TABLE OF CONTENTS

LIST OF EXHIBITS

1. INTRODUCTION

1.1 Background

In late 1987, a joint resolution of the Kenora-Rainy River, and Thunder Bay and Area Northern Development Committees requested provincial government assistance in examining the feasibility of a boating waterway extending from Atikokan to Minaki. This 450 kilometer route, encompassing the Atikokan, Seine, Namakan, Rainy and Winnipeg Rivers, Rainy Lake, and Lake of the Woods, was considered to have potential for significant tourism development and promotion, in an area of Ontario accessible to thousands of boaters from Canada and the United States. The area, bordered in part by Quetico Provincial Park and the Boundary Waters, has traditionally been well-known for its canoe-tripping opportunities but not for motor boating. The large area of lakes and rivers outside of the designated no-motorboating zones was felt to be capable of generating a different form of recreational boating for tourists if properly planned, developed, and promoted.

The Ministry of Northern Development and Mines agreed to provide the funds necessary for a feasibility study, and in November 1987, the consultant team was retained. Exhibit 1.1 illustrates the area under study, and the major navigation obstacles, waterbodies, and communities present.

1.2 Purpose

The feasibility of an extended waterway route, in scenic but sometimes difficult terrain, requires evaluations of many key aspects. The consultant team was directed to study the market for such a route, taking into account current and projected boating use, regional tourism patterns, and forecasts of tourist spending. The need to create a fully navigable route also required engineering research into both the extent and frequency of non-navigable portions, and the cost of effecting changes. Other physical factors such as hydrology and facility options were also studied. Specific concepts for development including overall themes, community involvement, and onshore development were examined in order to visualize what a route could provide to visiting boaters. This aspect was to be studied only if the initial results of the market and technical components warranted further study.

The concluding requirements of the study involved the examination of potential factors for a successful implementation of the route. This aspect included jurisdictional roles, marketing and promotion, project coordination, and funding arrangements.

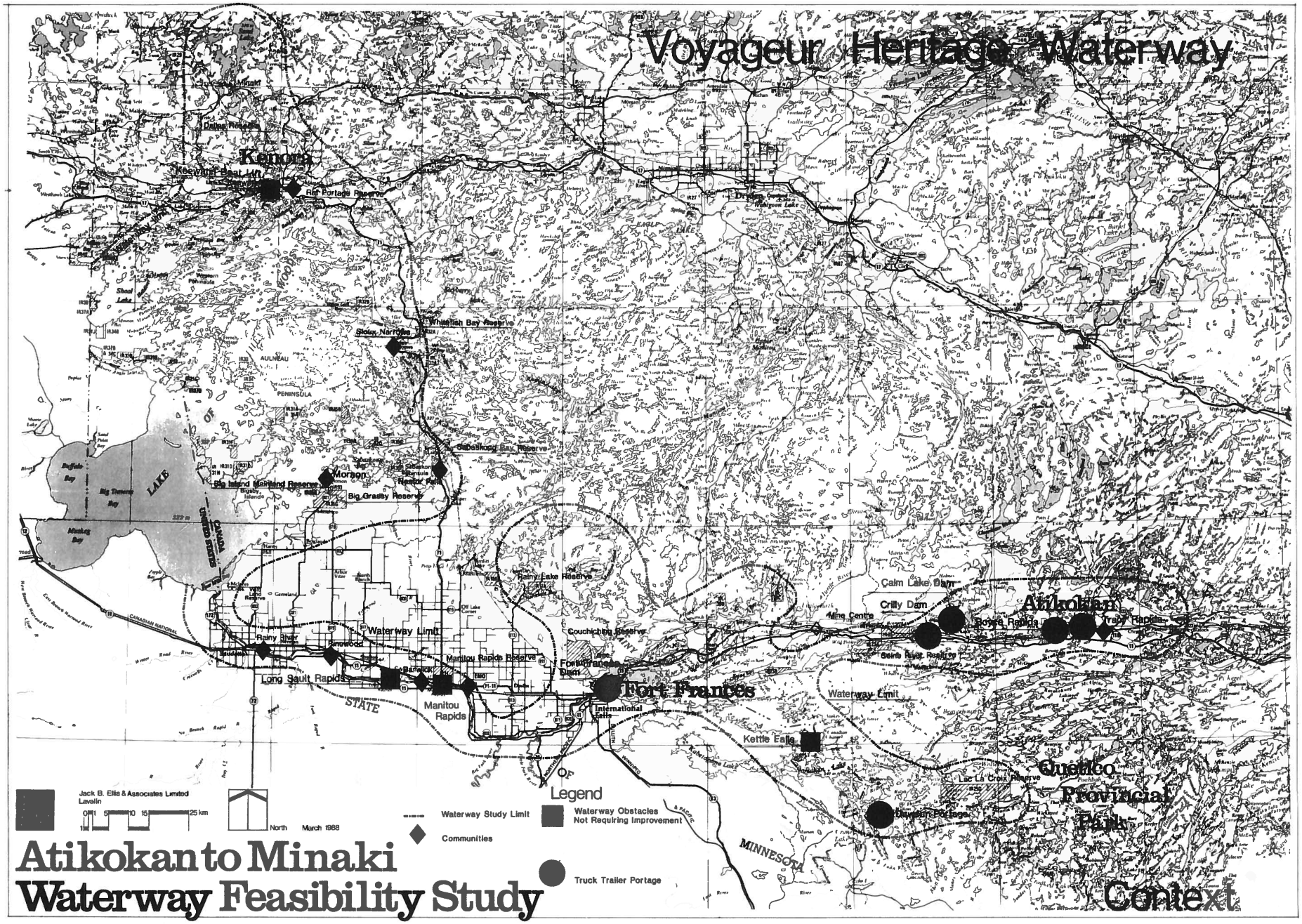
Voyageur Heritage Waterway
Kenora
Keewatin Boat Lift
Rat Portage Reserve
Whitefish Bay Reserve
Sioux Narrows
AULNEAU
PENINSULA
Big Island Mainland Reserve
Morson
Big Grassy Reserve
Rainy Lake Reserve
Couchiching Reserve
Waterway Limit
Rainy River
Birchwood
Manitou Rapids Reserve
Long Sault Rapids
Manitou Rapids
Fort Frances
International Falls
Calm Lake Dam
Crilly Dam
Ming Centre
Atikokan
Seine River Reserve
Kettle Falls
Lac La Croix Reserve
Quetico Provincial Park
Dawson Portage
Legend
Waterway Study Limit
Waterway Obstacles Not Requiring Improvement
Communities
Truck Trailer Portage
Jack B. Ellis & Associates Limited Lavalin
North
March 1988
Atikokan to Minaki
Waterway Feasibility Study
Context

Exhibit 1.1

1.3 Study Team

A multi-disciplinary team was established to undertake this study lead by Hough, Stansbury + Woodland. As prime consultant, this firm coordinated all elements of the research, developed concepts and onshore cost analysis, and conducted public participation efforts throughout the study. Market assessments and economic impacts were evaluated by Jack B. Ellis and Associates, with additional contributions toward implementation measures.

Engineering and other technical research were provided by the Lavalin Group. MacLaren Plansearch provided hydrological analysis, with Fenco Engineering assisting in the evaluation of navigation improvement options and costs.

1.4 Acknowledgements

The consultants wish to acknowledge the direction and assistance provided by the Steering Committee, the members of which are:

Larry Fontana	-	Atikokan, Chairman
Jack McTaggart	-	Rainy River, Vice-Chairman
Vic Prokopchuk	-	Atikokan
Annette Romanek	-	Kenora
Ida Olson	-	Emo
Bill Hatfield	-	Kenora

Advisors

David Feldbruegge	-	Thunder Bay, Ministry of Northern Development and Mines
Tom Nash	-	Atikokan, Ministry of Natural Resources
Lynn Arnold	-	Fort Frances, Ministry of Tourism and Recreation
Leo Heyens	-	Kenora, Ministry of Natural Resources
Paddy Reid	-	Kenora, Ministry of Culture and Communications
Dan Wright	-	Township of Atikokan

The following consultants were responsible for the work presented in this report:

Jim Stansbury	- Hough, Stansbury + Woodland Coordination
Ian Dance	- Hough, Stansbury + Woodland Project Management
Caroline Marshall	- Hough, Stansbury + Woodland Graphics, Cost Analysis
Jack Ellis	- Jack B. Ellis and Associates Market Research, Impacts
Lamoire Alexander	- Lavalin P.Eng., Hydrology
Charles Rate	- Lavalin P. Eng., Navigation Improvements
Paul Moorhouse	- Lavalin P. Eng., Navigation Improvements

2. STUDY PROCESS

2.1 Nature of Study

This study examines the feasibility of implementing a recreational waterway between Atikokan and Minaki in northwestern Ontario. While it proposes concepts of what such a route is likely to require in terms of physical development, it is not a design-oriented project. Rather, it addresses the question of whether such a route is sound from a technical, marketing, and economic point of view. Should the waterway proceed, more detailed design of both the navigation and onshore improvements will be required.

2.2 Phased Approach

The study was conducted in five distinct phases, as follows:

Phase 1 Project Startup included field orientations, agency contact, data collection, and community surveys.

Phase 2 Market Assessment examined boating and tourist activities, primary and secondary impacts, employment impacts, and business opportunities. The nature and extent of the market, and the economic opportunities by location and sector, were the key ingredients of this phase.

Phase 3 Engineering Assessment, undertaken simultaneously with Phase 2, included hydrological analyses, potentials and constraints, alternatives, and costs. The extent of navigational improvements required and the costs of making the entire route navigable were key aspects of this phase.

Phase 4 Concept Analysis was undertaken only after the basic market and technical feasibility results proved positive, and included public review, field checking, overall themes, and concepts for waterway development. The types and locations of development, and related costs were the important items addressed in this phase.

Phase 5 Development Plan consisted of operating and management options, phasing and costs, and opportunities for both the public and private sectors.

2.3 Public Participation

A 450 kilometer waterway relies heavily upon Crown land and waters, and also touches many communities along its length. These communities were asked to participate throughout the study in varying ways. In Phase 1, we distributed a questionnaire (Exhibit 2.1) to Indian Reserves, Improvement Districts, Townships, and Towns along the proposed route, requesting views about the waterway, as well as the local resources available to support recreational boating should a route be developed and promoted. In addition, we met with representatives of Atikokan, Fort Frances, Emo, Rainy River, Sioux Narrows, Kenora, and Keewatin to discuss the study. We also visited Indian Reserves at Seine River, Manitou Rapids, Long Sault, and Rat Portage.

In Phases 2 and 3, contact with government agencies, tourism organizations, and outlets was an important part of the market and technical analysis, and included both Canadian and American sources of information.

Phase 4 incorporated public open houses in Atikokan, Fort Frances, and Kenora at which the findings to date and potential waterway concepts were presented. A handout comment sheet (Exhibit 2.2) was issued to all in attendance.

Exhibit 2.1
ATIKOKAN TO MINAKI WATERWAY FEASIBILITY STUDY
Community Questionnaire

February 8, 1988

The Ministry of Northern Development and Mines is undertaking the **Atikokan to Minaki Waterway Feasibility Study** to examine the possibility for a new recreational boating route in Northwestern Ontario. If feasible from technical, marketing, and economic standpoints, this route would permit resident and touring boaters to travel between the communities of Atikokan, Fort Frances, Rainy River, and Kenora, with extensions to Minaki on the north, and Lac la Croix on the south. A number of Indian Reserves and smaller communities also lie along this route.

Such a route will require a number of existing navigation obstacles to be overcome, using mechanical portages or other means. These possibilities are being evaluated, along with potential recreational boating markets, costs and benefits.

Hough, Stansbury + Woodland Limited, consultants for the study, would like to have your input to this project, in terms of your opinions, and the tourism impacts that you feel such a route would have on your community. Kindly help us to understand your thoughts by filling out this questionnaire.

1. Do you support the general concept of such a route? Please check off the single box which most closely matches your opinion.

Strongly Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Strongly Disagree

2. Why? Please describe your reasons:

(continued other side)

Exhibit 2.2
MINAKI TO ATIKOKAN WATERWAY FEASIBILITY STUDY
Community Comments

June, 198

The Ministry of Northern Development and Mines is undertaking the Minak to Atikokan Waterway Feasibility Study to examine the possibility for new recreational boating route in Northwestern Ontario. If feasibl from technical, marketing, and economic standpoints, this route woul permit resident and touring boaters to travel between the communities o Atikokan, Fort Frances, Rainy River, and Kenora, with extensions t Minaki on the northwest, and Lac la Croix on the southeast. A number o Indian Reserves and smaller communities also lie along this route. Suc a route will require a number of existing navigation obstacles to b overcome, using mechanical portages, transfer ramps, and removal o pilings. These possibilities are being evaluated, along with potentia recreational boating markets, concepts, costs and benefits.

Hough, Stansbury + Woodland Limited, consultants for the study, ar holding advertised open houses in Atikokan, Fort Frances and Kenor during the week of June 13. If you have any comments to offer about th waterway or the study, please use this sheet. We would appreciate i being returned before you leave the open house, but if you need mor time, please return it to us within seven days.

Please return to: Hough, Stansbury + Woodland
63 Galaxy Boulevard - Unit 1
Rexdale, Ontario
M9W 5R7

by: June 21, 1988

Your Name and Address:

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These are my comments:

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3. ENGINEERING ASSESSMENT

3.1 Purpose

The purpose of the engineering assessment was:

- to identify constraints to navigation on the proposed recreational boat route from Atikokan to Minaki including the spur from Rainy Lake to Lac la Croix;

- to develop engineering concepts and preliminary cost estimates for either removing or by-passing these obstacles to navigation.

The work was based on field inspections and surveys, review of available aerial photographs, topographic maps, and reports related to the proposed project.

3.2 Field Reconnaissance

The project team conducted a three day field inspection of the proposed waterway route on November 11 to 13, 1987 to familiarize itself with the study area, and to obtain a first hand appreciation of the navigational problems that would confront boaters travelling along the proposed waterway.

The trip began in Atikokan under the guidance of members of the Project Steering Committee and personnel from the Ontario Ministry of Natural Resources District Office at Atikokan. The project team travelled in an 18 ft outboard motor boat along an 18 km section of the proposed waterway extending from Atikokan to Perch Lake along the Atikokan and Seine rivers.

Relatively minor navigational problems were experienced along the Atikokan River. The boat grounded twice at the remains of old check dams previously used to increase water levels in the river near the Town of Atikokan.

The major navigational obstacles along this section of the waterway were encountered further downstream at Tracy and Boyce rapids. At Tracy Rapids, it was necessary on two occasions for all the occupants of the boat to alight in order to negotiate the shallow draught craft past the rocks along the rapids. The opportunity was taken to view the remains of an old marine railway previously used as a portage around the upper end of the rapids.

Navigational problems were not as serious at Boyce Rapids. In spite of low water conditions, it was possible to float the fully laden boat down the rapids with the propeller

raised, with only minor difficulty - the boat hit a submerged rock part way down the rapids.

The boat trip ended at Perch Lake. The team then proceeded by road to Calm Lake Dam to assess the possible opportunities there for a boat transfer facility.

The following day, the project team conducted a helicopter survey of most of the proposed waterway. The flight started at Atikokan and followed the course of the Seine River westward to Crilly Dam, and then proceeded southward to the section of the proposed waterway extending from Rainy Lake to Lac la Croix. Two marine railway portages on the U.S. side of the border were observed along the Loon River. The control structures at Kettle Falls at the outlet of Namakan Lake were also examined.

The helicopter survey continued with a visit to the international dam at the outlet of Rainy Lake, and then proceeded eastward along the Rainy River to Lake of the Woods. The major impediments to navigation observed along the Rainy River were the Long Sault and Manitou rapids. Several partially submerged timber piles were also observed along the river. These were considered to be potentially hazardous to navigation during high water when they would be difficult to detect.

The remainder of the trip over Lake of the Woods and along the Winnipeg River to Minaki was with no obvious problems to navigation having been observed.

On the third day, the project team travelled by boat along the Winnipeg River from Kenora to Minaki to experience the trip from the perspective of the boater. No navigational problems were encountered during the trip.

The project team also visited the boat lift at Keewatin. The lift had been closed for the winter; however, it was a good example of a boat transfer facility that may be considered at other locations along the proposed waterway.

During this field trip it was not possible to conduct a detailed inspection of the dam at Fort Frances and the Manitou and Long Sault rapids. However, a civil engineer from the study team later visited these sites to better assess the possible options for overcoming the navigational difficulties identified at these locations.

No further field work was conducted at that time due to the onset of winter. However, in the spring of 1988, a survey crew was deployed to measure cross-sections and topographic elevations at navigational obstacles identified along the Atikokan and Seine rivers.

3.3 Background Data Review

Available background data related to the proposed project were collected and reviewed. These data consisted of maps and aerial photographs of the study area, and hydrologic and engineering reports related to the proposed project.

The following maps and aerial photographs were obtained:

- 1:100,000 scale Ontario Ministry of Natural Resources, Provincial Series Maps of the study area;
- 1:50,000 scale topographic maps of the study area;
- 1:20,000 scale topographic maps along the Seine River near Atikokan;
- Hydrographic charts of Rainy Lake and the Seine River up to Crilly Dam (Sturgeon Falls);
- Aerial photographs of Tracy and Boyce Rapids;
- Aerial photographs of the dam at Fort Frances.

Several reports were reviewed which were of particular relevance to the proposed project. A brief summary of each report follows.

"Fort Frances to Atikokan Motor Boat Route - a Preliminary Study", submitted by Dan Wright, Tourism Co-ordinator, Township of Atikokan. This study examined various options for overcoming navigational problems along the Seine River from Crilly Dam to Atikokan. Marine railway portages were tentatively recommended for Boyce and Tracy rapids. Truck and trailer portages were recommended at Calm Lake and Crilly Dams.

"Report on the Investigation of a Proposed Boat Passage Facility, Town of Fort Frances", M.R. Byrne and Associates Ltd. for the Ontario Ministry of Natural Resources, October 1974. This report presents preliminary engineering designs for a boat transfer facility at the international dam at Fort Frances. It was concluded that the most practical and economical facility would be a system of gantry crane, runway, and elevator located in the existing canal through the dam.

"Briefing Paper on International Rainy Lake Board of Control, International Lake of the Woods Control Board" submitted to the International Joint Commission Semi-annual Meeting, Winnipeg, Manitoba, November 1984. This report presents an overview of the administrative structure for the Lake of the Woods and Rainy Lake basins, a description of the topography, hydrology and climate of the basins, and the background to the current regulation policies. The report contains useful information on the operating rule curves for the major dams in the basin and historical flows and water levels. Some of the climatic and hydrologic information given in Section 3 was taken from this report.

"Report on the Study of Water Levels on the Seine River System, Calm, Banning, Chub, Little McCaulay, and Perch Lake" MNR Engineering Services, North Central Region, November 1986. This hydrologic and hydraulic analysis was conducted for the section of the Seine River system from Calm Lake Dam to Perch Lake. It, unfortunately, does not include the reach of the Seine River containing Tracy and Boyce rapids. It, nevertheless, contained useful information on extreme flows and water levels in the river.

The background data review also consisted of telephone and personal interviews with several persons with local experience and agencies whose jurisdiction include the proposed waterway.

Historical flow data were obtained from the following streamflow gauges in the study area.

- The Atikokan River at Atikokan (1979-1987) Water Survey of Canada Station No. 05PB018
- The Rainy River at Fort Frances (1905-1984) Water Survey of Canada Station No. 05PC019
- The Seine River at Raft Lake Dam (1955-1987)
- The Seine River at Calm Lake Dam (1949-1985)
- The Seine River at Sturgeon Falls (Crilly Dam) (1949-1985)

3.4 Hydrologic Analysis

3.4.1 Topography and Hydrology

The study area may be divided into two sub-basins, namely; the Rainy Lake watershed with its outlet at Fort Frances, and the Lake of the Woods watershed below Fort Frances. There are two outlets for the Lake of the Woods near Kenora. The western outlet, which carries well over half of the outflow from Lake of the Woods, is controlled by Norman Dam. The eastern outlet is controlled by the Kenora generating station. The Rainy Lake watershed provides nearly 70% of the total inflow to Lake of the Woods.

The watershed is generally forested and characterized by frequent outcrop of Precambrian igneous, metamorphic and sedimentary rocks, thin soil cover, numerous lakes, ponds, and connecting channels. The vertical fall from the headwaters of the watershed to Rainy Lake is approximately 135 m. The watershed between Rainy Lake and Lake of the Woods is flatter with a vertical fall of only 15 m.

The proposed waterway coincides with the principal drainage courses in the watershed. The eastern leg of the waterway is along the Seine River which flows in a southwesterly direction to Rainy Lake from its headwaters at Lac des Mille Lacs . The southern spur of the proposed waterway is along the international boundary. This principal drainage course

consists of a series of connected lakes including Namakan Lake and Lac la Croix. The flow is generally northwesterly and discharges to Rainy Lake at Kettle Falls. The western leg of the waterway is along the Rainy River which flows northwesterly from Rainy Lake to Lake of the Woods, and along the Winnipeg River which flows northerly from Kenora to Minaki. The Winnipeg River discharges to Lake Winnipeg and ultimately to Hudson Bay by way of the Nelson River.

The drainage area at Kettle Falls is 19,300 square kilometers with a mean annual flow of 160 m^3/s. At the international dam at Fort Frances, the drainage area is 38,600 square kilometers with a mean annual flow of 307 m^3/s. The drainage area at the Lake of the Woods outlets to the Winnipeg River at Kenora is 70,450 square kilometers with a total mean annual flow of 459 m^3/s.

3.4.2 Climate

The climate of the study area is characterized by long severe winters with snow typically on the ground from November through April. Mean annual precipitation is about 680 mm with thirty percent of this amount in the form of snowfall. Mean annual lake evaporation in the watershed is approximately 635 mm, while mean annual evapo-transpiration (total evaporation loss to the atmosphere from all sources) averages 490 mm over the basin, or about seventy two percent of the mean annual precipitation.

The winter months, December through March, are normally the driest, while June, July, and August are the months with the greatest amount of precipitation. Extreme temperatures range from about -45°C to 38°C with January being the coldest month and July the warmest. River and lake freeze-up occurs by December 1 on average. In the spring, river breakup normally occurs by April 15 with lake breakup following about two weeks later. The spring freshet usually occurs in April or May.

3.5 Low Flow Analysis

An analysis of the historical low flows along the proposed waterway route from Atikokan to Perch Lake was conducted as part of the assessment of the navigability of the Atikokan River and Tracy and Boyce rapids.

The Seine River System originates at Lac des Mille Lacs and flows to Marmion Lake where the outflow is controlled at Raft Lake Dam. It continues through Finlayson Lake and the Seine River Diversion to Boyce Rapids just upstream of Perch Lake. The Atikokan River is a tributary of the Seine River and discharges to Apungsisagen Lake upstream of Tracy Rapids. Its confluence with the Seine River is approximately midway between Tracy and Boyce rapids.

The Atikokan River is unregulated and its flow has been recorded since 1979 by the Water Survey of Canada at a gauge at Atikokan where the contributing drainage area is 332 square kilometers. The discharge from Marmion Lake has been recorded at the Raft Lake Dam by Ontario Hydro since 1955.

Most of the flow through Tracy Rapids, particularly during low flow, comes from the Atikokan River. In an attempt to characterize the low flow regime through the Atikokan River and Tracy Rapids, a probability analysis of minimum monthly flows during the boating season (May to September) was conducted. The probability distribution of the minimum monthly flows during the period of record showed that the minimum flows recorded during the 1987 boating season were the lowest on record. The analysis also indicated that there is only a 10% chance that flows in the Atikokan River and Tracy Rapids will be less than that of the experienced flows in 1987. The minimum monthly flow in 1987 occurred in May; however, flow conditions were still near the historical lows on the day that the study team visited the rapids.

The flow through Boyce Rapids consist of Atikokan River flow plus the outflow from Marmion Lake. However, low flow analysis of the Marmion Lake outflow was not conducted since it is highly regulated and a statistical data analysis is not appropriate. The flow data, however, indicated that outflow from Marmion Lake on the day of the field trip was below average. Therefore, it appears that the study team experienced almost the worst navigational conditions that have occurred along that reach of the Seine River.

3.5.1 Navigational Obstacles

Based on the field reconnaissance and the review of background data, the following constraints to navigation along the proposed waterway were identified:

Atikokan River at Atikokan
- The remains of two small check dams are presently a hazard to navigation on this reach of the river. The relatively narrow river width may also restrict the size and speed of vessels along the reach.

Tracy Rapids on the Seine River
- Located approximately 6 km downstream from Atikokan at the outlet of Apungsisagen Lake.

Boyce Rapids on the Seine River
- Located approximately 5.5 km downstream from Tracy Rapids where the Seine River flows into Perch Lake.

Calm Lake Dam on the Seine River
- A hydroelectric generating facility operated by Boise Cascade of Fort Frances. The dam impounds the outlet

from Calm Lake with a difference between the upstream and downstream water levels of approximately 25 m.

Crilly (Sturgeon Falls) Dam on the Seine River
- Another hydroelectric generating facility, operated by Boise Cascade, located downstream of Calm Lake Dam near the town of Crilly. The water level difference from upstream of the dam to downstream is approximately 19 m.

The International Dam Fort Frances
- Located at Fort Frances at the outlet of Rainy Lake. It maintains a difference in water level between upstream and downstream of 8.5 m. There are two hydroelectric generating stations at the dam; one on the Canadian side, and the other on the American side.

Manitou Rapids on the Rainy River
- Located approximately 52 km downstream from the dam at Fort Frances. The rapids form a minor impediment to navigation during periods of low flow.

Long Sault Rapids on the Rainy River
- Located 13 km downstream from Manitou rapids. They form an obstacle to navigation during periods of low flow.

Dawson Portage between Sand Point Lake and Lac la Croix
- This portage route which cuts out two rail portages on the Loon River forms part of the route from Rainy Lake to Lac la Croix. The existing route requires upgrading if tourist boat traffic is increased.

3.5.2 Alternative Technical Solutions

Based on the initial field inspection and the review of available data, preliminary solutions to the navigational difficulties were formulated. The following is a brief description of the various alternatives considered to either remove the obstacle or by-pass it.

Atikokan River at Atikokan

The work required here consists of three parts. First, the river below Front Street in Atikokan requires clearing of debris and rubble at the locations of old check dams. It is assumed that the material to be removed is accessible to a backhoe located on the river bank. As has been noted, the river is relatively narrow; hence, some restrictions on boat speed will be required. Widening of the river channel is not proposed. Second, the river above Front Street, stretching to the Museum site, will require deepening by one foot to achieve adequate depths for smaller boats with stern drives. While the present river can be navigated, this

excavation is required to achieve a safety margin. Third, these efforts should be coupled with the construction of a low weir at Tracy Rapids, to maintain a 385 elevation in the river upstream to Atikokan.

Tracy Rapids

From observations made during the site visit and study of available topographic maps and aerial photographs, it was concluded that Tracy Rapids cannot be made safely navigable by channel improvements alone and a boat transfer facility will have to be provided. Two alternative methods were considered:

- marine railway portage
- truck and trailer portage.

Boyce Rapids

Boyce Rapids is located approximately 5.5 km downstream of Tracy Rapids. This location currently presents some impediment to navigation. However, based on observations during the field trip and interviews with local residents who have boated frequently along the rapids, it is anticipated that channel improvements and channel marking can provide a navigable route through the reach. Further investigation is required to fully define the feasibility of providing a navigable route by channel improvements and channel marking only.

In case the channel improvements prove not to be feasible, marine railway and truck and trailer portages were also considered.

Weir at Boyce Rapids

An alternative to the works proposed at Tracy and Boyce rapids is the construction of a weir downstream of Boyce Rapids to raise the water through the reach sufficiently to drown out the rapids during the boating season. A navigation lock allowing passage for up to 7.5 m (25 ft) boats would be incorporated in the dam.

Calm Lake Dam

Calm Lake Dam was built in 1928 as a hydroelectric generating facility and no provision for boat passage was included in the design. The difference in water level between upstream and downstream is 25 m which, in practical terms, limits the options for boat transfer to either a mechanical lift over the dam or truck and trailer portage around the dam. A preliminary investigation of a lift facility indicated that this would be an expensive option, and its operation would be fraught with problems regarding ownership and rights-of-way and conflicts with the power

generation operations at the dam. As a result, the only practical option for boat transfer here is a truck and trailer portage.

Crilly (Sturgeon Falls) Dam

Crilly Dam does not have any facilities for transferring boats between the upstream and downstream reaches of the river. The situation is similar to that at Calm Lake Dam, i.e., the only practical option for boat transfer is a truck and trailer portage.

The International Dam at Fort Frances

A major impediment to boating traffic occurs at Fort Frances where Rainy River has been dammed for hydroelectric power generation. There is no boat transfer capability at the dams; however, it was learned that a local service for transporting boats around the dam by truck and trailer exists at Fort Frances.

The feasible boat transfer options here consist of a boat lift at the dam and/or the establishment of a more reliable truck and trailer portage.

Manitou and Long Sault Rapids

Manitou Rapids are located 52 km downstream of Fort Frances on the Rainy River. The rapids are a minor impediment to navigation during period of low flow when rock and boulders become exposed. From field observations and consultation with local residents, it was determined that the reach can be made navigable by channel improvement and marking.

At Long Sault Rapids, it was determined that only a small amount of channel improvement and marking will be required.

The channel of the Rainy River downstream of Fort Frances contains the remains of old timber piles which were used to mark the navigable channel. In some areas, the piles are now just below the water surface and are dangers to boating. Removal or marking of these piles in order to improve the safety of navigation in the Rainy River will be required.

Dawson Portage

Dawson Portage connects Sand Point Lake to Lac la Croix on the boundary waters south of Quetico Park. The portage consists of a gravel surface road 5.0 km long between the landing locations. A truck and trailer portage is operated on the road. This route cuts off approximately 30 km from the river route and eliminates two marine railway portages; one at Loon Falls on the Loon River, and another at Beatty

Rapids. The roadway is in need of repair and upgrading of the landing facilities is also required.

In order to ensure that any environmental concerns associated with the proposed developments are recognized and addressed, most of the above proposed navigational improvements will require approval under the Lakes and Rivers Improvement Act.

3.6 Cost Analysis

3.6.1 Basis of Cost Estimates

Preliminary cost estimates were developed for the alternative technical solutions identified in the previous section. These estimates were used to compare the costs of the various schemes and for input to the cost/benefit analysis.

Costs for equipment and vehicles are based on recent quotes by manufacturers and suppliers. The costs of civil engineering works are based on unit prices for comparable work in Ontario. Costs for operation and maintenance of the facilities are based on current labour rates and equipment costs in the Fort Frances area.

In order to develop reliable costs for the channel improvements and boat transfer facilities along the Seine River, an engineering survey crew spent two weeks in the Atikokan area measuring channel cross-sections and surveying the proposed portage sites. Local suppliers were contacted to obtain price quotes for supplies and services. Contractors based in Atikokan were also contacted to provide estimates of project mobilization costs for the various sites, and to obtain their opinions on the best technical approaches for conducting the work. The help of local residents and members of the project Steering Committee who are familiar with the area was also obtained and their input was found to be most helpful.

All costs are given in 1988 dollars.

3.6.2 Cost of Alternative Technical Solutions

Channel Improvements at Atikokan

First, a one kilometer reach of the Atikokan River downstream of the trailer park was identified as an area requiring clearing of boulders and debris from the old check dams. Costs are based on removal and disposal of approximately 40 m^3 of material. Haulage by rock truck for an average distance of 3 km was assumed. An allowance for marking the channel with floating markers is included.

The estimated capital cost for the channel improvements is $20,000, with annual operating and maintenance costs of $500. Second, the river excavation from Front Street to the Museum site, a stretch of about 2 kilometers, will cost about $150,000, with annual operating and maintenance costs of $1,000. This cost is based upon the interpolation of cross-sections obtained from previous floodplain investigations by Underwood, McLellan in Winnipeg. A low weir is also required at Tracy Rapids, to maintain a 385 elevation in Atikokan River through town to the Museum site. The cost of this weir is estimated to be $27,000, with annual operating and maintenance costs of $1,000.

Boat Transfer Facilities at Tracy Rapids

Tracy Rapids consist of two sets of rapids separated by a deep pool. The upper rapids begin at the remains of an old dam and is approximately 75 m long with a vertical drop of about 0.7 m. The channel is 8 m wide at the upstream limit and widens to approximately 25 m at its lower limit. The pool separating the rapids is over 200 m in length with an average depth of 2.5 m along its centre line. It is about 7 m in depth at its deepest point.

The lower rapids are approximately 240 m long, with a vertical drop of about 0.8 m. The channel width, for the most part, varies from 20 to 35 m; however, an extremely narrow section, 7 m wide, exists near the lower limit.

Neither of the rapids can be safely navigated by boat; hence, cost estimates were developed for a boat transfer facility. Both a marine railway and truck and trailer portage were considered.

During the field survey, several alternatives portage routes were investigated along both the north and south river banks. The southern route was selected because it was judged to be more accessible. Ontario Hydro has constructed a 3 km rough road from Highway 11 to Tracy Rapids; however, its use is presently restricted to the winter because of several wet areas. The road would require upgrading for use in the summer.

