96.2, 1991-1997

UTILIZATION OF HARDWOODS IN NORTHERN ALBERTA SUMMARY REPORT

prepared for:

Alberta
NORTHERN ALBERTA
DEVELOPMENT COUNCIL

SUMMARY REPORT

UTILIZATION OF HARDWOODS IN NORTHERN ALBERTA

SUMMARY REPORT

CANADIANA

MAR 12 1991

Prepared for: Northern Alberta Development Council

Prepared by: Woodbridge, Reed and Associates Ltd.
A Division of H.A. Simons (International) Ltd.
Vancouver, B.C.

February, 1985

The cost of this report has been jointly shared between the Northern Development Branch of Alberta Tourism and Small Business, and the Forest Products and Forest Industrial Development Research Program (Alberta Economic Development, Alberta Energy and Natural Resources and the Alberta Research Council).

UTILIZATION OF WASTEWATER IN NORTHERN ALBERTA

SUMMARY REPORT

Prepared for: Northern Alberta Development Council

Prepared by: Woodbridge, Reed and Associates Ltd.
A Division of R.A. Simons (International) Ltd.
Vancouver, B.C.

February, 1977

The purpose of this report is to provide information on the current status of wastewater utilization in Northern Alberta. The report is based on a review of the literature and interviews with representatives of the Northern Alberta Development Council, the Government of Alberta, and the private sector. The report is intended to provide a basis for the development of a wastewater utilization program in Northern Alberta.

SUMMARY REPORT

Introduction

This is the summary report of Utilization of Hardwoods in Northern Alberta.^{*} The Northern Alberta Development Council (NADC) commissioned an examination of the current status and development prospects for the northern hardwood resource. The NADC, together with assistance from Alberta Economic Development and Alberta Energy and Natural Resources, established a joint government-industry study steering committee, and employed Woodbridge, Reed and Associates Ltd. to complete the research project.

For many years, northern Alberta's extensive hardwood resources have been recognized as having considerable potential for development. Current harvest levels are higher than a few decades ago, and some notable successes have been achieved in forest products manufacturing investment based on the resource. Nevertheless, there are extensive tracts of hardwoods throughout Alberta which are significantly underutilized. The hardwood resource in northern Alberta comprises three species which grow to commercial size. Trembling aspen is the most numerous of the three and accounts for 81 per cent of the total standing hardwood inventory. Balsam poplar and white birch account for a further 15 per cent and 4 per cent respectively.

The reader should bear in mind that the factors determining the rate of timber utilization, in the forest products industry, are 1) markets and 2) economics. There is a well documented evolution in utilization worldwide whereby, for sound commercial reasons, preferred species and sizes normally are harvested first. Later, as the supply of these declines and the costs of logging less accessible sites increases, the commercial value of other species is enhanced and higher levels of utilization commence. An exception to this is where technological or market changes shift the balance of desirability in favour of lesser utilized species. This has been the case, for example, with aspen waferboard and oriented strand board (OSB) which are now produced in Alberta and in other areas.

It appears that there are grounds for cautious optimism that much more of northern Alberta's hardwood resources could become economically attractive for forest product investment within the next five to ten years. A number of recent studies have pointed to this possibility.

* For more detailed information, the reader is directed to the main report.

SUMMARY REPORT

Introduction

This is the summary report of the research project of the Northern Africa Development Council (NADC) carried out in cooperation of the various states and development agencies in the northern African region. The NADC, created with a view to the African Economic Development and African Energy and Natural Resources, has established a joint government-private study group, composed of the following members: World Bank and Associates, UNCTAD, the International Labour Office, and the African Development Bank.

For many years, northern Africa's extensive natural resources have been recognized as having considerable potential for development. Current estimates indicate that the region's oil and gas reserves are among the largest in the world. In addition, the region is rich in minerals, particularly iron, copper, and uranium. The region's agricultural resources are also considerable, particularly in the areas of wheat, citrus fruits, and olive oil. The region's strategic importance is further enhanced by its location as a major transit route between Europe and Asia. The region's development is therefore of great importance to the world economy. The region's development is therefore of great importance to the world economy. The region's development is therefore of great importance to the world economy.

The reader should bear in mind that the factors determining the rate of economic activity in the African private industry are 1) markets and 2) resources. There is a well-documented tradition of abundant natural resources, the most common of which are oil, gas, and minerals. These resources are however largely unused, as the majority of them are held in the hands of a few individuals. The cost of bringing these resources into use is very high, and the benefits of their use are often shared by a few individuals. The cost of bringing these resources into use is very high, and the benefits of their use are often shared by a few individuals. The cost of bringing these resources into use is very high, and the benefits of their use are often shared by a few individuals.

