many cases there were more barrels and debris than originally inventoried by Synergy as indicated by letters on DIAND files at Yukon Archives (14). (Provided to AES in Teslin & Ross River District Review Files - #10 & #15). (Other than the maps provided in the Synergy report (55), there were no other sketches or maps showing the location of camps on the North Canol Road, and their associated debris and oil stains etc., or actual location of bury sites.)

Interview - Lorne Gay - Field Operations - DIAND
Lorne Gay was an officer at Land Use, DIAND in charge of clean up activities and contractors hired during the Canol Road clean-up from 1974-1976.

In 1974, the telephone wire was gathered up by our Land Use staff. In 1975 we

started to clean up the South Canol burning and cleaning up old Canol Project No.1 camps and associated garbage dumps. At Johnson's Crossing there was an old buried dump site left by the Army which should be investigated. (See Teslin District Review). In those days we buried what was of no value, including barrels of oils/lubricants and general debris. We burned what we could first. Deines Brothers of Calgary had the clean up contract for crushing barrels. Wire and pipe were brought to Ross River to a metal storage site at the junction of the Robert Campbell Highway and access road to Ross River. All empty barrels were brought there for crushing. If barrels were full of oil or gas, or partially filled these were buried on site, or close by. A D-8 cat was used to dig a hole and bury debris. On the North Canol, at Sheldon Lake, there was a big camp (MP213), we cleaned it up but we didn't touch the oil stains. At MP174 there's buried oil and at MP216 we buried all motor oils at the site. There was a large camp there. At MP236 there was also a major site and we buried it all. At MP272 we left vehicle hulks.

According to L.Gay the locations of potential burying sites, proposed by Synergy in 1975 (55), were not actually used. He thought that areas which should be looked at were near MP213 to MP218, around Sheldon Lake, and at MP236, where there were oil and grease areas which should be tested. As barrels full of oil products were buried in the Yukon during this clean up in 1975-76, these sites of burial could possibly be causing contamination. Sites were bulldozed over during clean up and in some cases completely covered over. (L.Gay-pers.comm.)

Lorne Gay stated in a clean up report in 1975:

"From my experience on the Canol Road Project, I have found that there is invariably a garbage dump within one mile of every American camp. Also, anywhere a road leads off the highway you will probably find refuse. Talks with residents in the area in question should be encouraged as one never knows if there is a hidden site." (14)

In the clean up procedures on the Canol No.1 project, from Johnson's Crossing to the border of the Northwest Territories, buildings and garbage dumps were burned, barrels which were partially full or full with oil were buried, empty barrels were transported to Ross River depot and crushed. Salvageable materials on the South Canol between MP0 and MP73.5 were taken to Johnson's Crossing and from MP74-142 to Ross River by Yukon Pioneer Transport Ltd. From the North Canol, these were taken to Ross River, by Deines Brothers Arctic Services. Vehicle hulks were lined up at MP268, near the NWT border and at Johnson's Crossing.

Departmental specifications for clean up procedures for the clean up contractors in 1975-76 is presented in Appendix J. (14). (DIAND files) . This applied to both the Alaska Highway and Canol Road clean up projects:

- Oil spill sites will be scarified and where available top soil applied to a depth of 3 inches.
- Combustible material, garbage and debris shall be burned and non-combustibles shall be crushed and

buried under a minimum of 4 feet of soil.
- Waste pits cannot protrude more than 2 feet above the adjacent ground level and shall be sloped to conform to the adjacent topography.

Clean up notes on government files by L.Gay, Canol Clean Up Project Manager, DIAND (14) were the following:

South Canol:

Val Scheck, Yukon Pioneer Transport Ltd. - MP0-MP142

MP0-2 - Canol Camp - Stored vehicle hulks, several dumps in area, trenches-compacted, re- buried; 1 buried site from U.S. Army (?) - not touched.
MP22 - Camp, 62 barrels, truck hulks, collapsed buildings, cleaned up, approved August/76
MP46 - Sawmill Site near Quiet Lake, cleaned up wooden collapsed buildings.
MP54 - Sawmill Site, slabs,some metal debris, cleaned up
MP73.5-4 - debris from camp, over bank along river, cleaned up, approved August/76
MP99.5 - Collapsed buildings
MP124 - 3 concrete foundations, 120 barrels, wooden ramps
MP125.2 - Refuse area used by camp at MP124, metal, wood, refuse, debris over bank, cleaned up,

North Canol:

Mel Deines, Brothers Arctic Services Ltd. - MP142-283

MP142 - Old Ross Town Site
MP213 - Camp, Garbage dump, cleaned up, buried
MP218 - Garbage dump, barrels taken out and crushed, no further action
MP220 - Old Sawmill Site - barrels taken out, no further action
MP232 - Garbage dump for camp at 233-234, site burned & buried
MP232, 233,247,253,267,268,275 - Camps cleaned up and passed September 30,1975

The contractor wanted disposal pits at MP174, 213, 233,253,268,275. Two sites at MP268 and MP275 were selected for disposal pits. Vehicle hulks would be located at MP268.

During clean up, all concrete footings and floors would be preserved in their present condition on site as well as the following:

South Canol:

MP0 - Johnson's Crossing - 1 tool Shed and 1-125,000 Gallon Tank
MP74 - 1 building
Foot bridges: at MP117 on the Lapie River, at MP142 on the Pelly River at Ross River

North Canol:

MP174 - 1 building
MP200 - 1 building
MP232 - 1 building
MP232-233 - truck hulks
MP247 - 1 building
MP275 - 3 buildings adjacent to the airstrip

Clean up information and available site sketches along the Canol Road has been divided according to Districts. Clean up on the South Canol from MP0-MP90 is presented in the Teslin District Review and from MP90-MP283 is discussed in the Ross River District.

Interview- Peter Kershaw - University of Alberta
Peter Kershaw has studied the impacts of oils spills on vegetation from the Canol No.1 project on the NWT side of the border since the early 1980s. His thesis for the University of Alberta in 1983 is a comprehensive document on the effects of pipeline on the environment, concentrating on the eastern portion Canol No.1 in the NWT.

"The massive CANOL project, which affected a diversity of ecosystems, presents an ideal opportunity for the study of natural rehabilitation of man-induced disturbance. It has produced numerous examples of the type of disturbance that recovers naturally as well as those which remain little changed after three and 1/2 decades. " (19)

He indicated that more environmental damage occurred with the method of clean up done on the Yukon side of Canol No.1. Tractor tread marks and bulldozing of sites created greater damage for revegetating sites, as well as, spread out potential contaminants. His review of oil spill information is presented in Appendix Q.

Canol No.1 - NWT - Environmental Assessment - 1994
In 1994, Royal Roads Military College's Environmental Sciences Group, completed an assessment of the Canol Pipeline in the Northwest Territories. (20) These old pump stations and construction camps have not been cleaned up. A total of 157 soil, 4 water, 92 plants, 11 asbestos and 12 building samples were taken from Camp Canol to the Yukon/NWT border. The contents of 72 barrels were also sampled. This report is available at AES. (20)

In the Northwest Territories, the six pump stations were the largest sites and the maintenance camps with garage and accommodation facilities were considerably smaller. The pump houses contained asbestos but no PCBs were found in the buildings. Black oils and greases were found to contain the elements cadmium, lead and chlorine in amounts exceeding those recommended for environmentally safe incineration. The contents of barrels containing these products should be removed for proper disposal. Soils that are deeply stained (which could contain PAHs) from POL or surge tank spills should also be removed. (20)

4.6 HAINES-FAIRBANKS PIPELINE

Literature Review - Haines - Fairbanks Pipeline
Relevant information has been compiled from files on the Haines-Fairbanks Pipeline and is presented in Appendix N. These were collected from interviews (E.Kelly), Environmental Protection Service files (Whitehorse) and from Kim Hudson (Champagne /Aishihik First Nation files). Each report and memo from the U.S. Army and Canadian government officials is summarized in chronological order, from 1953-1995. Information is separated according to subject: description of facilities and management procedures, herbicides and oil spills. (These were not provided as appendices due to the volume of paper required for photocopying but are available for review in a complete file, provided to AES. File # 7).

Description of Facilities
In 1953 the Korean War was causing concern and getting fuel to Alaska for defense purposes was a priority. The Canol No. 2 pipeline, Skagway to Whitehorse (four inch line) and the Canol No.4 from Whitehorse to Fairbanks (three inch line) were proving to be too small to do the job of carrying fuels to Alaska. A larger pipeline was a necessity to supply the big bases in Alaska, which would be called "ALCANGO" The Alaska-Canada Gas Oil Pipeline. (56) The prime mission of the system was low cost delivery of JP-4 fuel to Eielson Air Force Base for use by the Strategic Air Command (SAC) B-47 and B-52 bombers. A pipeline presented a smaller military target and fuel at a cost of approximately $.01/gallon from Haines to Fairbanks. (57)

The design of the pipeline was accomplished for the Corps of Engineers by the Fluor Corporation, Los Angeles, California between 1950-1952. The Haines-Fairbanks Pipeline was constructed in 1954/55, by William Brothers of Tulsa, Oklahoma, McLaughlin Inc. of Great Falls, Montana and Marwell Construction of Vancouver, B.C. Shipments of pipe, construction materials and equipment began arriving in Haines and Valdez in 1954 and were trucked to staging areas along the pipeline right of way, throughout Alaska, British Columbia and the Yukon. In four months 42,000 tons of pipe was moved to the site requiring some 10,000,000 ton-miles of hauling. Field construction began early in 1954 with the main pipeline essentially completed before winter; pump stations and storage facilities were completed in summer 1955. Testing of the line was completed by October 1955, at which time the U.S. Army accepted the pipeline and facilities. (See Appendix N - Facilities/Management- February 1977)

Ocean tankers or barges brought fuel to the Haines, Alaska Petroleum Oils and Lubricants (POL) dock. This alone, cost 5 million to build. Products were transported via an 8 " pipeline, from Haines to Fairbanks, a total of 626 miles with 25 major river crossings, 82 minor stream crossings, 49 major highway crossings and 39 secondary road crossings, and 11 major tundra swamp crossings. The initial cost of the project

was $38,249,796, with additional construction it was increased to $43,749,796. (57)

American materials were used in the American portion and Canadian materials within Canada. Since Canada had no pipe fabrication factory, pipe for the Canadian section of the pipeline, was purchased from Stewart and Lloyds of Great Britain, and shipped from Scotland. (56) The remainder of the seamless steel pipe was purchased from American mills in Pennsylvania and shipped to Alaskan ports.

This was a multi-product line, transporting Diesel Fuel (Grade DFA), Aircraft turbine and Jet Engine Fuel (Grade JP-4), Automotive Combat Gasoline (Grade 95C), and Aviation Gasoline (Grade 115/145). The product held in the pipe at any time during operations was approximately 210,000 barrels. In addition to bulk fuels, a wide variety of POL (Petroleum, Oils and Lubricants) products (lube oils, antifreeze, Stoddard solvent, benzene, acetone etc.) were handled at the terminals at Haines and Tok, Alaska. These terminals each had a storage capacity of 281,000 barrels or 11,802,000 U.S. gallons.

The Petroleum Distribution Division of the Director of Supply and Procurement, USARAL Support Command, was in charge of scheduling, receiving, storing and distributing petroleum products to Army and Air Force installations on the Alaska mainland. The facilities of the system were valued at approximately $44,500,000 and consisted primarily of the Haines-Fairbanks eight inch pipeline facilities and the Anchorage and Port of Whittier terminals. The system utilized 3,209 acres of land.(58)

Pump stations were built at Haines, Border, Haines Junction, Donjek and Tok. Original design criteria required 450 BPH (barrels/hour) to maintain turbulent flow with only Haines, Border and Tok Pump stations in operation. As originally designed it could deliver about 16,500 barrels of product per day. However, an additional 6 pump stations were required to provide 27,500 BPD (barrels/day) throughout. In a very short period from April to November 1962, six other pump stations were added; at Blanchard River (PP87), Destruction Bay (PP208.9), Beaver Creek (PP323.8) in the Yukon and at Lakeview, Sear Creek and Timber, in Alaska. A total of five pump stations were located within the Yukon. Terminals and storage tanks were located at Haines, Tok, Fort Greely, Birch Lake, Fort Wainright, Eielson Air Force Base, and Fairbanks, in Alaska.

The pipeline was capable of moving up to 28,000 barrels of fuel a day with a normal flow rate of 18,000 barrels/day. The flow and pressure were monitored constantly in the mainline pumphouses and reported hourly to the dispatch office. A pressure drop indicated the possibility of a ruptured line. Pressure was maintained to prevent intermingling of the different fuels. One fuel pushed the other through the line. (57)

Construction crews cleared a 50 foot right of way along most of the length of the pipeline. The Yukon portion of the pipeline consisted of approximately 251 miles (PP86 to 337.5), the Canadian portion being close to 296 miles long, laid on the surface and following local topography except where difficult sections required burying. Crews lived in trailer camps, including mess halls and living quarters, which moved with the progress of construction.

Mud and flooded areas were a problem in construction. A considerable amount of the right of way was flooded in the summer of 1954, as it was unusually wet. Normally it was not more than 2-3 feet deep but personnel frequently worked in waist deep water. In some stretches the pipe was welded into sections, pushed across the flooded area and tied in. Concrete river weights were used to anchor the pipe in these areas. The Slims River was the most difficult crossing. (61)

Mileages along the pipeline, noted as pipeline posts (PP) at each pump station are indicated below: (59)

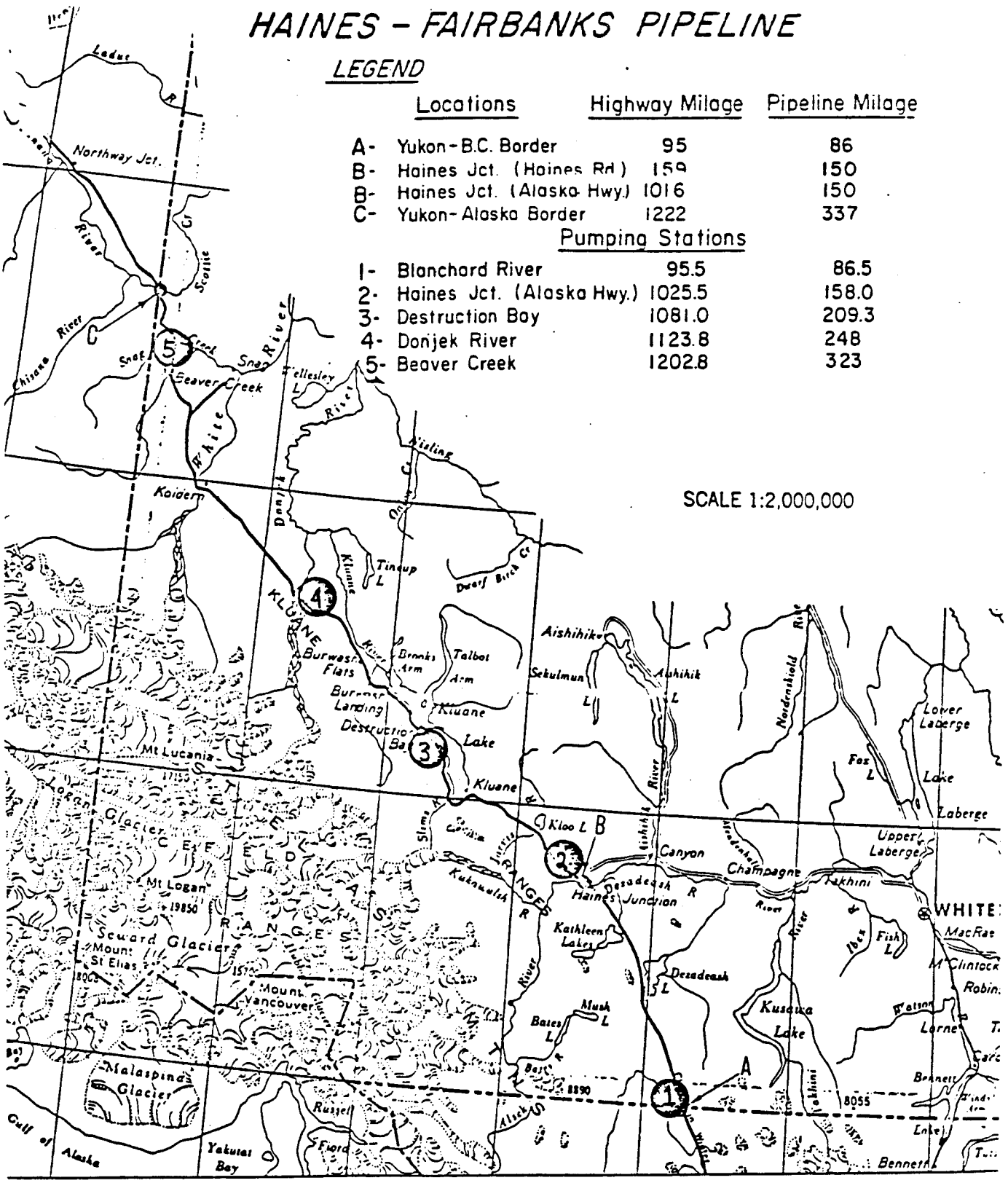
Pump Stations:Pipeline Milepost (PP): Hwy Mileage

ALASKA			
Haines Terminal	- PP0	- Haines	
BRITISH COLUMBIA			
Border Station	- PP47	- Haines Road	MP42
HAINES JUNCTION			
BC/Yukon border	- PP86	- Haines Road	MP95
Blanchard River	- PP87	- Haines Road	MP95.5
Haines Junction	- PP158	- Alaska Hwy	MP1026
Destruction Bay	- PP209	- Alaska Hwy	MP1081
BEAVER CREEK			
Donjek	- PP248	- Alaska Hwy	MP1124
Beaver Creek	- PP324	- Alaska Hwy	MP1204.2
Yukon/YT Border	- PP337.5	- Alaska Hwy	MP1221.4
ALASKA			
Lakeview	- PP369		
Tok Terminal	- PP430		
Sears Creek	- PP484		
Timber	- PP528		
Birch Lake	- PP569		
Eielson	- PP598		
Fairbanks Terminal	- PP626		

Terminals: Alaska - Anchorage-Elmendorf Air Force Base,Fort Richardson, Whittier, Fort Greely, Eilson Air Force Base, Fairbanks, Tok and Haines.

An overview map of the pipeline, indicating the 5 pump stations within the Yukon is presented as Figure 5. (59)

FIGURE 5: Haines -Fairbanks Pipeline with Mileages



The pumping stations were located on the following parcels:

British Columbia:		
Border Station	(32 acres)	Rainy Hollow
Yukon:		
Blanchard River	(12.2 acres)	Lot 2 Gr 753
Haines Junction	(5 acres)	Lots 31,33 Gr 803
Destruction Bay	(9.9 acres)	Lot 287 Gr 852
Donjek River	(5 acres)	Lot 2 Gr 902
Beaver Creek	(12.1 acres)	Lots 30,31 Gr 951

Each pump station had a pumphouse, powerhouse, a maintenance garage, fuel storage tanks and family housing. A description of facilities at Border Station in British Columbia and the five stations within the Yukon are indicated in Appendix I. (60) A brief summary at each station includes:

Border Pump Station

This is located on the Haines Road (west side), an area of 32 acres (12.95ha) approximately 5 miles north of the International Boundary near the Klehini River. The site is 47 miles north of the Haines Terminal at an elevation of 1,300 ft (396m). This station has a capacity to pump products over the Chilkat Pass in the Coast Range, the peak elevation of the system at 3500 ft. (1067m).

At this site facilities consisted of:

a) Mainline Pump Building:
   Consisting of engine room, isolated by a fire wall, pump room, and control room, isolated by a pressure barrier fire wall and door arrangement. Pumping facilities consist of three units of a Chicago Pneumatic Model CP-69, 6 cylinder, 4 cycle, diesel engine driving a Byron Jackson, 4 stage centrifugal pump. In the pumphouse is two Morlan strainers serve as both filters and water extractors, the discharge accumulated in a product sump is disposed of by pumping into the line when appropriate.

b) Warehouse - Garage - Shop Building:
   For spare parts, pipe fittings and tools for station maintenance, also a four place garage for vehicle storage.

c) Utility Building:
   Engine Room housing two 150 KW General Electric generators, each driven by a Chicago - Pneumatic diesel engine identical to those which drive the mainline pumps.

d) Family Housing:
   Housing consists of wood frame construction, foundation and basement flooring of concrete, upper structure of floors-linoleum covered, walls, sheathing and asbestos siding. Roofs of insulated wood decking have a gravel protective coating.

1. Dormitory with a capacity of ten men, including a living room, dining room, kitchen and bath.
   (At this site, this was used as a schoolroom for personnel children)
2. Apartment type building with six - 2 bedroom units
3. Apartment type building with six - 3 bedroom units.

e) Cold Storage Locker Building:
Concrete building with freeze room (-10F) and chill room with individual food lockers (35F).

Blanchard River Pump Station

Located at MP95.8 on the Haines Road, this station area consists of 12.2 acres at an elevation of 2,720, (829m). Facilities consist of:

1. Combination building:
   One storey construction with engine room; pumping facilities are composed of a Chicago Pneumatic Model CP-69, 6 cylinder, 4 cycle, diesel engine driving a Bingham centrifugal pump; isolated by a fire wall from the pump, office, generator room and maintenance shop.
2. Family Housing:
   Six 10' by 50 ' trailers, heated by piped in steam from the central heat plant.

Haines Junction Pump Station

Located 10 Mile northwest of Haines Junction, MP 1026 Alaska Highway, pipeline post (PP) 169 miles from the Haines Terminal. Station elevation is 2,722 ' (830m) above sea level at 137° 40' longitude and 60° 55' north latitude.

Facilities consist of:

1. Main line Pump Building: Same structure as Border Station.
2. Utility Building:
   Engine room with two power units (Caterpillar Model D-13000 diesel engine driving a General Electric 480 volt, 60 cycle 50 KW, 900 RPM generator), 5-man bunkroom, a garage-shop area, tool room, and room for a pneumatic water tank with Peerless pump.
3. Station Housing:
   Single family dwelling, 3 bedroom unit for the Station Foreman heated by oil furnace.
   Apartment building, five - 3 bedroom units heated by a boiler in the basement.

Destruction Bay Pump Station

Located at Milepost 1080 on the Alaska Highway (west side), approximately 3 miles south of Destruction Bay, consisting of 9.9 acres, at an elevation of 2780' (847m).

1. Combination Building:
   Pumping facilities are composed of a Chicago Pneumatic Model CP-69, 6 cylinder,

4 cycle, diesel engine driving a Bingham centrifugal pump. Two oil fired steam boilers and two 60 KW generators (powered by Caterpillar engines) are in the generator area.

2. Family Housing:
   Six 10 x 50 ' trailers, with piped in steam heat from the central heat plant with an underground utilidor for utilities from the utility building.

Donjek Pump Station

Located at Milepost 1124 Alaska Highway, near the Donjek River bridge, at PP248, 2,673' (815m) above sea level.

1. Mainline Pump Building:
   Engine room, pump room and office. Chicago Pneumatic Model CP-69, 8 cylinder, 4 cycle, diesel engine driving a Byron Jackson centrifugal pump. Diesel fuel is provided from a 1,000 barrel station bulk storage tank.
2. Utility Building:
   Multipurpose building with engine room, 5-man bunk room, garage shop area, tool room, room for water tank.
3. Family Housing:
   Single family 3-bedroom unit, for station foreman , heated by forced air ,oil fired furnace. Apartment building with four-bedroom units, heated by a boiler.

Beaver Creek Station

Located at Milepost 1204.2 on the Alaska Highway, covering 12.1 acres, at an elevation of 2,100' (640m).

1. Combination Building:
   Engine room, pump room, office, generator room and maintenance shop. Pumping facilities, two units of chicago Pneumatic Model CP-69, 6 cylinder, 4 cycle, diesel engine driving a Bingham centrifugal pump. Generator area includes two low pressure oil fired steam boilers and two 60 KW generators, powered by Caterpillar engines.
2. Family Housing:
   6 - 10'x50' trailers, heated by steam heat from the utility building. (60)

A strip map at 1:250,000 scale, locates the pipeline, the valve openings, pump stations and pump stations along the pipeline within Canada, from the Alaska/British Columbia border to the Yukon/Alaska boundary, and on to Tok Junction. (Copy provided to AES -File# 7). This was provided by Ernest Kelly.

The pipeline crossed many gullies and streams supported by H-frame bents a maximum of 50 feet apart. There were several suspension crossings with spans up to 200 feet. Wide rivers were crossed by supporting the pipe on A-frames welded to the vertical members of the steel highway bridges. Special designs were necessary to

prevent over stressing of the pipe from expansion and construction in straight sections of pipe on these bridges. (62)

The Haines-Fairbanks pipeline was considered an economic asset from the very beginning. A 1960 report cited annual savings in transportation costs in excess of $3.5 million." (CRREL Report-February 1977)

Management Procedures

The pipeline operators had Standard Operating Procedures to guide every aspect of managing the pipeline, from pumphouse operations, to dealing with oil spills and applying herbicides for brush control. The Station Foreman made decisions for each pump station, reporting to USARAL in Alaska, and the General Superintendent at the Tok Terminal should problems arise.

Oil spills caused by the hydrostatic testing in June 1955, caused ice in the line and ruptures. Wherever these occurred, these areas were burned off. In February 1956, Canada recommended that this be discontinued. In areas of fuel soaked grass, it was recommended that a chemical in a powder or foam be used to cover the area, acting to reduce the potential of fire. From 1956 to 1968, there were no records of oil spills.

Drops in operating pressure were to be reported immediately and line crews sent to the spill or problem area(s) as soon as possible. (Appendix N - Management - April 1969). The oil spill at Dezadeash Lake (PP119.1), the largest which occurred, was noticed May 17, 1968, and was reported that day to Tok Terminal. Reports differ on what the pipeline was carrying, jet fuel (Appendix N - Management- September 10, 1968) or as a 1972 report (23) says, "some 4000 barrels of diesel fuel were spilled". On May 23, 1968, when the oil spill at Dezadeash Lake occurred, due to corroded pipe, the authorities were notified, but were not quick to respond to clean up which was primarily done by Yukon federal and territorial workers; the U.S. Army was billed for clean up expenses at $6,500. Two army boats and boom arrived and personnel assisted with setting up a boom around the leakage area. A U.S. Army engineer arrived to survey the situation on May 31st. Yukon crews worked night and day to collect the oil with straw and by the barrels for one month, collecting 2 barrels per day, until satisfactory results were obtained. Many fish died as well as birds, but Yukon workers "prevented what may have easily been a catastrophe to one of the finest lakes in the Yukon". (Appendix N - Management- September 10, 1968).

In May 1968, a tuboscope survey was done for 12 miles along Dezadeash Lake to assess the corrosion. In a meeting August 1969, U.S. officials agreed to reduce operating pressures in the Canadian portion of the pipeline from 1440-1000 psi. In September 1969, a U.S. Memo stated, under the terms of the treaty there was no requirement to furnish technical data to the Canadians nor were repairs or modifications subject to their approval, yet they did contact Ottawa regarding the

replacement of pipe at Dezadeash Lake. A tuboscope survey of the northern section in Canada, in the summer 1970, revealed further corrosion problems. In September 1970, there was concern stated: that there was also serious corrosion in the pipe near the Donjek River (PP262); and at Kluane Lake (PP187) the pipe, along the shore 30 ft from the water, was subject to ice action and possible breaks.

"The standards of construction would be more appropriate for a temporary war time pipeline than a permanent pipeline for 20 years operation." (September ,1970 - R. Smyth Report)

"In 1970 the pipeline transported 1.3 million barrels of JP-4 and 54.6 million barrels of gasoline for support of Vietnam flights, Alaska Air Command and Army aviation operations in Alaska." (CRREL-February 1977)

In 1970, 12 miles of pipe were replaced at Dezadeash Lake, the pipe first purged with 10,000 gallons of alcohol to remove the fuel; old corroded pipe was removed and disposed of by the contractor. In October 1970, operation pressures were to be kept below 1000 psi at Border Station and 800 psi at every other point on the line. In March 1971, procedures were outlined by USARAL for pollution control. In April 1971, pipe with severe corrosion, listed by pipe lengths included: Border to Blanchard - 19 lengths, Donjek to White River-23 lengths; White River to Scottie Creek -13 lengths. A total of 1036 pipe lengths were in Canada from the Border (Alaska\B.C.) to Scottie Creek (Yukon/Alaska Border).

Herbicide Use:

Interviews with E. Kelly and D. Duensing, indicated that applications of herbicides were done around the pump stations by hand and with a fire truck along the pipeline right of way, with applications of 2,4-D, 2,4,5-T, Esteron. A 1967 Standard Operating Procedure included recommended application rates: one gallon of herbicide to nine gallons of water, for small amounts of brush spraying around the stations, and 10 gallons of solution per acre or 60 gallons of solution per mile of right of way. From discussions with the Pesticide Information Line, Ottawa, the Army made a herbicide mixture, with the same ingredients as Esteron, commonly called "Agent Orange", used heavily in Vietnam as a defoliant. A request was put forward for further details on the % of active ingredient of this herbicide, but information has yet to be received.

In 1963, the U.S. Army made a request to the Yukon Government to substitute Esteron brush killer (2,4-D, 2,4,5-T) for Fenuron and Tordon 101 mixture. Approval was given by the Yukon Government in March 1965 to use Esteron. The % of 2,4,5-T as active ingredient in this mixture was not mentioned. In May 1968, the US Army requested the use of Fenuron in lieu of Esteron to the Yukon Game Branch and in June 1968 permission was granted to use 2,4-D if possible and if not available, then Fenuron could be used. (Additional information acquired indicated Fenuron was de-registered in Canada in 1962). In October 1968, the US Army informed Canada that

they would like to use Tordon 101, and that a 500 ft buffer would not be sprayed by rivers and streams. The Canadian Department of Fisheries responded (December 1968) that safety zones greater than 100 ft would not be required. They recommended that Tordon 101 could be utilized and that "excess spray materials for disposal should be buried in plastic containers." In June 1969, Tordon 101 was delivered in 30 gallon drums by the helicopter spray contractor (Okanagan Copter Sprays Ltd.) and stored at the Blanchard, Destruction Bay, Haines Junction, Donjek and Beaver Creek Pump Stations. During delivery at Beaver Creek, 15 of the 30 gallon drums were damaged with considerable loss of herbicide. These were stored at Beaver Creek, then replaced by Dow Chemical. Drums delivered to the other stations were not damaged enough so they leaked, though some damage occurred in transport. (It is not certain that aerial spraying actually occurred in 1969). Specifications were drawn up in October 1969, for spraying in 1970, utilizing Tordon 101. Interviews indicated this did occur. US Army contract specifications indicated that discarded herbicides shall be disposed of by burial or by "another manner approved by the contracting officer".

Interviews and information gathered confirmed that Tordon 101 was spayed by helicopter. People in the Klukshu area indicated that they were not informed, prior to spraying of the pipeline right of way. Although the U.S. Army stated that they would stay away from settlement areas and water sources, especially fish bearing, it is not certain whether the contractor did in fact adhere to this specification.

By the early 1970's solid-fuel Minute Man missiles began to replace B-52 bombers, greatly reducing the need for fuel in Alaska. In June 1971, in a meeting with the Permanent Joint Board of Defense (PJBD), National Energy Board and U.S. officials, a decision was reached to suspend Haines-Fairbanks pipeline operations. The U.S. Army did not want to make major repairs on the pipeline, estimated at approximately $96 million, and in its present condition it was not safe to operate. No Canadian government agency indicated an interest to take over the line.

Pipeline Closure

After 17 years of operation, the pipeline ceased operations in late 1971. Between July-August the pipeline was emptied of fuel and cleaned with alcohol and water. When the pipeline was closed it was left with the capability of being operational in 30 days. 370,00 gallons of stored fuel were pumped to Tok, Alaska. As the tanks were emptied they were cleaned and filled with fresh water which followed the fuel through the lines to clean the pipe. One 5,000 barrel tank was filled with methanol alcohol and pumped into the line behind the water. A device known as a "Pig" was launched into the line behind the alcohol and pushed through by compressed air. This process dropped the relative humidity inside the pipe to below 25%, preventing rust formation. (57)

A series of meetings were held with the National Energy Board beginning in 1972. Environmental Protection Service, Edmonton, Alberta made recommendations on the removal or rehabilitation of the pipeline (Appendix N- Management- August 25, 1972). "Pollution resulting from spills of oil, fuel or other pollutants from the past operation of the system should be corrected."

In September 1972, a report was prepared by DIAND, describing the right of way conditions from a salvage and removal point of view. (59). The pipeline route was divided into two sections:

Section I - BC/Yukon Border to Burwash Landing:

Between the British Columbia -Yukon Boundary (PP86) to Burwash Landing (PP221), the right of way crosses the highway 10 times. Most of the pipeline is within one quarter mile of the highway and the maximum distance is one-half mile.

The pipe is buried for 12 miles along Dezadeash Lake (PP114-126) and for 10 miles along Kluane Lake (PP182-192) and at road and stream crossings. It is suspended across some of the smaller creeks and crosses major rivers on the bridges, ie. the Donjek and White River. The pipeline at the major crossings including the Blanchard River (PP86), Takhanne River (PP94), Klukshu River (PP109), Kathleen River (PP133), Dezadeash River (PP148), Christmas Creek (PP179), Silver Creek (PP183), and Slims River (PP188) are all buried. The pipe is partially buried over short lengths by alluvial fan material along the west side of Kluane Lake.

There are a few locations on this section which are poorly drained and would require special attention if the pipe were to be recovered (PP88, 106, 185). Some local erosion has occurred over limited lengths of the right of way at PP120, 160 and 185 and restoration of these areas should be considered.
Length of Buried Pipe - 34.0 miles
Length of Pipe on Surface/well drained right of way -92.0 miles
Length of Pipe on Surface/poorly drained areas - 9.0 miles
Total Length -Section I = 135.0 miles

Section II - Burwash Landing - Alaska Boundary

From PP221 to the Alaska Border (PP337), the right of way is not as well drained. Burwash Flats, areas adjacent to the Koidern River and the area near Beaver Creek are poorly drained and will require particular attention. There are about ten locations where the pipeline and road cross and numerous lengths where they are immediately adjacent to one another. Most of the pipeline is within one-quarter mile of the highway and is up to two miles away near the boundary with Alaska.

There are 17 significant stream crossings on this portion of the route. Major crossings at the Duke River (PP226), Burwash creek (PP230.5), Quill Creek (PP237), Koidern

River (PP269), Koidern River (PP274), Koidern River (PP286.5) and Beaver Creek (PP332) are buried. Removal of this pipe would cause damage to the environment. It is suspended across some of the smaller creeks and stream crossings including Longs Creek(PP278) and Dry Creek(PP312). The pipeline is carried on the bridges at the Donjek (PP256) and White River (PP291) and could be removed.

Short lengths of erosion have resulted from water flowing along the right of way at PP270 and PP322. The pipeline has subsided where the right of way is wet, and is completely out of view.
Lengths of pipe buried - 8 miles
Lengths of pipe on surface in well drained right of way - 35 miles
Lengths of pipe near surface in poorly drained areas - 73 Miles
Total length -Section II = 116 miles

Recommendations for salvage of the pipeline included:

1. Certification of inspection of pipeline contents, immediately prior to any salvage operation should be required to ensure there is no harmful materials contained in the pipe.
2. Sufficient access exist for salvage operations and no new clearing for access is required.
3. All pipeline mileposts and signs indicating the location of the right of way should be removed.
4. All portions of the pipeline lying on the surface where additional clearing or damage to the environment would not occur should be removed.
   (Approximately 127 miles or 50% of the total length would fall in this category. This includes all lengths where pipe is suspended across streams.)
5. Buried portions should be abandoned in place to minimize damage to the right of way. Approximately 42 miles or 17% of the total length is buried. In particular, all the stream crossings and the revegetated areas along the Dezadeash and Kluane Lake should be left undisturbed. Selective buried portions where the pipeline is buried along the highway right of way or where the pipeline right of way is completely cleared and well drained could be recovered. These areas would then require additional restoration.
6. The remainder of the pipeline consisting of 82 miles or 33% of the total length requires special attention. The pipe is unburied but has subsided into the wet right of way over considerable lengths. Minimal environmental damage would result if this portion were left in place. Selected portions of this pipe could be recovered using special equipment or during a period when the ground is frozen. This alternative would cause additional damage to the right of way and would require additional restoration work after pipe recovery. Five sites have erosion as a result of right of way clearance. A few short lengths of right away will require special attention to assure vegetation. Large scale seeding of grasses, planting of shrubs

or the use of fertilizers should not be required.

7. All facilities connected with the pumping stations, which are not purchased or obtained for use by private or government agencies, should be salvaged and removed. (59)

The 20 year, Canada-US treaty for the pipeline, expired in 1973. "This was allowed to extend itself, by mutual agreement for an indefinite period when neither party acted officially to terminate it." (Appendix N-Management-April 1974) Although interest was shown, it was determined that US companies could not purchase or lease the Canadian portion of the pipeline. The US could not lease land in Canada to another agency or company. In April 1974, it was recommended that no long term fixed arrangements be made concerning the use of the pipeline. Discussions continued between the US and Canada. In 1978, British Columbia requested that the land used for the pipeline be returned to British Columbia in order that re-alignment of the Haines Road could occur. In 1980, the General Services Administration (GSA) of the US, then responsible, indicated that it would dispose of the pipeline. An inventory report in Alaska in 1987, indicated there was a potential presence of POLs in the pipeline, in storage tanks, at pumping stations and spill sites. "Possible soil and water contamination could exist." Also, it stated that clean up and restoration of the pipeline could cause more damage to the environment than abandoning the line in place. (Appendix N- Management- January 1987).

In this period, the portions of the pump stations which could be removed and sold off, ie. residential housing and trailers etc. were removed. There was no information on how these assets were disposed of, ie. in Canada or Alaska. The Border station at Rainy Hollow was completely removed by the late 1970s. The Blanchard Station was transferred to YTG Highways in 1985 (PC 1985-76) and is currently a YTG Highways maintenance station. The remaining pump stations are Crown land (not titled) and have the main pump buildings, fuel storage tanks intact, with chain link fencing surrounding them. At Beaver Creek, there is a small sawmill operation next to the pump station building.

In 1990, a map for the dismantling of the Haines-Fairbanks pipeline was prepared by DIAND, from Pipeline Post 42.6 to Mile 337.5. (62) This map shows location of pipeline and mileages, the extent of pipe which was to remain buried or removed. In many of the wet areas it was to the discretion of the contractor as to whether the pipe was removed, ie. if more environmental damage would occur to remove it. (This map is on file at AES). The pipeline was dismantled by contractors in 1991 and hauled south. In 1994, Royal Roads Military College's Environmental Sciences Group was hired by AES to conduct a preliminary environmental assessment of the Beaver Creek, Donjek, Destruction Bay and Haines Junction pump stations to identify obvious concerns and further assessment work to be conducted in the summer 1995.

4.7 OTHER MILITARY ACTIVITIES

Other military activities include practice bombing, military exercises and transportation of military goods.

Practice Bombing
Military sites have included practice bombing areas. As determined by interviews and archival records these areas were located at Nisutlin Bay near Teslin, Watson Lake and Target Lake, north of Watson Lake, and by Richtofen Island on Lake Laberge, north of Whitehorse. (See Watson Lake, Teslin and Laberge District Reviews.)

Targets were set up, by an x marked on the land or ice, or by using green plastic dummies, set on a wooden raft. Aircraft would drop practice bombs, as well as use ammunition, at the target. A "Mustang" fighter is apparently located in Nisutlin Bay, which crashed during a military practice bombing run. (See Teslin District Review).

Several people were contacted to determine what these practice bombs would be made of. A munitions expert, who requested that he remain anonymous, at Headquarters Air Combat Command, U.S. Air Force, Langely, Virginia, "unofficially" indicated that the standard practice bomb of the Air Force is a BDU-33, about 30 pounds of iron, with a sheet metal fin, 3 ft. long. It was indicated that there is no lead in these and that they have no toxic compounds. These have been around since the start of bombing practices, and are not a new item. Inside the nose there is a cartridge with a spotting charge, which releases a cloud of smoke when they hit the ground. There is no residues left in the air, just the metal left (iron). The bombs in the water after all this time would have lost their propellant, as it would have dissolved, and they wouldn't be harmful. If on land though, the propellent may not be dissolved. "If the spotting charge should be released then it could expel hot gases and it could burn you badly. If you find one, the spotting charge may not have gone off, so be real careful." In the U.S., the Explosive Ordinance Disposal Troops are called. They stick a "spotting charge probe", into the nose of the bomb, it only goes in so far, it is fired, and thus discharged. There is no "explosives" in the bombs. Craters which have been left behind, as in the Watson Lake area for example, are a result of the direct impact from 1000 ft into the ground surface.

The ammunition used on the planes in World War II was mostly 50 and 20 mm calibre, depending on the aircraft. This was steel jacketed, the case was brass and the propellant was nitroglycerine and cellulose, a black powder. There would be no problem with these shells, going off, if not expended. It is necessary to do a formal inquiry (by letter) and the U.S. Air Force will provide information.

Some interviewees indicated that the "practice bombs" were made of flour with a dye to be able to see if one "hit" the target. Apparently at each of the target practice areas mentioned, there are ammunition shells and practice bombs which may have not "exploded". Although it appears that there are no contaminants present in these bombs, areas of known military practices need to be assessed for presence of "active" practice bombs, for the hazard factor.

An attempt was made to see if information was available on the INTERNET, regarding the type of practice bombs and ammunition used during this time period. There was no information on military practice bombs, but there was full instructions as to how to make an atomic bomb from scratch!

Military Projects

In 1947, the U.S. Air Force proposed to establish two research stations on the Columbia Glacier at the foot of Mt. Logan. This proposal was called Operation " Fairy Castle" and "Cornice". This apparently caused concern in Ottawa regarding American interests in the north (D. Roderick, pers. comm.). Apparently nothing became of this proposal.

Military Exercises

Numerous exercises by Canadian and American armed forces have been held along the Alaska Highway. 17 Works Coy RCE supported all military exercises both large and small. (44) Two exercises they supported included:

Exercise North III (1948 or 1949)

The Western Command Buildings (Northwest Highway System) in upper Whitehorse (Takhini) were fitted up for occupation by Exercise North III.

Exercise Sweetbriar (1949-50)

From August 49/March/50 the main effort was to provide accommodation for the 1300 troops to be involved in Exercise Sweetbriar. 18 "Huts Prefabricated General Purpose", the Western Command buildings in upper Whitehorse, the long warehouse and "H" Hut in the Refinery were utilized. Three leanto's were built onto the long warehouse for ablution benches. Outside bucket latrines were provided for all accommodation erected especially for Sweetbriar.

At MP1056, Kluane Lake, an existing camp which was dilapidated was refitted for the use of personnel on the return trip from Northway. Log buildings were covered outside with tar paper and inside with Vancouver board, wells and water supply system and pit latrines were utilized. At MP1156 (Koidern) an old camp site, now private was rented, and a 400 man mess hall was set up for the troops' lunch stop.

Exercise SWEETBRIAR was probably the most famous of all northern exercises on account of the large number of Canadian and American troops involved. Here the bulk of the Mobile Striking Force taking part was employed as traditional infantry, advancing up the highway ahead of a larger US force, with one company engaged in a parachute assault to disrupt the opponents line of communication. Though the exercise was rigidly controlled, the task of dislodging the enemy proved to be quite difficult, and certainly beyond the capabilities of the Mobile Striking Force alone. (64)

In early 1950s there were a number of exercises. (K.Kavanagh-DND, pers. comm.). In 1952 there was an exercise called "Eager Beaver" which took place from Champagne to Kluane Lake and near the Donjek River. In the early 1950s, ammunition was also destroyed by the Department of National Defense (DND), in particular at Watson Lake.

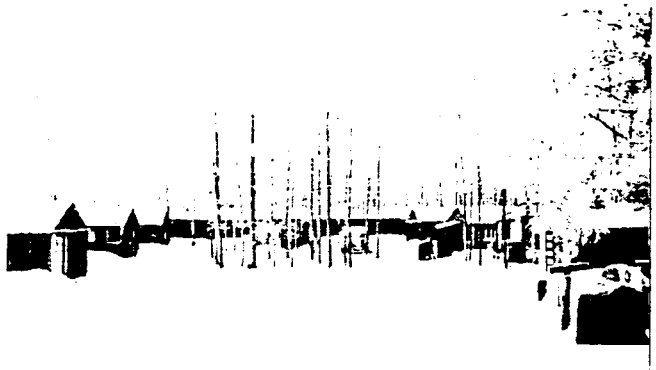
By the end of 1952," General Vokes of the Western Command was authorized only to localize a militia subunit in Whitehorse for the town's immediate defense; apart from this, he would have another reserve battalion to move, when it was ready. The security of the Alaska Highway was now a militia responsibility and it remained so for six years. By the early 1960s, the threat of an attack down the Northwest Highway system had dwindled to almost nothing compared to a nuclear attack. Hence, the army 'abandoned the area as a potential operational theatre'. Then in 1964, the army happily gave up its responsibility for maintaining the Alaska Highway. (64)

Mariele Botts - Director of History - Department of National Defense
Information was requested regarding history of military activities and records. No information was available over the phone and it was necessary to make a formal inquiry by letter. It was also recommended to go to National Archives.

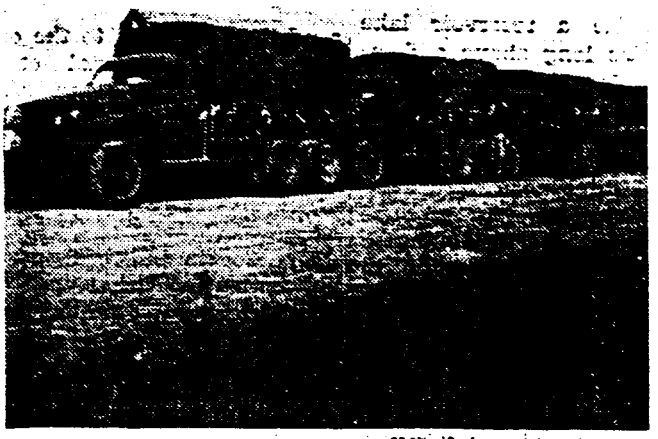
Transportation of Military Supplies
A review of newspaper articles indicated a few other interesting aspects of military activities; including methods of transporting military supplies along the Alaska Highway, shown in Photo No. 11, and inventions for road clean up, shown in Photo No.12. (43) Thousands of convoys of US trucks travelled in groups of five vehicles, from Chicago to Fairbanks, sealed, and not opened in Canada. Trucks contained anything from canned butter to weapons, bomb sites and ammunition. (43) The pilots who flew the planes along the Northwest Staging Route (7th Ferrying Group) were an interesting lot. (65) A magnet was developed to pick up nails and other metals left behind from the removal of old U.S. Army buildings. (43).

OTHER RELATED EFFECTS ASSOCIATED WITH MILITARY ACTIVITIES

In the process of literature review, many articles were found regarding the change in lifestyle and quality of life with the military defense projects of World War II. These 'other related effects of military activities' are summarized in Appendix K.



CONSTRUCTION CAMPS such as above, operated by civilian contractors are similar to those used by the Army. Southbound convoy, below, halts briefly for instructions from leader.



SEPTEMBER 20, 1942—At Dawson Creek, the first convoy of American Army trucks arriving from U.S. destination loaded with cargo, consigned to Fairbanks and travelled through Canada in bond. In batteries of five vehicles, this was one vanguard of thousands of more convoys which came through from Chicago, sealed and not opened in Canada. Often the convoys had armed soldiers riding in the cab, drove day and night, equipped with two drivers and the guard. Once in a while, a convoy would get wrecked and lorries burst open. To the astonishment of anyone who happened to see them, they might contain gruesome weapons, bomb sights, ammunition or canned butter. However, secrecy was loyally kept, during the war. No report ever got out what any of the big imposing vehicles contained. Note the two drivers, and a soldier in the middle, standing by the second and third lorry. One van was not able to get in this picture, snapped by Gordon Wilson of Dawson Creek, B.C. These convoys travelled in groups of five vehicles. They were so constructed that when the going was tough, the whole five could be strung together with cables underslung from the carriage. Many instances are on record where the connecting cables saved one or more of the convoy from being submerged in the gooey bog the vehicles were plowing thru....

Pilots Played 'Chicken' with Truck Drivers

A war veteran calling himself a pacifist sounds like a contradiction in terms, but that's what it took to convert Gordon Leenerts of San Bernardino, Calif.

Leenerts was in Fairbanks to attend the Russian-American Lend Lease pilots reunion.

He's a member of the 7th Ferrying Group that flew more than 8,000 warplanes from Great Falls, Montana, up the Northwest Staging Route through Canada to Fairbanks by American pilots.

There the planes were picked up by Russian pilots who then flew them through Nome and across Sibena to the Eastern Front.

Leenerts made more than 40 flights himself during 1942-43 and has some hair-raising stories to tell about their flights along the Alaska Highway.

"I started flying in the winter of '42 which was a very severe winter. We got to fly low and do a lot of buzzing. Sometimes we'd go down very low on the highway, which was being built at the time and play chicken with the truck drivers.

"We'd get right on the deck and play chicken with a truck coming down the road. At first they'd stop the trucks and jump out because they were afraid. Then they'd start throwing rocks at us, and that forced us up to at least the height of this building," he quipped.

He said the Russian pilots were pretty stand-offish in those days. "It appeared to me that they had instructions not to mingle too closely with us," Leenerts said. "They weren't unfriendly, but it just seemed that every time we'd make friendly overtures they'd back away."

There was nothing stand-offish about the Russians at the reunion. The veteran pilots took full advantage of renewing friendships with comrades they trained and flew with nearly 50 years ago.

GORDON LEENERTS

"The world has undergone tremendous changes and I'm just happy as heck to see this. I'm a pacifist myself."

Leenerts said he became a pacifist after serving as a B-47 aircraft commander in the Strategic Air Command.

"During the 'cold war' I sat over the North Pole with nuclear weapons aboard and I had targets in Russia.

"I thought of all the men, women, children, grandmothers, dogs, cats, canaries and whatnot that would just be wiped off the face of the earth. It gets to you after awhile. The inhumanity of man to man is so ridiculous."

He believes the American nuclear accident at Three Mile Island and the Russian accident at Chernobyl pointed out to people that "you just can't do these things to the people of this planet."

"If you've ever been to a museum and seen a Minuteman (missile) warhead, it gives you an eerie feeling.

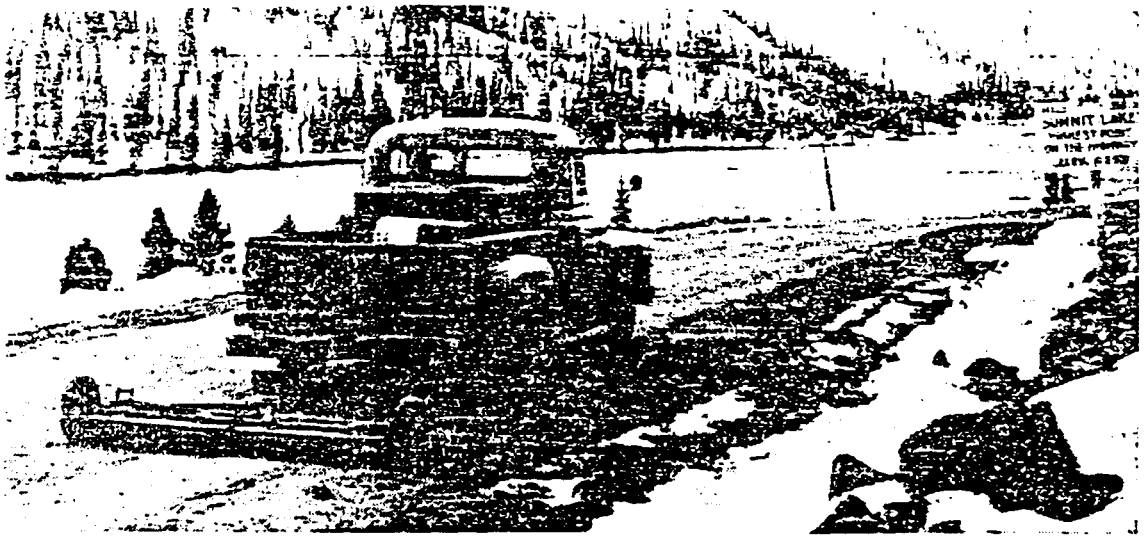
"A Minuteman stands about four feet high and looks like a beautiful piece of jewelry. It's stainless steel and looks like silver and gold.

"But inside that thing are 10 warheads, each of them independently targetable, each of them with more nuclear destruction capacity than we laid on Japan at Hiroshima and Nagasaki—and we've got hundreds of them sitting around."

He said many of his American comrades and the Russian veterans feel the same way.

"The idea of the world getting into such a state that you could even contemplate a nuclear exchange is just beyond me. I think we're finally getting away from that concept."

12. Other Military Activities



THE CANADIAN ARMY introduces from time to time ideas which are entirely new to this part of Canada. Shown here is the army's device for saving motorists and truckers pains and headaches from punctured tires.

This device is a mobile magnet which picks up nails, bolts, bits of steel and old iron, staples, brads, steel tools, wire, pieces of broken spring, bits and pieces of grader blades, bobby pins, safety razor blades, old scissors, shears, wrenches, screw drivers and other items too numerous to mention.

The magnet is rolled along at the rear of a pick-up. In the course of a day's picking up, the machine will rescue a tidy load of junk which is in turn piled into the pick-up.

One regret is that the machine will not pick up gold. Gold is not a metal which responds to the magnet. But it will haul in anything from a needle to an anchor.

At both ends of the highway there has been a big business in removal of old army buildings used by the United States Army. These buildings are hauled over the highway and with every removal a great shower of rusty nails and metal junk of one kind or another was left to menace the tires of the motoring fraternity.

The magnet is a great saving to the army itself since it undoubtedly removes objects which would have taken a toll of tires on the big equipment — and some of these tires cost many hundreds of dollars.

The magnet was the subject of theft charges at Fort St. John. A frugal citizen found it lying by the side of the road one night and just naturally took it for granted that it was some sort of army equipment which was about to be declared surplus. The man loaded it up and took it home. It was such a novel machine that he could not make head or tail of it. He did notice, however that it had a powerful attraction for jackknives, screw drivers and other metal objects left near it.

He was a bit amused at this and was thoroughly alarmed when it drew into his place an army investigator. The precious magnet was restored to the highway to resume its noble work of making the road more safe for owners of tires. There was a court case and the man who took the magnet got off lightly.

4.8 CLEAN UP ACTIVITIES 1971-1995

Several clean up reports and inventories of waste sites, completed by the federal government, covered all areas in this study.

During 1973, field staff of the Yukon Lands and Forest Service identified 279 sites within the Yukon which required clean up. This included abandoned U.S army construction camps and sawmill sites, along the Alaska Highway, Haines and Canol Roads; vehicle disposal sites,and abandoned Dewline sites. (14) (Govt File 2396 - Yukon Archives- January 1974)

Two studies, by Edey in 1976 (13) and the Environmental Protection Service in 1983 (14), identified locations of past Army camps, relay stations and Canol pumping stations (No.3 & 4), along the Alaska Highway, Robert Campbell Highway, Haines and Canol Roads.

Alaska Highway-Haines Road Clean-Up Assessment-Edey 1976
Within the Yukon, a total of 83 major sites were identified, consisting of maintenance camps, communication repeater sites, as well as pumping stations for the Canol pipelines 1,2,3,4. The inventory identified 41 sites of the total 83 as being partly or wholly abandoned on Crown lands. In addition to the location of abandoned campsites, attempts were made to identify refuse dumps formerly utilized by these camps, however, it was felt that this phase is "extremely difficult and the degree of success is low". Of the refuse dumps identified as military origin, at least 4 remain active. A larger number of refuse dumps have been identified as military origin along the Alaska Highway than the Canol Road. Due to differing accessibility, there is a smaller amount of debris associated with the Alaska Highway and Haines Road than the Canol Road, which for some time was closed to public travel. A general summary of debris remaining includes wood debris on all sites and approximately: 28 refuse dumps, 400 vehicle tires, 100 vehicle hulks (most not of military origin), and 200 - 45 gallon drums. A full listing of former Army facilities for these sites and status of tenure is indicated in Appendix L. (13)

Edey identified potential burial sites, for which it was recommended that a minimum of 3 feet of overburden be used to cover debris with the maximum height above the landscape not to exceed two feet. Edey did not view the remaining materials on these sites as potentially salvageable due to the low amount of metal and salvageable debris. "Based on value of scrap metal this was not economical to warrant the salvaging 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." (13)

Edey prepared figures of certain sites to show potential burial sites and location of disposal areas. These were the best of the available sketches for the military sites along the Alaska Highway, besides the 1943 PRA maps . These have been presented in the District Reviews to further illustrate sites mentioned in interviews.

Waste Disposal Sites, Environmental Protection Service - 1983-84
The inventory of waste disposal sites by Environmental Protection Service (15) included pumping stations and facilities noted by Edey as well as current waste disposal sites, along the Alaska Highway, Haines Road and Carcross Road.
Sites which were of military origin are summarized in Appendix M for all districts in this study and as well appear in the separate District Reviews. Locations are noted by co-ordinates, comments on previous numbers of buildings and areas which have been "covered over" are noted. Many of these sites were mentioned by interviewees.

Heritage Resources in the Contaminant Site Remediation Project:
In this report (16) the contaminant sites which were of concern to the Yukon Heritage Branch were reviewed. These are noted in the relevant District Reviews. A clear message from this report was: "It is of utmost importance to clean up contaminant sites, protecting our environment and our heritage simultaneously."

APPENDIX D: LIST OF U.S. ARMY/CONSTRUCTION CAMPS, CANOL PUMP STATIONS, RELAY STATIONS ON ALASKA HIGHWAY - 1943 PRA MAPS (9)

SECTION/SHEET NO. - NAME - MILE POST

SECTION 6: MP620-642: LOWER POST - UPPER LIARD
WATSON LAKE DISTRICT
6/41- Lower Post, B.C. - MP620
6/45 - Army Quartermaster Camp-Watson Lake - MP635
SECTION 7: MP 639-803: UPPER LIARD-TESLIN
7/51 - Army Camp 14.5 E - Upper Liard - MP642
7/49 - Army Camp 14 E - Dodo Lake - MP652
7/45 - Army Camp 13 E - Little Rancheria - MP671
7/41 - Army Camp 12 E - Rancheria River - MP687
7/39 - Pumping Station 'Z'-Canol No.3-Rancheria River - MP693
7/35 - Army Camp 11 E - Rancheria - MP710
7/32 - Pine Lake Flight Strip No.5 - MP722
TESLIN DISTRICT
7/29 - Army Camp 10.5 E - 5 mi.East of Swift River - MP727.5
7/28 - U.S. Army Signal Corps Relay Station-N.side Hwy - Swift R.
Tanks - S.Side Hwy - Swift River - MP 734
Maintenance Camp - S.side Hwy - Swift River - MP734
7/26 - Army Camp 10 E - Screw Creek,B.C. - MP741.5
7/24 - Swan Lake Canol No.3 Pumping Station 'Y',B.C. - Woof Lake MP748
7/19 - Army Camp 9.5 E - Smart River,B.C. - MP759
7/16 - Army Camp 9 E - Morris/Morley Lake - MP770.5
7/8 - Army Camp 8 E - Hays Creek - MP790.5
7/7 - Morley Pumping Station 'X' - Canol No.3 - MP794
7/4 - D.O.T. Radio Range Station - MP800
7/3 - Camp 7 E - Teslin - MP804

SECTION 8: MP 803-928: TESLIN - WHITEHORSE
8/37 - Camp 6.5 E - Timber Point - MP826
8/36 - Brooks Brook Army Camp (6 E) & Relay Station - MP830
8/33 - U.S. Army Relay Station - Johnson's Crossing - MP836
- Canol Camp- Mile 0 - Johnson's Crossing - MP836
8/30 - Army Camp 5 E - Squanga Lake Flight Strip - MP843
8/25 - Big Devil Pump Station 'W'-Canol No.3 (Summit Lake)- MP855

TAGISH DISTRICT
8/16 - Army Camp 4 E - Marsh Lake Maintenance Camp - MP883
8/11 - Army Camp 2 E - Lewes River Bridge - MP898
8/9 - Military Police Checking Station - MP908
- K.C.B. Construction Co. Yard - Macrae - MP910
- Camp- MP 911
8/8 - Utah Construction Co. Camp - MP911
8/7 - Army Camp 1 E - Squatter's Road - MP914

APPENDIX D: (Cont.)

TAGISH DISTRICT (Cont.)
8/6 - K.C.B. Camp - Airport Hangers - MP916
- B.P.C. Camp - Old Weigh Scales - MP917
- Radio Range Station - Camp Takhini - MP917

LABERGE DISTRICT
SECTION 9: MP929 - 1093: WHITEHORSE - BURWASH LANDING
9/6 - Army Camp 1 W - Takhini Crossing - MP936
9/8 - Bates & Rogers Camp - Takhini River Bridge -MP946
9/10 - Army Camp 2 W - Stoney Creek - MP956
- Canol No.4 Pumping Station B - MP957
9/11 - Junction Kusawa Lake Road - MP959
9/13 - Army Camp 3 W - Mendenhall River - MP968
9/15 - Champagne, YT. - MP974.5

HAINES JUNCTION DISTRICT
9/18 - Army Camp 4 W - Cracker Creek - MP988
9/21 - Canyon Creek Relay Station - Canyon Creek - MP996
9/22 - Canol No.4 Pumping Station 'C' - MP1000
9/28 - Army Camp 5 W - Haines Junction - MP1016
9/29 - Mackintosh Trading Post - MP1022
9/33 - Canol No.4 Pumping Station 'D'- Jarvis River - MP1036
9/37 - Kluane - Silver City - MP1053.5
9/38 - Camp 150 W - MP1056
9/40 - Soldiers Summit - Kluane Lake - MP1061.5
9/41 - USC &GS Dump 1943 - Kluane Lake - MP1063
- USC &GS Dump 1943 - Kluane Lake - MP1064
9/47 - Canol No.4 Pumping Station - 'E'- Destruction Bay - MP1081
9/48 - U.S. Army Relay Station - Destruction Bay - MP1082.8
- Canol Tanks - Destruction Bay - MP1082.9
- U.S. Army Camp - Destruction Bay - MP1083
9/51 - Burwash Landing - MP1093
SECTION 10: MP1092-1221.4: BURWASH LANDING - US/CANADA BOUNDARY
10/4 - Burwash Flight Strip - MP1095

BEAVER CREEK DISTRICT
10/6 - Bates & Rogers Camp 200 W - Duke River - MP1098
10/14- Canol No.4 Pumping Station 'F' - MP1126
10/15- Dowell Construction Co. - Donjek River - MP1130
- Utah Construction Co.Camp 2 - Donjek River - MP1130
10/23- Utah Construction Co.Camp.259W -Koidern River - MP1155
10/25- U.S Army Koidern River Telephone Relay Station - MP1164
- Canol No.4 Pump Station 'G' - MP1166
10/26- U.S. White River Telephone Relay Station - MP1167.5
10/28- Utah Camp No. 5 - MP1171
10/32- Utah Construction Camp 283 W - Dry Creek - MP1184

APPENDIX D: (Cont.)

BEAVER CREEK DISTRICT (Cont)
10/33- Jct. to Snag Airport - MP1188.5
10/37- Canol No.4 Pump Station 'H'- Beaver Creek - MP1205.5
- Miller Camp - MP1206
10/42- Border US/Canada - MP1221.4

APPENDIX E: LIST OF SAWMILL SITES-ALASKA HWY/CANOL- 1943

WATSON LAKE
1. U.S.Army Sawmill - Watson Lake 331st Engineers
2. Watson Lake Airport - R.C.A.F.
3. Liard River Sawmill - M.H. Kansas City Bridge Co.

TAGISH
6. Mile 7 Carcross Road - Dowell Construction Co.
7. Wheaton River - M.H. Kansas City Bridge Co.
8. Watson River - Robinson Sawmill - M.H. Kansas City Bridge Co.

LABERGE
9. Mile 12 West Sawmill - U.S. Army - 331st Engineers
10. Mile 27 West Sawmill - M.H. Kansas City Bridge Co.
11. Mile 48 West Sawmill - Dowell Construction Co.
12. Mile 50 West Sawmill - Bechtel-Price-Callahan Co.

HAINES JUNCTION
13. Mile 100 West Sawmill - Dowell Construction Co.
14. Mile 100 West Sawmill - M.H. Kansas City Bridge Co.
15. Clyde Wann Sawmill - M.H. Kansas City Bridge Co.
16. L.Proctor Sawmill - Bechtel-Price-Callahan Co.
17. Burwash Creek Sawmill - M.H. Kansas City Bridge Co

BEAVER CREEK
18. Edith Creek Sawmill - Elliot Construction Co.
19. Beaver Creek Sawmill - M.H. Kansas City Bridge Co.

ROSS RIVER
20. Lapie River Sawmill - Bechtel-Price-Callahan Co.
21. Sheldon Lake Sawmill - Bechtel-Price-Callahan Co.

APPENDIX F: HISTORIC MILE POSTS

The Historic Mile Post, A Mile By Mile Guide,1942-1992, Alaska Canada 50 Year Highway Celebration, 1992. (38)

YUKON: HISTORIC MILESITES
Mileage: Location
ALASKA HIGHWAY:
627 - B.C./Yukon Border
635 - Watson Lake/Northwest Staging Route
639 - Upper Liard Camp
649 - Camp 14 E
666 - Camp 13 E Lower Rancheria River
683 - Camp 12 E Rancheria River
692 - Pumping Station No.3
710 - Rancheria
722 - Pine Lake Flight Strip No.5
727 - Camp 10 1/2 E
733 - U.S. Army Signal Corps Station - Swift River
790 - Camp 8 E
794 - Morley Pumping Station Canol No.3
800 - Department of Transportation Range Station
804 - Teslin
805 - Teslin Airport
825 - Camp 6 1/2 E
829 - Brook's Brook Army Camp and Relay Station
836 - The Canol Project - Johnson's Crossing Lodge
843 - Camp 5 E -Squanga Lake Flight Strip
855 - Big Devil Pump Station
866 - Jake's Corner
883 - Camp 4 E Marsh Lake
897 - Camp 2 E Yukon River bridge
908 - M.P. Checking Station
910 - McCrae
911 - Utah Construction Co. Camp
913 - Camp 1 E
914 - K.C.B. Camp
917 - Radio Range Station
918 - Whitehorse
936 - Camp 1 W
937 - Takhini Crossing
946 - Bates & Rogers Camp - Takhini River Bridge
956 - Camp 2 W Stoney Creek
957 - Canol Pumping Station
960 - Mendenhall Landing
967 - Army Camp Mendenhall River Bridge
968 - Mendenhall Village

APPENDIX F: (Cont.)

ALASKA HIGHWAY:
974 - Champagne
987 - Camp 4 W Cracker Creek
996 - Canyon Creek Relay Station/Canyon Creek Bridge
1000 - Canol No. 4 Pump Station
1013 - Pine Lake Flight Strip No.7
1016 - Haines Junction
1022 - Mackintosh Trading Post
1035 - Canol Pumping Station
1053 - Silver City
1055 - Camp 150 W Kluane Lake
1061 - Soldiers Summit
1080 - Canol Pumping Station
1082 - U.S. Army Relay Station
1083 - Destruction Bay/Relay Station
1093 - Burwash Landing
1094 - Burwash Flight Strip
1117 - 18th Engineers/Lieutenant Small Memorial Site
1126 - Canol Pumping Station
1130 - The Donjek River bridge
1155 - Utah Construction co. no. 259 W Longs Creek
1163 - U.S. Army Koidern River Telephone Relay Station
1165 - Canol Camp 'G'
1167 - U.S. Army White River Telephone Relay Station
1171 - Utah Camp No.5
1183 - Utah Construction Camp 283 W Snag, Dry Creek
1186 - Snag Road Junction
1202 - Beaver Creek
1205 - Canol Pumping Station
1221 - Boundary U.S/Canada -

HAINES ROAD:
42 - Alaska/B.C. Border
47 - Pipeline Camp
48 - The Haines Road
75 - Mule Creek Relay Station
87 - Construction Camp
94 - B.C./Yukon Border
103 - Relay Camp (MP99) (Million Dollar Falls)
118 - Klukshu Road
125 - Dezadeash Camp
142 - Kathleen Lake Camp

KLONDIKE HIGHWAY:
66 - Carcross

APPENDIX G: ALASKA HIGHWAY - MP619.8-917.3 - 1944

Department of Mines and Resources,
Surveys and Engineering Branch,
Engineering and Construction Service.

Alaska Military Highway

Inspection Report No. 98 for July 15th, 1944.

This report covers an inspection of the Whitehorse Eastern Area between Lower Post, mile 619.8, and Whitehorse, Mile 917.5 on July 1st, 2nd, 3rd, 4th and on July 13th and 14th, 1944.

Road Grade and Surface.

Following is a revised road log for the Eastern District-

Mile 619.8 - Junction with road to Lower Post (0.5 miles)
630 approx. - British Columbia - Yukon Boundary.
631.8 - Maintenance Camp (moving to 634.6)
634.6 - Junction with road to Watson Lake Airport (8 miles)
- Standard Oil pumping station.
- Army repeater and relay stations.
642.6 - Upper Liard River crossing.
643.4 - Albert Creek.
652.5 - Maintenance Camp (moving to 670)
670.2 - Little Rancheria River.
674.0 - Big Creek.
687.2 - Lower Rancheria River.
692.7 - Standard Oil pumping station Z.
694.9 - Spencer Creek.
710.1 - Maintenance Camp.
712.0 - Canyon Creek.
718.8 - Porcupine Creek (culvert)
721.6 - Upper Rancheria River.
722.3 - Junction with road to Flight Strip #5 (1.5 miles)
722.5 - Divide between Liard and Teslin watersheds.
725.1 - Swift River.
733.0 - Sea Gull Creek.
733.3 - Army repeater and relay stations (Swift River)
735.9 - Partridge Creek.
739 approx. - Yukon-British Columbia boundary.
741.6 - Screw Creek.
747.6 - Standard Oil pumping station Y.
751.2 - Logjam Creek.
755.4 - You All Creek (culvert)
759.2 - Smart River.
767.6 - Upper Hazel Creek.
768.7 - Lower Hazel Creek.
770.0 - Junction with road to Maintenance Camp (0.5 miles)
775 approx. - British Columbia- Yukon Boundary.
777.0 - Morley River.
793.9 - Standard Oil pumping station X.
803.6 - Nisutlin Bay of Teslin Lake.
803.9 - Maintenance Camp.
804.5 - Junction with road to Teslin village (1.0 miles)
804.8 - Junction with road to Teslin Airport (1.0 miles)
813.1 - Ten Mile Creek.
816.8 - Lone Tree Creek.
822.5 - Deadman Creek.
825.0 - Army 21 Bridge.
829.7 - Army repeater Station (Brook's Brook)
836.5 - Army relay station (Johnson's Crossing).
- Junction with Norman Wells Road (5.8 miles)
836.8 - Teslin River (new crossing)
843.0 - Maintenance Camp.
- Flight Strip #6
849.0 - John's River.

Mile 4.8 - Standard Oil pumping Station W.
865.4 - Junction with East Leg Carcross Road (33 miles)
872.2 - Judas Creek.
883.3 - Maintenance Camp.
888.5 - Glacier #1.
888.6 - Glacier #2.
890.3 - McClintock River.
893.4 - Glacier #3.
897.6 - Lewes River.
904.6 - Junction with west leg Carcross Road (31 miles)
908.3 - Army checking station (south gate)
909.4 - White Pass and Yukon Railway level crossing.
909.5 - McCrae.
911.1 - Headquarters Alaska Highway Maintenance Division and Maintenance Camp.
911.9 - Junction with road to Miles Canyon (1.5 miles)
916.2 - Whitehorse Airport.
917.3 - Junction with road to Whitehorse (2 miles).

Note: 1. The accepted U.S.E.D. mileage given above shows the distance from Lower Post junction to Whitehorse junction as 297.5 miles. The P.R.A. measured mileage between these points is given as 296.9 miles.

2. The new crossing of the Teslin River is likely to decrease the mileage from Teslin to Whitehorse by approximately 0.1 miles.

APPENDIX H : ALASKA HIGHWAY - MP917.3-1221.4 - 1944

Department of Mines and Resources
Surveys and Engineering Branch
Engineering and Construction Service

Alaska Military Highway

Inspection Report No. 8 for June 30th, 1944.

This report covers an inspection of the Whitehorse Western Area between Whitehorse and the Alaskan Boundary on June 17th, 18th, 19th and 20th and includes notes taken on May 25th and 26th and on June 26th and 27th, 1944.

Road Grade and Surface

A table is given following to show the highway mileage from Dawson Creek to the centre of all bridges and to all maintenance camps and other points in the Western District. This table is a revision of the road log contained in Report No. 2:

Mile 917.3 - Junction with road to Whitehorse (2 miles) and Canol Oil Refinery (0.5) miles.
- Junction with road to U.S.E.D. offices (0.1 miles) Standard Oil offices (0.3 miles) and Department of Transport radio range station (3.0 miles).
919.0 - Army checking station (North Gate)
919.1 - McIntyre Creek.
936.5 - Old Camp IN.
936.7 - Junction with road to lower Takhini Bridge and with winter road to Dawson City.
946.3 - Takhini River.
951.0 - Junction with road to lower Takhini Bridge.
956.0 - Stony Creek.
956.1 - Maintenance Camp (old 47)
956.8 - Canol Pumping Station B.
968.1 - Mendenhall River.
* 974.7 - Champagne Trading Post.
987.5 - Old Camp SOW.
987.8 - Cracker Creek.
995.3 - Junction with road to Aishihik Airport (78 miles)
996.1 - Army repeater and relay Stations (Canyon)
996.4 - Aishihik River.
998.8 - Canol Pumping Station C.
1005.5 - Marshall Creek.
1012.8 - Junction with road to Flight Strip #7 (1 mile)
1015.3 - Maintenance Camp (old 108).
- Junction with Haines Road.
1018.1 - Pine Creek.
1021.9 - Bear Creek.
1022.0 - Mackintosh Trading Post.
1028.3 - Bear Creek Summit.
1034.5 - Jarvis River.
1035.7 - Junction with road to Kloo Lake Trading Post (3 miles).
1035.9 - Canol Pumping Station D.
1043.5 - Jarvis Summit.
1048.1 - Christmas Creek.
1053.4 - Kluane Trading Post.
1055.8 - Maintenance Camp (old 150).
1059.8 - Slim's River.
1078.3 - Mines Creek.
1080.6 - Canol Pumping Station E.
1083.0 - Army Relay and repeater stations and hospital (Destruction Bay).
1083.7 - Old Camp.
1093.0 - Burwash Landing Trading Post.
1095.1 - Flight Strip #6.
1098.2 - Maintenance Camp (old 200).
1098.5 - Duke River.
1103.0 - Burwash Creek.
1111.6 - Quill Creek.

APPENDIX H : (Cont.)