The selected portage route begins at Dog Bay at the upstream end and continues along the top of the bluff along the south bank for a distance of approximately 1600 m to a downstream landing. A shorter route is possible if the portage follows the southern edge of the lower rapids. However, this route was rejected because it would be prone to flooding during the spring freshet.

The cost estimates for the portage at Tracy Rapids were based on the following (which are common to both a marine railway or truck and trailer):

- 1.6 km long, 3 m wide gravel portage road
- concrete ramps
- landing improvements
- channel marking
- floating docks
- reconstruction of 1 km of the access road from Hwy 11.
- capability to transfer boats up to 6 m (20 ft) long and 1800 kg (4000 lb) in weight.

A capital cost of $151,000 was estimated for the truck and trailer portage and a cost of $183,000 for the marine railway. Annual operating and maintenance costs were estimated at $46,000 and $36,000 respectively.

The truck and trailer option assumes a four wheel drive crew-cab type pick-up truck and the trailer would be a cradle type capable of handling various hull shapes without adjustment.

The marine railway option would use a steel track and carriage system. The carriage would be moved by means of a small power winch and cable system which would be capable of reversing and braking.

Boat Transfer Facilities at Boyce Rapids

During the field survey, it was confirmed that a navigable passage through Boyce Rapids could be provided through some channel improvements. The estimated capital cost for this work is $35,000. Annual operating and maintenance costs were estimated at $500. These costs are based on:

- dredging of about 75 cubic metres of sand and gravel
- blasting of rock ledges at three locations (a total quantity of 20 cubic metres of rock)
- removal of several boulders from the river channel
- channel marking.

For comparison, cost estimates were also developed for a marine railway and truck and trailer portage along the south bank. These facilities would be similar to those considered at Tracy Rapids. The portage route would be 1400 m long at Boyce and would be located along the South bank. A 2 km access road from Hwy 11 would be required. The proposed access road would be 4 m wide with a gravel surface and would follow the most direct practical route from the highway to the site.

The estimated capital costs for the marine railway portage is $303,000 and $163,000 for the truck and trailer portage. Estimated annual operating and maintenance costs are $36,200 and $49,000 respectively.

Weir and Lock Below Boyce Rapids

A cost for constructing a weir downstream of Boyce Rapids, to drown out both Boyce and Tracy rapids, was developed for comparison with the other options. The features of the proposed facility are as follows:

- a concrete free-overflow weir 6.5 m high
- a navigation lock for boats up to 7.5 m (25 ft) in length incorporated with the structure.

It was assumed that the weir will be founded on rock. Based on this conceptual design, a capital cost of $1,800,000 was estimated with annual and maintenance costs of $36,000.

Truck and Trailer Portage at Calm Lake Dam

As has been previously noted, a truck and trailer portage was identified as the most economical and practical boat transfer option at this site. This site was surveyed during the spring trip and local conditions were accounted for in the cost estimates. The cost estimate is based on:

- upgrading the existing access road
- a new and upgraded portage route
- concrete ramps
- markings for landings
- floating docks
- protective boom
- one 4 x 4 crew-cab truck
- one boat trailer.

The estimated capital cost is $100,000 and the estimated annual operating and maintenance costs is $47,000.

Truck and Trailer Portage at Crilly Dam

Costs are for facilities similar to the Calm Lake Dam truck and trailer portage. The total length of the portage is 3 km consisting of 1.3 km of gravel road from the upstream landing to Highway 11, 1.2 km along Highway 11, and 0.5 km of gravel road from Highway 11 to the downstream landing. A detailed survey was conducted from this site and local conditions are accounted for in the cost estimates. The downstream landing would be located at an existing camp ground.

The estimated capital cost is $75,000 with annual operating and maintenance costs of $47,000.

Boat Lift and Truck and Trailer Portage at Fort Frances

As has been noted, there is presently no reliable boat transfer facility at this location. However, there was a plan during the late 1800's to construct a canal on the Canadian side of the river to provide this capability. The

excavation for the canal was substantially completed by 1878 but a change in policy regarding the completion of the railway route through this area led to the decision to abandon the canal. The development of the timber industry led to the establishment of mills at Fort Frances and the construction of the dam and hydroelectric generating stations at the site of the rapids. The site has two generating stations and flow is controlled by a total of 16 gates, ten of which are located in the main dam adjacent to the powerhouse on the Canadian side of the river and six are located at the upstream end of the canal excavation on the Canadian bank of the river.

The location of a boat lift or lock at the dam does not appear to be feasible since the elevation of the highway bridge, located upstream of the structure, is too low to permit boats to approach the dam crest.

The most practical location for a boat transfer facility at the Fort Frances dam is at the canal excavation whose entrance is upstream of the highway bridge. However, there are constraints upon the use of this area. The international bridge linking Fort Frances to the town of International Falls, Minnesota passes over the canal excavation at its centre point, also several pipe bridges have been constructed over the canal from the Boise Cascade plant to the powerhouse and bridge. Furthermore, the canal sluicegates are the first to be opened when flows exceed the capacity of the power plants and the use of the canal as a boat transfer facility could be adversely affected.

As has been noted, an engineering study carried out in 1974 by M. R. Byrne and Associates of Burlington, Ontario for the Ontario Ministry of Natural Resources, studied a number of alternatives for boat passage at the Fort Frances dam. A review of the findings of the study taking into account any changes in physical, environmental, and economic conditions which have occurred in the intervening period has led to acceptance of the original conclusion that the most practical and economical boat passage facility would be a system of gantry crane, runway, and elevator located in the canal excavation and passing over the abutment wall adjacent to the sluicegates. The proposed arrangement would include construction of floating docks upstream and downstream, a walkway between the upstream and downstream landing stages with connection to the bank, relocation of the pipe bridges and dewatering, foundation construction, and structural steel work required for the lifts and runway.

A review of the flow records at the dam over the past eight years showed that on average, the canal sluicegates were in use about one third of the time during the boating season. When water is being spilled through the canal, high flow velocities in the vicinity of the canal entrance and outlet

can present a hazard to vessels attempting to use the proposed boat lift. Hence, the boat lift could be inoperative for significant periods during the boating season and an alternative boat-transfer system such as a truck and trailer portage would be required.

The cost estimate for the boat lift at Fort Frances was based on new quantity take-offs for the work required to construct the facility recommended in the previous Ministry of Natural Resources study. The estimated capital cost for the boat lift is $1,483,000 with annual operating and maintenance costs of $48,500.

Incorporating a lift lock into the navigation canal was not considered a viable option since it would require putting all six canal gates permanently out of service and severely reducing the outflow capacity of the dam.

An alternative portage system was considered using truck and trailer portage from a location upstream of the dam close to the existing government dock at Pither's Point to downstream of the dam adjacent to the sewage treatment plant. This alternative would require construction of new docking and ramp facilities at the upstream and downstream transfer locations and the use of pick-up trucks and trailers to transport the boats around the dam. The portage distance would be 5.6 km, would have to pass through the streets of Fort Frances, and would be subject to delays due to traffic congestion. The estimated time of a boat transfer would be 30-40 minutes compared to 16 minutes using the lift system proposed for the dam. The estimate of seasonal boat traffic which would use the facility is 1,880 with a daily peak traffic of 24. Based on a 10 hour operating day for the truck portage, one truck and trailer set would be required to provide equal service to the lift system. The estimated capital cost for the truck and trailer portage is $162,000 with annual operating and maintenance costs of $137,000.

Channel Improvements at Manitou and Long Sault Rapids

As has been mentioned, these rapids are only a minor impediment to navigation and can be easily navigated by boaters with knowledge of local conditions. The cost estimates for channel improvements include an allowance for clearing of boulders with a backhoe and channel marking. The estimated capital cost is $18,000 with annual operating and maintenance costs of $2,000.

The cost estimate for removal of old timber piles in the Rainy River is based on equipment and crew required to lift the piles, transport to shore, and dumping of the debris.

The estimated capital cost for the removal of the timber piles is $164,000.

Dawson Portage

The cost estimate is based on repairing the existing road, providing new landing ramp, and purchasing a truck and boat trailer capable of transporting boats up to 30 ft in length and 5000 lb in weight. It was assumed that all labour, materials, and equipment would have to be brought in by boat.

The estimated capital cost is $118,000 with annual operating and maintenance costs of $47,000.

A summary of the costs estimated for the alternative technical solutions is given in Exhibit 3.1.

3.7 Preferred Technical Solutions

The preferred solutions to the navigational problems identified at various locations along the proposed waterway are generally the most cost effective alternatives.

At Tracy Rapids, for example, the truck and trailer portage was found to be more economical compared to the marine railway option. From a technical point of view, the length of the portage route was found to be too long to provide a reliable service using a marine railway. Hence the preference for a truck and trailer portage at Tracy Rapids.

At Boyce Rapids, providing a navigable passage through the rapids is clearly the most cost effective and practical solution based on the cost estimates presented in Exhibit 3.1.

At Fort Frances, the truck and trailer portage is also the preferred solution. Constructing a boat lift at the dam is not only prohibitively expensive but such a facility would also be out of service during periods when the channel sluicegates are open. Accordingly, a truck and trailer portage would also be required to maintain a boat transfer capability during these periods.

The recommended solutions to the navigational constraints identified along the proposed waterway are as follows:

- Channel improvements at Atikokan
- Truck and trailer portage at Tracy Rapids
- Channel improvements at Boyce Rapids
- Truck and trailer portage at Calm Lake Dam
- Truck and trailer portage at Crilly Dam
- Truck and trailer portage at the International Dam at Fort Frances
- Channel improvements at Manitou and Long Sault rapids on the Rainy River

- Timber pile removal and channel marking on the Rainy River
- Truck and trailer portage upgrading at Dawson Portage.

A detailed breakdown of cost estimates for the preferred solutions are presented in Appendix A.

Exhibit 3.1 Cost of Alternative Technical Solutions

		Capital Costs (exc. Depreciation)	Annual Operating and Maintenance
1.	**Atikokan River**		
	- Channel Improvements downstream of Front St.	$20,000	$500
	- Channel Improvements upstream of Front St.	$150,000	$1,000
2.	**Tracy Rapids**		
	- Alt 1 Marine Railway	$183,000	$36,200
	- Alt 2 Truck & Trailer Portage	$157,700	$46,000
	- Alt 3 Weir	$27,000	$1,000
3.	**Boyce Rapids**		
	- Alt 1 Channel Improvements	$35,000	$500
	- Alt 2 Marine Railway	$303,000	$36,200
	- Alt 3 Truck & Trailer Portage	$163,000	$49,000
4.	**Weir & Lock Below Boyce Rapids**	$1,800,000	$36,000
5.	**Calm Lake Dam**		
	- Truck & Trailer Portage	$100,000	$47,000
6.	**Sturgeon Falls Dam (Crilly Dam)**		
	- Truck & Trailer Portage	$75,000	$47,000
7.	**Fort Frances Dam**		
	- Alt 1 Boat Lift	$1,483,000	$48,500
	- Alt 2 Truck & Trailer Portage	$162,000	$137,000
8.	**Manitou and Long Sault Rapids**		
	- Channel Improvements and Marking	$18,000	$2,000
9.	**Rainy River**		
	- Timber Pile Removal	$164,000	N/A
10.	**Dawson Portage**		
	- Truck & Trailer Portage	$118,000	$47,000

4. MARKET ASSESSMENT

4.1 Study Process

The work in market assessment consisted of the following efforts:

- a field review of the routes by water and helicopter was undertaken with the project team;
- in-field contacts were made in Minnesota, as well as Ontario (see Section 8.1 for listing of agencies and contacts), to obtain data, policies, back-ground information, and initial reaction to the concept;
- library research was undertaken in Toronto (at Queen's Park, Statistics Canada, and York University);
- data and information were assembled to assess their relevance and completeness;
- the data were analyzed to develop initial estimates of the market, in terms of amount of use of the waterway, sector by sector, and by various market segments;
- initial estimates of the volumes of new business likely to arise from waterway use, in all affected locations and business sectors, were made;
- the market data were used to guide development concepts for the different portions of the waterway;
- as concepts emerged for the waterway system as a whole, and for its range of development sites, the initial estimates of market and spin-off benefits were refined accordingly;
- project benefits were assessed in relation to the costs, in a formal benefit-cost framework;
- implementation, operational, and promotional, needs for the project to achieve its projected markets were developed;
- the whole work process was given a final refinement for inclusion in this report.

The projections and estimates offered in this report represent the results of our full market and economic analysis. This has been exhaustive, and has included every source of data known to us. But the definitive projection of use of a major new facility, particularly one which is of a type and scope not commonly known before in its

marketplace, is subject to various uncertainties. Through the development of the conceptual plans for the various sectors and sites, a fairly well-developed sense of what the waterway will be like for the user can be gained. But this sense can only be converted into actual numbers of users and volumes of spending by limited inference from available cases and a large degree of professional judgement.

For this reason, the projections of markets and economics must be seen as being based on a fairly general appreciation of how the waterway will be perceived by the users, in each part of its many sectors. The appreciation has been developed on the basis of a fairly "low technology" system which is in keeping with the generally unspoiled nature of the area landscape. The possibility of attracting massive numbers of users has been fairly well ruled out as our study proceeded. The numbers presented here are not large in the absolute sense, but they represent a useful area of new business for the area, and perhaps more important, the waterway offers a whole new avenue of promotion and image building for the entire region.
The usage and economic numbers given in this interim report will likely be found conservative in actual operating experience with the waterway, but they have been kept intentionally to the lower end of a possible range by the thought that the feasibility criteria must be met in a stringent manner, and be seen to be met, before the project as a whole can be implemented and construction proceeds. We believe that this feasibility has been established by the work presented in this report.

4.2 Current Boating Patterns

Most recreational boating along the proposed waterway route takes place in the major and minor lakes of the region. The smaller lakes in the Seine River chain offer limited potential for boat excursions, and their boating use is almost entirely for fishing and access to cottages and lodges. The Rainy River currently appears to provide mainly local boating opportunities, again with fishing as a prime motivation. The lakes and rivers in the chain extending from Rainy Lake to Lac la Croix provide boating opportunities for the cottages and lodges located along them, and for limited fishing and touring. The major lakes in the system - Rainy Lake and Lake of the Woods - offer the major opportunities for a wide variety of boating comprising a full range from small outboards to large houseboats in the 50-foot class. Their use is heavy for fishing, recreation, and cottage/lodge access. The stretch of waters from Kenora to Minaki is now travelled by boaters using craft up to the 30-foot range, since the Keewatin boat lift provides access to and from Lake of the Woods to the Winnipeg River system.

Long distance travel along the sectors of the proposed waterway is now possible, with severe limitations in some cases. These limitations, discussed in Section 3, have kept the numbers of users down to a relatively low level, comprised mainly of well-informed local boaters and a smaller number of "adventurous" types. The current use of some sectors of the waterway can be fairly estimated from data on the existing boat transfer facilities. Some of the facilities keep only general data, but good data are available for the Keewatin Boat Lift. Information from local informants has helped us to arrive at a more rounded picture of present use.

From all the above sources, we estimate the present annual numbers of transits on the various sectors are as follows.

Atikokan-Rainy Lake	nil
Rainy Lake-Lac la Croix	800-1,200
Fort Frances-Lake of the Woods	50-100
Lake of the Woods-Kenora	2,000 approximately
Kenora-Minaki	1,400-1,500

4.3 New Modes of Boating

The first factor to note regarding the potential use of the waterway system is that it will, in effect, be a new product in its marketplace. With the exception of the Atikokan-Rainy Lake sector, all sectors of the waterway can be used with varying degrees of difficulty at present. The essential question addressed is: what will be different when the missing links are in place, and the nasty parts (e.g., the pilings in the Rainy River) are removed? How much extra use can a smoothly-operating and well promoted waterway attract over what is now the case?

The answer has to be found in:

- projecting a whole new image of the waterway, and promoting it as a unique and varied long distance travel experience;
- offering the opportunity to travel the "routes of the voyageurs";
- tying into themes of historical interest to both Americans and Canadians;
- offering the experience of "wilderness" to those who cannot or do not wish to travel by canoe;
- providing something different to those who have "done it all";

- packaging the experience of boating, lodging, eating, viewing, enjoying nature, and exploring; yet feeling safe and knowing that the services are of good quality and value for money.

It will definitely be the case that a significant amount will have to be budgeted for annual promotion of the waterway, by both public bodies and private businesses, to develop the full market potential of the waterway and realize its full benefits. This promotion, however, will likely have significant "spillover" effects in appealing to visitor sectors in general, and will generally be money well spent.

The question of creating a whole new "image" for the waterway can be started off by selecting a name which is easily recognizable, appealing, and promotable. We suggest the waterway be called "The Voyageur Heritage Waterway" in order to set the image and tie it into related themes of interest and recognition to Canadians and Americans alike.

The different sectors can also be given sub-titles which both tie them into the overall theme, and yet distinguish their own individuality. While logic might suggest five sub-titles; one for each sector, we suggest three to be adopted to reduce confusion and apparent complexity. These would be "Quetico Country", for the Atikokan-Rainy Lake and Rainy Lake-Lac la Croix sectors; "Rainy River Country" for the Fort Frances-Lake of the Woods sector; and "Lake of the Woods Country" for the Lake of the Woods and Kenora-Minaki sectors. These are further discussed in Section 5.

4.4 Projection of Future Traffic by Sector

The projection of future use involves considering each sector of the route both alone and in combination with others. It is likely to be a rare user who will boat all the way from Atikokan to Minaki or vice versa. More likely, a typical user will do one or two sectors, enjoying from three days to a week of travel and stopovers.

Much will depend on the desire and ability of both accommodation businesses and boat rental outlets or outfitters to offer services, and particularly packages of services, to new waterway boaters. These will be a new market sector, and each business will have to feel its way into it carefully.

From our market studies, we have identified two prime motivators to travellers on the waterway.

- The **touring** motivation; where viewing and appreciating the scenery, nature, and points of interest will be central to the experience, where accommodation quality

will be important to most, while "roughing it" may be acceptable to a minority, those who may casually fish once in a while;

- The **fishing** motivation; where the waterway is used as a new territory to fish, or to join friends in other fishing areas.

We have identified six distinct market segments which we have used as the basis for the use projections for each waterway sector.

- local residents of the main start/destination nodes;
- other local or Ontario residents;
- U.S. boaters entering Canada with their own boats;
- U.S. boaters using the waterway to make a U.S. to U.S. trip;
- those using the services of motorboat outfitters, a "new breed" of service operation, some providing guided individual or group boat touring packages;
- those chartering a larger craft, some with guides or other crew.

There are many sources of information which we have used, and we have compiled many tables of additional information which were taken into account in arriving at our projected estimates of sector transits. The most relevant of these are included in Appendix B. We would like to express our thanks to many agencies and persons, on both sides of the international border, who provided the raw data and other reports containing the information needed as a base for the projections.

The projected volumes of transits shown below should be considered as conservative estimates of the numbers of one-way trips expected to develop by the third year of operation of the waterway, given that it is appropriately implemented and well promoted. The volumes are as follows.

Atikokan-Rainy Lake	1,200
Rainy Lake-Lac la Croix	800
Fort Frances-Lake of the Woods	1,900
Lake of the Woods-Kenora	1,200
Kenora-Minaki	500

Appendix B also contains a detailed spreadsheet table which shows the composition of the above transits by waterway sector, market segment, motivation, and year. The above numbers are transits projected to be made <u>in addition</u> to existing volumes of travel, and thus represent the new business added by the waterway. In the case of the Keewatin boat lift, this will be about one-third increase over present usage. In the case of the Atikokan sector, it is all new business.

The numbers of transits by sector, before and after the waterway improvements, are shown on the graph in Exhibit 4.1.

4.4.1 Factors and Ranges Affecting Projections

The main factors affecting the projections are:

- the final attractivity of the waterway will depend on what will emerge from the implementation phase;

- the response of communities and businesses can affect the overall and individual sector totals. For example, joint promotion and cooperation between a network of lodges and outfitters in various route sectors could have a major effect;

- the response of government to the overall concept, and to any perceived disbenefits in any sectors;

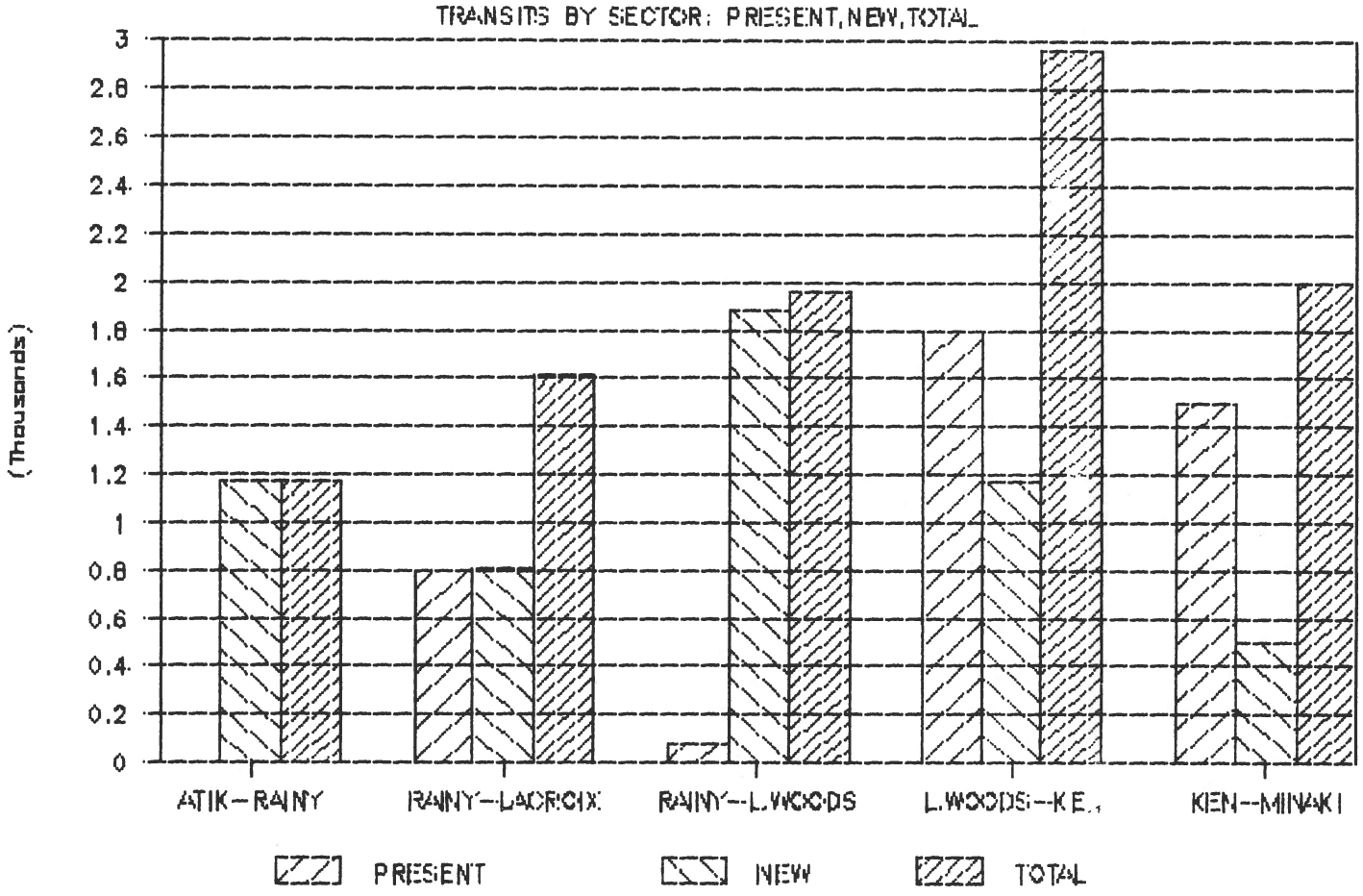
- the assumption that the general nature of regulations and restrictions placed on non-residents will not be changed with the waterway.

Given that the effect of any variations in the above-noted factors from our base assumptions should be generally favourable to the waterway, it must be noted that the base scenario projections presented in this report should be considered to have a range of about plus or minus 20%. The results in the spreadsheet tables of Appendix B may appear to be more exact, and thereby convey a degree of precision which is not warranted or intended because they are the results of mathematical calculations which are not rounded off.

4.5 Estimates of Related Activity and Spending

This section provides an overview and initial discussion of the business opportunities which the waterway is likely to bring to the region as a whole, and to each of the individual locations along the route. The details of the figures by markets and sectors can be found in the spreadsheet in the Appendix B, but there is a summary table at the end of this section. It must be noted again that the mathematical nature of the spreadsheet may lead to the figures in it appearing to be more precise than is actually intended or warranted in any pre-project market analysis. The following discussion rounds off the numbers to a certain extent, but all values should be taken as being mid-points of a range of perhaps 20% either way.

Exhibit 4.1 VOYAGEUR HERITAGE WATERWAY



4.5.1 Types of Business

The types of business that can be generated by the waterway fall into two general categories:

- services to the boaters
  - accommodation
  - supplies
  - outfitting or boat rental/charter
  - visits to additional attractions or events
- services to the boat
  - fuel
  - mechanical or other service.

These services may be delivered at enroute locations along each waterway sector, or at start/finish nodes of the various sectors. Each sector will be exposed to its own unique opportunities arising from its own unique combination of markets and resources. Each start/finish node also will have a different set of opportunities, dependent on its location, resources, and competitive features.

In this analysis, the projected levels of business for all of the above-noted items are included, with the exception of visits to additional attractions or events. Estimation of this added opportunity, potentially available to all sectors and start/finish nodes, depends on community response to the waterway and its linkages and the related promotion which can be developed. The analysis adopts a conservative approach to the market and dollar volume estimates, and leaves scope for their improvement by an active response from communities and businesses after implementation of the waterway projects.

4.6 Estimates of Economic Opportunities

4.6.1 Overall Synopsis

There are many opportunities for additional business generated in each sector of the waterway. These have been grouped, for convenience, into four categories.

- start/destination general business; comprising sales of fuel, supplies, service, and outfitting packages to boaters at a nodal point at either end of a sector;

- start/destination accommodation; involving the sale of camping and lodge or motel accommodation and meals to boaters at a nodal point at either end of a sector;

- enroute general business; consisting of fuel, sale of supplies, and service to boaters while travelling along a sector;

- enroute accommodation; involving the sale of camping and lodge accommodation and meals to boaters while travelling along a sector.

The details of how the estimates of each type of business were arrived at for each sector are shown on the spreadsheet "Use Projections and Business Opportunities" in Appendix B. Exhibit 4.2 shows a summary of the direct business opportunities by sector and type of business. The numbers are rounded to the nearest $1000.

Exhibit 4.2 Summary of Annual Business Opportunities by Sector and Type

Sector	Start/Destination Gen.	Bus.	Accom.	Enroute Gen.	Bus.	Accom.	Total
Atikokan-Rainy Lake	$213,000	$201,000		$35,000	$57,000		$506,000
Rainy Lake-Lac la Croix	$24,000	$126,000		$11,000	$39,000		$200,000
Fort Frances-Lake of the Woods	$61,000	$266,000		$48,000	$64,000		$439,000
Lake of the Woods-Kenora	$131,000	$155,000		$106,000	$73,000		$465,000
Kenora-Minaki	$13,000	$37,000		$1,000	$11,000		$62,000
Totals	$442,000	$785,000		$201,000	$244,000		$1,672,000

The sector totals for annual new business spending from boaters using the waterway are shown graphically in Exhibit 4.3 on the preceding page.

4.6.2 Atikokan-Rainy River Sector

Atikokan will be in a good position to gain outfitting business since its "starting" point on the waterway will be well publicized, and it already has a well established lead in the canoe outfitting sector. The volume of motorboating business will not be large in absolute terms, but since the current base is low, the increase will be noticeable. The town can also offer supplies, accommodation, and boat/motor service. Considering all factors available at present, we foresee Atikokan taking about a 70% share of the volume of start/destination general business for this sector, or about $150,000; plus around 40% of the accommodation business, for about $80,000 more. This preliminary total amounts to over $230,000 annually and yet does not reflect any influence from improved general attractions or events in Atikokan.

Exhibit 4.3 VOYAGEUR HERITAGE WATERWAY

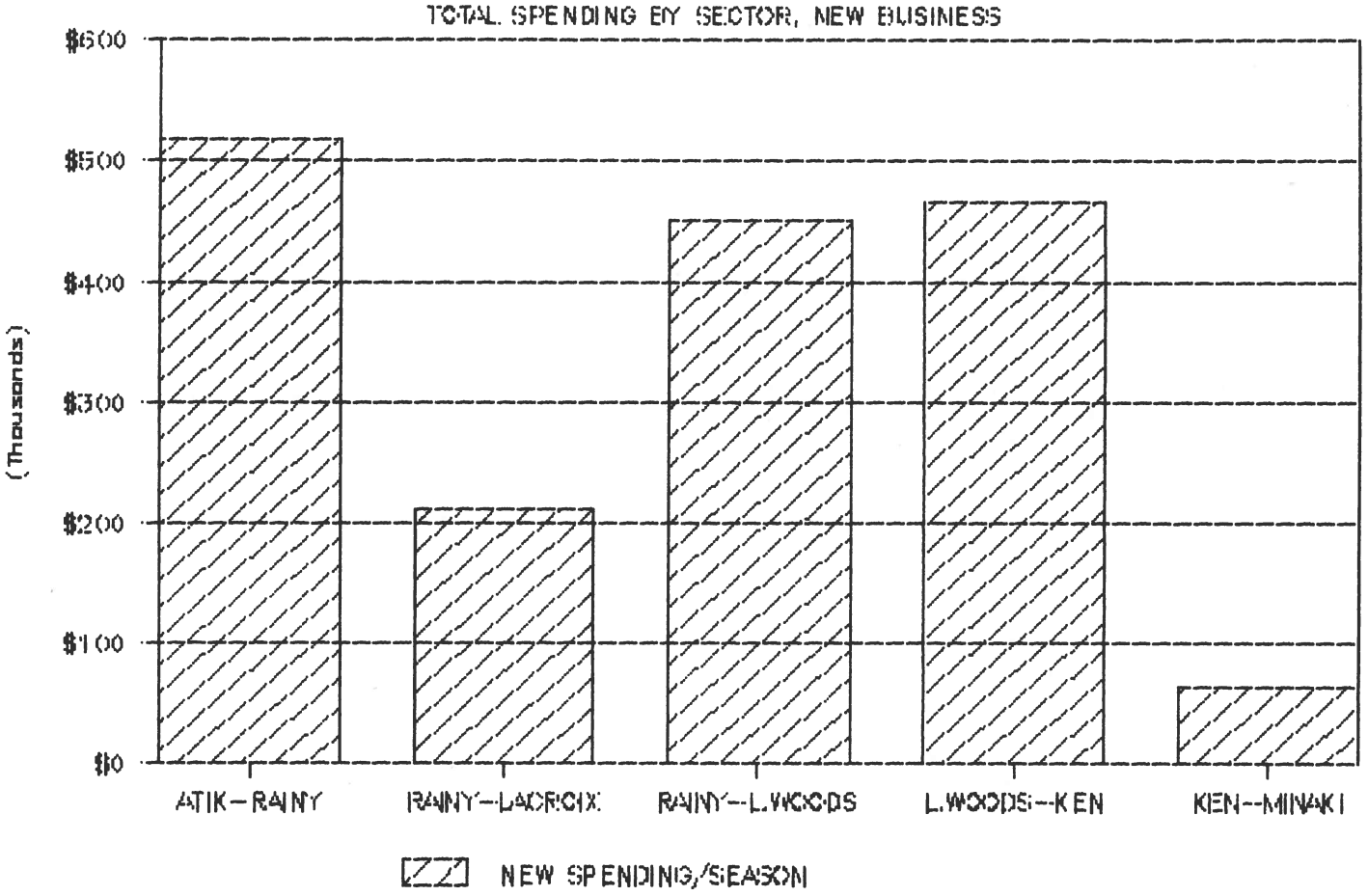


Exhibit 4.3

Existing resorts and the Seine River Indian Reserve are well situated along the enroute portion of this sector to gain business. The volume of enroute business and accommodation opportunities is likely to total over $90,000 annually. This volume is insufficient to make these establishments viable by themselves, but it can represent a useful increment to many of them. If the market is approached properly, some enroute lodges may also be able to capture a share of the motorboat outfitting business.

Fort Frances will be the "hub", in effect, of three route sectors and is also favourably placed as the reception point for U.S. entrants by water, or for those coming by road trailing their own boats. It can gain business in supplies, accommodation, and service and if motorboat outfitting is offered, this should also be quite successful. There is no doubt that the waterway will also create increased business in the same categories on the U.S. side of the Rainy Lake area, but we have not projected what this might amount to, thus excluding the U.S. component from projections of this and other sectors.

Fort Frances' share of the Atikokan-Rainy Lake sector's start/destination business will be about $64,000 for general business and $120,000 for accommodation, totaling $204,000. This excludes the contribution from traffic on other sectors, which is summarized further on, and at present also excludes any use by waterway clients of new attractions and facilities; some of which are definitely being planned for the Fort Frances waterfront.