It appears that there are grounds for optimism regarding the future of the African private industry. The region's abundant natural resources, if properly managed, could provide a significant source of income for the region. The region's strategic location, if properly managed, could provide a significant source of income for the region. The region's abundant natural resources, if properly managed, could provide a significant source of income for the region.

Alberta's Fibre Reserves in the Global Context

In the past decade, there has been a great deal of discussion about the prospect of global deficits in economically accessible supplies of softwood and hardwood timber. This has caused concern in some major traditional supplying areas, such as Canada, where it was assumed that the softwood timber reserve was much greater. The other side of the picture, however, has been an increased level of interest in "fibre supply" potential from (a) "new" supplying areas (particularly in plantation developments, e.g. Brazil, South Africa, Chile, etc.) and (b) areas of timber previously considered to be marginal by virtue of location, stand-densities, species, timber quality and so on.

In the late 1970's, Alberta certainly justified a position on most timber companies' "shopping-lists" as an area for expansion. Significantly Alberta's estimated 17 million cubic metre reserve represents the largest incremental wood supply in all of Canada. Given the recent recession, however, the immediate outlook for many companies is for priorities to be placed on upgrading of existing facilities in currently committed areas.

The analysis presented in this study indicates that Alberta still can offer competitive strengths in a number of important aspects. The reality is that the comparative attractiveness of these factors has to be viewed in the context of a much more competitive climate for new investment. Development of these resources is not so much a question of "if" as "when".

Current Utilization of Hardwoods in Alberta

There is, as of 1984, one waferboard plant and one OSB (Oriented Strand Board) plant in Alberta using aspen as their raw material. The waferboard plant is located at Slave lake. In 1979 the plant was purchased by Weldwood and extensive modernization was carried out. The plant commenced full operation in 1981 and has been producing waferboard since that time with a few temporary closures due to poor market conditions.

The OSB plant at Edson is of much more recent origin. It commenced full operation in 1984 and is a very modern plant with state-of-the-art technology producing a high quality product.

Apart from these two major facilities, hardwood logs are also utilized by a number of small sawmills. In total there are about 25 mills on record as cutting aspen. However, a number of these are very small and only operate on a sporadic basis producing less than one million board feet annually. Their products tend to be utilized very locally for construction purposes or are sold for a variety of low value uses such as pipe racks, dunnage and pallets.

Alberta's Place in the Canadian Economy

In the past decade, there has been a great deal of discussion about the prospect of Alberta's economic future. The province's economy is largely based on the oil and gas industry. This has led to a concentration of resources in the oil and gas sector, which has led to a neglect of other industries. The oil and gas industry is a key sector of the Canadian economy, and Alberta is a major producer of oil and gas. The province's economy is largely based on the oil and gas industry. This has led to a concentration of resources in the oil and gas sector, which has led to a neglect of other industries. The oil and gas industry is a key sector of the Canadian economy, and Alberta is a major producer of oil and gas.

In the late 1970s, Alberta's economy was largely based on the oil and gas industry. The province's economy is largely based on the oil and gas industry. This has led to a concentration of resources in the oil and gas sector, which has led to a neglect of other industries. The oil and gas industry is a key sector of the Canadian economy, and Alberta is a major producer of oil and gas.

The province's economy is largely based on the oil and gas industry. This has led to a concentration of resources in the oil and gas sector, which has led to a neglect of other industries. The oil and gas industry is a key sector of the Canadian economy, and Alberta is a major producer of oil and gas.

Current Situation of the Alberta Economy

There is a lot of discussion about the current situation of the Alberta economy. The province's economy is largely based on the oil and gas industry. This has led to a concentration of resources in the oil and gas sector, which has led to a neglect of other industries. The oil and gas industry is a key sector of the Canadian economy, and Alberta is a major producer of oil and gas.

The current situation of the Alberta economy is largely based on the oil and gas industry. This has led to a concentration of resources in the oil and gas sector, which has led to a neglect of other industries. The oil and gas industry is a key sector of the Canadian economy, and Alberta is a major producer of oil and gas.

There are two main issues that are being discussed in the current situation of the Alberta economy. The first issue is the concentration of resources in the oil and gas sector. The second issue is the neglect of other industries. The oil and gas industry is a key sector of the Canadian economy, and Alberta is a major producer of oil and gas.

Hardwood utilization for pulp in Alberta currently is limited to experimental volumes for aspen bleached kraft market pulp (BKP) at Procter & Gamble's Grande Prairie softwood bleached kraft market pulp. A specialty pulp/paper mill utilizing aspen has been proposed by Makin for the Drayton Valley area.

The Hardwood Species in Northern Alberta

Three species of hardwood grow to commercial size in northern Alberta: trembling aspen, balsam poplar and white birch. Trembling aspen is the most numerous of the three in Alberta. In fact, it is the most widely distributed tree species in North America. A major constraint to utilization in northern Alberta is that essentially the same type of resource occurs in many locations closer to some major North American population centres.