Mile 1113.9 - Glacier Creek.
1119.2 - Swede Johnson Creek.
1126.4 - Canol Pumping Station F.
1129.9 - Old Camp.
1130.4 - Donjek River #1.
1130.6 - Donjek River #2.
1130.8 - Donjek River #3.
1131.2 - Donjek River #4.
1131.7 - Donjek River #5.
1131.8 - Donjek River #6.
1143.8 - Andrews Lake.
1146.1 - Grafe Creek.
1146.6 - Edith Creek.
1151.5 - Lake Creek.
1155.8 - Maintenance Camp (old 259).
1155.9 - Koidern Creek #1.
1159 - Pickhandle Lake.
1163.9 - Koidern repeater station.
1164.0 - Koidern Creek #2
1164.3 - Two Lakes Creek.
1165.2 - White Overflow.
1165.9 - Canol Pumping Station G.
1167.3 - Army checking and relay Station (Koidern).
1169.1 - White River.
1175 - Horse Camp Lake.
1178.0 - Sanpete Creek.
1178.4 - Little Sanpete Creek.
1181.2 - Dry Creek #1.
1184.2 - Old Camp.
1184.2 - Dry Creek #2.
1188.5 - Junction with road to Snag Airport (18 miles).
1190.9 - Niggerhead Lake.
1195.7 - Niggerhead Creek.
1196.7 - Swamp Creek.
1199.8 - Old Camp (Lundeen's).
1200.3 - Beaver Creek #1.
1200.5 - Beaver Creek #2.
1200.6 - Old Camp.
1200.6 - Beaver Creek #3.
1205.6 - Canol Pumping Station H.
1206.3 - Maintenance Camp.
1208.0 - Snag Creek.
1208.9 - Mirror Creek #1.
1217.8 - Mirror Creek #2.
1221.4 - Alaska Boundary.

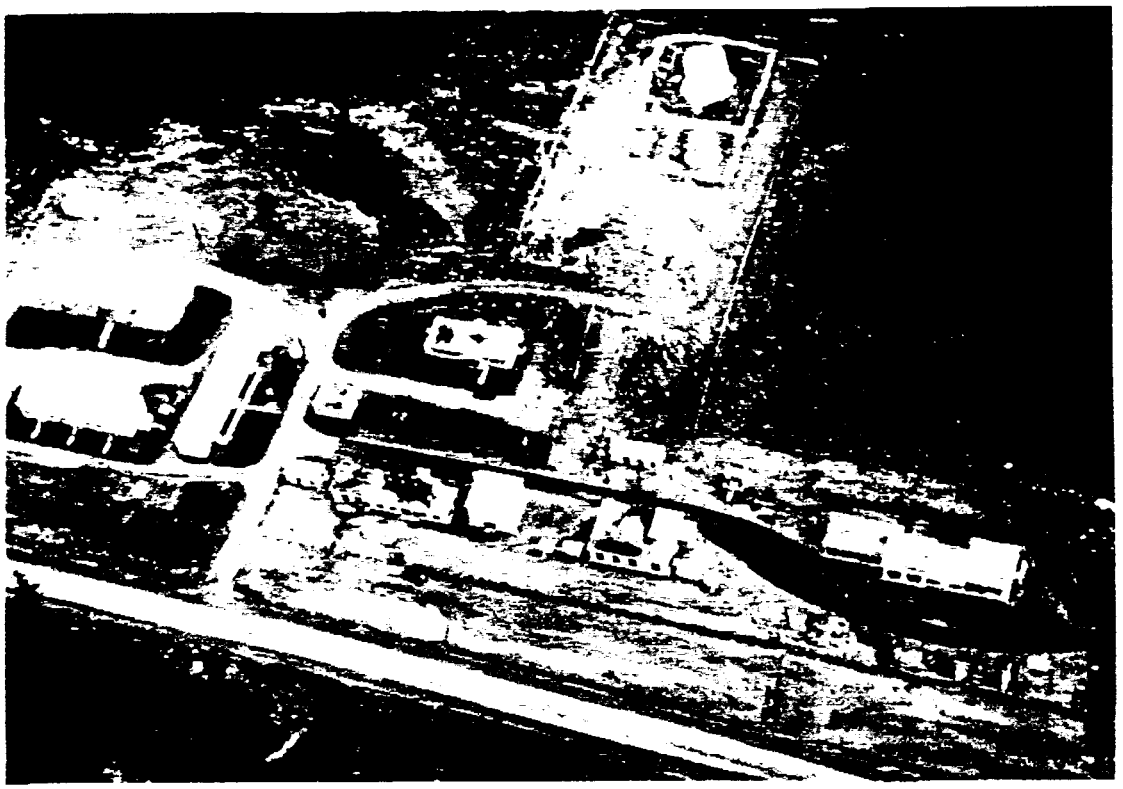
Note: The accepted U.S.E.D. mileage gives the distance from Whitehorse to the Alaskan Boundary as 304.1 miles. The P.R.A. measured mileage between these points is given as 306.781 miles.

APPENDIX I: DESCRIPTION OF HAINES-FAIRBANKS PIPELINE PUMP STATIONS IN CANADA

SECTION IV

BORDER PUMP STATION

1. GENERAL. Border Pump Station is located on the Haines Cut-off Highway approximately 7 miles north of the International Boundary near the Klehini River. There are no nearby towns. The site is 47 miles north of the Haines Terminal at an elevation of 1,800' above sea level. This station is an essential part of the normal pipeline operation with a capacity to pump products over the peak of the entire system at pipeline Milepost 57, elevation 3,750', where the Haines Cut-off Highway and the pipeline cross the Chilkat Pass in the Coast Range. The site is 32 acres in area.



Border Pump Station, 32 acres in area, is located on the Haines Cut-off Highway 47 miles north of Haines.

2. FACILITIES. a. Mainline Pump Building.
b. Utility Building.
c. Warehouse-Garage-Shop Building.
d. Family Housing.
e. Cold Storage Locker Building.

3. MAINLINE PUMP BUILDING. The interior of this building is divided into an engine room, pump room and a control room. The control room is isolated by means of a pressure barrier fire wall and door arrangement, permitting the room to be pressurized for excluding petroleum vapors from the area. A fire wall isolates the engine room.

a. The pumping facilities at this station consist of three units, each composed of a Chicago Pneumatic Model CP-69, 6 cylinder, 4 cycle, diesel engine driving a Byron Jackson, 4 stage centrifugal pump. The diesel engines are coupled to the pumps by means of a 4,750 to 1 geared speed increaser unit. Engine speed range is from 750 RPM to 573 RPM. Thus, the pump speed range is 3,515 RPM down to 2,722 RPM. Maximum engine brake horsepower is 293. The pumps may be operated individually or in series.

b. Two Moorlane strainers are also housed in the pump house. These strainers serve as both filters and water extractors. A product sump within the building is provided to accumulate the drain discharges from the strainers. The product in the sump is disposed of by pumping into the line when appropriate. Scraper traps are located on each side of the building for receiving and launching scrapers.

c. Engine coolant water is piped from the diesel engines to a 3-unit radiator building and returned to engines.

d. Diesel fuel oil is provided from the 5,000-barrel station storage tank located on a hill above the pump house. This tank is filled from the pipeline at scheduled intervals.

4. UTILITY BUILDING. This is a multi-purpose building which contains:

a. An engine room housing two 150 KW General Electric generators, each driven by a 6 cylinder Chicago-Pneumatic diesel engine identical to those which drive the pipeline pumps. Jacket coolant water is piped from the diesels to a 2-unit radiator building and returned to engines.

b. A pump room housing two domestic water pumps, a fire pump, chlorination equipment and boiler, and cooling water softening equipment. The water system is supplied by a Peerless deep-well pump in an insulated pump house on the bank of the Klehini River. Water is stored in a 60,000 gallon tank in a heated tank house on the station.

c. A boiler room housing three 80 HP low pressure (15 PSI) boilers which furnishes low pressure steam for station heating. Steam distribution and condensate return lines for the station are in underground conduit.

5. WAREHOUSE-GARAGE-SHOP BUILDING. a. Maintenance Shop.
b. Warehouse for spare parts, pipe fittings and tools for station maintenance.
c. Four-place garage for vehicle storage.

6. STATION HOUSING. Housing at this terminal consists of permanent type buildings of wood frame construction; foundation and basement flooring of concrete; upper structure floors of wood-linoleum covered; walls, sheathing and asbestos siding. Roofs are insulated wood decking, with built-up composition and gravel protective coating. These buildings include the following:

a. One dormitory (CBQ) with a capacity of ten men, including a living room, dining room, kitchen and bath, presently being utilized as a one-room school for the station personnel's children.

b. One apartment type building consisting of six 2-bedroom units.

c. One apartment type building consisting of six 3-bedroom units.

7. COLD STORAGE LOCKER BUILDING. This is a concrete building with freeze room (-10°F) and a chill room (35°F) with individual food lockers.

SECTION V

BLANCHARD RIVER PUMP STATION

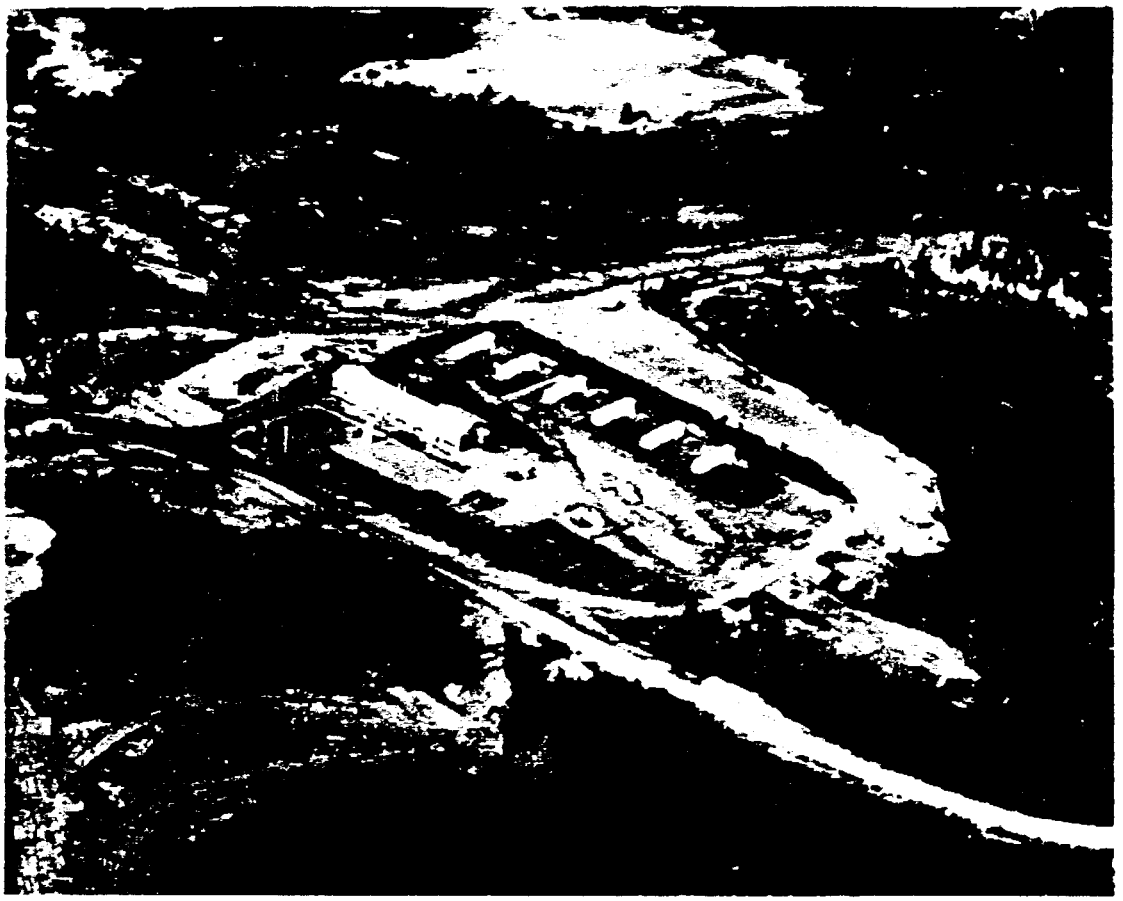
1. GENERAL. Blanchard River Pump Station is located at Milepost 95.8 on the Haines Road. The station area consists of 12.2 acres and is at an elevation of 2,720'.

2. FACILITIES.

a. Combination Building.

b. Family Housing.

3. COMBINATION BUILDING. This building is a one-story construction consisting of engine room, pump, office, generator room and maintenance shop. The engine room is isolated from the rest of the shop by a fire wall.



Blanchard River Pump Station, 12.2 acres in area, is located at Milepost 95.8 on the Haines Road.

a. The pumping facilities consist of three units, each composed of a Chicago Pneumatic Model CP-69, 6 cylinder, 4 cycle, diesel engine driving a Bingham multi-stage centrifugal pump. The diesel engines are coupled to the pumps by means of a Western Gear speed increaser unit. Maximum engine horsepower is 300. The pumps may be operated individually or in series.

b. Two low pressure oil fired steam boilers and two 60 KW generators, which are powered by Caterpillar engines, are located in the generator area.

4. FAMILY HOUSING. The housing facilities are comprised of six 10' by 50' trailers. They are partially furnished and have steam heat piped in from the central heat plant. The utilities are furnished through an underground utilidor running from the utility building. Automatic heat controls are provided in each trailer.

SECTION VI

JUNCTION PUMP STATION

1. GENERAL. Junction Pump Station is located approximately 10 miles northwest of the junction of the Haines Cut-off Highway with Alaska Highway, near Haines Junction, Yukon Territory, Canada. It is approximately 169 miles from the Haines Terminal. The station area consists of approximately 5 acres. The station elevation is 2,722' above sea level at 137° 40' longitude and 60° 55' north latitude.

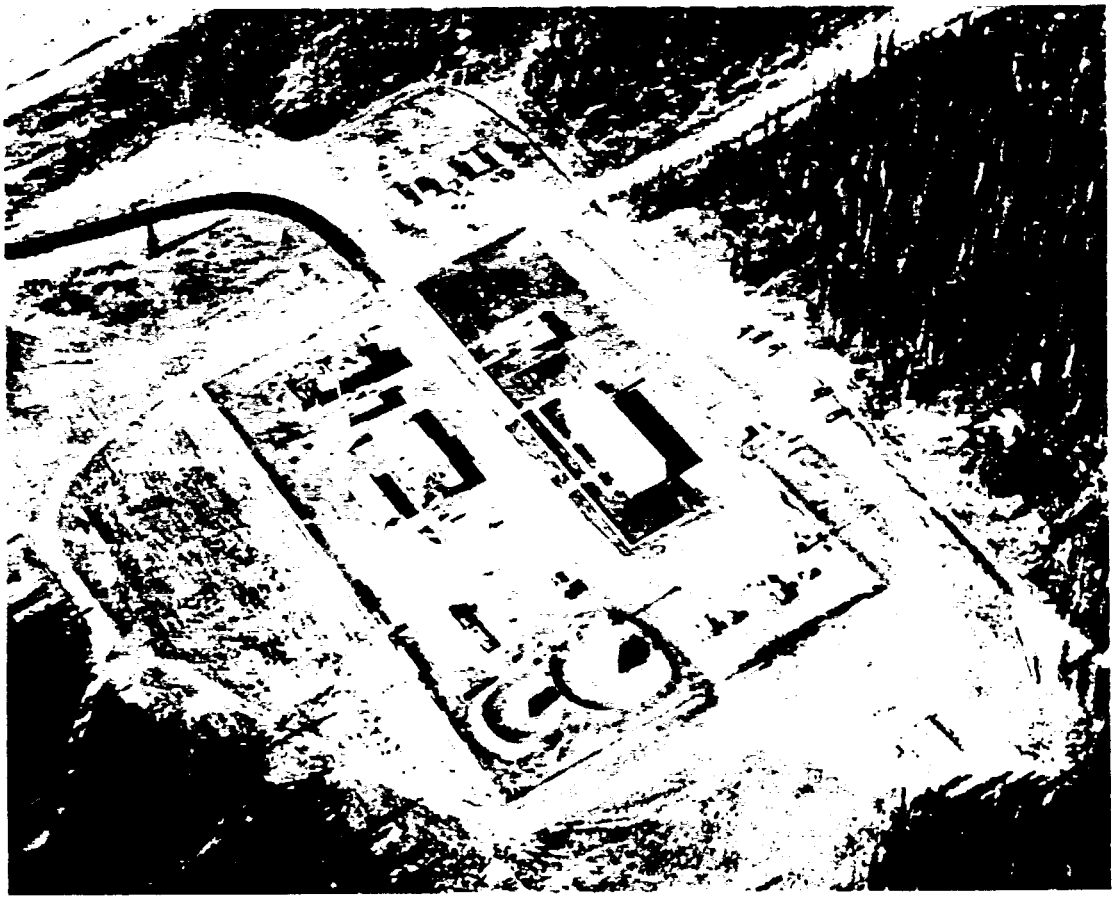
2. FACILITIES. a. Mainline Pump Building.
b. Utility Building.
c. Family Housing.

3. MAINLINE PUMP BUILDING. This building is a single story structure consisting of an engine room, pump room and office. The office is isolated from the pump room by means of a pressure barrier fire wall and door arrangement, permitting the room to be pressurized for excluding petroleum vapors from this area. The engine room is isolated from the pump room by a fire wall.

a. The pumping facilities at this station consist of two units, each composed of a Chicago Pneumatic Model CP-69, 8 cylinder, 4 cycle, diesel engine driving a Byron-Jackson centrifugal pump. The diesel engines are coupled to the pumps by means of a 4,750 to 1 geared speed increaser unit. Engine speed ranges from 705 RPM to 805 RPM. Maximum engine break horsepower is 425. The pumps may be operated individually or in series.

b. Two Moorlane strainers are also housed in the pump house. These strainers serve as both filters and water extractors. A sump tank outside the drain-off product could not be pumped from sump tanks into pipeline. Pumps have been installed to return product to pipeline. The Moorlane strainers are to be replaced by jet type strainers. The pump room is ventilated and the main line is insulated.

c. Scraper traps are located on each side of the building for receiving and launching scrapers through the pipeline.



Junction Pump Station, approximately 5 acres in area, is located 10 miles north of Haines Junction, Yukon Territory, Canada

d. Cooling jacket water is piped from the diesel engines to a 2-unit radiator building adjacent to the pump house and returned to engines.

e. Diesel fuel oil is provided from a 1,000-barrel station bulk storage tank. The tank is filled from the pipeline at scheduled intervals.

4. UTILITY BUILDING. This is a multi-purpose building containing:

a. Engine room with two power units, each consisting of a Caterpillar Model D-13000 diesel engine driving a General Electric 480 volt, 60 cycle, 50 KW, 900 RPM generator. Radiators are mounted on the diesel engines.

b. A 5-man capacity bunk-room for visiting line maintenance personnel.

c. A garage-shop area.

d. Tool room.

e. A room housing a pneumatic water tank with a Peerless pump.

5. STATION HOUSING. Housing at this station consists of two permanent type houses:

a. One is a single family, 3-bedroom unit for the Station Foreman, and is heated by a forced air, oil-burner fired furnace.

b. One apartment building consisting of five 3-bedroom units heated by a boiler located in the basement.

SECTION VII

DESTRUCTION BAY PUMP STATION

1. GENERAL. Destruction Bay Pump Station is located at Milepost 1080 on the Alaska Highway. The station area consists of 9.9 acres and is at an elevation of 2,780'.

2. FACILITIES. a. Combination Building.
b. Family Housing.

3. COMBINATION BUILDING. This building is one story construction consisting of engine room, pump room office, generator room and maintenance shop. The engine room is isolated from the rest of the shop by a fire wall.

a. The pumping facilities consist of two units, each composed of a Chicago Pneumatic Model CP-59, 6 cylinder, 4 cycle, diesel engine driving a Bingham centrifugal pump. The diesel engines are coupled to the pumps by a means of a Western Gear speed increaser unit. Maximum engine horsepower is 300. The pumps may be operated individually or in series.

b. Two low pressure oil fired steam boilers and two 60 KW generators, which are powered by Caterpillar engines, are in the generator area.

4. FAMILY HOUSING. The housing facilities provided for these stations are comprised of six 10' by 50' trailers at each site. They are partially furnished and have steam heat piped in from the central heat plant. The utilities are furnished through an underground utilidor running from the utility building. Automatic heat controls are provided in each trailer.

Destruction Bay Pump Station, 9.9 acres in area, is located at Milepost 1080 on the Alaska Highway.

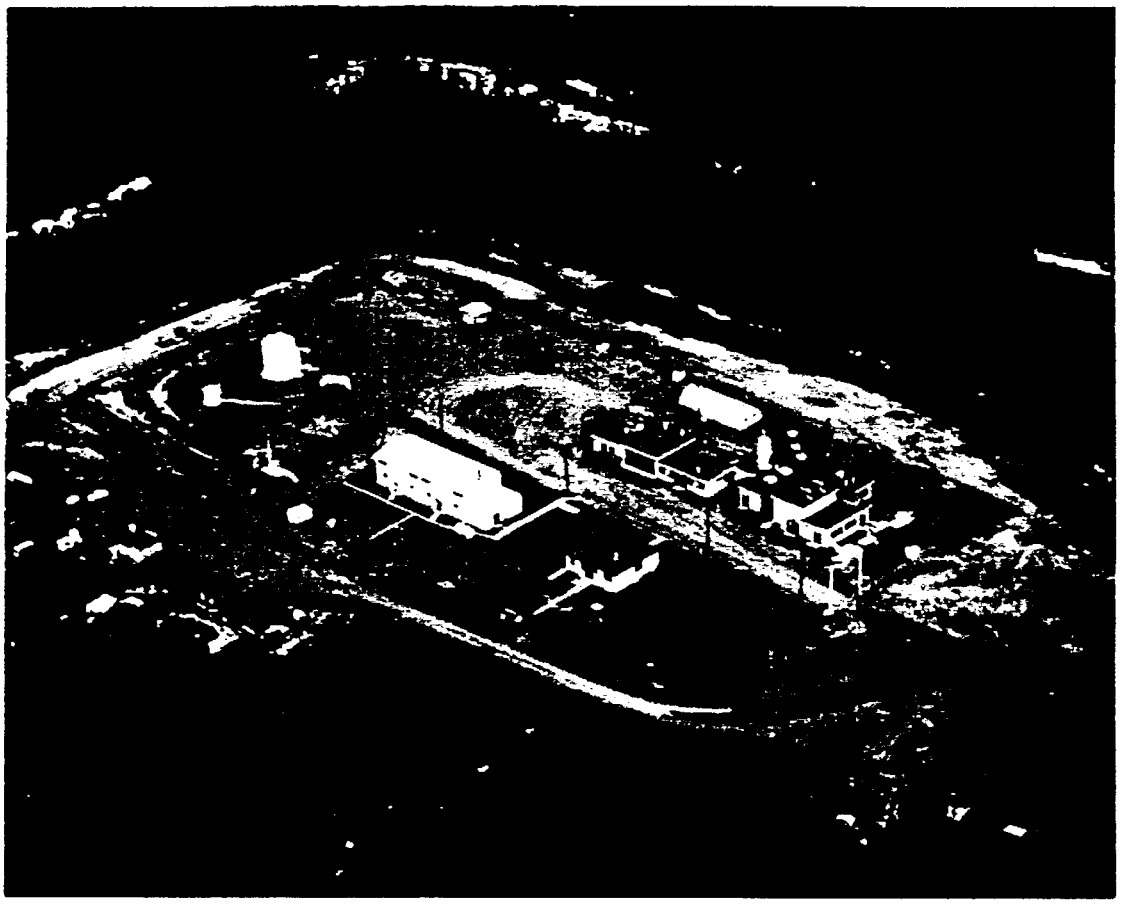
SECTION VIII

DONJEK PUMP STATION

1. GENERAL. Donjek Pump Station is approximately 25 miles northwest of the trading post of Burwash Landing, Yukon Territory, and approximately 500' north of the Alaska Highway, near Donjek River Bridge. The site is 245 pipeline miles from Haines Terminal at an elevation of 2,673' above sea level. The station area is approximately 5 acres.

2. FACILITIES. a. Mainline Pump Building.
   b. Utility Building.
   c. Family Housing.

3. MAINLINE PUMP BUILDING. This building is a single story structure consisting of an engine room, pump room and office. The office is isolated from the pump room by means of a pressure barrier fire wall and door arrangement, permitting the rooms to be pressurized excluding petroleum vapors from this area. The engine room is isolated from the pump room by a fire wall.



Donjek Pump Station, approximately 5 acres in area, is located 25 miles northwest of the trading post of Burwash Landing

a. The pumping facilities at this station consist of two pumping units, each containing a Chicago Pneumatic Model CP-89, 8 cylinder, 4 cycle, diesel engine driving a Byron-Jackson centrifugal pump. The diesel engines are coupled to the pumps by means of a 4.750 to 1 geared speed increaser unit. Engine speed range is from 705 RPM to 805 RPM. Thus, the pump speed range is 3,349 RPM to 3,824 RPM. Maximum engine break horsepower is 425. The pumps may be operated individually or in series.

b. Two Moorlane strainers are also housed in the pump house. These strainers serve both as filters and water extractors for the petroleum products. A product sump outside the building is provided to accumulate the drain discharges from the strainers. Originally this product could not be pumped back into the pipeline. A pump has been installed to return the product to the line, and jet type strainers will replace the Moorlane strainers.

c. Scraper traps are located on each side of the building for receiving and launching scrapers through the pipeline.

d. Jacket cooling water is piped from the diesel engines to a 2-unit radiator building adjacent to the pump house and returned to engines.

e. Diesel fuel oil is provided from the 1,000-barrel station bulk storage tank. The tank is filled from the pipeline at scheduled intervals.

f. There is a 6-inch product by-pass which is valved in such a manner that products can be routed through or by-pass the station pumps.

4. UTILITY BUILDING. This is a multi-purpose building containing:

a. Engine room with two power units, each consisting of a Caterpillar Model D-13000 diesel engine driving a General Electric 480 volt, 60 cycle, 50 KW, 900 RPM generator. Radiators are mounted on the diesel engines.

b. A 5-man capacity bunk-room for visiting line maintenance personnel.

c. A garage-shop area.

d. Tool room.

e. A room housing a water pneumatic tank with a Peerless pump.

5. FAMILY HOUSING. Housing at this station consists of one permanent house and apartment.

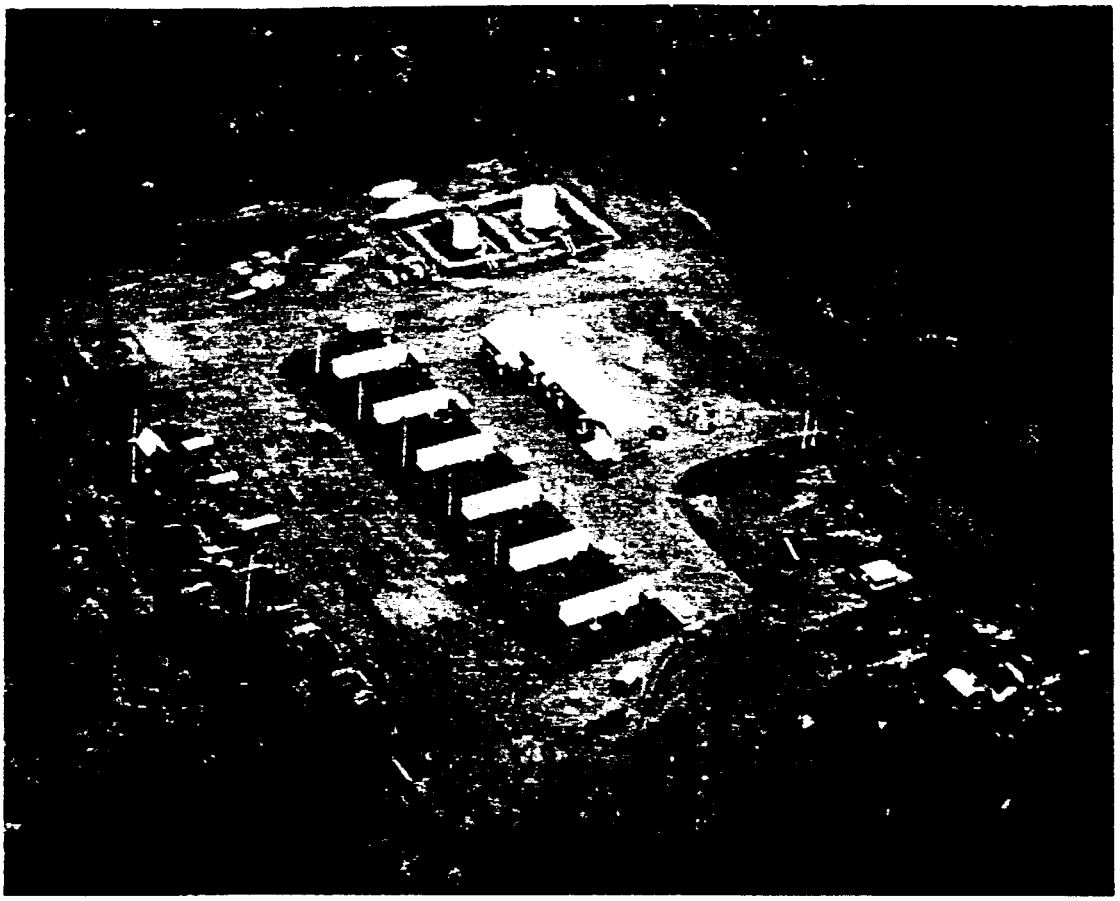
a. The permanent type house is a single family 3-bedroom unit for the Station Foreman, heated by a forced air, oil fired furnace.

b. An apartment building consisting of four 3-bedroom units, heated by a boiler located in the basement.

SECTION IX

BEAVER CREEK STATION

1. GENERAL. Beaver Creek Pump Station is located at Milepost 1204.2 on the Alaska Highway. The station area consists of 12.1 acres and is at an elevation of 2,100'.



Beaver Creek Pump Station, 12.1 acres in area, is located at Milepost 1204.2 on the Alaska Highway.

2. FACILITIES.

a. Combination Building.

b. Family Housing.

3. COMBINATION BUILDING. This building is a one story construction consisting of engine room, pump room, office, generator room and maintenance shop. The engine room is isolated from the rest of the shop by a fire wall.

a. The pumping facilities consist of two units each composed of a Chicago Pneumatic Model CP-69, 6 cylinder, 4 cycle, diesel engine driving a Bingham centrifugal pump. The diesel engines are coupled to the pumps by a means of a Western Gear speed increaser unit. Maximum engine horsepower is 300. The pumps may be operated individually or in series.

b. Two low pressure oil fired steam boilers and two 60 KW generators, which are powered by Caterpillar engines, are in the generator area.

4. FAMILY HOUSING. The housing facilities provided for these stations are comprised of six 10' by 50' trailers at each site. They are partially furnished and have steam heat piped in from the central heat plant. The utilities are furnished through an underground utilidor running from the utility building. Automatic heat controls are provided in each trailer.

APPENDIX J : DIAND CLEAN UP SPECIFICATIONS - 1975

SPECIFICATIONS

1. All garbage and wooden debris to be burned and buried.

2. All metal to be crushed and buried.

3. All concrete foundations to remain for historical purposes, and sites should be marked by the Department of Tourism.

4. Contractor(s) to take photographs (35mm color) of each site, before and after cleanup, and turn the negatives over to the Land Use Inspector.

5. P.L. and P.D. clause for $100,000 included in contract.

6. The Contractor will be responsible for arranging permission to utilize all privately and government maintained roads.

7. The Contractor will maintain an inventory of each site, e.g.:

   Tonnage of buried metal material
   Amount of barrels
   Pipe
   Wood
   Garbage Sites

8. Any printed material, books, newspapers, reports, etc., uncovered while completing the removal of items or disposing of buildings, will become the property of the Department of Indian and Northern Affairs.

9. All buried material shall be deposited in an excavated pit, compacted with heavy machinery and covered with a minimum of four (4) feet of soil.

10. The pit area shall not protrude more than two (2) feet above the adjacent ground level and shall be sloped to conform to the adjacent topography.

11. The disposal of buildings will be accomplished in a manner utilizing existing access where possible and using a combination of equipment and manpower to preserve the vegetation established around the sites. In all cases, the buildings will be removed in a fashion that an undisturbed vegetation buffer strip will be left between such building sites and the main Alaska Highway. Such debris will be removed to a designated site for burning and burial.

APPENDIX J : (Cont.)

12. The Contractor will provide road signs posted on each side of the working area to indicate caution to the travelling public.

13. All work shall be performed by utilizing existing access roads and clearings for burying, work areas and access.

14. Bulldozing to facilitate the collection of material for disposal will only be allowed in areas designated by the Inspector.

15. The collection of material in standing forest cover must be accomplished by hand labour, dragging, or winching the material to where it can be handled by equipment.

16. Oil spill sites will be scarified and where available, top soil applied to a depth of 3 inches.

17. All areas disturbed by heavy machinery shall be levelled and landscaped to conform to the adjacent land contour.

18. All combustible garbage and debris from the work camps shall be incinerated and all other noncombustible material shall be buried under a minimum of 4 feet of soil.

19. Sanitary wastes from the camp shall be deposited in a pit of adequate size to contain all materials and retain material four feet below the level of the adjacent topography.

20. Stationary fuel storage locations shall be located at least 300 feet (by Land Use Regulations) from any stream or water body and be located in such a manner or enclosed by a dyke that will not permit the lateral movement of fuel.

21. All fuel containers used during this project shall be returned to their source of supply at the completion of the contract.

22. All buildings, facilities and equipment used for this project shall be removed from Federal Crown lands at the completion of the contract.

APPENDIX K: OTHER RELATED EFFECTS ASSOCIATED WITH MILITARY ACTIVITIES

"ARMY OF OCCUPATION"

"Two of the more appalling side effects of the overwhelming U.S. presence were the overcrowding and sanitation problems at places like Dawson Creek and Whitehorse and the thousands of square miles of forest destroyed by carelessly discarded cigarette butts. One wartime observer called Whitehorse an open sewer. ... As it was nobody made much fuss about the forest fires or the leaks in Canol's pipelines. After all there was a war on."(30)

SANITATION

Whitehorse was the major focus of all military command within the Yukon with associated camps and thousands of troops/employees for the construction of the Alaska Highway. In 1942:

"Water was supplied from shallow wells and the Lewes River. Garbage and other wastes were dumped on the ice of the river to be carried away during the spring thaw. No proper sewage system existed. Instead privies, cesspools, septic tanks and tile fields were employed and those were not always properly maintained. If the major towns along the Alaska Highway offered these sanitary affairs, what would the camps and villages along the route be like?

Sanitary conditions along the route were certainly not much better! The Indian villages had similar or worse problems with water, garbage and sewerage. The camps established by the Army during the construction of the pioneer road were primitive and moved with the crews. Pit latrines and straddle trenches were used for sewerage; water came from the closest streams, creeks and lakes, and garbage was either buried or burned. ... They had few facilities for personal hygiene and had to tolerate inclement weather and a monotonous diet. In addition, outbreaks of cerebrospinal meningitis, diphtheria, and measles occurred in the civil population, and tuberculosis was a major killer, especially of Indians. Bacillary dysentery was endemic in settled areas, particularly during spring and fall... All refuse and garbage were either incinerated, buried outside of town, or disposed of in garbage dumps located at least one mile from camps and villages". (18)

"In Whitehorse and Dawson Creek the Army constructed water systems to which the towns eventually connected. Camps initially used pit latrines but gradually installed septic tanks and leach fields to handle flush toilets. In Whitehorse a sewerage line had been laid in the same trench as the water line. Whenever the level of ground water reached above the wood stove pipes which formed the two lines sewerage would seep into the water supply, causing an epidemic of dysentry." (18)

A notice from the Medical Health Office appeared in the Whitehorse Star in October 1942;
"Owing to the prevalence of dysentry and measles in the district and the danger of same becoming an epidemic, the representatives of the Medical Health Officer in Whitehorse have issued the following instructions as preventative measures to safeguard further spread of diseases:
a) That the Public School in Whitehorse be closed.
b) That all children under 16 years of age be prohibited from attending the Picture Show or any public gathering.
c) That all restaurants in Whitehorse be prohibited from serving any untreated water to their patrons.
All residents of the town are urged in the interests of their own health to boil or chlorinate or otherwise treat their water so as to render it safe for use. Do not drink any water you are not sure of." (66)

EPIDEMICS
The impact on the native people was another side effect of the "Army of Occupation". Epidemics of dysentry, meningitis, diphtheria, measles, jaundice, influenza and tuberculosis broke out as Native people came in contact with the Alaska Highway workers. At the native settlements of Teslin and Lower Post, with previously few contacts with white people, they had the least opportunity of creating an immunity to white peoples diseases. Near Whitehorse, natives had become relatively well immunized by regular contact with whites over the years. Even so the sheer variety of germs brought in by the hordes of strangers temporarily in their midst took its toll on these people as well.

"At Lower Post, 15 people in the village of 150 died from influenza, at Teslin out of a community of 135 Tlingit people, 129 got measles, and 3 died. At Aishihik, 40 southern Tutchone people died, many from measles, during the construction of the airport. In 1942 the mortality rate among Yukon native infants under one year old was 47%." (67)

"The band at Teslin suffered epidemics of measles and whooping cough, which in some cases developed pneumonia in 1942. There was a diphtheria epidemic among the Indians on the Ross River during August 1943." (67)

"The skimpy statistics that exist indicate that many more deaths than births occurred among the region's native peoples in 1942 and 1943, a trend not decisively reversed until 1947." (30)

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construction camps. They would find a group of women and visit them. From the moment I arrived the soldiers were forbidden to come back to the settlement." (68)

"The problems of sanitation and police was not difficult, due to the fact that the troops were living in the field and many miles from civilization. Communicable diseases were at an absolute minimum. No cases of venereal diseases were reported during the entire spring and summer; and in fact it was not until furloughs began, in December that cases were reported". (69)

"Beginning in December 1942,when furloughs were given the rate of venereal disease increased as the men visited local settlements and the United States. Men were prohibited from visiting villages where venereal diseases were epidemic or endemic. ... Any one working on the highway had to have an up to date small pox and triple typhoid immunization. Civilians who refused immunization were dismissed." (69)

MILITARY POLICE

"A detachment of Military Police was established in Whitehorse for the purpose of maintaining discipline and orderliness in the town. This detachment originally consisted of four men on Detached Service from the 18th and 340th Engineers. As the number of troops stationed near Whitehorse increased, the Detachment was increased to approximately 16 men. Court-Martials were extremely few, and in general records of all units were remarkably good." (69)

WILDLIFE

"Game and fish supplies dwindled. Unites States Army personnel and civilians working on the highway had been granted resident fishing licenses. There were reports that they shot large game animals for sport, or caught fish and wasted what they could not consume.... The dwindling supply of big game animals in the Kluane area led to the establishment of the Kluane Game Sanctuary in 1942." (70)

"While Alaska Highway construction did not quickly or irrevocably alter the occupational pursuits of the natives of the southern Yukon, it did have a noticeable impact on big game resources near the road. In the Yukon, unlike the Northwest Territories, American soldiers and construction workers were allowed to secure licenses to hunt big game and game birds. In addition to this legalized hunting, allegations were made that 'Yankee' personnel engaged in wanton destruction of game and stories circulated about carcasses abandoned by zealous American target shooters. There was an increasing demand for wild meat at all the construction camps, especially in Whitehorse." (70)

In 1942, the federal government decided to close off a block of land to become the Kluane National Park. Four months later the Yukon Government declared a portion along the highway as a game sanctuary, suspending all hunting activity including that by

local Indians. Eugene Jacquot, (Kluane First Nation) attempted to get the area reopened. As a result a ten mile section was excluded along the highway near the White River, and because hunters could not be controlled, this section was returned to the sanctuary in 1949. Later, limited access was granted in this area for a few native trappers.
"In this one instance the coming of the Alaska highway had more serious consequences than elsewhere in the territory, as it resulted in the closure of a substantial tract of land along with the reduction of accessible game." (71)

For more information regarding wildlife see:
Yukon Wildlife: A Social History, Robert McCandless, March 1981, Yukon Archives.

LIFESTYLE
In 1942, Teslin natives had remained in town that winter and didn't trap hoping to find work. However, by the next winter they were back at the traplines during the winter months. At the Champagne settlement natives were continuing to trap and fish with a few accepting seasonal work along the highway.
"Such a pattern was widespread, with local authorities calling on the Indians as season and need dictated and the natives accepting part time employment providing it did not conflict with trapping hunting or fishing." (71)

APPENDIX L: ALASKA HIGHWAY-HAINES ROAD CLEANUP:ASSESSMENT STUDY- 1976

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

APPENDIX L: (Cont.)

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 L: (Cont.)

Appendix A (Continued)

Mile	Location	1945 Military	1976 Status
1056	Kluane	26 buildings, maintenance camp (old 180)	Y.T.G., primarily disposed 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. Brad! 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 L: (Cont.)

Appendix A (Continued)

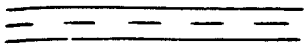
Mile	Location	1945 Military	1976 Status
1176		1 building	Unidentified
1184	Dry Creek	18 buildings	Crown
1191.5	Enger Lakes	2 buildings	Crown, abandoned gravel pit
1200		12 buildings, old camp (Lundeen's)	Y.T.G. highway right-of-way, undeveloped highway rest stop
1200.7	Beaver Creek	22 buildings, old 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 L: (Cont.)

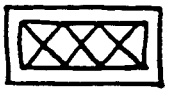
LIST OF FIGURES

APPENDIX L: (Cont.)

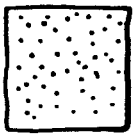
LEGEND


– ALASKA HIGHWAY


– WOODEN DEBRIS


– CONCRETE


– DUMP SITE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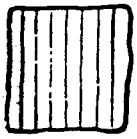

– VEHICLE HULKS

– GRAVEL PITS


– STANDING BUILDING


– PARTIAL BUILDING


– BUILDING FOUNDATION OTHER THAN CONCRETE

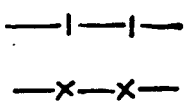

– POSSIBLE BURY SITE


– POSSIBLE BURNING SITE


– MUSKEG

LEASED or TITLED
PROPERTY BOUNDARY


– OVERALL AREA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APPENDIX M : U.S. ARMY WASTE DISPOSAL SITES-1983

ALASKA HIGHWAY
WATSON LAKE:

MP516 km 830 Ak Hwy Lat/Long (NA) Emergency Landing Field - Smith River Airstrip, 25 miles on Smith River Road completely burned in 1982 Fire, established flight strip during NWSR

MP633 km 1020 Ak Hwy Lat 60-03'-40" Long 128 42'30" Watson Lake - U.S. Army maintenance camp? + public, several covered mounds/areas covered with gravel

MP699 km 1029 Ak.Hwy Lat 60-03-40 Long 128 45'30" Watson Lake - trench (4m x 30m) U.S. Army + public - backfilling over ledge of dumping site, very old dumpsite, old Army era refuse has mostly been covered, metal, brush domestic and burnables - still open (1983)

MP644 km 1036 Ak Hwy Lat 60-03' Long 129 56' Upper Liard - U.S. Army + public, road built through this dump-backfilled

MP652.8 km 1048 Ak Hwy Lat 60-02'30" Long 129 09'00" Dodo Lakes - U.S.Army had 26 buildings in 1945 Covered over with gravel, site overgrown

MP670 km1078.6 Ak. Hwy. Lat 60-08-40" Long 129 36' 50" Little Rancheria - US. Army maintenance camp - 17 buildings several gravel and soil covered mounds

MP687 km1106 Ak Hwy. Lat 60 12' Long 130 03' 30" Rancheria river- US.Army camp had 13 buildings in 1945

MP710 km1144 Ak hwy. - Lat 60 05' Long 130 36' 40" Rancheria - U.S. Army maintenance camp - 28 bldgs here in 1945

MP722 km 1162 Ak Hwy Lat 60 04' 30" Long 131 54' 40" Rancheria area - was Great Divide Restaurant + U.S. Army camp

MP722 km 1164 Ak Hwy Lat 60 40' 30" Long 130 56' 20" Pine Lake Airstrip - U.S. Army - Area bulldozed over

TESLIN:

MP725 km 1167 Ak Hwy Lat. 60 04' Long 130 58' 50" Swift River Bridge - perhaps U.S. army

MP727.3 km 1171.5 Ak Hwy Lat 60 02'20" Long 131 03' Swift River - U.S. Army - 3 buildings here in 1945 Site covered over

MP732 km 1178 Ak Hwy Lat 60 00'50" Long 131 09' 50" Swift River - Maintenance camp - perhaps U.S. Army Still open (1983) close to Swift River (100m)

APPENDIX M : (Cont.)

TESLIN (Cont.)

MP733 km 1180 Ak Hwy Lat 60 00' 30" Long 131 12'
Swift River-U.S. Army, 1945-14 bldgs, Repeater station and maintenance camp - now YTG maintenance camp

MP733.8 km 1181 Ak Hwy Lat 59 59' 40" Long 131 11' 40"
Swift River - B.C. - U.S. Army dump - covered area with gravel/sand

MP741.6 km 1194 Ak Hwy Lat 60 53' 20" Long 131 18' 30"
Screw Creek -B.C.- 1 collasped building - graded over Old U.S. Army camp - 28 buildings, in 1945

MP747.5 km 1204 Ak Hwy Lat 59 53' 20" Long 131 27' 50"
Swan Lake,B.C. - U.S. Army, Canol No.3 Pump Station 'Y' 8 buildings in 1945

MP761.2 km 1222.5 Ak Hwy Lat 60 56' Long 131 45'
Smart River,B.C.- U.S. Army camp, 2 buildings, area covered

MP770 km 1241 Ak Hwy Lat 60 58' Long 132 02'
Hazel Creek,BC. - U.S. Army Camp, 23 buildings in 1945 area covered with gravel/soil - heavily overgrown

MP777.7 km1250.5-1251.5 Ak Hwy Lat 60 00' 40" Long 132 08'10"
Morley River - U.S. army, 15 bldgs, covered over with gravel

MP780.4 km 1256 Ak Hwy Lat. 60 01' 30" Long 132 13' 00"
Morley River - U.S. Army, covered with gravel

MP793.8 km 1277.5 Ak Hwy. Lat 60 06' 30" Long 132 28'30"
Morley Bay - U.S. Army oil tank station - 9 bldgs bulldozed over and in use as gravel pit (1983)

MP794 km 1278 Ak Hwy Lat 60 06' 50" Long 132 29' 20"
Morley Bay - U.S. Army camp - sawmill - bulldozed over

MP802 km 1290.5 Ak Hwy Lat 60 08' 30" Long 132 40' 40"
Teslin - US. Army + public, in use (1983)

MP802.5 km 1291.5 Ak Hwy Lat 60 09' Long 132 41' 20"
Teslin - U.S. Army + public - Covered gravel/sand

MP804.7 km 1295 Ak Hwy Lat 60 10' 40" Long 132 43' 50"
Teslin - U.S. Army airport, partially bulldozed

MP806 km 1297 Ak Hwy Lat 60 10'40" Long 132 51' 00"
Teslin- NW end of Teslin Airstrip - U.S. Army + Public Covered with landfill

MP829.7 km 1335 Ak Hwy Lat 60 25' 00" Long 133 11' 30"
Brooks Brook, U.S. Army maintenance camp - 23 bldgs, area covered with soil

MP836.6 km 1346 Ak Hwy Lat. 60 29' Long 133 18' 10"
Johnson's Crossing - U.S. Army Camp - Canol

APPENDIX M : (Cont.)

TESLIN (Cont.)

MP843 km 1356.6 Ak Hwy Lat 60 29' 10" Long 13 27' 10"
Squanga Lake Airstrip - U.S. Army 6 blgs, covering of soil- both sides of hwy

MP849 km 1366.5 Ak Hwy - Lat 60 26'50" Long 133 35' 00"
Squanga Lake- U.S. Army camp + gas station

TAGISH

MP883.2 km 1421.3 Ak Hwy Lat 60 31' Long 134 21'
Marsh Lake Lodge - U.S.Army Maintenance Camp - 11 bldgs here in 1945 - some areas covered with soil

MP890.5 km 1433 Ak Hwy Lat 60 33' 30" Long 134 29' 30"
McClintock Bay - U.S. Army - light covering of soil

MP897.6 km 1444.5 Ak Hwy Lat. 60 34' 30" Long 134 40' 50"
Yukon River bridge - U.S. Army camp -11 bldgs in 1945

MP900.5 km1449.2 Ak Hwy Lat 60 34' 30" Long 134 46'
Shadow Lake near Golden Horn, perhaps U.S. Army
Trenches were dug- caved in

WHITEHORSE

MP917 km 1470 Ak Hwy Lat 60 46' Long 135 05' 30"
Army/City Dump - Range Road, Cleaned Up

LABERGE

MP945 km 1521.5 Ak Hwy Lat 60 51' 10" Long 135 43' 40"
Takhini, Domestic in use, perhaps Army

MP945.7 km 1522 Ak Hwy Lat 60 51' 10" Long 135 44' 40"
Takhini River Camp - U.S. Army -11 bldgs in 1945.
Light covering of soil

MP956 km1538.4 Ak Hwy Lat 60 48' 00" Long 136 00' 00"
Stoney Creek - U.S. Army maintenance camp - 9 bldgs in 1945, Covering of dump areas with soil

MP956.8 km1539.7 Ak Hwy Lat 60 47' 30" Long 136 00' 30"
Canol No.4 Pump Station B - 4 concrete foundations, some covering of areas with gravel

MP968.1 km1558 Ak Hwy Lat60 47' 10" Long 136 17' 30"
Mendenhall River - U.S. Army Camp - 2 concrete foundations, 10 bldg in 1945 - Slight covering/soil

MP976 km1570.6 Ak Hwy Lat 60 48' Long 136 31'
Champagne - U.S. Army?/covered with gravel

HAINES JUNCTION

MP987 km1588.3 Ak Hwy Lat 60 49' Long 136 51'
Cracker Creek - U.S.Army camp, 19 bldgs in 1945, 2 old covered refuse areas

MP996.3 km1603.3 Ak Hwy Lat 60 51' 30" Long 137 02' 20"
Canyon Creek - U.S.Army camp,4 concrete foundations, 4 buildings, small areas covered with gravel

APPENDIX M: (Cont.)

HAINES JUNCTION (Cont.)

MP996.4 Km1603.5 -Old Ak Hwy Lat. 60 51' 30" Long 137 03'
Canyon Creek - U.S. Army dump site

MP1000 km1609.3 Ak Hwy Lat 60 51' 25" Long 137 07' 30"
Aishihik River- Canol Pump Station C - military dump

MP1013 km1630.7 Ak Hwy Lat 137 30' 20" Long 60 48' 20"
Pine Lake Road 2km)to CN Tower - perhaps U.S. Army
Covered over with gravel

MP1016 km1635 Ak Hwy - Lat 60 47' Long 137 30' 50"
Haines Junction-Old dump site, perhaps Army-Closed 1980
bulldozed over, covered with soil
Old Ak Hwy(East of HJ)-km 1 Lat 60 45' 20" Long 137 30'
Haines Junction Refinery Site
Old Ak Hwy - km 1.5 Lat 60 45'35" Long 137 28'
Old disposal site
Old Ak Hwy -km 2 Lat 60 45'30" Long 137 28' 20"
public garbage
Old Ak Hwy - Near km 1.5-2 - South side of road

MP1036 km1667.5 Ak Hwy - Lat 60 55'30" Long 137 55' 45"
Canol No.4 Pump Station D - Jarvis River - U.S. Army

MP1039.5 km1674 Ak Hwy Lat 60 57' Long 138 00' 30"
Sulphur Lake (perhaps Army site?) - area completely
covered over

MP1054 km1696 Ak Hwy Lat 61 02' Long 138 23' 20"
Silver City, 20 blgs, trading post/roadhouse - dump?

MP1054.4 km1696.8 Ak Hwy Lat 61 01' 50" Long 138 23' 40"
Kluane -Silver Creek, Airstrip, US. Army, long narrow
dump area, parts bulldozed over.

MP1054.5 km1697 Ak Hwy Lat 61 01'15" Long 138 24'15"
Kluane-Airstrip, U.S. Army + public -

MP1054.8 km1697.5 Ak Hwy Lat 61 01' 15" Long 138 24' 30"
Kluane - Sheep Mountain Motel/Kluane Lodge - old U.S.
Army maintenance camp

MP1056 km1699.4 Ak Hwy Lat 61 01' 15" Long 138 25'
Kluane - U.S. Army Maintenance Camp -26 bldgs in 1945

MP1080 km1738 Ak Hwy Lat 60 13' 45" Long 138 45'
Destruction Bay - Canol No.4 Pump Station 'E'/Haines-
Fairbanks Pumping station - U.S. Army

MP1083 km 1742.9 Ak Hwy Lat 61 15'20" Long 138 48' 20"
Destruction Bay - 26 buldgs in 1945, Army relay station
and hospital, maintenance camp (old dumps + new nearby)

MP1093 km1759 Ak Hwy Lat 61 21' 30" Long 139 00' 30"
Burwash Landing, 0.3km north, perhaps U.S. army - 1
trench(20m x 30m), exposed metal, Partially bulldozed
over/covered

APPENDIX M: (Cont.)

HAINES JUNCTION (Cont.)

MP1095.5 km1763 Ak Hwy Lat.60 22' 20" (?) Long 139 03'
Burwash Airport Lodge - Private - Army?- debris/garbage

BEAVER CREEK

MP1126.5 km1808.3 Ak Hwy Lat 61 36' 45" Long 139 37' 20"
Canol Pump Station F - U.S. Army, 5 bldg, 1 oil tank

MP1130 km Ak Hwy Lat 61 38' 20" Long 139 43' 20"
Old Ak Hwy - Donjek River - U.S. Army, 16 bldgs - At MP1130.1 there was a military dump

MP1156 km1860 Ak Hwy Lat 61 53' 50" Long. 140 13'
Koidern - U.S Army maintenance camp, 26 bldgs in 1945

MP1166 km1876.4 Ak Hwy Lat 61 58' 30" Long 139 27' 45"
Koidern-Canol No.4 Pump Station G - U.S. Army

MP1167 km1878 Ak Hwy Lat 61 59' Long 140 28'
Koidern - perhap part of Army camp - Relay Station 13 buildings in 1945

MP1168.5 km1880 Ak Hwy Lat 61 59' Long 140 32'
White River Lodge - commercial - military?

MP1189 km1913 Ak Hwy Lat 62 14' 30" Long 140 41'
Near Snag Turn-off - U.S. Army? public - bulldozed over
Snag - 17 miles off hwy - U.S. Army, established weather station and flight strip in 1942 - part of NWSR

MP1200.7 km1932 Ak Hwy Lat 62 21' 45" Long. 140 52'
Beaver Creek-U.S. Army, 22 bldgs here in 1945, both sides of Beaver Creek bridge - old dump, vehicles, wood debris -1976

MP1205.5 km1940 Ak Hwy Lat 62 26' 30" Long 140 51' 30"
Canol No.4 Pump Station H - U.S. Army- debris burned

MP1206.2 km1941 Ak Hwy Lat 62 26' 30" Long 140 51'
Beaver Creek-Maintenance Camp-U.S. Army, 16 buildings in 1945, some areas covered, debris burned

KLONDIKE HIGHWAY

TAGISH

MP66 km106.2, Lat 60 10' 30" Long 134 41'50"
Carcross Dump - U.S. Military Dump to present use

MP159.2 km159.2, Lat 63 35'15" Long 134 51'20"
Ammunition Explosives Storage (Mile 3 Carcros Road)- perhaps U.S. Army,(Yukon Explosive Lease, mounds around containers)

HAINES ROAD

HAINES JUNCTION

MP96 km154.5 Haines Road Lat 60 02' Long 136 50' 30"
Abandoned Gas Station - less than 400m from Blanchard River

APPENDIX M: (Cont.)

HAINES ROAD (Cont.)
HAINES JUNCTION (Cont.)

MP103.5 km166 Haines Road Lat 60 06' 30" Long 136 56' 10"
Million Dollar Camp - U.S. Relay Station - dump in ravine near Takhanne River

MP122 km195 Haines Road - Lat 60 20' Long 137 02'
Dezadeash Lodge - old Army dump? + public/commercial

ROBERT CAMPBELL HIGHWAY
WATSON LAKE

MP.9 km 1.5 Campbell Hwy Lat 60 04' 30" Long 128 44'
near subdivion area, covered with gravel

MP8 km 13 Campbell Hwy Lat 60 07' 20" Long 128 48'
near Jct with Watson Lake Airport Road - U.S. Army dump bulldozed over

MP8 km 13 Campbell Hwy Lat 60 07' Long 128 49'
Watson Lake Airport - about 20 bldgs made after War II some areas bulldozed over
Watson Lake Airport Road Lat 60 07' Long 128 48' 20"
U.S. Army - site covered over

MP8.6 km 14 Campbell Hwy Lat 60 07' 30" Long 128 48'
Jct Windid Lake & hwy - U.S. Army + public -covered with gravel

MP10.6 km 17.2 Cambell Hwy Lat. 60 10' Long 128 55'
first left past junction with radio tower road- U.S. Army dump. No closure procedures (1984).
Comments: Mr. McCallum said he put 3-45 gallon drums of DDT here around 1963. None were found on inspection. Soil samples indicated p.69 ug/g Total DDT (Aug. 1984)

ROSS RIVER

MP231.7 km 373 Cambell Hwy - Lat 61 58' Long 132 25'
U.S. Army + public - reused many times covered old dump (80m x 120m) and trench (6m x 35m)

MP236 km 380 Cambell Hwy - Lat 61 59' Long 132 25'30"
Ross River - U.S. Army - buried debris/exposed metal, some of area covered with soil

SOUTH CANOL ROAD
TESLIN

MP0 Jct MP836 Km1345.9 Ak Hwy Lat 60 29'20" Long 133 17'40"
Canol Camp - MP 0 Canol Road- U.S. Army - tank Area bulldozed over

MP0.5 km .8 S.Canol Road Lat 60 29' 20" Long 133 18' 00"
U.S. Army- Abandoned vehicles collected for disposal (100-200), Canol Road Cleanup storage,

APPENDIX M: (Cont.)

SOUTH CANOL ROAD (Cont.)
TESLIN (Cont.)

MP1.5 km 2.4 S. Canol Road - km Lat 60 30' Long 133 16'
U.S. Army dump-large(20m x 35m?)-covered up area-trench? very old

MP46 km74 S.Canol Road Lat 60 49' 15" Long 133 02' 50"
Sawmill- Quiet Lake - U.S. Army - bldgs decayed - site overgrown

MP61 km98 S.Canol Road Lat 61 09' Long 133 04'
U.S. Army, Campground, hwy maintenance camp, covered many times, still open

SOUTH CANOL ROAD
ROSS RIVER

MP142 Canol Road Lat 61 56' 50" Long 132 29' 30'
near Jct South Canol and Campbell Hwy- U.S army - metal debris - used for metal refuse containment for Canol Road clean up 1976, contains 30-40 vehicles, 2000 crushed 45 gal. barrels (1983)

APPENDIX N: REVIEW OF HAINES-FAIRBANKS PIPELINE RECORDS (1953-1995)

FACILITIES/MANAGEMENT PROCEDURES:

June 30, 1953 - Haines -Fairbanks Pipeline Treaty Agreement between Canada and U.S.:
All land or interest in land required for the right of way including any pumping stations and for access roads will be acquired by and remain in the title of Canada. It is mutually agreed upon that the common defense of the two countries will require continuance of the pipeline for a minimum period of twenty years. The United states will connect the Haines Fairbanks pipeline to the three inch Whitehorse-Fairbanks (Canol No.4) pipeline at a point near Haines Junction. The United States will permit additional connections to be made to both the Haines-Fairbanks and the three inch line within Canada on reasonable terms and conditions as shall be mutually agreed upon. For the period of operation by the United States of the Haines-Fairbanks pipeline, the United States, if requested by Canada, will continue to operate and maintain the (Canol No.4) between the point of connection and Whitehorse. In operation of both the Haines-Fairbanks line and the three inch pipeline and the storage facilities at Whitehorse, the United States undertakes to make available at the request of Canada, on reasonable terms mutually agreed upon the use of these installations to meet the civil needs as military requirements permit. Also includes disposition of Skagway to Whitehorse pipeline (Canol No.2 line). The United States will be responsible for the satisfactory disposal of any construction camps and materials abandoned in Canada after the completion of the pipeline. This agreement contemplates that communication facilities may be erected, operated and maintained at the expense of the United States located within or reasonably near the right of way, for use solely in the construction and operation of the pipeline. "The United States undertakes to make reasonable provision for the disposition of claims and for the satisfaction of any claims arising out of damage or injury to persons or property occurring in the territory of Canada in the course of or connection with the construction, maintenance or operation by the United States of the pipeline or any of the works herein provided for."

May 1955 - Operating Manual
U.S. Corps of Engineers Alaska District, Products Pipeline Haines to Fairbanks Alaska Operating Manual (Section on brush and weed control), prepared by The Fluor Corp, Ltd. Los Angeles, California, May 1955.

June 30, 1955 - Hydrostatic Testing Program - Corps of Engineers - Alaska (Memo)
The hydrostatic testing program was started by the contractor on June 23, 1955 and is proceeding satisfactorily. Small leaks occurred in flange gaskets and valve lubricating fittings. "We expected to find a few bad joints of pipe in the Canadian section so testing progress is proceeding normally."

January 15, 1957 - Winter Operation Conference (Memo)
The operating agency intends to eliminate the check valves from the line and replace some of them with hand operated gate valves. Before any action in this regard the matter should be

cleared with Canadian officials because at their request the line was over-valved in order to protect the fish and wildlife in the drainage valleys along the route.

August 10, 1961 - Dept of Northern Affairs and National Resources - (Canadian Memo)
Canada has made a formal request to pump products for Canadian use through the pipeline. The U.S. Army may not enter in this arrangement as this is not directly related to the facilitation of national defense. The Canadian government has not asked that the U.S. government make the pipeline available for Canadian civil needs.

September 17, 1965 - Testing of Oil and Gas Pipelines (Report)
National Energy Board requirements for testing the strength and leakage of oil and gas pipelines.

January 1, 1966 - General Description of Facilities (Petroleum Distribution Office - U.S. Army Report-USARAL)
This report gives detailed information on the pipeline and pumping stations, buildings and equipment, from Haines to Fairbanks. (Provided by E.Kelly).

May 1968 - Corrosion Studies Dezadeash Lake area, Haines-Fairbanks POL (Report)
Corrosion was studied along the pipeline from pipeline post PP114-127. Of primary concern was the pipe at PP119.1 (Break occurred here May 2 ,1968) where concentrated erosion had perforated the line. Approximately 500 ft of line adjacent to the perforation showed extreme pitting due to unfavourable soil conditions. This was the second line penetration since the line went into operation. The first occurred above Haines (Alaska) in 1965. No major maintenance of the POL line was done to prevent loss of metal due to corrosion, nor was the entire POL line examined for unfavourable soil conditions. None of the line received any protection in the form of surface coatings other than factory applied pipe varnish. Three areas in the vicinity of Slims River and Kluane lake have been protected with magnesium anodes.

August 1968 Recommended Condition Survey (Memo)
In view of recently completed inspection of pipeline a tuboscope examination is recommended, for that excessively corroded line now existing between Haines, Alaska and the border, Blanchard River and Haines Junction, Destruction Bay and Beaver Creek, Fort Greeley and Fairbanks.

August 1968 - Corrosion Report/Photographs - Dezadeash Lake area
Portion available - includes recommendations for pipe repair and photographs.

December 1, 1968 - General Description of Facilities Haines-Fairbanks, Whittier-Anchorage Pipeline Pamphlet 360-1 (Report)
Full description of buildings, equipment at each of the pump stations along Pipeline from Haines, Alaska, to Fairbanks, Alaska. Pages of this report have been Laser copied of each of the Pump Stations within B.C. and Yukon. (See Appendix I).

April 10, 1969 - Emergency Operation Procedures (Army Memo)
Standard operating procedures for line break, repair and pollution control. Block valves will be closed by the fault and pressure readings from pump station personnel will be obtained to localize the position of damage. Line crews will inspect and remedy the site as quickly as possible. The potential sites of serious pollution are numerous...

April 11, 1969 - Contact Canadian Authorities (Army Memo)
Contact should be made to Defense Construction Limited (Ottawa firm in liaison with U.S. agencies) , whatever Canadian Government has as a contact and liaison officer for this repair project (replacing pipe along Dezadeash Lake). It is our belief that the existing treaty (due to expire in June 1973) is sufficient for planned construction. Adequate safeguard can be incorporated into bidding documents to protect Canadian contractors and labour and use of Canadian material.

May 19, 1969 - Emergency Repairs -Dezadeash Lake - US. Army Memo
Request that you take action to repair 12 miles of corroded pipeline near Dezadeash Lake, Canada. The Canadian government has stated that any future spill in their country, particularly in this area will be received very unfavourably. This Headquarters recommends that you operate the pipeline with minimum essential repair while the future requirements for and status of pipeline is documented to provide a basis for deciding the extent of the total repair project to be accomplished. Major repair of pipeline estimated to cost $96.08 million, minimum repair and replacement of Dezadeash section to cost $25.74 million.

June 25, 1969 - Replacement of Pipe-Dezadeash - US Army to Engineering -YT.
Bids will be tendered in mid July 1969 to replace 13 miles of pipe in the Dezadeash area of the Yukon Territory between PP104 to PP126, which will be buried. We intend to include provisions for the use of Canadian labour, Yukon labour rates, and Canadian materials.

July 29, 1969 - Field Investigation PP109-126 - Dezadeash Lake- US. Army memo
Best time for replacement of pipe along Dezadeash Lake is between mid October and mid June. Odours are still present and clean up operations are still in progress by POD personnel for the oil spill at PP119.

September 1969 - Repair to Fairbanks Pipeline -U.S. Army Memo
Under the terms of the treaty there is no requirement to furnish technical data to the Canadians, nor are repairs or modifications subject to their approval. Ottawa was contacted to inform of proposed pipe replacement for a 12 mile section at Dezadeash Lake. The pipe would be API5L, Grade A seamless with a 54 mil polyethylene extruded sheathing. Replacement would be done by December 31 and the remaining repair during the 1970 season.

January 5, 1970 - Repair of Haines-Fairbanks Pipeline - U.S. Army Memo
Of the $155,000 available for repairs, $130,000 has already been spent. Original instructions were to repair the line from Haines to the Canadian border. This was changed to repair the

Dezadeash Lake section of the line.

February 27, 1970 - Salvage of Pipe at Dezadeash Lake - U.S. Army Memos
Obtain approval from Canadian Government to abandon in place the buried portions of the old pipeline and to use alcohol for purging the twelve miles of replaced pipe. The only major contamination to date was on Dezadeash Lake, May 1968. As a result operating pressure along the line has been reduced as a deterrent measure. The pipeline may not have a useful economic life to the U.S. Army considering the proposed availability of commercial petroleum products in Fairbanks. It is suggested that buried portions be abandoned in place as these are believed to be the poorest portions of the pipe and would be of little value to the contractor.

The recommendation is that the Canadian-U.S. agreement will not be renewed in 1973 and that the Canadian Government should be advised that only routine repairs and maintenance are now anticipated until 1973. The present contract requirements call for the existing pipe to be examined, cut up in lengths of approximately 40 feet, sprayed with Santolene "C" capped with plastic caps and stockpiled. All pipe with severe erosion is to be marked, removed and disposed of by the contractor. If the fuel remaining in the existing pipes were to be displaced with water, instead of alcohol additional savings would accrue. The requirement for alcohol purging remains in place with the alcohol reduced from 15,000 to 10,000 gallons.

September 28, 1970 - Inspection of Haines-Fairbanks Pipeline (R.Smyth -Report)
Where the line has been buried and then emerges from the ground serious corrosion was found near the Donjek River (PP262). In the Kluane Lake area (PP187) the pipe was lying on the dry lake bed approximately 30 yards from shore. This pipe is subject to ice action and possible breaks. In a meeting held August 12, 1969, the U.S. Army officials agreed to reduce operating pressures in the Canadian portion of the pipeline from 1440 p.s.i. to 1000 p.s.i. There are large temperature fluctuations resulting in observed pumping pressures being drastically different from the calculated hydraulic conditions which should be present. About 4000 ft of pipe are being replaced this year around PP118 (Klukshu). "The standards of construction used would be more appropriate for a temporary war time pipeline than a permanent pipeline for 20 years operation."

September 18,1972 - DIAND Inspection Report- Haines- Fairbanks Pipeline, Yukon Territory
Full description of the pipeline and facilities, areas of buried pipe and also methods for clean up are proposed. (Described in detail in text).

October 13, 1970 - National Energy Board Canada to External Affairs (Letter)
The future of this pipeline is being actively pursued by the Canadian Permanent Joint Board of Defense. A reply from the U.S. Secretary of Defense would be appreciated. A systematic program of replacement of pipe is recommended. Severe corrosion also exists near the Donjek River Bridge. The U.S. is reluctant to proceed with major rehabilitation of the pipeline, an expenditure of $28.8 million. There is a serious concern for pollution from potential oil spills.

October 19, 1970 - US Secretary of Defense to External Affairs, Ottawa (Letter)
A PJBD meeting scheduled for October 19/1970 has been cancelled. The matter of the physical condition of the pipeline needs to be discussed with U.S. authorities.

January 28, 1971 - National Defense to External Affairs, Ottawa (Letter)
We were informed from Washington last March of a tuboscope survey of the pipeline but we have not been told officially. We understand that Army authorities are preparing a report which will make recommendations regarding the repair or abandonment of the line. This is necessary so that work can be completed this summer.

March 2, 1971 - Briefing for Permanent Joint Board on Defense (PJBD) - Letter
The pipeline is surface laid for 478 miles out of the 626 miles. The 20 year treaty expires on June 30, 1973. On October 5, 1970 the operational elements were instructed to keep the line pressures below 1000 psi at Border station and 800 psi at every other point on the line. A weekly aerial flight is conducted along the pipeline for surveillance.

March 15, 1971 - Environmental Pollution Abatement - USARAL Memo
Outlines procedures for pollution control. Pollution incidences have to be reported immediately to minimize unfavourable publicity to the United States, Alaska. Information relating to pollution incidences will not be released to the news media or to outside commands or agencies except by headquarters. Reports will be prepared each time ecological damage is observed etc.

April 29, 1971 - Department of Fisheries - Ottawa (Memos)
A decision will be made at the end of June as to whether the pipeline will be disposed of or the Canadian portion rehabilitated to the PJBD satisfaction. Meetings with U.S. officials are summarized. A few proposals from private interests had been received but these were not acceptable at the present time. Information for pipe lengths in Canada: Border to Blanchard-255 lengths; Donjek to White River - 174 lengths; White River To Scotty Creek -607 lengths. Pipe with severe corrosion, listed by pipe lengths: Border to Blanchard- 19 lengths; Donjek to White River-23 lengths; White River to Scotty Creek- 13 lengths.

October 22, 1971 - National Energy Board Meeting - U.S. & Canada Officials
Plans were discussed on the disposition of the pipeline. Sale of the entire pipeline appeared as one of the methods for disposal. Six companies were interested in buying it including Standard Oil of California and Imperial Oil Ltd. This was deemed not possible for the U.S. to acquire the right of way in Canada, as this land is in title of Canada and U.S. authorities could not sell it to a commercial contractor. It was decided that the Canadian portion of the pipeline would not be allowed to operate in its present condition. "There is no assurance that the corrosion can be arrested and that no further breaks would occur." At the June 1971 PJBD meeting a decision was reached to suspend Haines-Fairbanks pipeline operations. The treaty expires on June 30, 1973. Studies have been conducted to ascertain whether an economic advantage could be gained by Canada using the pipeline but no lowering of tariffs could be expected. No Canadian Government Agency indicated a desire to utilize the line.

November 23, 1971 - Department of Fisheries-Ottawa (Memo)
In July and August of this year, the portion of the line from Haines to Tok , Alaska, including the entire Canadian section, was emptied of gasoline and cleaned with alcohol and water. This line now constitutes no threat to the environment. If the line is put back in service, it will require upgrading costing from $12-28 million.

January 31, 1972 - National Energy Board-Ottawa (Memo)
A meeting was held October 7-8,1971 at the National Energy Board offices regarding the pipeline. Canadians insist on complete rehabilitation. Canadian representatives were generally satisfied with the evacuation of the pipeline, there was some concern expressed that there was some doubt that if this pipeline is empty of products for several months it might fill with water vapour and set up a corrosive atmosphere, and that some consideration should be given to use an inert gas to prevent corrosion deterioration internally to the pipeline. The tuboscope survey will give only a measure of degradation of the pipeline system not an exact measure. The National Energy Board will be in charge of this pipeline and will treat it the same as any other pipeline under its jurisdiction in Canada.

May 1972 - Report on Research under the Environmental-Social Program Northern Pipelines (Environmental-Social Committee-Task Force on Northern Oil Development)
A number of reports provide a summary of pipeline studies undertaken in 1971-72, to establish a context for the development of government policy. This work covers a range of disciplines of interest to anyone concerned with potential oil and gas pipelines from the north. Members of committee to contact in Ottawa listed.

July 1972 - Informal Assessment of Cultural Values on the Route of the Haines to Fairbanks Pipeline - Alaska Division of Parks
We would recommend that before sale of lands in question that the archaeological potential be determined. Brief description of native peoples along the pipeline route is described.

August 25, 1972 - Guidelines For Removal or Rehabilitation of Haines-FairBanks Pipeline System - Environmental Protection Service - Edmonton, Alberta
Guidelines fulfil regulatory requirements, pertinent to the proposed removal or rehabilitation. The pipeline facilities, include all pumps stations, associated structures, tanks, access roads, etc, along with communication sites, airfields, camps, material sites, bridges, equipment, signs and fences. Precaution should be taken to minimize damage to water, land, fish, wildlife and vegetation. Where removal of the pipeline system may cause substantial and long lasting damage to the environment, these parts shall be left in place, in a condition which will not be a public hazard, release pollutants or detract from the landscape or future uses. Erosion control should be provided and disturbed areas should be flattened to blend with the natural landscape, except where more damage could occur, ie. to disturb native vegetation, alter established drainage patterns or cause excessive damage to the terrain. All unvegetated land surfaces resulting from past operation, removal or rehabilitation of the pipeline should be revegetated, ie. in the pipeline corridor and pump station areas. Revegetation may require the use of grasses, shrubs, fertilizers, mulches, topsoil and adhesives. Pollution resulting from

spills of oil, fuel or other pollutants from the past operation of the system should be corrected. All combustible garbage, waste and debris should be removed or burned and similar non-combustible materials should be removed or buried. All buildings machinery, equipment, materials and storage containers should be removed from the camp sites. Fuel should be stored and dispensed in a manner that will prevent pollution of land and water resources. Special consideration should be given to the following environmentally sensitive areas: South end of Kluane Lake and those portions bordering Kluane National Park; and water sources containing commercial or sport fish.