4.6.3 Rainy Lake-Lac la Croix Sector

The start/destination business for this sector will be split between Fort Frances and the resorts on Lac la Croix, with the potential for the Lac la Croix Indian Reserve to participate, if they so desire. Because communities and businesses may respond to the opportunities and gain trade in ways we cannot fully foresee at present, our assumed split of business must be considered tentative. But we can see about 70% of the general business and 40% of the accommodation volume going to Fort Frances and the rest to the Lac la Croix locations. This amounts to about $17,000 in general business and $50,000 of accommodation sales to Fort Frances, with $7,000 general business and $75,000 in accommodation sales to the Lac la Croix outlets.

Enroute sales potentials are fairly limited along this sector, but some $50,000 in total sales might be captured by various lodges and other outlets such as at Sandpoint Lake.

4.6.4 Fort Frances-Lake of the Woods Sector

This sector is especially difficult to project since it will be heavily influenced by the U.S.-U.S. market component. Also, it is problematic to separate out the component of spending which may be made on the U.S. side since the sector literally is the boundary water and the present opportunities for spending on that side are so attractive relative to the Canadian side. This is particularly true in the Wheeler Point-Beaudette area. The implementation of the projects noted in this report will remedy some of the lack of attraction at Ontario points. As things are at present, it is possible that up to 50% of the total projected business for this sector could go to the U.S. side of the waterway. The following discussion is based on this leakage being excluded through improvements on the Canadian side. There will, of course, be added business on the U.S. side in any case as a result of the Voyageur Heritage Waterway. This added business is seen as incremental and additional to the amounts estimated in this report.

Our initial estimates show that Fort Frances might gain 70% of the Ontario start/destination general business and accommodation volume, which would be about $229,000 annually. Rainy River could gain the remaining 30% or about $98,000 worth.

The enroute business opportunities on this sector are not large since most boaters can traverse it in a day or part day without stopping. Communities enroute now generally lack facilities for boaters, which are addressed in this report (Section 5), but the potential market is small unless it is stimulated by specific efforts to attract it to enroute locations. The U.S. side offers a first rate historic attraction at Grand Mound (not yet boat accessible, though it is on the river), as well as the existing Franz Jevne State Park, and a county park located at Manitou Rapids, both offering camping. The U.S. communities of Indus and Clementson might be able to serve boaters if they had accessible docks. The Canadian side offers no park support at present, but the community of Emo is well situated to benefit, and Barwick and Pinewood might be possible beneficiaries as well. The Manitou Indian Reserve is well situated to offer camping and supplies, if there is some other base of business to assure their viability.

We foresee about $112,000 volume of enroute business from the waterway alone, which is small, but can be a seed from which local boating can grow and other markets be served. Emo is the most likely recipient of a good share of the general business, while the Manitou Reserve could develop some business and accommodation volume as well.

4.6.5 Lake of the Woods-Kenora Sector

This sector already has an appreciable volume of travel over its entire length, and there are established events such as the Lake of the Woods International Sailing Association (LOWISA) cruise and the "Exciting Canadian American Powerboat Excursion" (ESCAPE) which generate interest in travelling the length of the lake.

The creation of the waterway will add to this traffic and will also appeal to new market sectors, as noted earlier, through the promotion and mystique of the Voyageur Heritage Waterway. The start/destination business opportunities will be largely claimed by Kenora since it is so well developed to serve boaters. Some 80% of the general business and accommodation spending is likely to be received in Kenora, and 20% in Rainy River. This would amount to about $229,000 per year for Kenora and $57,000 for Rainy Lake.

The enroute spending levels are expected to be higher for this sector than for most others, since the sector is longer and the enroute opportunities are so diverse. Some $106,000 in general business and over $73,000 in accommodation sales are likely to result, with the latter figure being quite conservative.

4.6.6 Kenora-Minaki Sector

This sector is relatively short, but it is scenic and offers a major destination attraction at Minaki Lodge. The entire Sand Lake area offers an attractive destination for boaters and some local contacts suggest that the waterway could be extended from there into Manitoba in future with more low-tech boat transfer facilities.

Enroute spending on general business or accommodation is likely to be at quite a low level (about $12,000) for the above reason, and is not likely to grow to the level which can support new businesses.

Start/destination spending should amount to about $50,000 a year, however, and will be split between Kenora and Sand Lake businesses. Kenora is likely to get the larger share (perhaps 70%) of general business, and Sand Lake more of the accommodation (also, perhaps 70%). This would represent about $20,000 more overall business for Kenora and $30,000 for the Sand Lake area establishments.

4.6.7 Summary

Exhibit 4.4 summarizes the amounts and locations of likely spending, based on the above discussion and the detailed estimates in Appendix B. Still excluded are possible amounts generated by new attractions and events.

Exhibit 4.4 Summary of Business Opportunities By Location

Sector		Accom.	Gen. Bus.	Total
Atikokan		$80,000	$150,000	$230,000
Enroute Atikokan-Ft. Frances		57,000	35,000	90,000
Fort Frances	(Atik-FtFr)	120,000	64,000	184,000
	(FtFr-laCroix)	50,000	17,000	67,000
	(FtFr-L.Woods)	186,000	43,000	229,000
Subtotal		$356,000	$124,000	$480,000
Lac la Croix		75,000	7,000	82,000
Enroute Ft. Frances-la Croix		39,000	11,000	50,000
Enroute Ft. Frances-L. Woods		64,000	48,000	112,000
Rainy Lake	(FtFr-L.Woods)	80,000	18,000	98,000
	(L.Woods-Kenora)	31,000	26,000	57,000
Subtotal		111,000	44,000	155,000
Enroute L. Woods-Kenora		73,000	106,000	179,000
Kenora	(L.Woods-Kenora)	124,000	105,000	229,000
	(Kenora-Minaki)	11,000	9,000	20,000
Subtotal		135,000	114,000	249,000
Enroute Kenora-Minaki		11,000	1,000	12,000
Minaki Area		26,000	4,000	30,000
Overall Totals		**$1,027,000**	**$645,000**	**$1,672,000**

The above figures have been evaluated based on the realization of the conceptual plans and the engineering works outlined elsewhere in this report, and on the smooth implementation and management of the waterway. They may well be improved upon, perhaps considerably, if communities and businesses get behind the promotion of the waterway, and it meets with a positive response from its users.

4.6.8 Time Periods for Opportunities

It has been assumed for the purposes of the present discussion that the mechanical and structural portions of the waterway can all be built in one season, so that the full waterway can be promoted and used in the year following construction. This assumption is warranted by the

relatively low technology and simple solutions recommended for each barrier to navigation (see Section 3).

The user response to the new and improved facilities of the waterway is presumed to be spread over a somewhat longer period. To analyze the possible buildup of business benefits and operating costs, we have assumed the following possible time trajectory.

Year 0 — Decision taken, funding appropriated, and construction of portages completed.

Year 1 — Travel volume reaches 50% of nominal overall, 50% of nominal business generated in accommodation, general services outfitting about 30% of nominal.

Year 2 — Travel volume 80% of nominal, 80% of nominal business generated in accommodation, more lodge packages likely to be successful outfitting up to 70% of nominal.

Year 3 — Travel volume 100% of nominal, 100% of nominal business generated in all sectors.

Year 4-onward — Opportunities may expend well beyond nominal if markets develop well, response from businesses is enterprising, and communities are creative.

4.7 Primary and Secondary Economic Impacts

4.7.1 Income and Employment Effects

Discussion in the previous section showed the general analysis generating the estimates of business volumes by general type. These can be summarized from the data in Appendix B as follows.

Estimated Additional Annual Spending, by Sector

Fuel, etc.	$322,000
Supplies	111,000
Outfitting	188,000
Service	23,000
Portages	38,000
Accommodation	1,028,000
Total	$1,710,000

The estimation of the number of jobs, likely to be created directly by the above volumes and categories of visitor spending, will depend on the mix of seasonal and part-time workers that are engaged, as well as the type of enterprise.

The Ministry of Tourism and Recreation[1] has developed recent data on jobs/spending ratios for tourism sectors and regions, as well as on economic multipliers. Their results apply to the year 1985, and are very useful in studies such as this one, even though the data needs to be interpreted with some care and be supplemented with additional local data in each situation. Here, we offer some initial estimates of job generation which are derived from the MTR data and our own experience in the area.

In each business sector, differing volumes of business are needed to create a full-time job. For example, the business volume per job is highest for items such as fuel sales, where so much of the end price is paid to outside suppliers and in tax. It is lower in accommodation establishments and similar services, which need more staff for a given volume of business. The unit of job creation used here is the "person-month", which is one person employed essentially full-time (35 hours per week or more) for one month.

The following estimates of jobs are based on ratios of person-months of employment to sales volume by business sector. The results are:

Business Sector	Ratio $1000/Pers-Mo	Person-Months Employment
Fuel, etc.	2.6	124
Supplies	1.6	59
Outfitting	1.9	98
Service	1.9	13
Portages	3.1	31
Accommodation	1.6	632
Total		**957**

Thus, the above analysis shows that the Voyageur Heritage Waterway is projected to create over 950 person-months of direct employment annually, when in full operation. This does not include any spin-off employment generated as the result of the employment from the waterway, but some will occur among suppliers and other service businesses. If the average duration of a waterway-related job is in the order of 3.5 months, 950 person-months of employment thus means that about 270 jobs will be created on a full-time seasonal basis.

[1] Ministry of Tourism and Recreation. Economic Impact to Tourism in Ontario. August 1988.

4.7.2 Multiplier Effects and Regional Impacts

The effect of spending one dollar in a region is greater than $1.00 since the money circulates among direct suppliers and indirect purveyors of goods and services. The resulting impact is calculated by the economic multiplier, which has been the subject of MTR studies, referred to above.

When the effect of the spending of the new tourist dollars generated by the waterway has been taken into account for the whole region, the total economic impact can be measured. This will consist of increased output in the economy, and increased income to households (i.e., those who hold the jobs, or are proprietors of the business). From applying the multipliers for Ontario's Sunset Country derived in the MTR study, we estimate that the increased tourism spending will lead to the following set of overall economic impacts.

- Annual increased tourism spending	$1,710,000
- Increased economic output	$1,556,100
- Income received by households	$787,000

The above values have been calculated using the new multiplier data generated by the MTR studies noted. These studies are as accurate as possible, but it should be noted that some economists feel that they give too conservative a value for the impact of tourism in Northern Ontario. Thus, the impacts shown should be taken as minimum estimates, though they are impressive enough in themselves.

4.7.3 Taxation and Revenue Yields to Government

Direct revenue to the government can arise from user fees charged for transits of the various portages. However, user fees can have a direct effect on how many users there will be. For the present analysis, we have assumed for the purposes of estimating potential traffic levels, that there will be fees leveled on all portages with the exception of the portage at Tracy Rapids.

The presumed fees are:

- $5.00 per one-way transit at Calm Lake, Crilly Dam
- $15.00 per one-way transit at Fort Frances
- $15.00 per one-way transit of the Dawson Portage
- $3.00 per one-way transit at Keewatin Boat Lift. (the present charge)

The Tracy Rapids portage was not assessed a fee since it is presumed to be heavily used by local boaters and waterway users. A charge might be considered, although this could have the effect of raising the total cost of the Atikokan-Rainy Lake sector to a high level, unless the charge were made, say, $3.00 for each of the three portages along this route.

There is an argument to be made for allowing free use of all portages, since this is now the case for the Lac Seul trailer portage operated since 1976 by MNR. Here, we have assumed that the portages will be charged for at the nominal rates noted, to ensure that the local demands placed on them are not unreasonable.

The summary of user revenues based on the above charges and the volumes estimated to date is as follows:

Portage	Transits	Rate	Revenue
Tracy	2,000	-	-
Boyce	2,000+	-	-
Calm L. Dam	1,170	$5.00	$5,850
Crilly Dam	1,170	$5.00	$5,850
Ft Frances	782	$15.00	$11,730
Dawson Portage	810	$15.00	$12,150
Keewatin Lift	500	$3.00	$1,500
Total			**$37,080**

It should be noted also that the operating cost of the portages is likely to be significantly in excess of direct revenues on the above basis. But, if fees were raised to the level needed to cover costs from fees alone, traffic would drop to the point where there again would be a deficit. The overall benefit to the area economy must be taken into account in setting fees.

The overall level of taxation receipts by the Provincial and Federal governments can be estimated by using the data from the MTR multiplier studies referred to earlier. Based on the most recent data available to us, the annual tax receipts to the different levels of government would be as follows:

Taxation received by:	
Federal Government	$101,000
Provincial Government	$44,500
Local Governments	$21,500

The above provincial figure does not include receipts from such sources as fishing licenses or Crown Land camping permits.

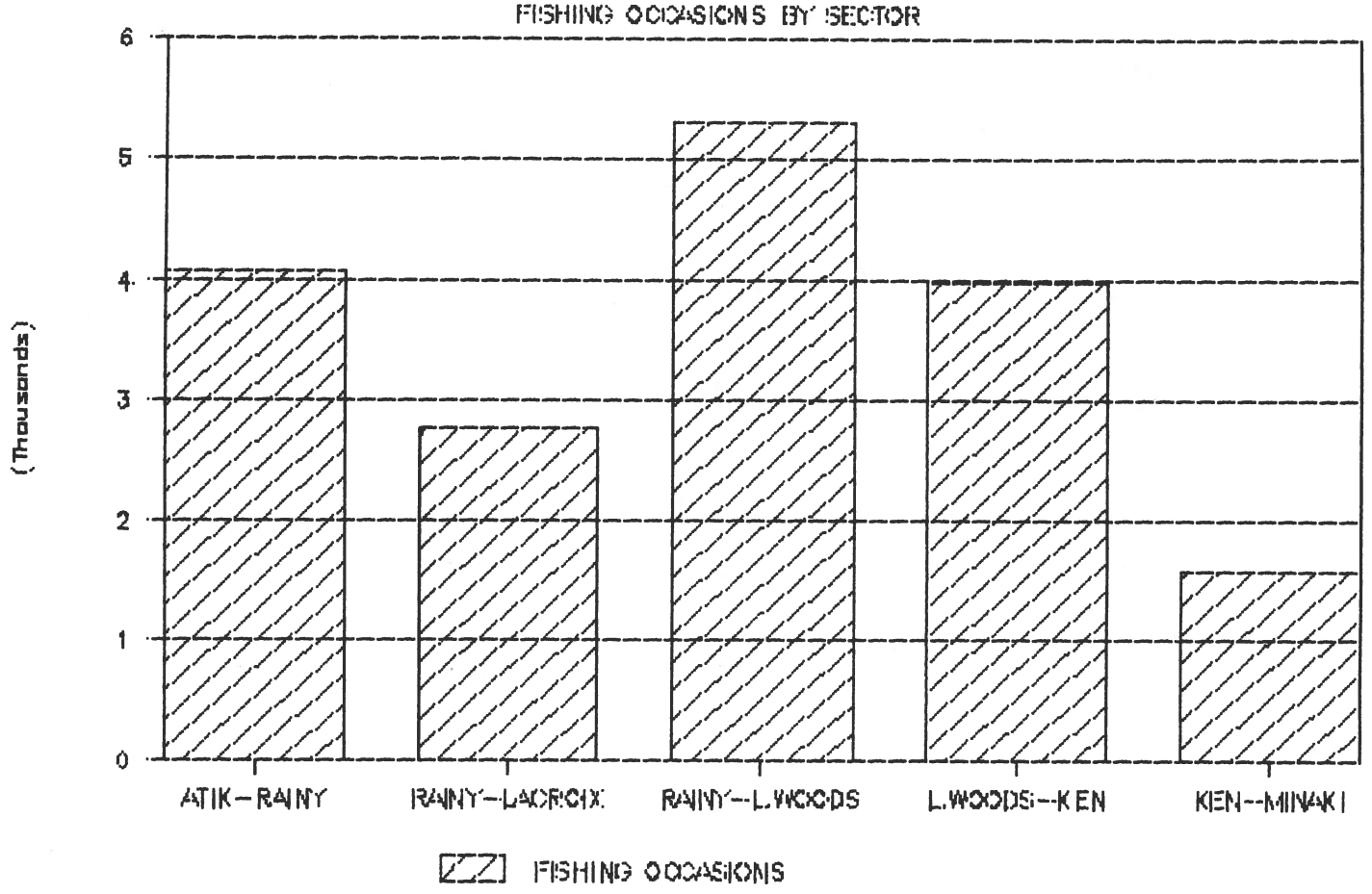
4.7.4 Potential Disbenefits

While the great majority of the businesses and communities in the region are likely to see the potential economic boost as a benefit, the potential for disbenefits must also be considered.

The distribution of the potential added fishing pressure is shown graphically in Exhibit 4.5 on the following page.

There is one argument which might reduce the apparent added fishing pressure over the levels noted above. That is, if some of the waterway users are not new visitors to the area but are locals or repeat visitors, who would be somewhere (more stationary) in the area fishing anyway, then the aggregate pressure on the area's fishing resources would not be increased by the above amounts. Under this argument, we should deduct the local's and repeat visitor's fishing from waterway "added pressure". It is hoped that this factor can be discussed further with the relevant fisheries personnel.

Exhibit 4.5 VOYAGEUR HERITAGE WATERWAY



5. CONCEPT DEVELOPMENT

In March 1988, the results of the market and technical assessments, which showed a very definite prospect of favourable benefit-cost ratios, were presented to the Steering Committee. By selecting a "low-tech" approach to resolving navigational constraints, at a cost of approximately $800,000, the team concluded that the project could produce a favorable benefit-cost ratio if the remaining development costs were budgeted at $1,500,000. Such costs would be those associated strictly with the waterway, and not other tourist markets. For example, a campground on the waterway drawing from both boating and highway traffic would have a portion of its costs assigned to the waterway within the above budget.

On this basis, the Steering Committee approved continuation of the study, and directed the consultants to proceed with concept development and more detailed economic impact analysis.

5.1 Waterway Themes

5.1.1 Overall Theme

A 450 kilometer waterway, connecting a number of rivers and lakes, is not of itself a cohesive, readily-understood resource. Man-made waterways such as the Rideau Canal, or the mixed canal-river system of the Trent-Severn Waterway, have a clearer geographical identity along with a history of promotion and use. In order to develop a better understanding of the waterway's potential for development and marketing, an overall theme was required to provide route identity. The "Voyageur Heritage Waterway" theme was selected as a basis for such identification and promotion of the route. This overall theme builds upon Northwestern Ontario's historical and cultural ties to the waterway routes, and will require further research in properly interpreting the area's history.

5.1.2 Sector Themes

Within the overall theme, three sectors were identified to allow for some important and realistic differentiation in themes and development. These are illustrated on Exhibit 5.1.

Quetico Country, on the east part of the route from Atikokan to Fort Frances, is seen as the most remote segment of the route, involving smaller boats and more dispersed facilities. The fur trade route and proximity to the

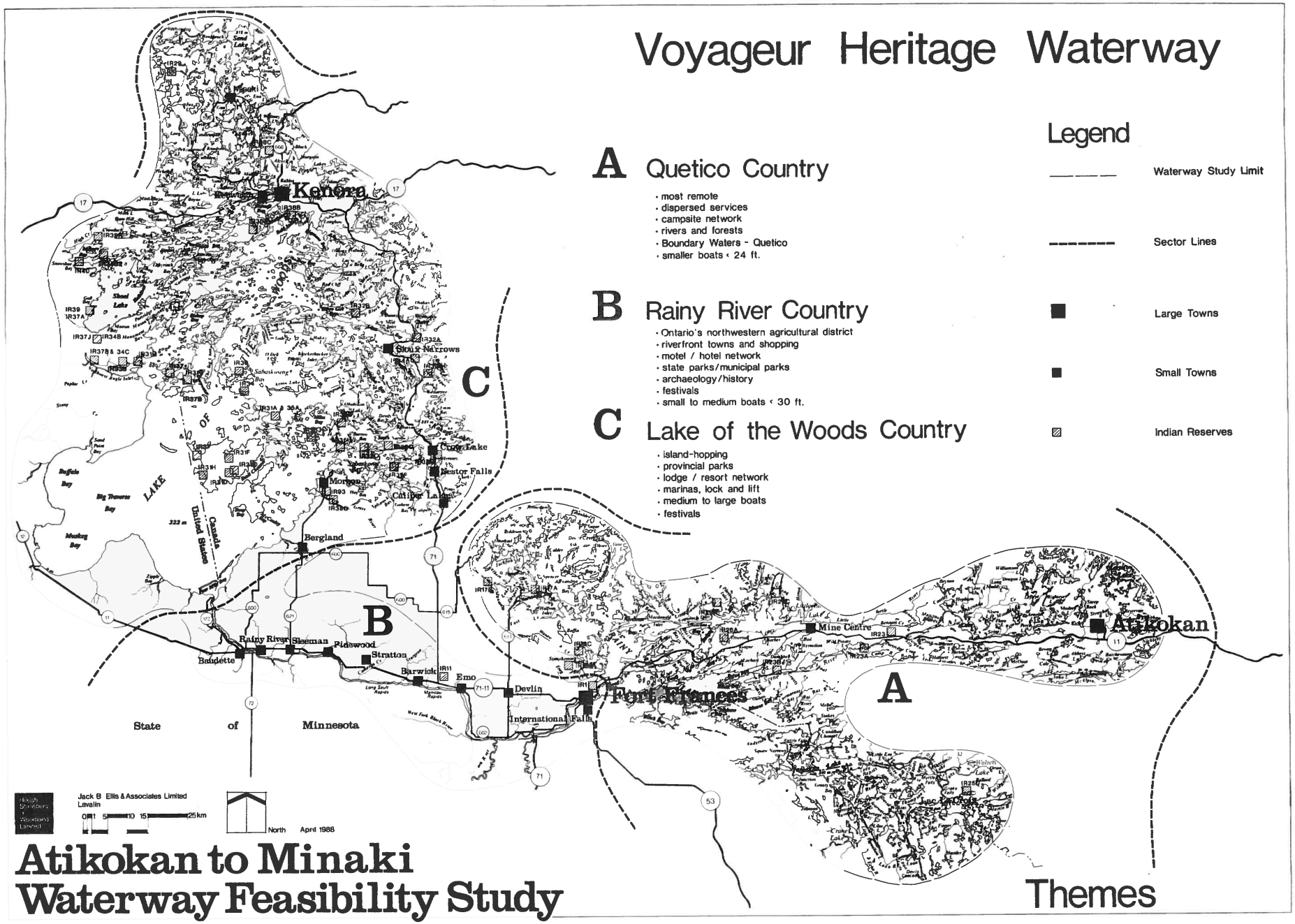

Voyageur Heritage Waterway
Legend
A Quetico Country
· most remote
· dispersed services
· campsite network
· rivers and forests
· Boundary Waters - Quetico
· smaller boats < 24 ft.
B Rainy River Country
· Ontario's northwestern agricultural district
· riverfront towns and shopping
· motel / hotel network
· state parks/municipal parks
· archaeology/history
· festivals
· small to medium boats < 30 ft.
C Lake of the Woods Country
· island-hopping
· provincial parks
· lodge / resort network
· marinas, lock and lift
· medium to large boats
· festivals
Waterway Study Limit
Sector Lines
Large Towns
Small Towns
Indian Reserves
Kenora
Minaki
Sioux Narrows
Nestor Falls
Morson
Bergland
Rainy River
Fort Frances
Atikokan
Mine Centre
Devlin
Emo
Barwick
Stratton
Pidgwood
Sleeman
Baudette
International Falls
State of Minnesota
LAKE OF THE WOODS
Jack B Ellis & Associates Limited
Lavalin
0 1 5 10 15 25km
North
April 1988
Atikokan to Minaki
Waterway Feasibility Study
Themes

Exhibit 5.1

Quetico and Boundary Waters area are key thematic elements for this sector. Its development will require a network of designated campsites situated among the scenic rivers and lakes, for which this part of the province is so well known.

Rainy River Country, the central segment of the waterway connecting Fort Frances and Lake of the Woods, will build upon the sequence of towns and Indian Reserves spaced along the Rainy River and its unique agricultural landscape. It will serve both small and larger boats; offering a completely different set of tourist attractions tied to the network of community festivals and attractions, as well as archaeological and other cultural resources.

Lake of the Woods Country will complete the western segment of the route; connecting the Rainy River portion to Kenora, Minaki, and beyond. It will emphasize big water and islands, catering to medium to large boats with opportunities for island-hopping, camping, and stopovers at resorts and municipal marinas.

Each of these segments is capable of attracting touring boaters on its own, but also complement each other in offering a combination of very different natural, cultural and, scenic resources over an extended route.

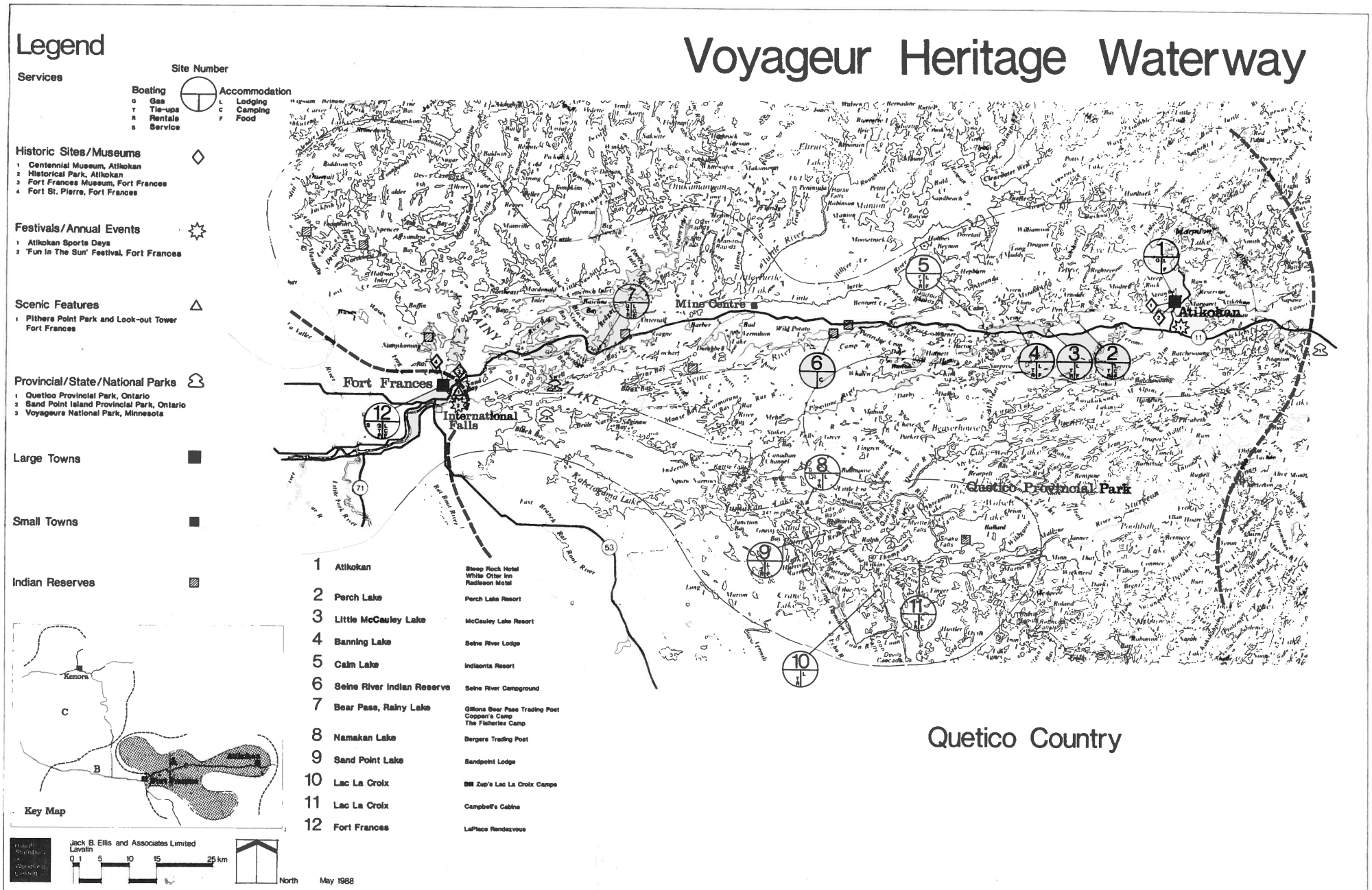
5.2 Existing Facilities

The Voyageur Heritage Waterway contains a wide variety of existing facilities and programs, which can readily be incorporated into the overall development. While additional developments will be required, the route concept is not dependent upon a massive investment in entirely new onshore facilities. An inventory of existing facilities was undertaken for each sector, and the results are shown in Exhibits 5.2-5.4. Each location is keyed by a distinct site number, and information regarding the type of boating and accommodation facilities currently available.

In addition, other attractions of interest to boaters are also identified including historic sites and museums, festivals and special annual events, scenic features, and provincial, state, or national parks.

This inventory is not intended to capture every facility, but does reveal the pattern of significant resources upon which a newly promoted waterway can build.