The extensive occurrence of aspen is in large part a result of its successful ability to regenerate through root suckering. This allows reestablishment after fire, logging, insects or disease have caused death of the overstory, as long as the root system has not been killed. It is also well adapted to extensive forest management, where the forester wishes to re-establish growth and stocking as quickly and inexpensively as possible after clear-cutting.

Balsam poplar, like aspen, is an early successional species with striking capabilities to reproduce naturally through root suckers or stump sprouts after disturbance. While the species is common, it is much less abundant than aspen. It is often found intimately mixed with aspen, a situation which is problematic for existing panelboard operations in Alberta which currently utilize only aspen. White birch is the least abundant of the three hardwood species.

Defect in the Hardwood Resource

Trembling aspen and balsam poplar are subject to a number of decay diseases which cause timber loss and degradation of wood quality. Decay is of paramount importance in any consideration of hardwood utilization in northern Alberta. The most frequently reported decay organism in northern Alberta is *Fomes ignarius*, often referred to as white heart rot or white trunk rot. It is more prevalent in aspen than in balsam poplar. The rot enters the trunk of the tree through wounds such as where branches have broken off or where frost cracks have opened the bark. Infection goes through several stages including stain (where the wood is discoloured but the structural integrity is maintained), through incipient or intermediate decay (when the cell walls making up the wood are beginning to break down), to advanced decay (when the wood is soft and visibly decomposed).

Although the significance of decay to commercial development of the resource is accepted, our ability to predict the extent of decay in existing or future hardwood stands is poor. In this study, we attempted to relate the percentage of decayed wood to stand age. Relating decay to other site variables was considered futile at this time, either because research had failed to quantify the relationship or because Alberta inventory data did not include the potential indicator variables.

In order to construct a simple mathematical model which could be used to predict decay levels from forest inventory projections, various formulae were manipulated until curves were obtained which seemed to best represent the relationship between decay and age. Given the amount of variation observed in the literature and in production experience, the selection of such curves was necessarily subjective and the resulting predictions will obviously deviate widely from the actual cull percentages encountered in many specific situations. Figure 1 summarizes these predictions. Note the exponential increase in decay forecast for aspen. The stand is considered effectively "broken-up" and unusable by 140 years of age, when the decay percentage exceeds 50 per cent.

Figure 1
(Extracted from Section 2.0)

Percentage of Decayed Volume Predicted in Relation to Age for
Aspen, Balsam Poplar and Birch

A central implication then, on the resource side of the utilization question, is that decay is unpredictably distributed throughout the tree in such a way that, although only 10 to 20 per cent of the wood might be rotten, loggers and manufacturers experience great difficulty in economically recovering the sound wood.

This means that many of the aspen trees in northern Alberta are either already too old and decayed to be utilized or are presently too small. Timing is critical in the successful utilization of the species and the logistic difficulties of harvesting the trees when they are large enough for manufacture, but before they succumb to decay, are not easily overcome.

The Phase III Inventory

The Alberta Forest Service has just completed a major assessment of the province's timber resources. This has provided the best, publicly available, assessment so far of Alberta's hardwoods. For the purposes of this study, analysis of these new data has been carried out in order to determine the general quality and location of the hardwoods.

Timber supply analyses provided in this study are very preliminary in nature, and will require much additional work before site-specific opportunities can be confirmed. On a tentative basis, however, it appears that there are grounds for cautious optimism that forest industry development in northern Alberta can be expanded, perhaps significantly, using part of its currently underutilized hardwood resources.

Specifically, the new forest inventory data indicate a fairly dramatic re-assessment of the distribution of hardwood supplies in northern Alberta, relative to the old allowable cut data. Higher hardwood volumes have been identified northwest of Slave Lake and lower concentrations east and south of Slave Lake. Encouragingly, the new data indicate a better age class distribution and large areas of young, healthy stands north and west of Slave Lake.

Young stands in some areas of Slave Lake and Whitecourt are believed to offer the best development opportunities. High volumes of aspen, generally with good age class distributions, have been identified in parts of the Peace River, Grande Prairie, Footner and Lac La Biche forests. They represent a potentially significant opportunity for hardwood manufacturing developments.

Map 4 taken from the main report is shown on the following page. The map displays the analyses of Phase III inventory data for pure stands of hardwood by age class distribution. Keeping in mind the earlier discussion on the potential for defect in older stands, the sub-merchantable quality of younger stands, the reader's attention is directed to the centre bar in each forest management unit graph--the merchantable stands.