August 30, 1972 - Environmental Protection Service - Vancouver (Memo)
EPS has reviewed the removal of the pipeline and requests that: EPS be informed of process and will survey the activities. The movements of machinery or activities shall minimize the introduction of suspended matter and silt into streams frequented by fish. Gravel shall not be removed from the wetted perimeter of any stream for any purpose. The EPS- Pacific Region will handle the Yukon Territory.

September 7, 1972 - DIAND - Ottawa (Memo)
The removal or rehabilitation of the pipeline falls under the authority of Department of Indian Affairs and Northern Development and must be considered as land use operation. The Territorial Lands Act and Regulations will apply. Application for a Land Use permit will necessitate advice and comments from the Advisory Committee.

September 18, 1972 - Haines-Fairbanks Pipeline Yukon Territory - DIAND Report (#1)
Contents of this report are described in the text, including locations/ lengths of pipe buried and salvage methods which should be used. (59)

September 29, 1972 - DIAND -OTTAWA (Memo)
The Yukon Territory is in favour of seeing the line disposed of by sale to a private entrepreneur for reactivation, the benefits from employment being a major factor.

October 31, 1973 - Environmental Protection Service (Memo)
The "Guidelines for Removal or Rehabilitation of Haines-Fairbanks Pipeline System" (8/25/1972) in our opinion adequately state our position.

November 23, 1973 - National Energy Board - (Memo)
General Services Adminstration (GSA) of the U.S. Government met with NEB to discuss the disposal of the pipeline. There are rehabilitation measures which should be met by GSA. As the pipe is above ground it is subject to wide ranges of temperature which can cause "skin" cracks and imposes extra stresses from thermal effects. The pipeline as it now exists does not have a legal survey nor a right of way. If privately owned land is found, permission to cross that land would have to be obtained from the land owner or tenant. The U.S. cannot lease land in Canada to another agency or company. The Treaty does not appear to include this in its terms and conditions and a revision of the Treaty would be necessary.

April, 1974 - Haines-Fairbanks Pipeline Yukon Territory - Appendix (#2) - DIAND Report
The treaty was originally to expire on June 30, 1973 but was allowed to extend itself , by mutual agreement, for an indefinite period, when neither party acted officially to terminate it. The line has had a number of oils spills, the most recent and serious at Dezadeash Lake in May 1968. This spill was cleaned up to the satisfaction of the National Energy Board and the Northern Natural Resources and Environment Branch of DIAND. A lower than design operating pressure had been used due to severe corrosion pitting parts of the line up to 75% of the pipe's wall thickness. In July 1971, the pipeline was purged of oil and capped. U.S. military estimated repairs at $6 million to meet NEB standards and operate in the 1400-1600 psi range. Companies interested in buying the pipeline are listed. At termination, the pipeline and installations shall remain with the U.S. government and the U.S. may remove the pipeline from the right of way , restoring the surface to its original condition as far as practical and reasonable to do so in the opinion of Canadian authorities. The U.S. could be persuaded to pass the assets in part or whole to Canada.

April, 1974 - Background Paper On Disposition - Haines-Fairbanks Pipeline Yukon Territory - Appendix (#3) - DIAND Report
Prepared for the ACND Sub-Committee on Transportation, an analysis was done to determine if it would be feasible for the pipeline to supply Yukon petroleum requirements. Rates would have to be lower than that provided by Whitepass Petroleum to make it feasible. Replacement cost for the pipe would be about $30,000 /mile for 160 miles. A 3" line from Haines to Whitehorse would cost 3.5-4 million dollars. Due to imminent possible future change in the petroleum -transportation systems in the Yukon, it is not recommended that any long term fixed arrangements concerning the use of the pipeline be made.

April, 1974 - Haines-Fairbanks Pipeline Yukon Territory - Appendix D (#4) DIAND Report
This report covers requirements for the rehabilitation and continued operation of the pipeline as well as the dismantling of the pipeline. For dismantling: 1. All surface pipe, block valves and similar surface installations must be removed; 2. All pumping stations must be removed including tanks, piping, buildings and equipment supports. Concrete floors, foundation etc. are to be covered to a depth of two feet with soil. (Relief from this shall require approval of Government of Canada.) 3. Within two years after the termination of the treaty all materials from the pipeline shall be disposed of. Pump stations shall be suitably rehabilitated, including regrading, removal of dykes and culverts, and restoration of land to its original condition. Disturbed surface areas are to be reseeded or revegetated to conform to the adjacent terrain.

May 31, 1974 - Field testing of Oil & Gas Pipelines - Provided by U.S. Government to National Energy Board Meeting
Report on hydrostatic testing of the pipeline, patrolling for leaks and breaks.

July 8, 1974 - Environmental Protection Service - Yukon (Memo)
If the pipeline is to be put into action again new conditions will be required including a spill contingency plan and additional improvements.

December, 1975 - External Affairs - Ottawa - (Memo)
Part of the U.S. proposal for the pipeline is to retain ownership and continued interest in the right of way with the line leased to a commercial operator. In Ottawa we have a difficulty with this and would propose that the line be sold to a company incorporated in Canada and would operate the line according to Canadian regulatory requirements.

November 12, 1976 - Province of British Columbia - Policy Division (Memo)
The 1953 pipeline treaty (PC 1071/53) indicated that the land is to be returned to British Columbia two years after the lands have been actively used for pipeline purposes. It is therefore requested that the lands covered by the treaty be returned to British Columbia (25ft either side of centre line of pipeline). This land is needed to facilitate re-construction of the Haines Road.

January 24,1977 - British Columbia Land Management Branch, (Letter)
Further correspondence on the transfer of land within the Haines-Fairbanks pipeline back to British Columbia, is sent to National Energy Board (NEB).

February 1977 - Special Report 77-4, Haines -Fairbanks Pipeline, Design, Construction and Operation, DE. Garfield, C.E. Ashline, F.D. Haynes and H.T. Ueda, (CRREL)
The completed length of the line was 626 miles, which was 11 miles longer, to go around rather than across 290 ft deep Kluane Lake. During construction few environmental precautions were recorded. After construction, water was pumped into the line for hydrostatic testing in late summer 1955. Enough water was pumped into the line to extend for 200 miles, followed by a batch of diesel fuel and this followed by a batch of jet fuel. Test pressures were 1500 lb/sq.in. on the Alaskan portion of the line and 1900 lb/sq.in. on the Canadian portion. Four ruptures developed in the Canadian portion, mainly caused by tractors running over the pipeline. Repairs were made and hydraulic testing completed in August. William Brothers Co. operated the pipeline until the U.S. Army accepted the facilities in October 12, 1955. After this it was discovered the pipeline was blocked, with water left in the line frozen in the "valleys", downstream from Junction Pump Station. Wood fires were lighted to remove some of the ice blockage and the pipe was cut in seven locations, but attempts to purge the line were unsuccessful. Full scale purging operations began January 23, 1956. Where ice was located, gate valves upstream and downstream from the plug were closed. Most attempts to construct a collection basin for the fuel were unsuccessful, since the ground was frozen. Lines were cut, purged, and rewelded 28 times between PP195.8 to PP382.5, from Haines, Alaska. To minimize the water in the line, water was removed daily from the bottom of all storage tanks. In 1961, a redesign was initiated to increase from 1,500 barrels per day (BPD) to 27,500 BPD. Six new pump stations would be installed to be completed by September 30, 1962. "Due to the urgency of this project the new facilities would be considered temporary construction." A 1960 report cited annual savings in transportation costs in excess of $3.5 million. During 1970, the pipeline transported 1.3 million barrels of JP-4 and 54.6 million barrels of gasoline for support of Vietnam flights, Alaska Air Command and Army aviation operations in Alaska.

During 1970, when a 12 mile section of pipe running under the Klukshu River was replaced , the river had to be diverted, the salmon herded through the diversion and then herded back to the original channel when construction was completed. About 10,000 gallons of fuel were drained from the line and trucked to Haines, Alaska.

Many problems occurred because of the arctic climate and the urgency of the project. Construction was temporary in nature and a vigorous program providing for the protection and longevity of the pipeline was not pursued. A pipeline exposed to severe temperature differences in the arctic must be carefully designed for thermal expansion. Pipe movement required considerable maintenance on the Haines-Fairbanks pipeline.

July 12, 1978 - Pipeline Right-of- Way in BC, External Affairs - Ottawa to Victoria, B.C. (Memo)
We have not had a reply from the U.S. government regarding the future of the pipeline. We are now preparing for meetings to determine the plan of action which may include the termination of the Agreement.

April 18, 1980 - General Services Administration (GSA) to Alaska Environmental Protection Agency (Letter)
The GSA is planning to dispose of the pipeline and is in the process of preparing an assessment of the environmental impact of the proposal. The pipe itself will be disposed of for off site removal only in Alaska. Of the 299 miles of pipeline in Alaska , 122 miles are buried. We are requesting your agency's comments regarding possible adverse impacts upon the environment, resulting from removal of the buried pipe.

January 15, 1982 - Description of Alaskan Military Petroleum Facilities, 172D Infantry Brigade (Alaska), Pamphlet 360-1
The Haines- Fairbanks pipeline was excessed to military needs in 1973 and the pipeline has been up for been up for sale since that time. This report gives a full description of facilities at each pump station, similar to the December 1968 report (Pamphlet 360-1).

January, 1987 - Inventory Report for Haines-Fairbanks Pipeline- US.Army Engineer District - Alaska -URS Corporation
Under the direction of the Army Corps of Engineers, an inspection was conducted of the pipeline within Alaska from Fairbanks to the Canadian border. Potential POL or hazardous materials were not identified. "There is a possible presence of POLs in the pipeline and storage tanks and possibly at spill sites and at pumping stations. These spill areas may have possible soil and water contamination. No contamination was observed but the potential exists." The clean up and restoration of the pipeline could cause more damage to the environment than abandoning the line in place.

OIL SPILLS:

June 30,1955 - Progress Report No.2 (Letter)
Letter states that hydrostatic testing program on pipeline was started by the contractor on June 23, 1955. Several small leaks occurred in flange gaskets and valve lubricating fittings. Several leaks occurred due to splits in laminated sections of the English pipe. " We expected to find a few leaky fittings on the valves and a few bad joints of pipe in the Canadian section. Therefore we can report the testing procedure is normal and generally satisfactory." (Also mentioned in Facilities/Management section).

February 1956 - Canada Dept. Northern Affairs & National Resources (Memo)
Considerable difficulty has been experienced in the operation of the Haines-Fairbanks pipeline due to ice blocking the passage of fuel. In clearing the line, it has been necessary to cut it in a few places. Orders are that oil should be burned as soon as possible after it has been released. Where the fuel has been burned soon after it has been released, there was evidence of an extremely hot fire, covering considerable area. The fire was still smouldering in the berm sixteen days after the burning had been done. Evaporation would remove the greater part of the fuel before spring. It is felt that stream pollution is not a factor. It is suggested that the burning of the spilled fuel be discontinued. "It would be appreciated if the fire already set would be extinguished completely."

May 3, 1956 - Canada Department Northern Affairs & National Resources (Memo)
The clean up of jet fuel spilled along the pipeline will proceed and be completed May 3rd, 1956. Residual hazards exist at the following points, MP1120.5, 1146.1, and MP1151 where fuel soaked grass is close to the Alaska Highway. It is recommended to cover the area with a chemical in the form of powder or foam, to reduce the potential of fire.

May 22, 1968 - Pollution of Dezadeash Lake - Game Branch, YT.
A leak was first detected at approximately MP129 on the Haines Road. On May 17th, there was a drop in pressure, recorded between pump stations (Haines Junction, MP1026 Ak Hwy) and Blanchard Station (MP94 Haines Road), indicating a break on the line. Officials in Anchorage were informed that evening but field crews did not commence until May 20th to uncover the line which is underground for about 7 miles in this area. Actual figures were not given to this department, but it is rumoured that about 2000 barrels were lost. The actual leak is at PP129 but it appears that the oil is seeping into the lake for a distance of 1 1/2 miles with the spring run-off. In some areas the oil film is one inch deep. We have recovered a few dead waterfowl and fish, and there are a number of ducks and geese resting at the lake on their way north. We feel that immediate action should be taken to prevent any further spread of the oil.

September 10, 1968 - Dezadeash Oil Spill - Sessional Paper, presented in Yukon Legislature, YT. (Report)
This report describes effects of oils spill at Dezadeash Lake in detail. At the time the leak was discovered (May 17,1968) the pipeline was carrying jet fuel. The exact number of gallons lost is considered classified information by the U.S. Army and these authorities were not

pressed for this information. D.P.W. (Highways) was asked to divert a stream which was flushing a major portion of the saturated hillside into the lake. On the 22nd of May, about one and a half miles of beach were oil contaminated. Fortunately drifting packs of needle ice and prevailing south wind had concentrated the oil leakage in narrow pools along the edge of the ice. Due to the slow response of the American Army in attempting to clean up the oil seepage into the lake, permission was obtained by the Alaska Support Command to bring in a number of local men (12) and set up our own camp to begin collecting and burning the oil. Maintenance crew from Haines Junction were put to work, digging pits and trenches along the hillside to act as catch basins, for the oil seeping from the saturated hillside. This oil was skimmed from the surface by hand and collected in 45 gallon drums. Baled straw was obtained from the Experimental Farm in Haines Junction and also trucked in from Alaska. This was spread on the north end of the lake where the prevailing south wind had concentrated the oil. The straw collection worked well and burned readily enabling the extraction of most of the surface oil from the lake. Pumps were employed to maintain the water level below the top of the catch basins and dyke at the lake. Crews worked night and day to collect the oil. A.P.T. boom and two army boats arrived and the boom was set up around the leakage area. A number of ling cod and whitefish were killed. Between 600 and 800 fish were found on the beach. Very little bird mortality was observed as they were at the south end of the lake in the lee of the wind. A US.Army engineer from Alaska arrived on May 31st to survey the situation. Billings were discussed for reimbursement carried out by the Territorial Government on behalf of the American Army. Total expenditure was close to the $6,500 mark. By the second weekend in June, satisfactory results were obtained. Two barrels a day were still being collected from the collection pits. The pooling of equipment and personnel and the quick action of the Department of Fisheries, the Yukon Forest Service, the Territorial Game Branch and the Department of Public Works, prevented what may have easily been a catastrophe to one of the finest lakes in the Yukon. (Submitted to Council-James Smith-Commissioner).

April 1972 - Preliminary Investigations of Petroleum Spillage, Haines -Fairbanks Military Pipeline, Alaska, W.E. Rickard,F.Deneke, April 1972, Cold Regions Research & Engineering Laboratory. (Report)
Primary fuels pumped through the line are: Diesel Fuel,grade DFA; Aircraft turbine and jet engine fuel, JP-4; Automotive combat gasoline, grade 95C; Aviation gasoline, grade 115/145.

In 1955, upon completion of pipeline construction, water was pumped in the line to test for hydrostatic testing. The U.S Army assumed command of the line in October 1955, "with all systems operating satisfactorily." When the petroleum was first introduced into the line it would not pass through the pipe. It was discovered that the water used to test the line had not been completely removed and that it had frozen inside the pipe, blocking petroleum flow in several locations. In January 1956, the Army began efforts to determine the exact locations of the frozen sections. Blocked areas were determined by the pressure variations at different locations, by maintaining 1000 psi near the origin of the pipe (Haines Terminal - Mile O). When areas of low pressure were found the line was walked and tapped with a 10 lb hammer. A sharp ringing sound indicated a clear pipe and a peculiar sound indicated ice in the line.

Where ice was located, the pipe was cut and the loose end placed off to the side of the 50 ft right of way to eliminate fire hazard when the pipe was welded back together. Attempts were made to make catch basins but these were impractical because of frozen grounds. The line was purged and the fuel allowed to run out on the frozen ground. The rate of flow from the open end varied but it was known to often exceed 500bph. The exact amount of fuel loss cannot be assessed with any degree of accuracy. During these de-icing operations in 1956, 28 cuts were made. In the Yukon, 27 of the 28 cuts were made between PP195.8-303.5 (MP1066-1182 Ak Hwy). Since 1956, there were 12 recorded ruptures and of the twelve, five are attributed to corrosion of the pipe, seven were caused by man, due to accidents and bullet holes.

In 1971, 20 spills were investigated, 11 of these were within the Yukon, including PP114.5, 119.1, 197.1, 207.6. 217.1, 244.7, 256.8, 257.1, 268, 273.2, 290.8. PP337.5 is at the Yukon/Alaska Border. These spills are listed in detail in the Haines Junction and Beaver Creek District Reviews.

Inhibitors used in the fuel in 1953 were the following: a) 2,6-ditertiary butyl-4 methyl phenol, b) N,N' disecondary butyl -para-phenylenediamine, c) 2,4 dimethyl-6-tertiary-butyl phenol. These were applied at a rate of 1 pound inhibitor per 5000 U.S. gallons of fuel for the prevention of gum formation. "It is possible that these concentrations of inhibitors could be responsible for the lack of vegetation growing in the spill areas." As of October 1970, the list of antioxidants in JP-4 has grown to nine.

December 1975 - Research Report 346, USA CRREL Oil Research in Alaska ,1970-1974, F.J. Deneke, B.H. McCown, P.I.Coyne, W. Rickard and J.Brown, Cold Regions Research & Engineering Laboratory

Between 1970-1974 research was conducted on oil spills in Alaska and Yukon along the Haines-Fairbanks pipeline. The pipeline mileages of oils spills are indicated in the Haines and Beaver Creek District Reviews. Two sites were selected for experimentation in 1972, at PP 119.0 near Dezadeash Lake and PP207.6 , south of Destruction Bay. The surface organic mattter was removed or retained, soil was fertilized at different rates and seeded with rye, brome and fescue. The best establishment was on the stripped plots with 112 kg N/ha seeded. Plots which were unstripped with the organic matter intact were still found to be devoid of vegetation. It becomes critical to develop efficient techniques for oil removal and subsequent revegetation.

February 1977 - Haines -Fairbanks Pipeline Design , Construction and Operation, D.E. Garfield, C.E. Ashline, F.D. Haynes, H.T. Ueda, Special Report 77-4, CRREL

This is a summary of oil spills along the pipeline from 1956 to 1970. Water pumped into the line for hydrostatic testing was not properly removed and during deicing operations in 1956 28 cuts were made to purge the line. The fuel was allowed to run out on the surface. In some instances attempts were made to construct catch basins but these proved impractical because of frozen ground. The exact amount of fuel loss cannot be assessed with any degree of accuracy. In one instance fuel was burned off, but this method was discarded and the fuel

was left to dissipate in the environment. Inhibitors were used in the fuel and may be the cause of lack of revegetation in spill areas. Because the fuel (JP-4) is not soluble in water and because of the lack of precipitation, leaching of chemicals from this soil is very slow. (Also mentioned in Facilities/Management).

HERBICIDES

April 9, 1963 - Use of Herbicides (U.S. Army Memo to Yukon Govt.)
Due to the Vietnam situation we are unable to procure 2,4-D, 2,4,5- T, Esteron Brush Killer herbicide for brush control on the pipeline right of way and pump stations. In lieu of the above herbicides we have substituted in Alaska, 25% Fenuron (3-Phenyl -1, 1-Dimethlurea) and 75% Inert ingredient; and Tordon 101 mixture, brush killer, 10% 4-Amio-3,5,6 Trichloropicolinic Acid, 39.6% of 2,4- Dichlorophenoxy-acetic acid, and 50% inert ingredient. Permission is requested to use these herbicides.

February 24, 1965 - Request Permission to Use Esteron (US Army to Director of Game-YT.)
Permission is requested to use a chemical to spray the pipeline right of way. It is proposed that Esteron, manufactured by Dow Chemical Company be used, and applied by hand-generated spray nozzles. The right of way will be sprayed to a width of fifty feet and not closer than 500 feet from any stream or lake.

March 18, 1965 - Authority to Use Esteron (Commissioner, YT to U.S. Army)
Authority is herewith given to use Esteron, supplied by hand-generated spray nozzles to spray to a width of 50 ft and not closer than 500 feet from any stream or lake.

June 10, 1966 - Advise of Spraying (U.S. Army to Dept of Game-YT)
This was a letter to advise that chemical spraying would be started near Haines Junction on June 6, 1966. There was no mention of the chemical to be used.

1967 Standard Operating Procedures - Pipeline Manual (USARAL)
Herbicides: 2-4-D, 2-4-5-T, Esteron were the approved herbicides of the day. The recommended mixture was 1 gallon of herbicide to nine gallons of water. The rate of application was 10 gallons of solution/acre or 60 gallons of solution per mile of right of way. (E.Kelly - Interview)

May 6, 1968 - Game Branch, YT. to USARAL (Memo)
This will acknowledge your letter of April 9th concerning the use of Fenuron Weed Killer in lieu of Esteron Brush Killer on the Haines-Fairbanks pipeline. The Canadian Wildlife Service and Fisheries Dept. are now evaluating the effect of Fenuron on fish and game.

May 9, 1968 -Brush Control-Game Branch, YT. to U.S. Army (Memo)
Acknowledge letter of April 9, 1968 requesting use of Fenuron in lieu of Esteron. There will be an further evaluation on what effect the herbicide will have on the fish and game in the area.

May 10, 1968 - Brush Control - Dept. of Fisheries- Vancouver to Whitehorse
Acknowledge letter of April 20, 1968 requesting comments on the use of Fenuron and Tordon 101 instead of 2,4-D, 2,4,5-T for brush control. Neither of these materials is particularly toxic to fish even at several times the recommended rates of application. The Department does not object to this with the provison that the mixing of spray materials and washing is done in an area well removed from ditches or streams leading to fish bearing waters and that the material is not directly applied over fish bearing waters.

June 14, 1968 - Brush Control- Game Branch,YT. to U.S. Army -USARAL (Letter)
Word has been received from Canadian Federal Fisheries and the Canadian Wildlife Service on the use of Fenuron for brush control. As a result of this information we would prefer that 2,4-D, be used. It is understood that this is available in almost any large centre in Canada. However in the event that you cannot obtain 2,4,-D it is suggested that Fenuron be substituted. You can now consider this authority to apply either 2,4-D or Fenuron Weed and brush killer on the Yukon section of the pipeline right of way.

November 1968 - Brush Control - PP42.5-337.5 (U.S.Army Memo)
It is requested that your office obtain approval from the Federal Committee on Pest Control for the application of picloram (Tordon 101) to control brush along the Haines-Fairbanks Right of Way, from PP42.5-337.5, to facilitate inspection, maintenance and safety.

November 5, 1968 - Brush Control - US Army to Fish and Game ,YT (Letter)
It was requested to use picloram (Tordon 101) for spraying along the pipeline R/W. This chemical was approved by the U.S. Federal Committee on Pest Control and by the Alaska Fish and Game Department for use in spraying the pipeline R/W from the Canadian border north to Fairbanks, Alaska. This work was done in the summer of 1968. Excellent results were obtained in extent of kill on broad-leafed vegetation. Please outline areas within which spraying areas should not occur because of proximity of streams, bodies of water or human habitations.

December 20, 1968 - Dept. of Fisheries Canada (Letter)
Acknowledges letter of Oct 30, 1968 from U.S. Army advising Canada that they intend to employ a 500 foot unsprayed buffer swathe on each side of rivers and streams. " It is our experience that with the low fish toxicity of brush killers, safety zones greater than 100 feet are not required." The Department does not object to the aerial application of Tordon 101 at the specified rates with the provison that: 1. washing of spray equipment and mixing of chemical be done in an area well removed from fish bearing waters and 2) *excess spray materials for disposal should be buried in plastic containers.*

January 1969 - Brush Control in Canada - U.S. Army Memo
Pesticide Unit, Department of Agriculture, Ottawa was contacted in regards to application of Tordon 101 herbicide brush killer. Verbal approval was given on proposed spraying program and formal approval is forthcoming soon.

February 5, 1969 - Brush Control-Canada - US. Army Memo
It is proposed to spray the pipeline R/W in Canada with a non-standard herbicide formulation for brush control using a helicopter application of a thickened mixture of picloram plus 2,4-D similar to the project on the Alaska section during the summer of 1968. Estimated cost is $111,000 dollars. The project documents, have been approved by the Canadian Department of Agriculture (Ottawa), and Department of Fisheries, B.C. (Copies of approval letters from Canada did not appear in this file review.)

March 25, 1969 - US Federal Committee on Pest Control to U.S. Army (Letter)
The committee did not object to the use of Picloram and 2,4-D with the Norbak thickener, in view of unsatisfactory results from 2,4-D and 2,4,5-T on spruce in the right of way. We noted also that the spraying would be limited to within 100 feet of streams, lakes or other bodies of water and would not be considered if the wind is stronger than 5 miles per hour.

June 11, 1969 - Notes on Spray Program
Mr. Hubbard (Spray contractor- Okanagan Copter Sprays) has Tordon 101 being delivered starting June 12, 1969. Permission was given to store material at: Beaver Creek, Donjek, Destruction Bay and Blanchard stations. The contractor is fully responsible for all herbicide stored at the site. Herbicide is in 30 gallon drums. Spray date is June 23. Helicopter will be calibrated in Haines Junction.

June 20, 1969- Okanagan Copter Sprays Ltd. to U.S. Army (Letter)
We are having difficulties acquiring helicopters due to the forest fires in B.C. and Yukon. The chemical has been transported to the sites (pumping stations) by June 20th. We may require an extension from the July 20th completion date, depending on weather.

June 27,1969 - Okanagan Copter Sprays Ltd. to U.S. Army (Letter)
If our spraying contract is terminated we would like to be reimbursed for 85% of the cost of the chemical already delivered to the job sites. We would arrange to have the chemical transported back from distributed places and arrange for storage in Whitehorse.

September 5, 1969 - Damaged Herbicide Barrels - U.S Army (Memo)
During delivery fifteen 30 gallon barrels were damaged (container seams opened, tops and bottoms split) with considerable loss of liquid herbicide. These damaged barrels containing Tordon 101 were rejected and were stored at Beaver Creek pump station. According to the contract the damaged or contaminated material will be replaced.

October 7, 1969 - Damaged Herbicide at Beaver Creek (Dow Chemical)
Dow chemical will replace the 15 damaged barrels (30 gal.) of Tordon 101 that arrived in Beaver Creek. .

October 13, 1969 - U.S. Army to Canadian Commercial Corp. (Memo)
Ruptured drums of Tordon 101 delivered at Beaver Creek ; 11 drums had leaked approx. 10

gallons from each and one was 90% empty. The drums of herbicide delivered to Blanchard, Haines Junction and Donjek stations were not damaged to where they would leak, though some drum damage occurred in transport. Whitepass Corporation was the carrier.

October 1969 - Technical Specifications for Brush Control (US.Army Contract Specifications Report)

Contractor specs for spraying Pipeline Post 42.5 to 337.5 through Canada, a total of 1329 acres. Right of way to be sprayed is 50 ft. wide, spraying centre 40 ft. From Haines, Alaska to north to the Canadian border is to be aerial sprayed to a width of 40 ft, total distance = 274.5 miles. Pipeline pumping stations at Beaver Creek , PP323.8, Donjek River, PP238, Destruction Bay, PP208, Haines Junction, PP158, Blanchard River, PP87 and Border Station, PP47.3, and Haines Terminal, PP0.0, may be utilized by the contractor for storage of materials, equipment mobilizing areas and heliports, providing permission is obtained by the Station Foreman.

The chemical to be used shall be Tordon 101, picloram and 2,4- D, chemical analysis:(4-amino-3,5,6-trichloropicolinic acid (10.2%) (2,4-D dichlorophenoxyacetic acid (39.6%): Inert Ingredients (50.2%). This mixed with water and particulating agent (Norbak) shall give a total application rate of 15 gallons per surface area. This shall be applied at the rate of 72.75 gallons per mile. This should be sprayed by helicopter with a minimum gross payload of 560 pounds of spray material. This will be sprayed with booms at least 1-1/4 inch outside diameter with a maximum wall thickness of .065 inch, and no more than 20 lbs per square inch pressure at the end of the boom. Spray droplets should be as coarse as possible, at approximately 2,000u (microns) to minimize drift and still obtain coverage. The spray boom shall be mounted on the forward edge helicopter skid gear, to eliminate vortex swirl of chemical spray. The system should be calibrated with the particulated spray, using methods sufficiently accurate to establish desired swath width, distribution and coverage within the swath, and volume per acre.

The chemicals shall be delivered to the job site in sealed containers, each fully labelled, bearing the name and trademark of the producer. The empty containers can be disposed of as follows:

1. Sealed and returned to manufacture or supplier.
2. Buried in a sanitary fill with at least 2' of soil cover and where water will not carry the residue into stream channels, or as directed by the commanding officer.

Burning of containers is not permissable as fumes /or smoke from the herbicides could do extensive damage. Any spray material discarded or rejected after mixing shall be disposed of by burial or other manner approved by the contracting officer. Materials discarded or spilled shall not be in a location where streams or lakes would be contaminated, where drifts of flumes would damage crops or timber, or where material could leach downward through the soil and kill vegetation through the roots.

Formulation is at rate of 3 gallons of herbicide to 12 gallons of water plus a particulating agent. Mixing Directions: To prepare 100 gallons of spray, mix 20 gallons of picloram, 2,4,D

with 20 gallons of water. Agitate vigorously and add approximately 12 pounds or particulating agent (Norbak) into the solution and add 60 gallons of water. Each mixture will be tested using a funnel tester and will have a consistency reading of 45 to 85 seconds.

Spraying will be accomplished within established local, state and Federal Regulations pertaining to aircraft operations and herbicide spraying operations. Flight spraying shall not exceed 25 miles per hour, will not occur when wind speed exceeds 5 miles per hour, and is not to exceed 2 feet above the canopy of the trees on either side of the pipeline right of way. Spraying will not occur when the foliage is wet, during rainstorms or 18 hours before a predicted heavy rain. Application should occur at least 6 hours before light rainfall. The designated spray areas are:
PP42.5 to PP51.0 (8.5 miles)
PP64 to PP149 (85 miles)
PP152 to PP186 (34 miles)
PP191 to PP337.5 (146.5 miles) = Total 274 miles

.....and will be given two primary treatments by flying the R/W twice - one half the spray volume being applied in one direction and the other half in the opposite direction. The contractor will come back in four weeks after the primary treatment and spray any areas missed or insufficiently sprayed, as determined by the Contracting Officer. Extreme precautions shall be used to prevent drift damage to areas mentioned in TS-05 (Aerial spraying will not be closer than 500 feet of any building site, stream, lake, cleared area, surrounding settlements, homesteads and pump stations.) An area forty feet of the 50 foot right of way is to be sprayed a total of 274.5 miles from PP42.5 to PP337.5.

Date? - General Project Data - U.S. Army Report
Specifications on Pipeline given. Liquid spray Tordon 101 will be used as it is effective on all vegetation including black spruce, fir and balsam. Liquid brush killer 2,4-D, 2,4,5-T Esteron has also been experimented with, but some species of trees were found to be resistant to it.

April 27, 1971 - Director of Fisheries - Pacific Region (Memo)
Article from Washington D.C. (Sun Washington Bureau) indicated that Tordon 101 and Fenuron, had been used for spraying the right of way. Fenuron is a soil sterilant. John Summers advised that Fenuron had never been used but Tordon 101 was used. A chartered Canadian helicopter was used plus ground spraying by truck and U.S personnel.

September 27, 1994 - Summary of the Non-native Activities in the Klukshu Reserve Area and Their Impact on Traditional Life: A Response to the Federal Offer Respecting the Klukshu Specific Claim by Champagne/Aishihik First Nations. (76)
The information from this report regarding the Haines-Fairbanks Pipeline, specifically on herbicide use and management of the pipeline are indicated in the Haines Junction District Review. (See Appendix P).

March 1995: Report on 1994 Site Assessment & Remedial Response Program, Border Pump Station, Rainy Hollow, B.C., Golder Associates for Environment Canada, March 2, 1995. Work was completed at Border pumping station on the removal of 40 buried canisters of DDT. An empty drum of "carbontetrachloride" (volatile organic compound) was found but no 2,4,5-T (Agent Orange). These canisters were transferred to a permitted facility in the U.S.. A preliminary assessment was done of the trench area near a former airstrip that parallels the Klehini River. Hydrocarbons and DDT were present in the soils around the trench, at concentrations below the drinking water criteria, but above fresh water aquatic life criteria. Fish tissue samples were taken from the Klehini River with DDT levels below detection limits. Further sampling is required to assess potential impacts.

5.0 DISTRICT REVIEWS

The military activities and associated dump sites within each of the seven resource management districts within the study area are summarized. Interviews which have been conducted are presented according to district, from east to west along the Alaska Highway and from south to north along the ancillary highways.

A summary table of the seven districts has been prepared indicating the areas covered by each district and coverage of each report map, noted by mileposts along the Alaska Highway, Robert Campbell Highway, Canol Road or Haines Road.

DISTRICT MAP COVERAGE/MILITARY ACTIVITIES

WATSON LAKE:
Boundaries:
Alaska Hwy- MP627 YT Border to Pine Lake MP724
Robert Campbell Hwy- MP0 Watson Lake to MP142
Map Coverage:
Map 1: Watson Lake - 105A/104P
Alaska Hwy - MP606 Hyland River to MP685
Robert Campbell Hwy- MP0 Watson Lake to MP69
2: Wolf Lake - 105B/104O
Alaska Hwy-MP671 Little Rancheria to MP767
Military Activities:
Watson Lake Airport - Northwest Staging Route
Alaska Highway construction camps, Army Quartermaster Camp, Sawmills, Canol Pipeline No.3, Military bombing practices

TESLIN:
Boundaries:
Alaska Hwy - MP724 Pine Lake to Jakes Corner MP865
South Canol Road - MP0 Johnson's Crossing to MP90
Map Coverage:
Map 2: Wolf Lake - 105B/104O
Alaska highway - MP724 Pine Lake to MP767
3: Teslin - 105C/104N
Alaska Hwy - MP770.5 Morley Lake to Jakes Corner MP865
South Canol Road-MP0 Johnson's Crossing to Quiet Lake MP47
Atlin Road - Little Atlin Lake to Telecabin Creek MP0-70
11: Quiet Lake - 105 F
South Canol Road - MP47 to MP90
Military Activities:
Teslin Airport, Alaska Highway Construction Camps, Sawmills, Canol No.1 (South Canol Rd, Alaska Hwy), Canol No.3(Alaska Hwy), Radio Range Station, Military bombing practices

TAGISH DISTRICT

Boundaries:

Alaska Hwy - Jakes Corner-MP865 to MP917 (Whitehorse)
Carcross/Tagish Road- Carcross to Jakes Corner (MP 0-33)
Carcross Road - Jct Alaska Hwy to B.C. border (MP 0-50)
Atlin Road - Little Atlin Lake to BC Border (MP 0-25)
Annie Lake Road, Fish Lake Road
Includes City of Whitehorse (in this report)

Map Coverage:

Map 4: Whitehorse - 105 D
Alaska Hwy - Jakes Corner MP865 to MP917 (Whitehorse)
Carcross Road - Jct Alaska Hwy to B.C. border (MP0-50)
Carcross/Tagish Road - Carcross to Jakes Corner (MP0-33)
Atlin Road - Little Atlin Lake to B.C. Border (MP0-25)
7: Dezadeash - 115 A
Kusawa Lake

Military Activities:

Whitepass & Yukon Route Railroad, Canol No.1,2,3, Alaska Highway Construction Camps, Sawmills,
Whitehorse: Whitehorse Airport (Northwest Staging Route), Canol Refinery, Canol No. 1,2,3,4, Army Headquarters, Radio Range Station, Alaska Highway Construction and Maintenance Camps

LABERGE DISTRICT

Boundaries:

Alaska Highway - MP917 Whitehorse to MP975 Champagne
Klondike Highway (Mayo Road Jct- Braeburn) (MP0-MP57)
Takhini Hotsprings Road
Kusawa Lake Road

Map Coverage:

Map 4: Whitehorse - 105D
Alaska Hwy - MP917 Whitehorse to Stoney Creek MP956
Klondike Hwy - Jct MP925 Ak Hwy - Mayo Road MP0-MP15
5: Laberge - 105 E -
Klondike Hwy - MP15 to MP57 Braeburn
6: Aishihik Lake - 115 H
7: Dezadeash - 115 A
Alaska Hwy - Stoney Creek MP956 - Champagne MP975
Kusawa Lake Road

Military Activities:

Alaska Highway Construction Camps, Canol No.4,
Military bombing practices, Sawmills

HAINES JUNCTION DISTRICT

Boundaries:

Alaska Highway - MP975 Champagne to MP1104 (Burwash Flats)
Aishihik Lake Road - Canyon MP0 to MP71 Aishihik Airport
Haines Road - B.C./Yukon Border MP87 to Haines Junction MP159

Map Coverage:

Map 6: Aishihik Lake - 115 H
Aishihik Road - MP26 to MP71 Aishihik Airport
7: Dezadeash - 115 A
Alaska Highway - Champagne MP975 to MP1037
Aishihik Road - Canyon MP0 to MP26
Haines Road-BC/Yukon Border MP87 to Haines Junction MP159
8: Tatshenshini River, B.C. - 114 P
Haines Road - MP27.2 to MP87 B.C./Yukon Border
9: Kluane Lake - 115 F&G/ 115 B&C
Alaska Highway - MP1037 to MP1104 Burwash Flats

Military Activities:

Aishihik Airport, Alaska Highway Construction Camps, Haines Road Construction Camps, Relay Stations, Sawmills, Canol No.4, Haines-Fairbanks Pipeline

BEAVER CREEK DISTRICT

Boundaries:

Alaska Highway- MP1104(Burwash Flats)to Yukon/Alaska Border MP1221.4
Snag Road & Airport

Map Coverage:

Map 9: Kluane Lake - 115 F&G/115 B&C
Alaska Hwy - MP1104 Burwash Flats to MP1170
10: Snag - 115 J & K
Alaska Hwy - MP1170 to Yukon/Alaska Border MP1221.4

Military Activities:

Snag Airport, Alaska Highway Construction Camps, Sawmills, Relay Stations, Canol No.4, Haines-Fairbanks Pipeline

ROSS RIVER DISTRICT

Boundaries:

Robert Campbell Highway -MP143 Finlayson R.- Magundy R. MP270
South Canol Road - MP90 Lower Sheep Creek to Ross River MP142
North Canol Road - MP142 (Ross River to Yukon/NWT Border MP283

Map Coverage:

Map 11: Quiet Lake - 105 F
South Canol Rd-MP90 Lower Sheep Creek to Ross River MP142
Robert Campbell Hwy - MP201 Horton Creek to MP225

12: Tay River - 105 K
Robert Campbell Hwy - MP226 t MP270 Magundy River
North Canol Road - MP142 Ross River to MP160

13: Sheldon Lake - 105 J
North Canol Road - MP160 to MP255

14: Hess/Sekwi Mountain - 105 O/ 105 P
North Canol Road - MP255 to NWT/Yukon Border MP283

Military Activities:

Canol Pipeline No.1, South and North Canol Road

5.1 WATSON LAKE DISTRICT REVIEW

WATSON LAKE:
Boundaries:
Alaska Hwy - MP627 YT Border to Pine Lake MP724
Robert Campbell Hwy - MP0 Watson Lake to MP142
Map Coverage:
Map 1: Watson Lake - 105A/104P
Alaska Hwy - MP606 Hyland River to MP685
Robert Campbell Hwy - MP0 Watson Lake to MP69
2: Wolf Lake - 105B/104O
Alaska Hwy - MP671 Little Rancheria to MP767
Military Activities:
Watson Lake Airport (Northwest Staging Route)
Alaska Highway construction camps, Army Quartermaster Camp, Sawmills, Canol Pipeline No.3, Military bombing practices

Communities:
Watson Lake, Upper Liard

Watson Lake Airport

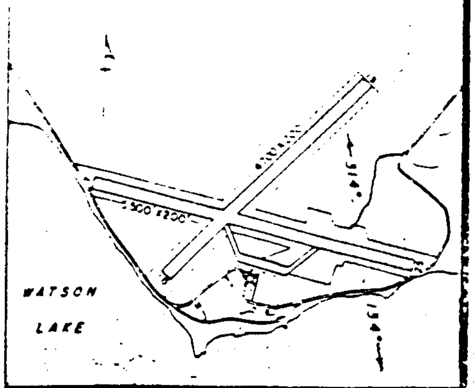
Airport facilities in Watson Lake were first constructed in 1937 by Grant McConachie for his United Air Transport airline route from Edmonton to Whitehorse. (30) In mid 1941, as part of the construction of the Northwest Staging Route airports, the Canadian government turned its attention to upgrading McConachie's facilities at Watson Lake. The airport was situated on the northern shore of Watson Lake. In January 1944, as shown in Photo# 13, the airport had a radio and radio range station, hangars and was operated by the Department of Transport and R.C.A.F. In 1943, there were 40 RCAF, 10 USAF and 61 U.S. Army staff working at the airport. Some photos from Radio Waves (48), shown in Photo #14, indicate aircraft on the tarmac at Watson Lake in 1944. The Department of Transport continues to operate this airport which will be transferred to the Yukon Government in 1996.

Alaska Highway

"I was sitting in Watson Lake... after Pearl Harbour, when the announcemment came over the radio that the Alaska Highway would be built and open for traffic in October this year. That was the first part of forty-two...and I rode a convoy back from Watson Lake to Teslin on the 23rd of October, which to me was something unbelievable." (33)

As part of the Alaska Highway construction, there was an Army Quartermaster Camp in Watson Lake, and extending west along the highway, 5 U.S. Army construction camps. An emergency flight strip was built near Pine Lake. In 1943, there were three sawmills in the Watson Lake area. A relay station was also located in Watson Lake as shown in Photo #15 (49).

13. Watson Lake Airport - 1944



NAME AND LOCATION

WATSON LAKE AIRPORT, located on N. shore of Watson Lake, 20 miles NW. of Lower Post.
POSITION - Lat. 60° 07' N., Long. 128° 46' W.
MAGNETIC VARIATION - 33° E.
ALTITUDE - 2,245 feet.
LANDMARKS - Confluence of Liard and Dease Rivers, 20 miles S. Watson Lake S. of airport.

GENERAL INFORMATION

OPERATED BY - Dept. of Transport and R.C.A.F.
REMARKS - Snow controlled by rolling. Subject to icing conditions all year. Icing level approximately 10,000' in summer.

DESCRIPTION

Strip WNW. ESE. 7-25. 5,500' x [illegible] with runway [illegible] x [illegible]. NE. SW. 1-19 [illegible] x [illegible] available when required of crushed compacted gravel.
SURFACE - Runway blacktop, remainder of strip dirt and gravel. Gravel taxi strip and standing in front of administration building. Blacktop turning areas on ends. Gravel as good as blacktop.
MARKINGS - Wooden runway markers. Wind indicator at SE. end of strip. Red flags, flares.
LIGHTING - Rotating beacon. Flares at ends of runway. Boundary lights along edge of strip. Contact lights.
OBSTRUCTIONS - Approaches clear except for trees close to E. end of runway. Hills to N. and E. Runway 16' higher than lake.

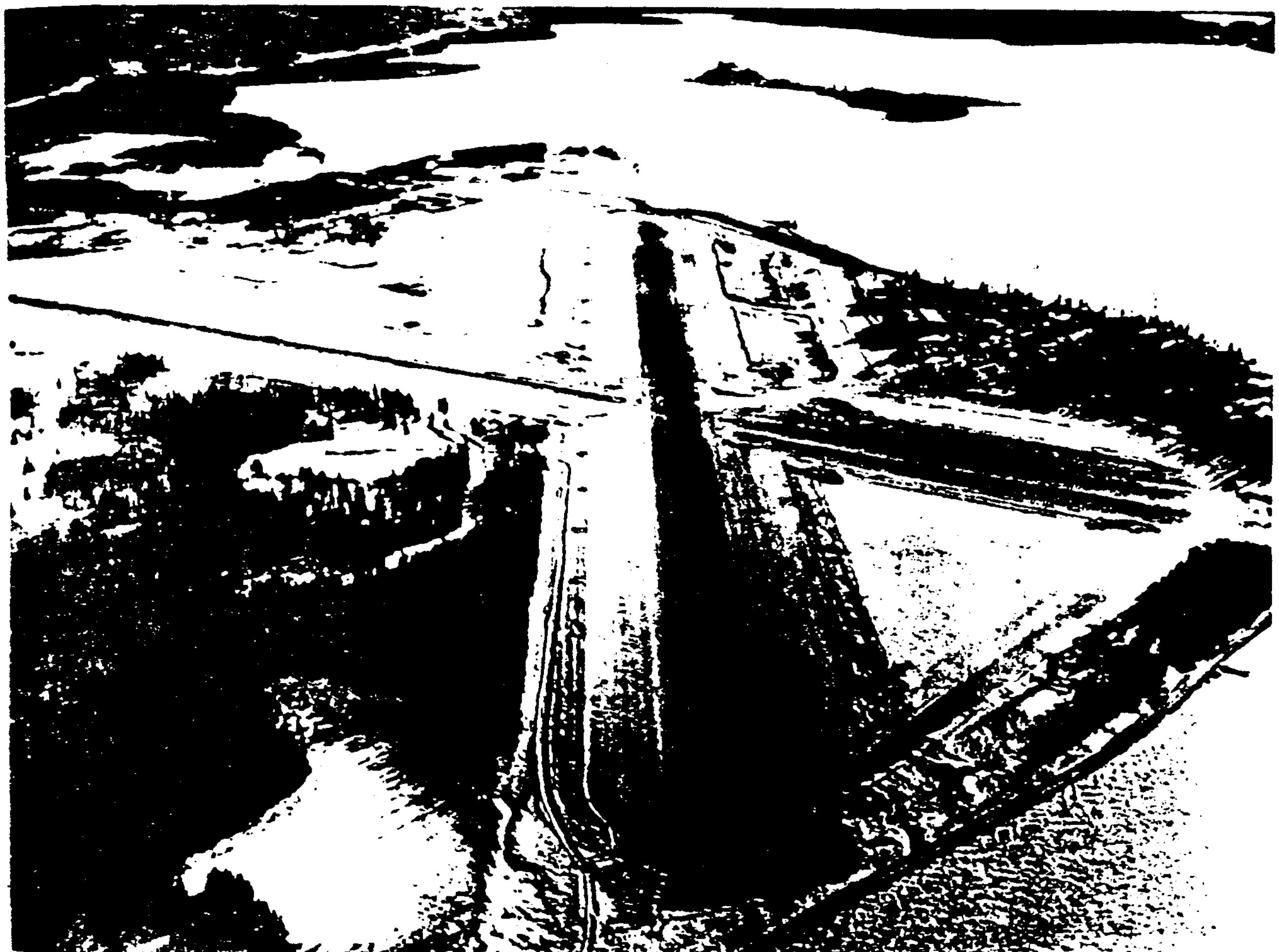
FACILITIES

HANGARS - Small nose hangar, 2 hangars planned.
REPAIR FACILITIES - Minor, some mechanics.
FUEL AND OIL - No planes will be refueled at Watson Lake unless absolutely necessary. Plan to gas at Whitehorse or Fort Nelson. Bulk storage under construction.
COMMUNICATIONS - Radio and radio range.
WEATHER REPORTS - Available from D. of T.
TRANSPORTATION - Army motor transport. Alcan Highway.
ACCOMMODATIONS - Staff quarters and temporary barracks; permanent under construction. Meals are excellent.

WEATHER

PREVAILING WINDS - Summer W. and WSW. Winter W. and WSW. with occasional wind from NE. Maximum in summer - 30 m.p.h.
PRECIPITATION - Quite frequent instability showers. Average 15" rain and 68" snow per year.
TEMPERATURE - Annual range: 90° F. to -40° F.
VISIBILITY - Ground fogs in fall until freezeup.

CHARTS - Whitehorse-Watson Lake (Canada Air Navigation); Whitehorse Regional.



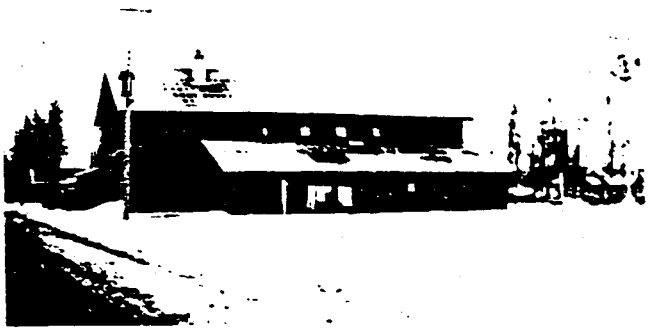
Watson Lake, Yukon Airport, January 1944. USA SC 323088

14. Watson Lake Airport and Radio Range Station

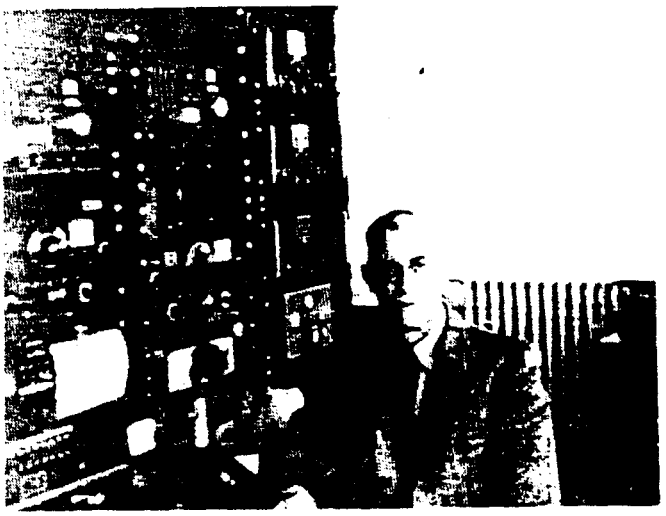
A B29 Superfortress Bomber on the ramp at Watson Lake - 1944

Watson Lake Airport Administration Building 1955

Planes lined up on Watson Lake tarmac, fighter aircraft destined for the Russian Eastern Front, 1944



Single men's barracks, Watson Lake until 1951, then they were converted into D.O.T. married personnel quarters.



Technician Lofty Harris sitting at the Radio Range Position - Watson Lake, Yukon 1955

15. Watson Lake Relay Station

WATSON LAKE Relay Station

WATSON Lake Relay Station landmark is old dispatch office, above.

WATSON Lake camp pet, shown above.

CAPT. Smith and Lt. Olsen with day's catch, above.

POKER game in recreation room: Pvt. Bill Darnell; Pvt. Edwin T. Shalley; Cpl. Clifford Beaver; and Pvt. Grady Thor

Alaska Highway: Camps/Relay & Pumping Stations - 1943

Section/Sheet No. - Camp Name - Mile Post
SECTION 6: MP620 - 642: LOWER POST - UPPER LIARD
WATSON LAKE DISTRICT
6/41 - Lower Post, B.C. - MP 620
6/45 - Army Quartermaster Camp - Watson Lake - MP 635
SECTION 7: MP 639 - 803: UPPER LIARD - TESLIN
7/51 - Army Camp 14.5 E - Upper Liard - MP642
7/49 - Army Camp 14 E - Dodo Lake - MP652
7/45 - Army Camp 13 E - Little Rancheria - MP671
7/41 - Army Camp 12 E - Rancheria River - MP687
7/39 - Canol No.3 - Pumping Station 'Z'- Rancheria River - MP693
7/35 - Army Camp 11 E - Rancheria - MP710
7/32 - Pine Lake Flight Strip No.5 - MP722

Sawmills:
1. U.S.Army Sawmill - Watson Lake 331st Engineers
2. Watson Lake Airport - R.C.A.F.
3. Liard River Sawmill - M.H. Kansas City Bridge Co.

Watson Lake

"When I was a kid, we used to have a fish camp at Watson Lake. We would travel there from a long way and there were always lots of good quality fish. We always had lots to eat and took lots home. Then the Army came and dumped their garbage nearby. When they left they dumped barrels into the lake. Ever since then the fish have been no good-too soft-and the water makes my skin feel tight and itchy. Nobody uses the lake for a food fishery anymore." (1)

Military activities, centred at the airport, were adjacent to Watson Lake. Barrels were dumped into the lake, DDT was sprayed by the R.C.A.F., the lake being in the centre of the spray zone, between 1949-1963. (See Potential Contaminants Section). Underwater diving surveys and salvage of barrels in Watson Lake have been conducted in 1991, and in 1993, (72) (73). Fraser Burrard Inc. completed a survey of the shoreline and identified areas with barrels, and also the tail of a Lancaster bomber on the southern shore. (Map provided to AES in File#9) In 1993, Foreshore Technology determined that this previous survey had no debris shown in depths of more than 4.6 metres, had inaccuracies in position of debris and barrels and identified 142 barrels previously not identified. A group of 130 barrels were removed just offshore from the Forest Service's Initial Attack Base at the east end of the main runway, and another group of 84 barrels from around the lakeshore. A number of barrels near the attack base contained residues of a tar like substance. Also in 1993, the Watson Lake Underwater Diving Association, removed 30 barrels from the lake, mostly empty with some filled with the remains of runway tar, near the Forest service's attack base. Some barrels were scattered while others were grouped in large numbers. Barrels were transported to the landfill site. There are still approximately 90-

100 barrels located in the lake near this area. Scanning sonar was used to search for a sunken barge containing barrels, however, the search was unfruitful.

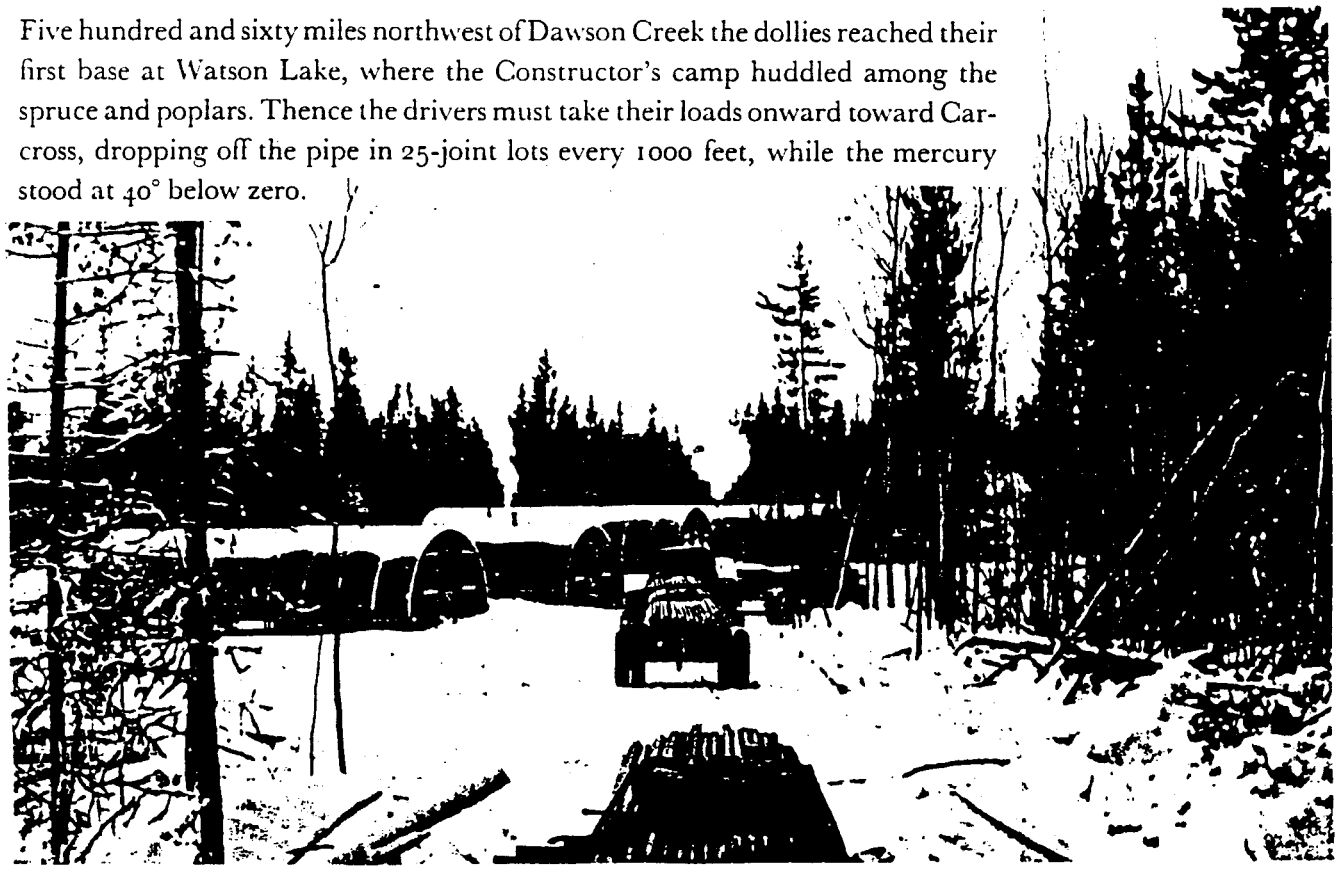
The island in Watson lake, as shown in Photo#13, was used for military bombing and firing range practice. Practice bombing primarily occurred at Target Lake, about 28 miles north on the Campbell Highway. The military constructed a rough trail to this lake so personnel could set up targets. (See Bob Watson interview.) Craters can be seen in aerial photographs of the area which were created when the practice bombs hit the ground surface. According to some people interviewed, they can remember that in the 1950s (some say 1980s), the military were de-arming or expending the bombs and ammunition near the Airport and in Watson Lake. "They dug a pit across from the airport terminal, put in dynamite with the ammunition and blew them up."

CANOL No.3 Pipeline

The Canol No.3 pipeline extended along the Alaska Highway, crossing it many times, but located primarily on the south side. This route is shown on the 1943 - PRA Maps. (9). Within the Watson Lake District, there was pump station 'Z' near Rancheria River at MP693 with 2250 barrels storage. In Watson Lake, there was a tank farm, to the north of the airport, located near the entrance to the present ski hill with 50,000 barrels of storage. This was gravity fed to the airport where there was storage of 2250 barrels. Another 6750 barrels were stored at MP635, near the Army Quartermaster camp. Watson Lake was the first base for the pipeline construction as shown in Photo#16. (51) Pipe driven up the Alaska Highway from Dawson Creek was dropped off in 25 joint lots every 1000 ft. towards Carcross.

16. Canol No.3 Camp - Watson Lake

Five hundred and sixty miles northwest of Dawson Creek the dollies reached their first base at Watson Lake, where the Constructor's camp huddled among the spruce and poplars. Thence the drivers must take their loads onward toward Carcross, dropping off the pipe in 25-joint lots every 1000 feet, while the mercury stood at 40° below zero.



INTERVIEWS

Watson Lake

Kaska Tribal Council:

The Kaska Tribal Council indicated that the Liard First Nation would be better to deal with regarding contaminants and no interviews were completed.

Liard First Nation:

Roberta Jules, working for the Liard First Nation office, had helped collect information for the contaminant study in 1993.(8) She gave us a list of Elders to contact. We also explained our project to Fran Byers (office manager) and provided copies of the AES Contaminant Factsheets and reports.

Eilene Vanbibber

She was a great help and provided names of elders to talk to and arranged our meeting with Clara Donnessey and Bob Watson. She mentioned the dumps at 1.5, 2 2.5 and 5 mile along the Robert Campbell Highway.

Bob Watson

Mr. Watson worked for the Canadian Army as labourer in the late 1940's to early 50's. At the time when the Army came through in 1942, nobody was living in Upper Liard. There was a native village at Windid Lake or "Wounded Lake", north of the current Watson Lake airport.

We used to use DDT for mosquitos, we'd take it from the 5 gallon containers (you could buy it in the grocery store), and put it in a smaller one so we could keep it in our pockets. We'd spread it over our faces, necks and hands. It was used everywhere. The Canadian Army used to spray it from a DC-3 for mosquitos. I got wet from the spray one time. It would eat the paint right off the cans.

In 1950 the Army made a road to Target Lake and I was in charge of putting in targets in the lake, which were green blow-up rubber figures, shaped like men. Then, I'd high tail it out of there. They did lots of bombing in a west to east direction across Target Lake. Some of the practice bombs did not go off and are still there. There are no fish in Target Lake.

There was a pump station for the Canol pipeline near MP693, it operated from 1943 - 1945. There was also a pump station at Watson Lake. It shipped aircraft gas, gas for trucks, and diesel for stove oil. There were 7 underground tanks located at the Airport. In those days it would take one week to get to Whitehorse, you had to go over pontoon bridges.

There was also a sawmill operated by the Army Engineer sawmill in Watson Lake. A dump was located on the road up to the radio range tower, north of the airport. There was an old army camp at Big Creek with a dump site. At Bulldozer Creek up the Robert Campbell Highway (location not known), there's a bulldozer buried there. They would let the bulldozers go and walk themselves through a swamp, and sometimes they would sink."

Bob told us of a plane crash on Stewart Mountain, now the Sa Dene Hes mine north of Watson lake. " A Canadian Pacific plane crashed there (in August 1943) and the pilot (Stan Emery) walked out in 3 days. The Fairchild (71-CF-AKT) plane which was on floats, flipped upside down. In the spring 1944, Bob Watson and Vic Johnson, while on their trapline, went to the crash site and removed the motor,and instrument panel. Stan Emery flew in a Beech 18 to get the motor out, to Little Tom Lake. They hauled the motor back to the plane by dogsled. On take-off the motor was so heavy the plane's elevators didn't work. Stan made Bob and Vic go back to the rear of the plane in order to push the tail down to get the lift off the lake and over the pass."

The rest of the plane was removed in 1972, the airplane was taken apart and flown out by helicopter (this was filmed). This plane has been fully restored and is at the Western Canada Aviation Museum in Winnipeg, since 1991. (M.Biggin-Interview).

Clara Donnessey
Its time they cleaned up Watson Lake, Wye Lake, Liard River, and Upper Liard. There is a dump at 2 Mile, and from there, north 3 miles on the left hand side of the Robert Campbell Hwy. There is a Lancaster bomber in Watson Lake, which crashed in 1948.

Jim Close - Watson Lake Flying Service
Mr. Close was born in Mayo and came down to Watson Lake in 1959. He worked on the Alaska Highway in 1951-52. He described the tank farm on the hill to the east of the airport (west of the Watson Lake ski hill entrance) which was gravity fed down to the airport. Av-gas came to Carcross from Skagway and on to Watson Lake via the Canol Pipeline No.3, the 2" line. There are underground tanks and fixtures still present at the airport. He mentioned the pump stations, west of Squanga Lake (MP855), west of Morley Lake (MP 777- north side of hwy) and at MP790 between Hayes and Strawberry Creek. The latter, burned down in the fall of 1952. He remembered the maintenance camps along the highway at Brooks Brook (MP830), Swift River, Watson Lake and Coal River (at Fireside). In 1959-60, the Canadian Air Force picked up the bombs at the end of the Watson Lake Airport. During the 1994 catch and release Fishing Derby in Watson Lake, there were a number of fish caught with bumps on them. They have been cleaning up the barrels around the airport and

lake and have cleaned up about 3 dump sites.

Willa Reams - Secretary - Watson Lake Office
There is an old army dump behind the industrial area about a 1/2 mile down the road towards the sewage lagoon (down the hill by the sand pit).

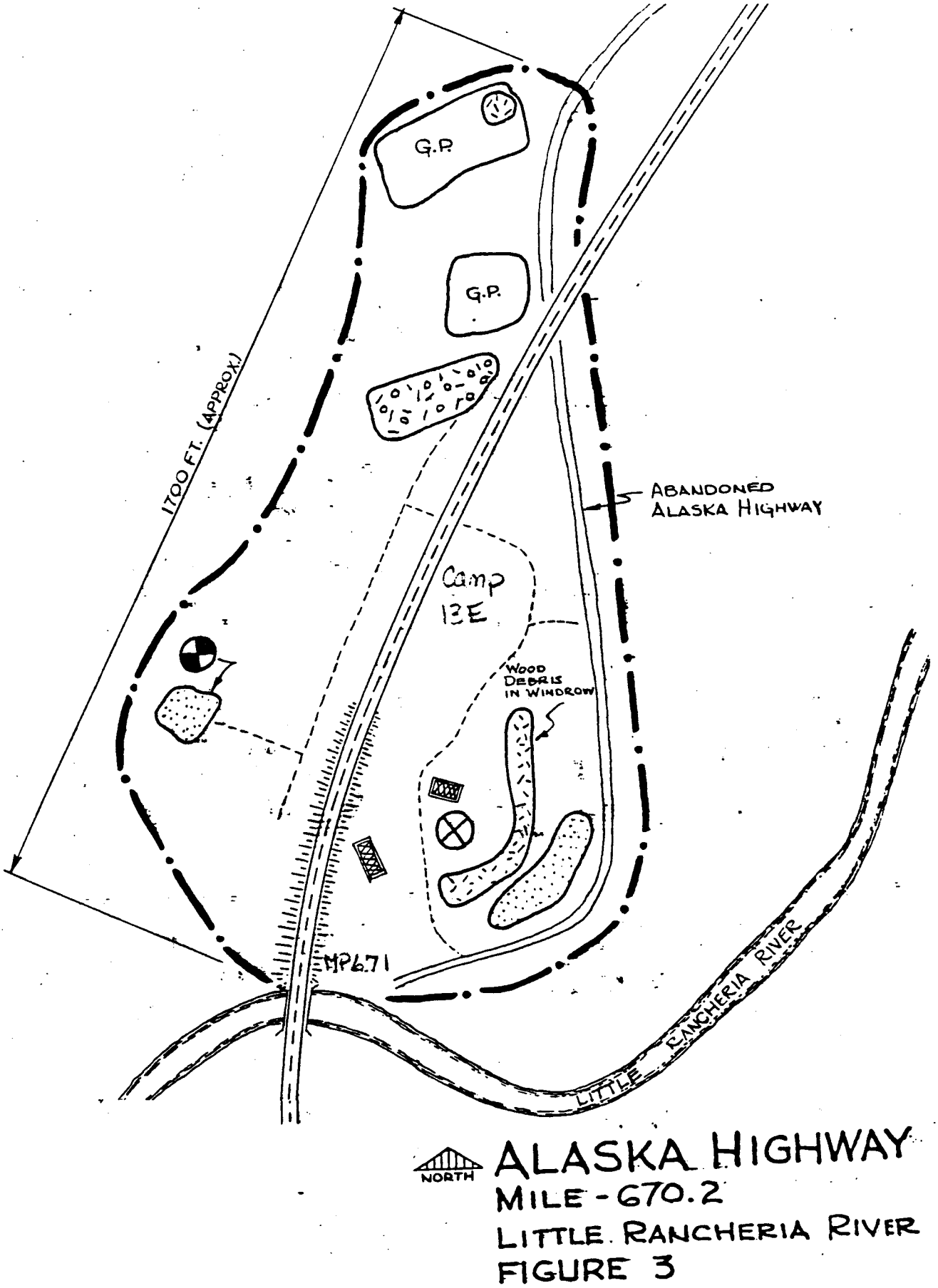
Gordon Toole
Mr. Toole was contacted by telephone. He worked at the Snag airport in 1946 and 1947 and recorded the coldest temperature at Snag Airport on February,1947 of 81 degrees (official), 83 (unofficial) below zero (F). He remembers the old Canol pump station near the Rancheria River at MP693, Station ' Z '.

Ann Morgan - Watson Lake Recreational Director
Ann wanted the old car bodies, Canol pipeline pipe and telephone wires cleaned up by the recreational trails within the community of Watson Lake.

Harry Holmquist - Watson Lake Underwater Clean Up Project
Mr. Holmquist was in charge of the underwater clean up project done in Watson lake in 1993. This was supported by AES. He gave us a copy of his report (73). He would like to see more clean up done at Watson Lake. The Watson Lake Underwater Diving Association also did some clean up at Roger Lake, part of the Dodo Lakes approximately 20 miles west of Watson. It was the site of a military camp during construction of the highway (Camp 14E), MP652. In 1993 (73), divers spent an afternoon searching the lake, finding the remains of an old dock and evidence of an old fuel line which ran parallel to the highway (Canol No.3) and appeared to be integrated into the dock, perhaps for loading fuel barrels onto float planes. Nine barrels were removed from the lake.

Upper Liard
Fred Hasselberg
There was a U.S. army camp on the north side and an army dump on the south side of the Alaska Highway at Upper Liard. There was a dumpsite on the Radio Tower Road, north of the Watson Lake Airport. Fred told us about an old dumpsite in a gravel pit at MP671, near the site of a former Alaska Highway camp (Camp 13E), at Little Rancheria River. (This site, illustrated by Edey in 1976 (13), as MP670.2,is shown in Figure 6. (Legend in Appendix L.) It is also located on the PRA maps. (9)) Fred was ten years old when war first broke out. He heard about the war on the radio while out on the trapline with his family. He said that the Air Force dumped calcium into Watson Lake in the 1940s, to melt snow on the lake. It used to be loaded with whitefish but after that there weren't as many. He guided near Target Lake and when he heard the machine gun practices he thought he was in the middle of the war! Fighter planes and guns were tested out, shooting at the island in Watson Lake.

FIGURE 6: Little Rancheria - U.S. Army Camp 13E



Upper Liard

Dick Morris

He was a trapper up in the Morley Lake/Morris Lake area, near MP777. He worked for the Canadian Army at the airport, as a labourer. He didn't know of any dump sites. He did say that what is now called Morley Lake used to be Morris Lake, named after his family. Somehow the names were switched by government mappers.

Dump Sites

Dump sites were located along the Robert Campbell Highway (MP1-10), in Watson Lake, south of the highway, at Upper Liard, near Dodo Lakes (Roger Lake), Little Rancheria River, at MP687, Rancheria (MP710), and Pine Lake airstrip. The dump at Rancheria was one of the worst on the highway.(15) Many of these sites were cleaned up in 1994.

RMO Waste Management Sites

The waste management sites of military origin within the district were reviewed with the Assistant RMO in Watson Lake, Mike Sparks.

#3 - old Army Dump - Cleaned up 1994
#4 - MP660 - scrap metal dump, near microwave
#5 - Big Creek Campground - refuse dump
#7 - km 1.1 Nahanni Range Road - barrels & batteries (?)
#8 - Transport Lodge Property
#9 - MP690 - south side Ak Hwy- Rancheria
#10 - old Army Dump - near Rancheria Hotel
#13 - Upper Liard Village - military dump
#19 - dump by Swift River -(Lat 60 0'18" Long 131 09'50")
#54 - Watson Lake - diesel, fuel pesticides.
#55 - MP715 Message Post (General refuse)
#60 - MOT dump - drums & refuse
#66 - Watson Lake - drums, road tar, diesel fuel

1983 WASTE DISPOSAL SITES:

ALASKA HIGHWAY
WATSON LAKE:

MP516 km 830 Ak Hwy Lat/Long (NA) Emergency Landing Field - Smith River Airstrip, 25 miles on Smith River Road completely burned in 1982 Fire, established flight strip during NWSR

MP633 km 1020 Ak Hwy Lat 60 03'40" Long 128 42'30" Watson Lake - U.S. Army maintenance camp? + public, several covered mounds/area covered with gravel

MP639 km 1029 Ak.Hwy Lat 60 03'40" Long 128 45'30" Watson Lake - trench (4m x 30m) U.S. Army + public - backfilling over ledge of dumping site/ very old dumpsite, old Army era refuse has mostly been covered, metal, brush domestic and burnables - still open (1983)

1983 WASTE DISPOSAL SITES:(Cont.)

ALASKA HIGHWAY

MP644 km1036 Ak Hwy Lat 60 03' Long 129 56' Upper Liard - U.S. Army + public, road built through this dump- backfilled

MP652.8 km1048 Ak Hwy Lat 60 02'30" Long 129 09'00" Dodo Lakes - U.S. army had 26 buildings here in 1945, Covered over with gravel, site overgrown

MP670 km1078.6 Ak Hwy Lat 60 08'40" Long 129 36'50" Little Rancheria - US. army maintenance camp - 17 buildings in 1945, several gravel and soil covered mounds

MP687 km1106 Ak Hwy Lat 60 12' Long 130 03'30" Rancheria River-U.S.Army Camp-13 buildings in 1945

MP710 km1144 Ak hwy. - Lat 60 05' Long 130 36'40" Rancheria - U.S.Army maintenance camp - 28 bldgs in 1945

MP722 km 1162 Ak Hwy Lat 60 04'30" Long 131 54'40" Near Pine Lake - U.S. Army camp & Great Divide Restaurant

MP722 km 1164 Ak Hwy Lat 60 40'30" Long 130 56'20" Pine Lake Airstrip - U.S. Army - Area bulldozed over

ROBERT CAMPBELL HIGHWAY

WATSON LAKE:

MP.9 km 1.5 Campbell Hwy Lat 60 04' 30" Long 128 44' near subdivion area, covered with gravel

MP8 km 13 Campbell Hwy Lat 60 07' 20" Long 128 48' near Jct with Watson Lake Airport Road - U.S. Army dump bulldozed over

MP8 km 13 Campbell Hwy - Lat 60 07' Long 128 49' Watson Lake Airport - about 20 bldgs made after War ended some areas bulldozed over

Watson Lake Airport Road - Lat 60 07' Long 128 48' 20" U.S. Army - site covered over

MP8.6 km 14 Campbell Hwy - Lat 60 07' 30" Long 128 48' Jct Windid Lake & hwy - U.S. Army + public -covered with gravel

MP10.6 km 17.2 Cambell Hwy - Lat. 60 10' Long 128 55' first left past junction with radio tower road- U.S. Army dump. No closure procedures (1984).

Comments: Mr. McCallum said he put 3-45 gallon drums of DDT here around 1963. None were found on inspection. Soil samples indicated p.69 ug/g Total DDT (Aug. 1984)

Sites Identified in 1993 AES Report (8)

Robert Campbell Highway:

Target Lake - military discarded barrels in the lake, believed to have contained gasoline, no fish in lake since.

2 mile, 2 1/2 mile - dump sites

Transformers, barrels at Radio Range on Alaska Highway past Watson Lake Airport

Alaska Highway:

Upper Liard dump - south of highway, military origin

Heritage Resources

WL3 - Army Dump -Lat 60 05' Long 128 44'

Old army dump consists of drums, refuse, scrap metal and vehicles. Contact Transportation Museum in Whitehorse to see if they are interested in examining the area for military vehicles. Site Cleaned up -1994. (16)

5.2 TESLIN DISTRICT REVIEW

Boundaries:
Alaska Hwy - MP724 Pine Lake to Jakes Corner MP865
South Canol Road - MP0 Johnson's Crossing to MP90
Map Coverage:
Map 2: Wolf Lake - 105B/104O
Alaska Highway - MP724 Pine Lake to MP767
3: Teslin - 105C/104N
Alaska Hwy - MP770.5 Morley Lake to Jakes Corner MP865
South Canol Road-MP0 Johnson's Crossing to Quiet Lake MP47
Atlin Road - Little Atlin Lake to Telecabin Creek MP0-70
11: Quiet Lake - 105 F
South Canol Road - MP47 to MP90
Military Activities:
Teslin Airport, Alaska Highway Construction Camps, Sawmills, Canol No.1 (South Canol Rd, Alaska Hwy), Canol No.3(Alaska Hwy), Radio Range Station, Military bombing practices
Communities: Swift River, Teslin, Johnson's Crossing

ALASKA HIGHWAY

In 1943, along the Alaska Highway from MP727.5 (east of Swift River) to Jakes Corner (MP865) there were 7 Army construction camps, 3 relay stations, Canol No. 3 pump stations (W,X,Y) and Canol No. 1 Camp at Johnson's Crossing. There were two sawmills, at Nisutlin Bay and Deadman Creek.