Voyageur Heritage Waterway



Quetico Country

Atikokan to Minaki Waterway Feasibility Study

Samples of Existing Facilities

Exhibit 5.2

Voyageur Heritage Waterway

Legend

Services

Site Number

Boating
- G Gas
- T Tie-ups
- R Rentals
- S Service

Accommodation
- L Lodging
- C Camping
- F Food

Historic Sites/Museums
- 3 Fort Frances Museum, Fort Frances
- 4 Fort St. Pierre, Fort Frances
- 5 Rainy River District Museum, Emo

Festivals/Annual Events
- 2 'Fun In The Sun' Festival, Fort Frances
- 3 Ojibway Indian Pow-wow, Emo
- 4 Emo and District Fall Fair

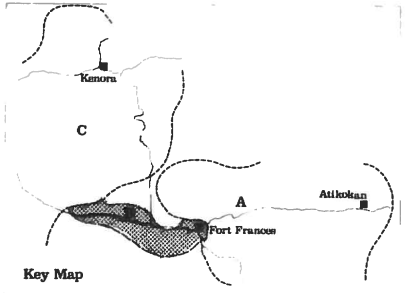
Scenic Features
- 1 Pithers Point Park and Look-out Tower, Fort Frances

Provincial/State/National Parks
- 4 Grand Mound State Park, Minnesota
- 5 Zipple Bay State Park, Minnesota
- 6 Lake of the Woods Provincial Park, Ontario

Large Towns

Small Towns

Indian Reserves



12	Fort Frances	LaPlace Rendezvous
13	Emo	Emo Inn
14	Rainy River	Road Runner Motel
15	Rainy River/Lake of the Woods	Budreau's Oak Grove Camp Sunset Beach Camp

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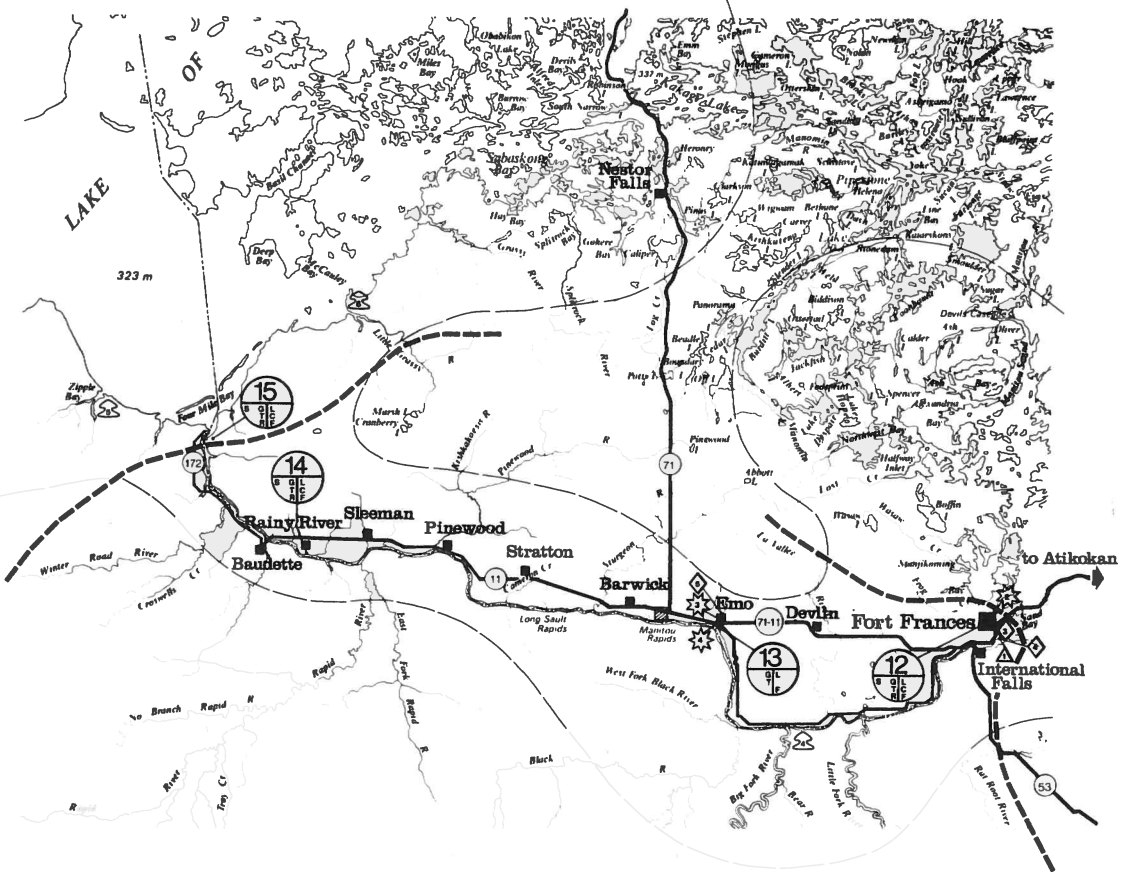
Lavalin
0 1 5 10 15 25 km
North
May 1988



Rainy River Country

Atikokan to Minaki Waterway Feasibility Study

Samples of Existing Facilities

Exhibit 5.3

Voyageur Heritage Waterway

Legend

Services

Site Number

Boating
- G Gas
- T Tie-ups
- R Rentals
- S Service

Accommodation
- L Lodging
- C Camping
- F Food

Historic Sites/Museums
- 6 Lake of the Woods Museum, Kenora
- 7 Mather-Walls House, Keewatin
- 8 Fort St. Charles, Magnuson's Island

Festivals/Annual Events
- 5 Indian Pow-wows, Sioux Narrows
  Arts Festival, Sioux Narrows
- 6 Lake of the Woods International Sailing Regatta, Kenora
  Lake of the Woods Cultural Festival, Kenora
  Lake of the Woods Folk Festival, Kenora
  International Indian Pow-wow, Kenora

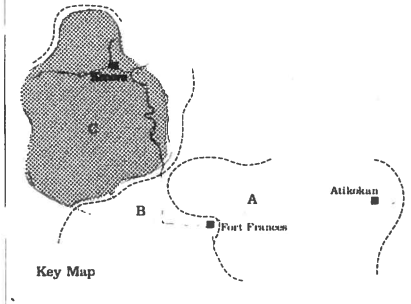
Scenic Features
- 2 Nestor Falls
- 3 Crow Island Natural Potholes, Lake of the Woods
- 4 Indian Pictographs, Lake of the Woods
- 5 Devil's Gap, Kenora
- 6 Keewatin Natural Potholes, Keewatin

Provincial/State/National Parks
- 6 Lake of the Woods Provincial Park, Ontario
- 7 Caliper Lake Provincial Park, Ontario
- 8 Sioux Narrows Provincial Park, Ontario
- 9 Rushing River Provincial Park, Ontario

Large Towns

Small Towns

Indian Reserves



Key Map

Hough Stansbury Woodland Limited

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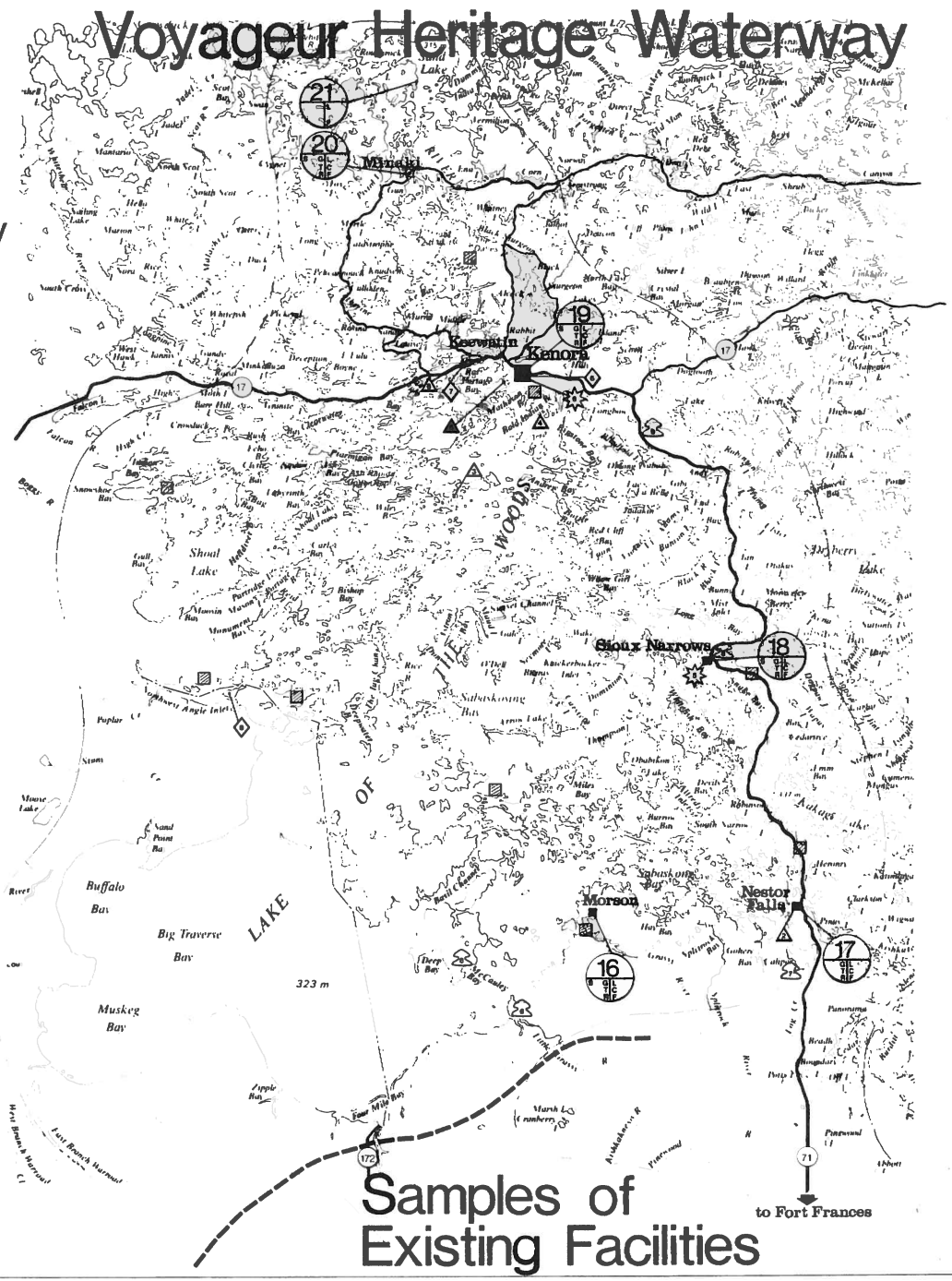
North

May 1988

Lake of the Woods Country

16	Morson	Buena Vista Resort Mylle's Place New Moon Landing Redwing Lodge Sabaskong Bay Lodge Black Island Resort Duck Bay Lodge Grassy Narrows Camp New Moon Lodge Obabikon Bay Camp Pine Island Real Em In Lodge Tamarack Lodge Amber's Resort
17	Nestor Falls	Lecuyer's Resort Canadian Haven Camp Clarke & Crombie Camp Court's Camp Green's Camp Heller's Resort McLeod's Camp Red Deer Lodge Sunset Cove Camp Tinker's Places Vic & Dot's Camp Whitefish Bay Camp Hanson's King Island Lodge Lake of the Woods Lodge Split Rock Lodge Tolton's Miles Bay Camp Young's Camp
18	Sioux Narrows	22 Small to Large Establishments The Sanctuary
19	Kenora	Ash Rapids Camp Big Narrows Resort Centre Island Resort Crow Rock Camp Mead's Spruce Island Camp Moore Bay Lodge Pine Acres Camp Pipestone Point Resort Portage Bay Camp Sandy's Monument Bay Resort KCR Camp, Winnipeg River
20	Minaki	Minaki Lodge Porky's Cove Halley's Camps,English River Big North Lodge, Winnipeg River Gun Lake Lodge,Gun Lake Caribou Falls Lodge
21	Sand Lake	Sand Lake Camp



Samples of Existing Facilities

Atikokan to Minaki Waterway Feasibility Study

Exhibit 5.4

5.3 Specific Development Concepts

An identifiable and well promoted waterway will not be successful without a commitment of onshore resources and development in support of touring boaters. The proposed concept incorporates both primary and secondary facility developments which are shown in the following exhibits.

5.3.1 Basic Support Centres

A system of strategically spaced facilities is proposed along the waterway, consisting of both primary and secondary sites. Primary sites offer fuel, docks, launching ramps, repair services, sales and rentals, access to retail shopping, and information services at intervals of less than one day's slow travel. They are intended to be staffed on a seasonal basis. Such centres are proposed at Atikokan, Fort Frances, Rainy River, and Kenora as shown on Exhibit 5.5.

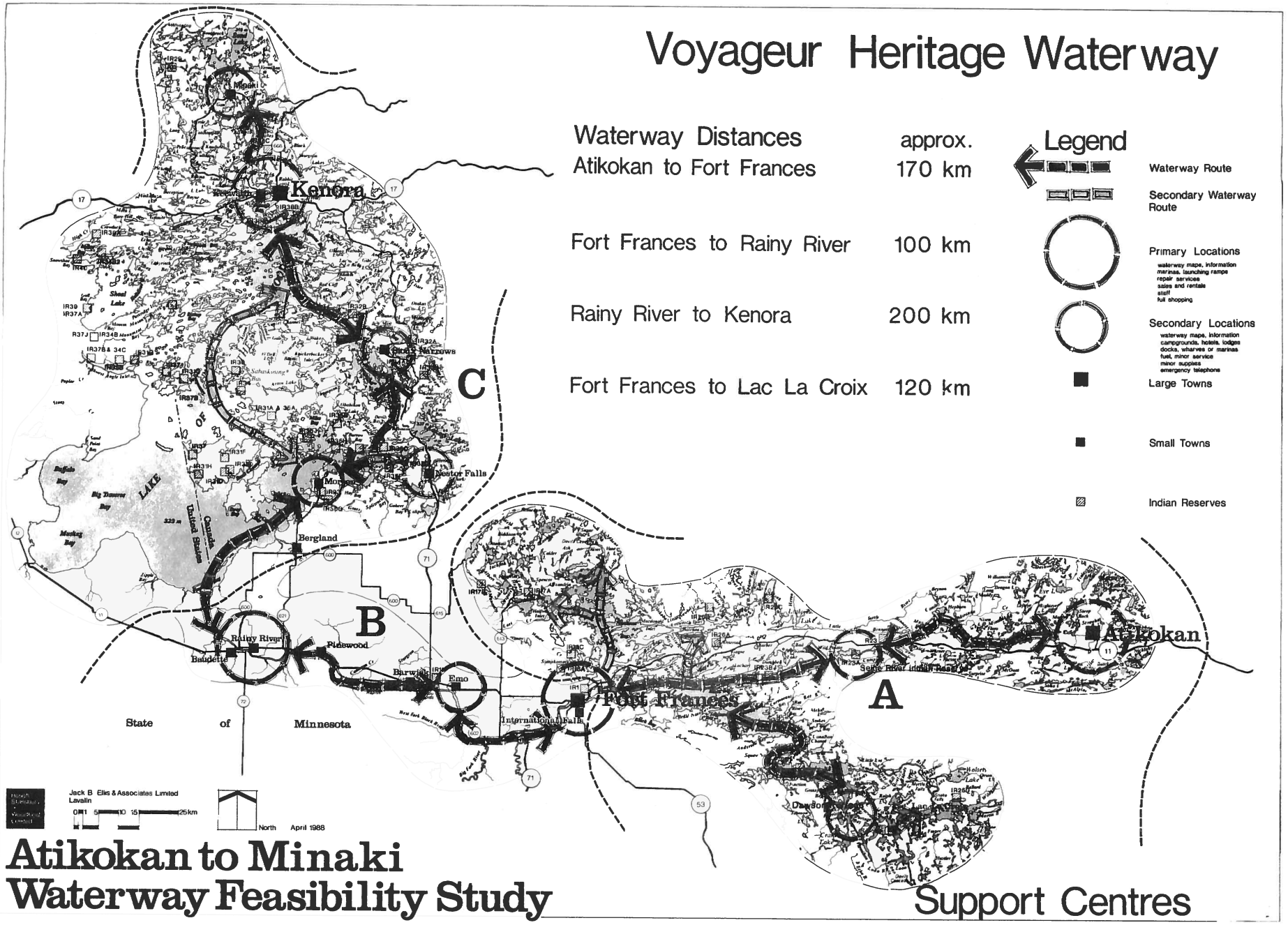
Exhibit 5.5 also shows secondary sites, which offer more basic facilities without repairs or staff. They are located at intervening points between primary sites and include; Seine River Indian Reserve, Dawson's Portage, Emo, Morson, Nestor Falls, Sioux Narrows, and Minaki.

The content of Basic Support Centres will be subject to some variation depending upon the nature of local capabilities.

5.3.2 Dispersed Support Centres

The success of the route will also depend upon a wide variety of tourist attractions and designated facilities. These include places for family camping on Crown land or at Indian Reserves, resorts and lodges, motels in the more urban areas, intervening marinas, and recreational or interpretive sites along the waterway. As discussed earlier, many of these facilities already exist, but will need to be promoted and in some cases upgraded and augmented to serve the new waterway market.

Lesser levels of boater support will be required between communities, and will rely largely upon the appropriate use of designated Crown lands. A system of individual and group campsites are needed to provide touring boaters with a wide variety of places to camp, between visits to larger communities having fixed roof accommodation. Exhibits 5.6-5.8 show, for each sector, the full range of primary, secondary, and dispersed facilities supportive of the waterway and related attractions. Where facilities are incomplete, new proposals are shown to fill out the system.

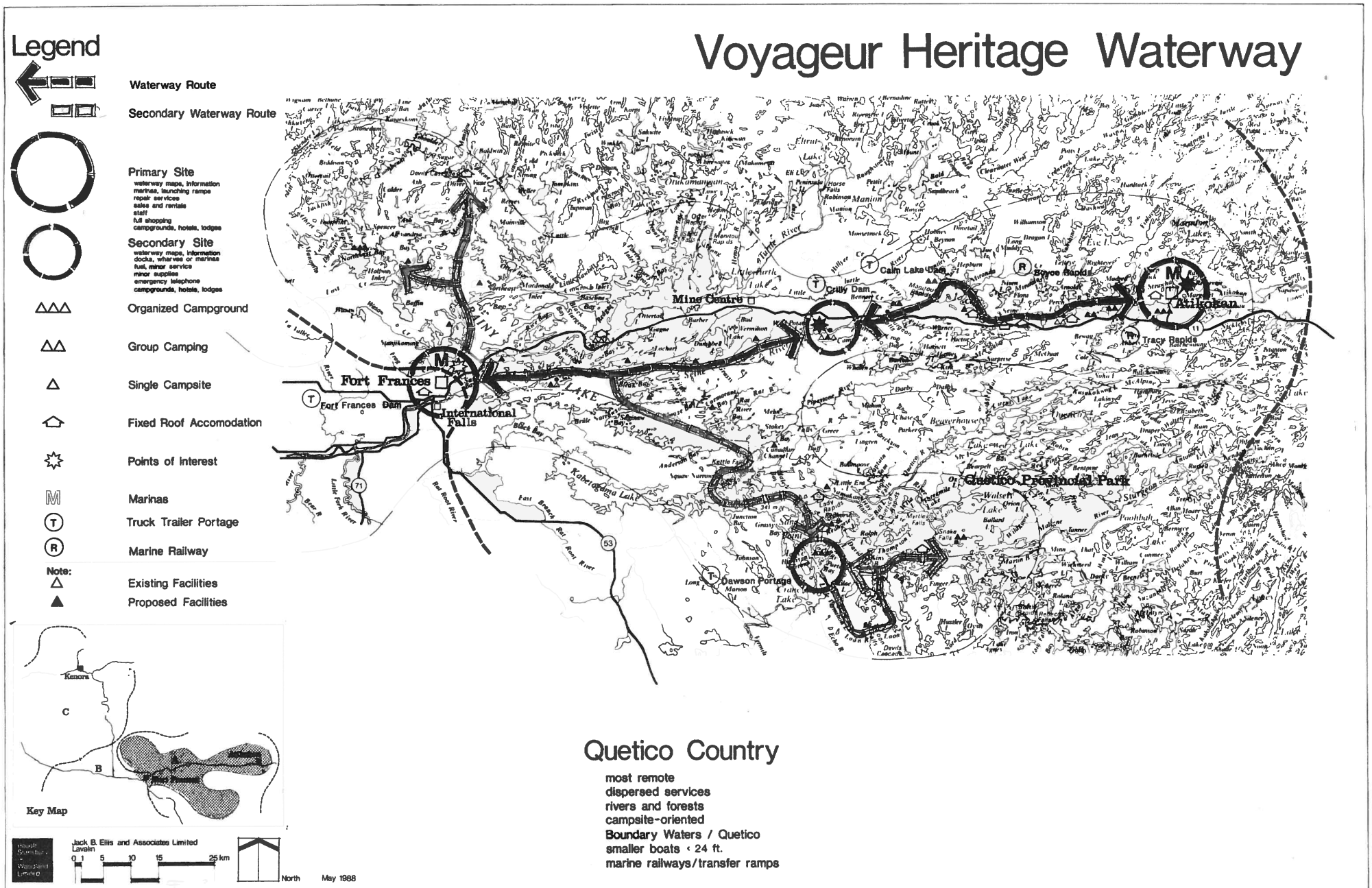


Atikokan to Minaki Waterway Feasibility Study

Support Centres

Exhibit 5.5

Voyageur Heritage Waterway



Quetico Country

most remote
dispersed services
rivers and forests
campsite-oriented
Boundary Waters / Quetico
smaller boats < 24 ft.
marine railways/transfer ramps

Atikokan to Minaki Waterway Feasibility Study

Sector Support System

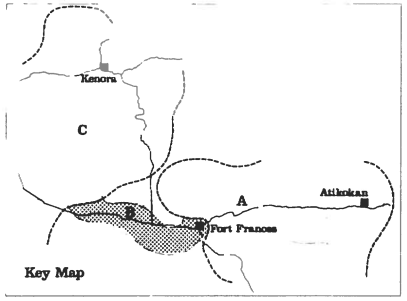
Exhibit 5.6

Legend

- Waterway Route
- Primary Site
  waterway maps, information
  marinas, launching ramps
  repair services
  sales and rentals
  staff
  full shopping
  campgrounds, hotels, lodges
- Secondary Site
  waterway maps, information
  docks, wharves or marinas
  fuel, minor service
  minor supplies
  emergency telephone
  campgrounds, hotels, lodges
- △△△ Organized Campground
- △△ Group Camping
- △ Single Campsite
- Fixed Roof Accomodation
- Points of Interest
- M Marinas

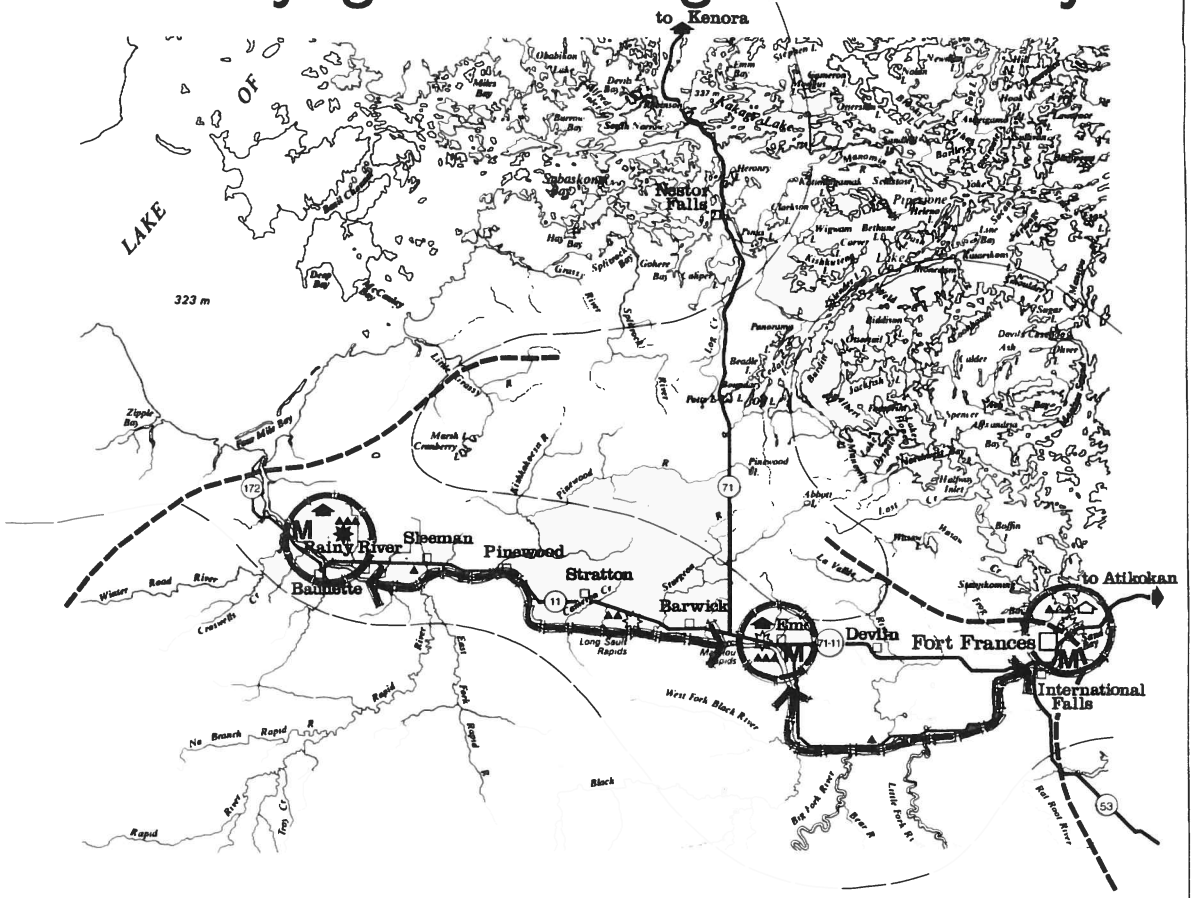
Note:

- △ Existing Facilities
- ▲ Proposed Facilities



Jack B. Ellis and Associates Limited
Lavalin
0 1 5 10 15 25 km
North
May 1988

Voyageur Heritage Waterway



Rainy River Country

Ontario's northwestern agricultural district
riverfront towns and shopping
state parks
archaeological sites
festivals
small to medium boats ‹ 30 ft.
docks / wharves
hotel / motel oriented

Atikokan to Minaki Waterway Feasibility Study

Sector Support System

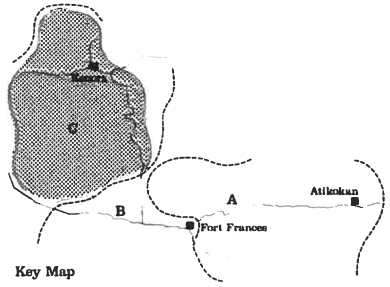
Voyageur Heritage Waterway

Legend

- Waterway Route
- Secondary Waterway Route
- **Primary Site**
  waterway maps, information
  marinas, launching ramps
  repair services
  sales and rentals
  staff
  full shopping
  campgrounds, hotels, lodges
- **Secondary Site**
  waterway maps, information
  docks, wharves or marinas
  fuel, minor service
  minor supplies
  emergency telephone
  campgrounds, hotels, lodges
- Organized Campground
- Group Camping
- Single Campsite
- Fixed Roof Accomodation
- Points of Interest
- Marinas

Note:

- Existing Facilities
- Proposed Facilities



Key Map

Lake of the Woods Country

- island-hopping
- provincial parks
- special events
- marinas, lock and boat lift
- medium to large boats
- island campsite or lodge/resort oriented

Jack B. Ellis and Associates Limited
Lavalin
0 1 5 10 15 25km
North
May 1988

Atikokan to Minaki Waterway Feasibility Study

Exhibit 5.8

Sector Support System

5.4 Typical Onshore Site Development

In order to describe the waterway facilities which will be required, as well as to prepare cost estimates, a selection of the most critical site specific development concepts were prepared. Such site planning concepts illustrate the kind of facility development envisaged for typical primary and secondary levels of boater support. While actual sites and site information were used, they are considered to be generic site plans, the cost of which can be applied elsewhere along the waterway.

5.4.1 Atikokan Marina

As a terminal site, Atikokan represents a key point of entry to or exit from the waterway. Current facilities are inadequate to attract or service the additional traffic forecast for the route. Two potential sites for a primary support centre were investigated, each having different attributes. A downstream site was reviewed, offering access into the Atikokan River on the southwest edge of town. Its advantages of more direct access into the waterway system were considered by the team to be offset by the distance from the retail and civic centre of the community. Such a distance, coupled with a generally uninteresting site, would greatly reduce the sense of being in Atikokan, and the economic benefits to downtown. However, a small secondary dock facility should be provided at this location, for those boaters not wishing to navigate further upstream.

A primary site was selected, located much more strategically on a bend in the Atikokan River at Main Street. Its close proximity to the existing museum, Township offices, and the Main Street retail zone offers a greater interest and attractiveness, as well as more likely economic benefits.

This site will require additional river excavation, and a low weir at Tracy Rapids to ensure navigability under typical boating season conditions. In addition, it assumes that the existing Bailey Bridge, currently in disrepair, will be removed, and that the piers of a second footbridge will be adjusted. Development of this site will depend upon a cooperative effort with the Museum Board, and careful integration with proposed housing development.

The site has recently been under consideration as a housing development project. The consultants feel that both projects can be very compatible and in fact mutually supportive. Finally, the proposed marina and river improvements can serve as a catalyst for open space enhancements along Atikokan's riverbanks, with future pathways, landscaping, and sitting areas being added.

Exhibit 5.9 illustrates a preliminary concept for this important facility. It can be modified to better fit the idea of a mixed housing/marina development at a later date. A modest widening of the river is proposed to incorporate a series of finger docks connected by boardwalk along the lower bank. A launching ramp with associated parking is also provided. A Marina Centre, located near the Museum at the top of the bank, and access for vehicles and pedestrians are also incorporated. Direct linkage to the Municipal Office and downtown retail and accommodation facilities is the key element of the design.

5.4.2 Tracy Rapids Portage

A concept for the truck and trailer portage described in Chapter 4 is shown in Exhibit 5.10. A typical design for each launching ramp is shown, along with nearby campsite and pit toilet facilities. The camping facilities will be important to boaters arriving at the rapids too late in the day to make a transit, and are located on nearby sites offering good views of the waterway.

An existing road, recently improved for hydro crew access, provides good access to the portage for the operator.

5.4.3 Calm Lake Portage

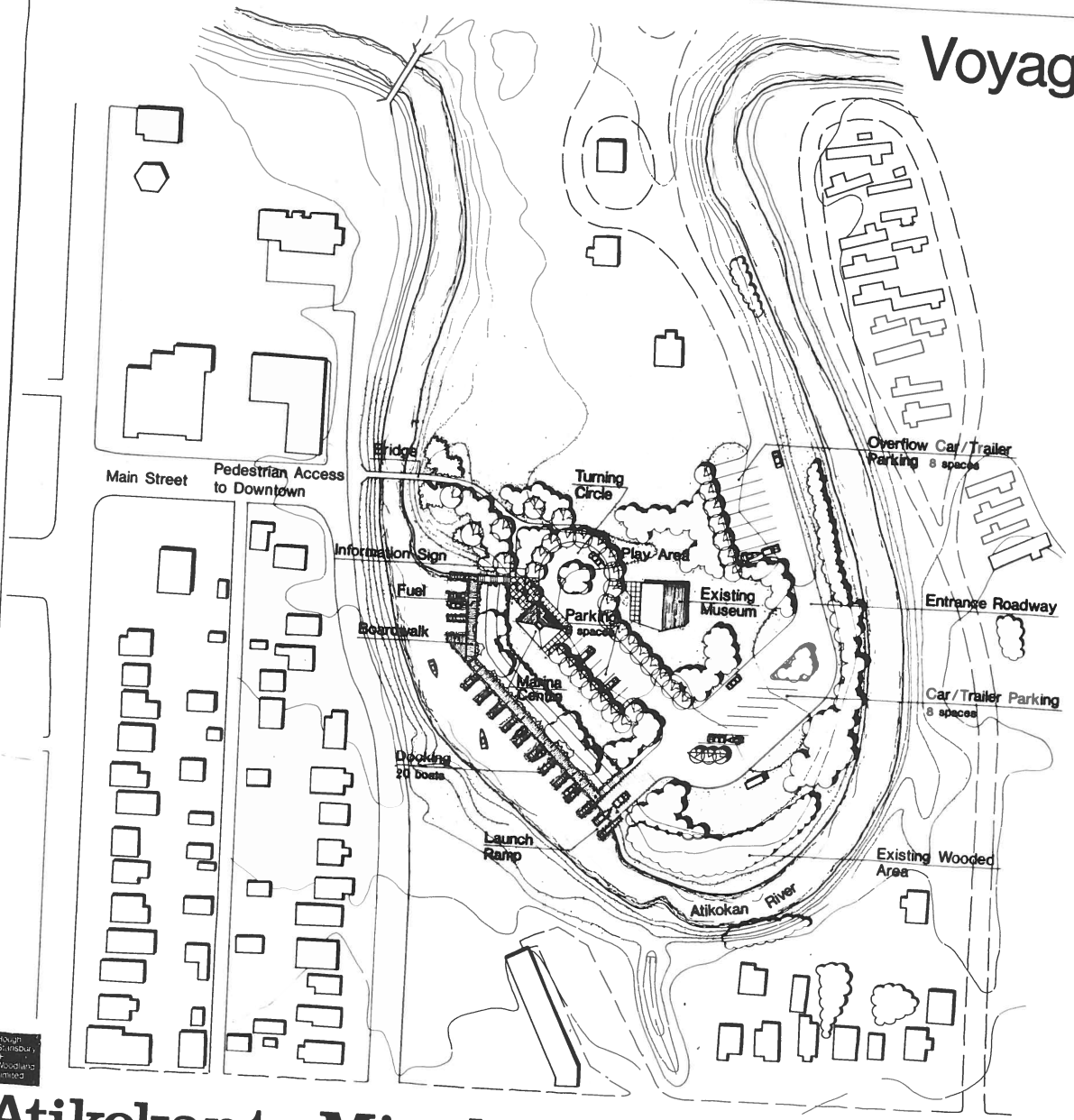
A similar concept is needed at Calm Lake, in this case, to bypass the dam. Again, two launching ramps and associated campsites and pit toilets are proposed, as well as a connecting road. Exhibit 5.11 illustrates the portage concept for this location, and also provides a typical boat-in campsite.

5.4.4 Crilly Dam Portage

Exhibit 5.12 describes the truck and trailer portage concept for this site. In this case, the facilities are located on the north shore, to permit the Seine River Indian Band to tie the development in with improved camping on the existing Reserve campground. Should the Band not wish to participate, the launching facilities could be relocated to the south side. The current campground is inadequate to support the route, and will require considerable upgrading before it can be promoted as a stopping point.

A major benefit of this location is its association with Highway 11 whereby it can continue to cater to road, as well as waterway traffic. A schematic design for a revitalized campground complete with ramps, docks, and both R.V. and tent campsites, is offered.