Map 4

(Extracted from Section 3.0)

MAP 4
AREAS OF PURE HARDWOOD STANDS BY AGE CLASS

- 0 - 45 years (sub-merchantable)
- 50 - 75 years (merchantable, thrifty)
- 80 years + (merchantable, decay-prone)
- 10,000 ha
- non-inventoried areas

The Potential for Producing A Wide Range of Hardwood-based Products Has Been Evaluated

A central objective of this study is to evaluate the new data in the light of product and market opportunities for more hardwood forest industry expansion in northern Alberta. A wide range of products options have been evaluated in terms of a) technical feasibility b) economic feasibility and c) market outlook. Each product option has been ranked in terms of 'high', 'moderate' or 'low' probability of success based on these criteria.

Pulp and Paper Options

Technically, it is possible to produce a very wide range of pulps and a variety of papers and paperboards from northern Alberta's hardwood species. Previous studies have reviewed most of these technical options and have dismissed many of them from further consideration because of market or economic limitations, or both. For the purposes of this study, a brief review of these ranking conclusions was carried out. The results generally verify the conclusions of the previous studies. However, additional market analysis carried out in this study, suggests that a slightly different ranking is justified in the ratings of the product options considered to have greatest investment potential for northern Alberta. Table 1 displays the results of our assessment.

Table 1

Preliminary Screening of Pulp and Paper Development Options

Short-listed Options	Technical	Economic	Market
Aspen bleached kraft pulp	H	L	H
Bleached CTMP	M-H	H	M-H
Uncoated woodfree papers	H	L	L
Uncoated groundwood papers	M	M	M-H*
Light weight coated paper	M	M-H	Very H
Tissues	L	L	L
Newsprint	L	L	M

L = low M = moderate H = high * longer term

Wood Product Options (stand alone)

The evaluation approach for wood product options is similar to that used for pulp and paper. The evaluation criteria are identical to those used for pulp and paper. However, only stand alone wood product options are considered. Integrated wood product options are discussed separately in the main report. Below in Table 2 is a summary of the options considered and the ranking on technical, economic, and market criteria.

Table 2

Preliminary Screening of Wood Product Development Options (Stand Alone)

Short-Listed Options	Technical	Economic	Market
Waferboard OSB	H	M/L	L
Construction Plywood	M	L	L
Medium Density Fiberboard	H	M/L	L
Particleboard	H	M/L	M/L
Specialty Plywood	M	M	M
Industrial Handling Lumber	H	M/L	L
Reconstituted Lumber	M	L	L
Specialty Lumber	H/M	M	H/M

L = low M = moderate H = high

Rating of Pulp and Paper and Wood Products Development Options

As a conclusion to the market assessment the short-listed pulp and paper development and solid wood product options are ranked in the table below in terms of most probable likelihood of success in northern Alberta. Obviously additional work is required to confirm these initial findings and to identify other relevant factors.

**Northern Alberta: Ranking of Pulp & Paper*
and Solid Wood Products Development Options**

Most Promising

Aspen/Softwood CTMP
Lightweight Coated Paper (LWC)
Bleached Aspen-Kraft Market Pulp
Specialty Lumber

Longer Term Potential

Uncoated Groundwood Papers
Uncoated Woodfree Papers
Waferboard/OSB

Possible, But Not Given a High Ranking

Newsprint
Tissues

- * Specialty pulp and paper products have not been considered.

Aspen Pulping Holds Considerable Promise

One of the principal conclusions of this study is that pulpmaking offers probably the best major development opportunity for utilizing the hardwood resources of northern Alberta. Two specific options have been evaluated as having a fairly high ranking for future manufacturing investment. These are aspen bleached kraft market pulp (aspen BKP) and aspen/spruce mix chemi-thermomechanical market pulp (aspen/spruce bleached CTMP). Aspen kraft pulping already has been tried on an experimental basis (Procter & Gamble at Grande Prairie) and the results apparently are encouraging. This technology fits best with existing experience and expertise in northern Alberta. It has a high ranking in terms of technical and market feasibility but the economic and financial viability of a greenfield mill is uncertain at this time.

Bleached CTMP, based on 50 per cent aspen/50 per cent spruce is a lower capital and operating cost option to kraft pulping. There are more locations in which it would be feasible in northern Alberta. The market prospects are good and the economic feasibility is potentially very high. This is a comparatively new, although proven process (a generally similar type exists in the B.C. Interior and an identical mill to the one identified

for northern Alberta is being considered for Taylor, B.C.). However, it would require expertise which does not exist in Alberta at present. This option has the added advantage of potential feasibility as a stand-alone market pulp mill and scope for subsequent integration into paper/paper-board manufacturing either with existing or any new kraft pulp mill in the province.