Alaska Highway: Camps/Relay & Pumping Stations - 1943
Section/Sheet No. - Camp Name - Mile Post
SECTION 7: MP 639-803: UPPER LIARD - TESLIN
7/29 - Army Camp 10.5 E - 7 mi.East of Swift River - MP727.5
7/28 - U.S. Army Signal Corps Relay Station-N.side Hwy Swift R.
Tanks-S.Side Hwy-Swift River-MP734
Maintenance Camp-S.Side Hwy-Swift River-MP734
7/26 - Army Camp 10 E - Screw Creek,B.C. - MP741.5
7/24 - Swan Lake-Canol No.3 Pump Station'Y',B.C.-Woof Lake-MP748
7/19 - Army Camp 9.5 E - Smart River,B.C.- MP759
7/16 - Army Camp 9 E - Morris/Morley Lake - MP770.5
7/8 - Army Camp 8 E - Hays Creek - MP790.5
7/7 - Morley Pumping Station X -Canol No.3 - MP794
7/4 - D.O.T. Radio Range Station - MP800
7/3 - Camp 7 E - Teslin - MP804
SECTION 8: MP 803-928: TESLIN - WHITEHORSE
8/37 - Camp 6.5 E - Timber Point - MP826
8/36 - Brooks Brook Army Camp (6 E) & Relay Station - MP830
8/33 - U.S. Army Relay Station - Johnson's Crossing - MP836
- Canol Camp- Mile 0 - Johnson's Crossing - MP836
8/30 - Army Camp 5 E - Squanga Lake Flight Strip - MP843
8/25 - Big Devil Pump Station W - Canol No.3 (Summit Lake) - MP855

Sawmills - 1943
4. Nisutlin Bay Sawmill - Dowell Construction Co.
5. Deadman Creek Sawmill - Dowell Construction Co.

Swift River

Approximately 7 miles east of Swift River, U.S. Army construction camp 10.5E was located. At Swift River MP734, a relay station and maintenance camp were located here. In Photo#17, the U.S. Signal Corps at Swift River and Brooks Brook Relay station are shown. (49) CNT eventually took over this property and built additional buildings. In 1968, buidings were sold for removal. An advertisement in the Whitehorse Star, (June 1968), indicated housing units at the Swift River Relay Station were up for sale, as is. (50)

LEGAL NOTICE

CN

"For sale and removal from CNT property at Swift River, Y.T., Mile 733 Alaska Highway, the following buildings -

Four married quarters, A, B, D, and D, 20 feet x 48 feet, frame construction, insulated, wood foundation, two bedrooms, living room, kitchen, three piece bathroom and utility room.

Buildings to be removed within 30 days of date of sale and site left in a clean and tidy condition. Buildings to be bid on individually.

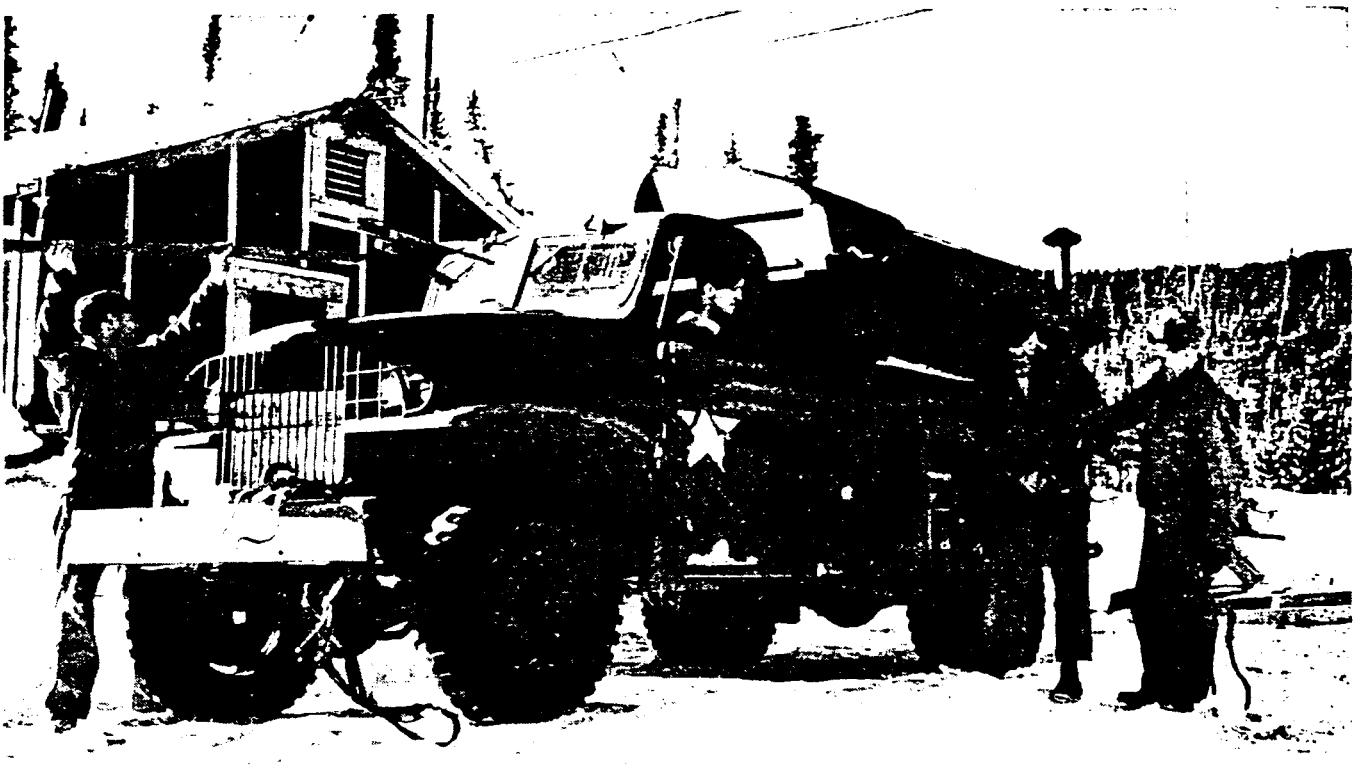
Bids to be received in the office of Mr. R.E. Bolander, Purchasing Agent, 20th Floor CN Tower, Edmonton, Alberta, not later than 2:00 p.m. M.S.T., June 24, 1968. Highest or any bid not necessarily accepted."

Three army construction camps and Canol No.3 pump station 'Y' were located in British Columbia. (At Yukon Archives there is a detailed as-built drawing for the Swan Lake Pump Station -'Y', done in 1943, Yukon Archives, Maps H-1919. It was not possible to reproduce this map). There was a Army construction camp near Hays Creek and Canol pump station 'X' at MP794. According to a Teslin Elder this station was shut down in 1947 and burned down during a forest fire in 1956. This site was illustrated by Edey in 1976, as shown in Figure 7.

A radio range station was constructed at MP800 to guide planes into the Teslin Airport, built as one of the "intermediate" airstrips, as part of the Northwest Staging Routes, started in 1942 and completed in 1944.

TELEPHONE LINE LINKS ALASKA WITH U. S.

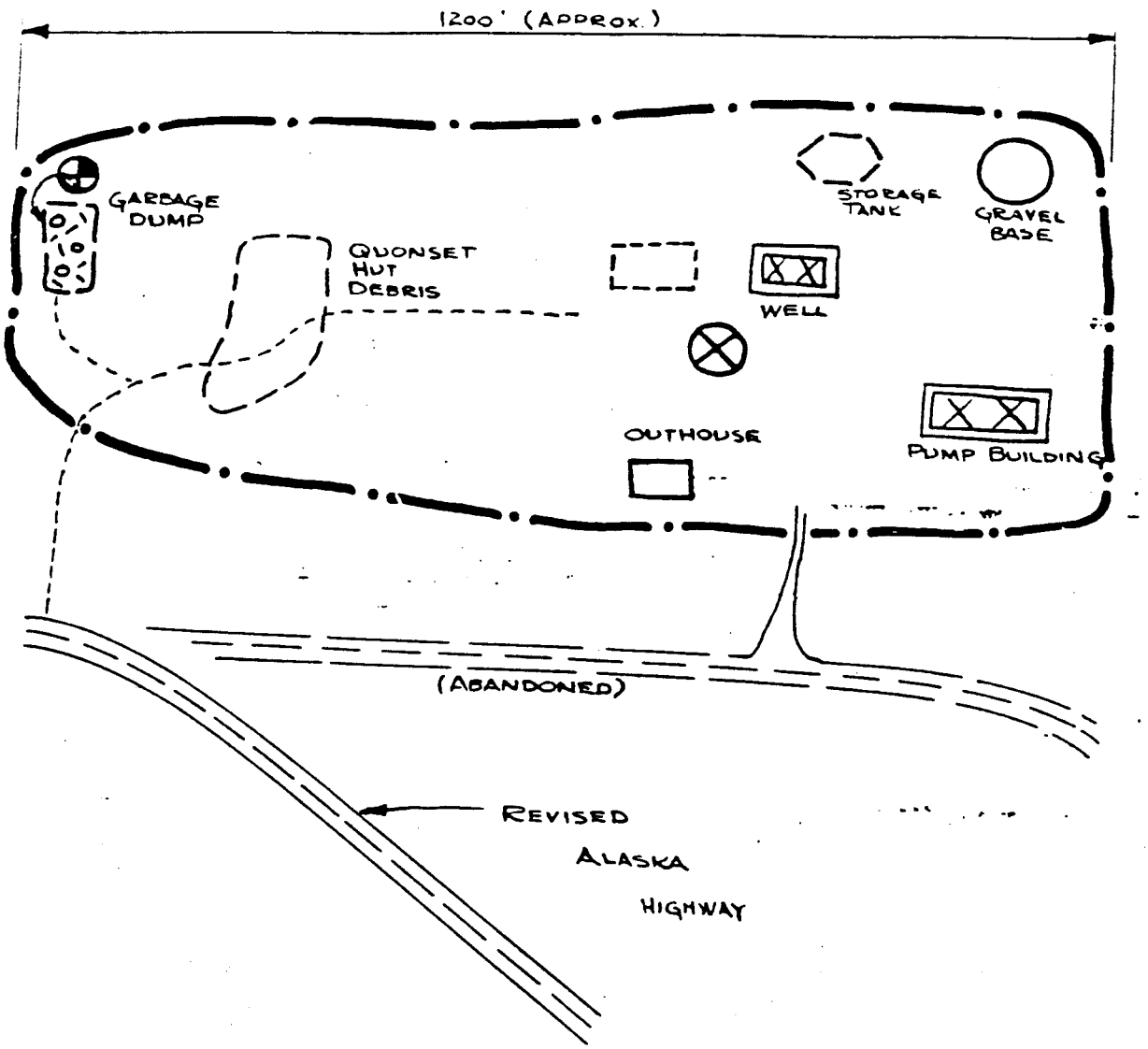
17.



ALONGSIDE the Alaska Highway, over the same hills and ravines, the Signal Corps has built and operates a telephone line linking Alaska with the United States. Above, a line crew at Swift River gets ready to work, left to right: Pvt. James B. Blythe, Hot Springs, N. Mex.; Pfc. Wallace Young, Bayfield, Wis.; Sgt. Robert Robb, Riverdale, Calif.; Pfc. James P. Johnson.

SIGNAL CORPS repeater stations along the road relay telephone, radio, and teletype messages. Through these means, Alaska Highway Headquarters is able to keep its fingers on the pulse of a 1523-mile artery. Crew at Brook's Brook, near Teslin Relay Station, includes, left to right: T/4 E. H. Guthelet, Hempstead, N.Y.; T. Sgt. Donald C. Mathewson, Cooperstown, N.Y.; Pvt. J. B. Curry, Oklahoma City, Okla.; Pvt. Guy Hall, Battyville, Ky.; T/5 Wm. S. Loft, Sterling, Colo.; T/3 Benjamin Henry, Kingston, N.Y.; S. Sgt. H. H. Lang, New York, N.Y. These men are on duty or on call 24 hours a day.

FIGURE 7: Canol No. 3 - Pump Station 'X'



NORTH

ALASKA HIGHWAY
MILE - 793.9
CANOL PUMPING STATION X
FIGURE 12

Teslin

The settlement of Teslin, a trading post and native village in 1942 was affected by the construction of the Alaska Highway . There was an immediate impact on health:

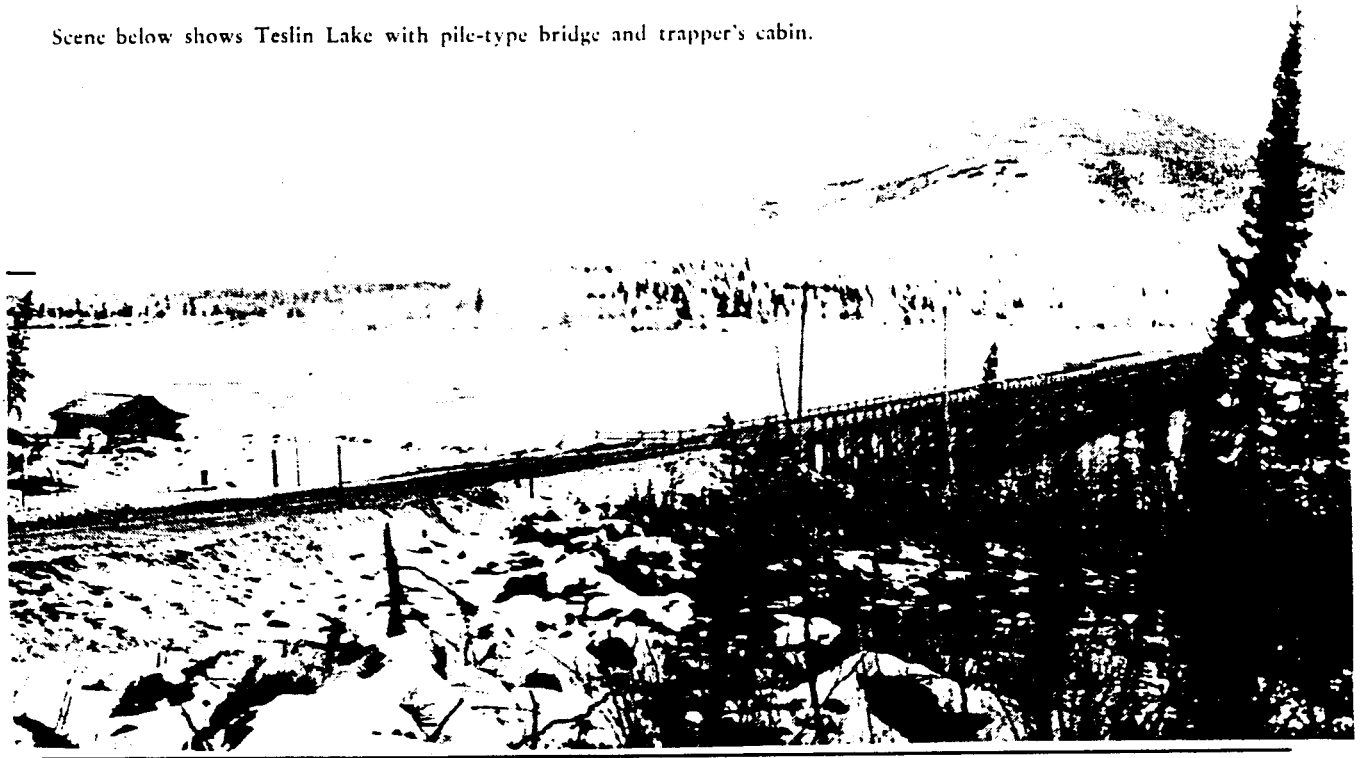
" In September 1942, in spite of strict quarantine measures, measles had spread to 129 natives in a population of 135 and had resulted in three deaths from a comlicatiing bronchopneumonia. Of the six natives spared by the epidemic, 5 were more than 70 years of age, and 1 girl of 18 was thought to have had the disease while away at school. In 1942 and 1943, the native settlement on Teslin Lake was attacked sucessfully by measles, dysententery catarrhal jaundice, whooping cough, German measles, mumps, tonsilitis and meningococcic meningitis, the latter killing four people. (67).

Teslin in 1942-43: (49)

NISUTLIN BAY —a trading post and Indian village not far from the British Columbia boundary in Yukon Territory.

Between 1942 and 1943, the PRA constructed a pile trestle bridge 2,326 feet long across Nisutlin Bay. Subject to damaging action by drift jams and ice flows this bridge deteriorated very fast.... (47)

Scene below shows Teslin Lake with pile-type bridge and trapper's cabin.



The pile trestle bridge, constructed across Nisutlin Bay was the longest along the highway and required the largest foundation and superstructure in 1944.
Bates & Rogers Co., bridge contractors, put in a foundation and superstructure which would permit river navigation , completed on October 5, 1944. (36)

Next to the bridge, now the centre of Teslin, was U.S. Army camp 7 E . To the north, there was a sawmill by Nisutlin Bay. Logging also occurred up the Nisutlin River to provide logs for the Teslin bridge. Interviewees mentioned "a truck and a 'Cat' " in the bay near the bridge, and that these have been hauled out.
In 1946, a tractor trailer carrying a bulldozer broke through the deck and plunged into the bay. (47)

John MacIsaac, president of MacIssac Construction Co. Ltd., Whitehorse, hauled a 'Cat' (TD-40) out of the Nisutlin Bay which had been declared surplus: recorded in a newspaper article in 1959. (43)

ADVENTURE THAT CASHED IN

John knew now where there was a TD-40 buried in the silt of the Nusutlin slough. This shallow river joins Teslin Lake at Mile 800, and for two years this piece of equipment had rested, out of sight, in the mud. God knows there were enough pieces like this "cat" that disappeared. Rumors checked this one to be as is where is, and the Army declared it war surplus, pricing it at $1500. John bought it and gambled the bulk of his wealth.

Taking Eric Steeves, a master mechanic, into his confidence, John proceeded to retrieve his purchase from its watery bed. The pair set up a tent, frames, etc., when they found the machine, winched it out, and in less than a fortnight, they had it out of the river and began to overhaul it. It was a dirty job and patience was the virtue to stay with it. In due time, however, it began to wheeze and sputter, and with caution the pair drove it across the ice toward the highway. No one was more surprised than Col. Bob Jones, himself, when John MacIsaac came up to Army headquarters with the old war surplus "cat" running like a buzz saw and John looking for bids to contract a job at Jakke's corners.

JOHN WITH HIS PRIZE. Fished out of the Nusutlin slough, John now is ready to go to work on the Jake's Corner contract. His TD-40 International he retrieved as war surplus and which he parlayed into a million dollars worth of equipment, in ten years.

That was John MacIsaac's first machine and his first job and it was enough!

JOHN AND TESLIN JOE, testing the ice on Nusutlin. They drove the TD-40 to the other side and loaded it on a truck for Whitehorse.

Activities as a result of the Teslin Airport, included practice bombing, at targets set up in Nisutlin Bay, near the mouth of the Nisutlin River. A plane crash occurred in the Bay as a result of practice bombing activities.

Interview - Murray Biggin

Mr. Biggin indicated that the plane in Nisutlin Bay, was a "Mustang" fighter that crashed in 1954. The pilot (Erkarht) was killed in the crash during a practice bombing run, near the mouth of the Nisutlin River. Apparently, one practice bomb was dropped, which exploded and the other bomb got jammed in the opening. The pilot was not able to get out of the dive and crashed. Whether the other practice bomb ever went off is not known.

Teslin Tlingit Council:

The project team met with the Elders at two separate meetings to obtain comments and concerns on contaminants associated with military activities. Blanche Boseley and Doug Smarch helped to coordinate these meetings and Robert Lee, Environmental Co-ordinator also assisted. Elders which contributed their concerns included:

Frank Smarch	Doug Smarch	Harry Morris
Florence Smarch	John Martychuck	

Comments/Concerns:

- Construction troops and equipment came via the steamers, Klondike and Keno from Whitehorse to Teslin and Morley Bay, which had about 500 people living there in 1942.
- Nisutlin Bay was designated as a Special Management Area under the Land Claims Final Agreement. The Teslin Renewable Resource Council will be developing management guidelines for Nisutlin Bay.
- The plane crashed in the winter of 1954, John Martychuck's mother caught her fish net up on the plane's tail, off the end of the point in about 85 feet of water. One bomb exploded and it is thought the other bomb is still on the plane.
- Watson Smarch helped to set up the targets on the ice for the Army. He set up a big cross with a white sheet. He worked with Johnny Johns and Dave Johnston on blazing the trail for the highway from Tagish.
- Tiny Kitchen had logged up the Nisutlin River in the early 1950s and placed vehicles in the mouth of the Nisutlin to provide a better water flow for transporting the logs. They also used dynamite to provide a better channel at the mouth.
- A cabin, located along the Nisutlin River near the junction with Wolf River, is still filled with dynamite which should be removed.
- 'Lily Pond', located near the Nisutlin River, north of the junction with the Wolf River, used to be a good muskrat area. Muskrats were found dead, floating around in the water. Water should be tested here..

- Horses were found dead from unknown causes near the mouth of the Nisutlin River.
- Three people died while at a fish camp on the Nisutlin River. What could have caused this?
- Wildlife and bird populations have declined and this has become a great concern.
- The Council members use the Brooks Brook area for gatherings. Last year several people got sick and there is concern the water may contain guardia or be contaminated. Buried septic tanks from the old maintenance camp are still there. When they relocated the highway they changed the course of the creek -why?
- There are a couple of old dump sites located around the airport, some of these have been cleaned up.
- At the east end of the airport runway, they also used to do practice bombing, in 1943-44.
- Six people in Teslin now have cancer. There is a concern that this is due to potential contaminants in the environment. It was stated that the military brought the pollution and should pay to clean it up.
- The fish in Nisutlin Bay have been caught with bumps and weird growths on them. This was never the case before. Fish caught 3 miles upstream on the Nisutlin River are fine.
- Helicopter spraying was done along the B.C. border in the late 1960s (1968?). What was the spray used - Agent Orange?
- A low boy and crane are located in Quiet lake on the west side.
- There is also supposed to be a 'Cat' buried near the old post office in Teslin.

The last meeting defined areas of the most concern; a proposal was prepared to apply for AES funding, to clean up Nisutlin Bay and Brooks Brook and to provide for soil, water and fish testing.

Nisutlin Bay Area:

1. Remove vehicles from the mouth of the Nisutlin River
2. Remove plane from Nisutlin Bay
3. Complete water quality testing
4. Complete testing of fish for contaminants and abnormalities.

Brooks Brook:

1. Remove septic and fuel tanks from old maintenance camp area
2. Complete soil and water quality testing.

Bill Boseley

Mr. Bosely was involved in the salvage of materials on the Canol Road in the summer of 1951-1953. He salvaged the 'Cats in this area, and remembers getting two 'Cats' out on the south side of Godlin Lake. Most of the salvaging was between MP222 (past Sheldon Lake) to the NWT border (MP282). Small areas are maybe contaminated with oils. He didn't do any burying of sites. He helped to tear down the Canol refinery in Whitehorse in 1948.

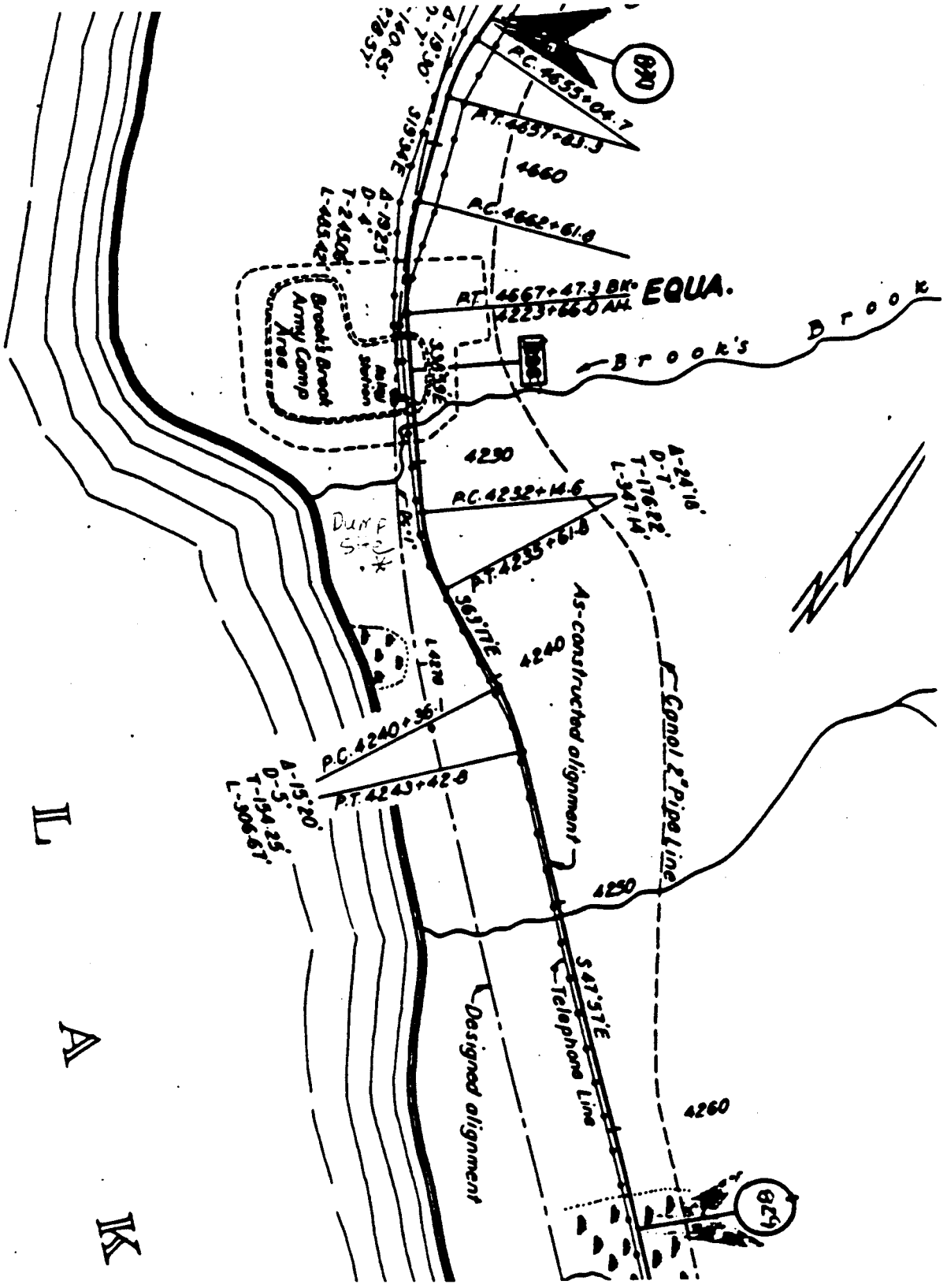
Along the Alaska Highway, there was a camp; at MP1156 near Pickhandle Lake, just south of the Donjek River near MP1130, and at Destruction Bay MP1083. At MP1111 (Quill Creek) there was a big camp, which was hauled out when they moved out. He also knew of a crane in Quiet Lake. The vehicles at the mouth of the Nisutlin River were placed there by Tiny Kitchen to make the channel better for transporting logs.

George Mahoney
Mr. Mahoney worked at the powerhouse in Teslin, which they shut down in 1985. They cleaned up this site. There is an old dump site by the airport, near the new subdivision. He remembers pump station 'X' near Morley Bay MP794 for the Canol pipeline from Carcross to Watson Lake.

Orville Smith
Mr. Smith worked at Brook Brooks maintenance camp at MP830. At MP829 on the west side of the highway by Teslin Lake, there is an old dump from the maintenance camp, of iron, cans, bottles. (Noted in Figure 8). There was the CN Relay station at Brooks Brook which used this dump as well. The repeater station had 100's of batteries. In 1965, the repeater station was shut down at the same time as the maintenance station which was moved to Teslin. There is some cement buried at Brooks Brook, about 50'x75' cement floor for the garage. The septic went into Brooks Brook creek, later a septic tank was put in. One can still see man holes for the sewer/septic tank. At Johnson's Crossing they had big garages there for Canol project. By the pond (east side of Canol Road) there was stuff buried in the water/slough. The Americans closed it down in 1945, and when they came back in 1948, they buried everything that was left. In 1951, he worked for Ray Hyde who had bought the pipeline and equipment and had the salvage rights, so he didn't bury anything. He removed equipment and pipe at the pump stations and camps. "Nothing was buried at the time, they took out everything to Johnson's Crossing." He worked up to the Northwest Territory border. He hauled pipe out at MP170 etc. We cut off the pipe and pulled it out in 40 ft. lengths with a bulldozer. The pipe was sold outside to Calgary and Fairbanks. A local man, Bill Cochan buried for the U.S. Army between 1945-1948. He's dead now.

Len Usher
The site of Fox Point Lodge is built on an old dump site, which was used until 1953. There is another dump in an old burrow pit, on the west side of the highway between Fox Point and the current road to the new Corrections Centre. This area was covered up but you can still see the disturbance area. **There was a dump from the Air Force off the Teslin airstrip, towards the north, near the new subdivision.** An old plane wreck is near this area. **Near the site of the old powerhouse, near the airport, there was a dump along the powerline R/W.** He remembers that the bomber in Nisutlin Bay, crashed in 1954.

FIGURE 8: Brooks Brook Relay Station - 1943



Brooks Brook

At Brooks Brook, MP830, there was an army camp and relay station. This area is was shown on the PRA Maps (9) in 1943, presented in Figure 8. It became a maintenance camp for the Northwest Highway System as one of the four maintenance camps in the central portion of the highway (Photo#18). In the mid 1960s, the maintenance camp was moved to Teslin, near the airport.

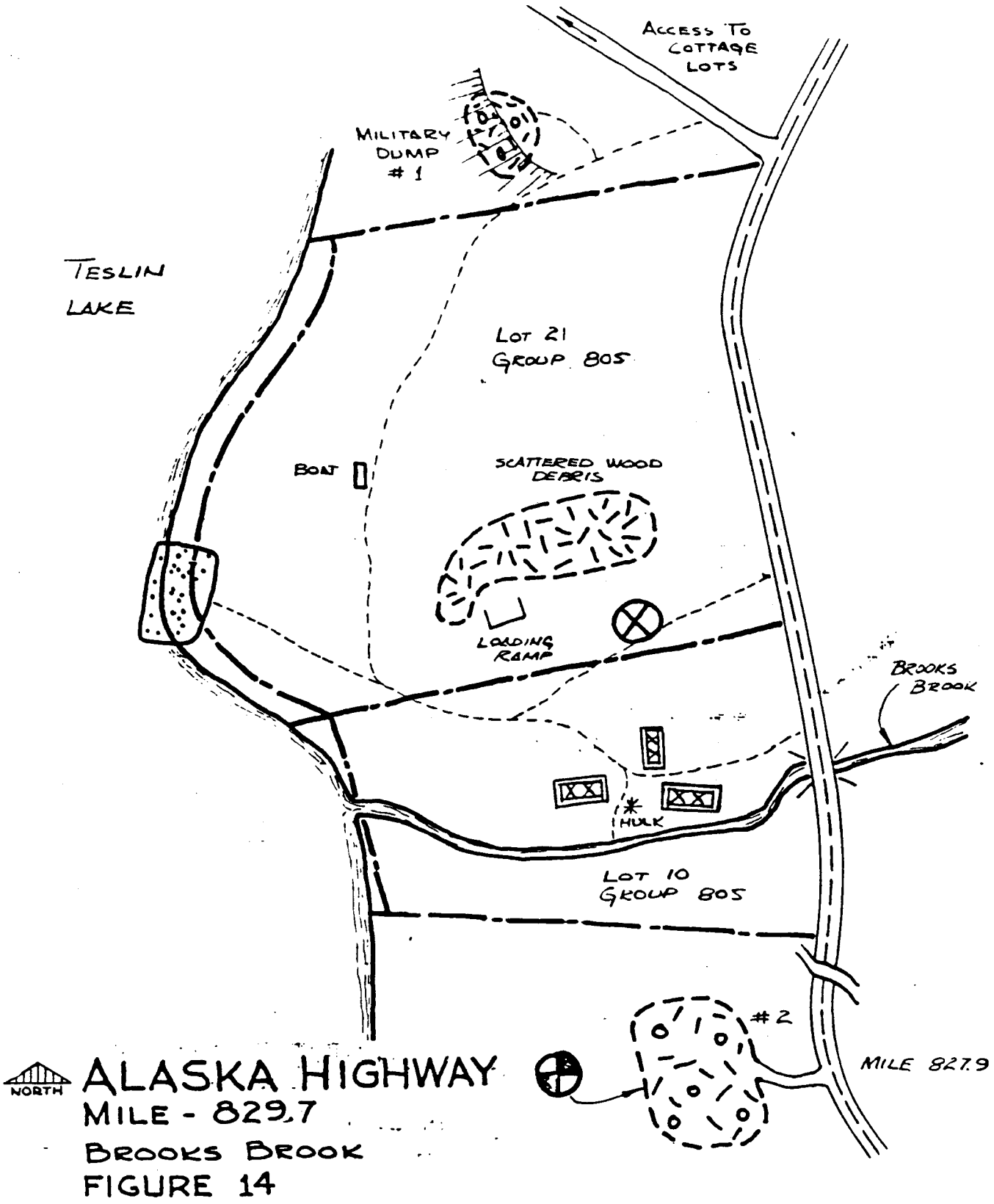
18. Maintenance Camp at Brooks Brook, 1959

During the 1976 assessment by Edey (13), a sketch was prepared of this site showing the location of two dump sites associated with this camp, to the south at MP827.9 and to the north, both on the west side of the highway. This is shown as Figure 9.

Johnson's Crossing:

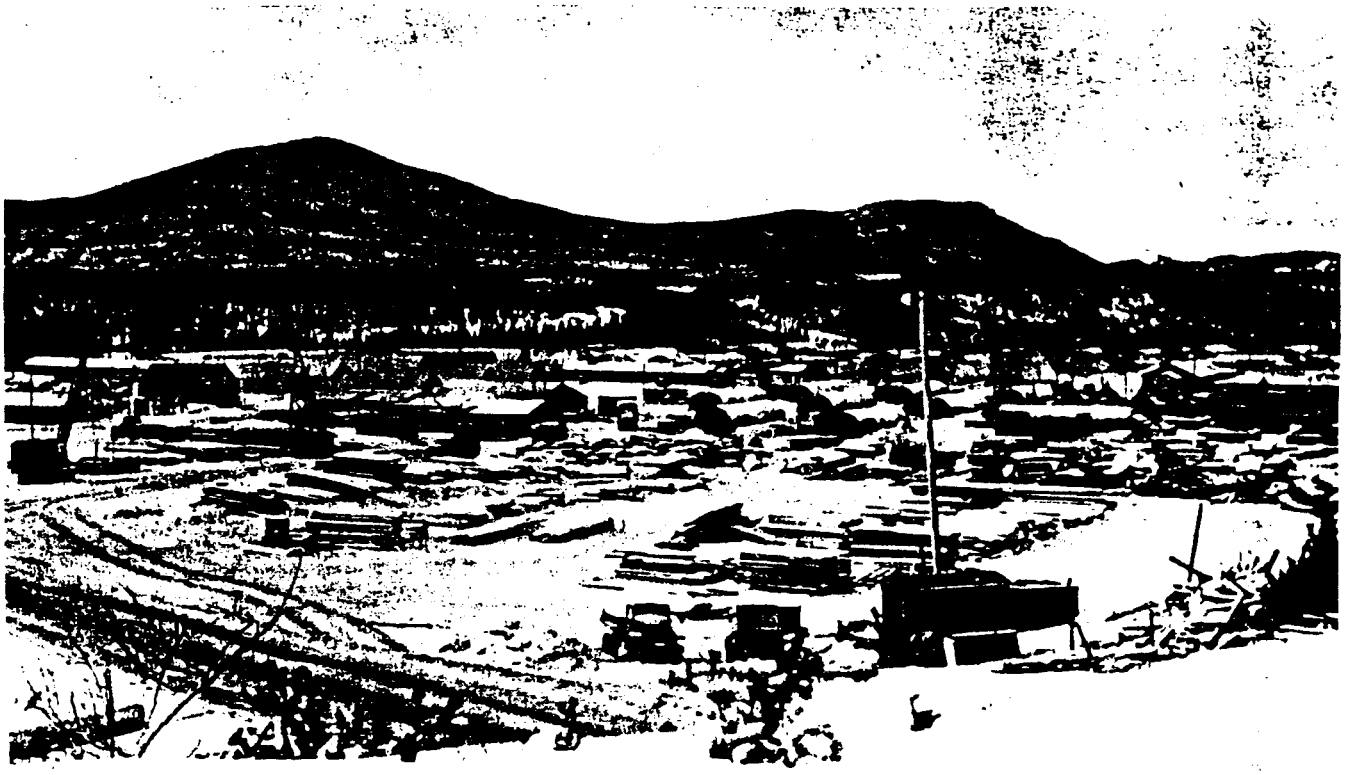
At MP836, Canol Camp existed for the Canol No. 1 Project, spread out over 20 acres. At this site, pipe and equipment were stored for the western portion of the Canol project. Canol Camp, near Norman Wells, NWT, served the eastern portion of the route. Richard Finnie's photograph, shown as Photo#19 (51), and the PRA map (9), presented as Figure 10, show the general layout of Canol Camp and the U.S. relay station in 1943/44.

FIGURE 9: Brooks Brook Camp - 1976



19. Canol Camp at Johnson's Crossing - 1943/44

For the supply and administration of the Canol Road there was a large camp at either end. One was Johnson's Crossing, at the junction of the Alaska Highway, eighty miles east of Whitehorse.



Johnson's Crossing

Pansy Allen

There is an old dump site, used by the Army and Johnson's Crossing Lodge at the bottom of the hill, along a road from the lodge, to the north. This needs to be cleaned up. There is also two dump sites near the old Canol Camp, across the river from the Lodge. There was a sawmill at Quiet Lake.

Lorne Gay - Field Operations - DIAND

A sketch prepared by Lorne Gay, Canol Clean Up Project Manager of the Johnson's Crossing Canol Camp in 1975 is shown as Figure 11. On this sketch at the northernmost point is a site where metal debris was buried in a previous Army clean-up. As this was already buried, this was left as is during the 1975 South Canol Road clean-up. Lorne thought that this site should be investigated. (14) The remains of truck vehicles from the 1975-76 clean up are stored at this site.

FIGURE 10: Johnson's Crossing - 1943/44

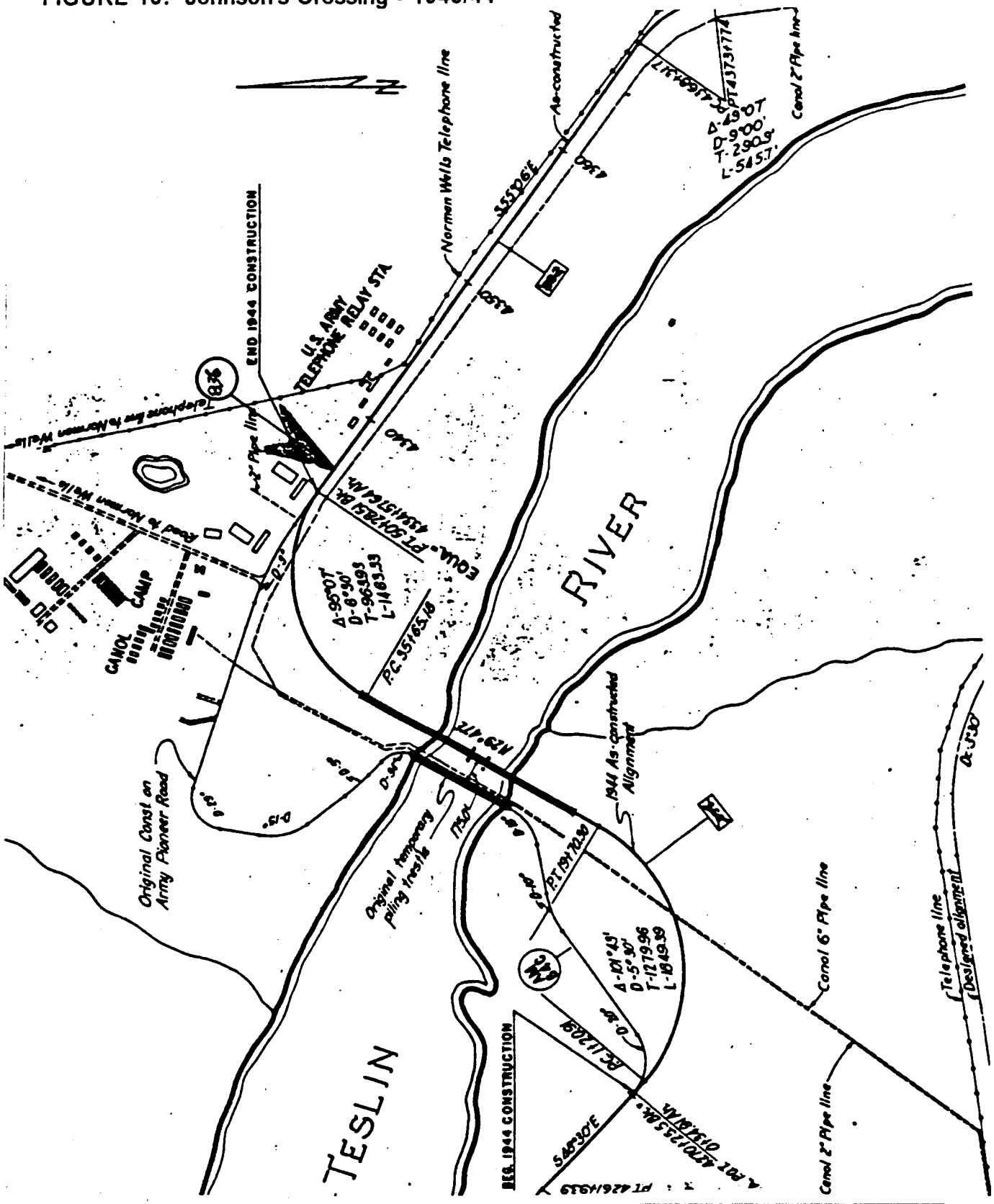
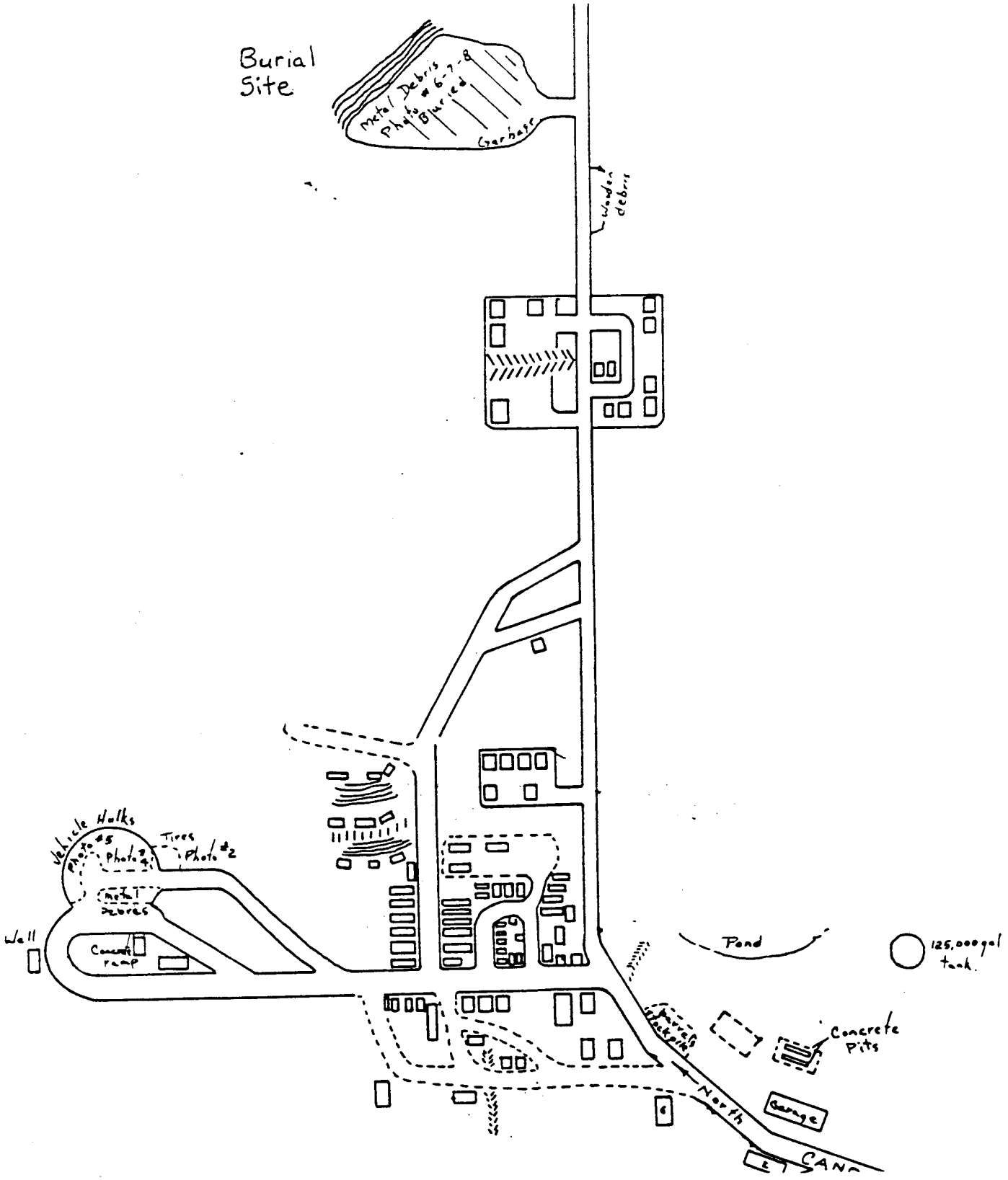


FIGURE 11: Canol Camp and Old Dump Site - 1975



South Canol Road - MP0-90

Sketches of burial sites for the 1975/76 clean up of the South Canol, were found on Government Files (14) for MP1.6 (1.4), MP22.7, MP73.6. At MP46 and MP54, sites of sawmills associated with the Canol project were also cleaned up, primarily by burning. These sites primarily consisted of collapsed wooden buildings, barrels, tires, truck hulks and some metal debris, shown in Figures 12-15. Additional disposal sites, not shown at MP0.5, MP1.75, MP54 and September 1975 reports, by Lorne Gay, are provided in File# 10 to AES). In 1975, Snergy West Ltd. prepared sketch for MP73, near the Nisutlin River, shown as Figure 16. (55) At MP73, there was a vehicle ramp for greasing and oil spill areas are shown. Clean up crews (L.Gay) identified debris over the bank near the Nisutlin River, not mentioned by Synergy.

The list of pumps stations, relay stations and emergency shelters along the South Canol (MP0-90) from PRA map (11), discussed in Section 4.5, are also indicated below:

Pump Stations/Relay Stations/Maintenance Camps/South Canol - 1943

MP from NWT	**Camp Name**	**MP from Johnson's Crossing**
MP428	- Rose River - Emergency Shelter	MP85
MP437	- Gravel Creek - Pump Station 10	MP76 *
	- Relay Station No.1	
MP444.7	- Nisutlin River - Emergency Shelter	MP68.3
MP457.5	- Emergency Shelter	MP55.5
MP466.3	- Emergency Shelter	MP46.7
MP472.9	- Emergency Shelter	MP40.1
MP480.8	- Emergency Shelter	MP32.2
MP491	- Murphy Creek - Elliot Maintenance Camp	MP29
MP496	- Emergency Shelter	MP17
MP502	- Emergency Shelter	MP11
MP513	- Johnson's Crossing- Camp Canol	MP0
	Elliot Maintenance Camp, Emergency Shelter - MP836 Alaska Highway	
MP596	- Whitehorse - Tank Farm & Refinery	- MP917 Alaska Highway

* Mileages on PRA map (11) were used and some locations do not correlate to topographical area. Location appears to be more like MP67, as noted on Report Map No.11.

– Mileages of Synergy (55) also varied from those in Government Files (14).

FIGURE 12: Burial Site at MP1.4 - South Canol Road

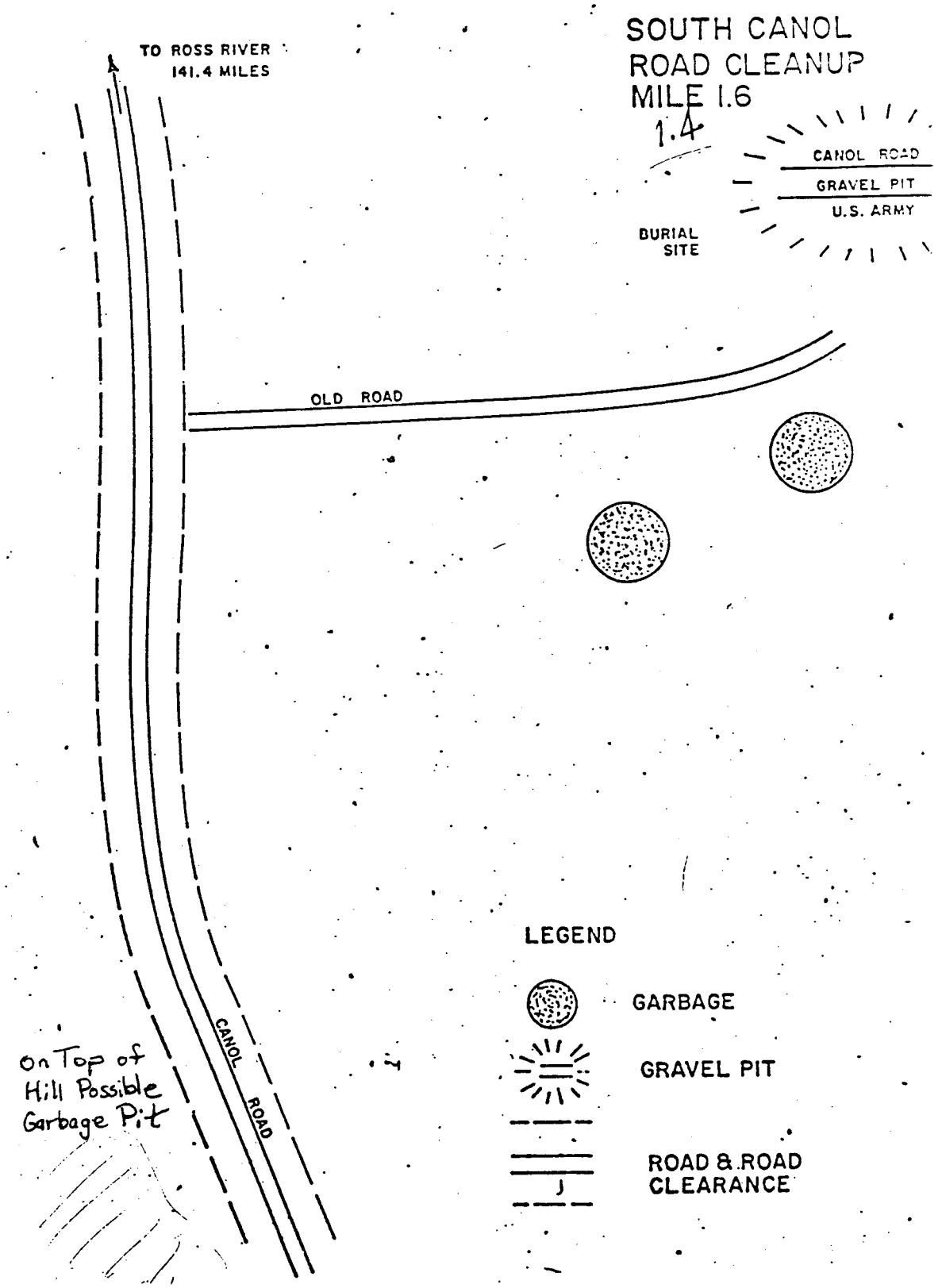


FIGURE 13: Burial Sites at MP22.7 - South Canol Road

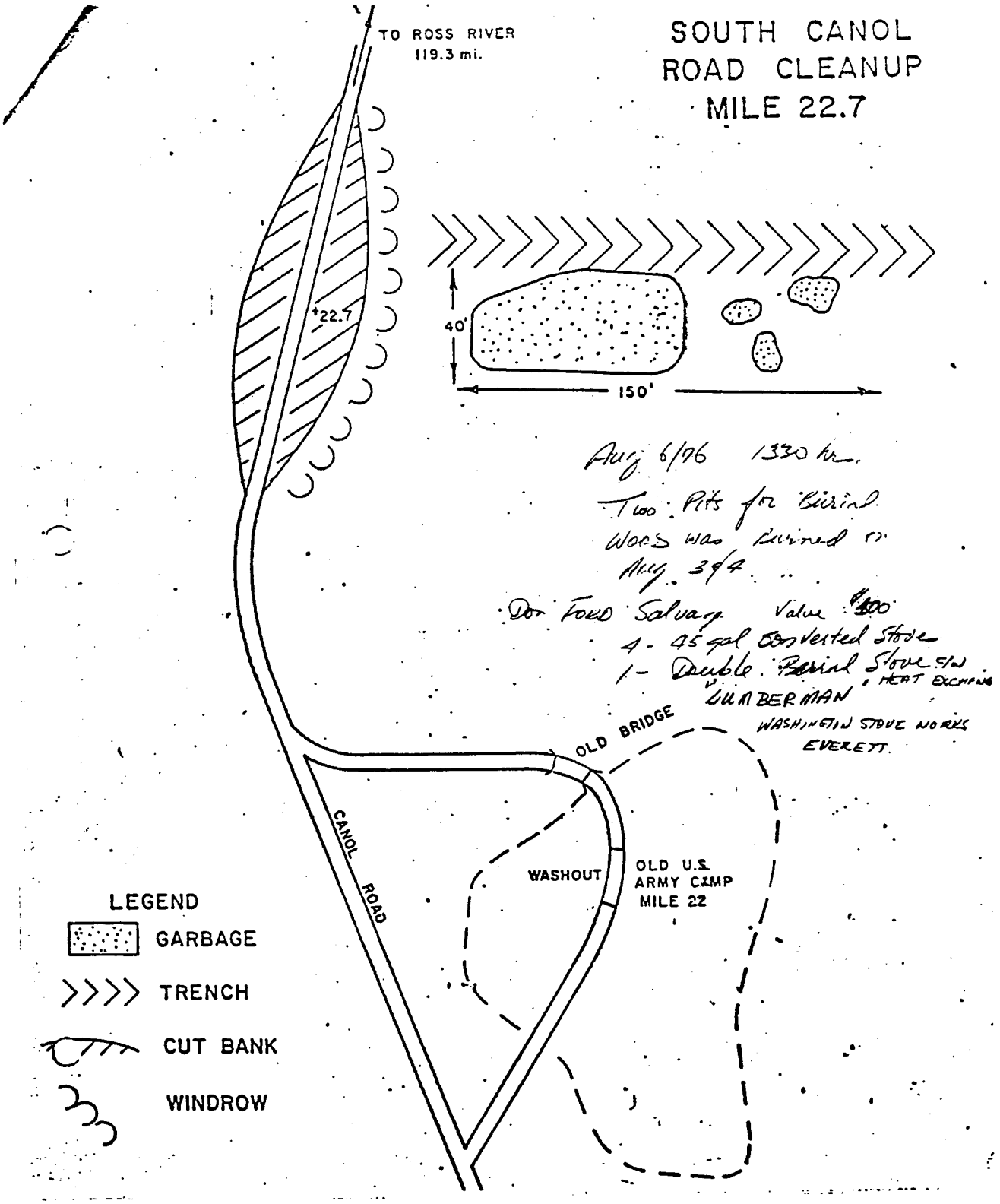


FIGURE 14: Quiet Lake Sawmill Site at MP46 - South Canol Road

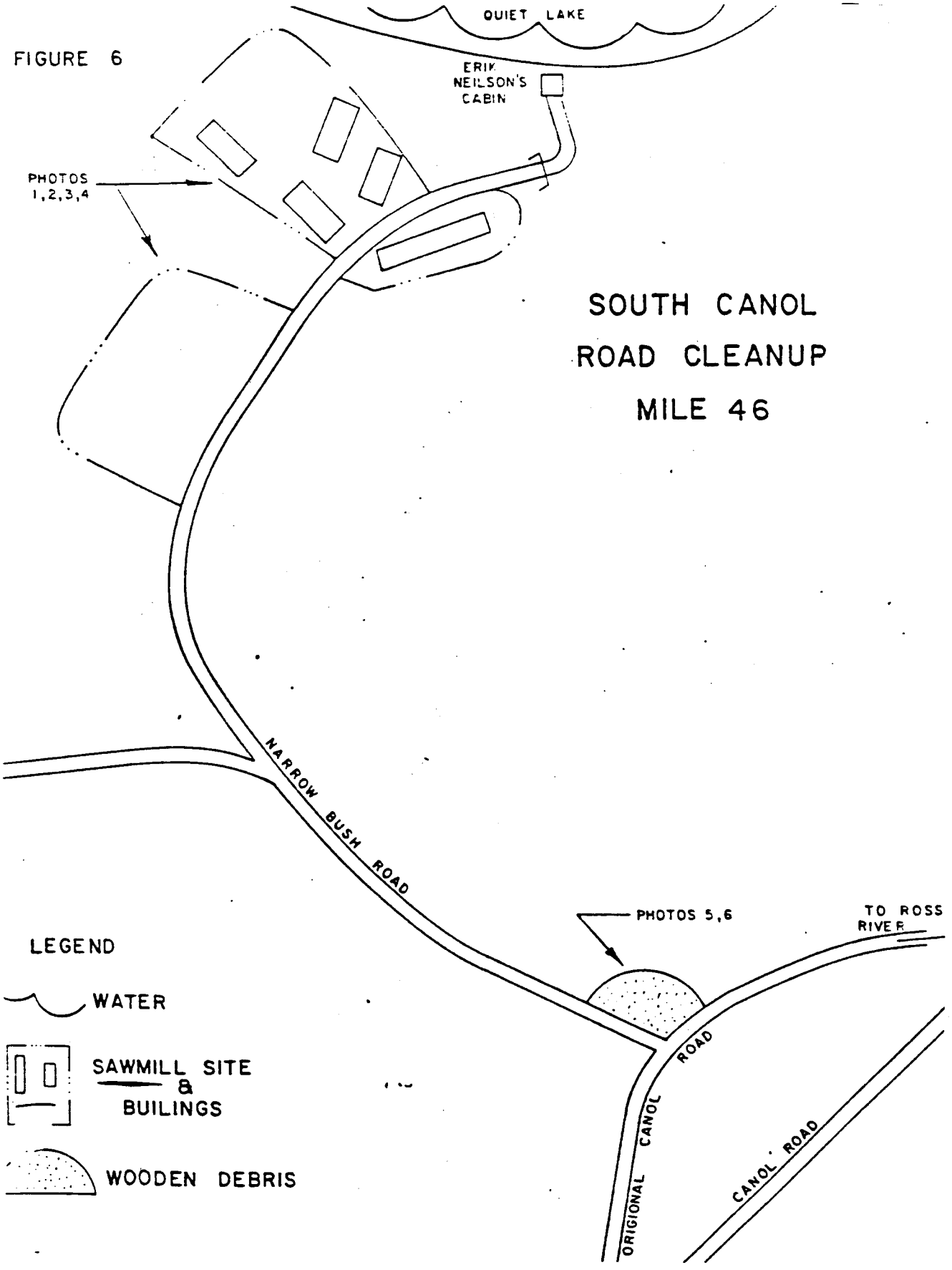


FIGURE 15: Dump Site at MP73.6 - South Canol Road

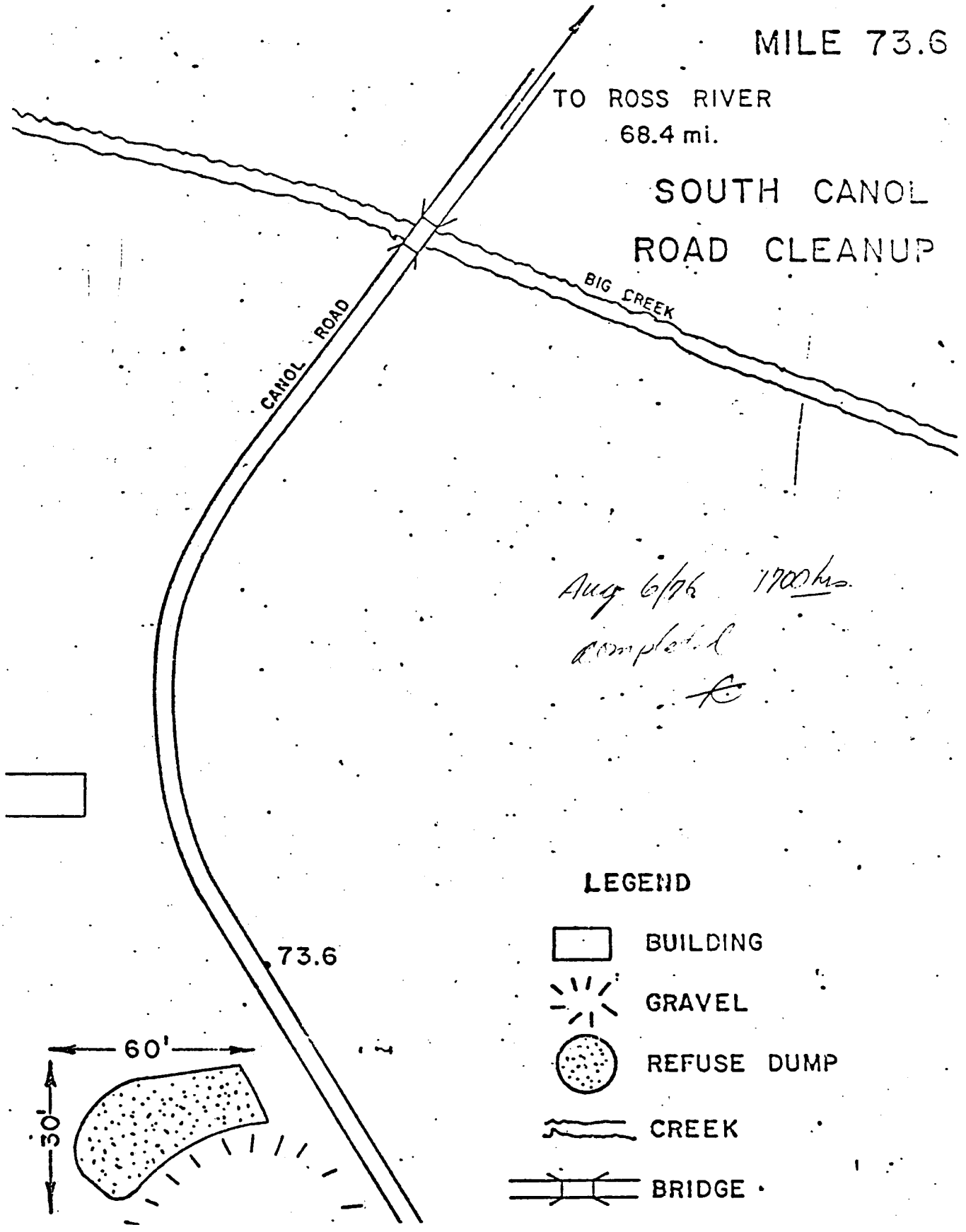
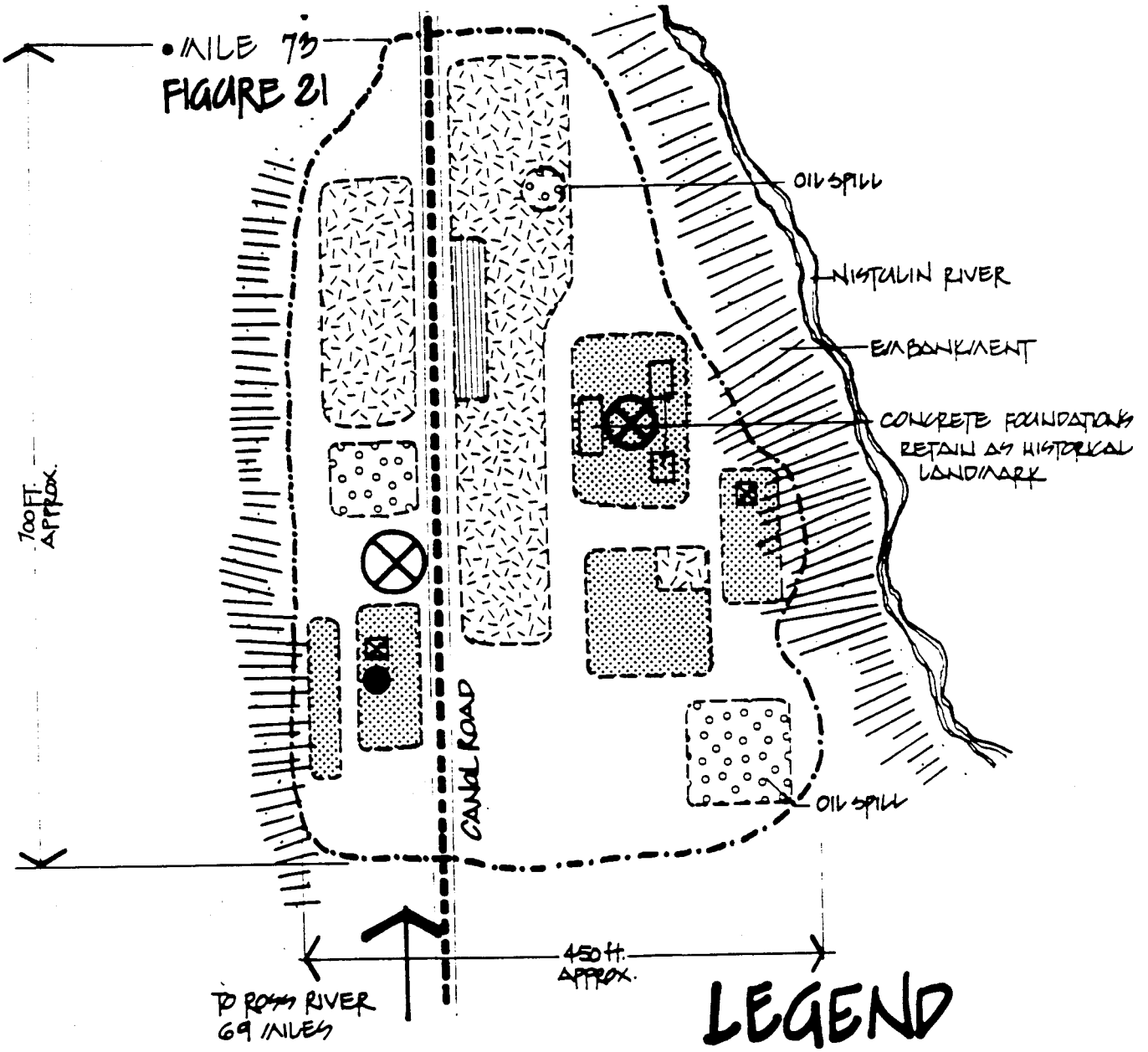


FIGURE 16: Canol Road Clean Up - MP73 - 1975



CANOL ROAD CLEAN UP

synergy

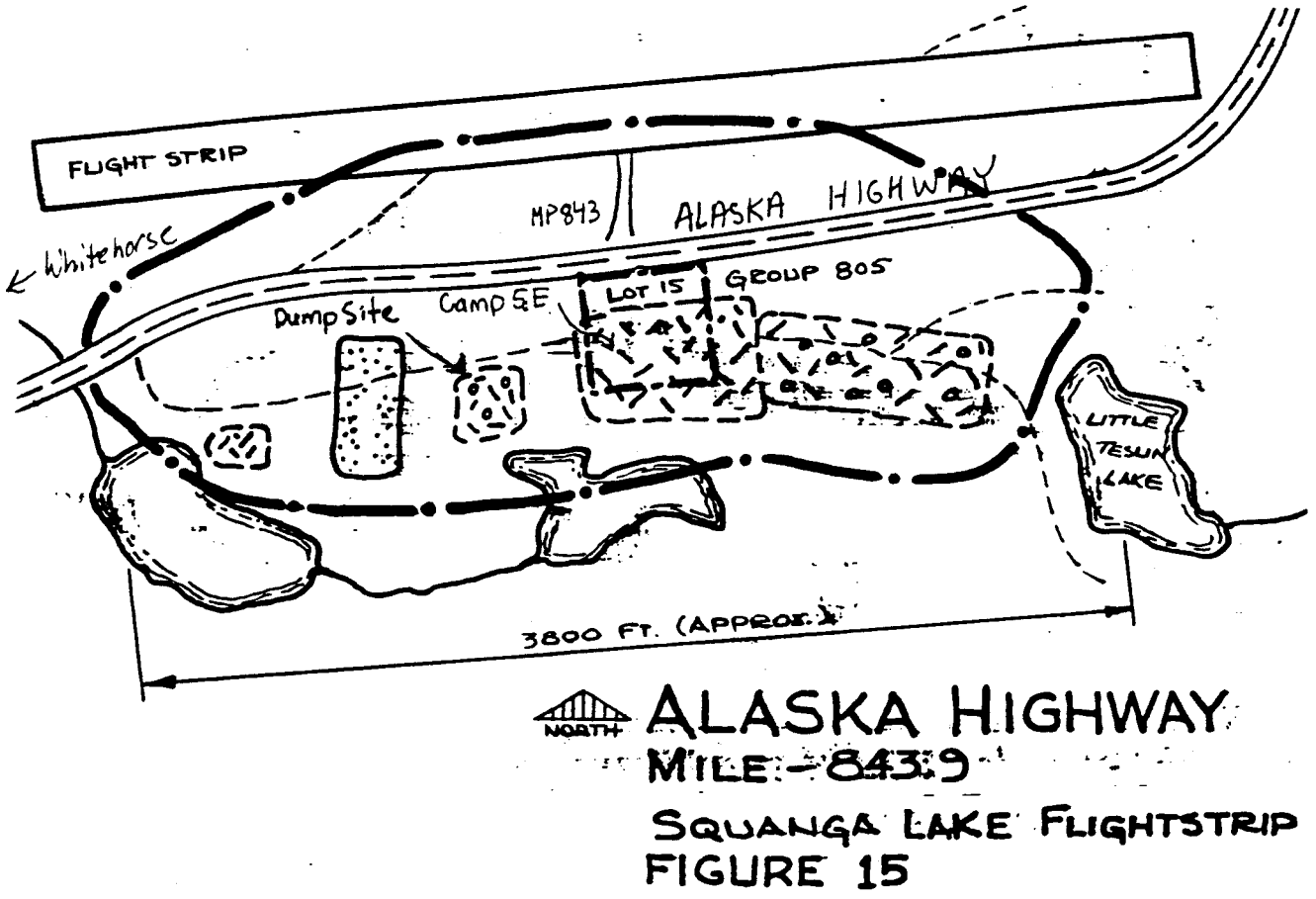
Squanga Lake

East of Squanga Lake, at MP843, there was an Army construction Camp 5 E, on the south side of the highway, and on the north, was the Squanga Lake Emergency Flight Strip # 6. This site is illustrated on PRA Map Sheet Section 8: Sheet 30. (Provided to AES - File #1). Edey identified a dump site in this area in 1976, as shown in Figure 18. At Squanga Lake, MP849.5, there was no development noted in 1943. On the 1943 PRA maps (Sheet # 8:27) shows a creek, named the Johns River, after Art Johns' family. This has since been changed to Seaforth Creek. (See Tagish District Review). At MP855, was Canol No. 3 Pump Station 'W'. On the 1943 PRA maps this was noted as Big Devil Pump Station (Sheet #8:25). The name of Big Devil Lake is now Summit Lake. There were no other camps identified along the Alaska Highway to the District boundary near Jakes Corner, MP865.

Ted Hall

About four miles north of Squanga Lake there was pump station for the Carcross to Watson Lake pipeline (Big Devil Station ' W' - Summit Lake, MP855). Across from Squanga Lake Emergency Flightstrip #6, at MP843 is an old army dump from Camp No. 5 E, which was burned down.

FIGURE 17: Camp 5 E at Squanga Lake Flightstrip, MP843



RMO Waste Management Sites - Teslin District

Gordon Dumas, Resource Management Officer, for the Teslin District provided information on military waste sites. He offered to inspect the cabin near the Nisutlin River, which was identified as having explosives stored in it. He thought that if the vehicles were to be removed from the mouth of the Nisutlin River that there was a very narrow margin of time in early spring, when water levels are low, that these vehicles could be removed. If a plane was in Nisutlin Bay, he thought that it would be so covered with silt that it would be difficult to find.