Voyageur Heritage Waterway



Atikokan Marina

Primary Stopover

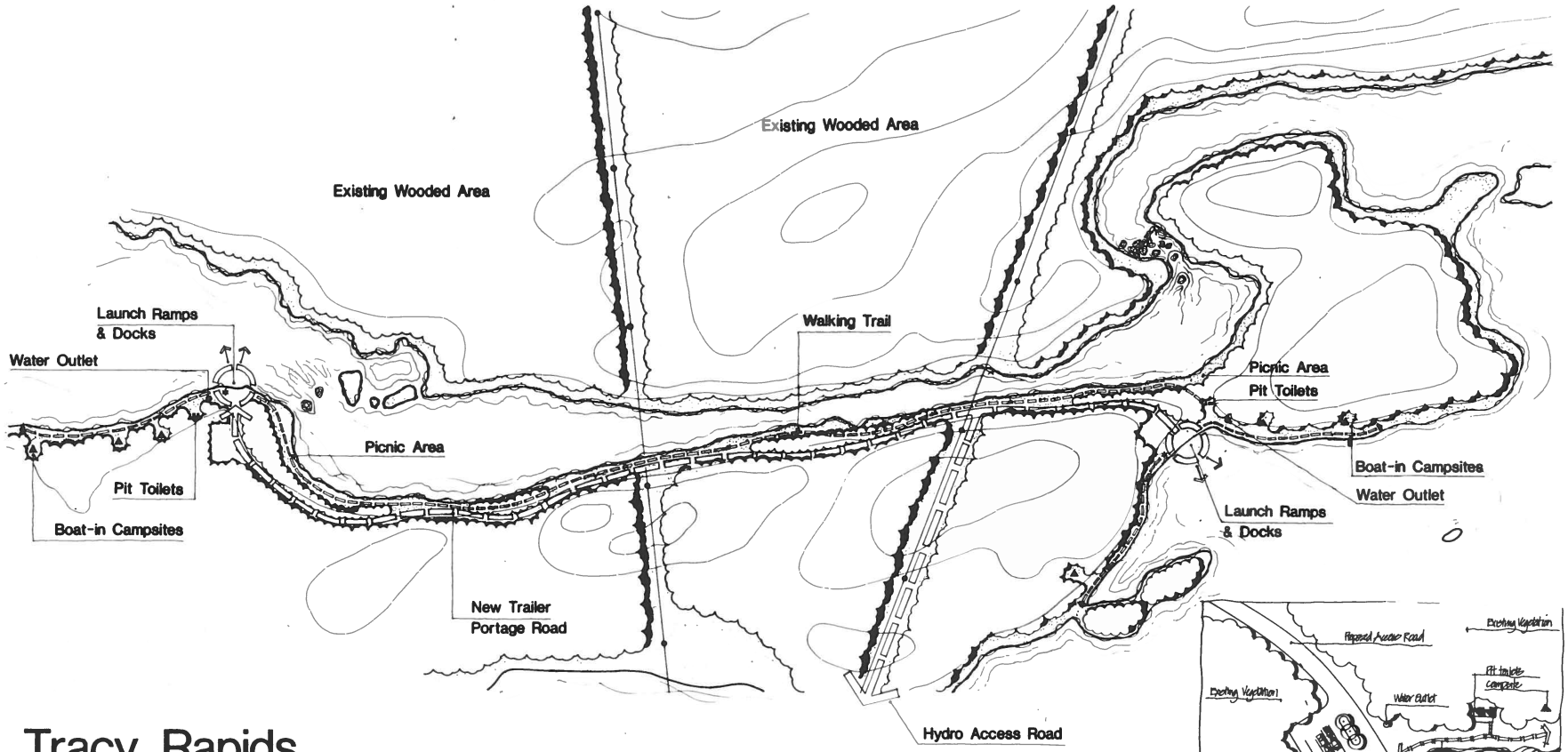
Hough Stansbury + Woodland Limited

Atikokan to Minaki Waterway Feasibility Study

Exhibit 5.9

Concepts

Voyageur Heritage Waterway



Tracy Rapids

Typical Launch Ramp & Parking

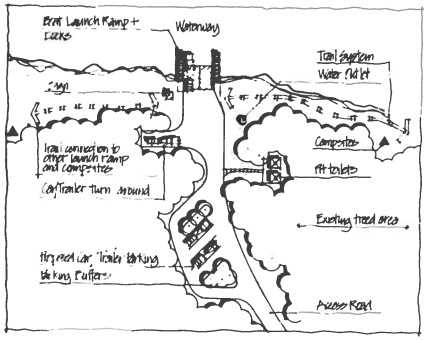
Hough Stansbury & Woodland Limited

Atikokan to Minaki Waterway Feasibility Study

Concepts

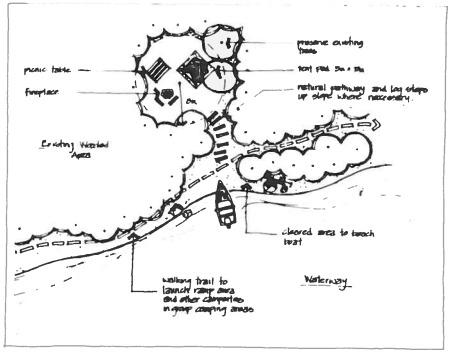
Exhibit 5.10

Voyageur Heritage Waterway



Typical Launch Ramp & Parking

Calm Lake Dam Portage



Typical Boat-in Campsite

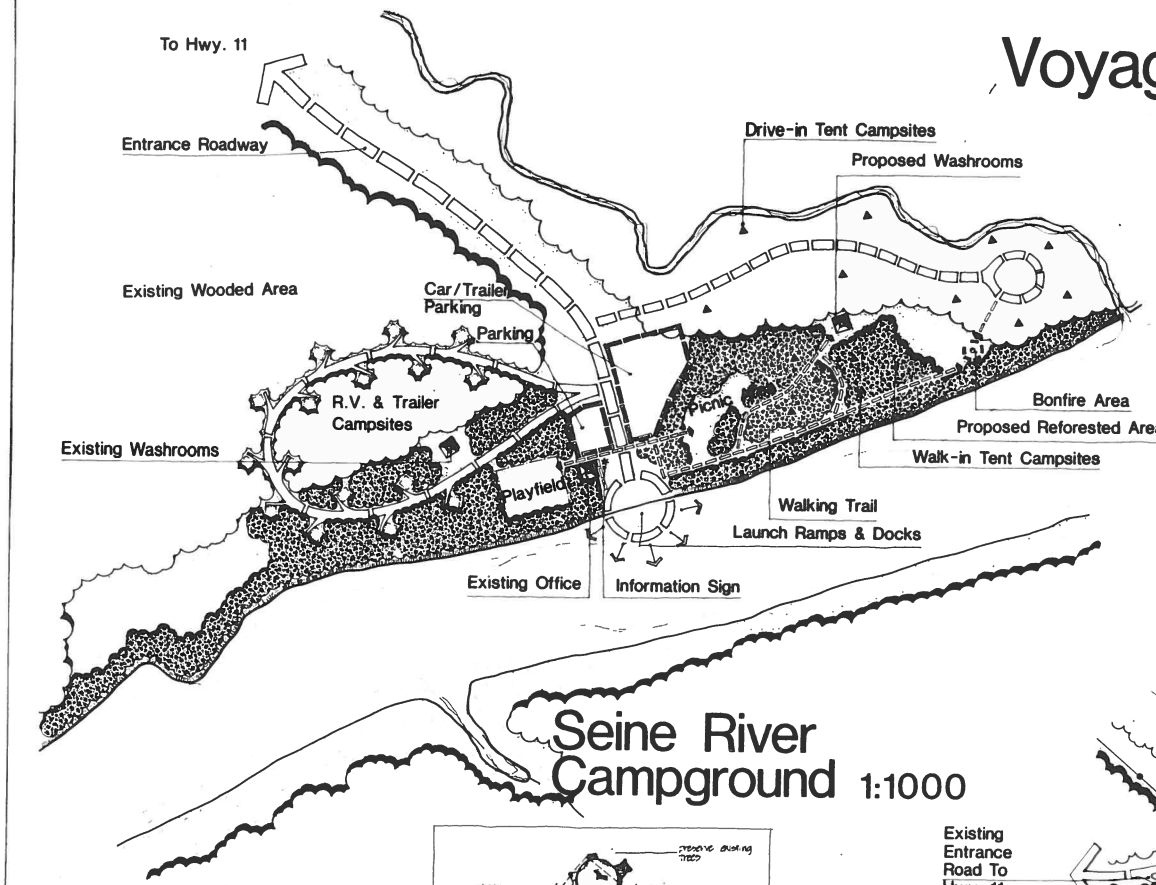
Hough Stansbury + Woodland Limited

Atikokan to Minaki Waterway Feasibility Study

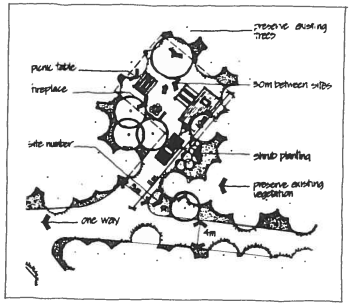
Concepts

Exhibit 5.11

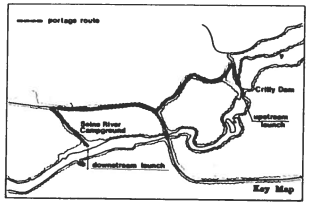
Voyageur Heritage Waterway

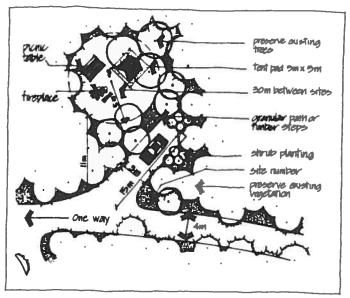


Seine River Campground 1:1000



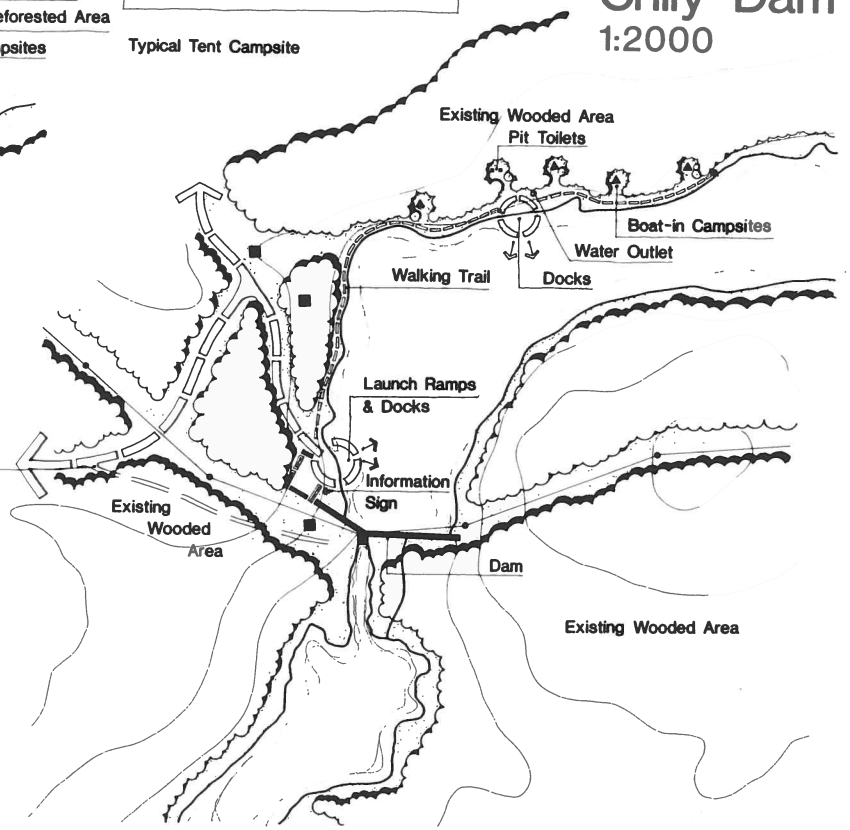
Typical R.V. & Trailer Campsite





Typical Tent Campsite

Crilly Dam 1:2000



Hough Stansbury + Woodland Limited

Atikokan to Minaki Waterway Feasibility Study

Concepts

Exhibit 5.12

5.4.5 Fort Frances and Emo Waterfronts

As described earlier, a number of communities along the waterway are in a position to provide primary or secondary support centres. At Fort Frances, a major improvement to the city's waterfront is planned, the details of which have not been released. Exhibit 5.13 shows the portage route which would connect the city's proposed marina facilities on the east to a new launching ramp below the Boise Cascade Dam at International Falls.

At Emo, waterfront improvements have already been initiated to provide pedestrian access and overlooking decks on the Rainy River. An expansion of current facilities is shown providing a protected basin and launching ramp for waterway visitors, as well as a Marina Centre and related picnic facilities. Convenient access to the downtown retail area, including the picturesque stores on Front Street, make this an attractive stopping point.

5.4.6 Rainy River Waterfront

A facility similar to that proposed in Emo is required at Rainy River, reflecting different site conditions. The existing federal wharf is augmented with new docking and launching facilities located to minimize ice damage. Nearby picnic and children's play opportunities and links to the downtown are shown on Exhibit 5.14.

5.4.7 Other Waterfront Development

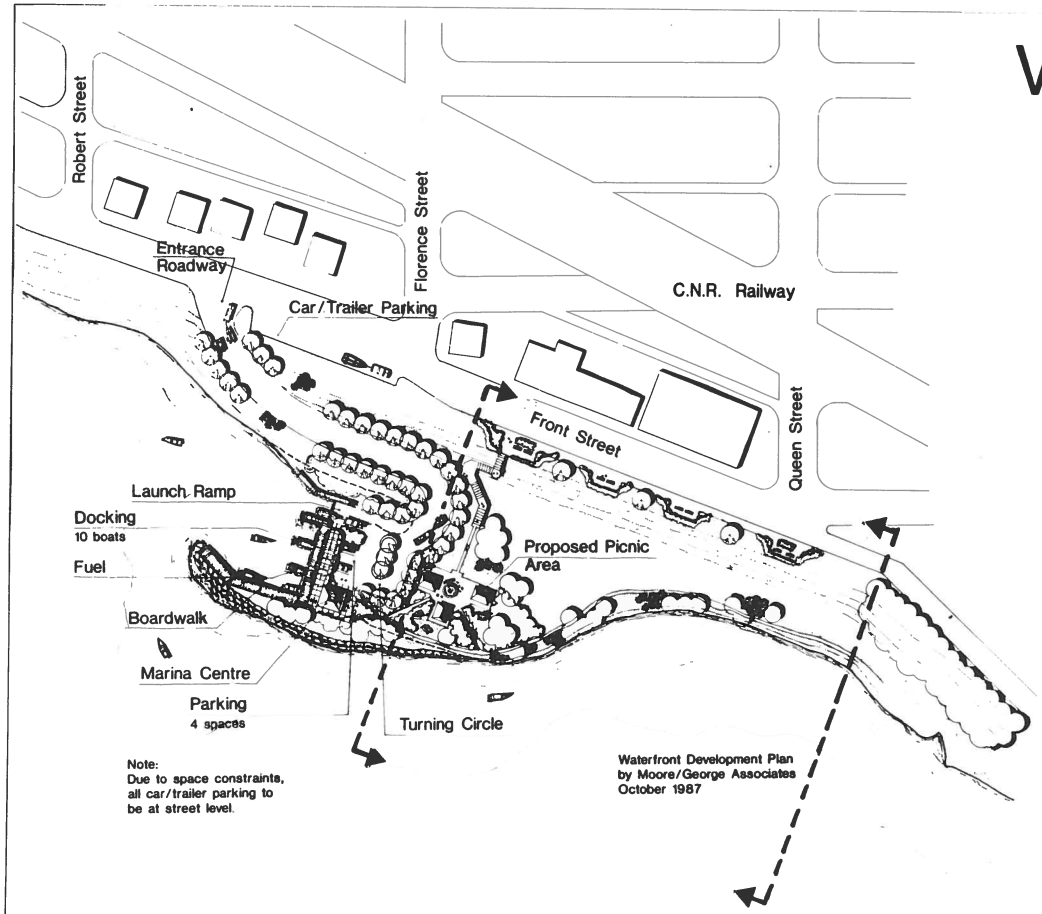
The above concepts offer designs which are flexible enough to apply to new facilities required on the Lake of the Woods sector of the waterway, such as at Morson and Nestor Falls. That sector also benefits from good existing development such as the marina facilities at Sioux Narrows, Devil's Gap, and Kenora.

5.6 Onshore Site Development Costs

The above concepts, and the application of similar site development elsewhere along the waterway, have been analyzed in terms of their capital costs. Cost information was derived from project files and discussions with local contractors.

Exhibit 5.15 provides the details of estimated construction costs for each of the three waterway sectors. In addition to overall costs, an apportioning of total costs to waterway and non-waterway markets is provided. For example, a campground development such as that proposed at the Seine River Indian Reserve will cater to both highway and waterway traffic. Only the waterway portion is assigned to this project.

Voyageur Heritage Waterway

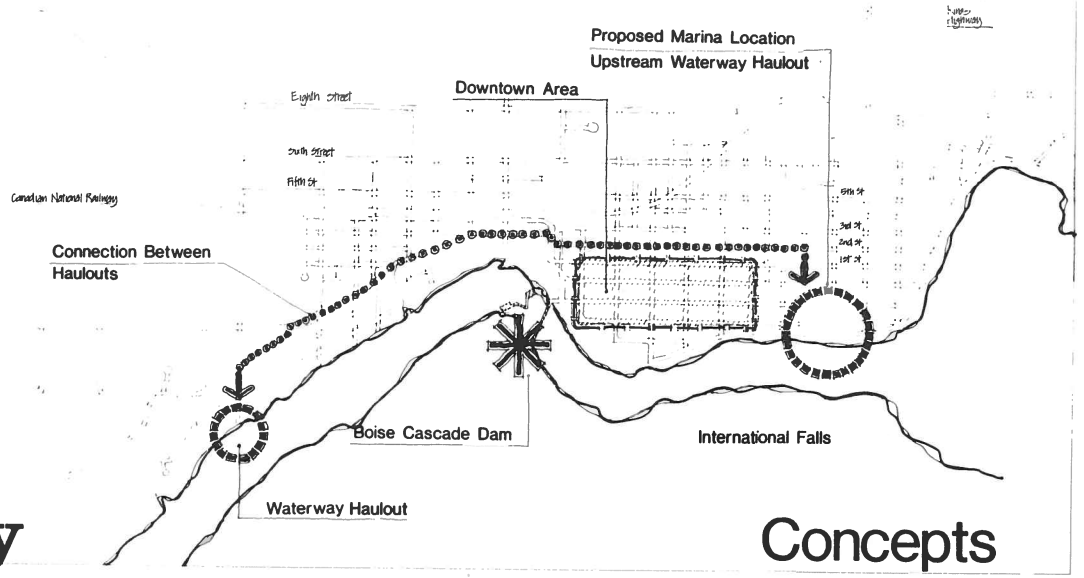


Fort Frances

Primary Stopover

Emo Waterfront

Secondary Stopover



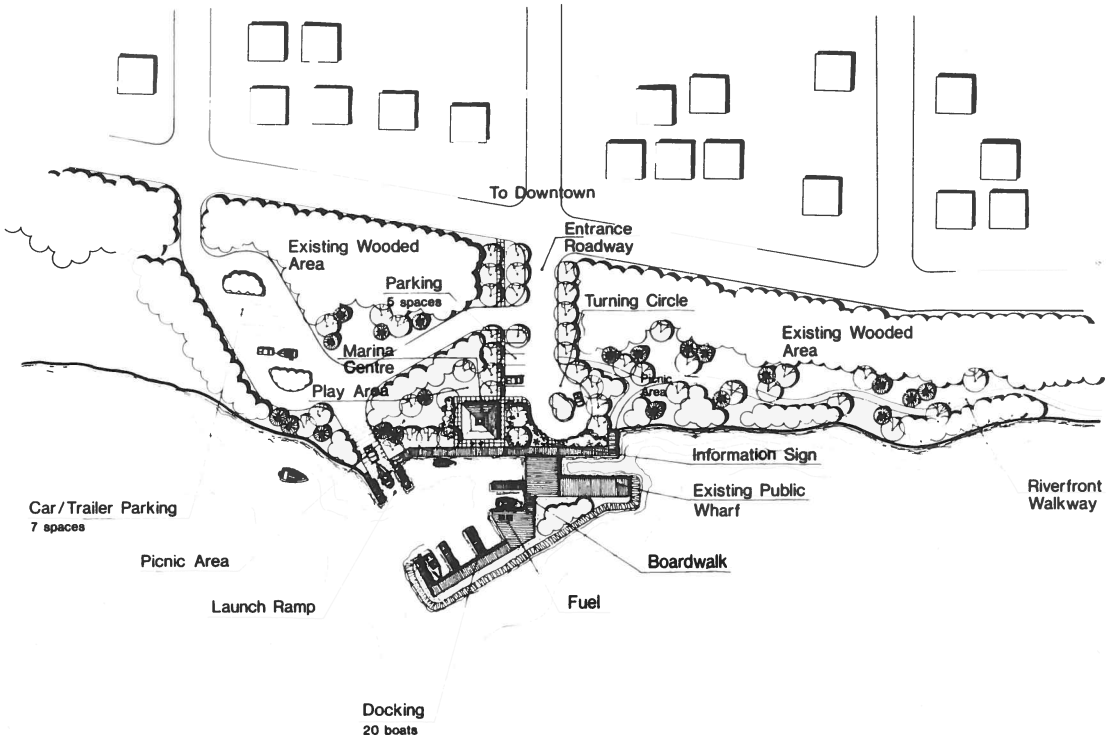
Hough Stansbury + Woodland Limited

Atikokan to Minaki Waterway Feasibility Study

Concepts

Exhibit 5.13

Voyageur Heritage Waterway



Rainy River Marina

Primary Stopover

Hough Stansbury & Woodland Limited

Atikokan to Minaki Waterway Feasibility Study

Concepts

Exhibit 5.14

Exhibit 5.15 Estimated development costs - three waterway sectors

Location	Capital Cost	% Waterway Use	Cost
Sector A Atikokan to Fort Frances - Lac la Croix			
Atikokan	$394,700.00	70%	$276,290.00
Tracy Rapids	78,200.00	100%	78,200.00
Calm Lake Dam	82,225.00	100%	82,225.00
Crilly Dam	55,650.00	100%	55,650.00
Seine River	322,000.00	20%	64,400.00
Customs Point/ Sand Lake	82,800.00	100%	82,800.00
Dawson Portage	13,000.00	100%	13,000.00
Enroute Single Campsites	42,500.00	100%	42,500.00
Northwest Bay	48,300.00	100%	48,300.00
Lac la Croix	58,300.00	100%	58,300.00
Total			**$801,665.00**
Sector B Fort Frances to Rainy River			
Fort Frances	$ 50,000.00	75%	$ 37,500.00
Emo/Manitou Indian Reserve (camping)	210,000.00	30%	63,000.00
Rainy River	230,000.00	80%	184,000.00
Long Sault	48,300.00	100%	48,300.00
Enroute Single Campsites	8,500.00	100%	8,500.00
Total			**$341,300.00**
Sector C Rainy River to Kenora			
Morson	$ 75,000.00	80%	$ 60,000.00
Nestor Falls	50,000.00	80%	40,000.00
Sioux Narrows	100,000.00	80%	80,000.00
Kenora	15,000.00	100%	15,000.00
Lake of the Woods	75,000.00	100%	75,000.00
Single Campsites	23,000.00	100%	23,000.00
Total			**$293,000.00**

The total cost, in 1988 dollars, of onshore projects is estimated to be $2,062,475, of which $1,435,965 or 70% is assignable to the waterway. These costs, along with the navigation improvement costs identified in Chapter 3 form the basis for the benefit-cost analysis described in the following section.

5.7 The Benefit-Cost Picture

The economic benefits to the region will consist of new spending arising from the new business which arises as a result of the waterway. A summary of the annual spending and employment volumes (presented earlier in Section 4) is as follows:

- Annual Direct Spending $1,710,000
- Annual Direct, Indirect, and Induced Spending $2,565,000
- Annual Direct Employment 371 person-months
- Annual Direct, Indirect and Induced Employment 482 person-months

Revenues and taxes will annually accrue to the provincial and federal governments, in amounts estimated at:

- Provincial Taxation Receipts $185,000
- Federal Taxation Receipts $164,000

5.7.1 Benefit-Cost Calculations

The benefits of the waterway are seen as arising from the increased spending which occurs in the area as a direct result of the project. We have not added to our analysis the benefits which will arise because of enhanced image of the region, greater safety for boaters, impacts of construction costs, local or community enhancement, or intangibles. We have not done so because most of them are difficult to quantify. Such values do exist, however, and any consideration of the actual benefit-cost picture should at least acknowledge them since they help the purely financial benefit-cost picture.

The costs attributed to the waterway in this analysis are:

- the construction costs, taken on the basis that all projects described in this report are undertaken;

- the annual operating costs of the waterway portages and facilities, taken over a 25-year period representing the conservative lifetime of the facilities.

In some cases, the facilities are shown as having only a partial use by the waterway, if they are likely to be of direct benefit to local or other users. In such cases, the capital and operating costs of the facility are attributed partly to the waterway and partly to other users. The

proportions vary, depending on the facility type and location, but in each case where an allocation has been made, this is shown in the Appendix B spreadsheets on the benefit-cost analysis.

Further assumptions used in the benefit-cost analysis are:

- the costs and benefits are taken all in constant 1988 dollars, without inflation, as is normal for a formal benefit-cost analysis;

- the values of future year spending (benefits) and costs (operating) are all discounted to their present value by applying a 10% discount factor;

- the analysis frame is taken over a 25-year period, with all future values of costs and benefits being brought back to present values using the discount factor;

- intangible costs are not included, but are likely to be low or negligible, as discussed earlier in Section 4.

On the above basis, the benefit-cost ratio for the entire project was calculated for two options:

Option 1 Where all portages are built, equipped and staffed by a public agency;

Option 2 Where all portages are built by a public agency, but are equipped and staffed by a private contractor (with the exception of Tracy Rapids, as noted in Section 4).

The difference in the initial capital costs are shown in the graph in Exhibit 5.16, on the following page. The difference in the annual operating and maintenance costs are shown in Exhibit 5.17, on the next following page.

When the calculations are completed on this basis (details given in Appendix B), the results are:

Option 1 Benefits outweigh the costs by 1.9 times
Option 2 Benefits outweigh the costs by 2.6 times

Thus, the project can be seen to create considerably more benefits than its cost (Exhibit 5.18).

While the waterway would not be a complete entity without one or more of its key segments, the benefit-cost ratios for each sector were also calculated (see Appendix B). These ratios show that there is no individual sector of the waterway whose B/C ratio falls below 1.7.

Exhibit 5.16

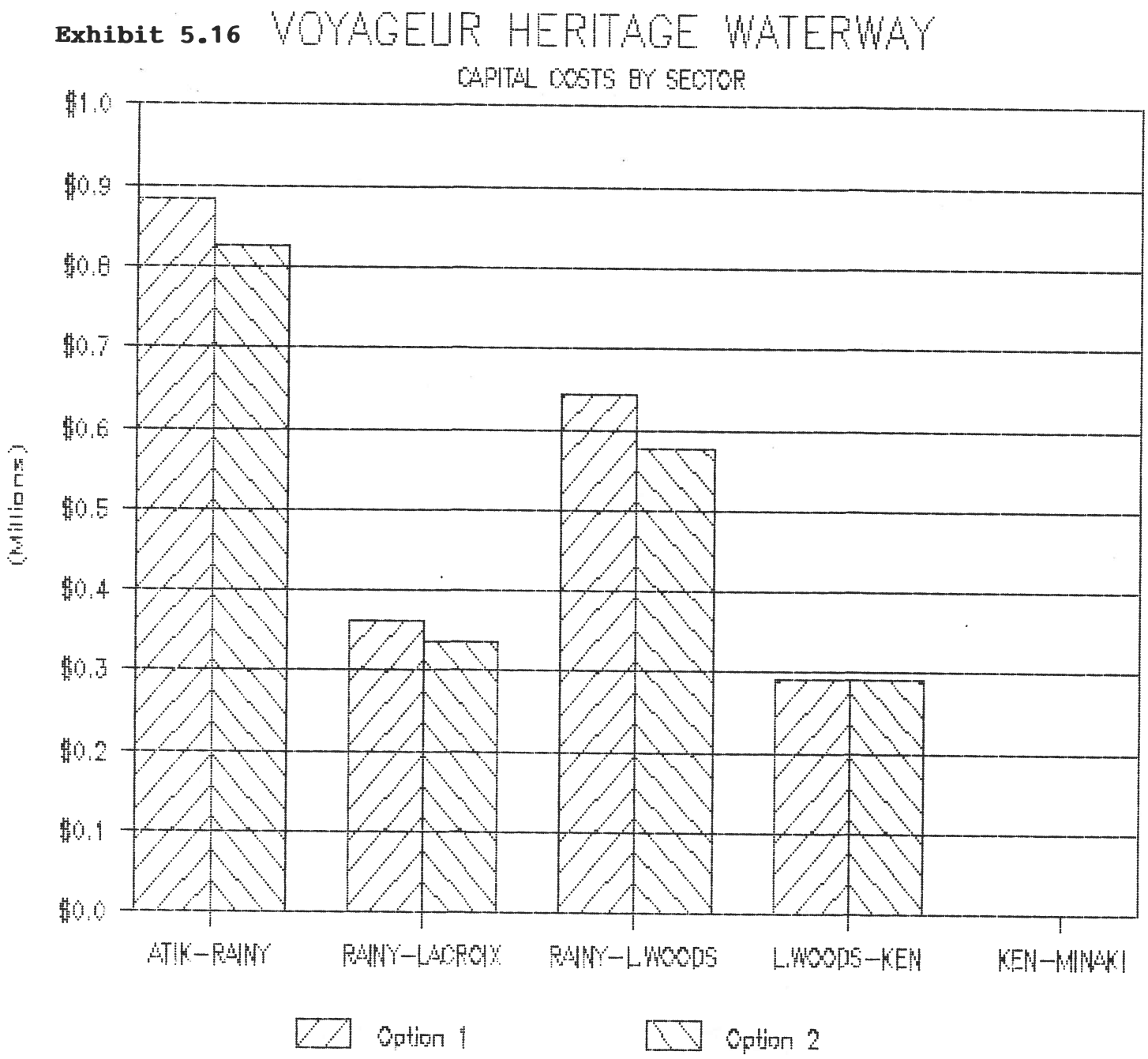

VOYAGEUR HERITAGE WATERWAY
CAPITAL COSTS BY SECTOR
(Millions)
$1.0
$0.9
$0.8
$0.7
$0.6
$0.5
$0.4
$0.3
$0.2
$0.1
$0.0
ATIK–RAINY
RAINY–LACROIX
RAINY–L.WOODS
L.WOODS–KEN
KEN–MINAKI
Option 1
Option 2

Exhibit 5.17

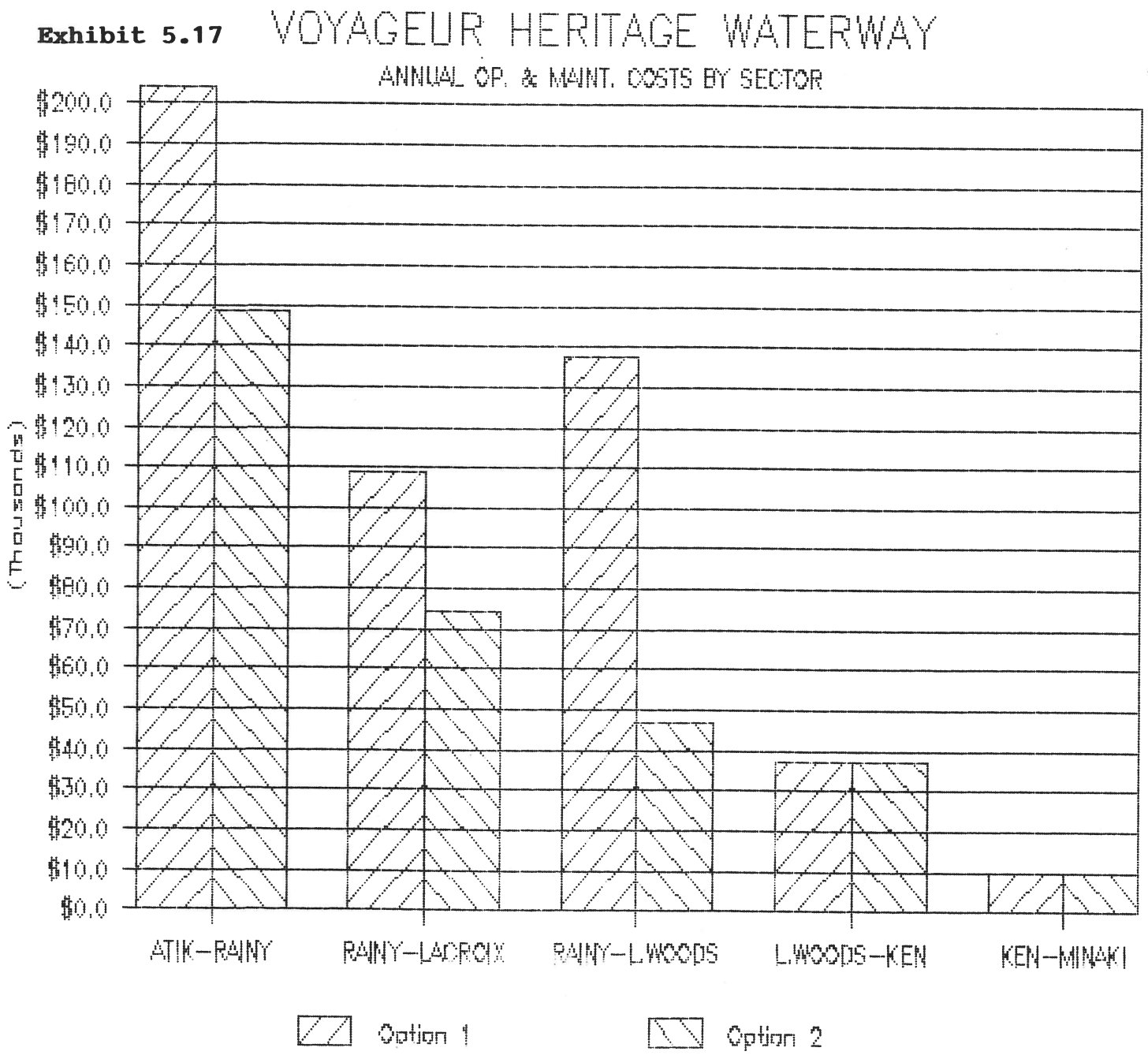
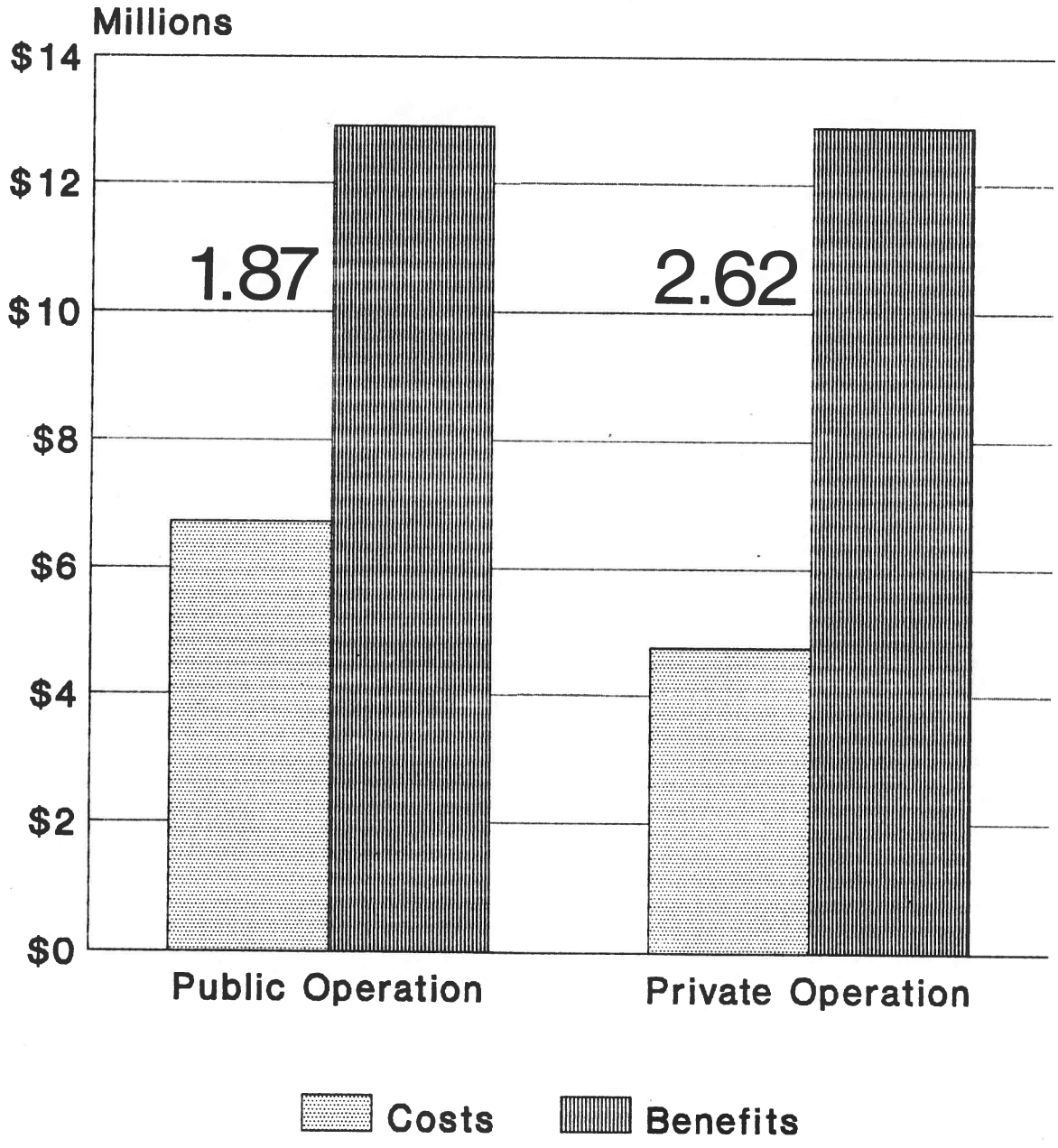

VOYAGEUR HERITAGE WATERWAY
ANNUAL OP. & MAINT. COSTS BY SECTOR
(Thousands)
$200.0
$190.0
$180.0
$170.0
$160.0
$150.0
$140.0
$130.0
$120.0
$110.0
$100.0
$90.0
$80.0
$70.0
$60.0
$50.0
$40.0
$30.0
$20.0
$10.0
$0.0
ATIK–RAINY
RAINY–LACROIX
RAINY–L.WOODS
L.WOODS–KEN
KEN–MINAKI
Option 1
Option 2

Exhibit 5.18

Benefit/Cost Summary
Two Options



NPV at 10% at 25 years

6. IMPLEMENTATION

6.1 Project Management and Coordination

One of the prime requisites for the successful realization of the Waterway project will be good coordination and management. While it is not a mega-project in capital terms, it is a complex array of many small to medium sized capital improvements to navigation and shore facilities. All must be realized in a coherent and coordinated fashion, or the utility and the image of the entire Waterway will suffer as a result.