Decay Levels Pose Some Constraints to Possible Pulp Mill Locations

The subject of decay, and its commercial implications, have been addressed in this study. The specific conclusions drawn from the analysis are as follows:

A. Aspen Bleached Kraft Market Pulp

Annual fibre requirements are in the order of 1.4 million cubic metres of roundwood (net of defect). Maximum decay levels in delivered wood are probably about 20 per cent, although levels approaching this would create substantial increases in logging and manufacturing costs. Small trees, which usually are more sound than larger/older trees, can be utilized. Water and infrastructure requirements are critical factors in facility location, and are not addressed in detail here.

Basing the selection of candidate areas simply on the distribution of AAC would indicate the highest concentration, and hence the best opportunity, in the eastern Slave Lake area (over two million cubic metres of AAC available within a 100 km radius), followed by Whitecourt and Grande Prairie (each having over one million cubic metres of AAC within 100 km.).

However, in view of the probable shift in AAC distribution discussed in more detail in Chapter 4, the availability of "non-forest" wood, and the situation regarding existing commitments, we suggest that the best opportunities may exist in the Peace River Forest, the area west of Slave Lake, or the Grande Prairie area.

The area west of Slave Lake appears to contain about one million cubic metres of AAC mostly within a 100 km. radius, with a good age-class distribution. Whereas in some of the eastern Slave Lake units we anticipate AAC's may be overly optimistic, the converse may be true for the area in question. In addition a significant supplemental volume could be acquired from the yellow area and Metis settlements. The hardwoods in the area are largely uncommitted. The biggest resource constraint for kraft development in the area presumably is water availability.

Grande Prairie ostensibly has over one million cubic metres of hardwood AAC within 100 km. However, some of the supply units contain significant components of older wood, supplemental sources are limited, and we do not know whether this cut level is achievable. Given that much of the available hardwood resource lies within their lease area, utilization here will depend very much on Procter and Gamble Ltd.

The Peace River area merits further examination. The most hopeful location would probably be downstream from the town of Peace River, perhaps at Manning. Current AAC estimates indicate about 840,000 cubic metres within 100 km. If the new inventory data are correct, this figure is probably not only attainable, but conservative. If these data are going to result in AAC increases anywhere in the Province, it will probably be in the Footner and Peace River management units on the east side of the Peace. These units would only be accessible to Manning during the winter, but a large supply of summer wood could be attainable from the Procter and Gamble Reserve Area and supplementary sources. A very significant supply could be obtained from "non-forest" sources. Management unit PO3 alone contains at least 28 million cubic metres of standing inventory. Access to the Procter and Gamble Reserve Area would be a prerequisite for this option.

B. Aspen/Spruce Bleached CTMP

Annual fibre requirements are in the order of 260,000 cubic metres of hardwood, plus 240,000 cubic metres of softwood, which could be acquired in the form of residual chips from sawmill operations. Quality requirements are more stringent than for kraft, and we are assuming an upper decay limit of 10 per cent. Water requirement is only 5 per cent of that for kraft manufacture.

Several potential locations can be identified. We have preliminarily identified eight of these, and reviewed them with regard to the quantity of hardwood and of softwood chips economically available, existing tenurial commitments and utilization, and quality of the available hardwood.

Four locations have been retained as potentially feasible. These forest locations are Footner Lake, (Fort Vermilion), Peace River (Manning), Slave Lake (High Prairie Valleyview) and Grande Prairie. The Whitecourt and Slave Lake (East) locations have been provisionally rejected primarily because of anticipated decay problems. Adequate chip supplies are not readily available in the Fort McMurray and Lac La Biche areas. Facilities located in the Peace River or Grande Prairie areas would be at least partially dependent on lands over which P & G currently hold tenurial options.

Lightweight Coated Paper (LWC) Production Using Aspen Appears to be an Attractive Option

A number of important studies, financed or partially financed by the Departments of Economic Development and Energy and Natural Resources, recently have identified the potential for integrated production of papermaking in Alberta. Some of the conclusions are directly applicable to northern Alberta as a potential location of such plants.

The most promising papermaking option for northern Alberta is lightweight coated paper. This is used for magazines, catalogs and general printing. It is a growth market and Alberta has been considered as a possible location for a LWC plant by St. Regis Paper Co. which is a leader in this field.

On a technical and market basis, this option appears to be very feasible for northern Alberta: however, the comparative cost position of an Alberta based mill (compared with other possible Canadian and U.S. locations) has only been addressed at the general level in published studies. It is an option which the NADC should consider pursuing, subject to any existing negotiations which may be taking place at the senior government/corporate level vis a vis other possible locations in Alberta.