8 - Old sawmill site by Quiet Lake (MP46), wood debris, cabins
9 - Old sawmill site by Nisutlin Bay, north of Teslin, Cleaned up
16 - Canol Camp-MP0-Johnson's Crossing, old steel tank
18 - Army dump, Canol Camp-west side of South Canol Road, just north of vehicle storage area

1983 Waste Disposal Sites

ALASKA HIGHWAY

MP725 km 1167 Ak Hwy Lat 60 04' Long 130 58' 50"
Swift River Bridge - perhaps U.S. army

MP727.3 km 1171.5 Ak Hwy Lat 60 02'20" Long 131 03'
Swift River - U.S. Army - 3 buildings here in 1945
Site covered over

MP732 km 1178 Ak Hwy Lat 60 00'50" Long 131 09' 50"
Swift River - Maintenance camp - perhaps U.S. Army
Still open (1983) close to Swift River (100m)

MP733 km 1180 Ak Hwy Lat 60 00'30" Long 131 12'
Swift River-U.S. Army, 1945-14 bldgs, Repeater station and maintenance camp - now YTG maintenance camp

MP733.8 km 1181 Ak Hwy Lat 59 59' 40" Long 131 11' 40"
Swift River- BC. - U.S. Army dump - covered area with gravel/sand

MP741.6 km 1194 Ak Hwy Lat 60 53' 20" Long 131 18' 30"
Screw Creek - B.C.- 1 collasped building - graded over
Old U.S. Army camp - 28 buildings, in 1945

MP747.5 km 1204 Ak Hwy Lat 59 53' 20" Long 131 27' 50"
Swan Lake, B.C.- U.S. Army, Canol No.3 Pump Station 'Y'
8 buildings in 1945

MP761.2 km 1222.5 Ak Hwy Lat 60 56' Long 131 45'
Smart River,BC.- U.S.Army camp, 2 buildings,
area covered with gravel/soil

MP770 km 1241 Ak Hwy Lat 60 58' Long 132 02'
Hazel Creek,B.C. - U.S. Army Camp, 23 buildings in 1945
area covered with gravel/soil - heavily overgrown

MP777.7 km 1250.5-1251.5 Ak Hwy - Lat 60 00' 40" Long 132 08' 10"
Morley River - U.S.Army, 15 bldgs, covered with gravel

MP780.4 km 1256 Ak Hwy Lat. 60 01' 30" Long. 132 13' 00"
Morley River - U.S. Army, covered with gravel

1983 Waste Disposal Sites (Cont):

ALASKA HIGHWAY

MP793.8 km 1277.5 Ak Hwy. Lat 60 06' 30" Long 132 28'30"
Morley Bay - U.S. Army oil tank station - 9 bldgs bulldozed over and in use as gravel pit (1983)

MP794 km 1278 Ak Hwy - Lat 60 06' 50" Long 132 29' 20"
Morley Bay - U.S. Army camp - sawmill - bulldozed over

MP802 km 1290.5 Ak Hwy - Lat 60 08' 30" Long. 132 40' 40"
Teslin - US. Army + public, in use (1983)

MP802.5 km 1291.5 Ak Hwy - Lat 60 09' Long 132 41' 20"
Teslin - U.S. Army + public - Covered gravel/sand

MP804.7 km 1295 Ak Hwy - Lat. 60 10' 40" Long. 132 43' 50"
Teslin - U.S. Army airport, partially bulldozed

MP806 km 1297 Ak Hwy - Lat. 60 10'40" Long. 132 51' 00"
Teslin- NW end of Teslin Airstrip - U.S. Army + Public
Covered with landfill

MP829.7 km 1335 Ak Hwy - Lat 60 25' 00" Long 133 11' 30"
Brooks Brook, U.S. Army maintenance camp - 23 bldgs
area covered with soil

MP836.6 km 1346 Ak Hwy - Lat. 60 29' Long 133 18' 10"
Johnson's Crossing- U.S. Army Camp - Canol

MP843 km 1356.6 Ak Hwy - Lat 60 29' 10" Long 13 27' 10"
Squanga Lake Airstrip - U.S. Army 6 blgs, covering of soil- both sides of hwy

MP849 km 1366.5 Ak Hwy - Lat 60 26'50" Long 133 35' 00"
Squanga Lake- U.S. Army camp + gas station

SOUTH CANOL ROAD

MP0 Jct MP836 Km1345.9 Ak Hwy Lat 60 29'20" Long 133 17'40"
Canol Camp - MP 0 Canol Road- U.S. Army - tank
Area bulldozed over

MP0.5 km .8 S.Canol Road Lat 60 29' 20" Long 133 18' 00"
U.S. Army- Abandoned vehicles collected for disposal (100-200), Canol Road Cleanup storage,

MP1.5 km 2.4 S.Canol Road Lat 60 30' Long 133 16'
U.S. Army dump - large(20m x 35m?)- covered up area- trench? very old

MP46 km 74 S.Canol Road Lat 60 49' 15" Long 133 02' 50"
Sawmill-Quiet Lake - U.S. Army - bldgs decayed, site overgrown,

MP61 km 98 S.Canol Road Lat 61 09' Long 133 04'
U.S. Army, campground, hwy maintenance camp, covered many times, still open

Government Files at Yukon Archives (14), show pictures of old dumps located near Swift River, MP732, at MP 814.2 and MP827.9, and at Johnson's Crossing, MP835.8. These are provided to AES in File#10.

5.3 TAGISH DISTRICT REVIEW

Boundaries:
Alaska Hwy - Jakes Corner MP865 to MP917 (Whitehorse)
Carcross - Tagish Road- Carcross to Jakes Corner (MP0-33)
Carcross Road - Jct Alaska Hwy to B.C. border (MP0-50)
Atlin Road - Little Atlin Lake to B.C. border (MP0-25)
Annie Lake Road, Fish Lake Road
Includes City of Whitehorse (in this report)
Map Coverage:
Map 4: Whitehorse - 105 D
Alaska Hwy - Jakes Corner MP865 to MP917 (Whitehorse)
Carcross Road - Jct Alaska Hwy to B.C. border (MP0-50)
Carcross/Tagish Road- Carcross to Jakes Corner (MP0-33)
Atlin Road - Little Atlin Lake to BC Border (MP0-25)
7: Dezadeash - 115 A
Kusawa Lake
Military Activities:
Whitepass & Yukon Route Railroad, Canol No.1,2,3, Alaska Highway Construction Camps, Sawmills, Atlin Road
Whitehorse: Whitehorse Airport (Northwest Staging Route), Canol Refinery, Canol No. 1,2,3,4, Army Headquarters, Radio Range Station, Alaska Highway Construction and Maintenance Camps
Communities:
Tagish, Carcross, MacRae, Whitehorse

Carcross - Tagish Road

This road was first constructed from Carcross to join up with the route of the Alaska Highway and on south towards Teslin. Other troops had gone to Teslin via the Yukon and Teslin River by steamboat and were constructing the Alaska Highway from Teslin to Watson Lake. Equipment and supplies arrived in Carcross via the Whitepass Railroad and were transported south, along this route, for the Alaska Highway or Canol No.1 and 3 projects. The Canol No.3 line extended along this road. In 1943, a sawmill operated 7 miles east of Carcross near Crag lake, called 7 Mile Sawmill. (12). No maps were located showing camp sites.

Atlin Road

In June 1949, the Canadian Army began construction of the Atlin Road from Jakes Corner to Atlin, B.C., a distance of 61 miles. This involved 80 culverts and 12 bridges and required setting up two base camps (location not known) and two mobile camps. The road was open to traffic on December 1949. Snafu and Tarfu lakes are named after military terms.

One interviewee mentioned that when he was boating on Little Atlin Lake he was struck by a "big army gun" just beneath the surface. Unknown amounts and types of military equipment are in the lake. (8)

Tagish

Art Johns

At the Canol pump station in Carcross, north of the new store, there are holding tanks and oil stains. By 1952, nothing good was left on the Canol Road. He didn't know of any dump sites near Tagish. At MacRae, near the junction with the Whitehorse Copper Road, west side, where there were Army buildings, there were one or two tanks full of diesel dug up. At MP849, near Squanga Lake, there used to be a creek named after the Johns family, shown on the PRA maps (Sheet 8:27) as Johns River. It is now called Seaforth Creek and it should be changed back to its original name.

Carcross:

In 1942, supplies and troops started coming into town via the Whitepass Railroad, and Carcross became a large storage area, as well as a pumping station and tank farm (storage-30,000 barrels), for the Canol No. 2, from Skagway on to Whitehorse; and for Canol No.3 on to Watson Lake. Photo# 20 by Richard Finnie (51) shows the Carcross army camp by Nares Lake in 1943.

20. Carcross Army Camp - 1943

Forty-two miles south of Whitehorse, the Carcross camp was a supply depot and control point for the Watson Lake pipeline, with a pumping station and a tank farm.

Carcross/Tagish First Nation
Arrangements were made with Chief Patrick James to interview Elders within the community. A list of Elders to interview was provided. However, many of these people were away or not available for interviews.

Larry Whelan - Economic Development Officer
At least 17 sites have been identified by the Carcross/Tagish First Nation along the Carcoss waterfront and near the community which should be cleaned up. This includes the old Whitepass tie yard for the railroad, the area between Lake Bennett and Nares Lake, and the tank farm and pumping station area, for the Canol No. 2 and later the Whitepass pipeline.

There is an old dump site at the end of the Carcross Airstrip towards Chootla Creek, by Nares lake. Water quality testing has been done in this area along Nares Lake. There is an old dump site located 7 miles east of Carcross on the Carcross/Tagish Road, near the west end Crag Lake.

Venus mine site near Carcross is being assessed this year by AES. Arsenic and acid rock drainage are a problem. The zinc spill at Lorne siding on the Whitepass Railroad needs to be cleaned up. Environmental Protection Service(EPS) was involved with some clean up of this site.

In Carcross, the main priority is to ensure that the water quality of the area is maintained as it is the headwaters of the Yukon.

Norman James
The Carcross Dump was probably filled 3 or 4 times over by the Army. They buried a lot there, also they buried by the Carcross airport. There was a dump near Crag Lake, 7 miles east from Carcross.

Ron Edwards
I worked on the railroad for awhile (1947). When the army was here there was *so much* moving through here. Warehouses were full with all kinds of supplies coming in. The Army had all the food they wanted and sometimes offered it to locals, they said "just take a case". The Army took over the railroad and ran it night and day. They didn't know much about running trains, especially in winter. They were coal fired and trains would go off the tracks. One time the train ran off the track, ran out of coal and passengers had to wait 10 days through a blizzard at the Whitepass, burning seats to keep warm. The black regiments were not used to these kinds of conditions, it made you feel a little sorry for them . There was a dumpsite at Mile 7 (east of Carcross, west end of Crag Lake) and another dump off the end of the Carcross airfield.

Hershel Smith
As a kid, I watched the army dump a lot of things at the current site of the Carcross dump. They'd dig a new hole to dump more. There is an old dump north of Carcross, past the junction with the Carcross/Tagish Road, along the railroad track, just north of the track switch. This dump has barrels on the surface and is on Whitepass land. I don't remember any dumps along the Carcross Road and none between Carcross & Tagish. There may be a dump near the Tagish Bridge.

Larry Barrett
Mr. Barrett thought that at the end of Carcross Airstrip, to the east towards Nares Lake, there were military dump sites. Just past the wildlife museum, north of Carcross, on the east side of the Carcross Road, there is an old dump under the rock bluff. An old timer had told him he'd found a small dump site between the Marsh Lake maintenance camp (MP883) and New Constabulary, by Scout Bay. There are diesel spills all along the tracks for the Whitepass pipeline. This could be affecting water quality. The railroad ties from the old Whitepass tie manufacturing plant, were coated with oil/tar and are all along the waterfront and should be removed. There are two garbage dumps on Montana Mt. which should also be cleaned up. He knew of a guy who dug up by Jakes Corner, 6 Chrysler cars, still with the plastic covers on!

ALASKA HIGHWAY
In 1943, from Jakes Corner (MP865)to Whitehorse MP917, there were eight construction camps. Maintenance camps were located at Marsh Lake (MP883) and at MacRae (MP910). A radio range station was located at Camp Takhini in Whitehorse, MP917. Two sawmills were located along the Carcross Road and along the Annie Lake Road (Wheaton and Watson Rivers) for bridge construction timbers.

Alaska Highway: Camps/Radio Range Station -1943
Section/Sheet No.- Camp Name - Mile Post
8/16 - Army Camp 4 E - Marsh Lake Maintenance Camp - MP883
8/11 - Army Camp 2 E - Lewes River Bridge - MP898
8/9 - Military Police Checking Station - MP908
- K.C.B. Construction Co. Yard - Macrae - MP910
- Camp- MP 911
8/8 - Utah Construction Co. Camp - MP911
8/7 - Army Camp 1 E - Squatter's Road - MP914
8/6 - K.C.B. Camp - Airport Hangers -MP916
- B.P.C. Camp - Old Weigh Scales - MP917
- Radio Range Station - Camp Takhini - MP917

Sawmills
6. Mile 7 Carcross - Tagish Road - Dowell Construction Co.
7. Wheaton River - M.H. Kansas City Bridge Co.
8. Watson River - Robinson Sawmill - M.H. Kansas City Bridge Co.

Marsh Lake Maintenance Camp - MP883

A July 1973, clean up report (Provided to AES, File#11) identified this site for clean up. There were assorted vehicles, debris and household garbage, approximately 600 ft. from Marsh Lake. Edey identified wood debris and asphalt roofing material at this site in 1976. This site was cleaned up in June 1976. (14)

McClintock Bridge - MP890

John Suits

I was living near the McClintock River when the highway came through. In 1948 or 49 when they finished the McClintock River bridge, near MP890.1 on the Alaska Highway, they buried odds and ends left over from the camp. On the west side of the Alaska Highway, they dug a big hole about 100 feet to the north of where the boat launch is today. They pushed everything into this hole, including drums, odds & ends and old equipment. This site is probably covered in willows now. You could say that wherever they had camps things were buried. You just have to find out where the camps were. I can't recall anything about DDT.

Lewes River Bridge - MP898

Army camp 2 E was located on the northern bank of the Lewes River, which was used during the bridge construction.

MacRae

MacRae or McCrae was a storage site and maintenance camp for the highway project with 280,00 tons of highway supplies shipped here in 1943 alone. Warehouses, garages and barracks were located here. In Photo #21, the "gas station" at MacRae is shown, using hand pumps in the early days and later, stream lined, self computing pumps with no waste. (49) A relay station complete with housing facilities, mess hall, garages and dispatch office functioned 24 hours daily. The K.C.B. construction camp also occupied this area in 1943. As the military operation at MacRae moved out there were rumors of equipment, and ammunition being buried.

In the vicinity of MacRae, there were four associated dump sites identified by a Whitehorse study on waste sites in 1984. (74) These sites were confirmed by our interviews. Dumps were located on both sides of the highway near MacRae (2 on west side, 2 on east side). Portions of these have been cleaned up. One site is located south of MacRae along the road to the old fox farm, where "things" were buried. One can notice this from the highway. These sites are shown on Figure 18, an older edition of the Whitehorse 1:50,000 NTS Map.

21. MacRae Relay Station - 1943/1944

GASOLINE and diesel fuel are now dispensed by streamlined electric, self-computing pumps with no waste, as is being done by Cpl. Jack Griffith, Davidson, N.C., and Pfc. Rainey Fox, Hundlemills, N.C., at Trutch Way Station. Inset shows earlier days at McCrae when gas came from a barrel by use of a hand pump. In foreground are Capt. (then 1st Lt.) Dallas Criswell, Dallas, Tex., and 1st Lt. Alden S. Henry, Los Angeles, Calif. Dispatch offices were tents, as in background.

EACH HUNDRED miles along the Highway a relay station, complete with housing facilities, mess hall, shops and dispatch office functions 24-hours daily. Here drivers are changed, repairs made on vehicles and cargo sped on its way toward its destination. Scene above shows McCrae Relay Station parking lot with shops in background.

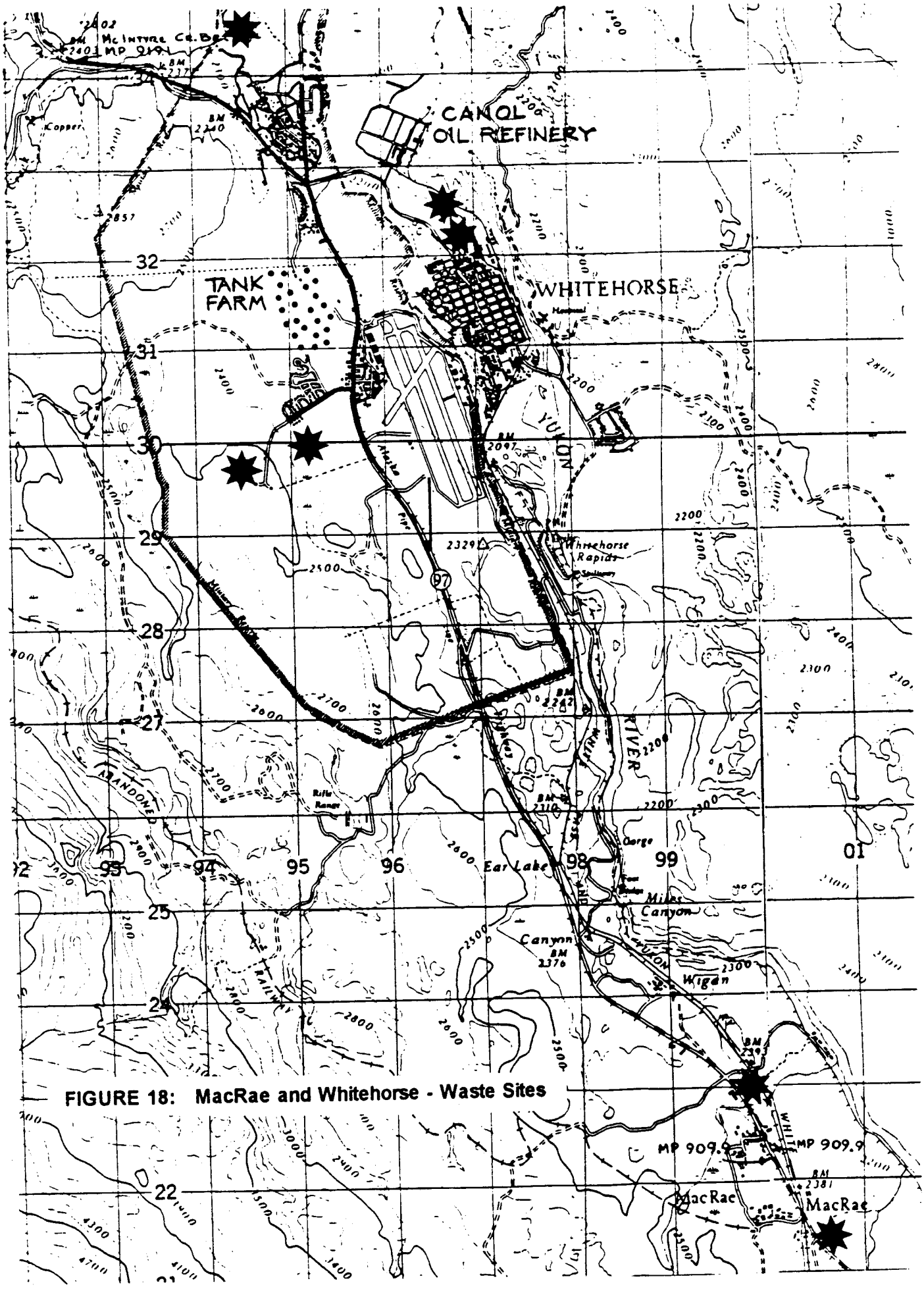
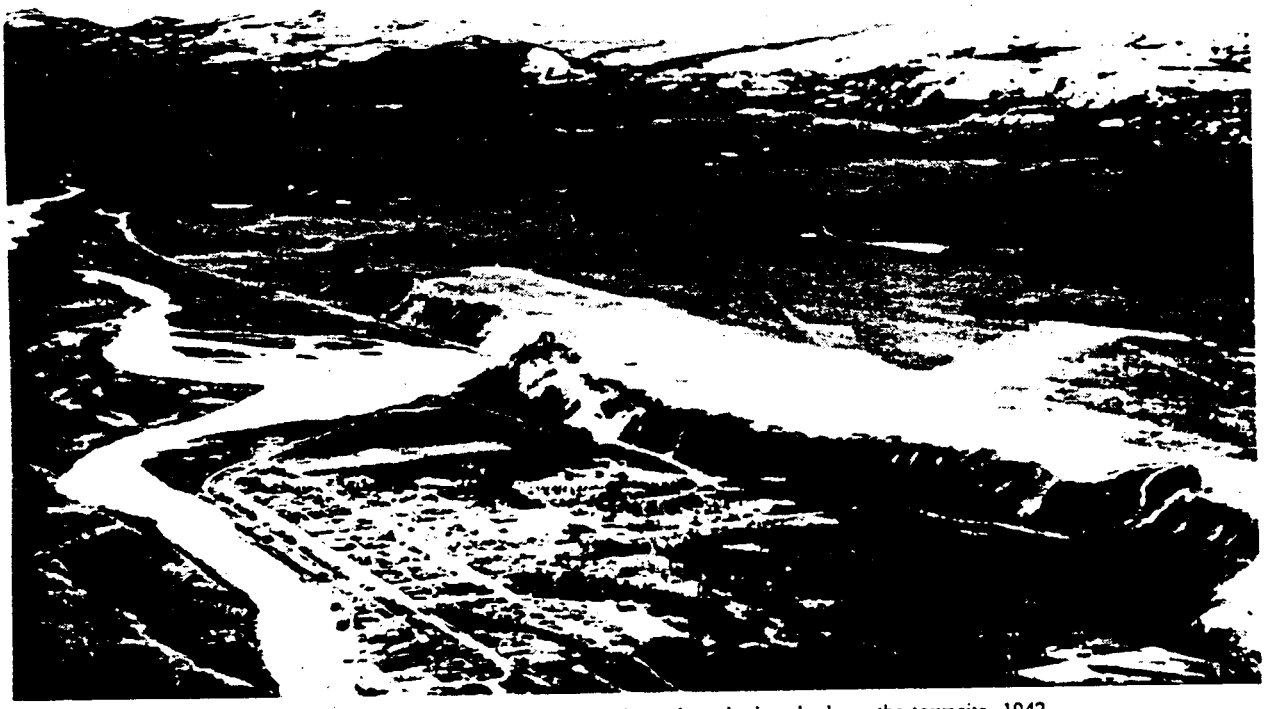


FIGURE 18: MacRae and Whitehorse - Waste Sites

Whitehorse Airport

The Whitehorse airport was first developed in 1920 using Cyr's wood lot on the hill above Whitehorse. The field was used regularly by military aircraft flying to Alaska. In 1927, Yukon Airways and Exploration formed the first commercial airline in the territory. By 1933, the north south runway had been realigned into the prevailing wind and a cross runway developed, under the control of the territorial government and paid for by local residents. For a time the field was operated by Whitepass. In 1937, Grant McConachie's (United Air Transport Ltd.) was flying airmail between Edmonton and Whitehorse. (75) Starting in 1941, the airfield was expanded as part of the Northwest Staging Route. This had greater amounts of money than any other airport in the Yukon, and was similar to Edmonton for funds. A Radio Range Station was constructed at Takhini. Photo #22, shows Whitehorse, with sternwheelers on the riverbank, the roads leading to the airport, and airport runways in 1942. (48) During World War II, the United States occupied the west side of the airfield and the RCAF, the east. In 1943, construction began on the hangars on the west side of the airport, one is still remaining today. In 1948, the RCAF relocated to the west side of the field. In 1958, Transport Canada took over management of the entire Whitehorse airport.

22. Whitehorse and Airport - 1942



Whitehorse, Yukon Territory with airport situated on the bench above the townsite, 1942

Whitehorse

With the influx of troops and workers for the Alaska Highway and Canol projects conditions in Whitehorse rapidly changed. Sanitary conditions became a problem as mentioned in Appendix K. Tent camps, and later barracks were built, by the Yukon River (Lower Whitehorse) and at Camp Takhini (Upper Whitehorse).

By June 1942 over 3,000 troops were stationed in the town itself, and more than 6,000 were there by the fall, with thousands more in nearby camps, that went to Whitehorse for leave and recreation. The population was at its wartime peak in the spring and summer 1943, with over 10,000 people in Whitehorse, 80-85 % of them Americans. By 1946, the population of Whitehorse had dropped by two-thirds to about 3,600. (29)

When the U.S. Army began to leave at the fall of 1943, there were rumours that everything was quickly disposed of by burying or burning. One interviewee mentioned a bury site at the bottom of the clay cliffs in Whitehorse, where clothes etc. were buried. This may be near the airport road down the bluff (this is in the centre of Photo #22).

Edmonton Journal (July 11, 1944)

A woman from Whitehorse said that "she had seen a barracks, between two and tree city blocks long, packed with winter clothes, overshoes, parkas, wool blankets, comforters, chairs, office desks and almost everything you could imagine. They stacked them up, poured gasoline over them, and set them on fire. Guards stood around with fixed bayonets so nobody could get anything." (33).

Solid waste disposal sites within the City of Whitehorse were documented during the summer of 1983 and 1984 and presented in a report. (74)

"The sites which have the greatest environmental impact on the Whitehorse area are the War Eagle dumpsite, the old dumpsite at Range Road, and the site of the present day MacRae Industrial area."

Sites mentioned which were related to military activities included:

1. Dump site on what is now Northland Trailer Park
2. Refuse site where Canamet Sales is located today,(9002 Quartz Road)
3. Range Road Dump. In the early 1950's the City of Whitehorse started using the Range Road dumpsite, which had been closed after the U.S. Army left. At the Range Road site, water sampling was completed, indicating no elevated levels of PCBs or pesticides.
4. Near the bottom of Two Miles Hill, on the east side.

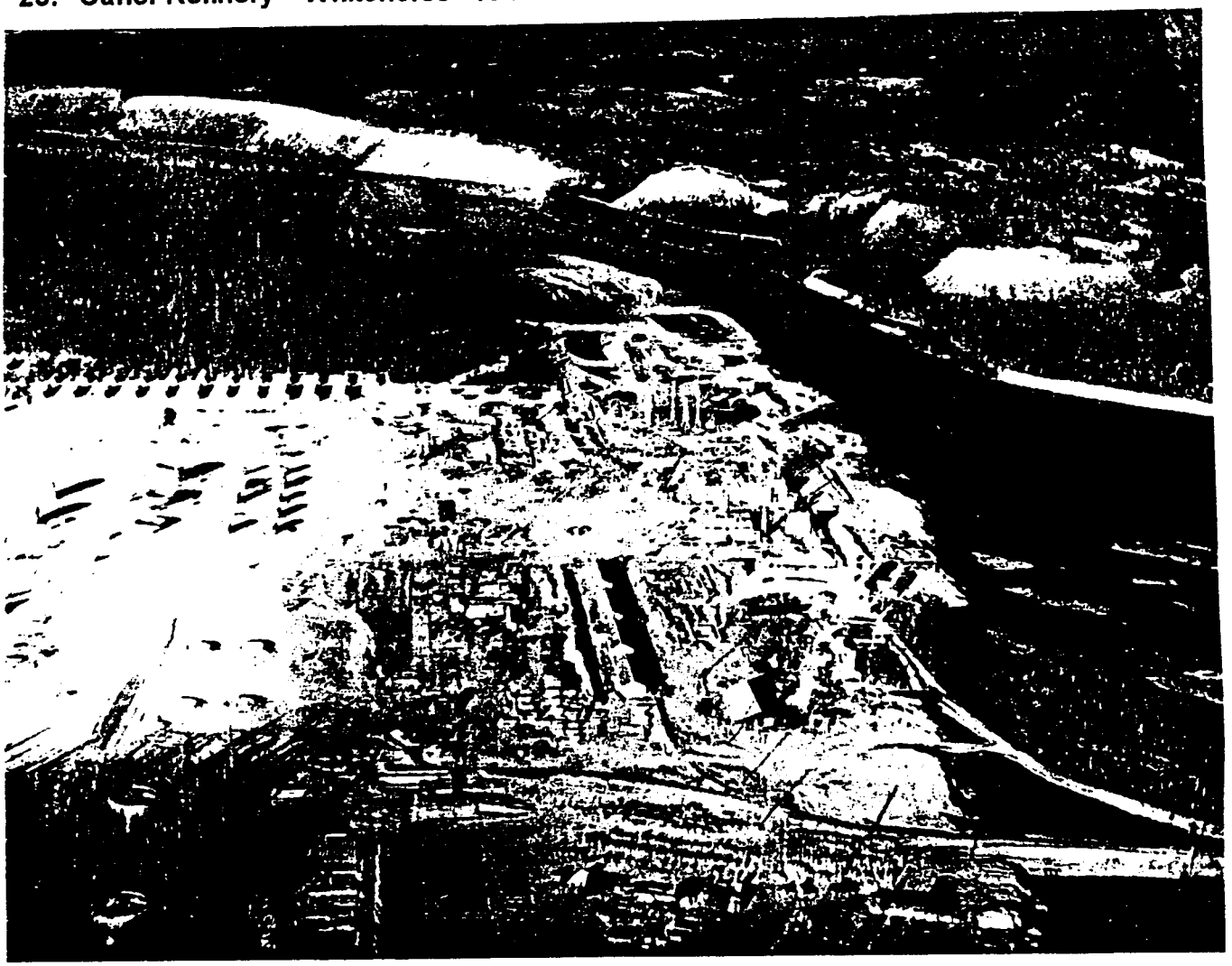
These sites were verified by our interviews. The trench for garbage at Northland Trailer Park, was investigated by Environmental Protection Service (EPS), in the late 1970s, when Norland Trailer Park was expanded. There were no concerns for contaminants (EPS pers.comm.). The Range Road dump at Lat. 60 46' Long. 135 05' 30 extended over the bank into MacIntyre Creek and the Yukon River. This has been cleaned up; vehicles were removed where possible and the remainder buried. The bank has been properly contoured and the area seeded to native grasses. Site 2 & 4

are now within areas used for the new Two Mile Hill Road and Canamet Sales.

CANOL PROJECTS

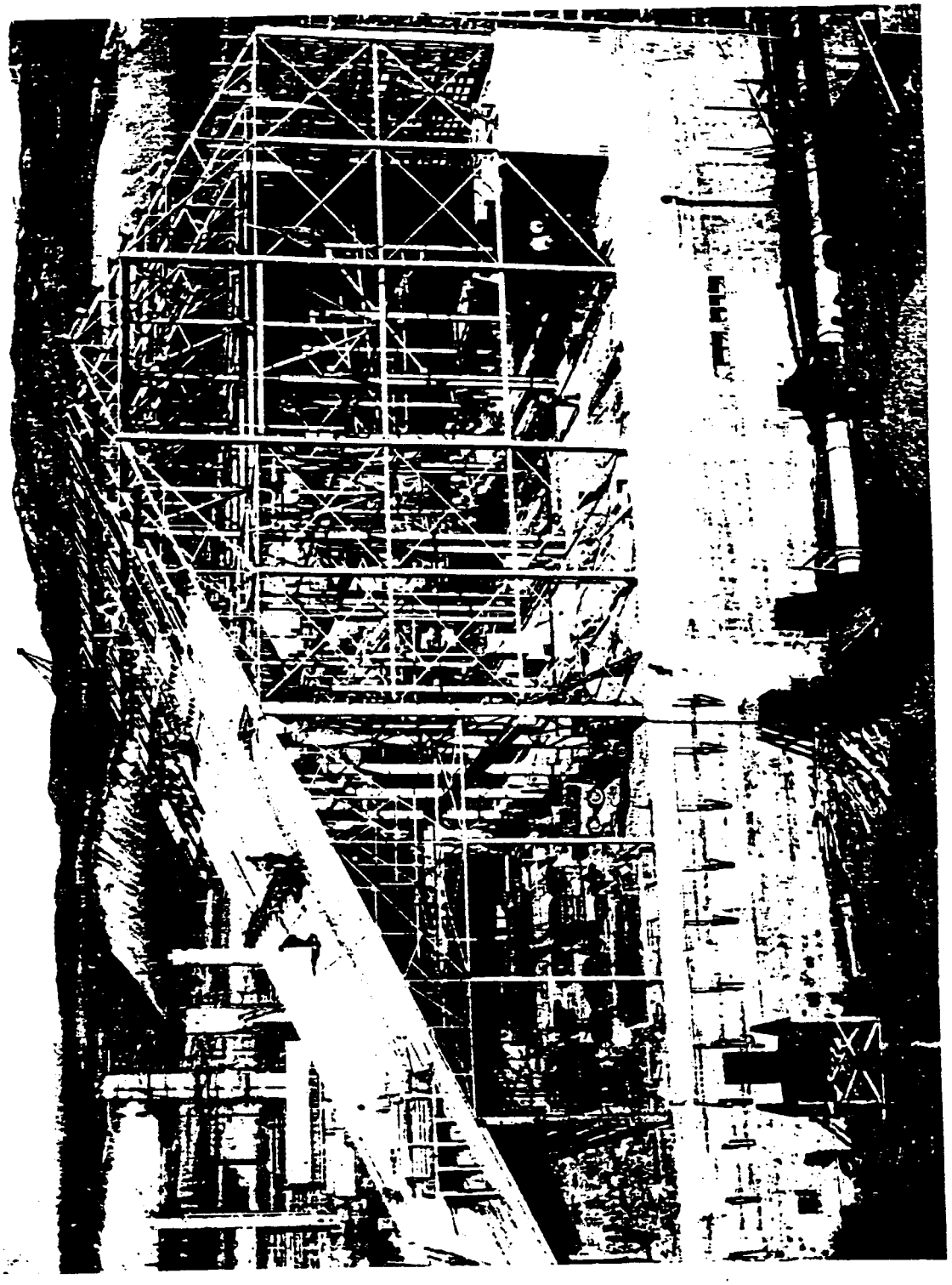
In Whitehorse, Canol No. 1 Pipeline went to the Refinery located by the Yukon River in the Marwell Area. Photo# 23 and #24, by Richard Finnie (51), show the refinery and powerhouse under construction in 1943. There were storage tanks with a capacity of 417,500 barrels near the refinery and another 240,000 barrels at the tank farm, west of the Airport. (See Figure 18). Canol No. 2, 3 and 4, were also connected to the tank farm and the refinery. (See Figure 4, Section 4.5). For Canol No.4, the refinery was considered as Pump Station 'A'.

23. Canol Refinery - Whitehorse -1943



While the tank farms, pumping stations, road, and pipelines were being built, the refinery at Whitehorse was rapidly growing. In April 1943 a site on the Lewes River was cleared just below the town; by October the installations were far advanced.

24. Powerhouse & Refinery Under Construction - 1943



In mid-October, along with the alkylation unit, the caustic treater, and the thermal cracking unit, the power house was taking shape.

Marwell Area

Aerial photographs of the Marwell Area, were acquired from Environmental Protection Service, for 1946 and 1978 to illustrate differences, of the time when the Canol Refinery and storage tanks still occupied the area, in 1946, when the refinery was gone and the area developed as part of the Marwell industrial area by 1978.

In Photo# 25; in 1946, one can see the refinery and power house near the banks of the Yukon River, and the associated storage tanks, and barracks. The REME (Royal Mechanical Electrical Engineer) Workshop was located here at this time.
At Camp Takhini, barracks can be seen, facing alternate directions.

In contrast, in Photo# 26; in 1978, the Canol refinery is gone, as well as, the power house and storage tanks. The YTG Maintenance Shop has been built beside the old powerhouse foundation. Quartz Road has been constructed and the swamp filled in at the Canamet Sales and Beaver Lumber area. Housing at Takhini has been constructed for federal government employees and is organized into a subdivision layout.

Interview - Bud Kofoed - J.R. Paine - Whitehorse

Soil drilling for foundation work was done in 1990, near the site of the old refinery, in back of Whitepass buildings towards the Yukon River. Old diesel which was fermented was found in a few drill sites. The old tarpit has been monitored but has not been fully cleaned up. There have been other sites within Whitehorse (Main Street) where hydrocarbons have been found.

WHITEPASS PIPELINE - Old Canol No.2

Interview - Ken Steele, Whitepass Corporation

The pipeline ceased to operate in October 1994. There is still fuel at the upper tank farm (Hillcrest) in Whitehorse. All fuel will be removed this summer. This line is gravity fed via a buried pipeline, under the Alaska Highway and down Two Mile Hill to the lower tank farm in the Marwell Area. Plans are to take the pipeline apart. Outside of Whitehorse, most of this pipe is above ground. Records of earlier spills are not available and most of the people who worked on the pipeline are gone. Earlier records would be held by the Army. There was a pumping station at the Whitepass Summit and at Carcross for this pipeline. The fuel transported was diesel, stove oil, and gasoline. Most of the fuel was pumped in the winter months. This was due to the fact that most of the pipeline is laid within the railroad right of way and fuel was not transported while the train was in operation for safety reasons. Whitepass purchased the Skagway to Whitehorse pipeline line in 1960. It has over the years also purchased old pipe from the Canol pipeline, Canol No.1, 3, and 4. When we had an oil spill, the fuel was burned off, this usually worked o.k. and was the technique of the times.

25. MARWELL AREA - 1946

26. MARWELL AREA - 1978

A summary of areas which are environmentally sensitive, and oil spills which occurred from 1966-1995, along the Canol No. 2/ Whitepass Pipeline route are presented in Appendix O. (21). In most cases the reason for spills were pipeline ruptures or failures. A strip map of the pipeline and spill data has been provided to AES in File#11, for the Tagish District.

Kwanlin Dun First Nation:
A session to meet Kwanlin Dun Elders was set up with Geraldine Pope, with Kwanlin Dun First Nation. Jessie Scarff kindly provided her time and information.

Jessie Scarff
She started working for Bechtel-Price-Callahan, at the head base camp in Whitehorse, in 1942, at the current Northwestel site near the airport. There were 57 people working in the office in Whitehorse. The top wages were paid by the Americans at $22.00/hr. Whitepass had to raise its wages to get employees. You had to have citizenship papers to be employed so most natives usually couldn't get a job. Native kids couldn't go to school.

Canadians were shipped up here after they were wounded overseas, they were shipped back to Canada and then shipped up here to work on the road. My husband, Leo Scarff, was wounded in Italy and then shipped here where he worked with the Canadian Engineers. "Yukon was an enlisted man's hell, officer's paradise and a civilian's goldmine."

Everyone had their own job to do. At first, where I worked was white inside the buildings, then with the U.S. Army, it was green inside in the barracks and working quarters. It was nice to get wooden desks to break up the colours. I would go out on inspection trips to bring records and take notes. We took pictures of the bridges. The part I hated the most was going across the temporary bridges made out of pontoons to cross the rivers. It made me feel sick. The one at Johnson's Crossing was something else as there was a swift current there! At Teslin, a few trucks in a convoy went off the pontoon bridge into the water. A few trucks and a 'Cat' are supposed to be buried right there in town.

There was a big camp at McRae, on both the east and west sides of the highway. A dump site existed, south of the railroad tracks crossing the highway at McRae, along the road which goes east towards the old fox farm, on the east side of the Alaska highway. They buried and covered everything at this site. There was also a dump on the west side of the road on the hill in McRae. "McRae is one big dump." There was also a camp at the bottom of Two Mile hill. Paddy's Pond, behind Hillcrest has barrels and unknown debris, which are sunken into mud and buried with landfill. Granger was

an old dump site. Towards Fish Lake along the old railroad bed for the underground mine (Kopper King), there are old dumps along there. There were trenches located to the north of Northland Trailer court where they buried garbage. They used to dump garbage in the swamp by Kishwoot Island, on the waterfront.

There were camps at the Takhini River bridge (MP946-south side of hwy), at Stoney Creek (MP956), and at Mendenhall (MP968 -big camp on both sides of highway). There was maintenance camp at Destruction Bay(MP1083) and at MP1156 (Koidern) there were fuel storage tanks. From here to Dawson Creek, every big bridge had a camp, with about 10-12 camps in total. Bechtel-Price-Callahan had about 50 people working on each bridge. There were dumps by each camp all along the highway. At Slims River they had a maintenance camp and dump there. I also worked at Snag in the office with 20 other people, I was the only native. The dump site was close to the buildings.

There was additional discussion regarding the changes brought about by a disregard for the environment. **"Attitudes need to be changed before its too late."**

Kwanlin Dun - Jason Shorty

Areas of known dump sites on Settlement Lands -

1. Old subdivision (S-12) - Old Alaska Highway MP932
   Building debris and garbage.
2. Golden Horn Lake - near Golden Horn Subdivision -south side of Alaska Hwy
   Called 'Frog Lake' in 1943 (9) (Sheet 8:10) - MP904
3. Yukon River, north of Lewes River Bridge on Alaska Hwy. Garbage dump near cabins, close to the Yukon River.

These sites may have been associated with Army activities.

Hector Lang

Mr. Lang was a contractor that built all the bridges on the North Canol Road from 1965-1968. I worked with my partner and the two of us, drove the pilings and rebuilt bridges of steel. At that time the old pumphouses were left but all the good equipment had gone. A lot of it was sold as war assets. In 1954, people were buying the buildings and whatever else and hauling what they could out of there. In the 1970s, the grease pit areas where trucks and cranes were greased were buried. It was a shame that all the equipment was taken out of there and put in one place. It was so much history just gone.

Jack Saunders

Jack worked on the construction of the Haines-Fairbanks pipeline and also worked on the bridges of the Alaska Highway. He worked constructing the final crossing of the

Slims River with the pipeline in the spring of 1955. He doesn't remember where things were buried. In those days you didn't worry about the environment you just did what you did, and didn't think about it. I've seen oils spills along the pipeline, and garbage/barrels dumps but I can't locate them.

Files locating specific clean ups in the Whitehorse area were very few, other than a couple of reports at Yukon Archives, and reports completed by Environmental Protection Service, in Whitehorse.

1973 Report (14)
Fish Lake Air Force Camp - Lat 60 38' 20" Long 132 03' 20"
Identified in a report, June 28, 1973, Debris includes Quonset type shelters, 70 drums and garbage. Cleaned Up.

1983 Waste Disposal Sites
ALASKA HIGHWAY

MP883.2 km 1421.3 Ak Hwy - Lat 60 31' Long. 134 21'
Marsh Lake Lodge- U.S.Army Maintenance Camp - 11 bldgs here in 1945 - some areas covered with soil
MP890.5 km 1433 Ak Hwy - Lat 60 33' 30" Long. 134 29' 30"
McClintock Bay - U.S. Army - light covering of soil
MP897.6 km 1444.5 Ak Hwy - Lat. 60 34' 30" Long 134 40' 50"
Yukon River bridge - U.S. Army camp -11 bldgs in 1945
MP900.5 km1449.2 Ak Hwy - Lat 60 34' 30" Long 134 46'
Shadow Lake near Golden Horn, perhaps U.S. Army
Trenches were dug- caved in

WHITEHORSE:

MP917 km 1470 Ak Hwy - Lat 60 46' Long 135 05' 30"
Army/City Dump - Range Road, Cleaned Up

KLONDIKE HIGHWAY

MP66 km106.2, off Klondike Hwy Lat 60 10' 30" Long 134 41'50"
Carcross Dump - U.S. Military Dump to present use
MP159.2 km159.2, off Klondike Hwy Lat 63 35'15" Long 134 51'20"
Ammunition Explosives Storage (Mile 3 Carcross Road)- perhaps U.S. Army,(Yukon Explosive Lease, mounds around containers)

Interviews identified similar dump sites during the 1993 Report (8):

Present Granger Subdivision (known presence of PCBs)
Royal Electrical and Mechanical Engineers (REME) shop location
(Near present day Canadian Tire Store and also Marwell Area)
Northland Trailer Court - trench
Baxter Gulch (north end of Whitehorse airstrip)
Slough adjacent to Kishwoot Island Bridge
Paddy's Pond (slough behind Hillcrest)
MacRae area (three sites)
Range Road dump

APPENDIX O: WHITEPASS & YUKON ROUTE (WPYR) PIPELINE (Old Canol No.2)

This includes a review of environmentally sensitive areas, pipeline breaks and spills from 1966-1976 (21) and spills from 1975 to 1995. (22) The Canadian portion of the pipeline was examined in regards to potential contamination of surface water, ground water, soil, and areas critical to water fowl.

ENVIRONMENTALLY SENSITIVE AREAS

Whitepass Area PP20-24
This area is dominated by broken rock with intermittent areas of standing and flowing water, forming the headwaters of Summit Lake. This area has a low productivity and disturbed areas have a slow recovery rate.

Fraser Hill PP24-27.7
This area is extremely wet and swampy with water flowing into the Tutshi river and Bernard Lake. The pipe dips into one creek (PP24.8) and is in a rocky creek bed for about 100 yards (PP25.8). The pipe is suspended on the bridge across the Tutshi River (PP26.7). This is sensitive with the wildlife and fish resources in this area.

Shallow Lake and Bernard Lake, PP27.7 -32
In this area the pipeline follows the lake shore and is within 5 yards in some places. The railway tracks separate the pipeline from the lake. The pipe crosses several streams which flow directly into the lakes.

Area north of Log Cabin- PP33-36
The pipe runs along the railroad line to Lake Bennett. This area is very wet and swampy, inhabited by beaver and muskrats. The pipe is in the ditch with water flowing throughout this distance. At PP35 the pipe is in a creek for about 100 yards (PP 35.3), which flows into Lake Lindeman, approximately 3 miles from this point.

Bennett Lake PP40.6 -67
The pipeline extends along the lake along the railroad right of way, the railway separating the pipeline from the lake. The pipeline crosses numerous streams which flow directly into Lake Bennett and the pipeline is often within ten yards of the lake. The fishery resource and recreational value of Bennett Lake make this a sensitive area.

Lewes Lake and the Watson River -PP74-86
The pipeline follows the Watson River south of Lewes Lake for several miles and is very close to the river in several locations. At PP85.6, it is less than 5 yards away from the Watson River. Between PP79-80.4 the ground is swampy and drains into the Watson River. Near Lewes Lake, the pipe is separated from the lake by the railway bed and is over 100 yards away from the lake on the bench. The close proximity to the river and lake make this a sensitive area.

Cowley Lake, Murray Lake and Wolf Creek Crossings, PP93-102.
The pipeline is for the most part on a ridge above the lakes and is over 100 yards from the lakes. These lakes are inhabited by beaver and muskrat and are a breeding area for waterfowl. The crossing over Wolf Creek is important as this flows directly into the Yukon River and into the City of Whitehorse domestic water supply.

OIL SPILLS

Spills from October 1966 to April 1976 are indicated in the 1976 report (21). In a letter from Whitepass dated August 13, 1976, 38 breaks are recorded. The largest product loss of stove oil occurred at PP51.2, by Bennett Lake of 1046 barrels on January 19, 1969. This spill flowed on top of the frozen lake and was burned off. The second highest spill was on May 13, 1969 at 213 barrels of diesel fuel at PP78.4, near the Watson River.

Spills November 1973- August 1976- 9 spills ranging in volume from fifty gallons to 6000 gallons: (Some of these are included in Whitepass letter) (See File #11).

PP89.2 - Annie Lake Road Crossing

November 5, 1973 - 1500-2000 gallons - Stove Oil

Pipeline break due to govt. grader, month or two before. Noticed by gauging station in Carcross and pipeline was turned off 15 or 20 minutes later. Old section of pipe was replaced same day. Contained in shallow ditch near road, not near any water course.

PP42.7 - Bennett Lake

December 29, 1973 - 65 Barrels (each 45 gallons) - Stove Oil

Most of the pipe is buried and in frozen ground and it was therefor impossible to locate the exact location of the break. This stove oil spill was burnt on December 31, 1973. Burning on the ice continued for the next several months as oil was noticed on the lake. In April 1974, there was a considerable amount of petroleum residue on the surface of the ice. By June 1994, only a streak of oil residue remained at the former ice surface along the shore of Bennett Lake.

PP86.7

July 4, 1974 - 74 Barrels - Diesel

There was an under estimate of the damage caused by this spill. It was finally estimated that 74 barrels of fuel were lost due to a high pressure break. The pipe seam was broken by rust and a high operating pressure of 3000 psi. The break caused a pressure drop at the Skagway gauging station and the pipeline was shut off. The survey in 1976 revealed an extensive patch of dead vegetation that surrounded the site of the break. This illustrates that "even a slight skim of oil will cause an extensive vegetation kill."

PP 104.1 - 200 yards South of McCrae - 60 38'/135 00'

July 5, 1974 - 1500 Gallons - Diesel Fuel

The break was due to rust weakening the pipe and the pipe breaking during a power surge. The surge came during start up procedures and therefore was not immediately detectable. When the normal pressure was not noted in an appropriate time the pipe was shut off in Skagway.

PP46.6

March 25,1975 - 3000 Gallons - Stove Oil

A break in the pipe occurred as a result of a rock slide the previous fall. Under the stress of winter conditions the pipe began to leak. The leaking pipe was found on March 26, 1975. On the first inspection there were a few signs of oil on the ice surface. About one week later cleanup include burning of the collected oil on the ice surface (April 3, 1975). It was estimated that 75% of the 3000 gallons were disposed of. (See Letter Dated April 4, 1975).

OIL SPILLS (Cont.)

PP87.5
October 14, 1975 - 6000 Gallons - Stove Oil
Originally, there was an underestimation of the damage of this spill. A path of oil flowed towards Rat Lake and there was an extent of dead vegetation along the north shore of the lake. In July 1976, there were no oil slicks seen on the lake, but there had been considerable damage to the waterfowl and muskrat habitat.

PP49.3
January 30, 1976 - 100 Gallons - Diesel Fuel
A bulldozer creased the pipe, creating a small leak, located approximately 200 yards from Bennett Lake. As the soil in the area has a high gravel content, oil disappeared into the ground.

PP40.1
March 31, 1976 -1400 Gallons - Stove Oil
The major portion of the oil seeped into the sandy soil, quite a way from Lindeman or Bennett Lakes. Leak was spotted at 0930 and was under control by 1400 hrs. Environmental damage was likely minimal due to the nature of the surrounding landscape.

PP21.5 - Whitepass Area
April 1, 1976 - 100 Gallons - Stove Oil
The break in the pipeline was due to a pressure build up due to slush in the line. The estimate of product loss was increased to 10 barrels (45 gal each). There was a large area where damage to vegetation was apparent and in July 1976 slicks could still be seen on ponds as much as 400 yards away from the spill.

Spill Records from 1975-1995, compiled by Environmental Protection Service, Whitehorse in 1995, (22) are indicated. Date, quantity spilled, location and reason for spill, pipeline rupture/failure (#), ice in valves (+), or valve left open (*) are recorded:

LIST OF SPILLS - WHITEPASS PIPELINE 1973-1995

Date	Quantity	Location	Lat/Long	Cause
5/10/73	8000L	Annie Lake	61 45/131 00	#
5/7/74	200L	Whitepass-PP86.7	60 29/134 55	#
23/7/74	6800L	McCrae	60 38/135 00	#
7/1/75	13,600L	Whitepass	60 43/135 03	#
25/3/75	13,600L	Whitepass-PP46.6	59 52/134 57	#
7/4/75	8200L	Carcross Pump Station	60 10/134 42	+
14/10/75	27,300L	MP14 Carcross Road	60 25/134 50	#
30/1/76	500L	Whitepass-PP49.3	59 58/134 55	#
31/3/76	6,400L	1 Mi S.of Bennett Lake	59 49/135 01	#
1/4/76	500L	.5 Mi inside Can.Border	59 38/135 07	#
11/3/77	2,300L	914 Alaska Highway	60 43/135 03	#
27/4/79	45,500L	Fraser,B.C.	59 43/135 43	#
4/5/79	400L	Whitehorse (*)	60 48/135 03	*
17/12/79	22,700L	PP30.5,Alaska	59 44/134 59	#
22/2/80	10,200L	PP28,Alaska	55 44/135 01	#
6/6/80	200L	PP80	60 20/134 54	#
16/12/80	4,800L	PP24,Alaska	59 40/135 06	#
25/2/81	4800L	PP25.8	59 40/135 04	#
31/1/83	18,400L	PP80	60 20/134 54	#
20/10/83	7,700L	PP? Whitehorse	63 43/135 03	#
4/12/83	12,700L	Whitehorse	60 41/135 03	#
3/4/86	600L	PP? Ak Hwy S.of Whse	60 43/135 04	#
8/8/87	34,300L	PP? km40 Klondike Hwy	59 43/135 00	#
22/8/87	60L	km 40 Klondike Hwy	59 44/134 59	#
14/9/92	3000L	WPYRcars-underwater 38yrs	59 59/134 54	

Note:
The Whitepass & Yukon Route Railroad cars which had been in the waters of Lake Bennett for 38 years were removed as part of clean up activities in the area, in 1994.

5.4 LABERGE DISTRICT REVIEW

Boundaries:
Alaska Highway - MP917 Whitehorse to MP975 Champagne
Klondike Highway (Mayo Road Jct to Braeburn) (MP0-MP57)
Takhini Hotsprings Road
Kusawa Lake Road
Map Coverage:
Map 4: Whitehorse - 105D
Alaska Hwy - MP917 Whitehorse to Stoney Creek MP956
Klondike Hwy - Mayo Road Jct- MP0-MP15
5: Laberge - 105 E -
Klondike Hwy - MP15 to MP57 Braeburn
6: Aishihik Lake - 115 H
7: Dezadeash - 115 A
Alaska Hwy - Stoney Creek MP956 - Champagne MP975
Kusawa Lake Road
Military Activities:
Alaska Highway Construction Camps, Sawmills, Canol No.4, Military bombing practices

Whitehorse/Lake Laberge

Ta'an Kwatchan First Nation
Doreen Grady provided a summary of a meeting held with Ta'an Kwatchan Elders when they were involved with a contaminant review for the Arctic Environmental Strategy, in 1991. As Elders had already voiced their concerns and there were no special funds available for interviews, no interviews were arranged.

Ta'an Kwatchan - Elders Meeting-July 26, 1991)

John Adamson	Kathleen Jones
Sophie Miller	Frances Woolsey
Irene Adamson	Shirley Adamson
Irene McIntosh	Chief Glen Grady

Comments/Concerns:
- There were concerns for the REME workshop area, by the Yukon River, in the Marwell area. This is probably polluted.
- One used to bulldoze in the MacIntyre Creek area, (old dumpsite) and after seeing the way pollutants were handled they didn't want to eat Laberge fish.
- Behind the present site of Beaver Lumber there is a dumpsite. There was a stream running through there that they covered up.
- In the late 1920s and early 1930s, below 2nd Avenue Chevron, there used to be a dump there. When spring came, the garbage used to go down to Lake Laberge.

- When the steamboats were running they used to coat the ice with oil in Lake Laberge to melt the ice. "Grandma said, 'Ice killed the fish' when lots of fish were floating on Lake Laberge." Maybe that is what she meant. 40 years ago at Lake Laberge you could taste oil in the fish.
- In World War II, people were careless about oil. At 17 Works they used to save oil and pour it on the swamp to keep the mosquitos down.
- Air Force sprayed chemical "gunk" to clean a carburetor or anything. They said you couldn't touch it with your hands.

Whitehorse/Lake Laberge

From Whitehorse, garbage and sewage has flowed its way down the Yukon River to Lake Laberge, since the beginning of the community. Sewage lagoons have been like holding ponds until they've been released into the Yukon River. The City has recently undertaken the construction of a lagoon that will meet the demands of Whitehorse with proper treatment facilities. As discussed in Section 3.0, Lake Laberge had the highest level of DDT of lakes sampled and is probably a legacy from the spraying done by the RCAF in Whitehorse, from the 1940s to the early 1960s. Newspaper articles mention the garbage along the Yukon River and the need for a proper sewage system back in 1968.

Whitehorse Star, November 1968

The Whitehorse Star, Thursday, November 14, 1968, Page 17

Pollution Report Recommends Changes For Sewage And Garbage

A number of recommendations for action are contained in the report and Pollution Survey received by the Commissioner of Yukon from Dr. Lyall Black, Medical Officer of Health for the Yukon Territory.

The report, made public last week, was presented after a careful survey of the Yukon River, sewage and garbage systems in the city of Whitehorse, as a result of complaints that pollution was becoming a serious problem in this area.

Here, in summary, are the conclusions and recommendations in the official report:

"The Yukon River is a natural resource that is an efficient transporter and stabilizer by natural processes of domestic wastes. Present and foreseeable future raw sewage discharges do not endanger human or fish life and do not damage the resource----BUT the report recommends :

1. A water quality management program should be initiated by the City and 2. Develop sewage treatment plant site and make plans to treat sewage before discharge to the River.

"The continuing use of unfiltered water from the McIntyre Creek watershed jeopardizes public health and this source of water should be abandoned and an alternative source found." Recommendation: Adopt an alternative source of potable water to McIntyre Creek.

"Commercial and recreational activities on Schwatka Lake, the City water supply source, constitute a potential health hazard". Recommendation: Post the City watershed and Schwatka Lake and curb activities there.

"The discharge of raw sewage on to bog lands from the Takhini DPW area could be hazardous to the health of unwary invaders" Recommendation: Build a facultative sewage lagoon system to settle the sewage from Takhini before discharge to the River.

"The City garbage dump is' an eyesore. Drainage and seepage from the dump can enter McIntyre Creek. Fish could be harmed by such discharges if these were toxic, which they might well be. There is, however, no hazard to public health from this garbage dump".

Recommendation: Take steps to find an alternative site for the City garbage dump.

"Health based legislation might benefit from bolstering by the preparation of Legislation to cover water supplies and sewage disposal similar to that used in other Provinces and the Northwest Territories". Recommendation: Examine existing Legislation and the proposed Water Regulations in detail.

Whitehorse Star, July 1968

Whitehorse Garbage Dump Eighty-two Miles Long

I recently made a canoe trip down the Teslin river from Johnson's Crossing to Hootalinqua where the 30 Mile section of the Yukon River joins.

Moving upstream on the Thirty Mile towards Lake LaBerge it was stormy and I was delayed a day during which I decided to go beachcombing.

Walking for two miles along the west shore I found the following.

GARBAGE FROM WHITEHORSE DUMP

Old Tires - 8 to the mile
Plastic containers - 30 to the mile.
Plastic & wooden toys, Xmas lights etc., - 5 to the mile.
Bottles - 50 to the mile.
Cans - 50 to the mile.
Wooden crates - 3 to the mile.

One more sampling was made some 18 miles up the Lake confirming this average of garbage.

The portion of the Yukon River between Whitehorse and La Berge is strewn with garbage of one kind or another.

During World War Two when there were some 40,000 people in the area, the Army kept a bulldozer operating 24 hours a day covering garbage and waste was thrown down the river bank. The present condition has come about with a population of from 5,000 to 7,000 people.

GARBAGE ALONG LAKE LaBARGE

Shoreline approximate 76 miles. (6 miles deleted approx. area which would not hold debris)

Old tires - 8 to a mile	560
Plastic containers - 30 to a mile.	2280
Plastic toys Xmas lights etc., - to to a mile	350
Bottles - 50 to mile.	3800
Cans - 50 to mile.	3500
Wooden crates - 3 to mile	210
Debris material, timber old boats etc.,	1000
	11,700

The portion of the Yukon river between Whitehorse and LaBerge is strewn with the same sort of material. The determination of responsibility appears to rest with the City of Whitehorse.

There does not appear to be any plan to solve the problem. As a suggestion the following:

1. Clean up the 82 miles of garbage.
2. Develop a new garbage dump in a NEW AREA.
3. Look into a modern incinerator set-up.
4. Cover completely to a depth of 4 feet the present garbage dump and also the river bank and develop the area for housing.

Ten thousand people will be coming to live here within the next eight to ten years, which means a total population of at least 18 to 20,000. THE TIME IS NOW.

Alan Innes-Taylor.

The condition of the streets of Whitehorse was almost as bad as the water and sewer systems. In 1944 residents of Whitehorse petitioned the authorities in Dawson City and then Ottawa for the streets to be regularly sprayed with oil. An investigation from Ottawa revealed that the Whitehorse refinery was prepared to supply oil to the town free of charge and eventually oil was sprayed and the problem partially alleviated. (29)

Large volumes of waste oil were applied to the streets of Whitehorse for dust suppression. Airphotos from 1946 and 1963 show extensive oiling on the streets. This practice could have also added PCBs to the environment. (8)

Waste oil was mixed with "lamp black" and applied to the surface ice on Lake Laberge in a strip 60 feet wide the length of the lake. The waste oil was added to keep the day's melting process from freezing at night. This may have contained some PCB contaminated oils. (2)

Military Practices

At Richtofen Island, near Deep Creek on Lake Laberge, a target was set up for military bombing practices, for aircraft and "on the ground". Some of the practice bombs may not have been fired and if found on land they could be active. (See Section 4.7) In the 1950s, the Army did clean up some of the munitions used in this area. However, if a bomb is found, the Explosives Disposal Division of the RCMP should be contacted to ensure safety. A resident of Deep Creek on Lake Laberge, said her children are always finding live bullet shells around her home, from military practices held in the area (B. Burns pers.comm.). A campground maintenance worker at the Deep Creek campground said she found lots of an object that had 3 metal rings inside of a triangle, probably for ammunition casings. She indicated she must have picked up more than a garbage bag full of these over the 5 years she worked there. (L.Sofiak pers.comm.)

Interview - Murray Biggin

The 1958 fire which burned most of the area north of Whitehorse was started by the military, while doing demolition of ammunition and bombs at the practice area at Lake Laberge. According to Mr. Biggin, this was denied by the U.S. Air Force, for about two years. Eventually they compensated 2 or 3 of the local landowners for damage to their property due to the fire.

ALASKA HIGHWAY

From Whitehorse (MP917) to Champagne (MP974.5), there were four army construction camps, at Takhini Crossing (MP936), Takhini River Bridge (MP946), Stoney Creek MP956, and by the Mendenhall River at MP968.1. One Canol No. 4 pump station 'B' was located to the west of Stoney Creek at MP956.8. Sawmills for bridge construction in 1943 were located near Takhini Crossing, 37 Mile Creek (MP951), and near the junction with the Kusawa Lake Road (MP959).

Alaska Highway: Camps and Pumping Stations - 1943

Section/Sheet No.- Camp Name - Milepost

SECTION 9: MP929 - 1093: WHITEHORSE - BURWASH LANDING
9/6 - Army Camp 1 W - Takhini Crossing - MP936
9/8 - Bates & Rogers Camp - Takhini River Bridge - MP946
9/10 - Army Camp 2 W - Stoney Creek - MP956
- Canol Pumping Station 'B' -Canol No.4 - MP956.8
9/11 - Junction Kusawa Lake Road - MP959
9/13 - Army Camp 3 W - Mendenhall River - MP968.1
9/15 - Champagne, YT. - MP974.5

Sawmills - 1943

9. Mile 12 West Sawmill - U.S. Army -331st Engineers
10. Mile 27 West Sawmill - M.H. Kansas City Bridge Co.
11. Mile 48 West Sawmill - Dowell Construction Co.
12. Mile 50 West Sawmill - Bechtel Price Callahan Co.

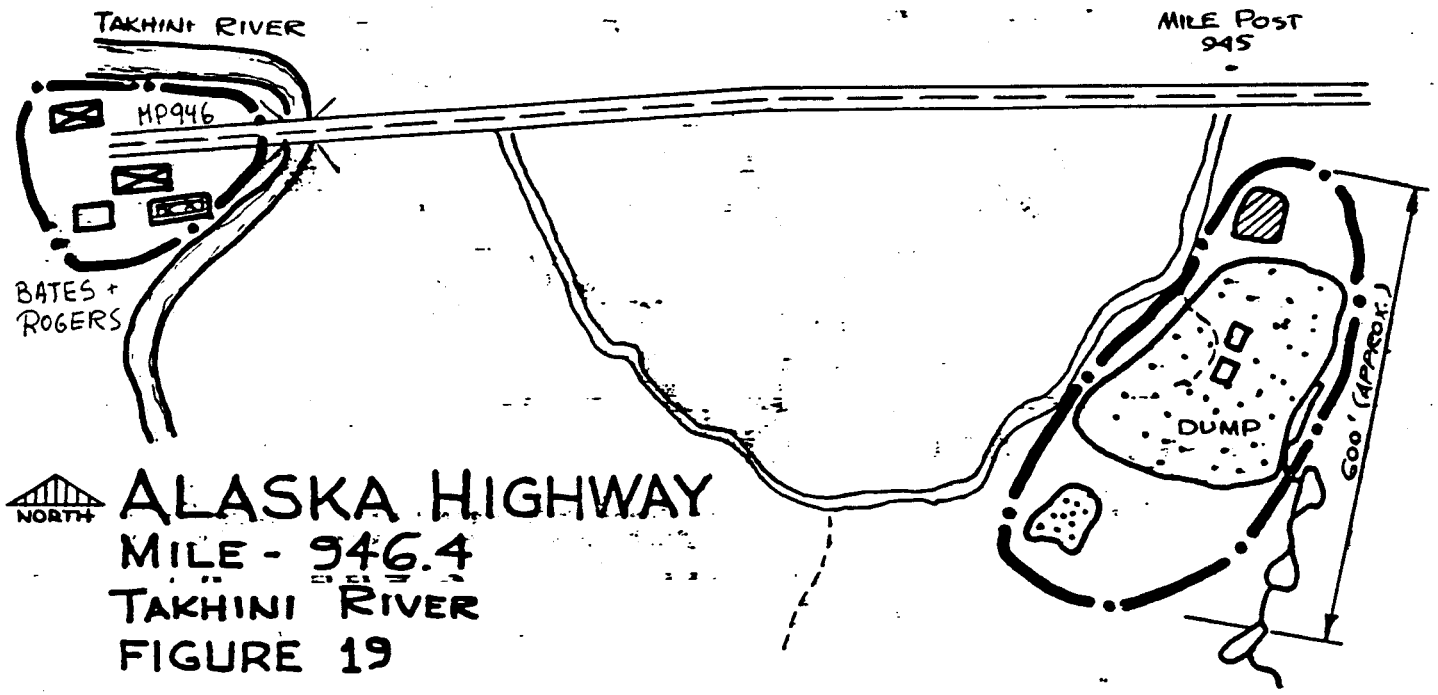
Takhini Crossing -MP936

Camp 1 W was set up here in 1943 and there was a ferry for transporting across the Takhini River for the old pioneer road, using the orginal wagon road to Champagne, and a portion of the old Dawson Trail.

Takhini River Bridge - MP946

In 1943, a construction camp of Bates & Rogers was located on the west bank of the Takhini River, while they were building the Takhini River bridge. This site was reviewed by Edey (13), shown in Figure 19. To the east at MP945, is an old army dumping site. Locals have continued to use this and it has become a real eyesore. Garbage is blowing in all directions, also shown in Figure 19.

FIGURE 19: Bates & Rogers Camp - Takhini River - MP946 - 1976



Stoney Creek - MP956

Camp 2 W near Stoney Creek is shown in Figure 20. (13) In 1976 Edey indicated there were six standing buildings, scattered wood debris and four vehicle hulks. He recommended removing vehicles and metal to the disposal site identified at MP956.8. The buildings were to remain for an historical site and assorted wood debris would be collected and burned. Pump Station 'B' for Canol No. 4 was located near Stoney Creek MP956.8 and is shown in Figure 21. (13) Edey identified a dump in an abandoned gravel pit adjacent to the pump station and suggested using this site as a possible bury site for the 400 ft of pipe and burning of wood debris from the pump station.

FIGURE 20: Army Camp 2 W - Stoney Creek - MP956 - 1976

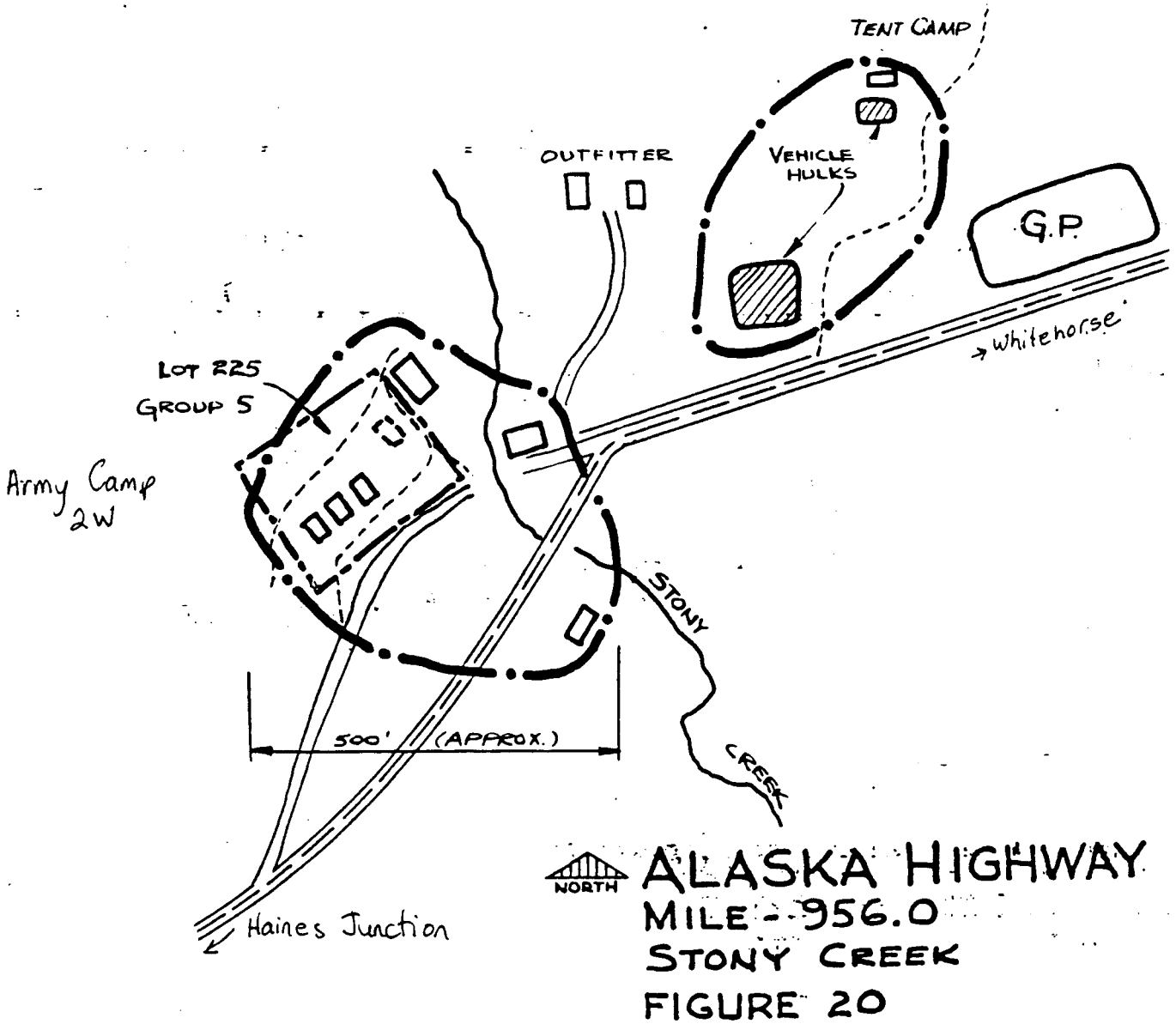
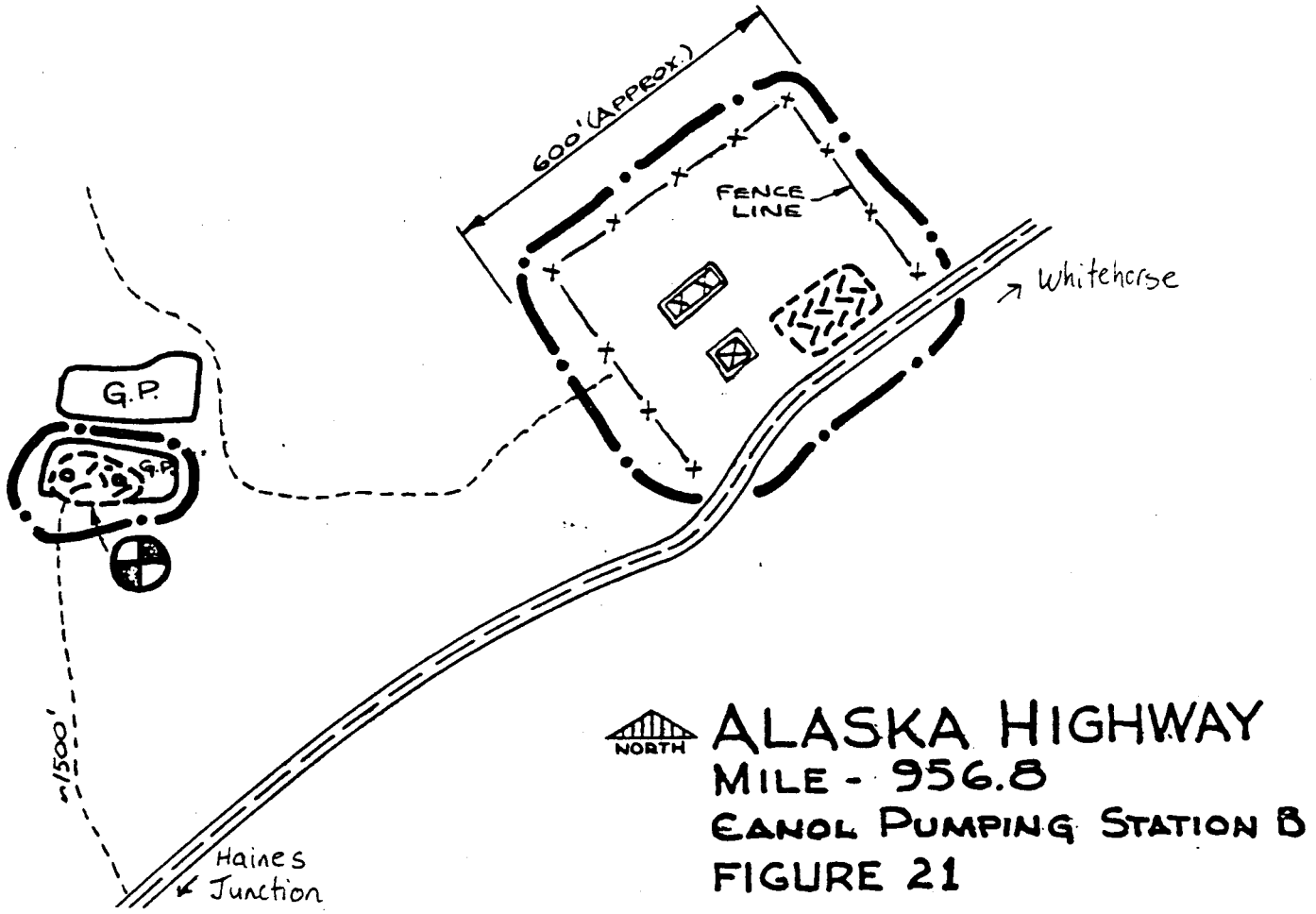


FIGURE 21: Canol No. 4 Pumping Station 'B' - MP956.8 - 1976



Champagne

The pioneer road went through the middle of the settlement of Champagne. Some of the residents worked as guides for the Army.

Alex VanBibber

Mr. VanBibber was part of the initial survey party in the fall 1942, with Ken Fuller and Guy Blanchet, to survey the route of Canol Pipeline No. 1 over the Macmillian Pass, called the Sheldon Route (51). He was also on a survey party to look at an alternate route from Mayo, YT to Fort Norman, NWT. The pump stations were clean during operation in 1944. Later,in the 1970s, he took hunting parties up the Canol Road and stayed at the abandoned camps. He stayed at a camp near MP220, near Macmillian River. Most of the good equipment and materials at the camps had been salvaged. A company from Prince George had hauled the pipe out. The pipeline to Watson Lake was a 4" line which operated until the late 1940s.

Mr. VanBibber has lived for many years at Champagne and has recently been involved in clean up projects around the Champagne area. There is an old army sawmill site, to the north of Champagne, where drums and cans are located through the bush. To the south of Champagne there was a dump site which is now cleaned up. The worst dump is after the Takhini River Bridge (MP946) going south, at the top of the hill on the right. There is garbage blowing into the woods everywhere. The army started it but highway maintenance has really let it go. This should be cleaned up.

At Aishihik there is a mess, and it was especially a mess when the airport was operating. There was a camp at 40 mile. Sites along Aishihik Lake, are cleaned up.