Perhaps the greatest need, and one of the first steps in implementation, should be to set up a body with a continuing presence and a wide enough mandate to see: first, to the implementation of the project; and then, to its operation and management. For want of a better term, we shall call this management body the **Voyageur Heritage Waterway Management Commission.**

This Management Commission should be composed of representatives from all affected communities and Indian Bands, and relevant senior government agencies, with a similar structure to the current study's Steering Committee but with a wider coverage. In some cases, groups of smaller communities in a given area might share one representative to keep the overall size of the Commission manageable, but the principle of wide and inclusive representation should prevail for all policy matters.

As navigational improvements proposed at four locations (Dawson Portage, Manitou Rapids, Long Sault Rapids, and Rainy River) fall within International Waters, it will be important to provide for representation from Minnesota agencies as well. The Commission should likely be an incorporated body, with the authority to enter into contracts, receive grants and other funds, and employ staff as necessary.

The Commission will have to ensure that the various projects comprising the Waterway are carried out, and that a set quality standard is maintained. Services, facilities, information, and even signing and promotional graphics will have to project a unified theme and a high quality of user experience.

The Commission may evolve a more task-oriented and streamlined sub-committee system to deal with the more frequently arising matters. An Executive Sub-Committee, for instance, could be empowered to make certain project or operational decisions on behalf of the Waterway. A Marketing and Promotional Sub-Committee could keep the

efforts on promoting the Waterway well coordinated, while still allowing considerable scope for communities and businesses to co-promote their own resources along with those of the Waterway.

It will likely be beneficial to hire a full-time Coordinator from the outset. This person would have the day-to-day mandate to carry out the process of implementation and the smooth operational management of the Waterway, under direction from the Management Commission. The Coordinator will, of necessity, require a base in one of the communities, but should have a suitable travel budget and access to a set of temporary-duty offices (with secretarial and similar help) on a shared basis in several other centres on the Waterway.

The Coordinator should have a good professional background in marketing and promotion, and some exposure to project management would be a distinct asset. Since the success of the entire project depends to a great extent on marketing, promotion, and coordination of efforts of many people, agencies, communities and businesses, the ability to work well with a diverse array of area interests will be essential.

In our budgets as projected for the benefit-cost analyses, we have allowed a nominal amount of $75,000 for initial set-up and promotion of the activities of the Waterway Commission, and $150,000 per year for the ongoing costs of promotion, the Coordinator, and general administration. These figures should be reviewed for their adequacy in the light of the marketing recommendations given in Appendix B.

6.2 Essential Role of Marketing and Promotion

The Waterway should be seen as a new product entering a marketplace where similar but not identical products are available. It has great potential for success but to realize this success, the market will have to be carefully cultivated and continually promoted. The Sony "Walkman" is perhaps the best example of a recent product that was almost entirely new to its marketplace, and which became a success through marketing and offering a new user experience. It achieved its success despite some initial sceptics within its own company.

In considering a strategy for taking the Waterway from a physical reality to an economic success, the "four P's" of marketing must be followed. They are:

PRODUCT The Waterway must be seen as a new experience for users, one which will have a diversity to it, through the different sectors and the different types of boating experience they offer, and as

types of boating experience they offer, and as projecting a new image of the Northwestern Ontario area as a whole. No longer are its lakes and waterways just single places on a map, joined by highway networks and separated by wilderness, they are a system accessible by average-size boats and by average users. A wide range of boating styles can be accommodated from primitive boat camping to luxury boating and resort accommodation. The different market segments identified in this report also will have to be appealed to in different manners since each will be buying a slightly different "product". The packaging of boating provision (including the user's own boats) along with accommodation, related activities, and the experience of different communities and landscapes (waterscapes) must be approached with some innovation. The provision of information to boaters and potential boaters will be a central element of the product since the Waterway, without information as to where it goes, what attractions and services are available and where, and how to use it, is just a collection of facilities. The image of the product will be a large part of the product itself.

PRICE

The price/quality balance of the Waterway system will be another essential ingredient of its overall success. The price levels for passages will be, in this context, a minor component of the whole. The pricing of a whole experience will be the key factor in affecting use and satisfaction; and hence, repeat business and word-of-mouth promotion.

POSITION

The "position" of the Waterway in the Northern Ontario tourism and boating market will be unique, in that there will be no other identical product. While there are similar waterways in other areas, such as the Trent-Severn system in Southern Ontario, the ability to gain powerboat access to such a vast and diverse network of waterbodies, communities, and scenic experiences will be unique. As such, the Waterway should be marketed as a different experience from other tourism products now current in the region. Specifically, its advertising should position the Waterway in a different manner than current "fishing" packages, though some users will also fish incidentally; and in a different manner than current houseboat rental packages, although some users will find accommodation on their boats.

PROMOTION This effort will be central to the Waterway's success, as already noted. The promotional effort should take on many levels:

- on-site and at-source advertising and information provision;
- advertising on its own behalf, through video and graphic media in selected target market areas;
- tied and related advertising, done through cooperation with communities and tourist operators who wish to both bolster the image of the Waterway and to boost their own images and business volumes through association with it.

6.3 Funding

There are several sources of funds which are applicable to the Waterway project, some of which apply to capital funding and some to operating support. It is likely that the Northern Ontario Heritage Fund may be a useful source to pursue, since this project has such a great potential for regional image building and spin-offs, in addition to being viable economically in itself.

It will undoubtedly be the case that new programs will arise, and currently existing ones change or disappear, as the project proceeds through implementation to normal operation. For this reason, this section does not expand on the use of the programs listed in Appendix B, nor does our economic analysis reflect their input. The project is feasible in a business and benefit-costs sense without them, but for the realization of individual elements of the system they will be crucial.

Thus, it is essential to set forth here some suggestions regarding strategies of funding, and general approaches which might be followed.

First, it must be recognized that each project needs a local government or agency to be its sponsor, as well as the Waterway overall. The Waterway can assist local agencies either directly or through its good offices and connections to funding sources. But it must be the first step of the Waterway governing body to assign the responsibility for implementation and funding of each capital improvement to some willing local agency.

Then, second, the funding for the operation of the Waterway Management Commission and staff must be sought. As we see it, this is a requirement to implement the Waterway successfully. The Waterway Commission must seek sources of funds to set itself up and to do its job. The best source of such funding will likely be a high-level approach to the

Ministry of Northern Development and Mines, since this ministry has accepted the role of "one window" service on projects and programs of broad regional benefit. Their help in securing a "package" of funding from regular programs and special grants, if needed, will be indispensable.

Finally, the operation of the waterway will become a joint responsibility of the many communities along the route, and the Waterway Management Commission itself. Each community should work out a strategy for operating the facility or facilities it houses, and these must be tailored to the nature of the facility and its additional uses by the community or other tourists. In some cases, the facilities may be best let out to the private sector to manage, as was suggested for the case of the portages. In other cases, the private sector may provide the facilities (marinas, service, etc.), as well as operate them. In the case of remote installations, such as enroute campsites, their operation and maintenance may be either up to the Ministry of Natural Resources, or contracted out to a nearby tourist operator or Indian Band.

The central message of this section is, however, that each element of the Waterway must have some direct sponsor/manager in addition to the Waterway Commission, and that a strategy for funding must start now to consider where the operating and maintenance support is to come from.

6.4 Jurisdictional Roles

The roles of the different jurisdictions are generally clear from the discussion of implementation and funding above. It is useful, however, to summarize them here so that any ambiguity is avoided.

6.4.1 National and International

The cases of Dawson Portage, Manitou Rapids, Long Sault Rapids, and the removal of pilings in the Rainy River will have to be approached from the national and international level. Once navigational improvements have been completed, the operation of Waterway facilities on the Ontario side can be done by other bodies, although facilities and promotional efforts will be undertaken on the Minnesota side as well, and their sponsors should be invited to participate through the Waterway Commission, as noted.

6.4.2 Provincial

The Ministry of Natural Resources is the custodian of all Crown lands and waters, and the resources which they contain. As such, it must be involved with the construction and operation of any Crown land (or water) facilities. The Ministry of Tourism and Recreation can help with the

promotion and information provision, as well as the facilitation of tourist operators in becoming involved with the Waterway. The Ministry of Culture and Communication can help with the development and interpretation of relevant historic and cultural sites, which should have interest beyond that of the Waterway and its users. The Ministry of Northern Development and Mines can assist in the overall economic development aspects of the Waterway, by offering assistance through regular or special program funding.

6.4.3 Communities and Indian Bands

These should be the landlords of the facilities within their areas, and should normally be their operators unless the private sector is found to be willing. They should see the Waterway facilities as adjuncts to their whole array of boating and tourism resources, while operating and maintaining the facilities to a standard set by the Waterway Commission (on which they should be represented).

6.4.4 Boise Cascade

This company owns and operates the Calm and Crilly dams, and has considerable interest in the use of the river for its own operations. It should be encouraged to participate in the detailed planning and development of the Waterway, and to cooperate in the provision of navigation improvements necessary to the Waterway's success.

6.4.5 The Waterway Management Commission

This body should manage and oversee the final planning and development of the Waterway. Its first activity will be fund raising, followed by planning and development of the route and associated facilities, promotion, and maintenance of high quality standards. It should be responsible for the overall image and marketing of the Waterway. As such, it should have the authority to sanction any other body whose performance may not be up to its standards, such as by removing the Waterway identification or logo from any facility or service where such action may be warranted.

In summary, the Commission should be responsible for:

- fund raising
- Waterway promotion
- route and facility development
- quality standards

To accomplish such role, it will require the efforts of a full-time staff person.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 Overall Feasibility

The concept of a Voyageur Heritage Waterway is a feasible one in which a variety of benefits to virtually all communities, and both the public and private sectors, will more than outweigh its relatively modest costs. There are many non-economic benefits to be realized, including a tangible identity linking waterway communities with each other. The waterway, if properly developed, promoted, and administered will unite what is an essentially random collection of towns and Indian Reserves into a framework of communities having a common link.

This identity will enhance the image of the area, especially in its ability to promote outdoor recreation and tourism which incorporates, but is not reliant upon, the provincial park system. The waterway is a community as well as provincial asset. There will be, in addition to the tourism generated (which will be the waterway's primary function), local improvements of waterfront quality and access of importance to all residents.

The economic benefits to the region will consist of new spending arising from new business as a result of the waterway. Annual spending and employment in the sectors directly affected should amount to over $1.7 Million and 950 person-months.

In addition, indirect and induced spending and employment will be generated. For the region as a whole, we estimate that economic output will increase by over $1.5 million annually, and that household incomes will increase by over $780,000.

Revenues and taxes will annually accrue to the federal, provincial, and local governments at the rate of almost $170,000 per year.

7.2 Benefit-Cost Summary

The benefit-cost picture is quite favourable; with benefit-cost ratios ranging from 1.9 to 2.6, depending on how the portages are operated. The higher benefit-cost ratios come when the private sector is involved in the operation of the main enroute portages.

7.3 Private Sector Operation

Each area municipality or Indian Band should operate the facilities within its own area. Facilities in unorganized areas should be operated by the Ministry of Natural

Resources, by the Waterway Management Committee directly, or be put out to tender to operate by an appropriate private sector party.

It appears that the option involving operation of the boat transfers by the private sector is more attractive from the point of view of public operating costs, gives better benefit-cost ratios, and may also be a simpler solution administratively. Thus, we recommend that this option be pursued initially, and that steps be taken to develop an information and requirements package for distribution to prospective bidders.

7.4 Coordination

With regard to operation and promotion, it is recommended that a Voyageur Heritage Waterway Management Commission be set up, perhaps on a basis analogous to that for the steering committee for this study. That is, all affected area municipalities, Indian Bands, and government agencies should be represented on it. In time, some representation from the Minnesota side should be considered.

A Coordinator should be engaged on a full-time basis by the Management Commission. The duties of this position should be the smooth operation, integration of individual operations, and promotion. Promotion of the waterway, and its coordination with other tourism promotion efforts, will likely be a major part of the workload.

All tourism advertisers in the area should be approached by the Waterway Coordinator to obtain tie-in promotion and advertising. The Coordinator should be authorized to spend a portion of the promotion budget for direct promotional efforts, and a portion should be available to supplement the promotion budgets of other area advertisers who agree to expand their promotion to include the waterway.

8. REFERENCES AND CONTACTS

8.1 Market Assessment

The following persons and agencies were contacted during this study.

LISTING OF ONTARIO CONTACTS

Tourism Ontario Information Centre, Fort Frances: general information on area opportunities, nature of centre users

Ministry of Tourism and Recreation, Fort Frances (Randy Tindale, tourism officer): tourism reports and suggested contacts

Fort Frances Chamber of Commerce: list of local marine businesses

Canada Customs, Fort Frances (Glen Treflin, District Manager): data on regional border crossings, water access (supplemented for years before 1984 by data from Statistics Canada, International Travel Section, Gerald Bailey)

Town of Fort Frances (Frank Myers, Industrial Development Officer; Ron Raynor, Chief Administrative Officer): data on waterfront development, policies, impressions of project

Pinewood Sports, Fort Frances (Chuck Arpin, President): large marine dealer, knowledgeable boater, now offers boat portage service around International Falls dam

Campbell's Cabins, Lac la Croix (Jay Handberg, Cheryl Handberg; proprietors): holds lease for ends of Dawson Portage, uses BWCA portages extensively, information on use and reaction to project

Zup's Fishing Camps, Lac la Croix (Bill Zupancich, proprietor): uses Dawson Portage for all guests and supplies, information on use and reaction to project

Tomkin's Hardware, Emo (Bill Mosbeck): significant marine business, knowledgeable boater, information on use of Rainy River and reaction to project

Ministry of Natural Resources, Fort Frances (Bill Darby, Roy Brown): data on fisheries, creel censuses, atlas of use, fisheries management plans

LISTING OF MINNESOTA CONTACTS

Minnesota Tourism Information Centre, International Falls: lists of area resorts, potential contacts

International Falls Chamber of Commerce: list of marine businesses

Baudette Chamber of Commerce (Dave Marhula): list of area resorts and marinas

Warroad Chamber of Commerce (Dick Myers, member, proprietor of hardware business and angling permit vendor): information on local marina inventory, use patterns and trends, suggested contacts, reaction to concept

Voyageur National Park (Richard Frost, Assistant Superintendent): policies and plans for the park, use data, suggested contacts, reaction to concept

United States Forest Service, Cook MN (Don Potter, District Ranger; Steve Hoecker, Recreation Specialist): use data and policies regarding Loon Falls Portage (BWCA), 3 other truck portages, suggested contacts

Minnesota Department of Natural Resources:
Fisheries, Rainier MN (Dave Friedl): creel census reports and data, policies, suggested contacts, reaction to concept.
Fisheries, Beaudette MN (Mike Larsen): fisheries and boating use data, suggested contacts, reaction to concept
Recreation, Orr MN (Robin Nelson): data and policies on Loon Falls Portage (BWCA)
Licence Information, St. Paul MN: data on boat registrations

Grand Mound Interpretive Centre, Little Fork (site manager): data on use, connection to river travel

Ballard's Resort, Wheeler Point (Steve Ballard, proprietor): information on boating use, patterns and trends, inventory in Wheeler Point area, reaction to concept

Thunderbird Lodge, Int. Falls (Mike Williams, proprietor): key informant on Kettle Falls (family grew up there, brother now operates hotel, portage and dam), boating patterns and trends, local marina inventory, reaction to concept

Rainy Lake Houseboats, Int. Falls (Bill and June Dougherty, proprietors): boating patterns and trends, local houseboat inventory and use data

8.2 Engineering Assessment

Mr. Bruce Adamson
Regional Engineer, MNR North Central Region

Mr. David Elder
MNR, Atikokan District

Mr. Bruce Donahue
The Corporation of the Township of Atikokan,
Engineering Dept.

Mr. C. W. Stevens
Geotechnical and Hydraulic Engineering Dept., Ontario Hydro, Toronto

Mr. R. Walden, Mr. R. Cousins,
International Rainy Lake Board of Control,
International Lake of the Woods Control Board, Ottawa, Ontario

Mr. E. A. Bailey
Advisor to the International Joint Commission, Ottawa, Ontario

Mr. J. McQuarrie, Mr. L. Cain
Boise Cascade Canada Ltd., Fort Frances, Ontario

Mr. J. Brueggeman
Tourist Lodge Operator, Perch Lake, Ontario

Mr. O. Larsen, Mr. L. Morin
Water Survey of Canada, Winnipeg, Manitoba

Mr. R. Fromson, Mr. B. Weber
Underwood, McLellan, Winnipeg, Manitoba

APPENDIX A

The attached notes are a summary of the field investigations undertaken from May 28 to June 3, 1988, by Paul Donahue and Geof Hebbert of MacLaren Plansearch Inc. Additional details, such as sounding surveys and topographic surveys, are not included in this report, but are available upon request.

Paul E. Donahue

ATIKOKAN WATERWAY TERMINUS

- P. Donahue and Geof Hebbert met with Larry Fontana May 31, 1988 to present our findings to date plus to enlist his assistance in identifying the location of a proposed waterway terminus in Atikokan.

- At that time (L.F.) identified the Front St. Launching Ramp as a possible site.

- Further to this he identified a 1 kilometer reach downstream of the Trailer Park as an area requiring dredging/clearing of Boulders and debris and old dams.

- His estimate of clearing with a backhoe is approx. 100 hours.

- He recommends that this work could be done by
  (1) B.R. Davidson (Atikokan)
  (2) Phil Lebrun (Thunder Bay)

- On Friday, June 3rd, 1988, P. Donahue and G. Hebbert met with Dan Wright.

- To (1) identify a waterway terminus in Atikokan
  (2) discuss our findings

D.W. identified the following ranked options

(1) Downtown Atikokan near the Museum and Library.
- (near the centre of town in the vicinity of hotels/services)

(2) Atikokan River at Front Street
- DW feels this is a little too far removed from downtown

(3) Apungsisagen Lake d/s of Dam (near Seaplane Base)
- DW feels this is too far from Atikokan (approx. 20 minutes by car)
- However, this site is close to a proposed Theme Park in the vicinity

N/B Mention was made of the possibility of a site further u/s of the downtown area (i.e. near the White Otter Inn (owned by Larry Fontana).

Site Evaluation

1. Downtown Atikokan near the Library and Museum

- travelling upstream to reach the downtown area from the Seine River a boater will encounter several bridges and shallow portions along the Atikokan River

- the bridge at White Street has a significantly low clearance, particularly when waterlevels are high (w 2 metre clearance)

- the bridge at O'Brien Street has a narrow passage between Structural supports w 3 metres

- at the proposed site the river was approx. 6 metres wide at the water level during the inspection. However, effectively a boat would be restricted to about a 3 metre waterway width

- in general there is a significant amount of room for the construction of service facilities; perhaps excavation of the west Bank would provide adequate room for mooring facilities

2. <u>The Atikokan River at Front Street</u>

- an existing ramp approx. 2.5 metres wide has been in use at this site for several years

- the addition of a concrete cap on the ramp plus the excavation of some of the North and South Bank would provide adequate room for manoeuvering and facilities (service and mooring) at the site

- this site is downstream of the two bridges identified in (1) however the shallow reach further downstream would still require dredging/clearing

- property along the South Bank is presently undeveloped, perhaps it could be purchased to construct the facilities.

3. <u>Apungsisagen Lake (Near Seaplane Base)</u>

- a ramp presently exists at this site. It is approximately 20 m long by 5 m wide, however, it is suggested that it be upgraded from its loose gravel/sand base to a concrete pad in addition to extending it further out into the water where deeper water can be achieved.

- the existing site provides ample parking for approx. 5-6 cars and trailers, however, approximately 250 metres of the roadway should be graded/widened

- Because of the sheltered location in the Bay it appears that this site would be ideally suited for the construction of docking facilities; however, some dredging in the shallow areas in the bay should be considered

- the site is approximately 8 km (by road) from downtown Atikokan, this trip takes approximately 10-15 minutes to travel

TRACY RAPIDS

The operator of a pleasure craft is presently unable to travel through Tracy Rapids without encountering several difficulties and risk to his vessel.

Tracy Rapids consists of two set of rapids separated by a deep pool.

1. The upper Rapids is approx. 75.0 metres long with a vertical drop of approx. 0.65 m. The width is approx. 8 m wide at the upstream limit however it widens to approx. 25 m at the lower limit.

2. Travelling downstream (through the Pool) from the upper rapids a boater could travel approx. 225 metres before encountering the shallow waters of the lower set of Rapids. This pool area has a maximum depth of approx. 6.7 metres however an average depth along the centre of the main flow path is approx. 2.5 metres.

3. The lower rapids extend downstream for a length of 235 metres. The vertical drop in waterlevel at the time of the survey was approx. 0.80 metres. The width of the main channel varies through this reach from 20 to 35 metres, however, a restriction was identified approx. 50 metres upstream of the lower limit where the width is reduced to approx. 7.0 metres.

   It is recommended that a portage route(s) be established around both sets of rapids.

Several routes/schemes were investigated at the time of the survey. (Figure 1)

A. North Bank Route

In the past, a marine railway was in use to enable boaters to portage around the upper rapids only; however, due to reduced water levels, the lower set of rapids have become shallower and the need to portage around them is important.

The best route identified along the North Bank is a similar path to that used for the earlier marine railway. However, instead of limiting the portage to the 60 metre route as before, the route should be extended along the northern edge of the pool area past the lower set of rapids. The length of the portage required would be approximately 550 m. To establish as straight a route as possible, the following actions would be required:

(1) Blasting of a bedrock outcrop at the upstream rapids (approximately 50 m^3)

(2) Clearing of vegetation/brush

(3) Fill material required at 2 locations approximately 750 m^3 (note: material available @ site)

(4) Armouring to protect from erosion @ times of high water levels (note: large boulders available at the site)

Alternatively, a portage route could be established along the top of the bluff on the north shore. Access could be easily gained just upstream of the rapids where a rough launch site has been established by Hydro; however, the route would have to travel approximately 500 metres downstream of the rapids before a downstream launch could be reached because of the steep banks along the river. The total length of the portage would be approximately 950 metres.

B. <u>South Bank Route</u> (Dog Bay to Tracy Rapids)

A potential route exists along the south shore starting at Dog Bay where Hydro has established a launching ramp (rough) and road that leads to the downstream limit of the upper set of rapids. With improvement of this 330 metre road plus the construction of good ramps, this route is good for a portage from Dog Bay to the pool between the two sets of rapids.

C. <u>South Bank Route</u> (Dog Bay to downstream of Tracy Rapids)

To portage around the upper and lower set of rapids, it is recommended that the route initiate at the Hydro Launch at Dog Bay and follow the existing road for approximately 75 metre and then a new road be cut westerly, staying approximately 40 metres from the south shoreline of the Tracy Rapids and travelling a total distance of 190 metres (from the Dog Bay Launch Ramp). To this point, a minimal amount of blasting of rock would be required. From this position, there are two options:

<u>Option 1</u> : Continue along the top of the bluff (approximately 20 - 30 metres above the rapids) and access a ramp downstream of the rapids

OR

<u>Option 2</u> : Grade the road down from the local topography and follow a route along the southern edge of the rapids

<u>Option 1</u>

Because the local topography along the South Bank is very steep, a roadway would have to follow a path along the bluff for at least another 1000 m; however, a significant amount of grading would be required to cut back the slope to a

reasonable grade enabling access to the river. Therefore, as another option, it may be preferable to continue along the bluff further west to a point where grade can be easily obtained. This option would require a roadway 1600 m long.

Option 2

-- From the point 190 metres from Dog Bay, Option 2 considers the roadway sloping down to the southern edge of the rapids.
-- From this point, the roadway must drop avertically approximately 5 m over a distance of 25 metres (i.e. 5:1 slope). This portion of the road will require approximately 350 m^3 of fill material plus the blasting of approximately 25 m^3 of bedrock.
-- Once a vehicle is down from the bluff, the roadway will travel along the edge of the lower rapids downstream approximately 400 m where a ramp may be easily installed.
-- The last 400 m of roadway will require some fill material and movement of boulders with a backhoe (fill - 400 m^3).
-- The total length of this option is approximately 530 m from Dog Bay.

Roadway from Highway #11 to Tracy Rapids

Ontario Hydro has put through a road from Highway 11 to Tracy Rapids; however, its use is limited to the winter season because of several wet areas. If upgraded, the road would be useful as an access route to the site; or, if the road was used only in the winter when the ground is frozen, it could be used to bring in supplies and equipment required to construct the portage route (length - 3000 m).

N.B. Three other means of access are available at Tracy Rapids to construct the portage route:

1. Barge equipment from Apungsisagen Lake
2. Access from Hydro Corridor on North Bank
3. Access from the CN Tracks south of Tracy Rapids

Note A. The Ministry of Natural Resources would consider leasing land at Tracy Rapids to construct a cottage for the portage operator.

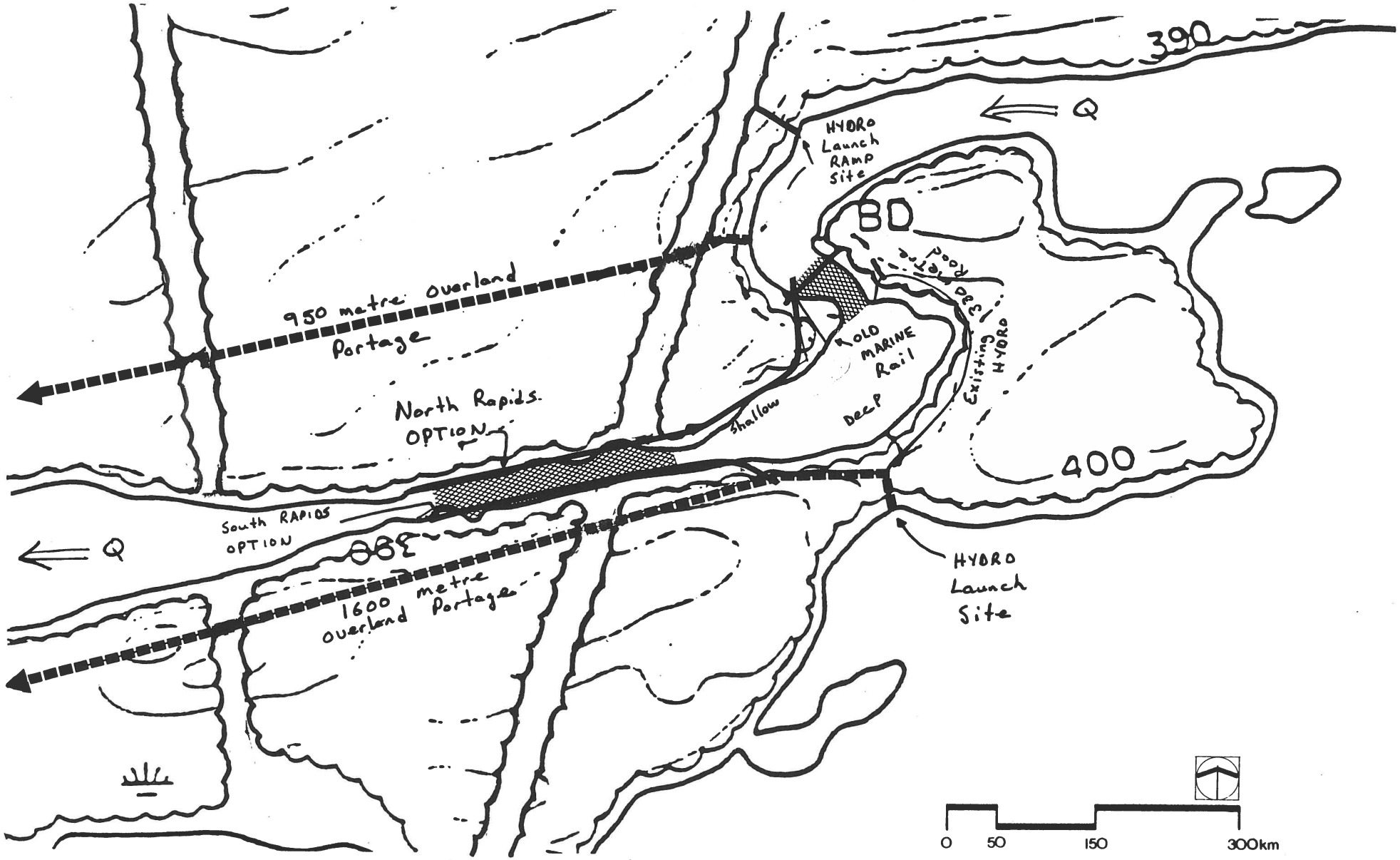


Figure 1

Tracy Rapids - Portage Route Alternatives

BOYCE RAPIDS

During the surveys of the waterway, water levels were low (similar to a typical water level for the month of August). Even under these conditions, a navigable path through Boyce Rapids is possible (Figure 2).

To improve on the existing path through Boyce Rapids, it is recommended that the following actions be taken.

1. Clearing

Cross-section #5-#6
Excavation of a shallow area just east of #5 (approximately 3.5 deep) should be undertaken to provide a clear passage of a suitable width (Quantity - 75 m^3 sands and gravels).

Cross-section #6-#7-#8-#9
The removal of approximately 30 boulders with a backhoe will provide a clear passage.

Cross-section #10-#11-#12
The removal of approximately 10 boulders will ensure a clear passage.

2. Blasting

Three areas of rock to be removed by blasting have been identified. Although it is not necessary that they be removed to provide clear passage, their removal will result in a straighter and wider passage way.