Other Papermaking Options Probably Could Not Be Considered For Some Time

Four other papermaking options are 'short-listed' in this study as potential development options for northern Alberta, using hardwoods. These are:

1. Uncoated Groundwood Papers
2. Uncoated Woodfree Papers
3. Newsprint
4. Tissues

Uncoated groundwood papers are used in similar applications to LWC papers (magazines, catalogs) and in business forms. The specific grade identified as having potential for northern Alberta is supercalendered groundwood which is a higher quality and higher priced product than some of the newsprint specialties produced by existing mills in western and eastern Canada. There are a number of unknowns relating to the feasibility of this development option for northern Alberta and it has been assessed as having longer term, rather than shorter term, potential.

Uncoated woodfree papers (photocopy, computer and office papers) would fit closely with the existing pulp industry structure in Alberta but there is a sizeable volume of overcapacity in North America at present. This is expected to continue for some time, despite significant market growth. Moreover, northern Alberta's competitive position is uncertain. This option also has been assessed as having longer term potential for northern Alberta.

Aspen newsprint has been produced on a trial basis by a number of companies (e.g. Prince Albert Pulp) and holds considerable longer term promise. However, it is not regarded as a significant option for the foreseeable future. Tissue production requires a strong domestic market opportunity to be viable. The technical feasibility for utilizing, in part, northern Alberta hardwoods is favourable, but this option has a low rating in terms of potential economic and market viability.

Lumber Specialties Offer Selective Development Opportunities

Construction grade aspen lumber is given a low rating on the basis of poor economics and weak market prospects. Industrial handling lumber (e.g. pallets) offers more potential, but is not given a high priority for successful new commercial development on a large scale in northern Alberta. Similar considerations apply to reconstituted products, such as laminated veneer lumber (LVL).

Specialty lumber options, based on aspen, have better potential. These comprise a wide range of products, such as turnings, panelling, shelving, furniture components, bedframes, mouldings and chopstick blanks. The technology to extract the necessary grades and sizes from aspen is readily available. Production economics frequently are variable and the most successful manufacturing operations (such as those in Ontario and the U.S. Lake States) emphasize the higher value-added products. Nevertheless, it should be recognized, in northern Alberta's case, that market for pulpable residuals will be critical. Much additional work is required before specific opportunities can be identified, but an encouraging development is the recent initiative by Canadian Forest Products Ltd. in Grande Prairie to develop market opportunities in aspen lumber specialty products in northern Alberta.

Smaller Scale Wood Product Development Options Could be Considered

It has already been pointed out that there does not appear to be any significant potential for new capacity to produce low value lumber for industrial handling. Higher value specialty products have better potential but are only economic if very high quality logs are used. Such logs are available on some sites but only on a selective basis. Furthermore they are often difficult to identify until the tree has been felled.

It is possible, therefore, that a number of small operators could exist if they were allowed to log on a very selective basis. From the resource management point-of-view this could, however, present some problems. Apart from provincial forestry policy considerations, there could be difficulties. Where the trees are within areas that have already been allocated (this would apply to much of the sites that are more easily accessed), the company with the existing allocation obviously is likely to resist losing the best trees. Even where the resource has yet to be allocated the existence of several small independents removing the best aspen could prove a negative factor to a potential larger investor.

It may be, however, that these difficulties can be overcome. The number of small operators can be limited and their volumes and areas of operation controlled so that any impact on large scale opportunities is minimized. Also it is worth noting that the large complexes such as pulp mills, or waferboard plants, are much more tolerant of variations in raw material quality than a small specialty lumber facility although there is still a cost involved. Thus while a pulp mill can, if necessary, use a great proportion of the qualities and sizes produced during logging, a specialty lumber operation, producing a high value product, can only be economic with the high quality log.

Assuming that the resource allocation aspect can be resolved, there is still likely to be a weakness at the production and marketing level. This type of operation is small and therefore has limited production sophistication and even less marketing expertise. Yet success in the manufacture of specialty products depends on

- consistent volumes and precise specifications
- extensive distribution and marketing since the products are designed for very specific markets.

It would be difficult for an individual small operator to satisfy these requirements alone, and the key to development appears to be in a cooperative marketing and distribution arrangement, perhaps assisted through regional development funding.

Despite Considerable Potential, A Number of Serious Constraints to Development Exist

One of the keys to successful economic expansion of the unutilized portions of the forest resources of northern Alberta is the development of an adequate transportation infrastructure. In many respects, however, this is a "chicken-and-egg" situation. On one hand, development of the full potential cannot be achieved without a) adequate physical infrastructure and b) the availability of rail/truck service offering a competitive rate structure for shipment of product. On the other hand, the economic provision of the physical infrastructure, beyond that which exists today, and the development of a competitive rate structure (e.g. rail) depends on the existence, or potential development, of a viable industrial base.