1983 Waste Management Sites

ALASKA HIGHWAY

MP945 km 1521.5 Ak Hwy - Lat 60 51' 10" Long 135 43' 40"
Takhini, Domestic in use, perhaps Army

MP945.7 km 1522 Ak Hwy - Lat 60 51' 10" Long 135 44' 40"
Takhini River Camp - U.S. Army -11 bldgs in 1945.
Light covering of soil

MP956 km1538.4 Ak Hwy - Lat 60 48' 00" Long 136 00' 00"
Stoney Creek - U.S. Army maintenance camp - 9 bldgs in 1945, Covering of dump areas with soil

MP956.8 km1539.7 Ak Hwy - Lat 60 47' 30" Long 136 00' 30"
Canol No.4 Pump Station B - 4 concrete foundations, some covering of areas with gravel

MP968.1 km1558 Ak Hwy - Lat60 47' 10" Long 136 17' 30"
Mendenhall River - U.S. Army Camp - 2 concrete foundations, 10 bldg in 1945 - Slight covering/soil

MP976 km1570.6 Ak Hwy - Lat 60 48' Long 136 31'
Champagne - U.S.Army ?/covered with gravel

5.5 HAINES JUNCTION DISTRICT REVIEW

Boundaries:
Alaska Highway - MP 975 Champagne to MP 1104 (Burwash Flats)
Aishihik Lake Road - Canyon MP0 to MP71 Aishihik Airport
Haines Road - BC/Yukon Border MP87 to Haines Junction MP159
Map Coverage:
Map 6: Aishihik Lake - 115 H
Aishihik Lake Road - MP26 to MP71 Aishihik Airport
7: Dezadeash - 115 A
Alaska Highway - Champagne MP975 to MP1037
Aishihik Lake Road - Canyon MP0 to MP26
Haines Road-BC/Yukon Border MP87 to Haines Junction MP159
8: Tatshenshini River,B.C. - 114 P
Haines Road - MP27.2 - MP87 BC/Yukon Border
9: Kluane Lake - 115 F&G/ 115 B&C
Alaska Highway - MP1037 to MP1104 Burwash Flats
Military Activities:
Aishihik Airport, Alaska Highway Construction Camps, Haines Road Construction Camps, Relay Stations, Canol No.4 (Pump Stations C,D,E), Haines-Fairbanks Pipeline (Pump Stations - Blanchard, Haines Junction, Destruction Bay)

Communities:
Alaska Highway: Cracker Creek, Canyon, Haines Junction, Silver City, Destruction Bay, Burwash Landing
Haines Road: Klukshu

MP1104 km1776.6 (Burwash Creek) is the approximate point where the Resource Management District boundary cross the Alaska Highway. Interviews in the Burwash Landing area revealed sites which were further north in the Beaver Creek District. These were included in this section.

This district was the "busiest" in terms of number of camps and numbers of projects, extending over the longest period.

ALASKA HIGHWAY:
The pioneer road west of Whitehorse followed the existing Whitehorse to Kluane Wagon Road to Champagne, on to Burwash Landing and to the White River District. Champagne, MacIntosh Lodge, Silver City, and Burwash Landing were the trading posts and native settlements along the pioneer road in 1942. In 1943, from Champagne to Burwash landing there were four Army construction camps, at Cracker Creek (MP988), at Haines Junction (MP1016), at Kluane Lake (MP1056), and Destruction Bay (MP1083). Bates & Rogers had a camp at the Duke River MP1098.

For Canol No. 4 there were pump stations 'C' west of Canyon (MP1000), 'D' at Jarvis River (MP1036) and 'E' at Destruction Bay (MP1081). Relay stations were located at Canyon (MP996), and Destruction Bay. Sawmills were located at Marshall Creek, near Pine Creek, north of Haines Junction, at Duke River and at Burwash Flats (MP1104).

Alaska Highway: Camps/Relay & Pump Stations -1943

Section/Sheet No.- Camp Name - Mile Post

9/15 - Champagne, YT. - MP974.5
9/18 - Army Camp 4 W - Cracker Creek - MP988
9/21 - Canyon Creek Relay Station - Canyon Creek - MP996
9/22 - Canol No.4 Pumping Station 'C'- MP1000
9/28 - Army Camp 5 W - Haines Junction - MP1016
9/29 - Mackintosh Trading Post - MP1022
9/33 - Canol No.4 Pumping Station 'D' - Jarvis River - MP1036
9/37 - Kluane - Silver City - MP1053.5
9/38 - Camp 150 W - MP1056
9/40 - Soldiers Summit - Kluane Lake - MP1061.5
9/41 - USC & GS Dump 1943 - Kluane Lake - MP1063 *
- USC & GS Dump 1943 - Kluane Lake - MP1064 *
9/47 - Canol No.4 Pumping Station 'E' - Destruction Bay - MP1081
9/48 - U.S. Army Relay Station - Destruction Bay - MP1082.8
- Canol Tanks - Destruction Bay - MP1082.9
- U.S. Army Camp -Destruction Bay - MP1083
9/51 - Burwash Landing -MP1093
SECTION 10: MP1092-1221.4: BURWASH LANDING - US/CANADA BOUNDARY
10/4 - Burwash Flight Strip - MP1095
10/6 - Bates & Rogers Camp 200 W - Duke River - MP1098

Sawmills-Alaska Highway - 1943

13. Mile 100 West Sawmill - Dowell Construction Co.
14. Mile 100 West Sawmill - M.H. Kansas City Bridge Co.
15. Clyde Wann Sawmill - M.H. Kansas City Bridge Co.
16. L.Proctor Sawmill - Bechtel-Price-Callahan Co.
17. Burwash Creek Sawmill - M.H. Censes City Bridge Co.

Cracker Creek - MP988

Chris Boland

Mr. Boland owns the Cracker Creek Lodge, near MP988 of the Alaska Highway. There used to be an old dump site by the creek but this has been cleaned up. This was mostly household garbage. There are no buried sites as far as he knows. He believes that every camp site had a dump site, lots of them are mostly jars, cans and beer bottles. He's heard of 'Cats' and stuff buried and that at Skagway they took out barges of 'Cats' and dumped them in the ocean, somewhere in the Lynn Canal, but he's not sure where.

Aishihik Airport

The Aishihik Airport was an "intermediate" airstrip as part of the Northwest Staging Route. Supplies were first transported to the site to begin construction in 1941. A relay station and radio range station were located here. This was closed down in 1967.

The majority of the telephone line along the Aishihik Road was removed by CN Telecommunications personnel in 1970 with the portion from Otter Falls to the Alaska Highway left intact or repaired. (Govt File 2396, Yukon Archives - February 22, 1972) (14)

Aishihik Airport was not cleaned up during the 1973-75 clean ups by DIAND. During an environmental assessment by Royal Roads College in 1994, tests were completed inside and around buildings at the Aishihik Airport. A total of 79 soil, 22 plant, 7 fuel/oil, 2 water and 3 plant samples were collected.(77) Figures from this study are presented. In Figure 22, the buildings, tanks, septic fields and transformers present in 1949 are located. Most of the original facilities have been demolished, leaving only the powerhouse, garage and airways building. The airways building has been extended and small cabins have been constructed for summer camps. In Figure 23, the location of dump sites and borrow sites are shown. PCBs were found inside the powerhouse at levels in excess of 50 ppm and soils samples around the power house also contained excess PCBs. "The powerhouse should be thoroughly cleaned before the building is used and the soil around the powerhouse disposed of in an appropriate fashion. The three dumps as shown on Figure 23 should be consolidated to one location." The area is now posted with warnings for presence of PCBs.

Jim Macmanus

In the summer of 1973 his father-in-law took out two of the transformers which were located 20 ft. to the south of the powerhouse. (Four transformers were located here on the 1949 sketch-10 460 V-2300 50K.V.A.- in Figure 22). He dumped the transformer oil (about 40 gallons) on the ground by the poles for the transformers. He was after the copper inside the transformers to make copper bracelets.

Canyon

Aishihik River bridge was built in 1904, as part of the original tote trail, restored by the 8th engineers in 1942 and by the Yukon Government in 1987. A Relay Station was located here in the 1940's, on both sides of the road, as part of the U.S. communication system along the Alaska Highway. This is shown in Photo# 27.(49) A figure by Edey (13), illustrates the dump sites in the Canyon area and also the Canol No. 4 - Pumping Station 'C' at MP 1000, on the north side of the highway, shown as Figure 24.

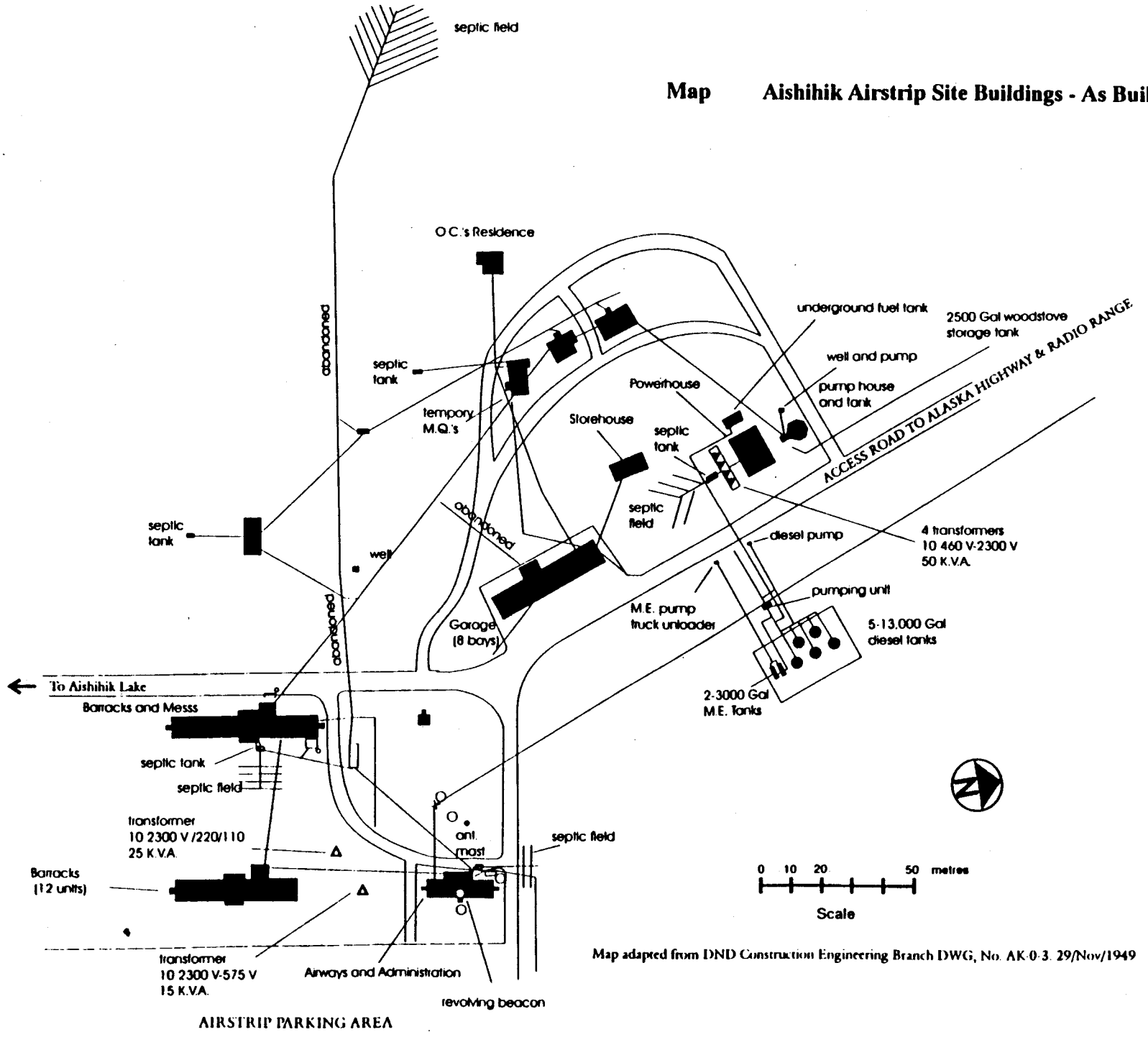


FIGURE 22: Aishihik Airport & Buildings - 1949

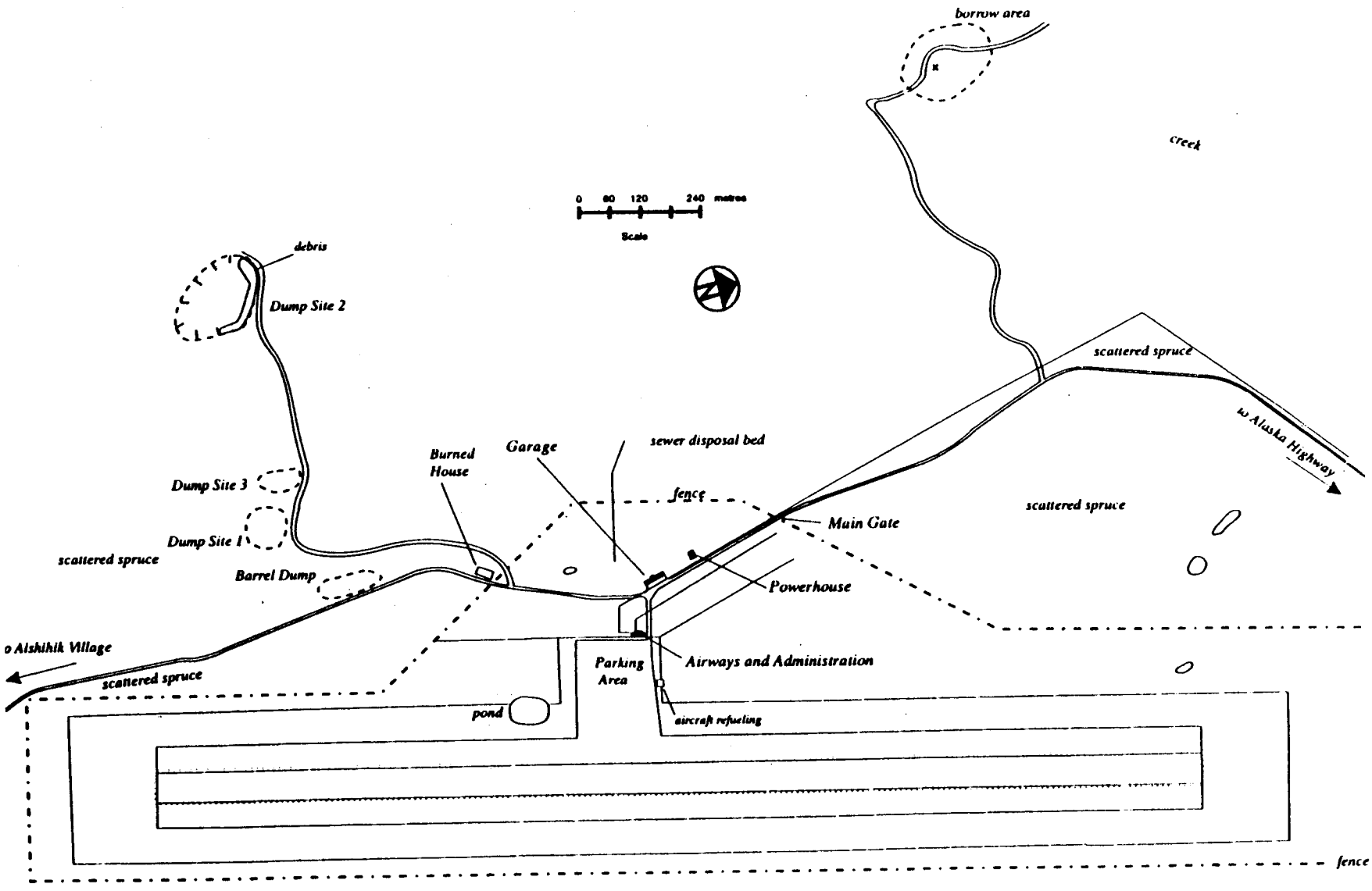


FIGURE 23: Aishihik Airport & Dump Sites - 1994

Map Aishihik Airstrip Layout

Map adapted from DND Construction Engineering Branch DWG, No. AK-0-3. 29/Nov/1949

27. Canyon Relay Station - 1943/44

CANYON
Way Station

CANYON WAY STATION is first stop of the truck drivers northbound out of Whitehorse or McCrae. Here they pause long enough for a hot meal or emergency repairs and then are on their way to Destruction Bay. Two types of housing are in evidence, the Nissen hut with its oval roof, and the constructed barracks made of native lumber sawed from the Yukon forests. Evidence of the pride the boys took in their camp is shown by the planted native evergreens and rustic fences.

Inspection shed in right foreground and garage, center rear, of Canyon station.

Canyon

Alice Stick/Hayden Woodruff

There used to be a dump site along the old pioneer road (south side of Alaska Highway), on the bluff west of the Aishihik River. There's lots of cans there. This is shown on Figure 24. These dumps were also used by people on the Aishihik Road.

At MP996, on the east side of Canyon Creek, approximately 2000' behind lodge, the dump site containing cans and household garbage was identified in an inspection report, dated August 1974. (Provided to AES in File # 13).

FIGURE 24: Canyon Area - 1976

Haines Junction

Champagne/Aishihik First Nations:
In Haines Junction we met with Elders of Champagne/Aishihik First Nations. Barbara Eikland kindly co-ordinated this for us.

Champagne/Aishihik Elders:

- Oliver Jim
- Hayden Woodruff
- Alice Stick
- Poly Fraser
- Oliver Jim
- Mary Long
- Kathy Kurshinruk
- Frank Joe
- Sam Williams
- Annie Nicholas
- Stella Boss
- Bessie Crow
- Jack Allen
- Bessie Allen
- Jennie Moose

Comments/Concerns:

- There was an old pump station for the Canol by Jarvis River (MP1036). Near the old village at Kloo lake there was a dump for household garbage.
- At Pine Creek near the old Experimental Farm there was a cordwood permit area and dumpsite. In Haines Junction, where the weigh scales are today there was an old Army camp (5W) at MP1016. Old car bodies are located along the old Haines Junction road (pioneer road) by the Dezadeash River. There could be possibly other dump sites in this area.
- There is a dump site near the end of the old military strip (Pine Lake) and downstream along Pine Creek.
- At Marshall Creek (MP1006); South side of hwy, near the confluence of the creek and the Dezadeash River, there is scattered debris from an old military camp along the bank of the river; North side of the old pioneer road, a large sawmill was there and is abandoned. This was an Army sawmill located on the south side of the new highway.
- There is a big dump along the old pioneer road on the hill above Canyon. Also there was an Army camp at Mendenhall River, east of Champagne. At Stoney Creek there was an army construction camp and a Canol pump station. Two sawmills could be found near the Kusawa Lake Road.
- At 40 mile near Lacelle Lake on the Aishihik Road there are a bunch of barrels for oil fuel and tar drums. This could be the remains of another army camp. It is 71 miles to airport, 74 miles to the village of Aishihik. North of the Aishihik airport, there are lots of drums between the radio range road and the buffalo fencing on the headwaters of the Nisling River. Just north of the airport on a beaver dam, barrels have been used to form part of a trail.

Earnest Kelly
Mr. Kelly was General Foreman for the Northern Division for ten years and Superintendent of the entire line for five years for the Haines-Fairbanks pipeline, from 1950-71.

In total this line from Haines to Fairbanks had 626 miles with 25 major river crossings and 82 minor stream crossings. It crossed major highways 49 times and secondary roads 39 times, and had 11 major tundra swamp crossings. The U.S. Army provided the management and the U.S. Air Force provided the dollars as they used the most fuel.

At MP42 of the Haines Road is the Canadian Border. At 48 mile was Border Station which was a larger pump station that had a larger, more positive, displacement pump to push the fuel 2000 ft up the Chilkat Pass, pipe was also 1/8" -1/4" thicker. Materials etc. were stored here from Haines, then went on to Tok, Alaska. Pipeline pressures were kept constant. If there was a change in pressure then a dispatcher in Anchorage was contacted. There were 3 means of communication: telephone, teletype and POL (Petroleum Oil Line Communication System). Sunshine raised the operating pressure as most of the pipe was surface laid. Pressure was monitored 24 hours per day. All different types of fuels were in the line at once with different interfaces between. At Tok, if we noticed a hydrometer change, then valves were changed to accommodate the different fuels. The mixing of fuels in the interface were put in a slop tank, to be used for fuel and not wasted. Aviation gas was the most sensitive fuel. Diesel was the most difficult as it holds water. Weather readings for temperature and wind velocity were taken every hour. With a change in weather the pressure was up and then we'd take a "bleed in" for the storage tanks at Tok. Usually at each station there were 6 employees, including repairmen for the powerhouse and pumphouse and a station foreman. There were Standard Operating Procedures (SOP) for each management operation at the pump stations.

For herbicides, Mr. Kelly mentioned that there was about 3 years of research done in Alaska before the particular herbicides were used to spray along the pipeline. Tordon 101, containing picloram with a particulating agent was sprayed by helicopter. This was good for bushes, alder and willow but not for grasses. The helicopter sprayed low, covering 40 ft of the 50 ft right of way. They didn't spray within 50 ft of road crossings or water. For smaller sprays around the stations the following procedure was used:
1967 Standard Operating Procedures - Herbicides: 2-4-D, 2-4-5-T, Esteron were the approved herbicides. The recommended mixture was 1 gallon of herbicide to nine gallons of water. The rate of application was 10 gallons of solution/acre or 60 gallons of solution per mile of right of way.

Earnest Kelly (Cont.)
When the line was shutdown in 1971 potable water was pumped into the line from Haines to Tok. When the water tasted okay at Tok, the line was considered cleaned. Pump stations were very clean. Each station had a dump, mostly for household garbage. "The PCBs in the transformers were removed, as far as I know. I doubt if any mile is free from a spill along the pipeline." There was an airplane out of Haines, Alaska 3 times/week watching for leaks. At Dezadeash Lake they replaced 13 miles of pipe as it had corroded and had caused a spill. At White River, there was a big spill by the bridge. Mr. Kelly showed us a Standard Operating Procedure for determining areas of corrosion damage along the pipeline and potential areas where corrosion could occur, ie. in soils that hold moisture.

For the Canol No.4 Pipeline, from Whitehorse to Fairbanks, there were concrete foundations built for pump stations every 40 miles or so. Mr. Kelly worked at Station 'J' near Northway, Alaska (MP1288) from 1947- 1950. At this time, he thought that Pump Station 'E' at Destruction Bay was the only other pump station in operation from Whitehorse to Northway. This was a high pressured system, and quite an engineering feat. This pumped primarily diesel fuel and there were alot of freeze ups. A hammer was tapped on the pipe to find the blockage and the pipe was then cut to remove it.

We were provided with some excellent documents from Mr. Kelly's library including:
Haines-Fairbanks Pipeline Strip Map - 1:250,000 scale showing valve openings, location of pump stations, and pipeline route.
Alaskan Highway an Engineering Epic, F. Rainey, The National Geographic Magazine, Vol. LXXXIII, No.2, Washington, D.C., February, 1943.
Haines-Fairbanks Pipeline, Whittier-Anchorage Pipeline, General Description of Facilities, Pamphlet 360-1, December 1, 1968.
General Description of Facilities, USARAL Petroleum Distribution Office, January,1 1966.

Al Tomlin
Mr. Tomlin worked on the Haines-Fairbanks pipeline at the Haines Junction pump station from 1956-1972. He noted that the dump for household garbage was located further to the northwest of the station along the old Alaska Highway road. It is buried 12 ft. deep. He didn't know of if any cans of DDT, paint or truck parts etc. would be buried there. To the south of the station was a "burn pit" where they put jet and diesel fuel and burned it. (?) At Destruction Bay, the pump station used the town dump which was north of town. He didn't know of any other sites.

He'd heard that there was a truck buried, east of the asphalt refinery in Haines Junction, by the Dezadeash River. This was an "Isotope truck" used for taking pictures of wells (?) and was apparently highly radioactive. This was dug up and

removed but the area should be checked for potential contaminants.

Ed Karman
Mr. Karman worked at the Border station on the Haines-Fairbanks pipeline. The right of way was cleared in 1953 and pipe laying occurred in 1954. In 1955, they started using the pipeline. Near Burwash Landing it froze in the pipe and had to be cut to let the water out. At first a spheric ball was used between fuels, later on we pumped jet fuel, then the diesel fuel, then gasoline/motor fuel, then aircraft fuel again. Readings would be taken to know the interface from the specific gravity. Fuel was stored at Tok. At Dezadeash Lake there was a major spill. At the Haines Junction pump station (MP1026) there was a spill filling the day tank and it went into the well, sometime in the late 1960s. Also barrels of used oil are buried approximately 800 ft south east of the station parallel to the highway. We used to clean the line with a 'pig' with a rubber/wire brush tail that hit the welds and cleaned them. At 720 RPM the pump building would start to vibrate and at 730 RPM it would settle down. In 1955 it was 48 mile (Border Station) that pumped to Haines Junction and then on to Donjek. At 48 mile there was a back pressure of 840 psi and 47.5 standing pressure. In the early 1960s they built new stations at Blanchard, Destruction Bay and Beaver Creek so the line could pump more fuel.

Mr. Karman also worked along the highway as a mechanic. He remembers the 2" Canol pipeline to Watson Lake. It also had "breaks" in the line, one was at Morley River, south of Teslin.

Rod Tait
Mr. Tait mentioned the numbers of dead fish at the north end of Dezadeash Lake after the spill in May, 1968 and the quantities of straw used to mop up the fuel. They used straw from the experimental farm. He indicated that fishing is only recently been suitable at this lake.

George Washington
Mr. Washington worked for Highways in the 1960s. At the Donjek River MP1128 there was a camp, where they buried alot including drums, cars and motors on the north side of the highway. They also dug a pit on the Donjek River, on the south side of the highway where they pushed in alot of junk. At the Duke River, in the "Meadow", they dug a pit and buried cases of canned foods. At Slims River, there was a big camp. At MP1033, Jarvis River we drilled a well for the Army, on the south side of the highway. There was a dump site at this location too. There was a pipeline camp west of Canyon for the 4" Canol line. You can still see the pipe sticking out of the ground as you leave Aishihik Road. Across the highway from the Burwash Airport, there was Joe's Airport Cafe which had a big dump, with motors and barrels etc.

Mike Crawshay
Mike worked at the Rainy Hollow clean up (Border Station) assisting with the removal of DDT in 1994. He wore the contaminant suits and had his equipment compounded and washed down every night. He mentioned that he had heard that transformers, metal and pipe were buried at the Blanchard maintenance camp (MP87), by a private contractor. This is located to the west of the current buildings. The Haines-Fairbanks pump station was located here.

Lynne Sofiak
Lynne worked as a cook in 1978 at a DPW camp located at the Haines Junction pump station at MP1026. She stated that the water from a well (part of pump station) smelt and tasted like diesel. She got DPW to install a water holding tank so she didn't have to cook with the bad tasting water. "It should be looked into to see if diesel is in the well or if it leaked into the ground and water table."

Smokey Gutman
Mr. Gutman was a Resouce Management Officer in the Haines Junction area for over 15 years. He assisted with clean-up at the old dumps along the Alaska Highway from 1973-1975. He mentioned an old U.S. dump site by MacIntosh Lodge before Bear Creek, on the hill above it, along the old pioneer road. There is also a dump site by the Dezadeash River, by Mabel Brewster's grazing lease, along the old pioneer road east of Haines Junction. This dump was supposed to have some radiation and has not been cleaned up yet. Past the Dezadeash Lodge on the west side, there was a dump where they buried lots of junk in a deep hole. There were carbodies and batteries. On the Haines Road, south of Klukshu, there was an old gas station, operated by Bill Brewster's dad, Jack Brewster. There are still remains of this building and debris. Aishihik was not cleaned up during the 1973-75 clean ups.

HAINES ROAD
Sites along the Haines Road which have been used for construction camps in 1943, have also been used during construction of the Haines-Fairbanks pipeline in 1954-55. Trailer camps moved as the pipeline was built. In 1978 survey crews for the highway realignment utilized these camps, and later, the construction crews for the Shakwak project.

The PRA Maps completed in 1943, by Foley Brothers, Inc.(10) show the location of relay stations and construction camps. (Provided to AES, File#2) Locations of barracks, mess halls, and garages are noted. Maps of these camps have been shown in figures to illustrate their layouts. Mileposts have changed with road improvements and these are noted. No As-builts were located for the pump stations for the Haines - Fairbanks pipeline. From the British Columbia border north to Haines Junction, camps

in 1943 and the Haines-Fairbanks pumps stations are indicated:

RELAY STATIONS/CONSTRUCTION CAMPS - HAINES ROAD - 1943

Alaska:

MP36.4 Relay Station (Alaska)
MP40.5 Alaska/British Columbia Border (new MP42)

British Columbia:

MP72 Relay Station- Glacier Camp/Mule Creek (new MP75) (See Figure 25)
MP84.5 Construction Camp- Stanley Creek (new MP87.8) (See Figure 26)

Yukon:

MP90.1 B.C./Yukon Border (new MP94)
MP99 Relay Station - Million Dollar Falls (new MP103) (See Figure 27)
MP120.3 Construction Camp, near Deazadeash lodge (new MP125) (See Figure 28)
MP138.3 Construction Camp (Kathleen River) (new MP143) (See Figure 29)
MP153.7 End of Haines Road at junction with Alaska Hwy in Haines Junction (new MP159)

Rainy Hollow, B.C.

MP48 - The Haines-Fairbanks Border Station operated from 1955-1971. In 1977, the B.C. Land Management Branch requested that the land used by the Haines-Fairbanks pipeline be returned to British Columbia to facilitate re-alignment of the Haines Road. (See Appendix N - March 1995). In 1978/79, Lobe Construction used this area as a base camp for highway construction. In 1983-87, this was used as a base camp for mineral exploration by Stryker Resources. B.C. Ministry of Forests cleaned up the site in 1987. In 1992-3, there was demolition of the buildings on site by DIAND under contract. In 1994, Golder & Associates removed 40 canisters of DDT (30 gal. drums) and completed a preliminary contaminant assessment on the west side of the highway by the airstrip and water pumping station. The east side of the highway where the pump station facilities were located was not assessed. (63) A list of potential contaminants of concern (PCOCs) was developed that include DDT and its metabolites DDE and DDD, hydrocarbons, volatile organic compounds and metals. Analysis includes: DDT, DDE, DDD; Hydrocarbons, oil and grease; BTEX (benzene, toluene, ethylbenezene and exylenes); PAH, polycyclic aromatic hydrocarbons: TEH Total exchangeable hydrocarbons; Volatile Organic Compounds (VOCs) (Carbontetrachloride, herbicides), and Metals.

A picture (looking north) by Golder & Associates, shows the clearings still evident in 1994, as shown in Photo # 28. Trench containing DDT in lower left corner.

28. Border Pump Station - Rainy Hollow, B.C. 1994 - Haines Road - MP48

Glacier Camp, near Mule Creek - Relay Station, B.C. -1943 - MP72
(New MP75) Interviews indicate "burying" in the bed of Mule Creek. An airport was here where they flew in supplies for the Army and for the Haines-Fairbanks pipeline, including herbicides. Interviews from reports (8) (76) also indicate dumps in this area. (See Appendix P). The camp in 1943 is illustrated in Figure 25 , from the PRA Map - Haines Road Sheet#13. (10)

Bear Camp, near Stanley Creek - Construction Camp, B.C. - 1943 - MP84.5
South of Stanley Creek there was a garage with oil and drum storage on the west side of the road, and barracks with mess hall and office on the east side of the road. This is shown in Figure 26, from the PRA Map- Haines Road Sheet #17 (10). An interview presented in 1993 report (8), indicated that there was a dumpsite near MP86, "between two streams on both sides of the road."

FIGURE 25: Glacier Camp - Relay Station, B.C. - 1943 - Haines Road - MP72

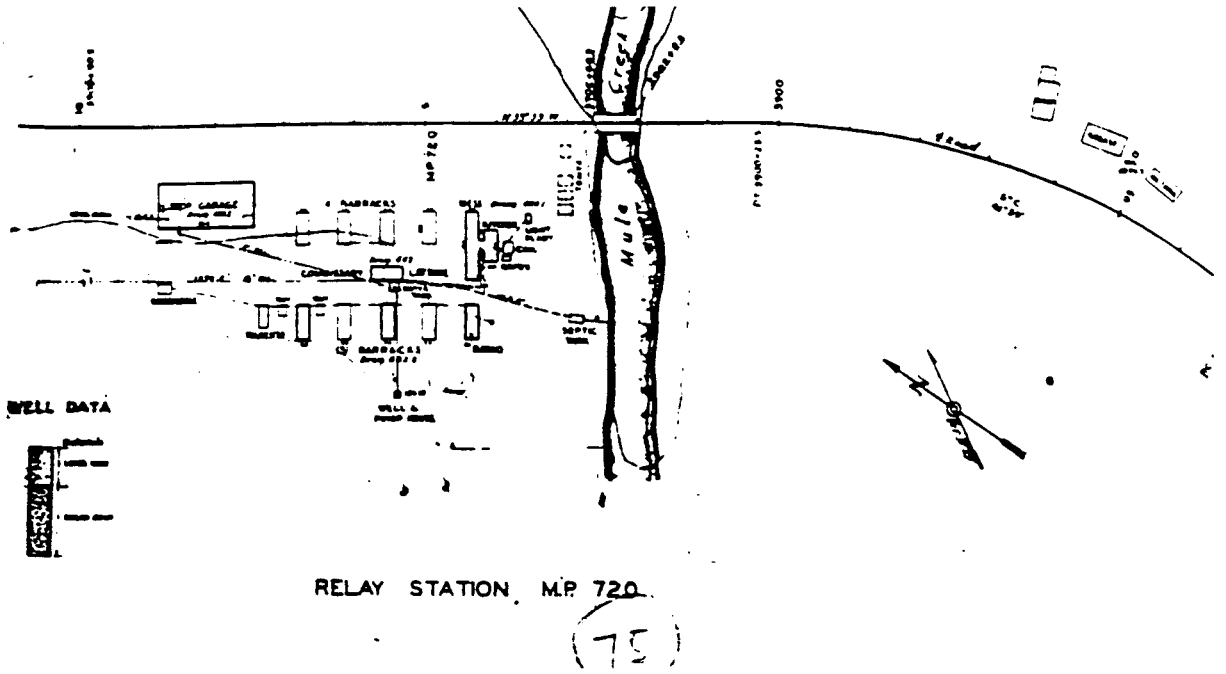
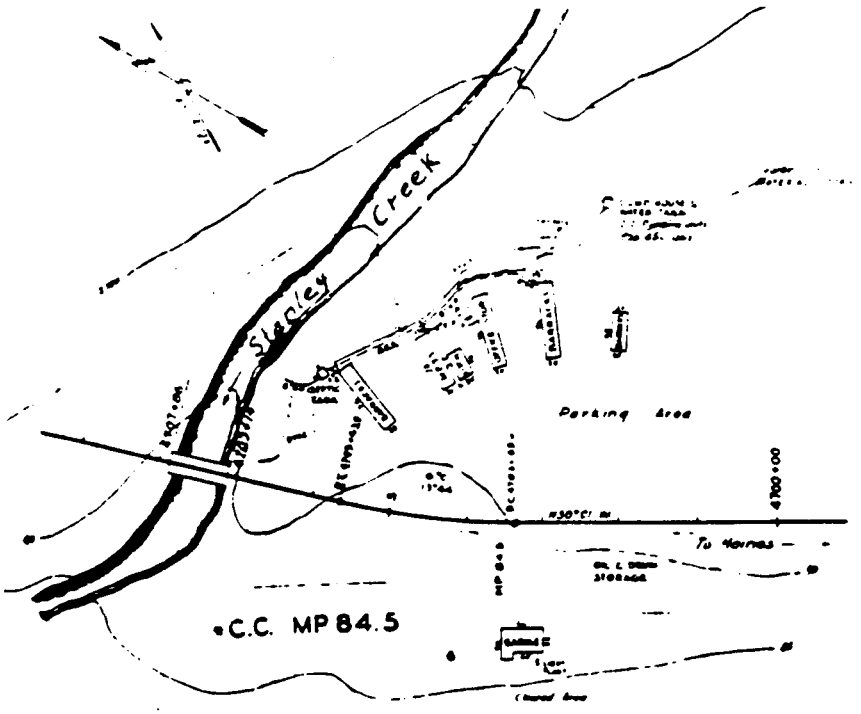


FIGURE 26: Bear Camp - Construction Camp - 1943 - Haines Road - MP84.5



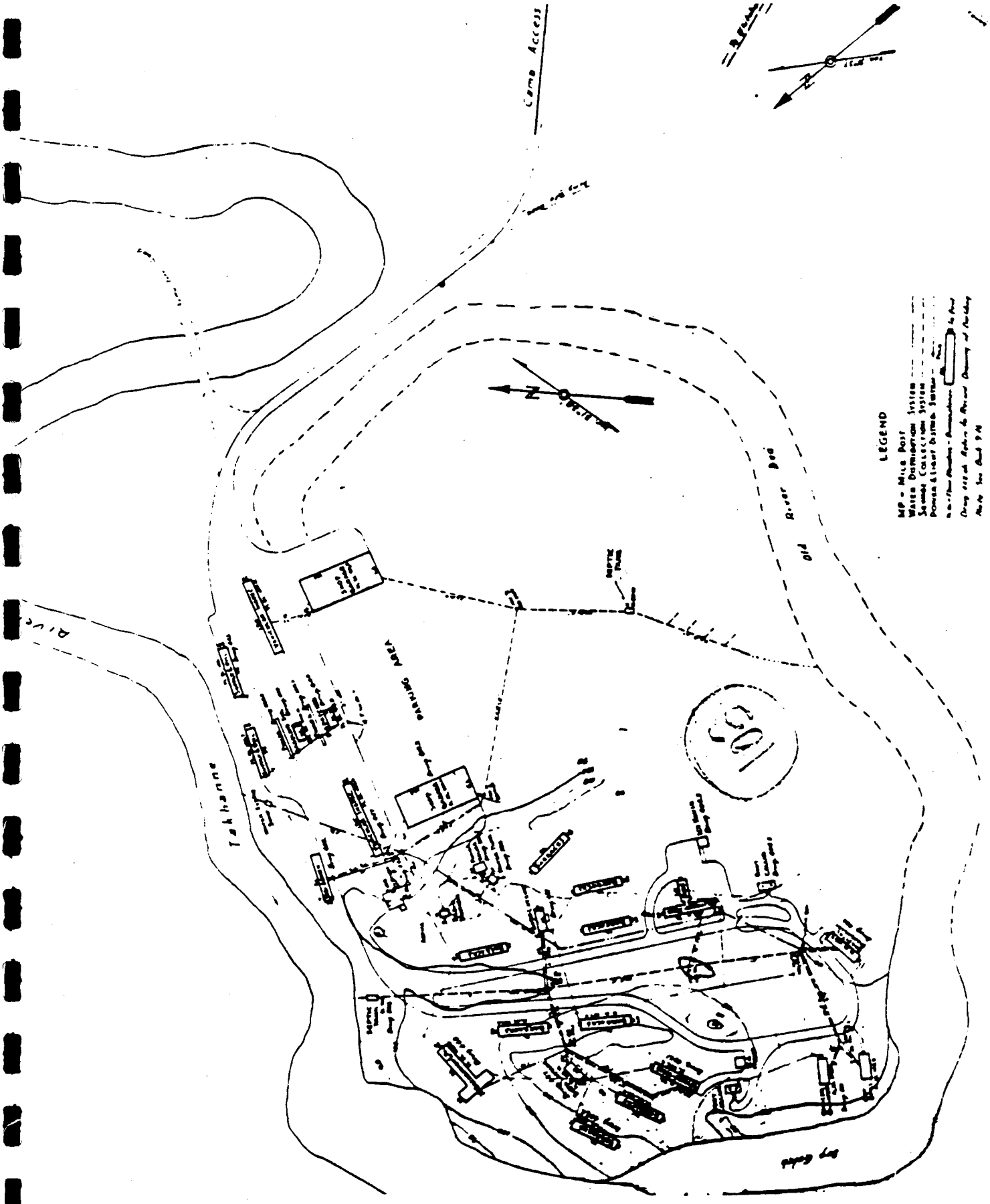
Blanchard Pump Station - Haines-Fairbanks Pipeline- Haines Road - MP95.5
Blanchard pump station was dismantled and the YTG highway camp was constructed at the same site. Transformers were apparently buried here in the mid 1980s, to the west of the existing buildings.

Million Dollar Falls - MP99
A large construction camp and relay station existed by the Takhanne River in 1943 as shown in Figure 27. (10) (The new mileage is MP103.) Barracks, mess hall, garage/gas station, and radio station buildings were located here. During the 1943-44 exodus, there are stories of large amount of dumping in the ravine. Cement pads are still present today in the midst of sites at the Million Dollar Falls campground. PRA Map - Haines Road - Sheet#22.

Interview - Ken Kavanagh - Department of National Defense (DND)
Mr. Kavanagh was employed at DND, mostly working on DEW line sites and is now a consultant for them. He was Assistant Highway Superintendent for the Western Command, Northwest Highway System (1956-1959). He built bridges on the Haines Road in 1956. He remembers requesting permission from USARAL (US Army in Alaska) to move the communication line (for the Haines-Fairbanks pipeline) for bridge repair. At that time the road was not open in the winter. He figures every camp had a dump for domestic garbage which was probably buried. At the time there were no environmental regulations and Canadian contractors did not think they were doing anything detrimental. He didn't know of actual buried sites but believes that there was probably equipment buried, in lakes, or left in the bush. He remembers recovering Quonset huts that were abandoned, for curling rinks and maintenance camps. At the Slims River camp at Kluane Lake MP1056, there was an every day camp, with domestic garbage going into the dump that was nearby.

Interview - Kim Hudson - Researcher for Champagne/Aishihik First Nations
The Champagne/Aishihik has been involved in a study regarding the effects of the Haines-Fairbanks Pipeline upon the Klukshu Reserve area, south of Dezadeash Lake on the Haines Road, MP117. (76) Kim Hudson has been conducting this research for the past several years and has compiled an extensive collection of literature on the pipeline. Most of this literature has been summarized in Appendix N. Research has been conducted in Yukon Archives, National Archives, Archives in Washington, D.C., Seattle, Washington, and Fairbanks, Alaska. U.S. Army records have been obtained as well as interviews. Aspects of the report (76) which are relevant to this project, in terms of maintenance of the pipeline, the use of herbicides and the effects of oils spills have been summarized in Appendix P, in this section. Relevant comments from people interviewed have been quoted. Names have not been mentioned on request.

FIGURE 27: Million Dollar Falls Relay Station - 1943 - Haines Road - MP99



Klukshu - MP117

Marge Jackson

Marge's husband worked for the Army in 1941, transporting supplies from Otter Falls, Canyon Lake up to Aishihik Lake and to Aishihik airport. There was a camp at Otter Falls (MP25) and at the beginning of Aishihik Lake, where they moved the freight to the barges. They took their garbage out to Canyon, to the U.S. Army dump there. She didn't remember the camp at 40 mile.

Every spring they did spraying to kill the weeds along the Haines-Fairbanks pipeline. They never told us they were going to spray. We used to pick berries along the right of way but now we don't. There used to be a dump about 2 miles south of the hay farm (near Dezadeash Lodge) on the west side of the Haines Road. They buried all of this dump.

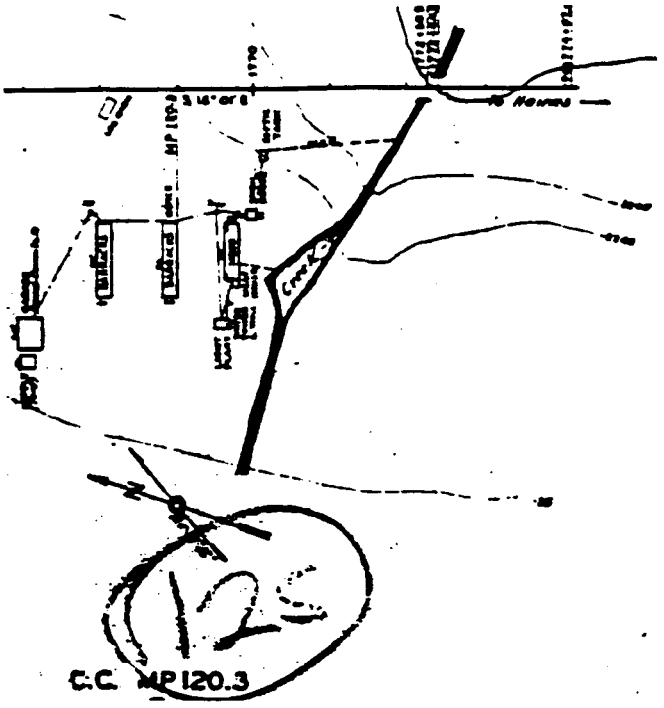
Frances Joe

In 1943, her mother Jessie Joe cut logs along Pine Creek by the site of the Experimental Farm (MP1019). There is an old dump site along Pine Creek in this area. Also there is a dump south of Dezadeash lodge which is buried over and another dump along Gribble Gulch. In 1959, there was an oil spill near the site of Dezadeash Lodge which killed the muskrats. At Million Dollar Falls, MP103, where there was an army camp, there was lots buried in the ravine and lots was burned. You could pick out what you wanted and you could take it. At MP95 there is the remains of Jack Brewster's old gas station, and associated debris. At MP75 (Glacier Creek) south of the camp on the east side, there was a garbage dump on the creek bed. This was buried during new construction? At the old Beloud Post (site of Dezadeash Lodge) they burned the old construction camp. We got some lumber from the old construction and relay camps. We used to pick berries and get rabbits along the Haines-Fairbanks right of way (R/W). They sprayed it without telling us. We were told not to pick the berries or burn the wood from the pipeline right of way anymore, so we don't.

Construction Camp - MP120.3

There was a construction camp located south of the old Beloud Post current site of Dezadeash Lodge. Barracks, messhall and garage were located here on the west side of the highway. Interviews tell of a buried dump site at this location, with car bodies and possibly batteries buried in a deep hole when this site was cleaned up. This camp in 1943 is shown in Figure 28, from the PRA map Sheet# 30. (10) New Milepost is MP125.

FIGURE 28: Construction Camp - 1943 - Haines Road - MP120.3



Haines-Fairbanks Pipeline - Oil Spills - Klukshu to Dezadeash

Oil spills from the Haines-Fairbanks pipeline occurred in this section, in 1968, noted on Report Map 7. There were no spills during the start up operations in 1955 and de-icing operations in 1956. Along the Haines Road, within Canada, the pipeline extends from PP42-150 to Haines Junction. Spills in this area, which were investigated in 1971 and presented in a 1972 report (23) include:

PP114.5, July 14, 1968: (Near Klukshu) (200Bbl) This break was caused by a bullet hole, located beside a garbage dump on a north facing 20 degree slope. The pipe was buried following the incident. The area was greatly disturbed and no vegetation is growing in the area. (23)

PP119.1, May 17,1968: (Dezadeash Lake) (4000Bbl) This spill was considered to be the most significant in the 15 year history of the pipeline, an estimated 4000 barrels of diesel fuel were lost along the west banks of Dezadeash, some 600-700 feet above the shore. Soils in the area were highly corrosive which eventually weakened the pipe and caused the leak(s) to form. On the slope below the pipe, trenches were dug to collect the fuel, as it flowed down the slope, which was pumped into barrels and burned. Strong prevailing winds caused the fuel to be transported across the lake. Straw was scattered over the water to absorb the oil which was collected and burned. A small clean up party was at the site for about 2 months to clean up any fuel. All

vegetation in the immediate area of the spill was killed. Dead fish were piled up on the north shore of the lake. (See also Appendix N -Oil Spills- September 10, 1968). The Yukon Government, DIAND (Forest Service), Federal Fisheries and YTG Highways, as well as, hired laborers dealt with the spill. A U.S. Army Engineer arrived on the 31st of May to survey the situation. Interviews indicate that the fishery on Dezadeash Lake is only now starting to be okay again.

This spill occurred on May 17th and an article appeared in the Whitehose Star, May 23, 1968. This says that "repair crews rushed to the scene" from Tok and Haines Junction pumpng station, cutting off the pipeline at PP135, just north of Dezadeash Lake. This article is presented on the next page.

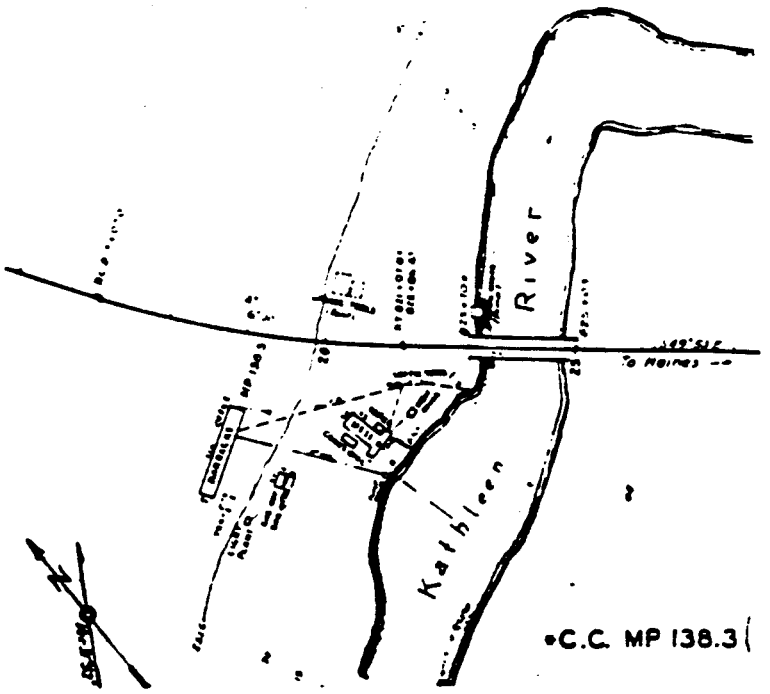
An additional article of interest appeared in the Whitehorse Star June 10, 1968. Due to the volume of oil in the area and dangers of causing a forest fire, the Yukon Forest Service utilized the Forest Protection Ordinance and, under this legislation, it was prohibited to set any fires within the spill area and no overnight camping was allowed. The closed area, noted in the sketch was the most saturated by the spill.

Kathleen River Camp - 1943 - Haines Road MP138.3

Foley Brothers had a construction camp here in 1943, on the north bank of the Kathleen River. This was a smaller camp, with one barrack and mess hall, on the west side of the road and a garage on the east side of the road.

"One witness lodged a complaint in August 1943 against Foley Brothers' Camp on Kathleen River, claiming that the toilet was built over the stream, and people were fishing just below it. The police officers who investigated reported that larger camps avoided such obvious problems but the smaller disorganized units were more likely to pollute their waters near their establishments." (29)

FIGURE 29: Kathleen River Construction Camp - 1943 - Haines Road - MP138.3



Pipeline Leak Pours Oil Into Lake

A break in the U.S. pipeline from Haines Alaska last week resulted in pollution of Dezadeash Lake by unknown quantities of diesel fuel oil.

Fisheries Officer John Summers told The Star the break was discovered Friday at Mile 129 on the Haines Road and pipeline officials were notified immediately in Alaska. Repair crews were rushed to the scene from the Haines station and Tok Junction, and the line was cut off at Mile 135 and at Klukshu by the Alaskan crews, but oil was still seeping through the gravel by the lakeshore this week.

Frantic attempts were made to divert the drainage and expert assistance has been promised by American officials in the nasty mopping-up process, but meantime, hundreds of water birds were getting soaked in the fuel oil and drowning in the lake. There was no evidence of dead fish on Tuesday.

Mr. Summers said the break was close to one of the best fishing spots in the Yukon, where the angler could stand on shore and cast for 20-pound trout.

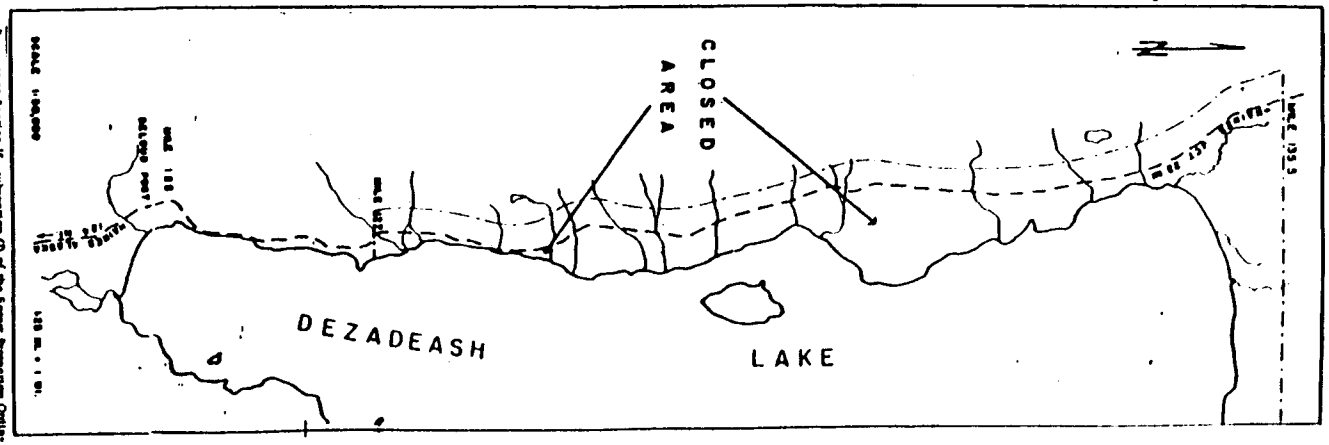
Department of Public Works equipment from Yukon was also on the scene over the weekend, assisting in efforts to prevent further damage to the lake.

The fuel oil soaked the surface ice, which is now being blown to every part of the body of water.

THEY'RE BITING AT DEZADEASH. The Yukon's are getting some nice catches these days with the open and ice disappearing from the lakes. Here a couple of lake trout, one nine pounds and the other pounds caught on Saturday at Dezadeash Lake. Bill Matthews, D.P.W. crusher foreman landed t spin casting from the shore.

The Whitehorse Star, Monday, June 10, 1968 Page 6

CLOSED AREA
Forest Protection Ordinance



Pursuant to Section 15, subsection (1) of the Forest Protection Ordinance, the Forest Supervisor hereby orders as follows:

1. That the setting out, starting, kindling or spreading of fires is prohibited within the area of land in the Yukon Territory along the west and north shores of Dezadeash Lake between approximately Mile 127 and Mile 135.5 on the Haines Highway and as illustrated on the accompanying map.
2. Persons entering within this area is prohibited.
3. This order shall remain in effect until cancelled.
4. This order shall remain in effect until cancelled.

Dated at Whitehorse in the Yukon Territory.

D.F. Merrill

Waste sites along the Haines Road, identified in 1983 (15), confirmed sites mentioned in our interviews.

1983 Waste Disposal Sites

Haines Road:

MP96 km154.5 Haines Road Lat 60 02' Long 136 50' 30"
Abandoned Gas Station - less than 400m from Blanchard River

MP103.5 km166 Haines Road Lat 60 06' 30" Long 136 56' 10"
Million Dollar Camp - U.S. Relay Station - dump in ravine near Takhanne River

MP122 km195 Haines Road - Lat 60 20' Long 137 02'
Dezadeash Lodge - old Army dump? + public/commercial

ALASKA HIGHWAY

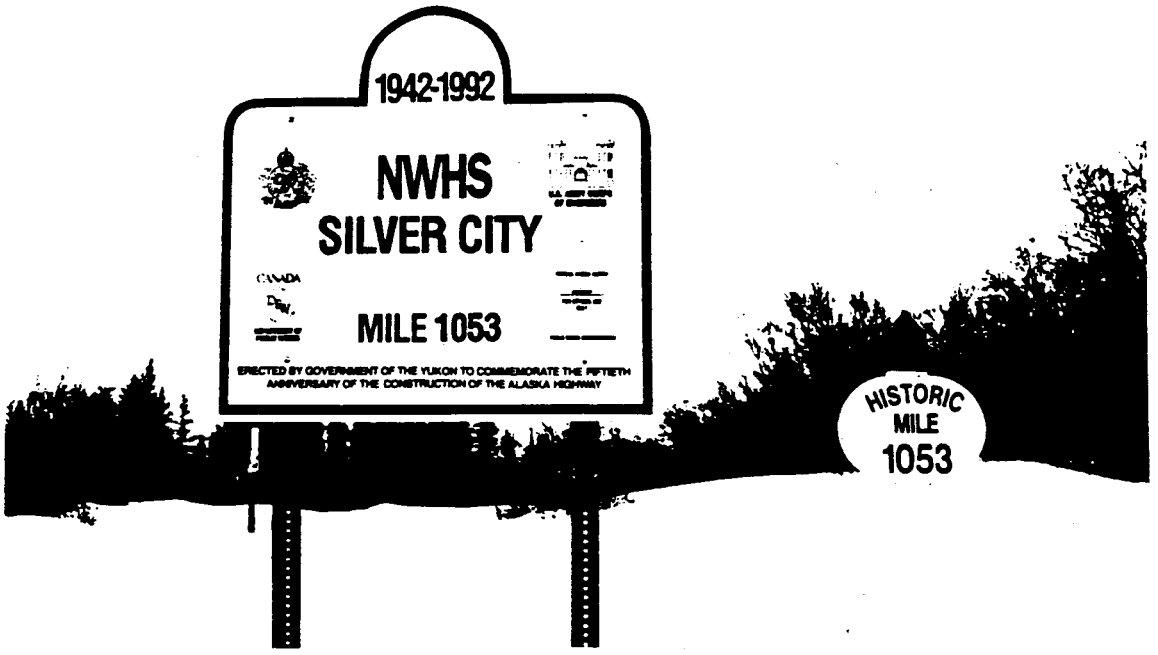
Ten miles north of Haines Junction, towards Silver City, the Haines-Fairbanks pump station at MP1026 can be seen from the highway, the power buildings and storage tanks still present, enclosed by a chain link fence. Photo# 29 was taken in February 1995, during one of our trips to Haines Junction for interviews. This site was used by survey crews in 1978. The cook complained of diesel tasting water, taken from the pump station well. Waste fuel apparently got into the well in the late 1960s. A garbage dump for the station was located to the northwest and a waste oil burning area to the southwest of the station. (See Haines Junction interviews).

At MP1036.2, near the Jarvis River, Canol No.4 pump station 'D' was located. In 1976, Edey (13) identified all that remained, which was two concrete foundations, a well and scattered wood debris. No burial sites were identified. In clean up files (14) the cement pad was buried together with old buildings in July 1978.

Photo#30 shows the pipeline crossing at MP1053, near the entrance off the highway to Silver City. Behind the new historic milepost signs is a sign warning of a pipeline in the area. The pipeline is most likely still buried at this location, as it crosses from the north to the south side of the highway.

29. Haines Junction Pump Station - Haines-Fairbanks Pipeline - Ak Hwy - MP1026

30. Haines-Fairbanks Pipeline Crossing at Silver City Historic Milepost - MP1053



Silver City

Josie & Frank Sias

Josie confirmed a dumpsite along the east side of the Slims River. She indicated the locations of the pump stations for the Canol Pipeline No. 4:

Station C - Stoney Creek - MP956	Station F - Donjek River - MP1126
Station D - Kloo Lake - MP1036	Station G - Koidern - MP1166
Station E - Destruction Bay - MP1080	Station H - Beaver Creek - MP1205.5

There was a camp for the U.S. Army at Edith Creek (MP1147) and a maintenance camp at MP1156. At MP1137 buildings were located there, not sure what for, but maybe for a survey camp. At the Donjek pump station at MP1124, for the Haines-Fairbanks pipeline, where Frank worked, we had an incinerator and what couldn't be burnt, we dumped at MP1120. A site could have first been used by the U.S. Army during the building of the Alaska Highway and Canol Pipeline or as a construction camp for the Haines-Fairbanks pipeline. Near Silver City, Josie didn't know of any buried sites but there were a number of dumps near Kluane Lodge and the highway camp at MP1056.

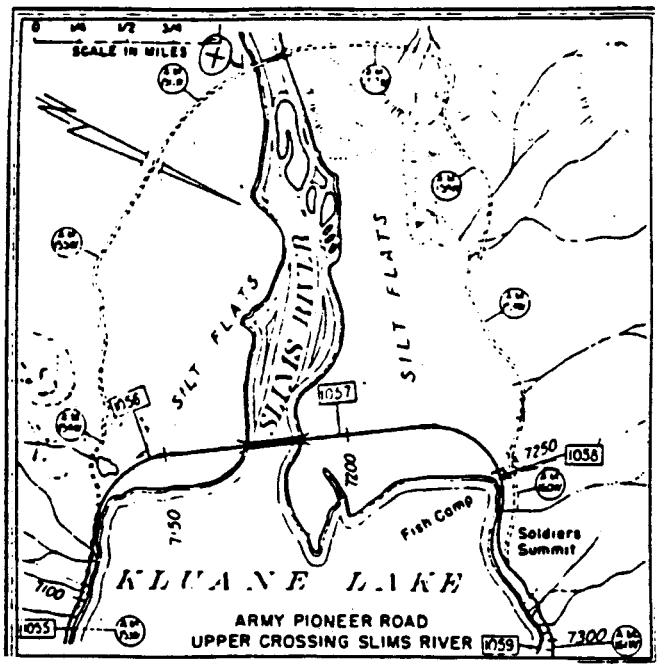
Slims River

The Slims River was one of the most difficult river crossings both for the Alaska Highway and Haines-Fairbanks pipeline construction. Camps were set up on the west and east side of the Slims River. A site was identified where items were buried on the west bank of the pioneer road. In Photo#31, a sketch from the PRA Map -1943 (9), shows the route of the pioneer road and illustrates this site (marked with an X). A tent camp was set up on the flats north of the Slims River, near a Fish Camp, during the pioneer road construction in 1942. In 1954, a permanent bridge structure was completed across the Slims River.

Haines-Fairbanks Pipeline Construction

In original Haines-Fairbanks pipeline planning, the pipeline was to be across Kluane Lake where it is 291 feet deep. This would have been the deepest water crossing in pipeline history and would have required an eight mile crossing. When the construction project was offered for bids contractors were permitted to bid on an alternate route around the lake. The land route skirting the lake was chosen. This would avoid the tricky crossing, but added 5 1/2 mile to the total length of the line and necessitated the crossing of the Slims River. When construction crews reached the Slims River in July 1954, this had to be by passed due to heavy run-offs and pipeliners continued southward towards Haines, Alaska. Work began on this section in early April 1955, with piles being driven for the H-frame bridging. Steel pipe pilings were driven to 55 foot penetrations in the stream bottom to provide framing that required three weeks to complete. The ice was disintegrating as crews put the pipeline across the Slims on this structure. With the crossing accomplished, the 1000 feet of pipe was welded into the mainline piping, completing the final link in the 626 mile long pipeline. (61)

31. Slims River Area - MP1060 Alaska Highway - 1942/43



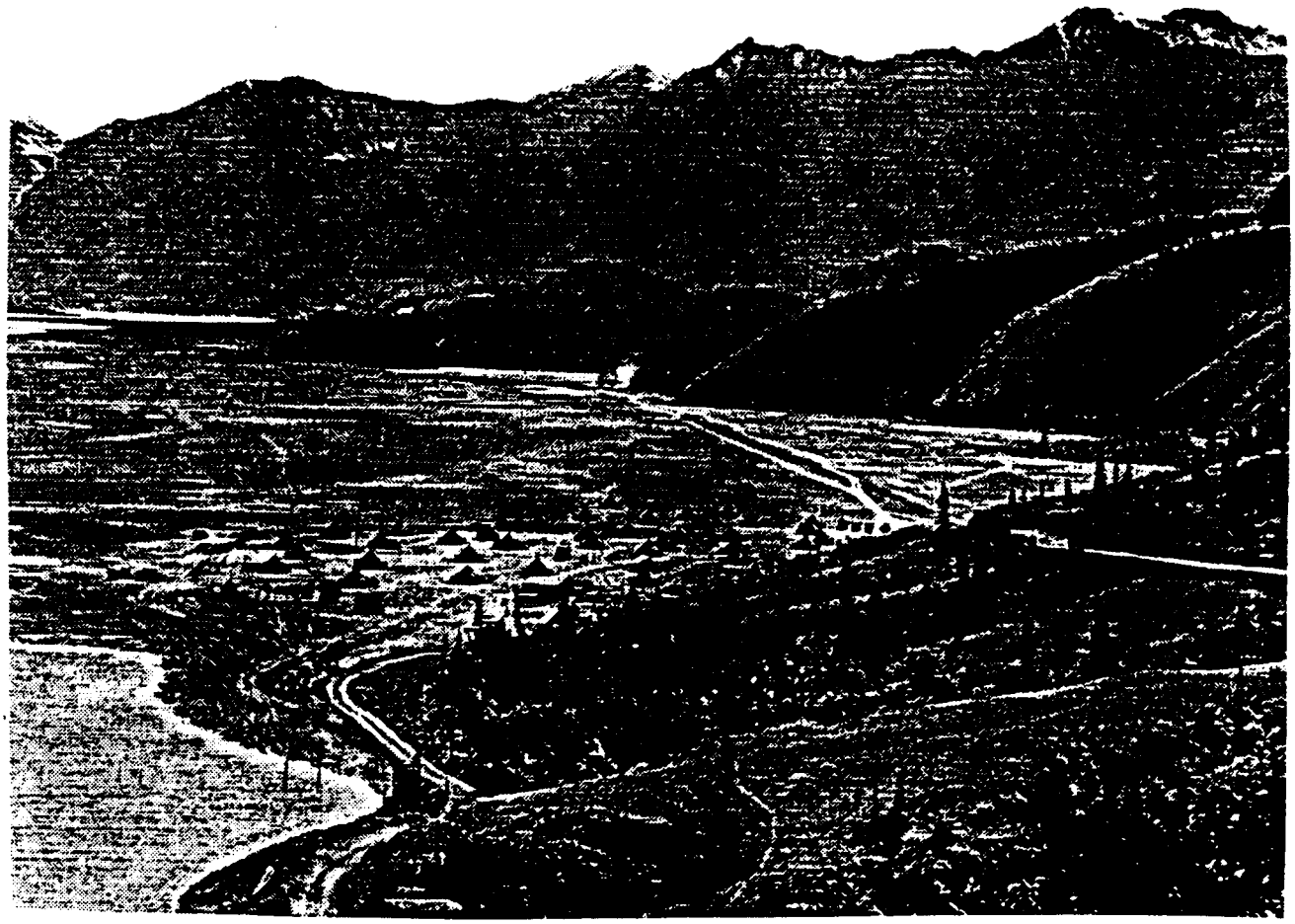
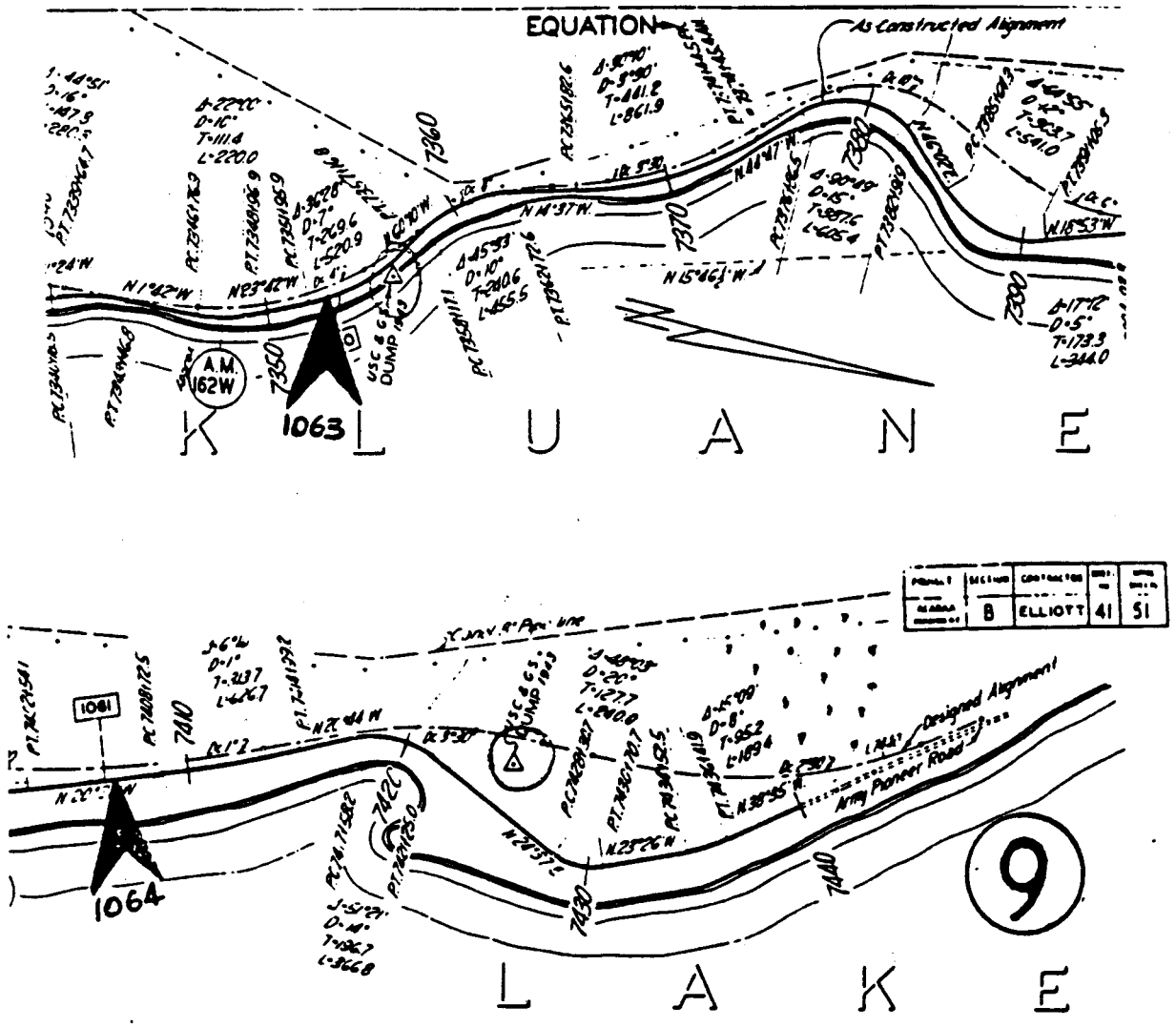


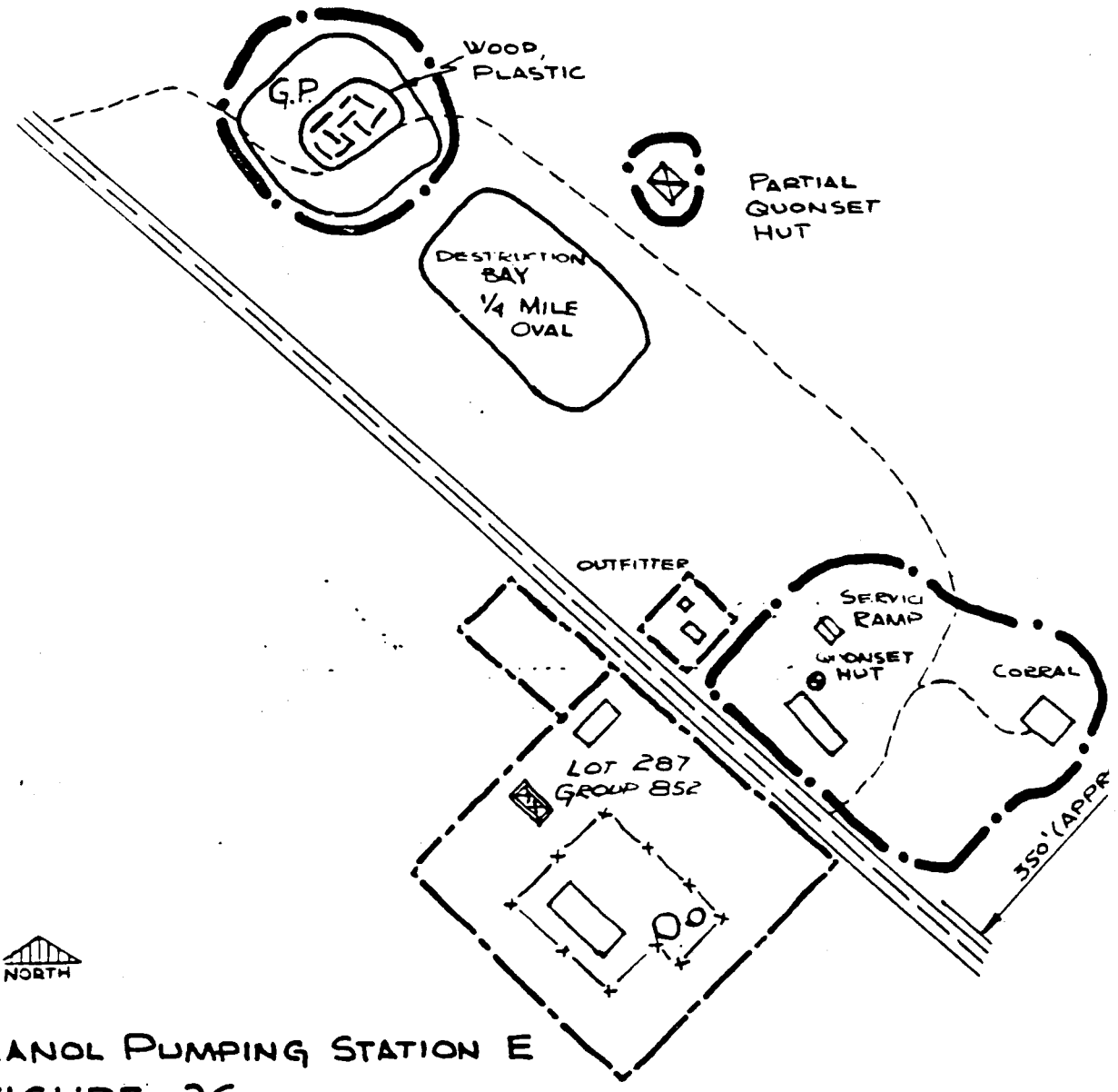
FIGURE 30: U.S. Army Dump Sites - MP1063 & MP1064.3 - 1943



At MP1061, known as Soldiers Summit, the opening ceremonies for the pioneer road occurred on November 20, 1942. In 1943, on PRA Map (9): Section 9/Sheet# 41, two dump sites were identified, one at MP1064.3, and one at MP1063, along the shores of Kluane Lake. These are shown in Figure 30. (Noted by a circle and small triangle). These were the only dumps sites specifically indicated, for the entire map series of the Alaska Highway from Watson Lake to the Yukon/Alaska Border. Both dumps are near the lakeshore, especially at MP1063. These may now be part of the new road through this section.