Ledge 1

This rock outcrop just out from the South Bank along a north-easterly direction

-- approximate dimensions are 8 m along the shoreline extending 8 m out from shore

-- average depth over Ledge - (2.5') .75 m

It is recommended that the Ledge be cut back approximately 4 metres to a depth of 1.2 m.
Therefore, the quantity of blast material = 6 m^3

Ledge 2
This Ledge is at an approximate depth of 0.5 m and extends approximate 2.5 m to the northwest.
It should be cut back approximately 2 metres to a 1.2 m depth.
Therefore quantity = 4 m^3

Ledge 3

This Ledge is located at the upstream limit of the rapids (along with several boulders to be removed). The existing width of the waterway at this location is approximately 8 - 10 metres; however, the blasting and removal of approximately 10 m^3 of rocks and boulders will allow easier access and provide a straighter approach into the rapids. This will increase the width at the entrance to approximately 12 metres.

3. Marking

Channel markers will be necessary to guide the boaters through the rapids. In addition, it is recommended that signs be posted informing boaters of minimum depth, shallow areas and a recommended speed limit.

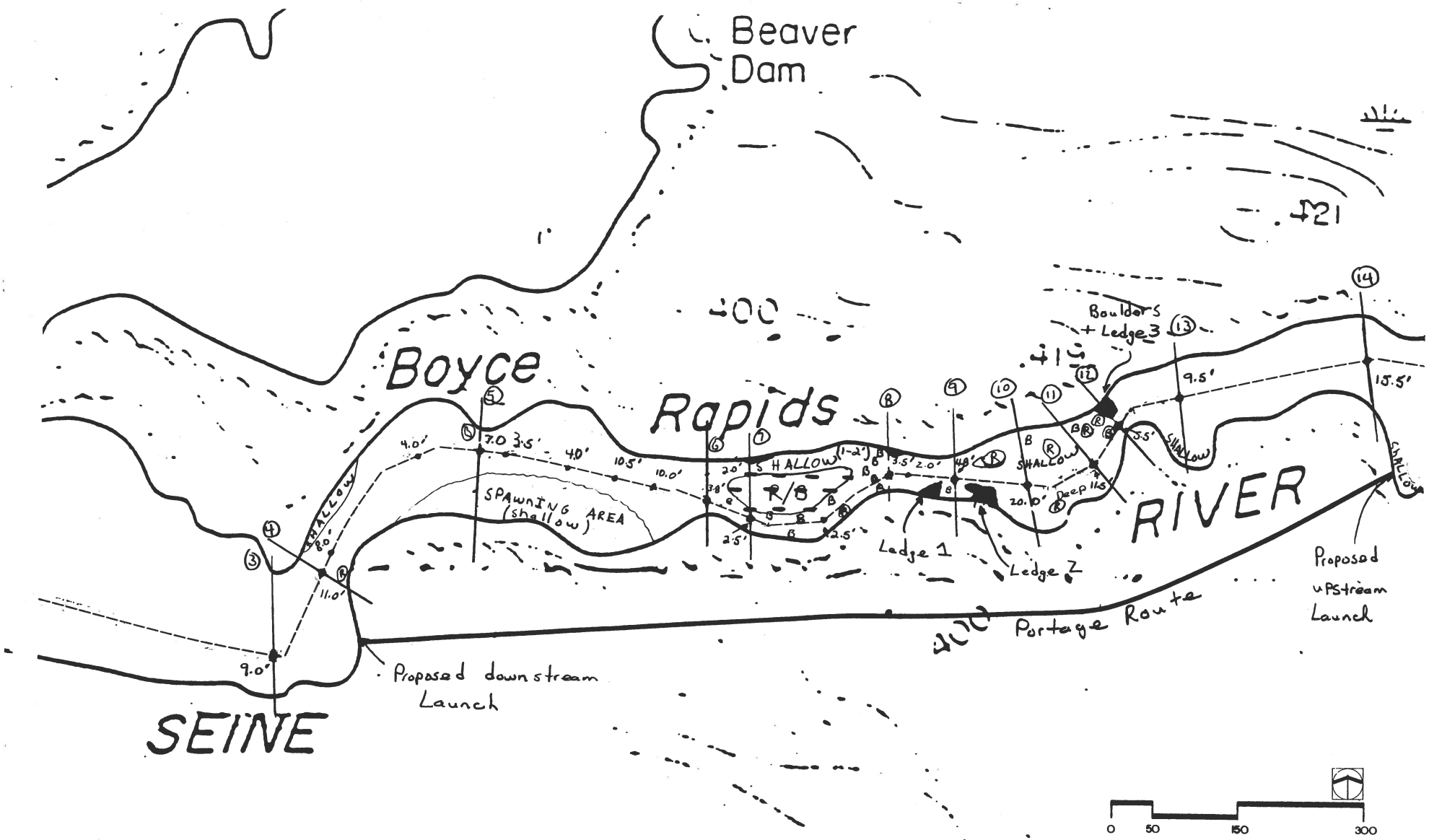


Figure 2

Boyce Rapids - Proposed Portage Route and Channel Depths

CALM LAKE DAM PORTAGE ROUTE

Upstream Launch

- As identified in Dan Wright's report, a suitable Launch site could be established approximately 35 metres east of the Calm Lake Dam. (Presently, a poorly maintained ramp exists approximately 10 metres east of the dam; however, this site is too close to the gates and would probably not be acceptable by Boise Electric - owners of the Dam.)

- A proposed ramp could be aligned such that boaters would access the ramp from the embayment area east of the Dam.

- In addition to positioning the Launch away from the Dam, a cable boom could be installed so as to encourage boaters to stay in the east embayment area away from the Dam.

- The ramp/approach required is approximately 40 metres long and presently exists at a 7.5% slope. However, blasting/-fill will be required to achieve a uniform grade.

- It is estimated that two (2) low areas on the approach would have to be filled requiring approximately 300 m3 of material.

- It is estimated that two (2) rock outcrops would have to be removed for a total removal of 35 m3 of rock.

- The net result of the blasting/fill requirement would yield a 4 metres wide ramp at a 7.5% slope, 40 metres long.

- As an option, the width of the ramp could be increased 2 m (east direction); however, this would probably double the expense due to the need of significantly more blasting.

- At the top of the ramp, a turning circle of an approximate diameter of 10 - 12 metres presently exists; however, removal of an embankment east of approach would provide a much larger area for manoeuvering.

- The existing roadway to the Dam consists of a winding sand and gravel road barely wide enough for two vehicles to pass plus two sections with a very steep grade that lead to the ramp site.

- The two steep sections above are separated by a (40 m x 8 m) relatively flat area that would serve well as a parking facility for 10 vehicles and trailers; however, hydro poles and cables are located at the south end of this site. Approximately 300 m3 of fill would improve the parking facility.

- Some granular material is available adjacent to the site (probably very low grade).
- The lower of the two mentioned steep sections follows a path from the parking site to the ramp/approach.
- It is approximately 25 metres long and is at a 19% grade.
- Evidence of sheet erosion and rutting (by traffic) is visible on the slope (loose material).
- The upper steep section is a winding roadway that leads from the top of the local topography to the parking site. (70 metres at a 16% grade)
- As in the lower section, the loose material presently limits the traction for a vehicle.

* Note

The MacLaren field crew was informed that T.B.H.I. general contractors of Thunder Bay is to begin regrading of the two steep sections noted above (sometime during the summer of 1988) so as to allow them to bring in their heavy equipment to begin dam maintenance in 1989. It is their intention to regrade to a slope less than 10%.

CALM LAKE

Downstream Launch

- The Downstream Launch site will require a minimal amount of work to improve the facilities.
- In general, a good ramp and camping/picnic facility already exists.
- The existing ramp is approximately 5 metres wide and is approximately 28 metres long at a 12% slope.
- The ramp is made up of grass with loose sands and gravels (plus cobbles); however, some areas are rutted indicating erosion and poor traction.
- The wetted portion of the ramp drops off at a 2:1 slope for approximately 2 metres then drops off to deep water.
- There is presently a large grassed area (50 m x 45 m) that is ideal for picnics and camping.
- 2 campsites already exist.
- This area is relatively flat and could easily be expanded by clearing of some bush and trees.
- Care must be taken to avoid the hydro pole and guide wires at the southeast end of the facility.
- The roadway leading to the Downstream Launch from the main road is approximately 550 metres long and is one car width wide (3 - 4 metres); many ruts and boulders were encountered along the road plus two or three culverts are required.

STURGEON FALLS - CRILLY DAM PORTAGE

Upstream Launch

- A launching ramp at the Upstream Launch site presently exists.
- It is approximately 3 m wide, 8.5 m long, @ a 13% grade.
- A small docking structure (wooden) is presently in place.
- The ramp is grass + sands and gravels + an old concrete slab is still in-place.
- At the water edge, the bottom slopes off to deep water at a 3:1 slope.
- Parking facilities are available (7 - 10 vehicles and trailers) at the site with approximate dimensions 40 m x 30 m (gravel base) (see photo 5-8 and 5-1)
- Possible problems at the site
  i) Fenced in hydro compound
  ii) Permission from Boise
- There is a steep portion along the roadway to the Launch site (photo 5-4), approximately 70 m long @ a 13% grade, with room for one vehicle only.
- The remainder of the roadway to Highway 11 is in need of minimal repair, perhaps scraping and gravelling.
- It is suggested that a boom installed across the river to keep boats away from the Dam.

  (Note gates are operated periodically from Boise's head office.)

STURGEON FALLS - CRILLY DAM PORTAGE

Downstream Launch

- The Downstream Launch site at the Indian Campground is in excellent condition; however, the road to the Launch from Highway 11 could use some resurfacing and gravelling.
- There is ample room for picnic/camping areas.
- Washroom facilities are present yet upgrading is required.
- Some shade trees/shelters could be added (i.e. very hot and dusty with limited shade.
- The reservation (Indian band) charges $ 6 / day to park
  $ 6 / Launch
- The existing ramp requires resurfacing and the docks require replacing (at least the west one) (photo 5-12).
- The ramp is approximately 40 m long, 5 m wide @ 11% grade.
- Concrete pad at the water's edge should be removed (photo 5-10).
- Water intake 30 m u/s is to be marked.
- Private property/boundary to be identified with signs.
- Parking for 20 cars and trailers easily available.

COST ESTIMATES

It is difficult to get contractors to estimate costs to undertake the proposed works primarily because of the uncertainty of access to the sites.
Particularly:

1. Boyce Rapids - where access is (probably) easier in the winter
   - the availability of a barge is uncertain for most contractors

2. Tracy Rapids - same as above

As of June 8, 1988, we are still awaiting reply from Stan Bates (Atikokan). A local contractor who would probably provide the best estimate for mobilization to Boyce and Tracy Rapids. However, the following rates are probably good estimates for some of the construction services required.

Cost Estimate Rates

Source : Ministry of Natural Resources

1. Rough Bush Road (with minimal blasting)

   - Heaving dozing
   - Not up to MTC standards
   - Few culverts included

   $ 20,000-25,000 / km

2. All Weather Road (Class 3) MTC Standard

   - 20 ft. wide road
   - Culverts
   - Full surface

   $ 50,000 / km

3. Gravelling

   B.G. Davidson $ 10 / yard - (high)
   MNR $ 2 / yard (not to standard) - if available

   Good estimate for pit gravel - $ 5 / yard or $ 100 / truck

Cost Estimate Rates

Source : LeBrun Construction Ltd. (Thunder Bay)

Barge rental from Thunder Bay	$ 32,000 / month
Boat	$ 1,000 / week
Backhoe (large 2 cy)	$ 100 / hour
Grader	$ 100-150 / hour
Bush Road	$ 25,000 / km
All Weather Road	$ 50,000 / km
Gravelling (depends on location of pit) Spreading & compaction extra	$ 5-10 / yard
Barge operator	$ 300 / day

Cost Estimate Rates

Source : Castonguay Blasting Ltd.

Option 1

Small compressor + small coring rig
$ 85-90/m3

Mobilization to Boyce/Tracy Rapids
$ 1,000 / site

Option 2

Large drill rig
$ 25-30/m3

Mobilization to Boyce/Tracy Rapids
$ 2,000 / site

N.B.

1. Assuming access is available to site (i.e. Barge/ Road)
2. Contractor recommends blasting to be done during winter

Cost Estimate

1. Calm Lake Dam Portage

--	Repair road from Highway #11 to Dam i.e. scrape/fill (road belongs to Boise)	$ (minimal)
--	Upstream ramp blast/fill	$ 4,500
--	Ramp construction i.e. concrete, gravel	$ (depends on type)
--	Parking facilities	$ (not required)
--	Mobilization	$ (?)

2. Sturgeon Falls Portage

--	Install boom	$ (?)
--	Widen (u/s) ramp (backhoe) (3 hours)	$ 300
--	Upgrade road from Highway #11 to site i.e. gravelling	$ (?)
--	Repair d/s ramp (backhoe) (3 hours)	$ 300
--	Mobilization	$ (?)

3. Boyce Rapids

--	Blasting (20 m3) assuming winter access	$ 2,800
--	Clearing (backhoe)	$ 2,000
--	Mobilization i.e. barge in summer travel on ice in winter	$ (?)
--	Additional labour (4 mandays for barge operator)	$ 1,200
--	Marking channel	$ (?)
--	Portage route around Rapids 1.3 km Bush Road	$33,000
--	Ramps at upstream and d/s end of Portage Route	$ (?)

4. Tracy Rapids

--	North bank overland Portage Route	$25,000

--	South bank overland Portage Route		$40,000
--	North Rapids option	- blasting	$ 3,500
		- fill	$ 4,000
		- armourstone	$ (?)
		- backhoe (3 weeks)	$12,000
		- mobilization	$ (?)
--	South Rapids option	- blasting	$ 3,000
		- fill	$ 1,750
		- Bush Road	$ 5,000
		- backhoe (3 weeks)	$12,000
		- mobilization	$ (?)
		- armourstone	$ (?)

Local Contractors and Miscellaneous Contacts

1.	Mutz Brothers (417 Portage Fort, Frances)	Tel: 274-3733
2.	Lebrun Constructors Ltd. (610 Hewitson, Thunder Bay)	Tel: 623-3500
3.	T.W. Judson (Emo)	Tel: 482-2507
4.	Stan Bates (605 MacKenzie E., Atikokan)	Tel: 597-4574
5.	B.R. Davidson (300 Main W., Atikokan)	Tel: 597-4326
6.	Ont. Hydro (Fort Frances)	Tel: 1-800-461-2913
7.	CN RDM Office	Tel: 597-6726
8.	TBHI General Contractors (P.O. Box 2119, Maureen St., Thunder Bay) * Contact Henry Lahtinen	Tel: 807-344-7294
9.	Castonguay Blasting Ltd. (Atikokan)	Tel: 807-623-3635

ATIKOKAN - MINAKI WATERWAY STUDY

COST ESTIMATES FOR CONSTRUCTION PROJECTS

ATIKOKAN - MINAKI WATER STUDY

COST ESTIMATES FOR CONSTRUCTION PROJECTS

UNIT PRICE DATA USED IN CAPITAL COST ESTIMATES

Where possible unit prices have been estimated for measurable units of work. Where this is not possible daily rates for work crews have been estimated (including labour, equipment and materials).

ITEM	DESCRIPTION	UNIT	UNIT PRICE ($1988)
1.0	Site Clearing	sq.ft.	$ .08
2.0	Excavating		
	2.1 Rock, Drill & Blast	c.y.	57.00
	2.2 Boulders, Blast and Remove	c.y.	43.00
	2.3 Overburden	c.y.	6.50
3.0	Backfill		
	3.1 Common Fill	c.y.	5.00
	3.2 Road-Bed (Compacted)	c.y.	10.00
	3.3 Gravel Surfacing	c.y.	10.00
	3.4 Rockfill (Dumped)	c.y.	23.50
	3.5 Impervious Fill (cofferdam)	c.y.	10.00
4.0	Reinforced Concrete (in place)	c.y.	400.00
5.0	Mass Concrete (in place)	c.y.	300.00
6.0	Structural Steel (in place)	ton	2,590.00
7.0	Work Crews		
	7.1 Dozer 200 hp, Operator and Labourer	per day	1,160.00
	7.2 Grader, Operator & Labourer	per day	1,060.00
	7.3 Backhoe, Operator & Labourer	per day	1,500.00
	7.4 16 ton Dump Truck & Driver	per day	560.00
	7.5 Dewatering Equipment & Operators	per day	500.00
	7.6 Pile Removal	per mo.	75,500.00

The following additional unit prices have been obtained from local contractors and MNR staff in the study area.

8.0	Roadwork		
	8.1 Rough Bush Road	km	25,000.00
	8.2 All Weather Road	km	50,000.00

1.1 REMOVAL OF MINOR OBSTRUCTIONS FROM THE ATIKOKAN RIVER DOWNSTREAM OF FRONT ST.

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
1.1	Remove Boulders (Allowance)	c.y.	50	$ 43.00	$ 2,150.00
1.2	Backhoe for removal of Dam Remains (Allowance)	days	5	1,500.00	7,500.00
1.3	Disposal of Debris (Allowance)	days	5	560.00	2,800.00
1.4	Channel Marking (Allowance)	L.S.			2,000.00
	TOTAL				$14,450.00

1.2 CHANNEL IMPROVEMENTS IN ATIKOKAN RIVER UPSTREAM OF FRONT STREET

Channel improvements from Front Street to the proposed marina site will require excavation of approximately 13,000 c.y. of material from the river.

It has been assumed that the material to be excavated is alluvial deposits and that no bedrock excavation will be necessary. The maximum width of the reach under investigation is 30 ft. and it has been assumed that all excavation can be carried out using a backhoe located on the river bank. Access to the river banks is available for a backhoe and dump truck to haul away the excavated material.

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
1	Alluvial soil excavation and disposal	c.y. days	13,000 43	$2,620	$112,000

Assumed material excavation at 35-40 c.y/hour using 1/2 c.y. bucket loading to 2x16 ton dump trucks.

Cost of 1 backhoe, 2 trucks, with operators and labour (including all mark-up) = 1,500 + (2x560) = $2,620/day.

13,000/38 = 342 hours/8 = 43 days.

2. CHANNEL IMPROVEMENTS AND PORTAGE FACILITIES AT TRACY RAPIDS

Estimate assumes a 5250 ft. truck/trailer portage on a gravel road; concrete ramps and allowance for markings, access road upgrading and removable docks. This route would be located on the south bank of the river linking Dog Bay at upstream landing with downstream end of the lower set of rapids. Access would utilize the existing Ontario Hydro access road from Highway /11 with appropriate upgrading.

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
2.1	Bush Road	km	1.6	$25,000.00	$ 40,000.00
2.2	Concrete Ramps	c.y.	22	400.00	8,800.00
2.3	Dewatering for Ramps (Allow.)				2,000.00
2.4	Landing Improvements				
	2.4.1 Boulder Removal (Allowance)	c.y.	10	43.00	430.00
	2.4.2 Backhoe Crew (Allowance)	days	5	1,500.00	7,500.00
2.5	Landing Marking (Allow.)	L.S.			2,000.00
2.6	Floating Docks	each	4	2,000.00	8,000.00
	SUBTOTAL PERMANENT FACILITIES				$ 68,730.00
2.7	Access Road Upgrading	km	1	25,000.00	25,000.00
	2.7.1 Allow 1 km Reconstruction				
	SUBTOTAL ACCESS				$ 25,000.00
	One 4x4 Crew Cab	LS			25,000.00
2.9	One Boat Trailer (20 ft x 3300#)	LS			2,000.00
	SUBTOTAL				$ 27,000.00
	T O T A L				$120,730.00

2.3 WEIR AT TRACY RAPIDS

Cost of rockfill overflow weir to raise water level by 0.7 m.
Length of weir approximately 30 ft.

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
1	Dewatering - coffer dam and diversion channel:				
	- rockfill	c.y.	120	23.50	$ 2,820
	- impervious facing	c.y.	15	10.00	150
	Excavation of diversion channel (20'x 3'x 40')	c.y.	89	16.00	1,422
2	Rockfill dam	c.y.	147	23.50	3,455
3	Impervious membrane and fill	ft^2	1110	7.00	7,770
4	Remove coffer dam and fill	c.y.	135	23.50	3,173
	diversion channel	c.y.	133	10.00	1,330
	TOTAL				$20,000

3. CHANNEL IMPROVEMENTS AT BOYCE RAPIDS

Obstructions to navigation can be removed by a combination of backhoe dredging of unconsolidated material and boulders and by blasting of some ledges. Discussions with contractors indicate that this would be most conveniently accomplished in the winter with access over the ice.

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
3.1	Mobilization	LS			$ 10,000.00
3.2	Backhoe Crew	days	5	$ 1,500.00	7,500.00
3.3	Boulder Removal	c.y.	50	43.00	2,150.00
3.4	Rock Removal	c.y.	27	57.00	1,500.00
3.5	Channel Marking	LS			4,000.00
	T O T A L				$ 25,150.00

4. PORTAGE FACILITIES AT CALM LAKE DAM

Estimate is capital cost of permanent facilities and purchase price of truck and trailer.

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
4.1	Upgrade Existing Access Road (Allowance)	LS			$ 20,000.00
4.2	New & Upgraded Portage Road	km	.55	$25,000.00	13,750.00
4.3	Concrete Ramps	c.y.	22	400.00	8,800.00
4.4	Dewatering for Ramps (Allow.)				2,000.00
4.5	Marking of Landings (Allow.)				2,000.00
4.6	Floating Docks	ea	2	2,000.00	4,000.00
4.7	Protective Boom	LS			1,500.00
	SUB TOTAL PERMANENT FACILITIES				$ 52,050.00
4.8	One 4x4 Crew-Cab Truck	LS			$ 25,000.00
4.9	One Boat Trailer (20 ft x 3300#)	LS			2,000.00
	SUB TOTAL				27,000.00
	T O T A L				$79,050.00

5. PORTAGE FACILITIES AT STURGEON FALLS DAM

Estimate for capital cost of permanent facilities and purchase price of truck and trailer. Total length of truck and trailer portage is 3.1 km using 1.3 km of gravel road from upstream landing to Hwy 11, 1.2 km on Hwy 11 and 0.6 k km of gravel road from Hwy 11 to downstream landing.

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
5.1	Allowance for Road Improvements				
	5.1.1 Road Bed (Allow)	c.y.	1000	$ 10.00	$ 10,000.00
	5.1.2 Grader & Crew (Allow)	day	5	1,060.00	5,300.00
5.2	Concrete Ramps	c.y.	22	400.00	8,800.00
5.3	Dewatering for Ramps (Allow)				2,000.00
5.4	Landing Marking (Allow)				2,000.00
5.5	Protective Boom	LS			1,500.00
5.6	Floating Docks	ea	2	2,000.00	4,000.00
	SUB TOTAL PERMANENT FACILITIES				33,600.00
5.7	One 4x4 CrewCab Truck	ea	1	25,000.00	$ 25,000.00
5.8	One Boat Trailer (20 ft. x 3300#)	ea	1	2,000.00	2,000.00
	SUB TOTAL				27,000.00
	T O T A L				$ 60,600.00

6. BOAT LIFT OR PORTAGE FACILITIES AT FORT FRANCES DAM

Estimate for boat lift facility is based on a lift and transfer structure located in the lock channel on the Canadian side of the dam.

A. BOAT LIFT TRANSFER FACILITY

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
6.1	Site Work & Temporary Works				
	6.1.1 Upstream Rockfill C/D	c.y.	6907	$ 23.50	$162,306.67
	6.1.2 Impervious Fill	c.y.	664	$ 10.00	$ 6,637.04
	6.1.3 Remove Temporary C/D	c.y.	1727	23.50	40,576.67
	6.1.4 Downstream Rockfill C/D	c.y.	3858	23.50	90,657.78
	6.1.5 Impervious Fill	c.y.	505	10.00	5,051.85
	6.1.6 Remove Temporary C/D	c.y.	1742	23.50	40,942.22
	6.1.7 Dewatering (Allow)	day	40	500.00	20,000.00
6.2	Downstream Channel Excavation	c.y.	3333	57.00	190,000.00
6.3	Runway Structure				
	6.3.1 Footing Excavation (Allow)	c.y.	32	57.00	1,824.00
	6.3.2 Con.Col. Footings	c.y.	14	400.00	5,688.89
	6.3.3 Structural Steel	ton	127	2,600.00	328,900.00
6.4	Boat Sling, Trolley and Mechanical Equipment				
	6.4.1 Structural Steel	ton	6	2,600.00	14,820.00
	6.4.2 Hoists & Mech. Equip.	LS			10,000.00
6.5	Lift Equipment	LS			50,000.00
6.6	Power Supply and Lighting	LS			31,000.00
6.7	Floating Docks				
	6.7.1 Upstream Dock Structure	sq.ft.	500	20.00	10,000.00
	6.7.2 Pile Supports	lin.ft.	200	8.00	1,600.00
	6.7.3 Downstream Dock Struct.	sq.ft.	900	20.00	18,000.00
	6.7.4 Pile Supports	lin.ft.	270	8.00	2,160.00
	T O T A L BOAT LIFT & TRANSFER FACILITY				$1,030,165.11

6. BOAT LIFT OR PORTAGE FACILITIES AT FORT FRANCES DAM (cont'd)

Estimate for boat lift facility is based on a lift and transfer structure located in the lock channel on the Canadian side of the dam.

B. TRUCK AND TRAILER PORTAGE

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
6.8	Conc. Trailer Ramps	c.y.	22	$ 400.00	$ 8,888.89
6.9	Access Road & Parking	sq.yd	1000	10.00	10,000.00
6.10	Floating Docks				
	6.10.1 Dock Structure	sq.ft.	1400	20.00	28,000.00
	6.10.2 Pile Supports	lin.ft.	280	8.00	2,240.00
	SUB TOTAL PERMANENT FACILITIES				49,128.89
6.11	4x4 Crew-Cab Truck	each	3	25,000.00	75,000.00
6.12	Boat Trailer (30ft.x5000#)	each	3	3,500.00	10,500.00
	SUB TOTAL				85,500.00
	T O T A L TRAILER PORTAGE ALTERNATIVE				$134,628.89

NB: Based on requirements for design year (peak day traffic - 63 boats)
Projected increase after 10 years to 130 boats will require 2 x vehicles.

7. CHANNEL IMPROVEMENTS AT MANITOU RAPIDS ON RAINY RIVER

Estimate includes allowances for minor channel improvements and channel marking.

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
7.1	CHANNEL IMPROVEMENTS				
	7.1.1 Boulder Removal (Allow)	c.y.	50	$ 43.00	$ 2,150.00
	7.1.2 Backhoe Crew (Allow)	days	5	1,500.00	7,500.00
	CHANNEL MARKING (Allowance)	LS			2,000.00
T O T A L					$ 11,650.00

8. REMOVAL OF TIMBER PILES FROM RAINY RIVER CHANNEL

Estimate is based on equipment and crew required to lift piles, transport to shore haul and dump debris.

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
8.1	Barges, Crane, Vibrohammer & Crew	mo.	1	$ 75,500.00	$ 75,500.00
8.2	Loader, Truck & Cres	days	20	1,910.00	38,200.00
T O T A L					$113,700.00

9. DAWSON PORTAGE

Estimate is based on repairing the existing road and purchase and operation of a truck-trailer portage.

ITEM	DESCRIPTION	UNIT	QTY.	U.PRICE ($1988)	COST
9.1	Road Repairs				
	9.1.1 Road Base(Allow)	c.y.	3400	$ 6.50	$ 22,100.00
	9.1.2 Grader Crew(Allow)	days	17	1,060.00	18,020.00
	9.1.3 Truck & Crew (Allow)	days	5	560.00	2,800.00
	9.1.4 Loader & Crew(Allow)	days	5	700.00	3,500.00
9.2	Ramps				
	9.2.1 Conc.Trailer Ramps	c.y.	22	400.00	8,800.00
	9.2.2 Dewater for Ramps (Allow)	LS			2,000.00
9.3	Mobilization (Barge Transportation)	LS			5,000.00
	SUB TOTAL PERMANENT FACILITIES				$ 62,220.00
9.11	4x4 Crew Cab Truck	each	1	25,000.00	25,000.00
9.12	Boat Trailer (30ft x 5000#)	each	1	2,000.00	2,000.00
	SUB TOTAL				$ 27,000.00
	T O T A L				$ 89,220.00

SUMMARY OF COST ESTIMATES

ITEM	DESCRIPTION	CAPITAL COST $	ENGIN. AND OWNER'S COSTS	CONTINGENCY COST	TOTAL	ANN. OPER. MAINT.COST (excl.deprec)	LIFE SPAN (years)
1.0	CHANNEL IMPROVEMENTS IN ATIKOKAN RIVER						
	1.1 Remove minor obstruction downstream of Front St.	14,500	2,900	2,610	20,010	500	N/A
	1.2 Channel improvements upstream of Front St.	112,000	21,000	16,000	150,000	1,000	N/A
2.0	TRACY RAPIDS						
	2.1 Access Roads	25,000	5,000	4,500	34,500	2,000	N/A
	2.2 Truck & Trailer Portage						
	2.2.1 Permanent Facilities	68,730	9,746	9,371	87,847	2,000	N/A
	2.2.2 Vehicles	27,000	0	1,350	28,350	44,000	5
	2.3 Weir	20,000	4,000	3,000	27,000	1,000	20
	Sub-total				177,697	47,000	
3.0	BOYCE RAPIDS						
	3.1 Channel Improvement	25,150	5,030	4,527	34,707	500	N/A
4.0	CALM LAKE DAM - PORTAGE						
	4.1 Permanent Facilities	52,050	10,410	9,370	71,820	2,000	N/A
	4.2 Vehicles	27,000	0	1,350	28,350	45,000	5
	Sub-total				100,170	47,000	
5.0	STURGEON FALLS DAM - PORTAGE						
	5.1 Permanent Facilities	33,600	6,720	6,050	46,370	2,000	N/A
	5.2 Vehicles	27,000	0	1,350	28,350	45,000	5
	Sub-total				74,720	47,000	
6.0	FORT FRANCES DAM						
	6.1 Boat Lift and Transfer	1,030,000	206,000	247,200	1,483,200	48,500	20
	6.2 Trailer Portage						
	6.2.1 Permanent Facilities	50,000	10,000	12,000	72,000	2,000	N/A
	6.2.2 Vehicles	85,500	0	4,275	89,775	135,000	5
	Sub-total				161,775	137,000	
7.0	LONG SAULT AMD MANITOU RAPIDS CHANNEL IMPROVEMENTS	12,000	2,400	2,880	17,280	2,000	N/A
8.0	TIMBER PILE REMOVAL RAINY RIVER	114,000	22,800	27,360	164,160	0	N/A
9.0	DAWSON PORTAGE						
	9.1 Permanent Facilities	62,500	12,500	15,000	90,000	2,000	N/A
	9.2 Vehicles	27,000	0	1,350	28,350	45,000	5
	Sub-total				118,350	47,000	

APPENDIX B

SECTOR:							ENROUTE GENERAL BUSINESS OPPORTUNITIES:							
ATIKOKAN-RAINY L	Avg Days=	1.5	# OneWay				Fuel		Supplies		Service		Total	
	Touring	Fishing	Transits	# Tour	# Fish	Av. P/Bt	@$/Trip	$ Fuel	@$/Trip	$ Suppl.	@$/Trip	$ Servic.	Genl. BO	
Locals - Atik.	40%	60%	200	80	120	3.0								
Locals - Ft. Fr.	20%	80%	160	32	128	3.0								
US/Can	50%	50%	300	150	150	3.5	avg prch=	10	avg prch=	$15.00	avg prch=	$50.00		
US/US			0	0	0	3.5	$/gal	$2.50						
Outfitters	80%	20%	500	400	100	3.5	% purch=	80%	% purch=	50%	% purch=	5%		
Charters	80%	20%	10	8	2	4.5								
TOTALS			1170	670	500			$23,400		$8,775		$2,925	$35,100	
	Note:Present traffic = nil						TOTAL, NEW SECTOR SPENDING =		$518,104					
RAINY - LA CROIX	Avg Days=	1.3	# OneWay				Fuel		Supplies		Service		Total	
	Touring	Fishing	Transits	# Tour	# Fish	Av. P/Bt	@$/Trip	$ Fuel	@$/Trip	$ Suppl.	@$/Trip	$ Servic.	Genl. BO	
Locals - Ft. Fr.	30%	70%	150	45	105	3.0								
Locals - other	70%	30%	50	35	15	3.0								
US/Can	50%	50%	350	175	175	3.5	avg prch=	10	avg prch=	$15.00	avg prch=	$50.00		
US/US	70%	30%	200	140	60	3.5	$/gal	$2.75						
Outfitters	60%	40%	50	30	20	3.5	% purch=	30%	% purch=	30%	% purch=	2%		
Charters	70%	30%	10	7	3	4.5								
TOTALS			810	432	378			$6,683		$3,645		$810	$11,138	
	Note:Present traffic = +/- 800						TOTAL, NEW SECTOR SPENDING =		$211,660					
FT FR - L/WOODS	Avg Days=	0.8	# OneWay				Fuel		Supplies		Service		Total	
	Touring	Fishing	Transits	# Tour	# Fish	Av. P/Bt	@$/Trip	$ Fuel	@$/Trip	$ Suppl.	@$/Trip	$ Servic.	Genl. BO	
Locals - Ft. Fr.	40%	60%	400	160	240	3.0								
Locals - other	60%	40%	250	150	100	3.0								
US/Can	50%	50%	350	175	175	3.5	avg prch=	15	avg prch=	$15.00	avg prch=	$50.00		
US/US	90%	10%	800	720	80	3.5	$/gal	$2.50						
Outfitters	80%	20%	50	40	10	3.5	% purch=	50%	% purch=	30%	% purch=	5%		
Charters	80%	20%	30	24	6	4.5								
TOTALS			1880	1269	611			$35,250		$8,460		$4,700	$48,410	
	Note:Present traffic = +/- 50-100						TOTAL, NEW SECTOR SPENDING =		$450,776					
L/WOODS - KENORA	Avg Days=	1.8	# OneWay				Fuel		Supplies		Service		Total	
	Touring	Fishing	Transits	# Tour	# Fish	Av. P/Bt	@$/Trip	$ Fuel	@$/Trip	$ Suppl.	@$/Trip	$ Servic.	Genl. BO	
Locals - Kenora	60%	40%	300	180	120	3.0								
Locals - other	20%	80%	120	24	96	3.0								
US/Can	40%	60%	420	168	252	3.5	avg prch=	30	avg prch=	$20.00	avg prch=	$50.00		
US/US	90%	10%	150	135	15	3.5	$/gal	$2.60						
Outfitters	70%	30%	100	70	30	3.5	% purch=	90%	% purch=	90%	% purch=	5%		
Charters	80%	20%	80	64	16	4.5								
TOTALS			1170	641	529			$82,134		$21,060		$2,925	$106,119	
	Note:Present traffic = +/- 1000-1200						TOTAL, NEW SECTOR SPENDING =		$465,760					
KENORA - MINAKI	Avg Days=	0.7	# OneWay				Fuel		Supplies		Service		Total	
	Touring	Fishing	Transits	# Tour	# Fish	Av. P/Bt	@$/Trip	$ Fuel	@$/Trip	$ Suppl.	@$/Trip	$ Servic.	Genl. BO	
Locals - Kenora	40%	60%	140	56	84	3.0								
Locals - other	80%	20%	100	80	20	3.0								
US/Can	70%	30%	200	140	60	3.5	avg prch=	5	avg prch=	$10.00	avg prch=	$50.00		
US/US			0	0	0	3.5	$/gal	$2.50						
Outfitters	80%	20%	50	40	10	3.5	% purch=	5%	% purch=	5%	% purch=	1%		
Charters	80%	20%	10	8	2	4.5								
TOTALS			500	324	176			$313		$250		$250	$813	
	Note:Present traffic = +/- 1400-1600						TOTAL, NEW SECTOR SPENDING =		$63,524					
OVERALL TOTALS			5530	3336	2194			$147,779		$42,190		$11,610	$201,579	