This study has indicated a reasonably favourable aspen resource situation in, for example, the Fort Vermilion area, yet the nearest rail point is at High Level. There are many similar examples. It is not possible, because of the general nature of this study, to conclude that the absence of an adequate physical infrastructure is the major factor precluding an industrial development. This would require site-specific study. Nevertheless, a basic principle can be identified. This is that for industrial development to proceed in these circumstances, realistically there must be public sector participation in the costs involved.

The detailed analysis of transportation rates, again, is beyond the scope of this study. In some areas there is a choice of transportation modes, but no choice in others. De-regulation of rail transportation in the U.S. is having a dramatic impact upon freight rates and service in North America and, in almost all cases, rates are now directly negotiated between carrier and shipper.

Transportation distances, road haulage weight allowances and transportation cost have been cited in some cases as negative factors affecting the viability of potential forest industry investments in northern Alberta. Any of these may be valid claims. It simply is not possible, in a study such as this, to identify any broad transportation-related constraints which may be precluding new forest product manufacturing investment in the area.

There are other serious and diverse constraints to development. First among these is the issue of business climate. A good business climate is conducive to new investment: a poor one obviously is not. There are two

aspects of business climate. The first aspect is the existing image of an area such as northern Alberta (and more generally of Alberta and, in turn, Canada) for forest products investment. The second aspect is related to information. It involves the identification of specific investment potential and its active promotion through business development.

Business climate is an intangible but very important factor in determining the attractiveness of an area for new capital investment. It is a particularly strong factor where investment is being considered by companies based outside Alberta, on either a direct or joint-venture basis.

Fewer Studies Are Needed: and More Promotion is Required

Alberta scores very well in producing information and studies related to aspen potential. The evidence for this is the extensive number of literature citations contained in the appendices to this study. Alberta scores less favourably, however, in the identification and active promotion of specific investment options.

It should be recognized that in the past few years, many competing supply areas to northern Alberta have taken some unprecedented steps to attract new investments into their areas and to encourage existing industry to expand in higher value-added products. These steps include a wide range of incentives ranging from information packages for specific sectors (e.g. quantifying favourable investment conditions) to comprehensive financial and taxation treatment. Examples include some U.S. states and many overseas countries.

In the pulp and paper industry specifically, there has been a major and positive shift in the attitude of local and state/provincial governments to this sector compared with a decade ago. In the buoyant demand conditions of the early 1970's, when very favourable growth rates were anticipated to continue for a wide range of products, it was comparatively easy to attract new investment. Today, the situation has been reversed. Companies seeking expansion are faced with tough competitive conditions. They are selective in their investments and they are attracted to those areas which offer the greatest potential for success and which minimize the business risks inherent in new ventures.

Areas which offer the best investment climate usually are the first to attract new investment. Canada's recent history has not been good in this respect and, compared with earlier decades, only a limited amount of new investment has taken place in the forest products industry over the past ten years. It appears probable, that unless this changes, much of the potential for forest products production in northern Alberta may not be realized.

For Some Product Opportunities, The Lack of External Economies is a Constraint

Any region which has an established industrial structure in a particular technology, normally offers certain advantages to complementary industries commencing operations in the area. These external economies include an established labour force in the technology in question; management skills and various other factors such as an established infrastructure (e.g. suitable rail stock for shipping comparatively high valued papers); an established distribution network and so on. In this regard, regions such as British Columbia have external economies in bleached softwood kraft and newsprint. The U.S. Midwest has external economies in LWC papers and the U.S. Northeast (non-integrated) and U.S. South (integrated) in u/c woodfree papers. The existence of these factors enhances the relative attractiveness of one region over another for new related investment.

Northern Alberta's external economies in forest products are limited. At present they include items such as softwood lumber, waferboard and market pulp. For some of the new product opportunities identified in this study, the limited external economies which exist in northern Alberta are not necessarily an unsolvable problem providing that at least some of these factors (e.g. key trained operating personnel and management) can be brought into the region by an established producer of such grades from another region, or where such skills can be obtained through joint-venture, or affiliate, arrangements involving the producer and paper maker/paper user.

In another respect, however, northern Alberta does have reasonably good future prospects as far as development of its existing product base and related new products (e.g. market pulp) are concerned. The region already has a well established lumber, waferboard and bleached kraft pulp industry and most of the highly rated forest product development options identified in this study capitalize on these existing strengths.

An Aggressive Approach to Development Promotion is Necessary...

It is recommended that the NADC should direct its future policies for forest products development towards the active promotion of the aspen-based products short-listed earlier in this Executive Summary. These are the ones which will optimize northern Alberta's comparative strengths (competitive wood costs, its fibre resource quality and Alberta's plentiful supplies of low cost energy, compared with areas such as the U.S.).