Canol Pumping Station 'E' & Haines-Fairbanks Pump Station - MP1081
The Destruction Bay pump station for the Haines-Fairbanks pipeline was built on the same site as Canol No.4 pump station 'E' at MP1081, on the west side of the highway. This site is Lot 287, Group 852. As part of this station, development was also on the east side of the highway. A septic system was located directly across the road from the station. In 1976, Edey identified a Quonset hut and service ramp in this area. He also noted the fencing around the existing buildings of the Haines-Fairbanks pump station, as shown in Figure 31. (13)

FIGURE 31: Canol Pumping Station 'E' - Destruction Bay - MP1081 - 1976



CANOL PUMPING STATION E
FIGURE 26

Destruction Bay

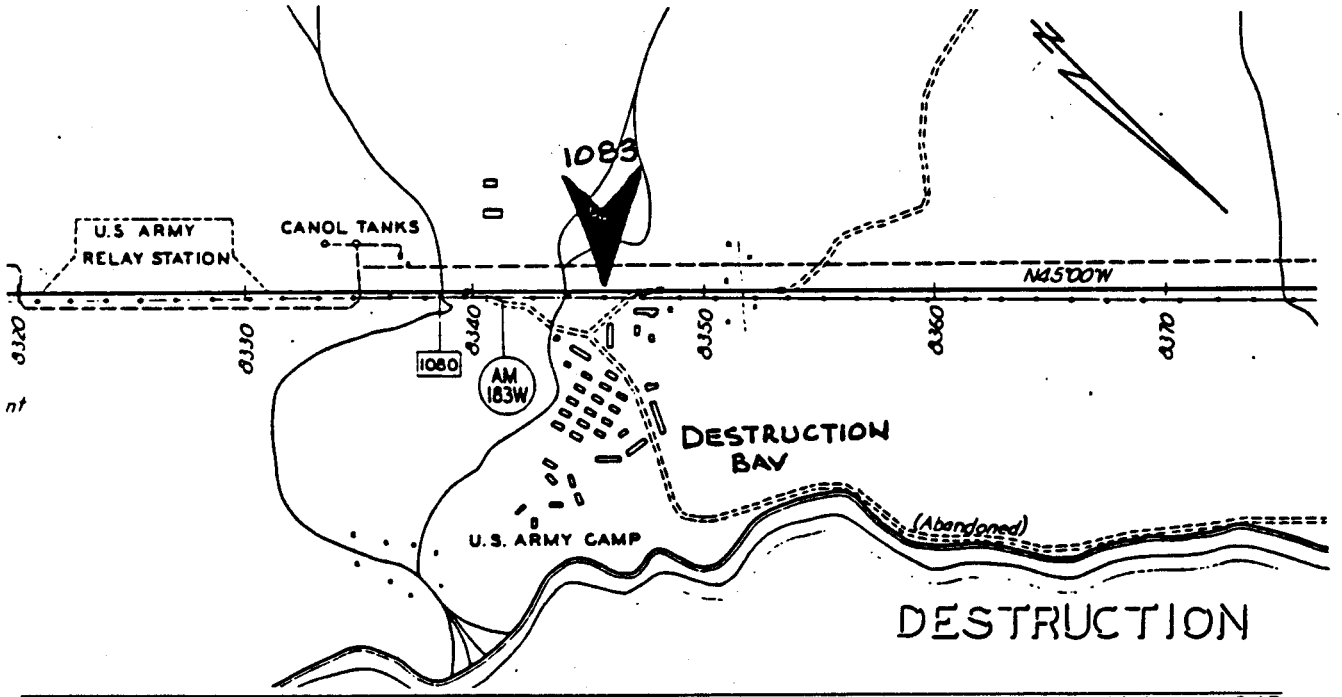
Marsha & Jim Flumerfelt

Wherever the camps and sawmills were located there would have to be a garbage, storage site and dump site. The Flumerfelts remember camps at Silver City, Sheep Mountain, Congdon Creek (sawmill), Destruction Bay, Duke River, Burwash Creek (sawmill & camp), and Donjek River (south side near old bridge).

We looked at the PRA Maps of the Alaska Highway (9) and identified dump sites in the area. At MP1083.8, north of Destruction Bay was the old garbage dump. At the Slims River, on the east side, near the original pioneer bridge there was a dump site, as shown in Photo #31. There was a tent camp on the west side. The army dumps at MP1063 and MP1064 (as shown on Figure 30) are most likely in the new road alignment. Sawmill sites in the area, were both run by Proctor for bridge construction in 1943, including the one at Duke River and Burwash Flats. There was also a sawmill site at MP1072.5. There may be a dump to the west (in back of) the Haines-Fairbanks pump station.(?) The telephone line is now in the process of being removed from Sheep Mountain to Burwash Creek. In the Teslin District at MP777, just past the campground at Morley River there used to be a dump site used by the military. This is noted on Report Map 3 and the PRA map (9). (File#1).

In 1943, a U.S. Army camp was located at MP1083 on the east side of the highway, near the shores of Kluane Lake. Across the highway, on the west side were Canol No.4 fuel storage tanks and a U.S. Relay Station. Figure 32 is PRA Map Section 9: Sheet #48.

FIGURE 32: Destruction Bay - 1943 - MP1083



32. Destruction Bay Relay Station - 1943

Haines-Fairbanks Pipeline - Oil Spills

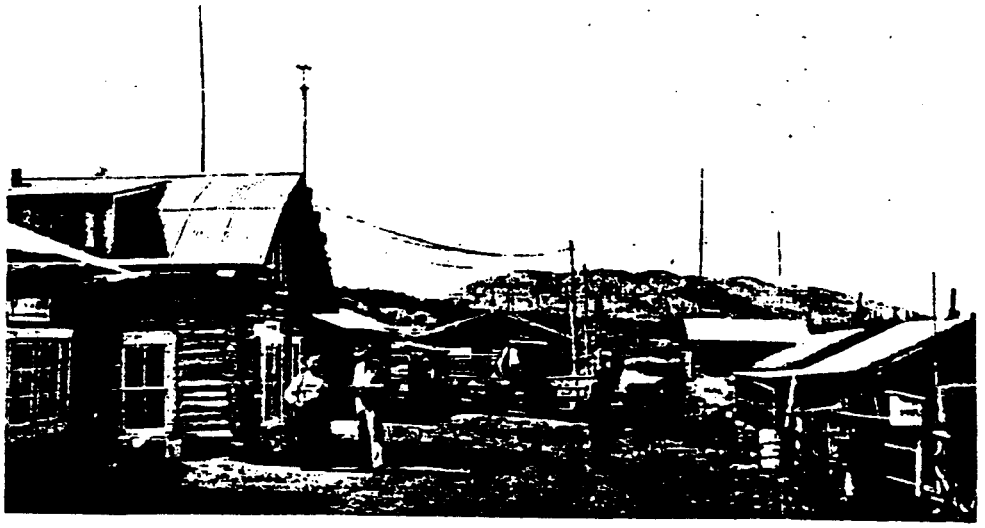
Oil spills occurred in this area during the de-icing operations in 1956. (See Appendix N-Oil Spills-April 1972). Of the 27cuts to the pipeline in the Yukon, 11 of these were in this area from PP195.8-217.4, between MP1066 (Bayshore) to MP1089 (Copper Joe Creek). Three of these were investigated in 1971 for vegetation regrowth (23). These spills are noted on Report Map 9:

PP 197.1, January 30, 1956: (South of Congdon Creek by Kluane Lake). When the line was cut for purging (due to freezing), the fuel was allowed to run down the north to northeast facing slope. All species of vegetation were killed at the time of the spill. Strong petroleum odors were found in all three soil pits placed on the slope.

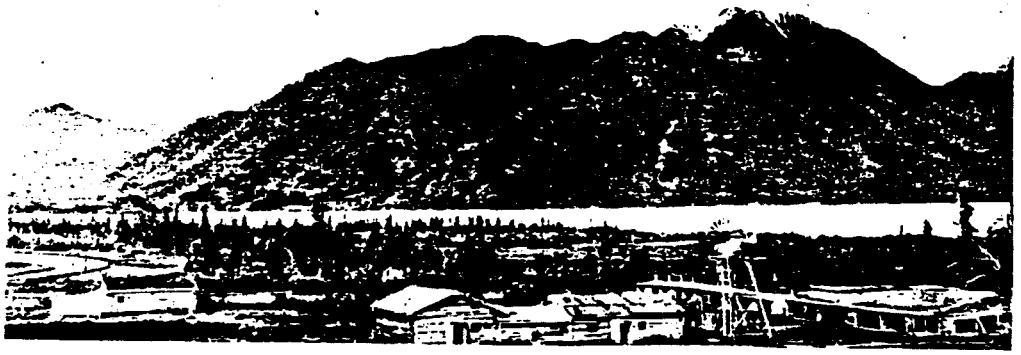
PP 207.6, February 2, 1956: (South of Destruction Bay). Spillage covered a 200 feet wide area and flowed 700-800 feet down a gentle slope. In 1971, vegetation was completely lacking in the centre of the main spill area. Three soil pits were placed in the kill area, and on the fringe. Odors of petroleum were present in all three with the soil frozen at 20cm.

PP 217.1, February 9, 1956. (North of Destruction Bay-Copper Joe Creek): Spillage was over an area 100 ft wide by 300 ft long on a very gentle slope. In 1971, within the spill area, a number of small spruce, laborador tea and other plants were growing. Of all the 1956 spill sites, this one had the most abundant amount of vegetation.

33. Burwash Landing - 1943

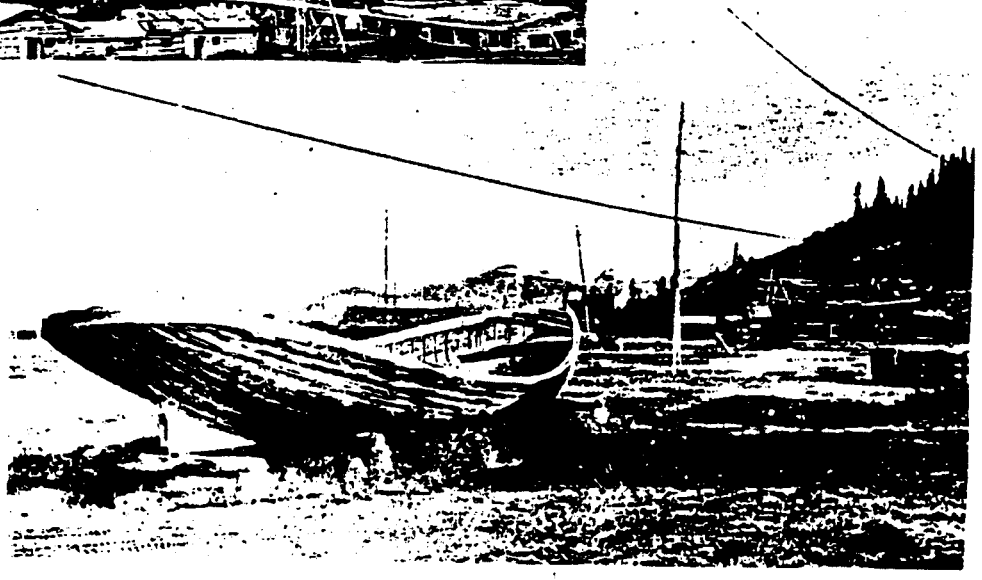


BURWASH LANDING (right)—a colorful and active trading post at the northwest end of Kluane Lake. At the left in photo is Jean Jacquot, genial proprietor of the general store. Beside him is H. R. Flint, safety engineer on the Alaska Highway.



KLUANE (left) has a beautiful mountain setting, with blue Kluane Lake as a background. The Alaska Highway curves at the left.

OLD FISHING BOAT at Kluane—a graceful example of boat building. Nearby buildings are disintegrating.



Burwash Landing

Kluane First Nation:

Two separate meetings with Elders were coordinated with Mary Jane Johnson, Resource Officer for Kluane First Nation in Burwash Landing.

Reports were provided by Mary Jane Johnson as part of the background information. (78)(79). Interviews were conducted and sketches of sites prepared by Keith Johnson of the Kluane First Nation Resource Management Centre in 1993. (78) (Report with sketches provided to AES - File #13.) A brief summary of interviews related to military activities from this report follows:

Chief Joseph Johnson

A large dump that the army used was on the east side of hwy(RHS) under a bluff, about 2 km south of Longs Creek MP1156. There was a large spill of diesel or fuel oil at Swede Johnson Creek (MP1119.3) when the pipeline was being repaired. The grayling couldn't be eaten there for about 3-4 years as you could taste the diesel right in the meat.

Dick Dickson

I can remember them using the "carbon tet" but after the army decided not to use the stuff any longer I don't know what they did with it. They probably buried it wherever they had a dump. There is an old gravel pit just past the White River (about a mile past the White River bridge) where there are some old barrels and metal sticking out of the ground.

Thomas Bradley

The army used "Agent Orange" for defoliation on the pipeline right of way and possibly on the Alaska Highway. He remembers crews spray a substance on the trees and willows along the highway, and over a period of time notice that the trees and willows were dying. He recollects two dump sites; between White River Lodge and Koidern Lodge. There was a garage that the army had constructed on the left side going north and a pump station between Bear Flats Lodge and Dickson's Place (Koidern). The cement pads are still there at both sites. An old timer, Henry Inger, had told him that he watched army personnel dig a large hole on the White River bar and dump barrels, vehicles and other materials into the hole.

Bessie Johns

At the Snag airport there are lots of barrels that the army left behind, many of them have rusted out and the contents have drained. The army left lots of batteries behind. Another dump is at the old pumphouse (Beaver Creek station -Haines- Fairbanks pipeline) and they buried lots of stuff there. This is located on the first road to the right after Canadian Customs. Behind the old Livesey's store (left side going north by Beaver Creek,) we found a bunch of old barrels sticking out of the ground, some of them are still full and there are lots of old trucks there too. At MP1220 there was an old army camp there. I don't know what is buried there.

William Peters

At the Dry Creek Hill, on top of the hill, there is a road on the right where the Army buried a bunch of stuff . (78)

Interview - Chief Joe Johnson

There is a concern that former military sites which may be acquired through land selections may contain potential contaminants, including the pump stations site for the CANOL No 4. pump station and the Haines-Fairbanks pipeline pump station at MP1081, south of Destruction Bay. There is an old sewer tank located across the highway from the Canol pumping station on the east side.

Dumps noted in this interview are located on PRA maps (9) provided to AES - File#1 as well as on Report Maps 9 & 10.

Destruction Bay:

PRA Map Sheet 9/48:

- East side of the Alaska Highway, off of old pioneer road, near MP1083.9. Site of original construction camp (old foundations) and dump, 40 -50 car bodies
- West side of the Alaska Highway, near site of old U.S. Army Relay Station MP1082.5, (became the REME maintenance garage and later the YTG garage), there is a heavy equipment/machinery dump to the west of the garage.
- West of the rest area, along the old pioneer road by Cluett Creek there is an old dump, and Chief Joe Johnson remembers an oil slick in this area from the Haines - Fairbanks pipeline.

PRA Map Sheet 9/49:

- North of Destruction Bay, near MP1086, east side of Alaska Highway off of old pioneer road, there is an old dump, by an unnamed lake and the current rifle range site. This area needs water testing.
- Dump site - South of Lewis Creek on the west side of Alaska Highway along an old access road - Near MP1086.

Burwash Landing:

PRA Map Sheet 9/51:

- 3 old dumps south of Burwash Landing by lake with household garbage (1970's-80's). These may have been partially cleaned up in the 1994 summer AES project.
- Old dump on Burwash Lodge property - A fence has been put up to prevent garbage from blowing into the new residential area.
- Two old dumps are located within the new residential area - just north of Burwash Lodge.
- Near MP1095 Burwash Airport, on the west side of the highway is the site of the old Airport Lodge - behind the lodge further to the west is an old dump site used by the military.
- Duke Meadows- There was an old camp near the Duke River, and perhaps buried garbage and foodstuffs.

At Long's Creek MP1154. 6 there was a dump used by Utah Construction's camp. located at MP1155 near Pickhandle Lake. This was next to a cliff, on the east side of the road. At MP1166 there was a Canol Pump station near Koidern.

Agnes Johnson

At Duke's Meadow, they buried canned goods. At MP1128 by the Donjek River, there was a big camp to build the new bridge. David Dickson, an outfitter, now uses it. There used to be a big garage there. There is supposed to be a dump on the gravel bar where they dug a big hole and put in equipment and canned goods. Full barrels were supposed to have been buried too. At MP1137, there used to be Army structures on the north side of the highway just past the creek. There was a camp at MP1130.

Jessie Joe

North of Destruction Bay, about 1/2 km on the east side of the highway is a dump and also one on the west side of the highway about 1 km north. On the west side of the highway, across from the Burwash Airport, there was a dump site near the old Airport Lodge. At Burwash Lodge, the owner dumped sewage, in front of the lodge by the lakeshore. At Burwash Creek and the Duke River there is a lot of mining equipment left behind and these areas should be cleaned up. When the Army came through we were told by our family not to mix with them. We sold them mukluks. There was a problem with tuberculosis after the Army came.

Grace Chambers

There was an oil spill between MP1118 and the Donjek Pump Station, at Swede Johnson Creek. The fish spawned in the little lakes above the creek and they tasted of diesel. There's no problem now with the taste. They sprayed the bushes along the highway at Burwash Landing.

Darrell Duensing

Mr. Duensing worked as a maintenance man on the Haines-Fairbanks pipeline in the 1960s. He worked at the Donjek Pumping Station at MP 1124. This was the sister station to Haines Junction. It wasn't until later that the Destruction Bay, Blanchard and Beaver Creek stations were built. The Canol 3" pipeline Donjek station (Station 'F') was several miles north of the 8" station at MP1126. "This station wasn't in use when I got here, and may have never been used, I'm not sure." All that remains are the cement slaps and a well house over the well. We used this well to supply drinking water because at the 8" Donjek station the water was swampy tasting. At the 8" station, the buildings with the engines/generators are still there, the fences have been broken down. We had an incinerator and burned most of the household garbage etc. There was a dump to the west of the buildings of the pump station, maybe 100 yards

from the compound, where we buried what couldn't be burned like old tires and the odd battery from the shop. We used 2,4,5-T to control brush along the pipeline. We had an old fire truck with a 500 gallon water tank and a spray nozzle which was used by hand to apply the herbicide. The 2,4,5-T came in 30 gallon containers. We got it from Alaska, it was not purchased in Canada. We'd put 1-2 of these containers in the 500 gallon tank of water. The mix was quite diluted. We sprayed all along the pipeline. We did quite a bit of spraying, along the pipeline by the Haines Road, including the camp at MP103 - Million Dollar Falls. We didn't do mosquito control and didn't use any DDT. "I'm not sure where the containers of the herbicide were stored. The containers may have been sent back to Alaska. If not, I guess they could be buried, but I don't know where."

Dave Cook

A flight controller at the Burwash Airport, Mr. Cook knew of the P-39 fighter plane that went down in 1943 on the east side of the highway, a few miles south of the airport. Parts of the plane are still there. A cross for the pilot is on the west side of the highway.

Duke River - MP1098

In 1943, L. Proctor had a sawmill at the Duke River, where he milled timber for bridge construction under contract to the Bechtel-Price-Callahan Co. Bates & Rogers Co. also had camp (200 W) here on the south bank of the river. In 1976, Edey drew a sketch of the area, shown in Figure 33, which indicates a dump site 1/4 mile to the south east of the old camp. (13)

Burwash Creek Sawmill - MP1104

At Burwash Creek, MP1104, L. Proctor operated a sawmill from 1943-1944 milling timbers for bridge construction for the Kansas City Bridge Company. This is shown in Figure 34. (12) A dump site was identified here on the north side of the highway by Burwash Creek.

FIGURE 33: Duke River - MP1098 - Alaska Highway - 1976

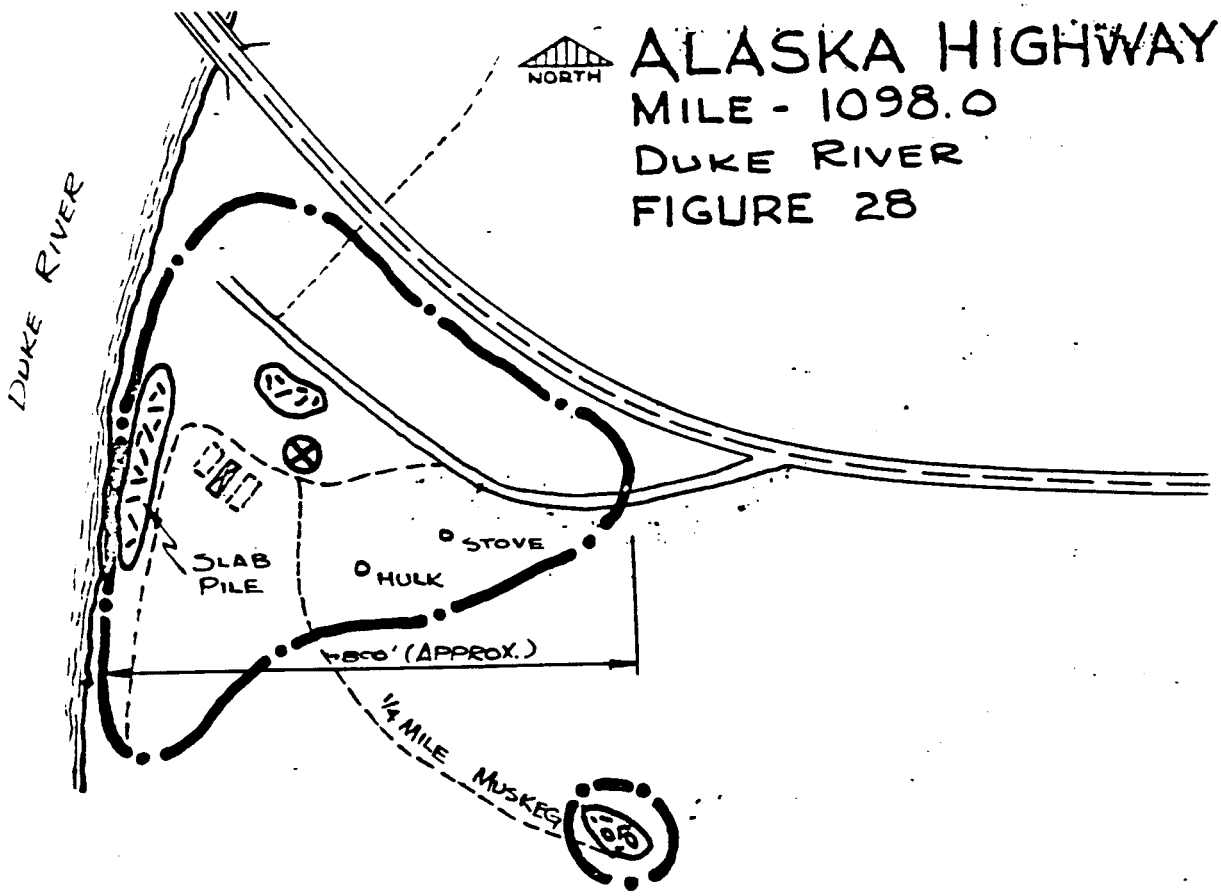
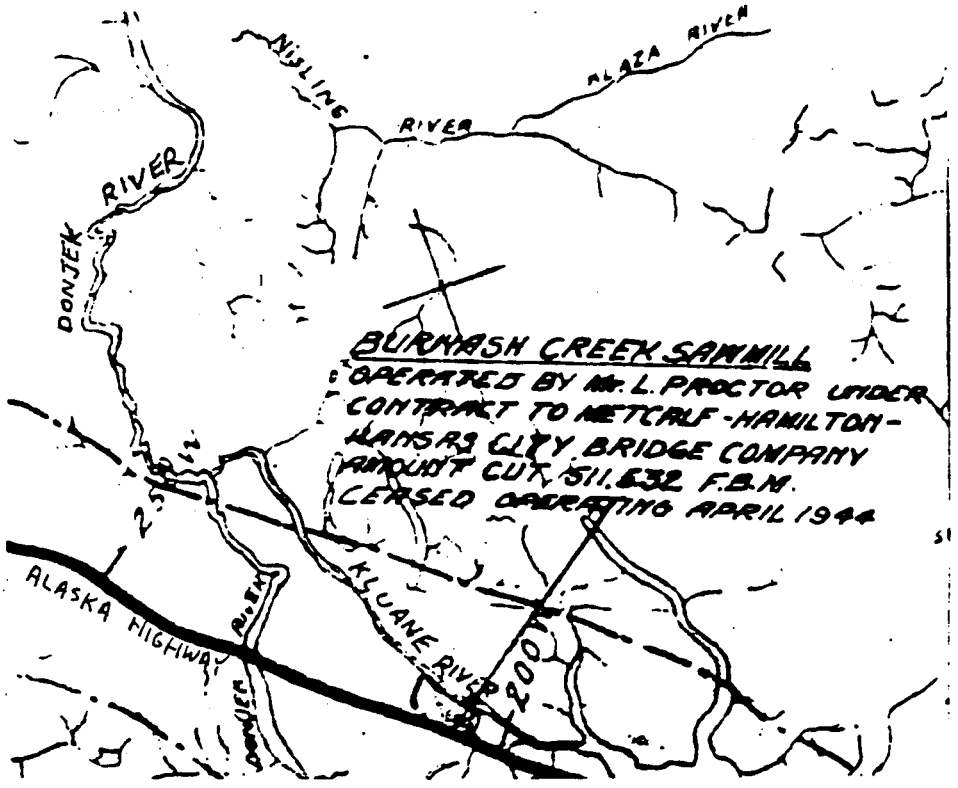


FIGURE 34: Burwash Creek Sawmill - MP1104 - Alaska Highway - 1943



RMO Waste Management Sites

The Assistant Resource Management Officer, for Haines Junction, John Trotter provided information on waste management sites that are related to military activities and included:

0 - Million Dollar Falls - within YTG campground - drums, cans wood, cable, soil work.
1 - Haines Junction Refinery - This was an asphalt refinery financed by a private entrepreneur. It was not associated with military activities. This site has had a recent environmental assessment for AES.
3 - Ashihik Airport - Environmental assessment by Royal Roads College (1994), Asbestos removed from barracks & beacon in 1993,it was bagged & cleaned up by Champagne/Aishihik. Area about 1/2 mile x 1/2 mile - 120 drums, multiplate culvert used to cross beaver dams to beacon site telephone line is removed.
4 - Beacon site - Aishihik Airport - scrap wire, old poles
5 - McKinley Creek - DC-3 - crashed in 1960s.
7 - Scrap metal dump - car bodies, past refinery - old municipal dump on old pioneer road by Dezadeash River
8 - MacIntosh Lodge - on side hill debris - cleaned up, still cement pad
10 - Million Dollar Falls - Above ridge along Takhanne River (may be same as #0)
11 - By Mabel Brewster's grazing lease, along the Dezadeash River Road, past refinery, old garbage site

1983 Waste Disposal Sites

Alaska Highway

MP987 km1588.3 Ak Hwy - Lat 60 49' Long 136 51'
Cracker Creek - U.S.Army camp, 19 bldgs in 1945, 2 old covered refuse areas

MP996.3 km1603.3 Ak Hwy - Lat 60 51' 30" Long 137 02' 20"
Canyon Creek - U.S.Army camp,4 concrete foundations, 4 buildings, small areas covered with gravel

MP996.4 Km1603.5 - Old Ak Hwy - Lat 60 51' 30" Long 137 03'
Canyon Creek - U.S. Army dump site

MP1000 km1609.3 Ak Hwy - Lat 60 51' 25" Long 137 07'30"
Aishihik River - Canol Pump Station 'C' - military dump

MP1013 km1630.7 Ak Hwy - Lat 137 30' 20" Long 60 48' 20"
Pine Lake Road (2km)to CN Tower - perhaps U.S. Army
Covered over with gravel

1983 Waste Disposal Sites (Cont.)

Haines Junction:

MP1016 km1635 Ak Hwy - Latitude 60 47' Long 137 30' 50"
Haines Junction-Old dump site, perhaps Army-Closed 1980 bulldozed over, covered with soil
Old Ak Hwy (East of HJ)-km 1 Lat 60 45'20" Long 137 30'
Haines Junction Refinery Site
Old Ak Hwy - km 1.5 Lat 60 45'35" Long 137 28'
Old disposal site
Old Ak Hwy - km 2 Lat 60 45'30" Long 137 28'20"
public garbage
Old Ak Hwy - Near km 1.5-2 - South side of road

Alaska Highway:

MP1036 km1667.5 Ak Hwy - Lat 60 55'30" Long 137 55' 45"
Canol No.4 Pump Station D - Jarvis River - U.S. Army

MP1039.5 km1674 Ak Hwy Lat 60 57' Long 138 00' 30"
Sulphur Lake (perhaps Army site?) - area completely covered over

MP1054 km1696 Ak Hwy Lat 61 02' Long 138 23' 20"
Silver City, 20 bldgs, trading post/roadhouse - dump?

MP1054.4 km1696.8 Ak Hwy Lat 61 01' 50" Long 138 23' 40"
Kluane - Silver Creek, Airstrip, US. Army, long narrow dump area, parts bulldozed over.

MP1054.5 km1697 Ak Hwy Lat 61 01'15" Long 138 24'15"
Kluane-Airstrip, U.S. Army + public -

MP1054.8 km1697.5 Ak Hwy - Lat 61 01' 15" Long 138 24' 30"
Kluane - Sheep Mountain Motel/Kluane Lodge - old U.S. Army maintenance camp

MP1056 km1699.4 Ak Hwy Lat 61 01' 15" Long 138 25'
Kluane - U.S. Army Maintenance Camp - 26 bldgs in 1945

MP1080 km1738 Ak Hwy - Lat 60 13' 45" Long 138 45'
Destruction Bay - Canol No.4 Pump Station 'E'/Haines-Fairbanks Pumping station - U.S. Army

MP1083 km 1742.9 Ak Hwy Lat 61 15'20" Long 138 48' 20"
Destruction Bay - 26 bldgs in 1945, Army relay station and hospital, maintenance camp (old dumps + new nearby)

MP1093 km1759 Ak Hwy Lat 61 21' 30" Long 139 00' 30"
Burwash Landing, 0.3km north, perhaps U.S. army - 1 trench(20m x 30m), exposed metal, Partially bulldozed over/covered

MP1095.5 km1763 Ak Hwy Lat.60 22' 20" (?) Long 139 03'
Burwash Airport Lodge - Private - Army? - debris/garbage

As part of the Land Use Planning process for the Greater Kluane Planning Region, an inventory of wastе sites was done in 1989. (79) Sites used for the Canol No. 4 pipeline, and Haines-Fairbanks pipeline and U.S. Army are listed. These sites have already been mentioned in this report. Comments were also made regarding environmental concerns on military sites, ie. potential for water contamination. (Provided to AES in File #13).

Sites with Heritage Concerns:

HJ03 Aishihik Airport 61 45' 137 30'
World War II airstrip and construction area for Alaska Highway. Three main buildings and three smaller buildings. Champagne/Aishihik First Nations interested in buildings. Heritage Branch to record and document. (16)

HJ05 McKinley Creek 61 04' 137 27'
DC3 crash site. Fuselage mainly intact, engines removed. Heritage Branch to be contacted prior to cleanup and will record and document. (16)

APPENDIX P: CHAMPAGNE/AISHIHIK REPORT - 1993 (76)

The pipeline spanned 626 miles through B.C, Yukon and Alaska. The Alaskan portion of the line was a seamless pipe capable of a maximum working stress of 21,600 lb/sq in. The construction in Canada used a British pipe with a maximum pressure of 1,387 lb/sq.in for the 0.277 inch wall thickness used above ground and 1,613 lb/sq in for the 0.322 inch wall thickness used for the buried sections.

Summary of Interviews:

- The pipeline was a multi-products line with three or four products in the line at one time. There was a "pig" at the interface of each fuel and a gauge to tell how much fuel mixing occurred.
- Several oil spills occurred along the pipeline. Near the access road to Klukshu village there was a valve on the pipeline that frequently was surrounded by a smelly pool of fuel. The village residents used to collect the fuel and use it to heat their homes. There was an oil spill at the Klukshu River bridge which covered a sizeable area.
- Maintenance of the pipeline right of way in the Klukshu area included replacement of the pipeline from the south side of the Klukshu River north to the Cortino lodge with a plastic coated pipe which was buried.
- The people of Klukshu took their household garbage to a dump site along a pipeline access road at Gribbles Gulch. They were not sure if it was used by Army people. There was also a garbage dump site located along the pipeline corridor within the Reserve area.
- An inspector who flew the pipeline right of way weekly to look for leaks in the pipeline-he recalls a 'Cat' being used to clear the right of way and there may have been some application of chemicals by hand methods.
- For the closing of the pipeline, alcohol was pumped through the line after it was emptied. A "scrubbing pig' was also sent through the line. Air compressors pressured the line to 1000 psi to remove the alcohol and blow the line dry. The closing operation was done by USARAL (U.S. Army in Alaska).
- Ex-RMO officer - doesn't recall any air spraying but does recall some ground spraying - he recalls the spraying of the same product that is used as a fire retardant. The most noteworthy spill was the Dezadeash spill. The wind was originally coming from the north causing the oil to pool at the south end of the lake. The wind then shifted and blew the oil to the north end of the lake where straw was used to clean it up. Trenches were dug at the south end of the lake to trap the oil where the line break had occurred.
- Memory of a construction camp at Blanchard Creek; Army men came to get fish out of the traps at Klukshu and they would sometimes give villagers bottles of mosquito repellent. People were unsure what to do with it and some people drank it making them feel quite ill.
- No memory of planes or helicopters flying over the right of way. No one came to the village (Klukshu) to inform them that the herbicide sprayings would be done. There were close to 100 people living at Klukshu during the 50's and 60's. Most lived in tents and bush camps.
- Do not recall ever being informed about pipeline construction or maintenance activities, particularly herbicide sprayings.
- They remember being fearful of some of the workers during construction as one man had

beaten another and escaped. A worker at Dezadeash Lodge came down to Klukshu to inform them.

- The maintenance of the pipeline involved regular flights over the right of way. People used to pump diesel from the ditches where there was a leak or repair in the line and use it in their homes. The right of way became a corridor for picking raspberries or to use to trap rabbits. The extremes of temperature caused the pipeline to move over time. The pipeline on the surface would migrate as much as 3 feet in the heat of the sun.
- One person recalls one spraying. A very strong substance was sprayed along the corridor using a Bell-type helicopter. No one was informed that the spraying would occur. Afterwards people were too afraid to pick berries or trap rabbits in the area because of the strong smell.
- Anything that had to be disposed of was trucked to Anchorage for military disposal. A "Cat" was used to clear the pipeline right-of-way.
- Several interviews with pipeline maintenance personnel indicated that there were approximately four airborne applications of an unknown chemical along the entire length of the pipeline right of way.
- One interviewee thought that it was Tordon 101 that was sprayed in a water emulsion from a helicopter mounted with two side tanks over the entire Canadian section of the pipeline corridor. Ground applications of herbicides were also done.
- Chemicals were flown into an airstrip at MP72 (or MP75) - Glacier Camp - where the DDT truck would load up and deliver them to where they were needed for ground spraying. A product was used for ground spraying that is used in fire retardant, a heavy mud material.
- One recalled the herbicide was a granular material administered on a "grains per square foot" basis. Herbicides were sprayed regularly along the entire pipeline right of way, possibly every year.
- The herbicides used were approved by a high level Canada-US. Agreement which required only ground application of herbicides near water bodies. Between 1957 and 1960 there was some ground application of herbicides. There was no particular documentation required for local sprayings. The local application of herbicides was dominantly near Haines Junction, not so much near Klukshu. Herbicide application was the responsibility of another department and there was very little local involvement.
- There was no formal procedure for acquiring the herbicides. The herbicides applied on a local basis was at the discretion of the Canadian station foreman and no paper work was required.

Summary of Herbicide Use:

Permission to spray Esteron, by hand methods, was requested and granted in 1965. Notice was then given that herbicides were re-applied in 1966. Esteron was no longer available in 1968 due to the use in the Vietnam war. In 1968 permission was granted for the spraying of Fenuron, and in November 1968, permission was requested to spray Tordon 101 along the Canadian portion of the pipeline. The spraying of Tordon 101 did occur according to interviews.

Esteron Brush Killer contained 2,4-D and 2,4,5-T up to December 1965 as active ingredients. It is absorbed by the root, bark and foliage. According to the Agrochemicals Handbook, the salts are readily soluble in water and the esters are soluble in petroleum oils at 25C. It recommends avoiding long term exposure, even to small amounts. Products containing 2,4,5-T are now banned in most countries. The Herbicide Handbook warns that aspiration of 2,4-D solution may lead to pulmonary damage.

Fenuron weed and brush killer was composed of 25% Fenuron, (3-Phenyl-1, 1-Dimethylurea) and 75% Inert Ingredients. It is moderately soluble with water and leaches most rapidly from sandy soil and more slowly from clay or organic soils. It is a non-selective herbicide which is absorbed by roots, and kills trees brush and perennials. Fenuron accumulates in the growing parts of vegetation.

A product called Dybar was used locally - mostly in storage areas in Alaska. Dybar is the trademark for pellets containing 25% fenuron. Any chemicals used were tested for a minimum of 5 years.

Tordon 101, contains 2,4-D and picloram as amine salts. Visually, it is white odourless crystals which decompose at 85 to 87C. It is extremely soluble in water. Inhibitors may have ben used in the solution applied in the Yukon to prevent precipitation in hard water. The 2,4-D is absorbed in the plant roots and eventually accumulates in the new roots and shoots. It causes abnormal growth which affects respiration, food reserves and cell division in plants causing plants to die from lack of nutrients. Picloram is a white powder with a chlorine-like odour. Picloram pellets are applied and it is absorbed rapidly by both tops and roots in the plant and accumulates in new growth. The salts are water soluble. Disappearance of Tordon 101 from soils varies according to temperature, rain fall and soil conditions. It is slowest under cold dry conditions in the north. Inhalation of isopropyl alcohol, a minor component of Tordon 101 may result in incoordination, hypothermia, circulatory collapse, respiratory arrest and even death. Prolonged exposure to Tordon 101 may cause liver, kidney, gastrointestinal, central nervous system, and muscular effects according to the Canadian Centre of Occupational Health & Safety.

The pipeline corridor became a well used transportation route for Champagne/Aishihik members as well as for deadwood along the corridor for heating homes and smoking fish, meat and skins. Band members spent may days breathing the smoke from herbicide sprayed wood, as they cured their meats and fish.

Sampling of the Haines Pipeline Corridor through Klukshu for contaminants began on October 5, 1992. A report found that the levels of dioxins and furans present in the surface soil indicate application of herbicides 2,4,5-T resulting in Klukshu being a hazardous site according to the levels set up for agricultural lands. People living off the land in the traditional style would have the exposure as if the land were agricultural... Furthermore because of the persistence and biaccumulation of dioxins, the toxic effects of herbicides are not restricted to those directly exposed at the time of spraying. Further sampling is recommended to test the

possible contamination by 2,4,5-T and 2,4-D at Klukshu. A systematic sampling program should test the entire pipeline corridor through the reserve, as well as the adjacent bush.

The people of Klukshu have noticed an increased occurrence of cancer and a general decline in the health of adults. A medical study would better determine if the negative health effects on the people of Klukshu are above normal.

Summary of Events:
1950:
Esteron brush killer was registered in 1950 containing 2,4-D and 2,4,5-T (Reg.#3372)
1952:
Pest Control Products Act passed
June 30,1953:
Haines-Fairbanks Pipeline Agreement signed Diplomatic Agreement-20 year Treaty (Canada+U.S.)
November 19,1953:
Diplomatic Agreement tabled in House of Commons.
December 3,1953:
Debate in House of Commons RE: pipeline cost to Canada, jobs for Canadians.
April 8,1954:
Debate in House of Commons RE: pipeline cost to Canada, jobs for Canadians.
Summer 1954:
Beginning of Pipeline construction; Pipe selected Canadian portion of line (max. pressure of 1397 lb/in on 0.277 in. walls and 1613 lb/in on 0.322 in. walls); In Alaska pipe was seamless (max. pressure 21,600 lb/in.).
October 1955:
Pipeline construction completed and U.S. Army assumed command of operations.
January 1956:
Ice in pipeline blocking fuel flow resulting in 28 cuts in the line and oil purging. Study shows tree growth depressed or absent for 15 years.
Summer 1956:
Airborne application of herbicide to pipeline right of way.
1956 - 1970:
Pipe Failures; 6 bullet holes and corrosion, 6 corrosion only.
1957,1959,1962,1964,1967:
Provisions for the use of the Haines Cut-Off Road for winter maintenance of the pipeline.
1959:
Registration of Fenuron in Weed + brush killer (Reg#7040).
1964:
Registration of Tordon 101 containing 2,4-D and picloram (Reg#9007-current)
February 24,1965:
Request by U.S. Army to clear the pipeline right of way of vegetation using the herbicide Esteron applied by hand methods.

Summary of Events (Cont.):

March 18,1965:
Permission from the Commissioner of Yukon to spray Esteron using hand methods over an area 55 ft wide and set back 500 ft from any stream or lake.
December 1965:
De-registration of Esteron Brush Killer (#3372)
June 10,1966:
Advisory letter from U.S. Army that a spraying of herbicides began June 1966.
April 9,1968:
Request from U.S. Army to use Fenuron and Tordon 101 on the pipeline right-of-way. Letter from U.S. Army (Petroleum Division) to Commissioner of Yukon.
April 30,1968:
Memo from Department of Game to research the effect of Fenuron and Tordon 101 on Fish & Game to Canadian Wildlife Service & Fisheries.
May 10,1968:
Department of Fisheries informs the Yukon division that they do not object to the use of Fenuron and Tordon 101.
May 17,1968:
Dezadeash oil spill where 4,000 barrels of fuel were released into the environment.
June 14,1968:
Permission from Game Branch to U.S. Army in Alaska (USARAL) to use Fenuron or 2,4 D on the pipeline R/W.
July 14,1968:
Pipeline failure at MP114.5 resulting in loss of 200 barrels of fuel. Study suggests fuel inhibitors responsible for lack of vegetation in spill areas.
November 5,1968:
U.S. Army plans to spray Tordon 101 June-August 1969.
June 1970:
Okanagan Helicopters has contract to spray pipeline- PP 42.5-337.5 in Canada, for $69,705.53, to spray between June 20- July 1970.
September 1970:
A 12 mile section by Dezadeash Lake was replaced, also running under Klukshu River.
December 1971:
De-registration of Fenuron (Reg. #7040).
1973:
Termination of U.S. Army's operation and maintenance of the Haines-Fairbanks pipeline,(20 year treaty/agreement expired)
1991:
Pipeline is removed as part of clean-up procedures.

5.6 BEAVER CREEK DISTRICT REVIEW

Boundaries:
Alaska Highway- MP1104(Burwash Flats)to Yukon/Alaska Border MP1221.4
Snag Road & Airport
Map Coverage:
Map 9: Kluane Lake - 115 F&G/115 B&C
Alaska Hwy - MP1104 Burwash Flats to MP1170
10: Snag - 115 J & K
Alaska Hwy - MP1170 to Yukon/Alaska Border MP1221.4
Military Activities:
Snag Airport, Alaska Highway Construction Camps, Relay Stations, Sawmills, Canol No.4, Haines-Fairbanks Pipeline

Community: Beaver Creek

ALASKA HIGHWAY

In this district, there were many camps located next to the rivers for bridge construction. In 1943, from MP1104 to the Alaska Border MP1221.4, there were four Utah Construction Co. camps, at the Donjek, Koidern and White Rivers and at Dry Creek. Dowell Construction camp was also at the Donjek River. Canol No. 4 Pumping Stations were near the Donjek, at Koidern and Beaver Creek. A relay station was located at Koidern/White River. Sawmills were located at Edith Creek and Beaver Creek.

Alaska Highway:1943
Section/Sheet - Camp Name - Mile Post
SECTION 10: MP1092-1221.4: BURWASH LANDING - US/CANADA BOUNDARY
10/14 - Canol No. 4 Pumping Station 'F' - MP1126
10/15 - Dowell Construction Co. -Donjek River- MP1130
- Utah Construction Co.Camp 2 - Donjek River - MP1130
10/23 - Utah Construction Co.Camp.259 W - Koidern River - MP1155
10/25 - U.S. Army Koidern River Telephone Relay Station - MP1164
- Canol No.4 Pump Station 'G' - MP1166
10/26 - U.S. White River Telephone Relay Station -MP1167.5
10/28 - Utah Camp No. 5 - MP1171
10/32 - Utah Construction Camp 283 W - Dry Creek - MP1184
10/33 - Jct. to Snag Airport - MP1188.5
10/37 - Canol No.4 Pump Station 'H'- Beaver Creek - MP1205.5
- Miller Camp - MP1206
10/42 - Border US/Canada - MP1221.4

Sawmills
18. Edith Creek Sawmill - Elliot Construction Co.
19. Beaver Creek Sawmill - M.H. Kansas City Bridge Co.

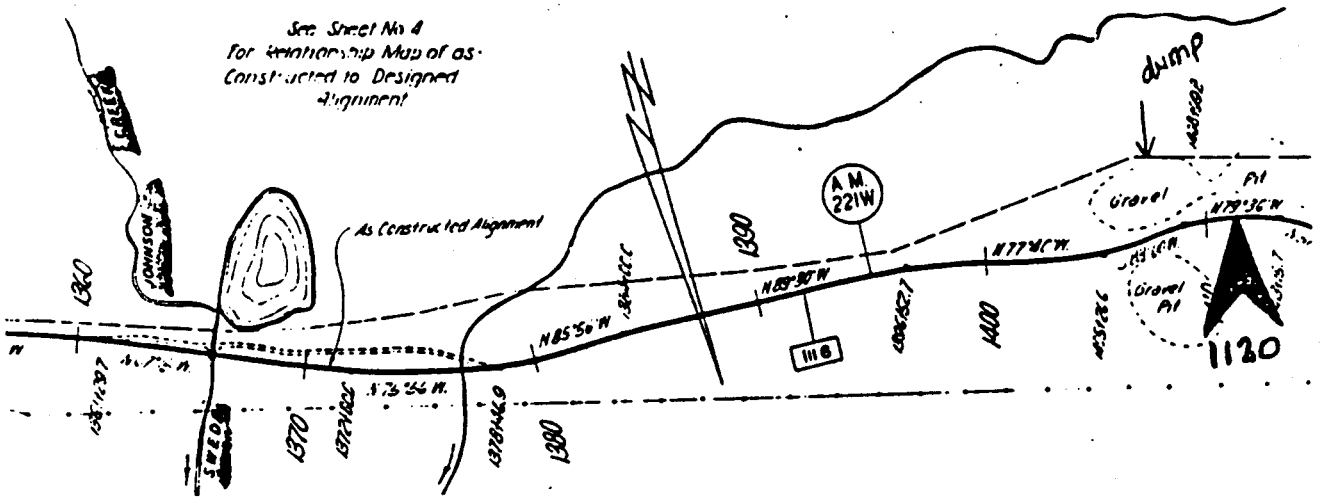
Alaska Highway - MP 1118 - 1130
At MP1124, is the present site of the Donjek pump station for the Haines Fairbanks pipeline, north side of the road. This was one of the original pump stations constructed in 1954/55 along with Haines, Border, and Tok pump stations. (See Darrell Duensing interview-Burwash Landing-Haines Junction District Review). The powerhouse building and storage tanks remain today. At MP 1126 on the south side of the highway was the Donjek pumping station 'F' for the Canol No. 4 pipeline.

John Trout - Kluane Wilderness Village MP1118
Scully - Wood Products MP1118
They identified an old dump near Burwash Flats MP1105, and at MP1128, in between the old Canol pump station (MP1126) and the Dowell and Utah Construction camps at MP1130, south side of the Donjek River. This was a big camp for bridge construction. The dump was on the north side of the road, where they apparently buried "stuff". There are stories of equipment etc. being buried in the gravel bars in the Donjek River to the north of the old pioneer road bridge.

Scully identified a dump site, south of Lewis Creek between Burwash Landing and Destruction Bay, on the west side of the highway along an old trail, approximately 5 minutes by four wheeler off the highway. He figures there are 20-30 dumps in the area where they buried things.

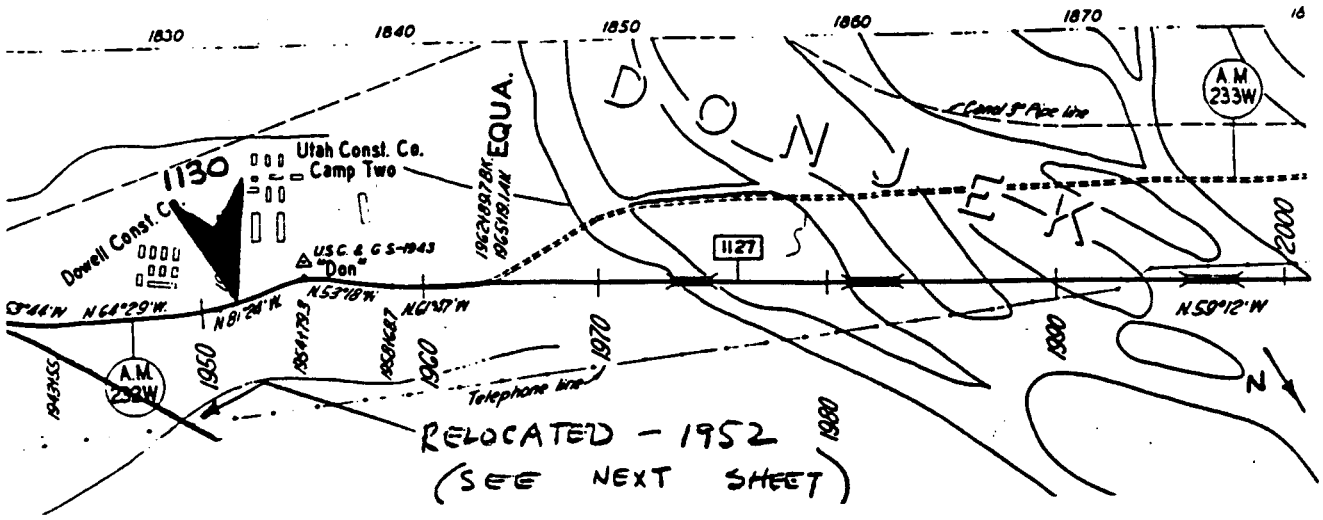
In Figure 35, the 1956 oil spill from the de-icing operations of the Haines-Fairbanks pipeline is shown. (PRA Map-(9) Sheet# 10:13) Also shown is the dump site at MP1120, which was identified by Josie & Frank Sias (See Haines Junction Review-Silver City). This site was used by workers at the Donjek Haines-Fairbanks pump station for wastes that couldn't be incinerated.

FIGURE 35: Swede Johnson Creek Oil Spill at MP1119.3 - Dump Site at MP1120



In 1943, at the Donjek River (MP1130), Utah and Dowell Construction had camps located south of the pioneer bridge on the west side of the highway. Rebuilding of the Donjek River bridge and relocation of the highway started in 1948 and was completed in 1952. This was the largest structure undertaken by the Canadian Army during peacetime and was built mostly by military labour. In Figure 36, (PRA Map (9) Sheet# 10:15) the 1943 camp layout is shown.

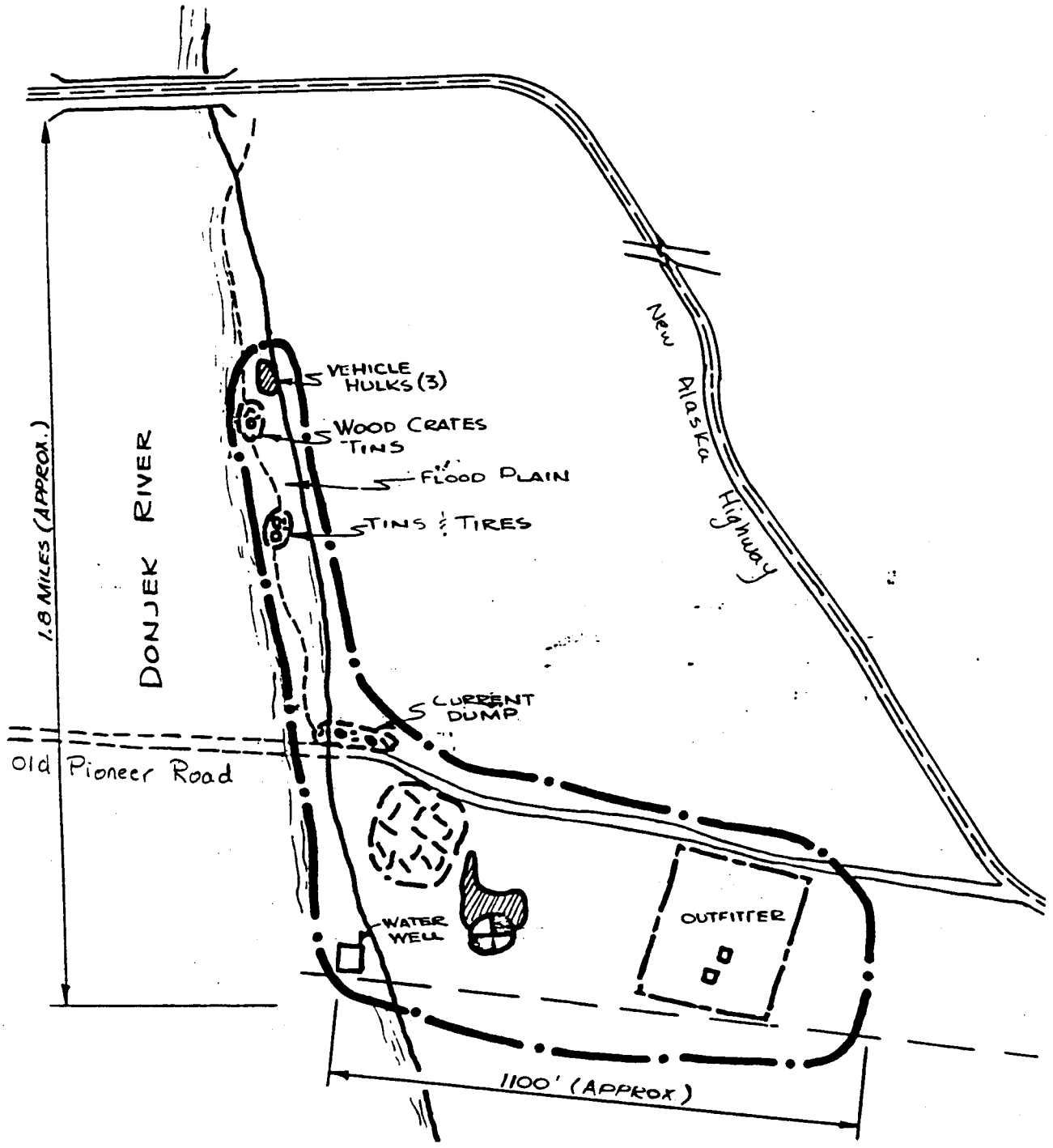
FIGURE 36: Donjek River Construction Camps - 1943



In 1976, Edey (13) , identified a potenial bury site and other debris along the Donjek River as shown in Figure 37. The new bridge and highway re-alignment is more than a mile to the north of the original pioneer road and bridge. Interviews have indicated that there could be equipment or debris buried in the Donjek along the old pioneer road, both south and north of it.

Military Excersises were held in this area in the early 1950s. Interviewees have mentioned that "war games" were played near the Donjek River, with Canadian Army and U.S. Army soldiers. "The Canadians really 'whupped' the Americans at the Donjek." (M.Biggin, pers.comm.).

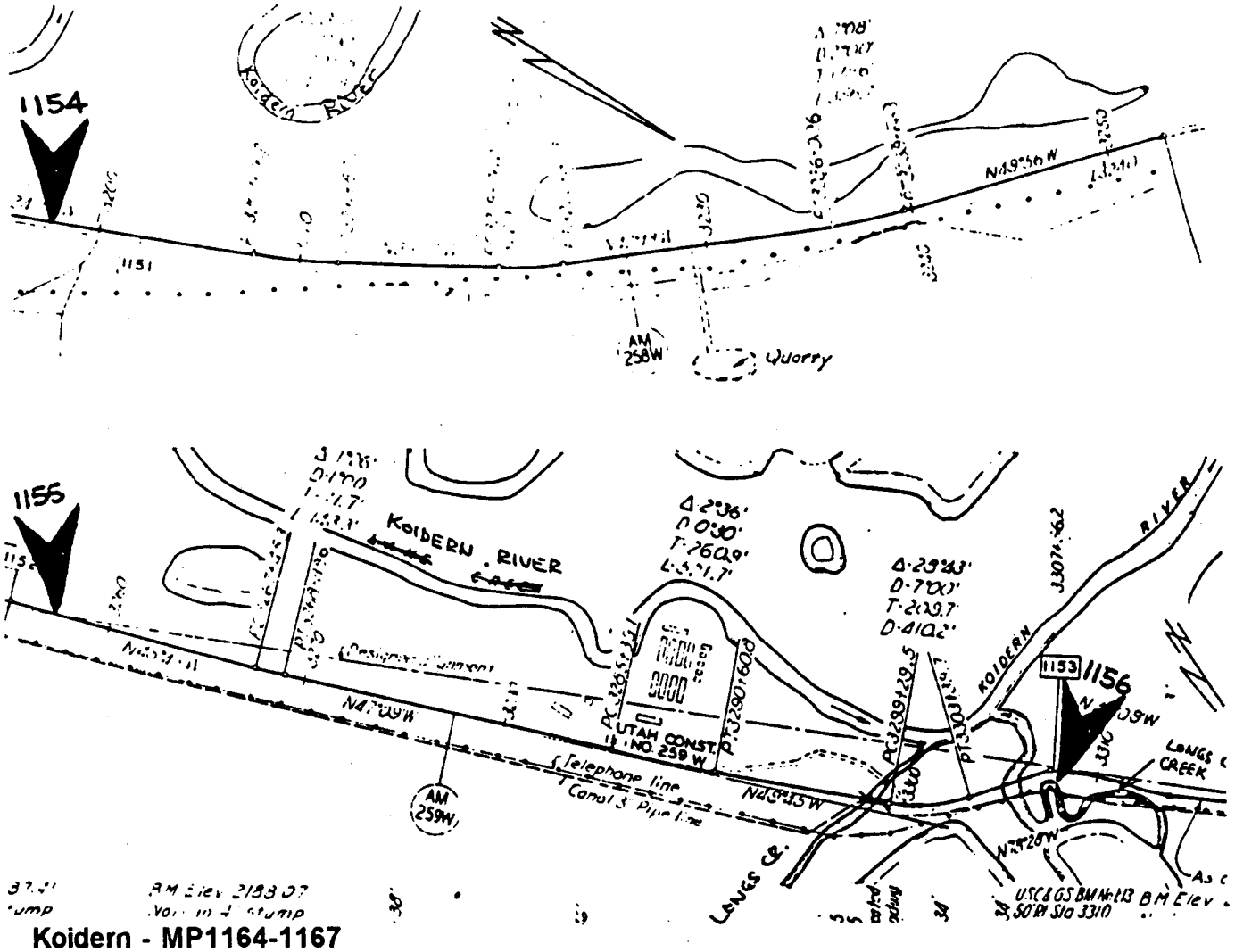
FIGURE 37: Donjek River Area - MP1130 - 1976



Koidern River No. 1 - MP1151.5 to Koidern River No.2 - MP1156

At Koidern River, Utah Construction Co. had camp No. 259 W at MP1155.6. According to interviews, there are all sorts of things buried near a bluff, south of Longs Creek (MP1156), on the north side of the highway. (See Kluane First Nation Report (78) provided to AES in File#13.) On PRA Map Sheet# 10:22 there is a quarry noted at approximately MP1154.5. This area in 1943 is shown in Figure 38. (9).

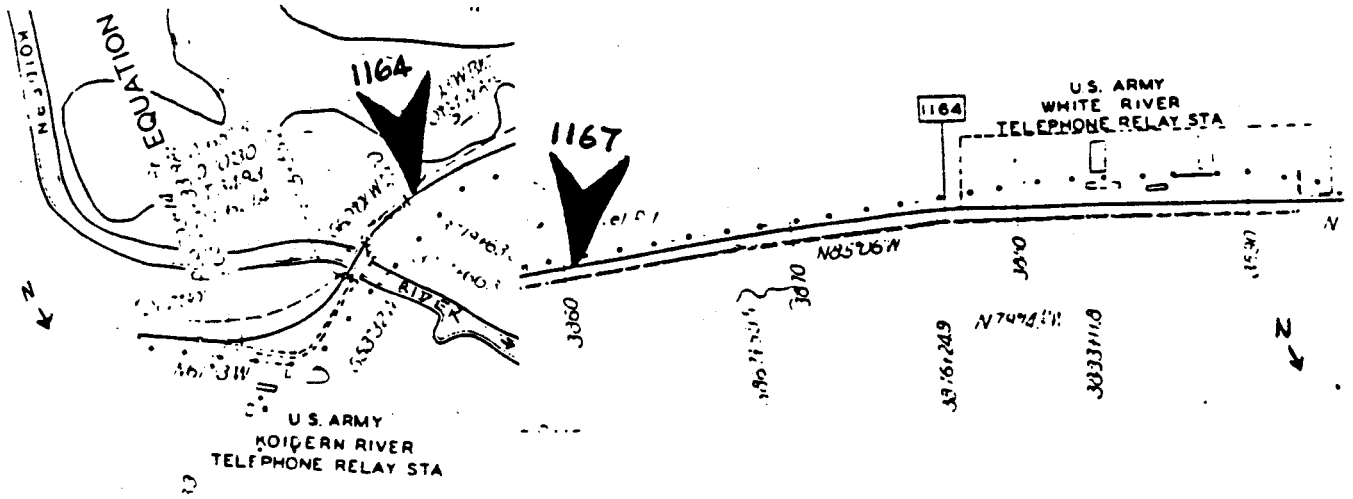
FIGURE 38: Koidern River - Longs Creek - MP1154-1156



Koidern - MP1164-1167

The 1943 PRA Maps identified two U.S. Relay Stations, one at Koidern River, at MP1164, and one at White River, at MP1167, shown in Figure 39. By all descriptions it would appear that there was only one station and it was located at MP1167, near Bear Flats, not at Koidern River.

FIGURE 39: U.S. Relay Station - Koidern River/White River - MP1164/1167



34. Koidern Relay Station - 1944

BUILDING of the Koidern Way Station has been quite recent. Scene above shows the camp during construction. Koidern takes its name from the Koidern River, which it is near. It is also near the White River, which became famous because of the difficulties in crossing it. Koidern is about halfway between Destruction Bay and Northway relay stations.

The Koidern relay station, shown in Photo#34, was built in 1944 and was halfway between Destruction Bay and Northway relay stations. (49) At MP1166, on the west side of the highway there was Canol No. 4 pumping station 'G'. Concrete foundations were noted at this site during the Edey 1976 assessment. There were a number of dumps identified in this area. Most of these sites have been cleaned up.

Haines-Fairbanks Pipeline Oil Spills
In 1956, 16 of the 27 cuts done in the Yukon during the de-icing operations were done in this district from PP233.2 (Burwash Flats) to PP303.5 (Sandpete Creek). In 1969, there was a spill near Koidern. In 1971, 6 of these spills were investigated (23). These are noted on Report Map 9.

PP244.7, 1956. (Swede Johnson Creek) The exact date of the leak is unknown as a valve was left open by workmen when the line was being purged in 1956. An unknown quantity of JP-4 leaked out overnight into a small stream and over an area 100 feet wide by 400 feet long. Fish taken from the stream reportedly tasted of petroleum for 4 to 5 years after the spillage occurred. In 1971, vegetation appeared to be doing quite well with willow, cottongrass, birch and moss growing over most of the area. (See Figure 35).

Interviews- Kluane First Nation & White River First Nation:
A number of peopled interviewed reported the fish (grayling) tasted horrible at this creek for 3-5 years afterwards. Some say the fish taste okay now, others don't fish in this area anymore.

PP256.8, March 2, 1956 (Near Donjek River) Vegetation is killed in this area, within a small watershed. Fuel moved uphill on each side of the basin for 2-3 feet. In 1971, hummocks within the area had some spruce and willows growing on them.

PP257.1, Same as above:

PP268, February 25, 1956. (South of Edith Creek) The pipeline was cut in a small flat area which is drained by a small stream. Spruce on the edge of the spill were killed.

PP273.2, February 29, 1956 (North of Koidern River)
The pipe was purged into a small drainage area on the 1-2 degree slope and the spill area is at least 250 feet in diameter. All vegetation, predominantly black spruce was killed at the time. In 1971, vegetation was growing in the drainage area, but outside of this no vegetation had become established.

PP290.8, June 12, 1969. (Koidern) (100Bbl)
This leak was caused by a bullet intended for a bear in a garbage dump. The leakage progressed for 1 hour before pumping operations were stopped. The pipe in this area was buried following repair operations. In 1971, a strong odour was present in the gravelly soil and no vegetation is growing in the area.

White River - MP1169 & MP1171
There are stories of Army personnel digging a large hole on a gravel bar in the White River and burying barrels, vehicles and other materials. The exact location is unknown. Utah Construction had camp No. 5, located approximately 2 miles north of the White River bridge on the east side of the highway. There are reports of a dump site in this location, with old barrels and metal sticking out of the ground. This area is identified on the PRA Maps in 1943 (9) and by Edey in 1976 (13) as shown in Figure 40. This area is also Historic Milepost 1171.

FIGURE 40: Utah Construction Camp No.5 - MP1171 - 1943 & 1976

A dump site was identified near Horsecamp Hill, MP1175, noted on Report Map 10.

Dry Creek - MP1184

In 1943, Utah Construction had a camp here (Camp 283 W). Interviews have indicated that the Army buried things on the east side of the road, "at the top of the hill where a road goes to the right, by Dry Creek". Interviews also indicate a dump site on the west side of the road on the banks of Dry Creek. Disposal sites are noted on the sketch done by Edey in 1976. Illustrations of these sites in 1943 (9) and 1976 (13) are shown in Figure 41.

FIGURE 41: Dry Creek - MP1184 - 1943 & 1976

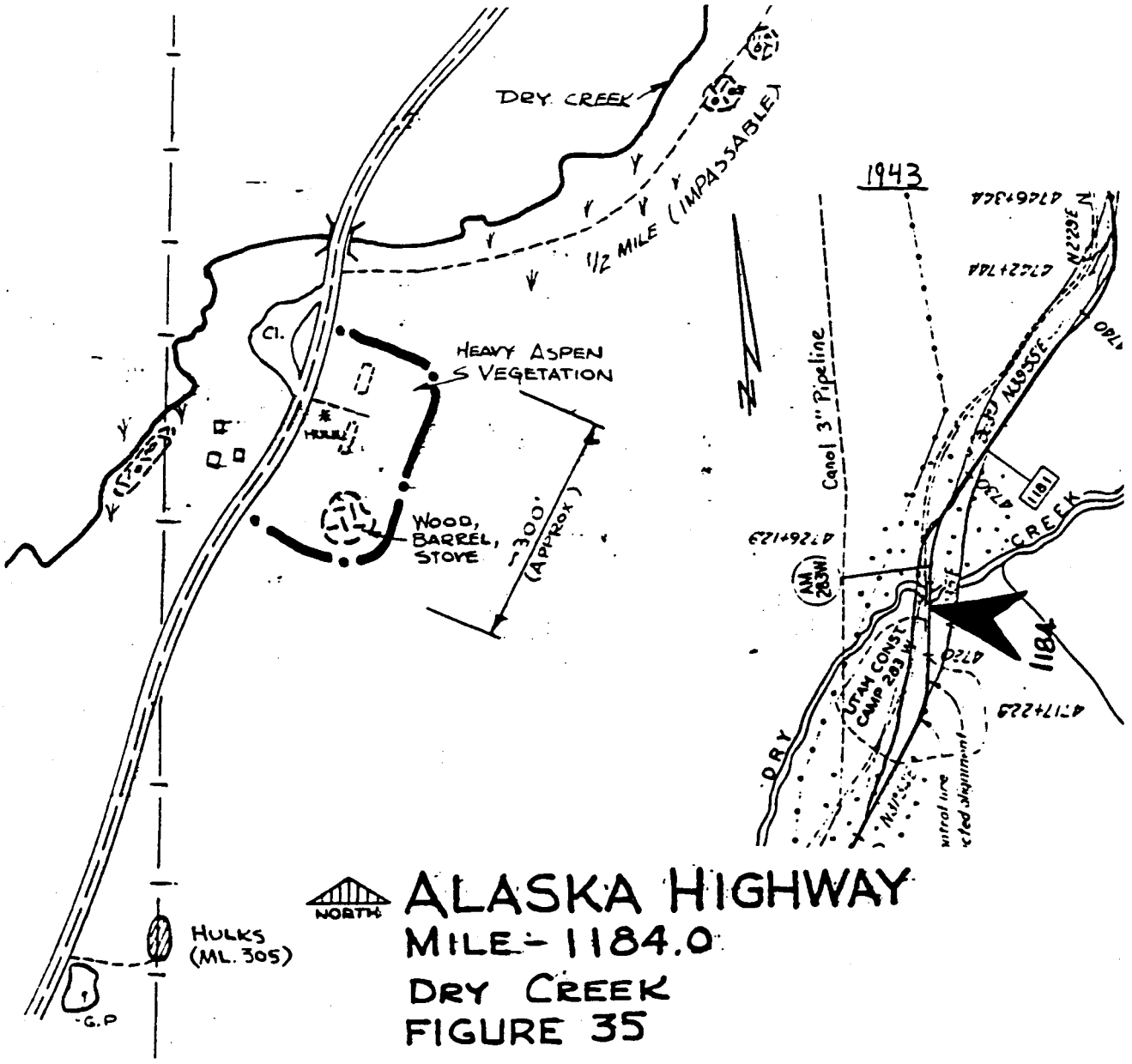
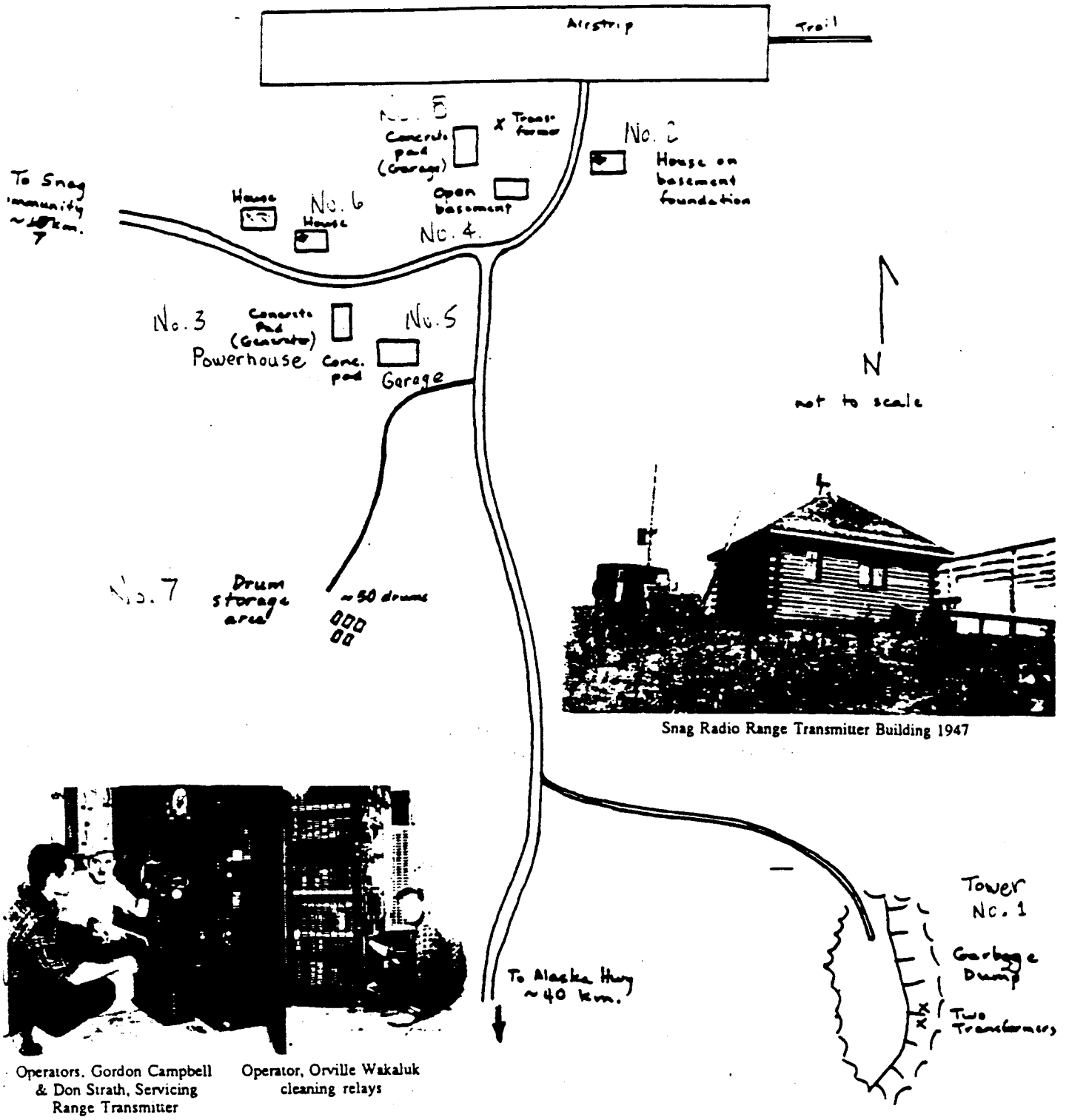


FIGURE 42: Snag Airport



Snag Radio Range Transmitter Building 1947

Operators, Gordon Campbell & Don Strath, Servicing Range Transmitter

Operator, Orville Wakaluk cleaning relays

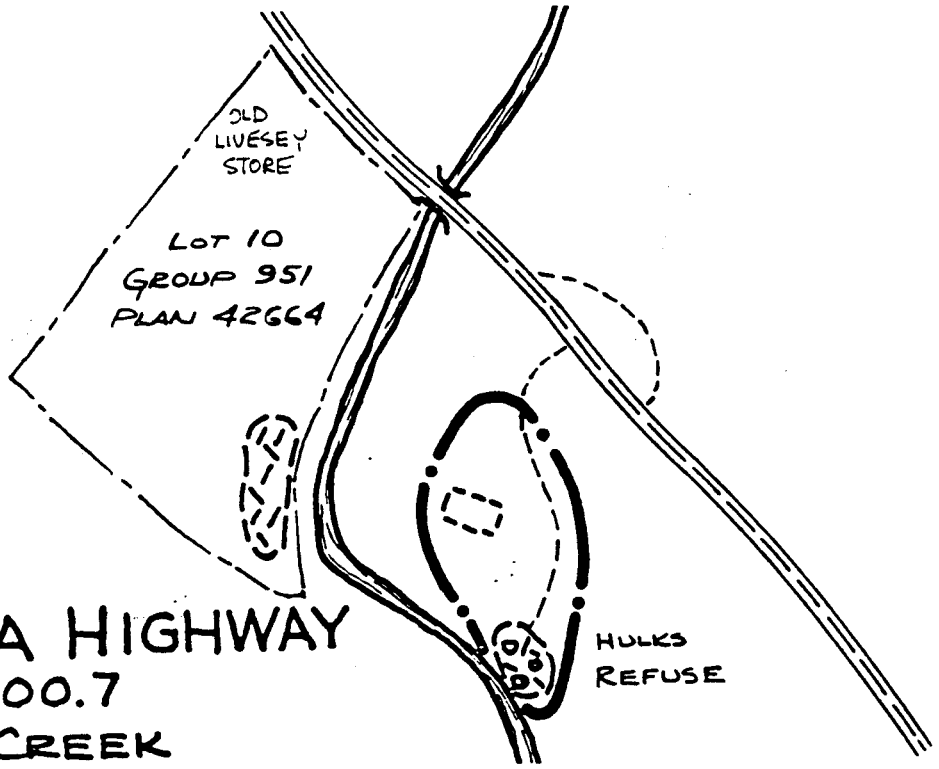
Snag Airport

The junction to the Snag Airport Road is at MP1188.5, Alaska Highway. It is approximately 25 miles (40 km) to the airport. Snag was an intermediate airport, for the Northwest Staging Route. Construction was initiated in 1942, including a radio range station. In 1947, record temperatures reached 83 degrees below zero. The native village of Snag was located approximately 4 miles (7km) north of the airport, originally built by the men of the Shoshoni Gold Rush in the 1890s. The name Snag came into being because there were so many logs and trees in the water. (48) This was closed in 1967 at the same time as Aishihik airport. A drawing done (6/25/89), by the RMO office in Beaver Creek, illustrates the airstrip and associated building layout, barrel storage area and garbage dump, shown as Figure 42. Concrete pads are what is left of the powerhouse and garage. Two transformers are noted as being in the garbage dump in the southeast corner. Additional clean up is required. In 1994, AES did a preliminary assessment of this site, which indicated the presence of PCBs and a warning has been posted. A detailed environmental assessment is scheduled for the Snag Airport in the summer 1995.