SECTOR: ENROUTE ACCOMMODATION OPPORTUNITIES:

ATIKOKAN-RAINY L	Touring Pty-Nts	Fishing Pty-Nts	Touring % Camp	Touring % Lodge	Fishing % Camp	Fishing % Lodge	Totals for: # CPrs-N	# CPty-N	# LPrs-N	# LPty-N	$ Camp	$ Lodge
Locals - Atik.	120	180	80%	20%	90%	10%	774	258	126	42		
Locals - Ft. Fr.	48	192	80%	20%	90%	10%	634	211	86	29	Avg. Cg=	$12.00
US/Can	225	225	60%	40%	70%	30%	1024	293	551	158	Avg. Lodge=	
US/US	0	0					0	0	0	0		$80.00
Outfitters	600	150	60%	40%	65%	35%	1601	458	1024	293		
Charters	12	3	50%	50%	50%	50%	34	8	34	8		
TOTALS	1005	750					4066	1227	1821	528	$14,720	$42,264
											Total:	$56,984

RAINY - LA CROIX	Touring Pty-Nts	Fishing Pty-Nts	Touring % Camp	Touring % Lodge	Fishing % Camp	Fishing % Lodge	Totals for: # CPrs-N	# CPty-N	# LPrs-N	# LPty-N	$ Camp	$ Lodge
Locals - Ft. Fr.	59	137	80%	20%	90%	10%	509	170	76	25		
Locals - other	46	20	80%	20%	90%	10%	162	54	33	11	Avg. Cg=	$12.00
US/Can	228	228	50%	50%	60%	40%	876	250	717	205	Avg. Lodge=	
US/US	182	78	50%	50%	60%	40%	482	138	428	122		$80.00
Outfitters	39	26	70%	30%	65%	35%	155	44	73	21		
Charters	9	4	50%	50%	50%	50%	29	7	29	7		
TOTALS	562	491					2213	662	1356	391	$7,948	$31,252
											Total:	$39,200

FT FR - L/WOODS	Touring Pty-Nts	Fishing Pty-Nts	Touring % Camp	Touring % Lodge	Fishing % Camp	Fishing % Lodge	Totals for: # CPrs-N	# CPty-N	# LPrs-N	# LPty-N	$ Camp	$ Lodge
Locals - Ft. Fr.	128	192	40%	60%	80%	20%	614	205	346	115		
Locals - other	120	80	50%	50%	90%	10%	396	132	204	68	Avg. Cg=	$12.00
US/Can	140	140	30%	70%	60%	40%	441	126	539	154	Avg. Lodge=	
US/US	576	64	50%	50%	60%	40%	1142	326	1098	314		$80.00
Outfitters	32	8	70%	30%	65%	35%	97	28	43	12		
Charters	19	5	50%	50%	50%	50%	54	12	54	12		
TOTALS	1015	489					2744	829	2284	675	$9,946	$54,016
											Total:	$63,962

L/WOODS - KENORA	Touring Pty-Nts	Fishing Pty-Nts	Touring % Camp	Touring % Lodge	Fishing % Camp	Fishing % Lodge	Totals for: # CPrs-N	# CPty-N	# LPrs-N	# LPty-N	$ Camp	$ Lodge
Locals - Kenora	324	216	80%	20%	90%	10%	1361	454	259	86		
Locals - other	43	173	80%	20%	90%	10%	570	190	78	26	Avg. Cg=	$12.00
US/Can	302	454	50%	50%	60%	40%	1482	423	1164	333	Avg. Lodge=	
US/US	243	27	50%	50%	60%	40%	482	138	463	132		$80.00
Outfitters	126	54	70%	30%	65%	35%	432	123	198	57		
Charters	115	29	50%	50%	50%	50%	324	72	324	72		
TOTALS	1154	952					4650	1400	2487	706	$16,800	$56,477
											Total:	$73,277

KENORA - MINAKI	Touring Pty-Nts	Fishing Pty-Nts	Touring % Camp	Touring % Lodge	Fishing % Camp	Fishing % Lodge	Totals for: # CPrs-N	# CPty-N	# LPrs-N	# LPty-N	$ Camp	$ Lodge
Locals - Kenora	39	59	80%	20%	90%	10%	253	84	41	14		
Locals - other	56	14	80%	20%	90%	10%	172	57	38	13	Avg. Cg=	$12.00
US/Can	98	42	50%	50%	70%	30%	274	78	216	62	Avg. Lodge=	
US/US	0	0					0	0	0	0		$80.00
Outfitters	28	7	70%	30%	65%	35%	85	24	38	11		
Charters	6	1	50%	50%	50%	50%	16	4	16	4		
TOTALS	227	123					800	248	348	102	$2,973	$8,182
											Total:	$11,154
OVERALL TOTALS	3962	2806					14474	4366	8295	2402	$52,387	$192,190

SECTOR: START/DESTINATION GENERAL BUSINESS OPPORTUNITIES:_____

ATIKOKAN-RAINY L	Fuel		Outfitting		Supplies		Service		Total
	@$/Trip	$ Fuel	@$/Trip	$ Outfit.	@$/Trip	$ Suppl.	@$/Trip	$ Servic.	Genl. BO
Locals - Atik.									
Locals - Ft. Fr.									
US/Can	avg prch=	18	avg prch=	$500	avg prch=	$40.00	avg prch=	$50.00	
US/US	$/gal	$2.50							
Outfitters	% purch=	95%	# purch=	250	% purch=	75%	% purch=	5%	
Charters									
TOTALS		$50,018		$125,000		$35,100		$2,925	$213,043

RAINY - LA CROIX	Fuel		Outfitting		Supplies		Service		Total
	@$/Trip	$ Fuel	@$/Trip	$ Outfit.	@$/Trip	$ Suppl.	@$/Trip	$ Servic.	Genl. BO
Locals - Ft. Fr.									
Locals - other									
US/Can	avg prch=	10	avg prch=	$500	avg prch=	$15.00	avg prch=	$50.00	
US/US	$/gal	$2.75							
Outfitters	% purch=	30%	# purch=	25	% purch=	30%	% purch=	2%	
Charters									
TOTALS		$6,683		$12,500		$3,645		$810	$23,638

FT FR - L/WOODS	Fuel		Outfitting		Supplies		Service		Total
	@$/Trip	$ Fuel	@$/Trip	$ Outfit.	@$/Trip	$ Suppl.	@$/Trip	$ Servic.	Genl. BO
Locals - Ft. Fr.									
Locals - other									
US/Can	avg prch=	15	avg prch=	$500	avg prch=	$15.00	avg prch=	$50.00	
US/US	$/gal	$2.50							
Outfitters	% purch=	50%	# purch=	25	% purch=	30%	% purch=	5%	
Charters									
TOTALS		$35,250		$12,500		$8,460		$4,700	$60,910

L/WOODS - KENORA	Fuel		Outfitting		Supplies		Service		Total
	@$/Trip	$ Fuel	@$/Trip	$ Outfit.	@$/Trip	$ Suppl.	@$/Trip	$ Servic.	Genl. BO
Locals - Kenora									
Locals - other									
US/Can	avg prch=	30	avg prch=	$500	avg prch=	$20.00	avg prch=	$50.00	
US/US	$/gal	$2.60							
Outfitters	% purch=	90%	# purch=	50	% purch=	90%	% purch=	5%	
Charters									
TOTALS		$82,134		$25,000		$21,060		$2,925	$131,119

KENORA - MINAKI	Fuel		Outfitting		Supplies		Service		Total
	@$/Trip	$ Fuel	@$/Trip	$ Outfit.	@$/Trip	$ Suppl.	@$/Trip	$ Servic.	Genl. BO
Locals - Kenora									
Locals - other									
US/Can	avg prch=	5	avg prch=	$500	avg prch=	$10.00	avg prch=	$50.00	
US/US	$/gal	$2.50							
Outfitters	% purch=	5%	# purch=	25	% purch=	5%	% purch=	1%	
Charters									
TOTALS		$313		$12,500		$250		$250	$13,313

OVERALL TOTALS	$174,397	$187,500	$68,515	$11,610	$442,022

SECTOR: START/DESTINATION ACCOMMODATION OPPORTUNITIES:

ATIKOKAN-RAINY L	Touring				Touring		Fishing				Fishing		Totals for:				
	Av Dy/Tr	St/Dst Nt	% Camp	% Lodge	Av Dy/Tr	St/Dst Nt	% Camp	% Lodge	# CPrs-N	# CPty-N	# LPrs-N	# LPty-N					
Locals - Atik.	3.0	1.5	10%	20%	2.0	0.5	20%	10%	7	2	90	30	$ Camp=				
Locals - Ft. Fr.	4.0	2.5	30%	20%	3.0	1.5	30%	10%	23	8	106	35	$842				
US/Can	6.0	4.5	40%	60%	6.0	4.5	50%	50%	129	37	2599	743	$ Lodge=				
US/US													$190,436				
Outfitters	6.0	4.5	30%	70%	6.0	4.5	40%	60%	76	22	5355	1530					
Charters	6.0	4.5	5%	95%	6.0	4.5	5%	95%	1	0	192	43	$ Total=				
TOTALS									241	70	8342	2380	$201,278				
									Atikokan Marina Revenues =				$10,000				
RAINY - LA CROIX	Touring				Touring		Fishing				Fishing		Totals for:				
	Av Dy/Tr	St/Dst Nt	% Camp	% Lodge	Av Dy/Tr	St/Dst Nt	% Camp	% Lodge	# CPrs-N	# CPty-N	# LPrs-N	# LPty-N					
Locals - Ft. Fr.	4.0	2.7	20%	20%	3.0	1.7	20%	10%	13	4	126	42	$ Camp=				
Locals - other	4.0	2.7	30%	20%	4.0	2.7	30%	10%	3	1	69	23	$763				
US/Can	6.0	4.7	30%	70%	6.0	4.7	50%	50%	132	38	3455	987	$ Lodge=				
US/US	4.0	2.7	40%	60%	4.0	2.7	50%	50%	53	15	1077	308	$124,772				
Outfitters	6.0	4.7	30%	70%	6.0	4.7	40%	60%	18	5	543	155					
Charters	6.0	4.7	5%	95%	6.0	4.7	5%	95%	2	0	201	45	$ Total=				
TOTALS									220	64	5471	1560	$125,535				
FT FR - L/WOODS	Touring				Touring		Fishing				Fishing		Totals for:				
	Av Dy/Tr	St/Dst Nt	% Camp	% Lodge	Av Dy/Tr	St/Dst Nt	% Camp	% Lodge	# CPrs-N	# CPty-N	# LPrs-N	# LPty-N					
Locals - Ft. Fr.	4.0	3.2	20%	30%	3.0	2.2	20%	10%	43	14	619	206	$ Camp=				
Locals - other	4.0	3.2	20%	30%	4.0	3.2	30%	10%	18	6	528	176	$980				
US/Can	6.0	5.2	30%	70%	6.0	5.2	50%	50%	132	38	3822	1092	$ Lodge=				
US/US	4.0	3.2	40%	60%	4.0	3.2	50%	50%	70	20	5286	1510	$264,784				
Outfitters	6.0	5.2	30%	70%	6.0	5.2	40%	60%	10	3	619	177					
Charters	6.0	5.2	5%	95%	6.0	5.2	5%	95%	2	0	667	148	$ Total=				
TOTALS									276	82	11541	3310	$265,764				
L/WOODS - KENORA	Touring				Touring		Fishing				Fishing		Totals for:				
	Av Dy/Tr	St/Dst Nt	% Camp	% Lodge	Av Dy/Tr	St/Dst Nt	% Camp	% Lodge	# CPrs-N	# CPty-N	# LPrs-N	# LPty-N					
Locals - Kenora	4.0	2.2	20%	15%	3.0	1.2	20%	10%	11	4	221	74	$ Camp=				
Locals - other	4.0	2.2	20%	30%	4.0	2.2	30%	10%	18	6	111	37	$911				
US/Can	6.0	4.2	30%	70%	6.0	4.2	50%	50%	188	54	3581	1023	$ Lodge=				
US/US	4.0	2.2	40%	60%	4.0	2.2	50%	50%	16	4	681	195	$154,334				
Outfitters	6.0	4.2	30%	70%	6.0	4.2	40%	60%	25	7	985	281					
Charters	6.0	4.2	5%	95%	6.0	4.2	5%	95%	4	1	1436	319	$ Total=				
TOTALS									262	76	7016	1929	$155,245				
KENORA - MINAKI	Touring				Touring		Fishing				Fishing		Totals for:				
	Av Dy/Tr	St/Dst Nt	% Camp	% Lodge	Av Dy/Tr	St/Dst Nt	% Camp	% Lodge	# CPrs-N	# CPty-N	# LPrs-N	# LPty-N					
Locals - Kenora	1.5	0.8	20%	15%	1.5	0.8	20%	10%	8	3	40	13	$ Camp=				
Locals - other	1.5	0.8	20%	30%	1.5	0.8	30%	10%	4	1	62	21	$258				
US/Can	3.5	2.8	30%	70%	3.0	2.3	50%	50%	47	13	1202	343	$ Lodge=				
US/US													$36,487				
Outfitters	2.5	1.8	30%	70%	3.0	2.3	40%	60%	10	3	225	64					
Charters	2.0	1.3	5%	95%	3.0	2.3	5%	95%	1	0	64	14	$ Total=				
TOTALS									74	21	1593	456	$36,745				
OVERALL TOTALS									1072	313	33963	9635	$784,566				

ENROUTE ACTIVITY SYNOPSIS:

SECTOR: ATIKOKAN-RAINY L	Touring: Pty Days	% Fishing Occasion:	#	Fishing: Tot. Fish Pty Days	Occasions	Transit Revenue @	Contrib. FFTransit
Locals - Atik.	360	50%	180	540	720	$5.00	10%
Locals - Ft. Fr.	144	50%	72	576	648	Crilly= Note:	0%
US/Can	788	40%	315	788	1103	$5,850 Tracy=	10%
US/US	0		0	0	0 Est.	Calm L= free	0%
Outfitters	2100	50%	1050	525	1575 Peak Day	$5,850	10%
Charters	54	30%	16	14	30 Transits=	Total =	0%
TOTALS	3446		1633	2442	4075 21	$11,700	100

RAINY - LA CROIX	Touring: Pty Days	% Fishing Occasion:	#	Fishing: Tot. Fish Pty Days	Occasions	Transit Revenue @	
Locals - Ft. Fr.	203	50%	101	473	574	$15.00	5%
Locals - other	158	50%	79	68	146	Dawson=	15%
US/Can	919	40%	368	919	1286	$12,150	10%
US/US	735	30%	221	315	536 Est.		0%
Outfitters	158	50%	79	105	184 Peak Day		10%
Charters	47	30%	14	20	34 Transits=	Total =	0%
TOTALS	2219		861	1899	2760 15	$12,150	55

FT FR - L/WOODS	Touring: Pty Days	% Fishing Occasion:	#	Fishing: Tot. Fish Pty Days	Occasions	Transit Revenue @		
Locals - Ft. Fr.	720	50%	360	1080	1440	$15.00		5%
Locals - other	675	50%	338	450	788			6%
US/Can	919	40%	368	919	1286		Total FF	30%
US/US	3780	30%	1134	420	1554 Est.		Transits=	50%
Outfitters	210	50%	105	53	158 Peak Day		782	10%
Charters	162	30%	49	41	89 Transits=	Total =	Peak Day=	0%
TOTALS	6466		2353	2962	5314 34	$11,730	14	544

L/WOODS - KENORA	Touring: Pty Days	% Fishing Occasion:	#	Fishing: Tot. Fish Pty Days	Occasions		
Locals - Kenora	810	50%	405	540	945		2%
Locals - other	108	50%	54	432	486		2%
US/Can	882	40%	353	1323	1676		10%
US/US	709	30%	213	79	291 Est.		8%
Outfitters	368	50%	184	158	341 Peak Day		10%
Charters	432	30%	130	108	238 Transits=		0%
TOTALS	3308		1338	2639	3977 21		72

KENORA - MINAKI	Touring: Pty Days	% Fishing Occasion:	#	Fishing: Tot. Fish Pty Days	Occasions	Transit Revenue @	
Locals - Kenora	252	50%	126	378	504	$3.00	0%
Locals - other	360	50%	180	90	270		1%
US/Can	735	40%	294	315	609		5%
US/US	0		0	0	0 Est.		0%
Outfitters	210	50%	105	53	158 Peak Day		0%
Charters	54	30%	16	14	30 Transits=	Total =	0%
TOTALS	1611		721	849	1570 9	$1,500	11

OVERALL TOTALS	17049	6906	10791	17697	$37,080	782

OPTION 1: FULL CAPITAL AND OPERATING COSTS IN PUBLIC SECTOR

BENEFIT-COST SUMMARY

COSTS:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
% of full costs	All Capital	70%	80%	90%	100%	100%	100%	100%	100%	100%
ATIK-RAINY	$1,063,066	$126,700	$144,800	$162,900	$181,000	$181,000	$181,000	$181,000	$181,000	$181,000
RAINY-LACROIX	$363,250	$48,300	$55,200	$62,100	$69,000	$69,000	$69,000	$69,000	$69,000	$69,000
FT.FR.-L.WOODS	$644,071	$112,700	$128,800	$144,900	$161,000	$161,000	$161,000	$161,000	$161,000	$161,000
L.WOODS-KENORA	$293,000	$12,950	$14,800	$16,650	$18,500	$18,500	$18,500	$18,500	$18,500	$18,500
KENORA-MINAKI	$0	$10,050	$10,050	$10,050	$10,050	$10,050	$10,050	$10,050	$10,050	$10,050
COORD./PROMOTION	$75,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
TOTALS	$2,438,387	$460,700	$503,650	$546,600	$589,550	$589,550	$589,550	$589,550	$589,550	$589,550
PV COSTS @ %/YRS	10.0%	25	$6,881,236							

BENEFITS:

% of full benefits		50%	70%	90%	100%	100%	100%	100%	100%	100%
ATIK-RAINY		$259,052	$362,673	$466,294	$518,104	$518,104	$518,104	$518,104	$518,104	$518,104
RAINY-LACROIX		$105,830	$148,162	$190,494	$211,660	$211,660	$211,660	$211,660	$211,660	$211,660
FT.FR.-L.WOODS		$225,388	$315,543	$405,698	$450,776	$450,776	$450,776	$450,776	$450,776	$450,776
L.WOODS-KENORA		$232,880	$326,032	$419,184	$465,760	$465,760	$465,760	$465,760	$465,760	$465,760
KENORA-MINAKI		$31,762	$44,467	$57,172	$63,524	$63,524	$63,524	$63,524	$63,524	$63,524
TOTALS		$854,912	$1,196,877	$1,538,842	$1,709,825	$1,709,825	$1,709,825	$1,709,825	$1,709,825	$1,709,825
PV COSTS @ %/YRS	10.0%	25	$12,900,517							
NPV BENEFITS/COSTS			$6,019,281							
BENEFIT/COST RATIO	Overall Project:		1.87							

Atik-Rainy	1.65
Rainy-LaCroix	1.84
Ft.Fr-L.Woods	1.85
L.Woods-Kenora	8.56
Kenora-Minaki	5.78

Note: B/C ratios for individual sectors are illustrative only. Validity of benefit attribution to sectors is less than for project as a whole.

OPTION 1: FULL CAPITAL AND OPERATING COSTS IN PUBLIC SECTOR

COST SYNOPSIS:	CAPITAL COSTS				Waterway	OPERATING & MAINT. COST/YEAR				Waterway
ATIK-RAINY	Onshore Cost	Marine Cost	Total Cost	% waterway	Share	Lavalin Est	JBE Est	Total Est	% waterway	Share
Atikokan	$394,700	$170,010	$564,710	70%	$395,297	1500	$20,000	$20,500	70%	$14,350
Tracy Rapids	$78,200	$177,697	$255,897	100%	$255,897	$47,000	$3,000	$50,000	100%	$50,000
Boyce Rapids	$0	$34,707	$34,707	100%	$34,707	$500	$0	$500	100%	$500
Calm L. Dam	$82,225	$100,170	$182,395	100%	$182,395	$47,000	$3,000	$50,000	100%	$50,000
Crilly Dam	$55,650	$74,720	$130,370	100%	$130,370	$47,000	$3,000	$50,000	100%	$50,000
Seine R.	$322,000	$0	$322,000	20%	$64,400	$0	$10,000	$10,000	20%	$2,000
TOTAL	$932,775	$557,304	$1,490,079		$1,063,066	$142,000	$39,000	$181,000		$166,850
Coordination/Promotion (Share)						40.0%	$60,000	$60,000	100%	$226,850
RAINY-LACROIX										
Customs/Sand L.	$82,800	$0	$82,800	100%	$82,800	$0	$4,000	$4,000	100%	$4,000
Dawson Portage	$13,000	$118,350	$131,350	100%	$131,350	$47,000	$2,000	$49,000	100%	$49,000
Enroute Campsites	$42,500	$0	$42,500	100%	$42,500	$0	$8,000	$8,000	100%	$8,000
Northwest Bay	$48,300	$0	$48,300	100%	$48,300	$0	$4,000	$4,000	100%	$4,000
Lac LaCroix	$58,300	$0	$58,300	100%	$58,300	$0	$4,000	$4,000	100%	$4,000
TOTAL	$244,900	$118,350	$363,250		$363,250	$47,000	$22,000	$69,000		$69,000
Coordination/Promotion (Share)						26.7%	$40,050	$40,050	100%	$109,050
FT.FR.-L.WOODS										
Emo	$210,000	$0	$210,000	30%	$63,000	$0	$8,000	$8,000	30%	$2,400
Rainy River-town	$230,000	$0	$230,000	80%	$184,000	$0	$10,000	$10,000	80%	$8,000
Long Sault	$48,300	$0	$48,300	100%	$48,300	$0	$4,000	$4,000	100%	$4,000
Single Campsites	$8,500	$0	$8,500	100%	$8,500	$0	$2,000	$2,000	100%	$2,000
Ft. Frances portg	$50,000	$161,775	$211,775	75%	$158,831	$135,000	$0	$135,000	75%	$101,250
Manitou Rapids	$0	$17,280	$17,280	100%	$17,280	$2,000	$0	$2,000		$0
Pile Remov R.Riv.	$0	$164,160	$164,160	100%	$164,160	$0	$0	$0		$0
TOTAL	$546,800	$343,215	$890,015		$644,071	$137,000	$24,000	$161,000		$117,650
Coordination/Promotion (Share)						13.3%	$19,950	$19,950	100%	$137,600
L.WOODS-KENORA										
Morson	$75,000	0	$75,000	80%	$60,000	$0	$2,000	$2,000	80%	$1,600
Nestor Falls	$50,000	0	$50,000	80%	$40,000	$0	$2,000	$2,000	80%	$1,600
Sioux Narrows	$100,000	0	$100,000	80%	$80,000	$0	$2,000	$2,000	80%	$1,600
Kenora	$15,000	0	$15,000	100%	$15,000	$0	$2,000	$2,000	100%	$2,000
L of the Woods	$75,000	0	$75,000	100%	$75,000	$0	$6,000	$6,000	100%	$6,000
Single Campsites	$23,000	0	$23,000	100%	$23,000	$0	$4,500	$4,500	100%	$4,500
TOTAL	$338,000	$0	$338,000		$293,000	$0	$18,500	$18,500		$17,300
Coordination/Promotion (Share)						13.3%	$19,950	$19,950	100%	$37,250
KENORA-MINAKI										
Coordination/Promotion (Share)						6.7%	$10,050	$10,050	100%	$10,050
COORDINATION/PROMOTION (TOTAL)								$150,000		
GRAND TOTALS:	$2,062,475	$1,018,869			$2,363,387	$327,000	$103,500	$439,550		$520,800

OPTION 2: PORTAGES OPERATED BY PRIVATE SECTOR (except Tracy)

BENEFIT-COST SUMMARY

COSTS:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
% of full costs	All Capital	70%	80%	90%	100%	100%	100%	100%	100%	100%
ATIK-RAINY	$1,006,366	$71,890	$82,160	$92,430	$102,700	$102,700	$102,700	$102,700	$102,700	$102,700
RAINY-LACROIX	$334,900	$23,905	$27,320	$30,735	$34,150	$34,150	$34,150	$34,150	$34,150	$34,150
FT.FR.-L.WOODS	$576,740	$27,811	$31,784	$35,757	$39,730	$39,730	$39,730	$39,730	$39,730	$39,730
L.WOODS-KENORA	$293,000	$12,950	$14,800	$16,650	$18,500	$18,500	$18,500	$18,500	$18,500	$18,500
KENORA-MINAKI	$0	$10,050	$10,050	$10,050	$10,050	$10,050	$10,050	$10,050	$10,050	$10,050
COORD./PROMOTION	$75,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
TOTALS	$2,286,006	$296,606	$316,114	$335,622	$355,130	$355,130	$355,130	$355,130	$355,130	$355,130
PV COSTS @ %/YRS	10.0%	25	$4,917,664							

BENEFITS:

% of full benefits		50%	70%	90%	100%	100%	100%	100%	100%	100%
ATIK-RAINY		$259,052	$362,673	$466,294	$518,104	$518,104	$518,104	$518,104	$518,104	$518,104
RAINY-LACROIX		$105,830	$148,162	$190,494	$211,660	$211,660	$211,660	$211,660	$211,660	$211,660
FT.FR.-L.WOODS		$225,388	$315,543	$405,698	$450,776	$450,776	$450,776	$450,776	$450,776	$450,776
L.WOODS-KENORA		$232,880	$326,032	$419,184	$465,760	$465,760	$465,760	$465,760	$465,760	$465,760
KENORA-MINAKI		$31,762	$44,467	$57,172	$63,524	$63,524	$63,524	$63,524	$63,524	$63,524
TOTALS		$854,912	$1,196,877	$1,538,842	$1,709,825	$1,709,825	$1,709,825	$1,709,825	$1,709,825	$1,709,825
PV COSTS @ %/YRS	10.0%	25	$12,900,517							
NPV BENEFITS/COSTS			$7,982,853							
BENEFIT/COST RATIO	Overall Project:		2.62							

Atik-Rainy	2.28
Rainy-LaCroix	2.80
Ft.Fr-L.Woods	4.08
L.Woods-Kenora	8.56
Kenora-Minaki	5.78

Note: B/C ratios for individual sectors are illustrative only. Validity of benefit attribution to sectors is less than for project as a whole.

OPTION 2: PORTAGES OPERATED BY PRIVATE SECTOR (except Tracy)

COST SYNOPSIS: ATIK-RAINY	CAPITAL COSTS Onshore Cost	Marine Cost	Total Cost	% waterway	Waterway Share	OPERATING & MAINT. COST/YEAR Lavalin Est	JBE Est	Total Est	% waterway	Waterway Share
Atikokan	$394,700	$170,010	$564,710	70%	$395,297	3500	$20,000	$20,500	70%	$14,350
Tracy Rapids	$78,200	$177,697	$255,897	100%	$255,897	$47,000	$3,000	$50,000	100%	$50,000
Boyce Rapids	$0	$34,707	$34,707	100%	$34,707	$500	$0	$500	100%	$500
Calm L. Dam	$82,225	$71,820	$154,045	100%	$154,045	$2,000	$8,850	$10,850	100%	$10,850
Crilly Dam	$55,650	$46,370	$102,020	100%	$102,020	$2,000	$8,850	$10,850	100%	$10,850
Seine R.	$322,000	$0	$322,000	20%	$64,400	$0	$10,000	$10,000	20%	$2,000
TOTAL	$932,775	$500,604	$1,433,379		$1,006,366	$52,000	$50,700	$102,700		$88,550
Coordination/Promotion (Share)						40.0%	$60,000	$60,000	100%	$148,550
RAINY-LACROIX										
Customs/Sand L.	$82,800	$0	$82,800	100%	$82,800	$0	$4,000	$4,000	100%	$4,000
Dawson Portage	$13,000	$90,000	$103,000	100%	$103,000	$2,000	$12,150	$14,150	100%	$14,150
Enroute Campsites	$42,500	$0	$42,500	100%	$42,500	$0	$8,000	$8,000	100%	$8,000
Northwest Bay	$48,300	$0	$48,300	100%	$48,300	$0	$4,000	$4,000	100%	$4,000
Lac LaCroix	$58,300	$0	$58,300	100%	$58,300	$0	$4,000	$4,000	100%	$4,000
TOTAL	$244,900	$90,000	$334,900		$334,900	$2,000	$32,150	$34,150		$34,150
Coordination/Promotion (Share)						26.7%	$40,050	$40,050	100%	$74,200
FT.FR.-L.WOODS										
Emo	$210,000	$0	$210,000	30%	$63,000	$0	$8,000	$8,000	30%	$2,400
Rainy River-town	$230,000	$0	$230,000	80%	$184,000	$0	$10,000	$10,000	80%	$8,000
Long Sault	$48,300	$0	$48,300	100%	$48,300	$0	$4,000	$4,000	100%	$4,000
Single Campsites	$8,500	$0	$8,500	100%	$8,500	$0	$2,000	$2,000	100%	$2,000
Ft. Frances portg	$50,000	$72,000	$122,000	75%	$91,500	$2,000	$11,730	$13,730	75%	$10,298
Manitou Rapids	$0	$17,280	$17,280	100%	$17,280	$2,000	$0	$2,000		$0
Pile Remov R.Riv.	$0	$164,160	$164,160	100%	$164,160	$0	$0	$0		$0
TOTAL	$546,800	$253,440	$800,240		$576,740	$4,000	$35,730	$39,730		$26,698
Coordination/Promotion (Share)						13.3%	$19,950	$19,950	100%	$46,648
L.WOODS-KENORA										
Morson	$75,000	0	$75,000	80%	$60,000	$0	$2,000	$2,000	80%	$1,600
Nestor Falls	$50,000	0	$50,000	80%	$40,000	$0	$2,000	$2,000	80%	$1,600
Sioux Narrows	$100,000	0	$100,000	80%	$80,000	$0	$2,000	$2,000	80%	$1,600
Kenora	$15,000	0	$15,000	100%	$15,000	$0	$2,000	$2,000	100%	$2,000
L of the Woods	$75,000	0	$75,000	100%	$75,000	$0	$6,000	$6,000	100%	$6,000
Single Campsites	$23,000	0	$23,000	100%	$23,000	$0	$4,500	$4,500	100%	$4,500
TOTAL	$338,000	$0	$338,000		$293,000	$0	$18,500	$18,500		$17,300
Coordination/Promotion (Share)						13.3%	$19,950	$19,950	100%	$37,250
KENORA-MINAKI										
Coordination/Promotion (Share)					$0	6.7%	$10,050	$10,050	100%	$10,050
COORDINATION/PROMOTION (TOTAL)								$150,000		
GRAND TOTALS:	$2,062,475	$844,044			$2,211,006	$59,000	$137,080	$205,130		$316,698