...But Only After Development Strategies Have Been Carefully Considered

It is essential that before active promotion is undertaken, the NADC should coordinate this process with initiatives being undertaken by provincial government departments. Specifically, possible locations for an LWC plant (one of the options available to northern Alberta) have been discussed also in southern Alberta. Clearly, uncoordinated active promotion of the same development option, in say the U.S., by two or more organizations from Alberta would have an adverse impact on Alberta's chances of success.

Once Decided, These Strategies Should be Pursued Consistently

Experience in areas seeking development in forest products has shown that success normally is greatest where a) viable development options have been correctly identified before development initiatives have been undertaken and b) where the development authority has not tried to be "all things to all men." It is the responsibility of the NADC to satisfy itself that a) has been adequately researched. Subsequently, with respect to b), it will be **imperative to be consistent** in promoting the product options in which northern Alberta will be claiming it can offer very competitive and attractive investment conditions.

Even So, Development Will Be Gradual

Even under optimum business climate conditions in northern Alberta, it should be recognized that future expansion of the forest products industry in northern Alberta would be gradual. A few of the product options appear to have immediate investment potential, as discussed earlier, and the employment and income implications could be significant. Most others are medium to longer term. Clearly, it is possible, through special measures and incentive programs, to bring forward some of these medium and longer term options, as discussed earlier.

Three broad criteria have been used to evaluate potential development options (i.e. technical feasibility; economic feasibility and market outlook). In product options identified, northern Alberta varies in its ability to compete with other areas on each criterion. Moreover, many product options have been researched only at a general level and more specific targeting of future study work is required.

For general planning purposes, however, the very approximate timing of aspen-related forest products development in northern Alberta, under current assumptions, can be summarized as follows:

APPROX. TIMING OF FOREST PRODUCT DEVELOPMENT OPTIONS FOR NORTHERN ALBERTA

Period	Investment Options which Could Prove Viable
1985-1990	Aspen/Spruce Bleached CTMP
"	Light Weight Coated (LWC) Paper
"	Specialty Lumber Operations
1990-2000	Aspen Bleached Kraft Market Pulp
"	Uncoated Groundwood Papers
"	Waferboard/OSB
Beyond the year 2000	All Other Short-listed Investment Options

Some Immediate Initiatives Should Be Considered

In order to facilitate the early development of the highly ranked forest product options in northern Alberta, three specific initiatives should be considered. These are:

1. Aspen Harvesting Policy

The government of Alberta has developed a flexible and negotiable approach to forestry development. Whilst the maintenance of this flexibility is desirable, some clarification of harvesting policy and resource availability is necessary in order that viable development options can be correctly identified.

Hardwood AAC's should be recalculated at the earliest opportunity, taking into account age class distribution, decay-age trends, and softwood harvest schedules. This should facilitate realistic identification of areas with potential for viable economic development.

In areas defined as having good potential, more detailed clarification of policy is necessary as a prerequisite to the promotion of targeted product-market opportunities. The availability of these forest lands for both long term and short term hardwood utilization should be clarified in relation to alternative uses such as softwood production and agriculture. In recognition of the fact that only a proportion of existing stocks are likely to be successfully utilized, it will be necessary to realistically define (in terms of accessibility and quality):

1. what components of the resource operators will be obliged to utilize,
2. what components will be recognized as unusable,
3. what obligations the public and private sectors have to rehabilitate unusable stands, and
4. how local discontinuities in supply (resulting from age class imbalances) may be accommodated.

2. Promotional Package

It is recommended that, when its development strategies have been determined, the NADC (in coordination with the provincial and the federal government) should consider the preparation of a promotional package specifically for forest industry development (involving available softwood and hardwood resources) targetted to specific product-market opportunities.

Various examples of successful promotional packages prepared for areas outside Alberta have been discussed with the NADC and the Steering Committee. They are principally designed to inform potential investors. The issue of the possible need for industrial incentives has been raised by the Committee. This issue is outside the scope of this report. Such incentives may be found to be necessary, but it is suggested that a) the need and b) the extent of any incentives should be determined independently of this report.

3. Active Marketing to Potential Investors

A program of active marketing should be developed, in consultation with, or carried out by, the provincial government. This could arise out of the recently signed Canada-Alberta Forest Resource Development Agreement and should continue over a 4 to 5 year period.

Various examples of successful promotional packages proposed for areas within Alberta have been discussed with the NAIDC and the Steering Committee. They are principally designed to attract potential investors. The issue of the possible need for industrial incentives has been raised by the Committee. This issue is outside the scope of this report. Such incentives may be found to be necessary, but it is suggested that the need and of the extent of any incentives should be determined independently of this report.

Active Marketing to Potential Investors

A program of active marketing should be developed in consultation with, or carried out by, the provincial government. This could arise out of the recently signed Canada-Alberta Foreign Investment Development Agreement and should continue over a 5 to 10 year period.

N.L.C. - B.N.C.

3 3286 10432222 3