Beaver Creek - MP1200.7

Several interviewees mentioned this area as requiring clean up, site of Livesey' store on the north bank of Beaver Creek. This site was identified by Edey in 1976, shown in Figure 43 (13).

FIGURE 43: Beaver Creek - MP1200.7



Beaver Creek

White River First Nation:

Chief Margaret Nieman provided a list of people who would be good to interview within the White River First Nation. She mentioned that it used to be that you could get $.50 /pound for the copper wire inside the transformers. The oil inside was yellow and about 5 gallons was in each one. We didn't think about dumping the oil out anywhere. There are 3 dumps at Snag, with barrels etc. which are buried over. Glen Stephan helped to introduce us to several of the elders and showed us where their residences were located.

Bessie Johns/Eddie Albert

There is old vehicles and junk by Beaver Creek as you're coming into town, on the west side, by the old Livesey store and camp (MP1200). For a mile around the Snag Airport there are lots of barrels and junk that has to be cleaned up. At the White River there was a big camp (MP1171). There is a quarry nearby, the water should be tested for contaminants and the site cleaned up.

On the north side of Canadian customs (MP1206) there was an Army camp. The Pelly Construction camp is using this now and there is oil spilled into the quarry. In addition the American customs office is dropping raw sewage into the Scottie Creek watershed which is affecting the whitefish.

In the 1950's at Pepper Lake (25 miles north of the highway on the Alaska Border), part of the Scottie creek system, poisoned lard balls were put on the lake by the Game Warden to kill wolf and wolverine. The poison went into the lake when the ice melted and killed some of the fish. In the 1970s, Bessie figured that there was another poisoning in this area. Now there is no more salmon in this creek system. There are now too many beavers and they should be moved to new locations.

William Peters

At Dry Creek, at the top of the hill on the east side, by the sharp corner, they pushed debris over the bank. At Koidern on the east side of the road behind the cabins on an old river bar of the White River there was an old dump. At MP1204, by the Haines-Fairbanks pump station, east of the present sawmill there is an old dump. At MP1206, on the west side of the highway by the airport, there was the old Canol pump station. There may be a dump there. Cigarettes used to be bought from the Army for 40 cents a carton.

He found poison on an old carcass on Wellsley Lake sometime in the 1960's. They didn't take the poisoned hide. Salmon don't come up the White River anymore.

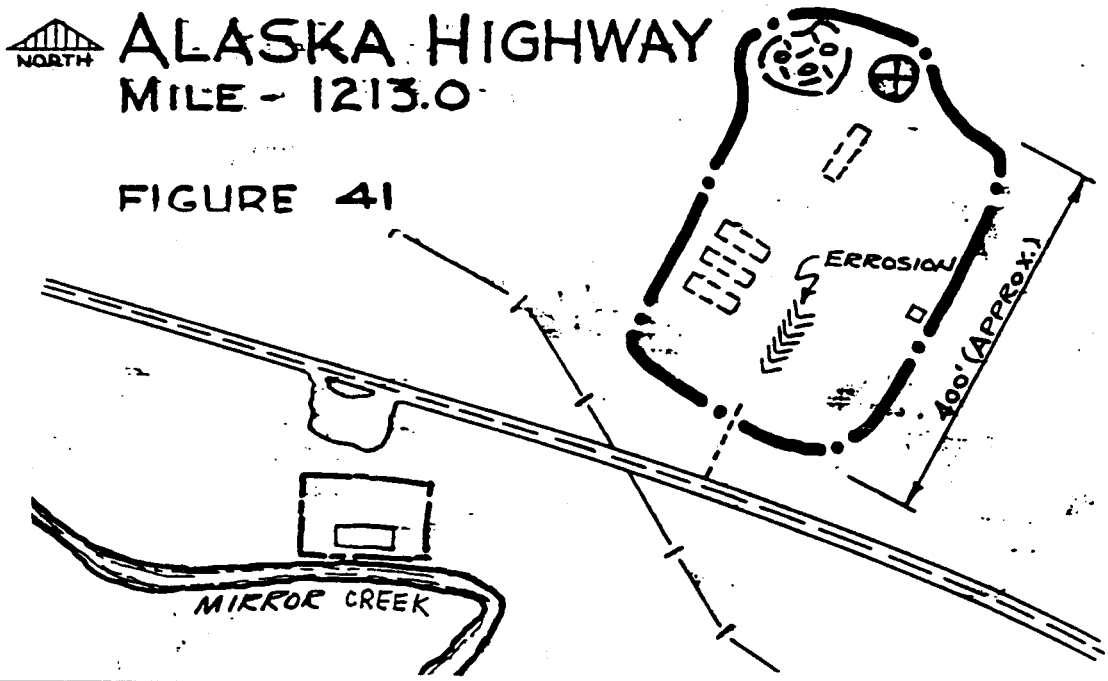
Jack Stalberg

He came up in 1951 and worked for the American pipeline and worked grading the Snag Airport Road for the Canadian Air Force. Snag used to be a weather station where 30 people were employed full time. There is one dump near the Snag airport where the army buried stuff. Right behind the old Snag village (4 miles north of the airport) there is an old DOT tower which is now shut down. There were U.S. Army camps on the White River. At Koidern No.1 was an inspection shed and a CNT Repeater station which burned down (now called Bear Flats). They buried vehicles and lots of other stuff between two creeks near MP1158. (Could be referring to Longs Creek). "If you go down any old road off the highway you are bound to find old vehicles or stuff buried."

MP1202 - MP1221.4

The centre of Beaver Creek is MP1202. At MP1205.5 on the west side of the highway is the site of the old Canol No.4 pumping station 'H'. Concrete pads were still remaining when assessed by Edey in 1976 (13). This is now part of the new airport runway. In 1943, Miller Camp was located on the east side of the highway at MP 1206. Miller constructed the telephone lines. This is adjacent to the Haines - Fairbanks Beaver Creek pump station, which is currently being used by Bert Ledegerber for a small sawmill operation. Pictures of this pump station were taken during our visits in February 1995, of the powerhouse and storage tanks. (Photo#35 & 36.) There were no camps noted on the 1943 PRA maps (9) to the Alaska Border at MP1221.4. In 1976, Edey identified a camp at MP1213 near Mirror Creek on the east side of the road, 10 buildings were here in 1945, shown in Figure 44.(13) Edey also identified a camp at MP1220, with 3 buildings in 1945. No sketch was prepared.

FIGURE 44: Mirror Creek Camp - MP1213 - 1976



Billy Blair
There is lots of stuff buried at the Snag Airport. He figures that heat sensitive film should be used to find it. At about MP1212, north of Beaver Creek, there is an old army camp with dumps nearby. There is a dump behind the Haines-Fairbanks Beaver Creek pump station (to the east).

In the valley at Dry Creek, MP1185, near the Chisana Gold Rush sign, a trail leads to Mr. Blair's trapping cabin. "There is a big gravel pit on the north side of the highway at the top of the hill. They didn't haul garbage away but pushed things off the hill and also dug a big hole and buried it." Billy Blair thought that this was an old dumping ground for the Army. He mentioned three sites in this area and offered to go out and pin point them. He wondered if any digging at the gravel pit revealed any old junk in this area?

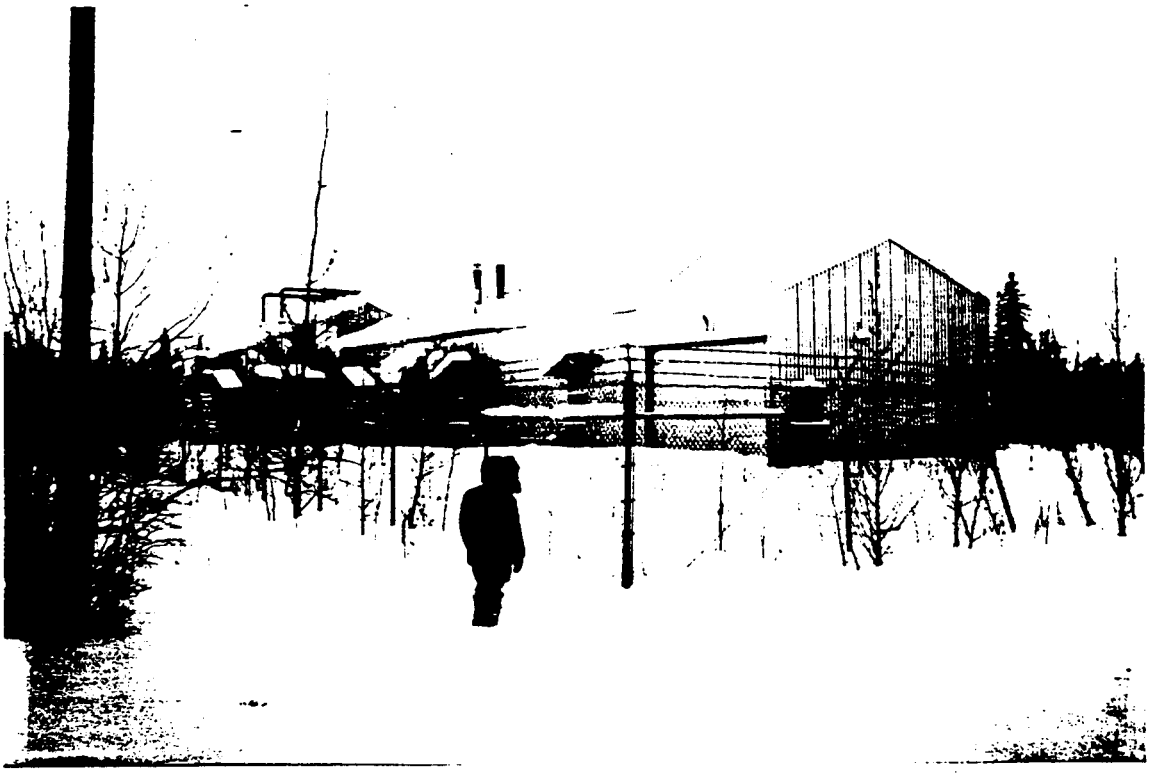
He used to take the oil out of old transformers and after he touched it with his hands he would get a tingling sensation for some time afterwards. The 3" inch pipeline (Canol No.4) leaked into a stream flowing into Dry Creek and killed trees, grass and the grayling which never came back.

Beat Ledergerber
He talked about the Snag Airport, and the Haines -Fairbanks pump station. He thought there may be a dump associated with this. He remembers the site of the Browns sawmill/ Whitehorse Lumber Co. on Beaver Creek, along the first road to the right past the pump station and sawmill. There are still remains of this site.

At Koidern No. 1 (MP1151.5) there were tar tanks on the right side past the old bridge. He thinks they buried groceries, engine blocks, cat parts and transformers here and also buried these at Snag and Aishihik airports too. At MP1156, there was a large camp. The new road now goes right over the old camp. Across the road from this camp is where the repeater station blew up, (this may be Koidern?). At MP1171, there was a big camp with barracks down an old road, just past the White River bridge. At Bear Flats there was a CN camp in the 1960's (Koidern) by Dickson's grazing lease. There is an old dump across on the flats on Dickson's grazing lease. On the hill above Dry Creek on the right side, was a gravel pit where I don't believe there is much stuff buried.

In 1968, Evergreen Helicopters sprayed agent orange just before they closed the Haines-Fairbanks pipeline.

35. Haines-Fairbanks Pipeline - Beaver Creek Pump Station - 1995



36. Haines-Fairbanks Pipeline - Beaver Creek Pump Station - 1995

RMO Waste Management Sites

The waste management files were reviewed in the office at Beaver Creek with Debbie Burgess and discussed with Neil Wortley (RMO), to assess which sites were of military origin. Most of the surface dumps, easily accessible have been cleaned up, with carbodies and barrels removed. Many of the identified waste management sites were related to mining activities. In fact, there were shocking photographs of equipment and whole trailer camps abandoned, in the Burwash Creek area. Sites relevant to this project included:

```
# 1 - Snag Airport - Poles, insulators lines, Ak Hwy to Snag
# 2 - Snag Airport - Drums, Buildings -Scrap Metal
# 5 - DC3 Aircraft in unnamed lake
# 6 - Bear Flats - Carbodies
# 7 - Bear Flats - Dumpsite
#17 - Donjek River - Car bodies, scrap metal, drums
#25 - Snag Airport - Repeater Site - Timbers - Scrap Metal
#33 - Donjek -Wooden Platforms, Wooden Tower, Shed
#34 - Duke River - Old Bridge Timbers ,decking
#37 - Duke River - Old Truck Frame
#44 - Bear Flats - Concrete Pad
#91 - Koidern- Canol pipeline No. 4 Pump Station
```

Haines Junction-White River Clean Up (14)

(Pictures & Report),Yukon Archives, Govt, 1168 Acc #80/64 Pt.1 - 1973/74

- MP1130 - Donjek River, old military camp - All wood debris was burned or buried.
- MP1156 - Old Relay station or pump station Koidern River - tank, wood debris (MP 1155.6)
- MP1165.8 - Army-100 miles of barbed wire; pump station (could be same place as MP1167.5).
- MP 1167.5 - Old pump station east of Koidern Lodge - old cement pad, cleaned up.
- MP 1171 - Garbage buried - cleaned up in 1974
- MP 1174.5 - Old Army site; Need to excavate and bunch old truck bodies and the other non-burnables -Inspection 7/25/73; Yukon Forest Service cleaned this up in 1974.

1983 Waste Disposal Sites

Alaska Highway:

```
MP1126.5 km1808.3  Ak Hwy  Lat 61 36' 45" Long 139 37' 20"
         Canol Pump Station F - U.S. Army, 5 bldg, 1 oil tank
MP1130   km Ak Hwy   Lat 61 38' 20"  Long 139 43' 20"
         Old Ak Hwy - Donjek River - U.S. Army, 16 bldgs - At
         MP1130.1 there was a military dump
MP1156   km1860  Ak Hwy  Lat 61 53' 50"  Long. 140 13'
         Koidern - U.S Army maintenance camp, 26 bldgs in 1945
MP1166   km1876.4  Ak Hwy  Lat 61 58' 30"   Long 139(?) 27' 45"
         Koidern-Canol No.4 Pump Station G - U.S. Army
MP1167   km1878  Ak Hwy  Lat 61 59'  Long 140 28'
         Koidern - part of Army camp-Relay Station-13 bldgs\1945
MP1168.5 km1880 Ak Hwy   Lat 61 59' Long 140 32'
         White River Lodge- commercial - military?
```

1983 Waste Disposal Sites

MP1189 km1913 Ak Hwy Lat 62 14' 30" Long 140 41'
Near Snag Turn-off - U.S. Army? public - bulldozed over Snag-17 miles off hwy-U.S. Army,
MP1200.7 km1932 Ak Hwy Lat 62 21' 45" Long. 140 52'
Beaver Creek - U.S.Army,22 bldgs here in 1945, both sides of Beaver Ck bridge-old dump,vehicles,wood debris
MP1205.5 km1940 Ak Hwy Lat 62 26' 30" Long 140 51' 30"
Canol No.4 Pump Station H - U.S. Army- debris burned
MP1206.2 km1941 Ak Hwy Lat 62 26' 30" Long 140 51'
Beaver Creek-Maintenance Camp/U.S. Army, 16 buildings in 1945, some areas covered, debris burned

Dump Sites Identified in 1993 AES Report (8)

- Account of military excavating a hole in a gravel bar on the White River, dumping barrels and vehicles, exact location not known.
- Dry Creek hill; on the top of the hill on the west side of the road
- Haines-Fairbanks pump station in Beaver Creek; large dump, buried material
- Behind Livesey's Store in Beaver Creek, full barrels partially buried, and old army vehicles.

Waste Sites with Heritage Concerns:

BC02 Snag Airstrip: This airstrip and weather station was built in 1942 by the Dominion Department of Transport in conjunction with the airlift to Russia. It closed in 1966. Contact Heritage branch before clean-up.
BCO5 - DC3 crash site: 62° 31' 00" 140 41' 00"
Military plane, engine removed, cock pit dynamited, partially submerged in small lake, northeast of Beaver Creek.
BC14 Snag Townsite: Leave buildings, notify Heritage Branch of proposed clean up of site. Clean Up in conjunction with White River First Nation and Heritage Branch.
BC65 Koidern River #2: Highway Construction Camp, 1940's. Located on an esker surrounded by wetlands. Heritage Branch to record before destroying.(16)

5.7 ROSS RIVER DISTRICT REVIEW

Boundaries:
Robert Campbell Highway -MP143 Finlayson R.- Magundy R. MP270
South Canol Road - MP90 Lower Sheep Creek to Ross River MP142
North Canol Road - MP142 (Ross River to Yukon/NWT Border MP283
Map Coverage:
Map 11: Quiet Lake - 105 F
South Canol Rd-MP90 Lower Sheep Creek to Ross River MP142
Robert Campbell Hwy - MP201 Horton Creek to MP225
12: Tay River - 105 K
Robert Campbell Hwy - MP226 t MP270 Magundy River
North Canol Road - MP142 Ross River to MP160
13: Sheldon Lake - 105 J
North Canol Road - MP160 to MP255
14: Hess/Sekwi Mountain - 105 O/ 105 P
North Canol Road - MP255 to NWT/Yukon Border MP283
Military Activities:
Canol Pipeline No. 1, South and North Canol Road

MP90 on the South Canol is the approximate location of the Resource Management District boundary, between the Teslin and Ross River districts. Camps/pump stations and associated clean ups for the South and North Canol Road, have been described in detail in Section 4.5, on the Canol Pipeline.

CANOL PIPELINE:
The Canol No.1 pipeline was the sole military activity in this region. Beginning in the winter of 1942/43, the route was surveyed through to the Macmillan Pass area. Locals were hired to act as guides to select the best route.(52) At Ross River there was a trading post, located on the north bank of the Pelly River and the mouth of the Ross River. At Sheldon Lake, approximately halfway between Norman Wells and Whitehorse, there was another trading post, and beyond that to the MacKenzie River, for 300 miles there was no human habitation. (51) In June 1943, workers started progressing from Johnson's Crossing towards Macmillan Pass to meet the other crew of road builders, pipe layers and telephone crews from Canol Camp in the NWT. The "Golden Weld" when they joined the ends of pipe was at MP281.5 near the Yukon/NWT boundary, February 14, 1944. Crude oil flowed to Whitehorse for 331 days until March 13, 1945, when evacuation orders had been given for the Canol workers. Buildings were boarded up, equipment was winterized, and everything left, in case the pipeline would open again. The pipeline was closed by April 30, 1945.

The ferry at Ross River did not operate after the war. People salvaged what they could over the years, until gradually the bridges deteriorated and people could not get very far up the North Canol. In 1969, bridges were starting to be built again so the country was once again accessible.

In 1943, the PRA map (11), located the following pump stations, maintenance camps and emergency shelters in the Ross River District, along the South and North Canol Road:

Pump Stations/Relay Stations/Emergency Shelters - 1943

MP from NWT	Camp Name	MP from Johnson's Crossing
MP231.3	- Yukon/NWT Border	MP283
MP233.2	- Near Border - Emergency Shelter	MP280
MP238.5	- Macmillan River - EMC	MP272
MP246	- Macmillan River - EMC	MP267
MP254.7,260,266	- Emergency Shelters	MP247-258
MP279	- Macmillan River - EMC	MP234
MP280	- Macmillan River - Pump Station No. 7	MP233
	- Relay Station No.3	"
MP286,292,294	- Sheldon Lake - Emergency Shelters	MP219-227
MP293	- Sheldon Lake airstrip	MP220
MP299	- Sheldon Lake - EMC	MP212
MP303,309,317,327.1	- Emergency Shelters	MP186-210
MP337	- Orchie Lake - Pump Station No. 8	MP176
	- Relay Station No.2/Weather Station	"
MP341,349,356,364.8	- Emergency Shelters	MP148-172
MP372.4	- Old Ross River - EMC	MP141* MP143
MP373	- Ross River	MP140* MP142
MP377.9,382	- Emergency Shelters	MP131-135
MP387	- Lapie River - Pump Station No. 9	MP126
MP393.6,398.3,404,409.2,415.9,419	- Emergency Shelters	MP94-119

EMC = Elliot Maintenance Camp

* On the PRA map (11), the old village of Ross River is MP141, ie. there are mileage differences. For this report, MP142 is the centre of the current site of Ross River.

In 1943, there were also two sawmills in the District for bridge and camp construction, one near the Lapie River at MP137 on the South Canol Road and another at Sheldon Lake on the North Canol near MP212.

20. Lapie River Sawmill - Bechtel Price Callahan Co. - MP137 S. Canol Road
21. Sheldon Lake Sawmill - Bechtel Price Callahan Co. - MP212 N.Canol Road

ROSS RIVER DENA COUNCIL

Roger Ellis, Resource Officer, for the Dena Council was the contact person and a meeting was arranged for Elders in the community. Sandra Bob, George Smith and Johnny Ladue, also working for the Dena Council attended this meeting. No Elders were in attendance.

Many of the people we wanted to interview were not in town or were out on their traplines. We left a list of names with Johnny Ladue, Ross River Dena Council, to conduct further interviews. Due to busy schedules and lay-offs, this was not able to be completed. Most of the Elders cannot be contacted by phone. One person we wanted to interview was Art Johns, local to Ross River, who delivered mail to the camps. He apparently tells a story about his first impressions of the black troops stationed at the camps on the South Canol, near Lapie River.

George Smith
On the South Canol there are still old foundations at the old campsites where you can see signs of oil stains. Jackfish Lake, which is now the float plane base, was used by the U.S. Army. There are reports of fish with spots on it, that the fish doesn't taste good and the meat is soft. There are possible barrels in the lake. This should be cleaned up.

There was an old army camp at the site of the old Ross River village on the Ross River, just across the bridge on the south side of the road. He also thought there might be oils spills at this camp as there are dark patches on the soil. On the North and South Canol, there are still telephone wires remaining which the moose and caribou get caught up in. At Sheldon Lake there was a big Army camp, a trading post and a sawmill. There are still old barrels at Sheldon Lake and popular growth over the old sites. At Mile 216 or 217 on the North Canol, trucks and equipment are buried. There are reports from outfitters that they still use some of the old Army equipment that they found.

In the Northwest Territories, the Canol Heritage trail has not been cleaned up and there are still places where telephone wires are found on the ground, hunters have found live moose tangled in the wire. Poison was put on the lakes and along the trapping trails in the Ross River area between 1930-1960s for killing animals (wolves) using the brand "tossit". As a result people are afraid to eat the berries along the trails.

Hazel Peters
She thought there might be dumps associated with U.S. Army camps at:
1. the north side of Gravel Creek, between Flat and Beaver Creeks on the North Canol.
2. the south side of Sheldon Lake and at MP280 (?), on the south side of the Macmillan River.

Amos Dick
At Fox Creek, on the South Canol (MP116), there are still wires and barrels. There is still too much of the telephone wires left from the clean up in 1975-76, as moose and

caribou get caught in the wire. At Jackfish Lake, the float plane base, there are still barrels in the lake. On the North Canol, 8 miles north of Ross River, on the south side of the road there is a old sawmill site, with lots of drums and oil stains can be seen on the ground. There is an old dump at Marjorie Creek (MP160) where the new section of road was built. He thought there might be barrels at Jenny Lake, Trout Lake, Dragon Lake and six miles from Gravel Lake. He said there you could still find sections of pipe left behind with oil in it where it crosses the rivers. He told us of how to tap the oil out of the line by putting a hole in the bottom and top of the pipe. When he has been out hunting he has seen barrels and old telephone wire along the pipeline route. The Sheldon Lake area needs clean up, by the old village. There is a ravine full of barrels along the shore of the lake. Fourteen miles past Sheldon Lake there is a lot of old trucks at an old campsite.

Father Veyrat
He first came to the Yukon in 1947, came again in 1950 and in 1967 he returned to stay in Ross River as Father of the Catholic church. He said there were camps 10-20 miles apart on the Canol and every camp would have had a dump. Subcontractors became the owners of the camp buildings. People bought the materials and removed them, ie. windows and good building materials.

On the South Canol, there was a camp north of Quiet Lake, just north of Deer Creek. There was a camp that was cleaned up at Rose lake (MP95). In the 1950s, the buildings were crushed by snow. On the Lapie River, 12 miles south of Ross River, there is an overgrown site for a pump station and camp (Pump Station No. 9 -MP126). There was a dump there with old cans in it that were rusted and decayed. If they did contain DDT he didn't think you could do much about it now. Two miles further to the north towards Ross River, on a high spot in the road there might be garbage found in a gully.

On the North Canol, there was a camp between Flat Creek and Beaver Creek and there was a big camp just past Gravel Creek (MP176). This area was cleaned up and he believes there is nothing left. There was an army camp at the top of the hill by Sheldon Lake, where one might find some metal debris at the edge of the camp. Most of the camps have grown over. He thought there was a camp at Mile 280, just north of Moose Creek(?) and another camp 8 miles into the NWT. There is a U.S. Army camp on the north side of Macmillan River Bridge (Mac #1 bridge) and old buildings. On the south side of Mac # 2 bridge there was a camp and there were burnt, rusty old trucks, and newer trucks which have been scavenged and should be cleaned up. Between 1945-1955 the road was okay and you could drive it. Gradually the bridges fell into disrepair and it was closed until 1969. Contractors were hired (See Hector Lang interview - Tagish District Review) in 1969 to rebuild the bridges.

Dick Craft
There was a small army camp 25-30 miles north of the Rose River bridge where they buried alot there. This is north of Quiet Lake, up the hill, and on the east side by the airport. At this site there was an old garage (100' long x 75' wide) with trucks. They cleaned up this site and buried the metal.

There was an old village at the mouth of the Ross River. On the other side of Sheldon Lake there is an old dump site that was American Air Force. There was no ferry after the war. "In 1947, Jimmy Smarch and I took apart a whole truck, carried it across the Pelly River on the foot bridge at Ross River, and put it back together again so we could drive up the North Canol." We got good oil from the North Canol and found about 300 barrels of 10 wt oil. We used the oil out of the transformers (PCBs) and would fill up 5 gallon cans to fix the 'Cat.' "I even swallowed some and I don't think its ever hurt me!"

They took the pipe out of the Canol No. 1 in 1959. Just after the war, in 1947/48, they drained the Whitehorse-Watson pipeline and pulled it out. There were alot of spills on this pipeline and we used to siphon the gas out of it. He worked on the Haines-Fairbanks pipeline and remembers the spill by Dezadeash Lake, when some 160,000 gallons of fuel went into the lake.

Jack Woods
There was a big army camp near Sheldon Lake on the west side of the road, by the last big turn in the road before Sheldon Lake. (MP212 - Elliot Maintenance Camp) He was pretty sure there was an army camp with a dump in between Flat and Beaver Creek (MP174) and another dump between MP179 and MP180. There was a camp at Macmillan No.1.

Jerry Wolchuk - Resource Management Officer - Carmacks/Ross River
The RMO office in Ross River has been closed since 1994 and the district is being managed by the Carmacks District Resource Management Officer (RMO). No RMO waste sites were identified related to military activities. The sites for waste management cleanup were associated with mining activities and not with the Canol Road or Canol pipeline.

CLEAN UP ACTIVITES
Comments are summarized for the sites inventoried by the Canadian Armed Forces in 1970 (7), by Snergy in 1975 (55), and sites which were cleaned up by DIAND in 1975-76, for the Ross River District. (For further detail see Section 4.5) During clean up; buildings, wood debris and garbage dumps were burned, then buried; full or partially full drums were buried; empty drums were brought to Ross River for crushing; and vehicles were brought to MP272 or Johnson's Crossing. (14) (YA-Govt.1168) .

The 1970 report (7) revealed what remained at each site and identified oil stain areas and number of drums, filled or empty. Comments are summarized for the Ross River District:

Canadian Armed Forces : 1970
South Canol Road: 1970
MP99.5 - Remains of wooden buildings
MP 124.5 - Pumping Station, remnants of buildings, barrels, truck hulks
MP125-142 - Wrecked vehicles, empty oil drums
North Canol Road: 1970
142-172 - Wrecked vehicles, empty oil drums
MP174 - Debris scattered both sides of road, collapsed buildings, quonset hut, empty drums, truck hulks, graders, evidence of heavy oil and grease saturated areas, also filled or partially filled oil drums.
MP175-216 - Empty drums, truck hulks
MP216 - This area is an real eyesore in addition to having a pollution problem, on both sides of the road:
East of the Canol Road: A 75' x 75' area was found to be black with oil and exhibited a strong oil smell. One area 25' x 25' was saturated with grease and 3 areas (roughly 25' x 25') were found saturated with oil, to a depth of about 2 inches; Another area of 600' x 150' is covered with debris, empty drums, truck hulks, grease ramp, and remnants of buildings.
West of the Canol Road: An area 400' x 150' was covered with six collapsed buildings oil drums and miscellaneous debris. 500 empty drums and 50 partially filled oil drums, 15 truck hulks were found in this area.
MP217-236 - 15 of the 20 drums were found at MP 233.5. Several thousand feet of 4-inch pipe were lying along the edge of the road
MP236 - 950 oil drums, 100 partially filled, truck tires (100),
bags of concrete (100), 18 trucks, buildings (15). These were scattered over two areas, 1000' x 200' and 700' x 100'. Two areas were found contaminated with oil and grease (25' x 25' and 50' x 50'). This area is a real eyesore and has the greatest potential pollution problem.
MP237 - Large building used as a supply depot
MP237.5 - Buildings and debris are scattered through the bush, about 300 yards east of the Canol Road.
MP237 -251 - 35 oil drums, lengths of pipe
MP251 - 450 empty oil drums, 3 partially filled, 7 truck hulks
Area 50' x 50' is saturated with oil down to a depth of 2 inches.
MP252-262 - Empty drums (165), truck hulks (9)
MP263 - Scattered debris, an area 25' x 25' partially saturated with oil.
MP264-271 - 23 empty drums

North Canol Road - 1970 (Cont.)

MP 271-272 - 1400 empty oil drums, 38 truck hulks, 12 collasped buildings, 6 standing buildings, 2 graders. Debris was scattered over two areas;approximate dimensions 700' x100'. One cache contained 1000 oil drums.
MP272 - Truck hulks lined up.
MP274-279 - 16 empty drums, 1000 ft of pipe.
MP280 - 1000 empty drums (800 in one cache)
MP283 - Yukon/NWT border

Sites at MP216, MP236, MP251, contained partially filled barrels of oil; these could be buried at or nearby the site. In the assessment of the Canol Pipeline in the Northwest Territories; black oils and greases were found to contain the elements cadmium, lead and chlorine in amounts exceeding those recommended for environmentally safe incineration. It was recommended that these be removed for proper disposal. (20)

Suggested Disposal Points - 1970 (7)
South Canol: MP 0 - Johnson's Crossing , MP 60 - Quiet Lake
North Canol: MP 142 - Ross River, MP 212 - Sheldon Lake

Synergy Report - 1975 (55)
Maps provided in the Synergy inventory report were the only sketches available for sites on the North Canol Road. These are presented for the following sites:
South Canol Road: MP99.5 Figure 45, MP124.5 Figure 46
North Canol Road: MP142 Figure 48; MP213.5 Figure 49; MP233 Figure 50
Sites which had primarily wood and metal debris were not included as Figures. Comments from this inventory regarding sites which had filled barrels and oil stains, at MP213.5 and MP233, are also presented.

It should be noted that mileposts for the Synergy Report varied from those in the 1970 report, and DIAND reports.

Army Report (1970)	Snergy (1975)
MP216	MP213.5
MP236	MP233
MP237	MP234
MP237.5	MP234.5
MP251	MP247
MP271-272	MP268-269
MP280	MP276
MP286-288	MP282-284
MP297	MP293

Suggested Disposal Points - 1975 (55)
Synergy indicated potential burial sites at the following locations:
South Canol: MP99.5, MP124.5, MP142
North Canol: MP142, Ross River, MP174, MP213.5 Sheldon Lake
MP233, MP247, MP253,MP258, MP260, MP268, MP282
(MP283 - YT/NWT Border)

DIAND Inventory - 1975
Information for the 1975-76 Canol clean up by DIAND, consisted of files by L.Gay, Canol Clean Up Project Manager, DIAND (14). The inventory by Synergy was corrected during site inspections. Only one sketch was found on file for the Ross River District. This showed the dump site cleaned up at MP125.2 on the South Canol, dump for Pump Station No. 9 - Lapie River, shown in Figure 47. Sites identified by Synergy for burial sites were not actually used during clean up. No sketches of actual burial sites were located for the North Canol. (Portions of these reports and photographs are provided to AES in File#15.) Comments on materials at sites and clean up procedures included:

South Canol:
MP74-142: Salvageable metal items shall be taken to Ross River.
Contract to Yukon Pioneer Transport Ltd.
MP99.5 - Collapsed buildings
MP124 - 120 barrels, 3 concrete foundations, 14 vehicle hulks, 20 collapsed buildings, 1 standing building, 2 wooden ramps, metal debris, 4 iron stoves.
MP125.2 - Refuse area used by camp at MP124, metal, wood, refuse, debris over bank, cleaned up, 1975.

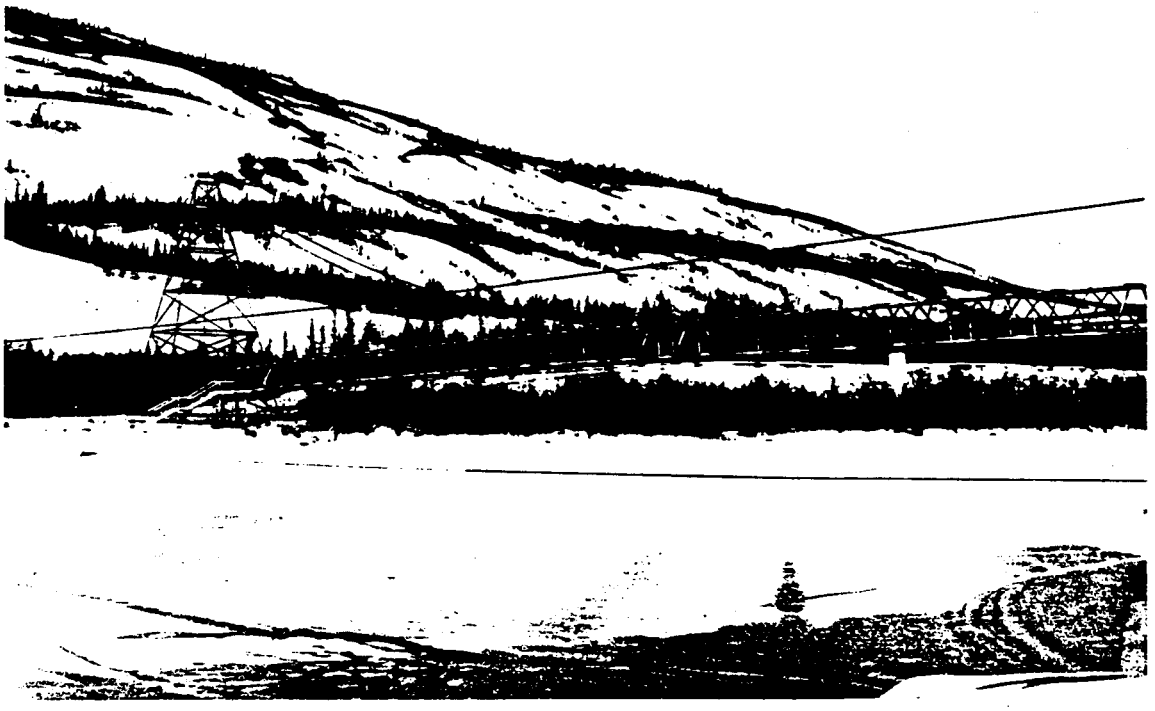
North Canol:
MP143-283: Salvageable metal items shall be taken to Ross River
Contract to Deines Brothers Arctic Services Ltd.
MP143 - Old Ross Town Site, 3 vehicle hulks, wooden buildings, wooden debris
MP213 - Camp, Garbage dump, cleaned up, buried
MP218 - Garbage dump, barrels taken out and crushed, no further action
MP220 - Old Sawmill Site - barrels taken out, no further action
MP232 - Garbage dump for camp at MP233-234, site burned & buried
MP232,233,247,253,267,268,275 -Camps cleaned up and passed-September 30,1975

Clean up work commenced at MP283 and finished at MP143. Start up date was August 1975, to be finished prior to the closure of the ferry and freeze up of the Pelly River at Ross River. The contractor wanted disposal pits at MP174, 213, 233, 253, 268, 275. Two gravel pit sites at MP268 and MP275 were selected for disposal pits. Vehicle hulks would be located at MP268. (old MP272). Pictures were taken of the

Ross River barrel crushing site (7/76). (Provided to AES in File#15.)

There were buildings which were left on a number of sites for historical reasons, listed in Section 4.5. One of the installations by the Army that was saved was the footbridge at Ross River, shown in Photo #34, February 1995. Maintenance has continued over the years.

37. Footbridge over the Pelly River at Ross River - MP142



1983 Waste Disposal Sites

North Canol Road:

MP231.7 km 373 Cambell Hwy - Lat 61 58' Long 132 25'
U.S. Army + public - reused many times covered old dump (80m x 120m) and trench (6m x 35m) (Ross River)

MP236 km 380 Cambell Hwy - Lat 61 59' Long 132 25'30"
Ross River - U.S. Army - buried debris/exposed metal, some of area covered with soil (Ross River)

Heritage Concerns

No documents were located on historical concerns for specific sites of the Canol No. 1 Project.

FIGURE 45: South Canol Road Clean Up - MP99.5 - 1975

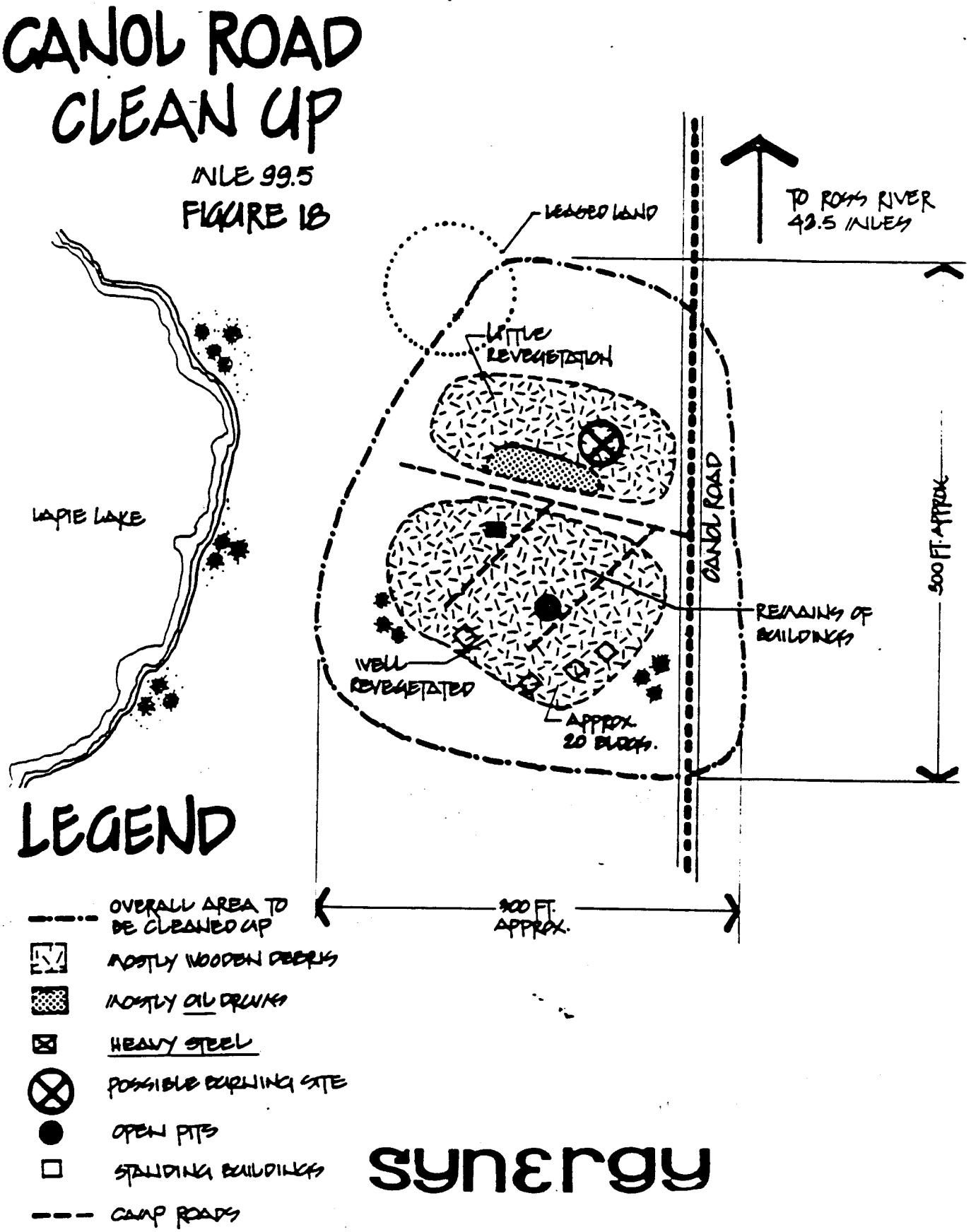


FIGURE 46: South Canol Road Clean Up - MP124.5 - 1975

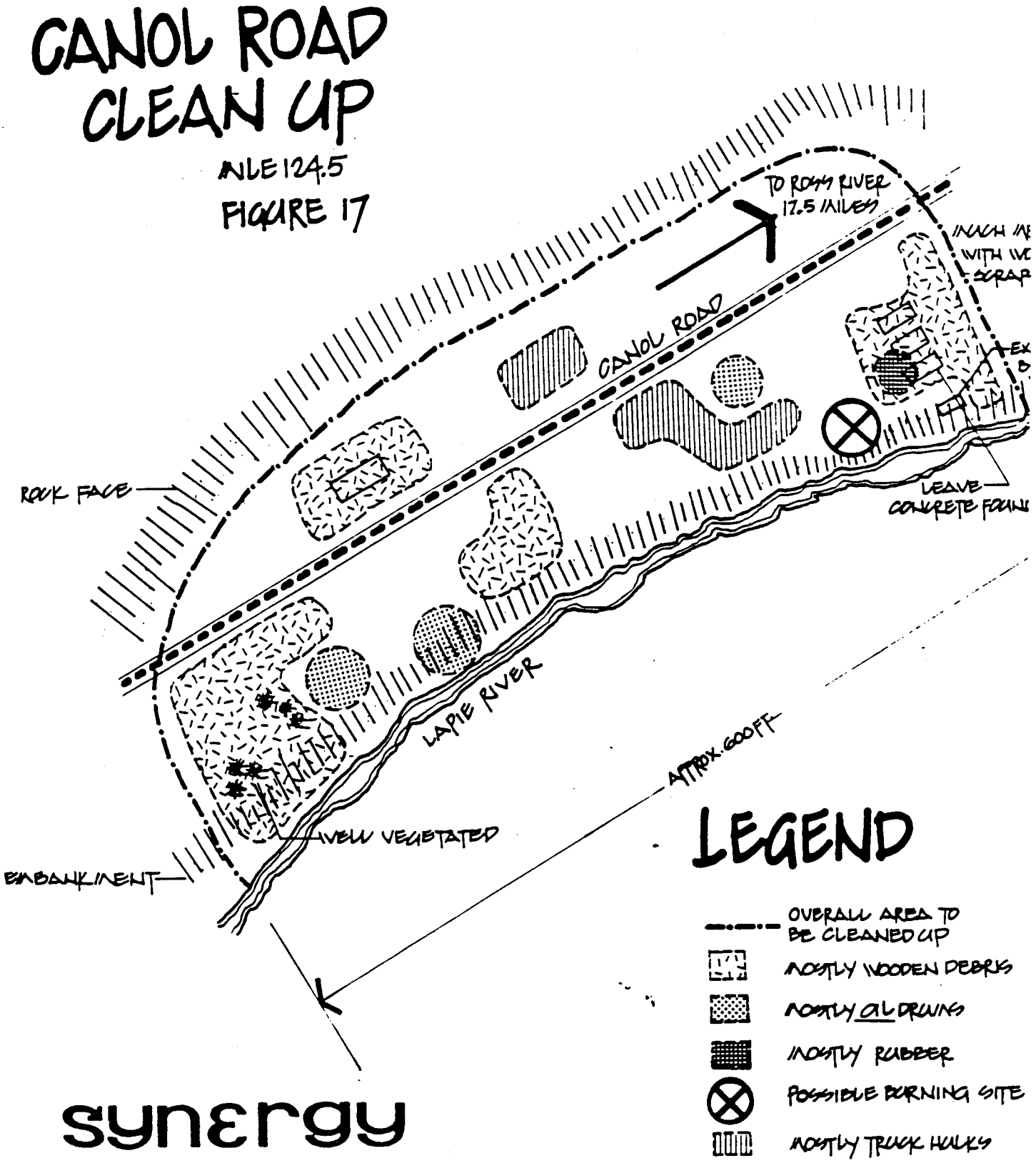


FIGURE 47: South Canol Road Clean Up - MP125.2 - 1975

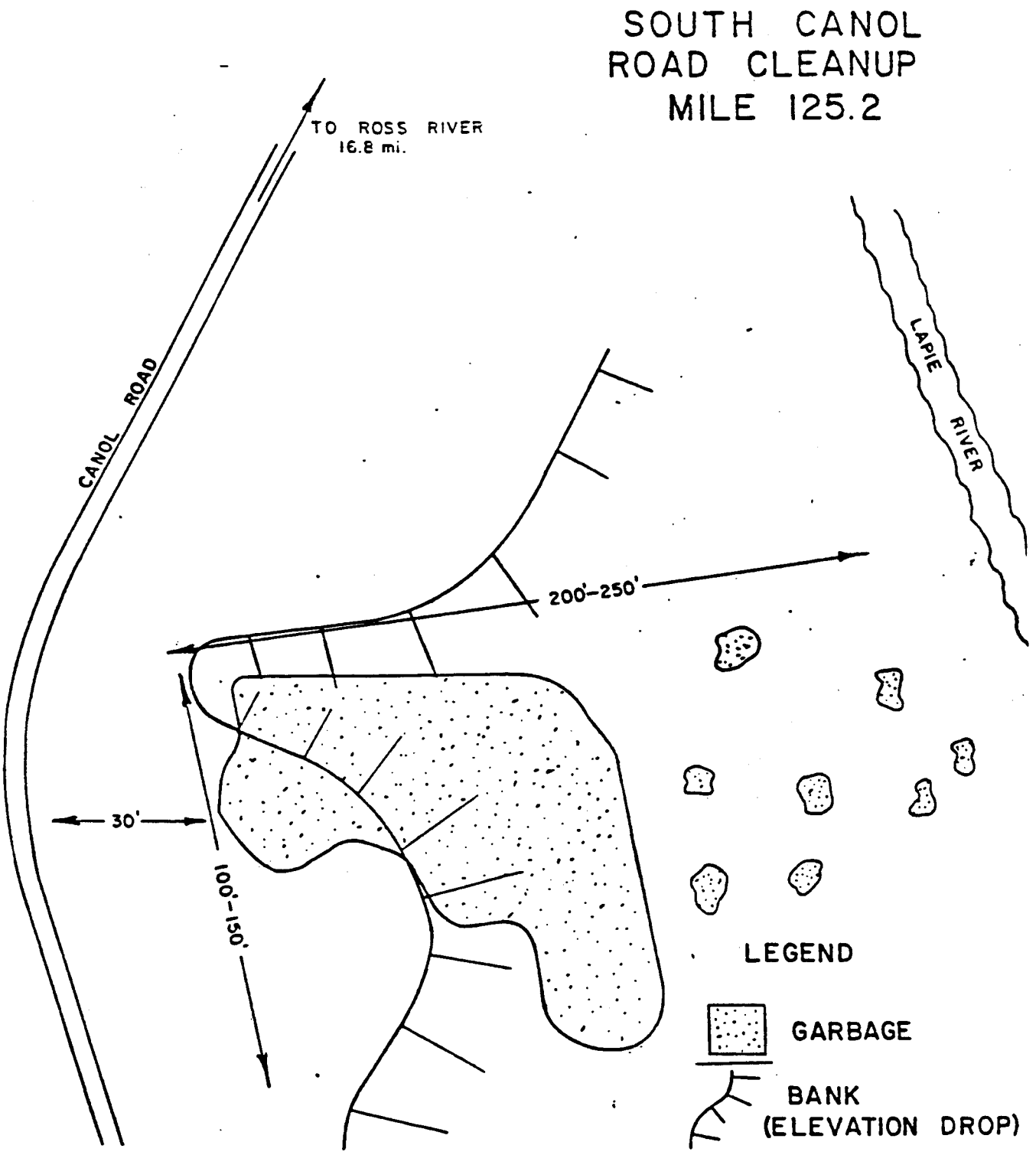
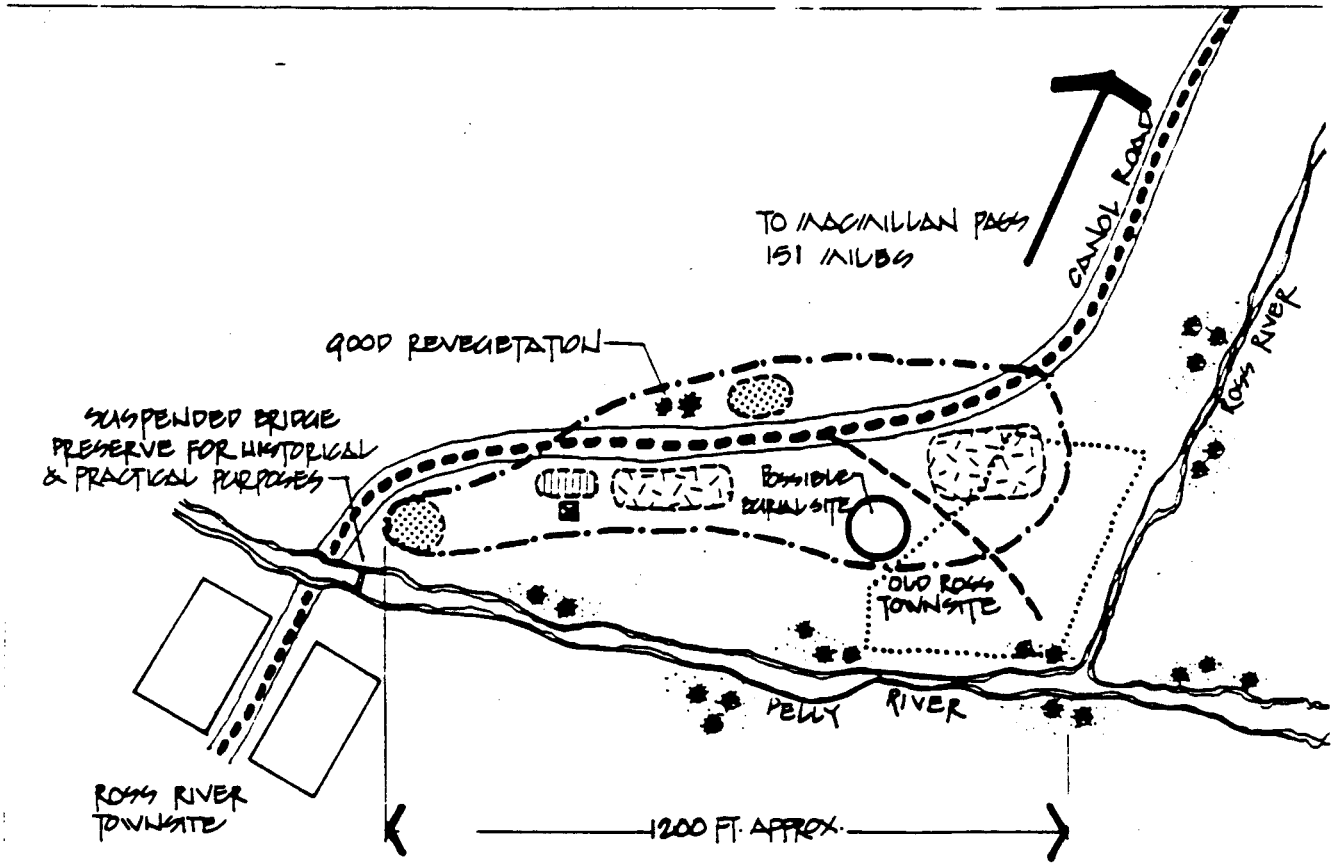


FIGURE 48: North Canol Road Clean Up - MP142-143 - 1975



CANOL ROAD CLEAN UP

ROSS RIVER MILE 142

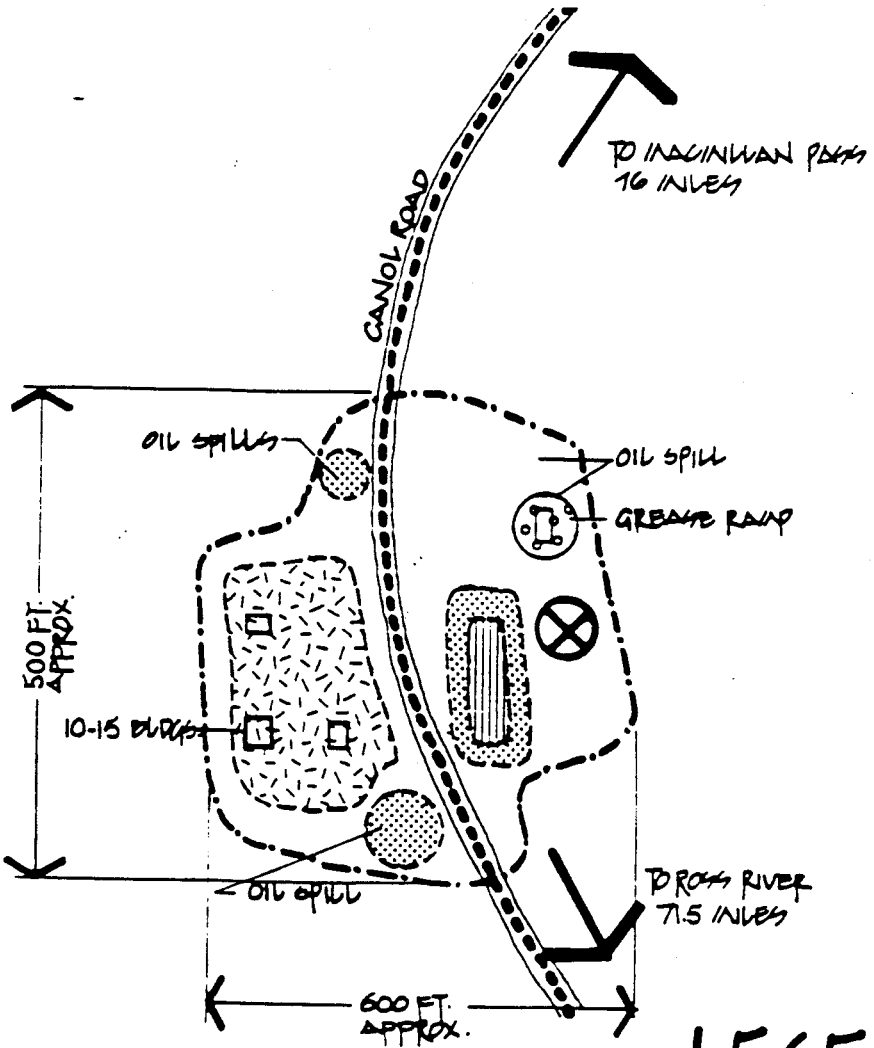
FIGURE 16

synergy

LEGEND

- OVERALL AREA TO BE CLEANED UP
- MOSTLY WOODEN DEBRIS
- TRUCK HULKS
- HEAVY STEEL
- MOSTLY STEEL SCRAPS
- POSSIBLE BURIAL SITE

FIGURE 49: North Canol Road Clean Up - MP213.5 - 1975



CANOL ROAD CLEAN UP

MILE 213.5

FIGURE 13

synergy

LEGEND

- OVERALL AREA TO BE CLEANED UP
- MOSTLY WOODEN DEBRIS
- TRUCK HULKS
- MOSTLY OIL DRUMS
- OIL SPILLS
- STANDING BUILDINGS

SYNERGY INVENTORY - MP213.5 & MP233 - 1975 (55)

MILE 213.5 (Figures 13 and 14)

CONDITIONS:

500 empty barrels	s	1 grease ramp
50 filled barrels	s	wooden debris
15 truck hulks	s	oil saturated soil
6 collapsed buildings		

RECOMMENDATIONS:

1. Crush barrels and truck hulks and bury debris on site.
2. Burn wooden debris and grease ramp.
3. Scarify oil soaked soil.
4. Assist revegetation.

COMMENTS:

A badly polluted site, however not complicated for clean up. There is little vegetation to disturb.

MILE 233 (Figures 10 and 11)

CONDITIONS:

950 empty barrels	s	3 scraper blades	s
100 filled grease barrels	s	1 oil storage platform	
100 tires		9 collapsed bldgs.	
100 solidified bags of concrete		6 standing bldgs.	
		2 graders	s
18 truck hulks	s		
1 dozer body	s		

- numerous oil saturated areas
- good revegetation which should only be minimally disturbed.

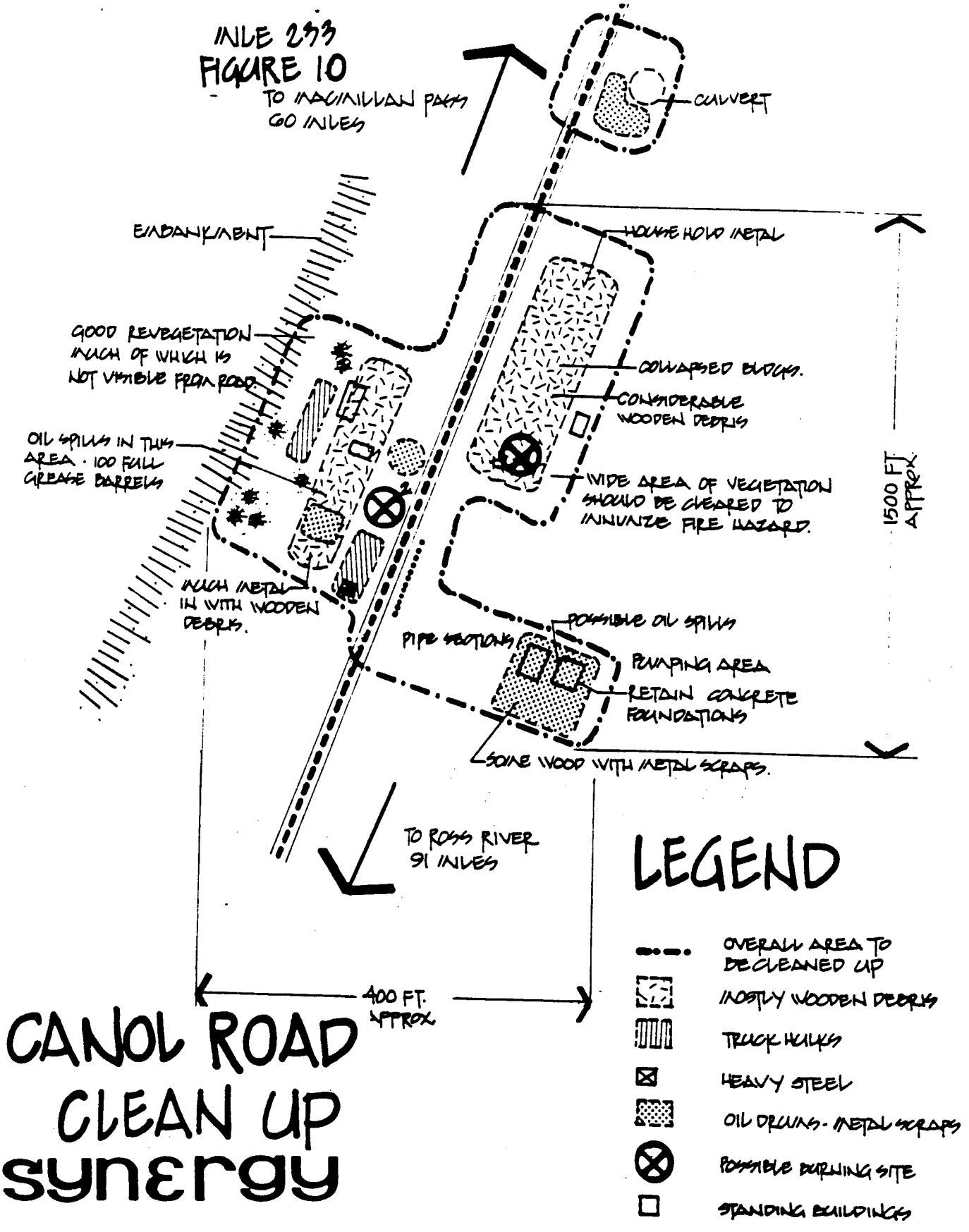
RECOMMENDATIONS:

1. See Figure 10 for suggested sites for burning. Burning site No. 1 should be well cleared with a radius of 75 feet to minimize fire hazard. Burning site No. 2 is relatively safe.
2. Use existing pathways and clearings for movement of vehicles.
3. Scarify oil spills.
4. Donate full grease barrels to the Highways Department, Yukon Territorial Government. Burn remaining grease.
5. Overburden (unconsolidated material above bed rock) appeared thin. Therefore a burial site may have to be located elsewhere in vicinity.
6. Barrels and truck hulks should be crushed.
7. Destroy all standing buildings.

COMMENT:

Clean-up must be well supervised to prevent unnecessary disturbance to vegetation.

FIGURE 50: North Canol Road Clean Up - MP233 - 1975



CANOL ROAD
CLEAN UP
synergy

Table 2.2: Summary of CANOL No.1 Pipeline operation (barrels)

Date	Total Pumped From Canol	Total Received At Whitehorse	Total Accounted For At Pump Stations	Pipeline Inventory	Total Unaccounted For	% Of Total Pumped
1943						
December 19	4,652	0	ND		ND	
1944						
January	10,458	0	ND		ND	
February	6,827	0	ND		ND	
March	35,554	0	ND		ND	
April	98,053	45,489	ND		ND	
May	81,890	76,399	ND		ND	
Sub-total	237,434	121,988	4,000(est.)	66,964	44,482	18.7%
June	89,725	81,723	758		6,718	7.5%
July	69,322	57,535	1,020		8,552	12.3%
August	89,801	78,963	1,015		11,300	12.6%
September	69,590	61,468	936		9,103	13.1%
October	117,589	109,406	1,084		5,805	3.3%
November	109,824	97,027	1,777		9,224	8.4%
December	106,834	93,324	2,326		5,584	5.2%
1945				Stor. 8,979		
January	120,967	118,448	2,248	Pipe 62,430	3,863	3.2%
February	106,571	102,287	2,691	Totl 71,409	4,226	4.0%
March	43,737	49,685	2,553	60,275	ND	
Total	1,161,394	971,685 (83.7%)	20,408 (1.8%)	60,275 (5.2%)	108,857 (9.4%)	

Total Potentially Spilled 108,857 + 60,275 = 169,132 (14.6%)

'ND' no data available

(after Hemstock 1945)

6.0 SUMMARY AND CONCLUSIONS

6.1 PROJECT SUMMARY

This project was initiated in January 1995, and completed in April 1995 for the Arctic Environmental Strategy, Action on Waste Program (DIAND) Whitehorse, Yukon. The objective was to identify potential sites of contaminants associated with military activities in the Yukon, including the Northwest Staging Route, Alaska Highway, Canol Pipelines, Alaska Highway, and Haines-Fairbanks pipeline.

Interviews:
Interviews were conducted within the communities during February and March. In the western portion of the study area, from Champagne to Beaver Creek and in the eastern portion, from Squanga Lake to Watson Lake, people were contacted and interviewed. Interviews were also completed in Ross River, Carcross and Whitehorse. A total of 102 interviews were conducted in the communities and 19 government or private agencies were contacted. As each interviewee gave us more names of people to contact, this part of the work could have continued had there been additional time. Several of these people could not be interviewed for various reasons.

There was a strong interest in cleaning up these sites and to find out answers for why people are getting sick, fish have abnormal growths, and why wildlife is diminishing at such a rate. Many of the interviewees volunteered to go out and locate the dump sites. Testing for contaminants was considered to be a necessary first step in the process of managing their environment.

Some of the information obtained from personal interviews includes "old stories" which tell of hidden caches of intact equipment, aircraft, and storehouses of food, buried on land or submerged in the lakes. These stories are part of the legacy of the development of the north and which, its seems, will most likely never die.

Information Sources:
Information was reviewed from Whitehorse Library, Yukon Archives, Y.T. G. Highways (Public Roads Administration-Archives), Environmental Protection Service (EPS) and Action on Waste Program (AES). Historical volumes from the Northern Collection at the Whitehorse Library, newspaper articles and government files at Yukon Archives were reviewed in detail. There was fairly good coverage of information from the early 1940s, until 1946, when the Alaska Highway and associated projects were taken over by the Canadian Army. Alaska Highway maintenance reports provided information on camps and general conditions until 1964. No records were acquired on the salvage contracts, along the Canol Roads, Alaska Highway and Haines Road, until the clean

up records from DIAND in the early 1970s.

Locations of military sites were determined by the PRA maps completed in 1943, Alaska Highway maintenance and construction reports 1943-1964, government clean up files from 1973-1976, and inventory/assessment reports done in 1975-1976 and 1983. These have been illustrated throughout the text where appropriate. The period from 1943, when most of the American troops left, until 1944, was when most of the dumping of excess supplies was documented. In many cases, the location of burial sites used by the military was general, ie. "they dumped on the gravel bars in the Donjek and White Rivers." Mileages varied and in some instances topographical features were erroneously located, so it was necessary to interpolate the information. Also, in many instances, the proposed location of burial sites, ie.by Synergy and Edey may not have been utilized in clean up procedures .

Questions to the Department of National Defense in Ottawa as well as the U.S. Air Force, revealed that all requests for information had to be done by letter and that it could take more than 2 months for a response. It is necessary to conduct research at National Archives to look into Department of National Defense files, RCAF and Canadian Army records, and to contact U.S. Army and U.S. Air force officials to acquire additional information, from the late 1940s through to the late 1960s.

Report:
A list of potential contaminants associated with military activities in the Yukon has been compiled, to answer some of the questions interviewees have asked: "What types of contaminants would the military have used ? What was done with these materials that could cause contamination in our environment?". Categories of potential contaminants included organochlorines, oil spills/wastes, herbicides and "Other".

A chronological review of military activities has been provided, starting with the proposed plans for the construction of the Alaska Highway, in 1939, to the closure of the Haines-Fairbanks pipeline, in 1971; and associated clean up activities up to 1995. Pump stations, construction camps, relay stations, radio range stations, maintenance camps, sawmills, airports, and oil spills have been noted as well as other relevant aspects of management of these projects by the U.S. and Canadian Army, U.S. and Canadian Air Force and other responsible government agencies of the time. The camp sites and associated dump sites etc. have been illustrated on 14 maps (1:250,000 scale - NTS maps) accompanying this report. The source of information for the dump sites is noted as archival and/or anecdotal, from interviews. Most dump sites identified on the Report Maps have been mentioned by more than one person and were also verified by archival sources.

Information from interviews and archival sources was presented according to the seven Resource Management Districts within the study area. This was to facilitate use by resource managers in the separate districts and communities.

Summary:

We did not specifically discover unknown sites of DDT, PCBs or equipment. In other words, we did not find a cache of DDT like the find at Rainy Hollow, B.C. in 1994. However, the list of camps is comprehensive and complete. This report identified additional sites, previously not mentioned in clean up inventories. The number of military camps and dump sites from previous maps and reports included: PRA maps along the Alaska Highway in 1943, 70 sites; Edey in 1976, 83 sites; and Environmental Protection Service in 1983, 87 sites. Added was the PRA map for the Canol Road in 1943, identifying along the Canol No.1 route in the Yukon - 4 Pump Stations, 13 maintenance camps and 32 emergency shelters. The number of sites identified in this report as military in origin has not been tallied to include archival sources and interviews, but it is well over 100 for the entire study area.

Details on "what was dumped" at these sites was not usually stated, both during the War and after, and during the clean ups in the 1970s. Most dump sites consisted primarily of household garbage and metal debris but may contain contaminants. Where bridge construction on the Alaska Highway was taking place the camps were in place longer and occupied by several contractors; ie. at the Liard, Nisutlin Bay, Teslin, Slims, Donjek, and White Rivers. Each contractor could have buried unknown materials and contaminants. As these dumps are located adjacent to water sources, interviewees indicated that these areas are a high priority for clean up.

Public Concerns

This project has helped to revive peoples' concerns for problems in their own environment and plan clean up activities. Several of the First Nations involved in this project have put forth proposals for community clean up projects under the Yukon Environmental Action Program, Arctic Environmental Strategy. This includes Teslin Tlingit Council, Kluane First Nation, Carcross/Tagish First Nation and Ross River Dena Council.

It was found that there are fears in the local population within each community regarding what was left behind from military activities, especially in regards to herbicide use and military bombing practices. These fears have been translated into a certain amount of reluctance to eat "country foods" i.e wild game, fish and berries in these areas. In the 1995 AES contaminant workshop, research scientists (Drs. Brian and Margaret Wheatley) put forth the idea that some diseases among natives could stem from a fear of eating local food. "A substitution of processed food, high in carbohydrates, can lead to inadequate diets and thereby cause more problems, than if

"country foods" are eaten. In other words a perception of risk can over ride actual risk and have more of a detrimental effect on peoples' health."

A summary of some of the fears that were voiced during this project include:
People don't eat the berries or shoot game in the Haines-Fairbanks Pipeline right of way anymore due to pesticides.
Elders in my community are getting cancer, could this be from the "country foods" or the water?
What is in the practice bombs and ammunition that the military used?
What about water quality? Can I safely drink the water?
Why do the fish in Nisutlin Bay and Watson Lake have weird growths on them?

6.2 RECOMMENDATIONS

A number of recommendations have evolved out of this project which could be accomplished in the near future, without a great expenditure of money, yet would improve public perceptions of contaminants in the Yukon environment and government clean up programs.

1. Additional interviews should be done with our Elder citizens not available or contacted in this project, to acquire their knowledge before it is lost.

2. It is suggested that water and soil testing, as well as fish and other "country foods" sampling should be done for contaminants as soon as possible.

3. Sites which are in environmentally sensitive areas, such as close to water sources or important wildlife habitats, should be assessed immediately.

4. Additional research should be completed on military files at Archives in Ottawa, in Washington, D.C., as well as, in Alaska.

5. Formal requests for government documents and files from the U.S. Army, U.S. Air Force, and Canadian Department of National Defense should be made to government officials to acquire more specific information on military activities in the Yukon, as it becomes de-classified.

6. Information on contaminants and their acceptable levels, should be made available to all communities, in a format which is easy to relate to, and which will help to alleviate fears.

Specific Areas of Concern:
With the end of the AES program in sight in March 1997, it is hoped that the information compiled from this project can be immediately put to use to determine further assessments and research priorities. Sites of camps and dump sites, listed in this report, should be inspected on site to determine if there are any oil stains, or areas that require assessment for contaminants. Interviewees who indicated they would gladly go out and locate sites should be contacted.

Summary of Sites:
Specific sites which should be tested, monitored and/or cleaned up are noted for each District; and the No.1 priority, indicated by interviews, has been summarized:

Watson Lake:
Watson Lake - Canol No.3 Tanks, Watson Lake Airport, Watson Lake,
Robert Campbell Highway dumps, Target Lake practice bombing area, Canol No. 3 Pump stations, Little Rancheria, Rancheria
1. Complete clean up in Watson Lake; monitor water and fish quality

Teslin:
Swift River, Teslin-Nisutlin Bay-Nisutlin River, Teslin Airport, Brooks Brook Camp, Johnson's Crossing, South Canol Road to MP90, Canol No. 1 & 3 Pump Stations
1. Test soil and water for contaminants in Teslin-Nisutlin Bay-Nisutlin River area and Brooks Brook; monitor water and fish quality.

Tagish:
Carcross - Waterfront (old Whitepass Tie Plant), Canol No. 2 Pumping Station/ Whitepass Pipeline, Carcross Dump
Whitehorse - Old Canol Refinery-Marwell Area along waterfront to Kishwoot Island, MacRae area, Range Road
1. Clean up waterfront at Carcross and Whitehorse, monitor water quality

Laberge:
Military Practice Bombing Area - Richtofen Island, Lake Laberge
Stoney Creek - Canol No. 4 pump station
1. Clean up the Yukon River from Whitehorse, and Lake Laberge, continue to monitor water and fish quality

Haines Junction:
Aishihik Airport, Haines-Fairbanks pump stations, Million Dollar Falls
Silver City to Slims River - MP1053-1060,
Slims River to Burwash Landing (MP1060-1083), along Shores of Kluane Lake
Duke River
1. Clean up and test old military camp and dump sites for contaminants, including Haines-Fairbanks pipeline pump stations.

Summary of Sites (Cont.)

Beaver Creek:
Haines-Fairbanks pump stations, Donjek River, Pickhandle Lake, Koidern River - Long's Creek (MP1154-1156), Koidern, White River, Dry Creek, Snag Airport, Beaver Creek - Scottie Creek

1. Clean up and assess old military sites for contaminants, especially along the rivers and Snag Airport, monitor the Scottie Creek watershed for water and fish quality.

Ross River:
South Canol and North Canol Roads: Pump stations, maintenance camps and areas with known pollution (MP213, MP233)

1. Clean up some of the remaining materials along the South and North Canol Roads, ie pipe, barrels, and telephone wire, and test areas for contaminants.

A U.S. Army construction worker, R.E. (Gene) Garrow wrote this poem in 1960, found in his souvenir edition of *Truck Tracks*, donated to Yukon Archives. (49) This poem aptly states what many of the people who were interviewed felt, towards cleaning up our environment:

We've ravaged the land,
With a selfish hand
Polluted air and waters once pure
But its not too late
This rape to abate
If our nation is ever to endure.
There's no other course
We must restore each resource
And protect it from day to day
Or abhor the thought
What our apathy bought
And the toil that mankind must pay.
Ere the cause be lost
Mans future the cost,
We must turn to mass education
To protect and preserve,
Respect and conserve
The resources of natures creation.
The child must be taught
The problems we've fought
To preserve his vital resources
And from boy to man
His part in the plan
Must lead all his other courses.

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